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ABSTRACT

This hearing was called to highlight the benefits of prevention of major diseases. Witnesses included representatives of the government, science, entertainment, and the fitness industry. Statements were made on the subjects of: (1) nutrition; (2) physical fitness; (3) prevention of heart disease; (4) prevention of cancer; (5) controlling hypertension; (6) lower back treatment; (7) orthopaedic rehabilitation; (8) disease prevention/health promotion initiatives by individual states; and (9) dietetics. (JD)

S. HRG. 99-513

NUTRITION AND PHYSICAL FITNESS IN PUBLIC HEALTH

HEARING

BEFORE THE

COMMITTEE ON LABOR AND HUMAN RESOURCES UNITED STATES SENATE

NINETY-NINTH CONGRESS

FIRST SESSION

OVERSIGHT ON DIET AND ITS ASSOCIATION WITH THE CAUSE AND PREVENTION OF CANCER, AND THE UTILIZATION OF QUALITY EXERCISE IN THE HEALTH CARE INDUSTRY

NOVEMBER 13, 1985

Printed for the use of the Committee on Labor and Human Resources

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NUTRITION AND PHYSICAL FITNESS IN PUBLIC HEALTH

WEDNESDAY, NOVEMBER 13, 1985

U.S. SENATE,
COMMITTEE ON LABOR AND HUMAN RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 9:38 a.m., in room SD-430, Dirksen Senate Office Building, Senator Orrin G. Hatch (chairman) presiding

Present: Senators Hatch, Kennedy, Metzenbaum, Kerry, Grassley, Simon, Nickles, and Dodd.

OPENING STATEMENT OF SENATOR HATCH

The CHAIRMAN. The committee will come to order.

We want to begin this hearing. I am pleased to welcome all of you today to this special full Labor and Human Resources Committee hearing devoted to nutrition and fitness.

We are holding this hearing to draw attention to what I believe is the most welcome change in attitude among our citizens about health and wellness.

So many of our legislative activities and national health policies have been directed at solving increasingly complex problems associated with illness and disease, problems which have created enormous economic and ethical dilemmas. But today, we are taking time to look at the bright side, to accentuate the positive, to celebrate the fact that more and more of our citizens are realizing that they can do more for themselves to ensure health and well-being than all the doctors and government programs put together.

As the Time magazine's managing editor, Ray Cave, states:

"A major change in modern life has been the increasing understanding of the benefits of fitness and preventive medicine. It is not a fad or craze. It is not a jog. It is here for the long run."

I have called this hearing to highlight the benefits of prevention. Many of you know that I have been working very hard to try to change some of the thrusts of our Federal programs to emphasize disease prevention and health promotion, not only because it is a smart thing to do, but because it will help us to save money for the Federal Government as well.

So we have called this hearing to highlight the benefits of prevention as a means of preventing disease, and to focus on the benefits of exercise and nutrition.

There is a growing body of scientific evidence supporting the notion that our most dreaded and common diseases, the major kill-

ers in our country, are in large part preventable. Heart disease, cancer, and stroke—our No. 1, 2, and 3 causes of death—still take an incredible toll in our society today, costing an estimated 1.6 million lives and $137 billion in medical care and lost productivity annually. A significant percentage of these are tragically unnecessary

The key to diminishing these staggering losses is prevention. As you will hear today, we are already making great strides. More Americans are exercising on a regular basis than ever before. Many people have begun to change their diets. These changes have included the types of foods they eat and the amount of food they are eating.

In addition, more people than ever are aware of the general health risks of alcohol and tobacco. It is important to note that women have been alerted to the specific risks posed by alcohol and cigarettes to their pregnancy.

Now, you do not have to be a regular jogger, a member of a health club, or on a strict diet to benefit from the fitness and nutrition movement. Little things like taking the steps instead of the elevator, or tasting food before adding salt can be significant.

This interest in fitness and nutrition has paid off in a big way. Since 1968, the rate of heart attacks has declined by 25 percent. This represents the prevention of 114,000 deaths annually. There has been an even larger decline in the number of strokes, which are down more than 40 percent over the last decade. Cigarette consumption has been on the decline for the last several years and is now at its lowest level per capita since 1944. The number of people who have quit has increased by 50 percent over the last 20 years.

Unfortunately, we still have a long way to go. About one-third of Americans are obese, and the majority of Americans are not getting enough exercise. Everyone has a different reason. They are too busy, too old, too sick, too tired, or exercise is too boring. This has been described as the "too" syndrome.

We have invited celebrated and accomplished people here today to help us in this effort. I am very pleased to welcome representatives from the highest level of Government, science and entertainment, and of course, the fitness industry itself here today.

Our first witness this morning, we will get to in just 1 minute, and we are happy to welcome you, Congressman Ritter, to testify before the committee, but first, we will turn to a man who himself is really quite fit and drives a lot of us crazy around the U.S. Senate because of all that fitness, but I have a lot of respect for Howard Metzenbaum and the health regimen that he lives.

So, let me turn to Howard Metzenbaum for any comments that he cares to make.

Senator METZENBAUM. Thank you, Mr. Chairman.

I want to say that I would be a lot more fit if you did not beat up on me so often.

The CHAIRMAN. You are such a nice subject to beat up on, Howard.

Senator METZENBAUM. I want to commend you for holding this hearing. I think the issue of fitness and nutrition is one that deserves the priority that you are giving it in this hearing.

At the same time, I want to pick up on the words that you spoke relative to people being concerned about the kinds of foods and the

types of foods that they eat and the amount of it. That ties in very much with the food labeling bill that Senator Hawkins and I have cosponsored and that is before this committee.

It is my firm belief that if we do not make available to the people in this country the facts with respect to calories in products being purchased, total grams of fat, total fat broken down by type, saturated, polyunsaturated, monounsaturated, and the specific common name of the fat or oil and do not permit the continued listing on a product such as saying, "Contains corn oil, soy oil, or lard"—well, that is fine. The first two, you are doing great; the third one, you get into a lot of trouble with. I think that people ought to be able to know exactly what is in the product, and that would be called for under our bill.

It also would call for the total milligrams of cholesterol and the total milligrams of sodium and potassium—how much salt they are ingesting.

So that I accept this hearing as being a particularly important one in highlighting concern to all of us having to do with the subject of nutrition and having to do with the matter of keeping fit. But I think if we are to implement the program, then I hope that we will see fit in this committee to move forward with our legislative proposals either in present form or in some modified form so that people can indeed learn what is in the products that they are purchasing and subsequently ingesting.

So I commend you, Mr. Chairman, for having the hearing and hope that it will provide some further basis for our moving forward with our labeling legislation.

The CHAIRMAN. Thank you, Senator Metzenbaum.

Senator Grassley.

Senator GRASSLEY. Thank you, Mr. Chairman.

I want to be very candid and say that even though I have views unrelated to the fact that my State is a leader in the production of food, I would be less than candid if I did not admit that that has some of my interest as well.

I think that the remarks that I made at our last hearing, the one on S. 1699, which dealt with nutritional labeling, are still very appropriate. On that occasion, I pointed out that most of us endorse the notion that we should try to understand as completely as possible the effects of food and diet on our physical and mental health.

It is sensible to support research into this matter, and it seems to me also sensible to try to make sure that the results of such research are provided to consumers in a way which allows them to make well-informed choices about what they eat.

However, it is also important, Mr. Chairman, for the public to be aware of the issues on which there is considerable controversy in the qualified scientific community, and this matter of the relationship between nutrition and disease is one in which there is considerable controversy, despite efforts to present recommendations as though they enjoyed the support and complete consensus within the scientific community.

Mr. Chairman, I would like to submit for the record the executive summary of a General Accounting Office study entitled, and I quote, "The National Academy of Sciences Report on Diet and

Health: Are they Credible and Consistent?" That is the end of the title.

The CHAIRMAN. Without objection, we will place it in the record.

[NOTE: In the interest of economy, the report referred to was retained in the files of the committee. However, if a copy is desired it may be attained from the General Accounting Office.]

Senator GRASSLEY. I recommend the GAO report to all those who are interested in finding their way in this policy area. Here, I would like to just call attention to several comments to be found in the conclusion of that GAO report.

The GAO concluded—and I quote—that "The scientific evidence required before providing public dietary advice to reduce chronic disease risk is a controversial matter in the scientific community."

It then went on to state—and I would quote again—"No standard of scientific evidence has been universally agreed upon for making public recommendations about diet's relationship to chronic disease risk."

And finally it said, referring to the two National Academy studies on nutrition and health that it studied, that, and I quote, "A discussion of the different schools of thought about public dietary advice would have provided a better context for policymakers as they assess the issue involved."

I would say to you, Mr. Chairman, that it seems to me that the same as what was said in the GAO study about scientific analysis of dietary advice might also be said of Senate committee hearings.

Finally, Mr. Chairman, I would also like to submit for the record an article from the New York Times, dated October 7, 1985, the point of which is well captured in the first paragraph of the article where it states, and I quote, "In an unusual move, the National Academy of Sciences announced today that some of the nation's most eminent scientists were in an irreconcilable conflict over proposals to alter the recommended levels of certain vitamins and minerals in the human diet."

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Grassley.

Let us turn to Senator Kerry.

Senator KERRY. Thank you, Mr. Chairman.

I am delighted to represent a State which has been pioneering a great deal in this field. But it is obvious to all of us, and the purpose of this hearing underscores the fact, that we have a great deal of distance yet to cover.

Today, according to a report—and I believe my colleague has mentioned it—by the National Academy of Sciences, nutritional factors are implicated in the etiology of 6 of the 10 leading causes of death in the United States: Heart disease, cerebrovascular disease, cancer, adult-onset diabetes, arteriosclerosis, and alcohol-induced sclerosis.

Moreover, that same report says that the role of diet in both the prevention and treatment of many conditions such as obesity, osteoporosis, gastrointestinal disorders, low birth weight, dental caries, iron deficiency anemia, and others, is clearly documented.

Now, that news is of obvious importance. Cancer and heart disease alone wreak an enormous social and economic cost on this country. Estimates indicate that coronary heart disease is responsi-

ble for more than 550,000 deaths in the United States each year. Cancer costs the economy of our country $37 billion annually.

If good nutritional practices can reduce the suffering and the anguish and the costs of these and other diseases, then obviously, we have an obligation to try to identify and to encourage those good practices.

But it is obvious that we have far to go. As a nation and as a world, we are faced with a very ironic set of nutritional dilemmas. We are simultaneously addressing the problem of both malnutrition and obesity. In the United States, obesity is the most prevalent form of nutritional problems. Thirty-two percent of men and 63 percent of women in our Nation are above what is known as "ideal weight," and at the same time, we know that many in our country suffer from caloric deficiencies, including the 10 to 15 percent of the infants and children of migratory workers and some poor rural populations who suffer both growth retardation because of dietary inadequacies.

In the world community, some 800 million persons are believed to suffer from hunger, with at least 450 million of those being children.

So we are faced with a situation where our dietary needs obviously vary. We need to know more about the effects of nutrition during pregnancy, during infancy, during childhood, and during the later years of life. And we need to understand the role of nutrition in the management of disease and its interaction with functions such as immunity.

These are difficult but vitally important challenges, and I think that today's hearing is an important step in the effort to draw from all walks of life to begin to understand how we can do a better job of getting America to understand this.

Unfortunately, over the years, nutrition and fitness have been areas fraught with myths and extremes. Uncertainty in our knowledge has allowed unscrupulous promoters to prey upon the fears of those concerned about their health, and as one consumer advocate recently noted. the public is not reading scientific literature; they are responding to Madison Avenue marketing.

Somehow, those of us in Government, industry, and the health professions have to find a way to develop, interpret and properly disseminate accurate and appropriate information about nutrition and fitness. It is difficult to do, but I look forward to the testimony today which will be part of the effort to do that.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you so much, Senator Kerry.

[The opening statements of Senators Kennedy and Dodd and the prepared statement of Senator Thurmond follow:]

OPENING STATEMENT OF SENATOR EDWARD M. KENNEDY

Senator KENNEDY. We are here this morning to hear about nutrition and fitness—two important elements of disease prevention. The benefits of prevention are extolled by many and clearly with good reason. Every individual stands to benefit from leading a healthy lifestyle.

But, while thousands of Americans are alive today who might not be if it were not for advances in prevention that have dramatically reduced our national incidence of heart disease, our success with other diseases and for many specific high risk populations has not been good.

The incidence of cancer continues to grow despite convincing evidence about the value of dietary changes and abstinence from smoking. We hear frequently about the increased use of cigarettes especially among young women and teenagers.

And, the disappointing statistics contained in the report of the Secretary of Health and Human Services establish that minority populations who stand to gain most through preventive strategies have hardly begun to reap any of the benefits of prevention.

The advantages to be gained through disease prevention are obvious, especially when compared with the expensive and grim alternatives. The evidence of its benefits is substantial and growing. Less obvious, though, are effective strategies for reaching people and affecting the necessary changes in their lives. This challenge should not be minimized.

Beginning with The Surgeon General's report, "Healthy People," in 1979, a series of federal studies issued by The Surgeon General and The Center for Disease Control have laid out a convincing road map toward a healthier America. But, the Reagan administration has failed to provide the leadership needed to achieve these goals. While much can be done at the state and community level, a national commitment is essential.

Preventive medicine saves lives and it saves money, but it will save fewer lives and less money if we do not support efforts to bring preventive medicine to the people of this country.

Yet, our government has behaved in this penny-wise fashion. For example, the WIC program has had a significant proven impact on iron deficiency anemia in many parts of this country. But, the Reagan administration has slashed the program.

Malnutrition had been stopped and even eliminated in many parts of this country by the food stamp and school lunch programs. But, now a new generation of American poor and especially poor children will suffer the effects of dietary deficiencies.

Hunger is the most preventable disease we have found. It would be particularly callous and irresponsible to turn our attention toward preventing disease for those who eat too much while ignoring the plight of those who can only afford to eat for part of each month.

I welcome the testimony here this morning because preventive medicine affords us such rich possibilities for the future.

STATEMENT OF SENATOR CHRISTOPHER J. DODD

Senator DODD. I am pleased to attend this hearing on a most important issue: Namely, the health and fitness of all Americans. Several months ago, this committee considered the effects of artificial sweeteners on the American Public. At that time, I raised the issue of the effect of such sweeteners on children, many of whom are consuming five or six sodas and an equal number of candy bars every day.

Last month, the Subcommittee on Children, Family, Drugs and Alcoholism on which I serve as ranking minority member held a hearing on nutrition and fitness as it pertains to the health of younger Americans. We heard from expert witnesses about the effect of fast food diets and sugar on the health of the 64 million Americans who are children. Just as importantly, we heard from experts about the physical fitness of our Nation's youth and the necessity for physical education and training at home and at school.

In my State of Connecticut, some schools are attempting to improve health and fitness training. At Wilton High School, for example, over the past 3 years students have been spending 3 days a week on fitness exercises. The rest of the week is spent on other sporting activities. Improvement on test scores for running, sit-ups, and stretching exercises has ranged from 7 percent to 17 percent likewise, the Simsbury public schools have initiated a physical fitness program for students, including a series of exercises students may practice at home. Recently, 52 Simsbury students received the Presidential award for fitness. Simsbury wants to continue its program, however, because the majority of its students still score below average on fitness tests.

In closing, I would hope that the focus on excellence in our public shcools would include physical fitness as well as scholastic achievements. I am certain that our witnesses this morning will be able to suggest ways to improve the health and fitness of future generations of Americans.

And, as we all know, health can be improved at any age. So, I look forward to hearing the testimony of the witnesses this morning about improving nutrition and fitness for Americans of all ages.

[The prepared statement of Senator Thurmond follows:]

STATEMENT OF SENATOR STROM THURMOND (R-SC) BEFORE THE SENATE LABOR AND HUMAN RESOURCES COMMITTEE REFERENCE FITNESS AND NUTRITION IN PUBLIC HEALTH, SD-430, NOVEMBER 13, 1985, 9:30 AM.

IT IS A GREAT PLEASURE TO BE HERE TODAY TO RECEIVE TESTIMONY ON FITNESS AND NUTRITION. I AM HAPPY TO HAVE EARNED A REPUTATION FOR TAKING THESE ISSUES VERY SERIOUSLY.

TO BECOME A SENATOR ONE MUST GAIN THE SUPPORT OF THE CONSTITUENTS. TO BECOME A SENIOR SENATOR, ONE MUST CONTINUE TO PLEASE THE CONSTITUENTS AND STAY HEALTHY.

I ASSUME THE HEALTH OF THE CAST IN A POPULAR TELEVISION PROGRAM IS ALSO VERY IMPORTANT TO ASSURE ITS LONG-TERM SUCCESS. MAYBE THAT IS WHY MS. EVANS, WHOSE TELEVISION HUSBAND IN DYNASTY IS A FEW YEARS OLDER THAN SHE, HAS ASKED ME FOR MY PERSONAL NUTRITION AND FITNESS SECRETS. UNLIKE SEVERAL OF THE OUTSTANDING WITNESSES HERE TODAY, I AM NOT QUITE READY TO WRITE MY FITNESS BOOK, AND PUBLICIZE THESE SECRETS.

IN ALL SERIOUSNESS, MR. CHAIRMAN, I COMMEND YOU FOR SCHEDULING THIS HEARING, AND FOR GATHERING SUCH AN IMPRESSIVE GROUP OF WITNESSES TO TESTIFY.

THIS COMMITTEE HAS BROAD JURISDICTION OVER HEALTH LEGISLATION. WE PASS MANY LAWS WHICH ARE DESIGNED TO IMPROVE THE QUALITY OF HEALTH CARE IN OUR NATION. FEDERALLY SUPPORTED RESEARCH HAS IMPROVED THE ABILITY OF THE MEDICAL PROFESSION TO SUCCESSFULLY TREAT VARIOUS DISEASES. WE ARE CHANGING THE LAW TO EMPHASIZE HOME HEALTH CARE, AND NOT EXPENSIVE INSTITUTIONAL CARE. DESPITE ALL THE GOOD CONGRESS MAY DO IN THE AREA OF HEALTH CARE, THERE IS NO SUBSTITUTE FOR THE COMMON SENSE APPROACH OF TAKING BETTER CARE OF OUR BODIES.

I FIRMLY BELIEVE THAT A DAILY EXERCISE PROGRAM, EATING A BALANCED DIET, GETTING SUFFICIENT SLEEP, AND STAYING AWAY FROM SMOKING AND ALCOHOL IMPROVES THE QUALITY AND THE QUANTITY OF LIFE.

THANK YOU ALL FOR BEING HERE. REGRETTABLY, I CANNOT STAY FOR THE FULL HEARING DUE TO PRIOR SCHEDULING CONFLICTS. HOWEVER, I LOOK FORWARD TO CAREFULLY STUDYING THE TESTIMONY WHICH WILL BE PRESENTED TODAY.

The CHAIRMAN. We are going to have a cloture vote at 10 o'clock sharp today, I believe, on the textile bill, so we are going to start right now, and hopefully, Congressman Ritter, we can finish with you before we have the vote.

Our first witness today will be Congressman Don Ritter. Dr. Ritter has a Ph.D. from the Massachusetts Institute of Technology and is a highly regarded scientist-legislator.

You and I have talked over the months about the importance of emphasizing the importance of prevention as it relates to health and the need for bringing this to the highest level of national awareness. So we feel very good in having you here, and we look forward to taking your testimony, Don, so please go ahead.

STATEMENT OF HON. DON RITTER, A REPRESENTATIVE IN CONGRESS, FROM THE STATE OF PENNSYLVANIA

Dr. RITTER. Thank you, Mr. Chairman, and members of the committee.

I think there is at least one witness here who is far more popular than I am, so I am going to try to get my testimony through as quickly as possible.

I am Don Ritter. I represent the Lehigh Valley of Pennsylvania. I am a runner. I am a fitness buff. I look after my diet. And I also serve on the House Subcommittee on Health and the Environment of the Energy and Commerce Committee.

I join you today in voicing concern that our Nation needs to continue and strengthen its commitment to preventive health measures. I am before you to support the bill to create a President's Council on Health Promotion and Disease Prevention which will be introduced in the near future by yourself, Senator Kennedy, and myself working closely with Congressman Waxman, to introduce similar legislation in the House.

Because of the critical need and importance of prevention measures, the President of the United States, through the President's Council on Health Promotion and Disease Prevention would focus national attention on health promotion and disease prevention, while encouraging individual and joint efforts among Government, business, health professionals, and community groups to take action in preventive activities.

As many persons in this room are acutely aware, Americans will spend nearly $1.2 billion every day for health care. This enormous financial burden weighs heavily on individuals, businesses and our society as a whole. Prevention, by looking to the future to avoid physical, emotional and financial burdens, is an effective way to help address health concerns and costs.

Prevention has proven to work very well. The case for heart disease illustrates this. In the last 15 years, the mortality rate from coronary heart disease in persons aged 35 to 74 has fallen more than 20 percent. Much of this is due to healthier lifestyles, including less cholesterol and fewer cigarettes, and perhaps these lifestyle changes played the biggest role in reducing the death rate.

This means that over 800,000 lives have been saved since 1968. This translates into an annual dollar savings of $10 billion in direct cost for care and treatment, in addition to the immeasurable value

of avoiding the psychological trauma of those affected by heart disease.

Mr. Chairman, public focus on prevention of consensus-acknowledged, health-damaging behaviors or risks also has the salutary effect of giving citizens some greater perspective on the hazards they face in a modern technological society.

Prevention programs already underway have, most naturally, engaged in priority rankings of hazards and risks that allow individuals to view their risk environment in more logical perspective.

Down the line, this can only be helpful to the intelligence of the health, safety, and environment regulatory process. This result would not deflect efforts away from air and water pollution, hazardous waste, food additives, et cetera, but would allow a system with scarce resources to use those resources more effectively.

Potential for prevention exists in key areas of injury and disease, such as motor vehicle accidents, fire accidents, cancer and stroke. For example, in hearings recently held by the science policy task force on the role of the social and behavioral sciences, we heard testimony regarding the recent research conducted on lights at eye-level in the rear of cars. Such lights are now being installed in cars and are preventing accidents. And many prevention methods can be promoted as simple, personal, voluntary acts: putting aside the salt shaker, watching one's diet, going out for regular, brisk walks or taking other regular exercise, getting sufficient sleep, installing a smoke detector, buckling up a seatbelt.

Already, several key sectors of our society have demonstrated an avid interest in prevention and recognize its significance. The Department of Health and Human Services has set up an Office of Disease Prevention and Health Promotion.

The 1990 Health Promotion Objectives established by the U.S. Public Health Service serve as an excellent blueprint for prevention actions on a national scale.

Mr. Chairman, at the vanguard of focusing attention on prevention has been Robert Rodale, chairman of Rodale Press, which publishes Prevention, the world's largest health magazine and has a readership of 3 million people. Rodale Press also sponsors the Prevention Index, a survey of people's attitudes and actions toward health-promoting behaviors which are defined by a cross-section of health experts, conducted by Lou Harris and Associates. Mr. Rodale for the past year has sought a way to motivate individuals, to make them aware, and to take more actions to ensure their own health.

The President's Council on Health Promotion and Disease Prevention, which he whole heartedly endorses, is a creative and potentially effective means to that goal.

The concept of individual actions is realized in this important legislation that you, Mr. Chairman, Senator Kennedy and I, working with Congressman Waxman, plan to introduce. According to the Prevention Index, in 1985, 70 percent of adults say that information from the media has motivated them to improve their health habits in the last 5 years.

Federal commitment to health prevention measures that will increase public awareness of disease prevention and health promotion is also important.

This administration, Mr. Chairman, prides itself on tapping grassroots citizens' efforts and then providing national coherence and motivation to such efforts. Such is the potential for a President's Council on Health Promotion and Disease Prevention.

Why shouldn't our most fitness-conscious, extremely healthy, senior citizen President lead the charge of a prevention-conscious America?

The President's Council on Health Promotion and Disease Prevention will be one important part of this Congress' actions to improve the health of Americans. The Council on Health Promotion and Disease Prevention would—and this list is by no means complete—crystallize the value of prevention in the public's mind; identify populations who can benefit most from increased emphasis on prevention and health promotion, developing programs for them, especially the poor, women, minority, and elderly populations, whose health at times lags behind; encourage State and local governments to emphasize prevention activities and research; evaluate available health promotion and disease prevention resources and suggest methods for better use of these resources.

Mr. Chairman, I commend you for taking an important step with the President's Council on Health Promotion and Disease Prevention in the fight to improve the health of Americans by increasing individuals' awareness of how they can themselves improve their own health

Thank you, Mr Chairman.

The CHAIRMAN. Thank you, Congressman Ritter.

We appreciate you taking time from a busy schedule and being with us today. We are grateful to have you here. Thank you for being with us.

[The prepared statement of Congressman Ritter follows:]

STATEMENT OF CONGRESSMAN DON RITTER

BEFORE THE

SENATE COMMITTEE ON LABOR AND HUMAN RESOURCES

REGARDING NUTRITION AND FITNESS

AND

THE PRESIDENT'S COUNCIL ON HEALTH PROMOTION AND

DISEASE PREVENTION

BILL OF 1985

NOVEMBER 13, 1985

The Need for More Emphasis on Preventive Health Measures

Good morning Chairman Hatch, and members of the Committee. My name is Don Ritter and I serve on the House Subcommittee on Health and the Environment of the Energy and Commerce Committee. I join you today in voicing concern that our nation needs to continue and strengthen its commitment to preventive health measures.

I am before you to support the bill to create a President's Council on Health Promotion and Disease Prevention, which will be introduced, in the near future, by Senators Hatch and Kennedy and by myself in the House of Representatives. Because of the critical need and importance of prevention measures, the President of the United States, through The President's Council on Health Promotion and Disease Prevention, would focus national attention on health promotion and disease prevention while encouraging individual and joint efforts among

government, business, health professionals and community groups to take action in preventive activities.

As many persons in this room are acutely aware, Americans will spend nearly $1.2 billion every day for health care. This enormous financial burden weighs heavily on individuals, businesses and our society as a whole. And prevention -- by looking to the future to avoid physical, emotional and financial burdens -- is an effective way to help address health concerns and costs.

Prevention has proven to work very well. The case with heart disease illustrates this. In the last 15 years, the mortality rate from coronary heart disease in persons aged 35 to 74 has fallen more than 20 percent. Healthier lifestyles -- including less cholesterol and fewer cigarettes -- played the biggest role in reducing this death rate. This means over 800,000 lives have been saved since 1968. And this translates into an annual dollars savings of $10 billion in direct co for care and treatment, in addition to the immeasurable value of avoiding the psychological trauma of those affected by heart disease. Public focus on prevention of consensus-acknowledged, health-damaging behaviors or risks also has the salutary effect of giving citizens some greater perspective on the hazards they face in a modern technological society. Prevention programs already underway, have, most naturally, engaged in priority rankings of hazards and risks that allow individuals to view their risk environment in more logical perspective. Down the line this can only be helpful to the intelligence of the health,

safety and environment regulatory process. This result would not deflect efforts away from air and water polluting hazardous waste, food additives, etc. but would allow a system with scarce resources to use those resources more effectively.

Potential for prevention exists in key areas of injury and disease, such as motor vehicle accidents, fire accidents, cancer and stroke. For example, in hearings held by the Science Policy Task Force on The Role of the Social and Behavioral Sciences, we heard testimony regarding the recent research conducted on lights at eye-level in the rear of cars. Such lights are now being installed in cars and are preventing accidents. And many prevention methods can be promoted as simple, personal, voluntary acts: putting aside the salt shaker, going out for regular, brisk walks, installing a smoke detector, buckling-up a seat belt.

Already several key sectors of our society have demonstrated an avid interest in prevention and recognized its significance. The Department of Health and Human Services has set up an Office of Disease Prevention and Health Promotion. The 1990 Health Promotion Objectives, established by the U.S. Public Health Service, serve as an excellent blueprint for prevention actions on a national scale. Still, many prevention activities that are effective remain under-used. And certain prevention needs are not being adequately addressed. Prevention measures deserve much more attention.

At the vanguard of focusing attention on prevention has been Robert Rodale, Chairman of Rodale Press, which publishes

Prevention -- the world's largest health magazine -- with a readership of 3 million people. Rodale Press also sponsors the Prevention Index, a survey of people's attitudes and actions toward health-promoting behavior defined by a cross section of health experts, conducted by Lou Harris and Associates. Working with Public Voice for Food and Health Policy, a non-profit consumer organization. Mr. Rodale for the past year has sought a way to motivate individuals to take more action to ensure their own health. The President's Council on Health Promotion and Disease Prevention, which he wholeheartedly endorses, is a creative and potentially effective means to that goal.

The concept of individual action is realized in this important legislation, that you, Mr. Chairman, and Senator Kennedy, plan to introduce. According to the Prevention Index 1985, 70% of adults say that information from the media has motivated them to improve their health habits in the last five years. Federal commitment to health prevention measures that will increase public awareness of disease prevention and health promotion is important.

This administration prides itself on tapping grass-roots citizens efforts and then providing national coherence and motivation to such efforts. Such is the potential for a President's Council on Health Promotion and Disease Prevention.

The President's Council on Health Promotion and Disease Prevention will be one important part of this Congress' actions

to improve the health of Americans. The President's Council on Health Promotion and Disease Prevention would:

- crystalize the value of prevention in the public's mind
- identify those populations who can benefit most from increased emphasis on prevention and health promotion and developing programs for them, especially for the poor, women, and minority population
- encourage state and local governments to emphasize prevention activities and research
- evaluate available health promotion and disease prevention resources and suggest methods for better use of these resources

Mr. Chairman, I commend you for taking an important step with The President's Council on Health Promotion and Disease Prevention in the fight to improve the health of Americans by increasing individuals' awareness of how they can improve their own health.

The CHAIRMAN. At this time, we will move to our first panel. Dr. C. Everett Koop is Surgeon General of the United States, who we are very grateful to have here, and Mr. Glen Swengros, of the President's Council on Physical Fitness and Sports.

I think before we take the testimony of Dr. Koop and Mr. Swengros, we do have a vote on the floor, and I think what we will do is recess, go over and get that vote over with, and then we should not have any more interruption and can get this thing moving. So, we will recess just for a few minutes and run over and come right back.

[Short recess.]

The CHAIRMAN. If we could have order.

Without objection, we will place a statement by Senator Thurmond in the record, immediately following the opening statement of Senator Dodd.

We are very happy to welcome our first panel here. First, I would like to introduce Dr. C. Everett Koop, the Surgeon General of the U.S. Public Health Service, who has just been reconfirmed for his second term of office.

Dr. Koop advises the public on health matters such as smoking, nutrition, environmental hazards, immunizations, and disease prevention. Dr. Koop went to great effort to be with us here today. He flew in from an important meeting in Los Angeles, or at least, on the west coast, and I believe he is going to have to fly out at about 11 today.

So, Dr. Koop, as soon as you are through testifying, we will be happy to excuse you. But we are very, very appreciative that you have taken the time to be with us today, because this is an important hearing, and it just would not be as important without having you here.

Second, I would like to introduce Mr. Glen Swengros, Director of Federal-State Relations of the President's Council on Physical Fitness and Sports. Working with State departments of education, Mr. Swengros keeps abreast of all legislation affecting physical education programs.

We want to welcome both of you here this morning, and we appreciate your being here. We would like to limit all witnesses to 5 minutes if we can, so we can have some time for questions

We will start with you, Dr. Koop.

Senator KENNEDY. Mr. Chairman, if I could, I would like to join in welcoming our witnesses today and also commend you for chairing these extremely important hearings. I think that what we are going to hear today will be of enormous importance to not only the members of the committee and the Senate, but also for the country.

I just want to mention the fact that in the whole area of disease prevention and health promotion, one of the very important areas is nutrition, and I am very much concerned about the failure of us as a society to meet this particular need. If there is one problem we know how to deal with in our country, it is how to feed people. We are debating now what Congress is going to do with enormous surpluses, expenditures of billions of taxpayers' dollars to find out the problems—particularly expectant mothers who are eligible for the WIC Program; increasing numbers of individuals who are not get-

ting the kind of nutrition they need, the prenatal, postnatal, perinatal care, something of enormous importance, and problems of hunger in other parts of our society are something that is enormously important, as well as the kinds of issues that we are going to raise today.

I do not want to diminish the importance of the kinds of recommendations, and the expertise, and the knowledge that we are going to hear today, because I feel very strongly that it is of great significance and importance. But I do want to flag at the very outset of the hearings that we have seen a continuing and ongoing reduction in essential nutrition programs for the most vulnerable people in our society, and when we are talking about fitness, this is an area which I hope we will be able to explore during the course of these hearings.

I thank you, Mr. Chairman, and I welcome our witnesses.

The CHAIRMAN. Thank you so much, Senator Kennedy.

Dr. Koop, we will turn to you.

STATEMENT OF DR. C. EVERETT KOOP, U.S. SURGEON GENERAL, ACCOMPANIED BY DR. J. MICHAEL McGINNIS, ASSISTANT SURGEON GENERAL AND DEPUTY ASSISTANT SECRETARY FOR HEALTH (DISEASE PREVENTION AND HEALTH PROMOTION); AND GLEN SWENGROS, REPRESENTING THE PRESIDENT'S COUNCIL ON PHYSICAL FITNESS AND SPORTS

Dr. KOOP. Thank you, Mr. Chairman.

I appreciate the opportunity to speak before this committee on the role of nutrition and physical fitness in public health from the perspective of the U.S. Public Health Service.

With me this morning is J. Michael McGinnis, Assistant Surgeon General and Deputy Assistant Secretary for Health—Disease Prevention and Health Promotion.

The CHAIRMAN. We are glad to have you, Mr. McGinnis. By the way, I want to personally tell you my appreciation for you coming out to Utah and participating in our Women's Conference, which was really a great success, thanks to people like you.

Dr. MCGINNIS. My pleasure.

The CHAIRMAN. Go ahead, Dr. Koop.

Dr. KOOP. Mr. Chairman, the health of Americans is, of course, primarily an individual, personal concern, but it is also a national concern and one which we have learned to be positively influenced by public policy as well as by publicly supported research and services.

Assessments of the health status of the American population indicate that we as a nation are healthier and live longer now than at any prior time in history. Many improvements in health status are due to advances in clinical treatment achieved in the last several decades. But a sizable portion of these gains is attributable to application of what we have learned about preventing disease.

Research into the various leading causes of death and disability for Americans has identified a number of controllable factors and suggested that our previous reliance on "a pound of cure" may have lulled us into giving too little attention to the effectiveness of the proverbial "ounce of prevention."

A shift in public policy occurred with the recognition of the potential of prevention for bringing about greater improvements in the health of Americans. This shift was enunciated in the book, "Healthy People—The Surgeon General's Report on Health Promotion and Disease Prevention," published in 1979. Since its publication, "Healthy People" has served as a focal point for a national policy the goal of which is the promotion of health and the prevention of disease.

An outgrowth of this basic promotion document was the publication in 1980 of "Promoting Health/Preventing Disease—Objectives for the Nation." Several hundred experts from across the country participated in that objective-setting process which addressed 227 items in 15 areas deemed to be high public health priorities; 2 of these 15 areas are nutrition and physical fitness—the subjects of your hearing today.

We have become convinced that activity targeted to these two areas can help reduce unnecessary risks and enhance good health.

For example, dietary factors have been found to play a significant role in a number of disorders such as cancer, atherosclerosis, hypertension, and anemia. Physical exercise and physical fitness have also been found to help reduce risks of hypertension, osteoporosis, and contribute indirectly to lower rates of problems like heart disease and diabetes.

Since 1980, when "Promoting Health/Preventing Disease" was first published, the Public Health Service has been engaged in research, public education, and monitoring, and surveillance efforts, whose purpose has been to facilitate a national improvement in health behavior across all 15 areas, including nutrition and physical fitness.

This year, 1985, we are engaged in what we have termed our mid-course review of the 1990 health objectives, allowing us to assess what progress has been made, what midcourse corrections might be in order, and what increased attention may be required to meet the objectives that were set in 1980.

Let me give you a few examples about what we know about the health of Americans in the area of nutrition and physical fitness and what new efforts are being considered:

OBESITY.

Obesity is a function of both nutritional and physical exercise, and data now available suggest we need improvement nationally in this area, though our midcourse estimate of progress is awaiting the results of 1985 surveys. We started from a baseline in the late 1970's of 28 percent of adults being overweight. That is equivalent to about 34 million people, 20 years of age and older, who are at risk for those chronic diseases associated with overweight and obesity.

For example, in the last National Health and Nutrition Examination Survey, 1976–80, about 60 percent of black women, aged 45 to 64, were overweight, as were 30 percent of white women of that same age.

CHOLESTEROL

The objective of reducing the proportion of adults with serum cholesterol levels from 230 milligrams by at least 50 percent started from a base estimate in 1980 that showed high serum cholesterol levels in middle-aged men and women. About 25 percent of men and 30 percent of women have levels over 240 milligrams.

Meanwhile, concerns about the effects of this problem of hypocholesterolemia has led us to mount a National Cholesterol Education Program, modeled on the earlier successful National High Blood Pressure Education Program, which is beginning on November 15 under the leadership of the National Heart, Lung, and Blood Institute and the Food and Drug Administration.

In spite of not having the estimates in for 1985, we do have surrogate measures provided by food consumption surveys that indicate there has been about a 15-percent decline in fat consumption between 1960 and 1980.

NUTRITION AWARENESS

An objective to increase public awareness about the association between diet and disease shows some significant progress, especially regarding such conditions as atherosclerosis and hypertension. For example, nearly 60 percent of Americans report making an effort to avoid high cholesterol foods. The recently revised "Dietary Guidelines," published jointly by the Department of Agriculture and the Department of Health and Human Services, addresses both this particular objective and a more general concern, to make a series of positive recommendations to the American public about what constitutes a healthful diet.

A recent evaluation of the use of more than 7 million copies of the first edition of "Dietary Guidelines" found widespread adoption by private and public sectors for such purposes as menu planning, curriculum development, food preparation practices, and public education efforts.

YOUTH FITNESS

Our objective to increase the proportion of children and youth participating in appropriate physical fitness programs faces the serious challenge in the next 5 years of increasing the number to 90 percent of the population. Yet our national children and youth fitness study last year indicated that 50 percent of today's youth do not receive appropriate physical activity, and that body fat measurements of children 10 to 17 are significantly higher than they were for children of the same age in the 1960's. We are planning to assist public schools and youth-serving organizations by providing criteria to better define what such programs entail and case studies of exemplary programs.

ADULT FITNESS

Physical exercise for adults, especially for the older population, is posed as an objective capable of reducing disease and disability among those over 65. Our estimates indicate that even though one-third of adults say they exercise vigorously, only about 10 to 20

percent of adults over 65 actively engage in appropriate physical activity. Our objective calls for 50 percent by the year 1990. Our healthy older people public education program, undertaken in cooperation with the Administration on Aging, is addressing this health behavior, along with nutrition and four other elements of health for older Americans.

Now, the question of fitness has ramifications that go far beyond physical exercise and nutrition, to include factors such as smoking, alcohol, and drug use, and we have mixed news to report on the progress to date in these areas.

With smoking, the objective to reduce the proportion of the population who smokes to below 25 percent for adults and below 6 percent for children and youth faces serious challenges as we now are coming down to the hardcore, heavy-smoker population. However, since smoking is the single most important preventable cause of mortality and morbidity in our country, efforts to influence people to quit smoking and to prevent young people from ever starting are at the top of our agenda—and, I might add, also have a very personal commitment of my own; 2 weeks ago, the National Center for Health Statistics reported on the first quarter of this year on the prevalence of smoking in America and if the three quarters that follow keep up with the first quarter, we will, for the first time in history, drop below 30-percent prevalence of smoking in this country.

As far as alcohol and drug abuse objectives go, we called for a reduction in alcohol-related automobile accident fatalities from a level of 11.5 per 100,000 to 9.5 per 100,000 by 1990. In 1983, this figure already had been reduced below our 1990 objective, to 9 per 100,000, and that was through extensive efforts by highway safety, law enforcement, public health, and very effective grassroots organizations.

The objective on the use of drugs by young people, age 18 to 25, addresses important fitness issues. It calls for holding the proportion of users at a no-growth level. The 1985 survey of high school seniors provides disturbing evidence that the 5-year downward trend in the use of illicit drugs among high school seniors has unfortunately leveled off.

Cocaine was tried by 17 percent of the 1985 class of high school seniors, the highest rate observed so far in this continuing survey; 15 percent of high school seniors report using marijuana one or more times in a 30-day period, and 15 percent report using some drugs other than marijuana, which is far above our target of less than 1 percent.

These are only a few of the many fronts on which we have engaged the risks to public health posed by poor nutrition, lack of adequate physical exercise, and related problems. Others include nutritional labeling to assist consumers to make better choices; public education programs aimed especially at high-risk populations such as pregnant women and infants, partnerships with private sector businesses to bring health promotion, and fitness programs to employees at their worksites and cooperative projects with organizations such as the American Dietetic Association, the Society for Nutrition Education, the American School Health Association, and the American Association of School Administrators to

address nutrition and fitness issues through their professional memberships.

As a final comment, sir, I want to report that progress is being made on a major project with the guidance of our departmental Nutritional Policy Board to publish in 1986 a Surgeon General's report on nutrition and health. This report will provide a comprehensive analysis of the current state of our knowledge about the relationships of nutrition with diseases and conditions that continue to cause premature death and untold suffering and economic loss to Americans. Its development by scientists primarily within the U.S. Public Health Service is receiving careful peer review by nutrition scientists across the country.

Our purpose in preparing and promulgating the Report on Nutrition and Health is to provide a firm foundation for public health policy related to nutrition as we move forward to meet our 1990 objectives and beyond that, as we formulate our national health goals and strategies for the next decade leading to the year 2000.

Thank you, Mr. Chairman. I would be happy to respond to any questions.

[The prepared statement of Dr. Koop and responses to questions submitted by Senators Hatch and Grassley follows:]

STATEMENT

BY

C. EVERETT KOOP, M.D.

SURGEON GENERAL

PUBLIC HEALTH SERVICE

U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Before the

COMMITTEE ON LABOR AND HUMAN RESOURCES

UNITED STATES SENATE

November 13, 1985

Mr. Chairman, thank you for the opportunity to speak before this committee about the role of nutrition and physical fitness in public health from the perspective of the U.S. Public Health Service. I am C. Everett Koop, Surgeon General of the U.S. Public Health Service. With me today is J. Michael McGinnis, Assistant Surgeon General and Deputy Assistant Secretary for Health (Disease Prevention and Health Promotion).

The health of Americans is, of course, primarily an individual, personal concern. But it is also a national concern, one which we have learned can be positively influenced by public policy as well as by publicly supported research and services. Assessments of the health status of the American population indicate that we as a nation are healthier and live longer now than in any prior time in history. Many improvements in health status are due to advances in clinical treatment achieved in the last several decades. But a sizable share of these gains is attributable to application of what we've learned about preventing disease. Research into the various leading causes of death and disability for Americans has identified a number of controllable factors, and suggested that our previous reliance on a "pound of cure" may have lulled us into giving too little attention to the effectiveness of the proverbial "ounce of prevention."

A shift in public policy occurred with a recognition of the potential of prevention for bringing about greater improvements in the health of Americans. The shift was enunciated in Healthy People - The Surgeon General's Report on Health Promotion and Disease Prevention, published in 1979. Since its publication, Healthy People has served as a focal point

for a national policy the goal of which is the promotion of health and the prevention of disease. An outgrowth of this basic health promotion document was the publication in 1980 of Promoting Health/Preventing Disease - Objectives for the Nation. Several hundred experts from across the nation participated in that objective-setting process which addressed 227 items in 15 areas deemed to be high public health prevention priorities. Two of those 15 areas are nutrition and physical fitness--the subjects of your hearing today. We have become convinced that activity targeted to these two areas can help reduce unnecessary risks and enhance good health. For example, dietary factors have been found to play a significant role in a number of disorders such as cancer, atherosclerosis, hypertension, and anemia. Physical exercise and physical fitness have also been found to help reduce risk of hypertension and osteoporosis and contribute indirectly to lower rates of problems like heart disease and diabetes.

Since 1980, when Promoting Health/Preventing Disease - Objectives for the Nation was published, the U.S. Public Health Service has been engaged in research, public education and monitoring and surveillance efforts whose purpose has been to facilitate a national improvement in health behavior across all of the 15 areas, including nutrition and physical fitness. This year--1985--we are engaged in what we have termed our "mid-course review" of the 1990 Health Objectives, allowing us to assess what progress has been made, what mid-course corrections might be in order, and what increased attention may be required to meet the objectives that were set in 1980.

Let me give you a few examples of what we know about the health of Americans in the areas of nutrition and physical fitness and what new efforts are being considered:

- Obesity--Obesity is a function of both nutrition and physical exercise, and data now available suggest we need improvement nationally in this area, though our mid-course estimate of progress is awaiting the results of 1985 surveys. We started from a baseline in the late 1970s of 28 percent of adults being overweight; that's equivalent to about 34 million people 20 years of age and older who are at risk for those chronic diseases associated with overweight and obesity. Hanes survey

- Cholesterol--The objective to reduce the proportion of adults with serum cholesterol levels above 230 mg/dl by at least 50% started from a base estimate in 1980 that showed high serum cholesterol levels in middle-aged men and women. The next National Health and Nutrition Examination Survey in 1988 will chart our progress in this objective. Meanwhile, concern about the effects of this problem of hypercholesterolemia has led us to mount a National Cholesterol Education Program, modeled on the earlier successful National High Blood Pressure Education program, which is beginning on November 15 under the leadership of the National Heart, Lung and Blood Institute and the Food and Drug Administration.

- Nutrition Awareness--An objective to increase public awareness about the association between diet and disease shows some significant progress, especially regarding such conditions as atherosclerosis and hypertension. The recently revised Dietary Guidelines, published jointly by the Department of Agriculture and the Department of Health and Human Services, addresses both this particular objective and a more general concern to make a series of positive recommendations to the American public about what

constitutes a healthful diet. A recent evaluation of the use of the more than 7 million copies of the first edition of the Dietary Guidelines found widespread adoption by private and public sectors for such purposes as menu planning, curriculum development, food preparation practices and public education efforts.

- Youth Fitness--Our objective to increase the proportion of children and youth participating in appropriate physical fitness programs faces the serious challenge in the next five years of increasing the number from 66% to 90% of the population. We are planning to assist public schools and youth-serving organizations by providing criteria to better define what such programs entail and case studies of exemplary programs.
- Adult Fitness--Physical exercise for adults, especially for the older population, is posed as an objective capable of reducing disease and disability among those over 65. Our estimates indicate only about 10% to 20% of adults over 65 engage in appropriate physical activity. The objective calls fo 50% by the year 1990. Our Healthy Older People public education program, undertaken in cooperation with the Administration on Aging, is addressing this health behavior, along with nutrition and four other elements of health for Older Americans.

The question of fitness has ramifications that go beyond physical exercise and nutrition to include such factors as smoking, alcohol and drug use. We have mixed news to report on the progress to date in these areas.

- Smoking--The objective to reduce the proportion of the population who smoke to below 25% for adults and below 6% for

children and youth also faces serious challenges. A downward trend in the proportion of the adult population who smoke faces resistance as we get to the hard-core, heavy-smoker population. The trend in smoking among adolescents seems to have plateaued in the last year rather than continuing its previous decline, exemplary in boys, dropping from about 30% to about 20% in 3 years. Obviously, since smoking is the single most important preventable cause of mortality and morbidity in our country, efforts to influence people to quit smoking and to prevent young people from ever starting are at the top of our agenda--and, I might add, also a personal commitment of my own.

- Alcohol--The alcohol and drug abuse objectives called for a reduction in alcohol-related automobile accident fatalities from a level of 11.5 per 100,000 to 9.5 per 100,000 in 1990. In 1983, this figure had already been reduced to 9.0 per 100,000, through extensive efforts by highway safety, law enforcement, public health and very effective grassroots organizations.
- Drug Use--The objective on use of drugs by young people age 18 to 25 addresses an important fitness issue. It calls for holding the proportion of users at a no-growth level. The 1985 survey of high school seniors provides disturbing evidence that the five-year downward trend in use of illicit drugs among high school seniors has unfortunately leveled off. Cocaine has been tried by 17% of the 1985 class of high school seniors, the highest rate observed so far on this continuing survey. Fifteen percent of high school seniors report using marijuana one or more times in a 30 day period, and 15 percent report using some drug other than marijuana, far above our target of less than one percent.

These are only a very few of the many fronts on which we have engaged the risks to health posed by poor nutrition, lack of adequate physical fitness and related problems. Others include:

- o nutrition labeling to assist consumers to make better choices about what foods to eat;
- o public education programs aimed especially at high risk populations such as pregnant women and infants;
- o partnerships with private sector businesses to bring health promotion and fitness programs to employees at their worksites; and
- o cooperative projects with organizations such as the American Dietetic Association, the Society for Nutrition Education, the American School Health Association and the American Association of School Administrators to address nutrition and fitness issues through their professional memberships.

As a final comment, I want to report that progress is being made on a major project, with the guidance of our Departmental Nutrition Policy Board, to publish in 1986 a Surgeon General's Report on Nutrition and Health. This report will provide a comprehensive analysis of the current state of our knowledge about the relationships of nutrition with diseases and conditions that continue to cause premature death and untold suffering and economic costs to Americans. Its development by scientists primarily within the U.S. Public Health Service is receiving careful peer review by nutrition scientists across the country. Our purpose in preparing and promulgating the report on nutrition and health is to

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provide a firm foundation for public health policy related to nutrition as we move forward to meet our 1990 Objectives and, beyond that, as we formulate our national health goals and strategies for the next decade leading to the year 2000.

Mr. Chairman, I will be happy to respond to any questions. Thank you again for this opportunity.

Questions from Senator Hatch

1) Dr. Koop, can you give us some examples of the progress you cited has been made in the areas of nutrition and fitness over the last 5 years?

The principal, documentable progress in nutrition and fitness over the past five years relates to public awareness about the relationship of diet and health and the relationship of exercise and health. Recent studies conducted by the Food and Drug Administration and the Centers for Disease Control estimate that public awareness objectives for 1990 in the priority areas of nutrition and physical fitness and exercise have already been met as of 1985, with 75 percent of the population correctly associating the principal dietary factors known or strongly suspected to be related to disease and 50 percent understanding the positive association of exercise with cardiovascular fitness. Data are not readily available to document the degree to which the increase in public awareness has translated into increases in the number of people who have adopted healthier eating habits and patterns of exercise.

2) What factors do you think are primarily responsible for the reduction in cigarette use and what is now needed to continue this downward trend?

There can be no doubt that reductions in smoking prevalence and cigarette consumption experienced over the past 20 years are a direct result of concerns about the health consequences of smoking. Before the 1964 report of the Advisory Committee on Smoking and Health, even anecdotal reports of smoking cessation were infrequent, and both smoking rates and per capita cigarette consumption were increasing.

In 1964, over 50% of adult males and approximately a third of adult females were regular cigarette smokers and per capita consumption stood at 4,345 cigarettes annually and increasing. In 1985, an estimated 33% of adult males and 28% adult females are smokers and per capita consumption is now at its lowest level since the mid-1940s at 3,384 cigarettes.

These reductions are the direct result of programs carried out by all levels of society to educate the public about specific health risks associated with cigarette smoking.

Further reductions in smoking prevalence can be achieved and even accelerated with intensified educational programs that are coupled with supportive social and economic policy.

3) In your opinion, what are the most effective national efforts to promote the public's knowledge of fitness and nutrition?

Our experience with national public awareness and public education programs suggest that effective programs have a number of features. They must take into account the existing beliefs, attitudes and practices of people. For example, we are learning that people are very aware of what not to eat--fats, sugar, salt--but are confused about what constitutes a healthy diet. They may say they want to reduce cholesterol, but not understand why that is important or how to do so. Information programs must investigate very carefully what the intended audience thinks in order to communicate effectively. Materials must then be carefully reviewed by professionals to assure accuracy and by the audience to be sure they are understandable before being produced and distributed.

We also know that materials and information must be reinforced by information from health professionals, the media, and other sources. We must be creative in communicating information. For instance, grocery store chains which offer nutrition information on shelf labels can support people selecting healthier foods.

Community-wide support for healthier lifestyles is very important. Besides information about specific exercise routines, accessible facilities and opportunities to use them are critical.

In sum, no single activity will assure success, but carefully tailored information and chances for people to practice their new lifestyle habits can lead to the healthier behaviors. Current Federal programs, such as "Healthy Older People" and "Healthy Mothers, Healthy Babies," have been developed with these factors in mind.

4) I am pleased to hear that you are preparing a Surgeon General's Report on Nutrition. This is likely to be highly regarded by the public, as is your report on Smoking and Health. How do you see this nutrition report being used? Is it going to be a guideline for healthy eating, or is it going to be a technical document for scientists?

The Surgeon General's Report on Nutrition and Health has been designed to provide a review of the key scientific issues in nutrition and health. It is recognized that the nutrition policy on a national level involves a highly complex process and that recommendations involving changes in food intake or dietary habits have concomitant influences on food production, employment, and food prices. These issues are beyond the scope of the report. Neither will it make definitive or final judgments regarding nutrition and health. It will identify key nutritional factors related to public health, review their status and relative importance, and assess the strengths and implications of their association with health/disease issues. It will support the newly released, second edition of the DHHS/USDA dietary guidelines for healthy people, but it will not make specific recommendations on dietary habits or specific foods which should or should not be incorporated into the diets of the American public. In addition, this document will not address the issue of determining nutrient requirements.

The report will highlight the most recent state-of-the-art research insights. It will not, however, take a textbook approach. For example, there will not be extensive discussions of physiologic systems, metabolic pathways, or chemical structures, except for illustrative purposes related to central themes. Rather, for each chapter topic, the focus is to be on the identification, discussion and documentation of current scientific issues. The content of the report can be categorized into 5 areas:

1. Nutrient influence on health
2. Dietary patterns and practices
3. Food health fraud and fadism
4. Diet-related disease status
5. Implications of nutrition on the health of special groups

The major objective of the Surgeon General's Report on Nutrition and Health is to provide the scientific base for health care strategies and policy decisions affecting government programs and public health nutrition.

The report is a public document available to anyone. However, the language and format are directed to reasonably well-educated and informed individuals who depend on thorough scientific documentation as the basis for decision about health care delivery, public education and public health recommendations. The general public will benefit from this report, especially as a supporting document to the USDA/DHHS dietary guidelines. Nutritional scientists may find it useful as a review of current scientific findings on high priority research topics.

5) I understand Federal nutrition activicies are dispersed throughout government agencies. Do you think it would be useful to have a central nutrition office which could coordinate all research and public education activities?

We already have coordination of nutrition activities among government agencies which is crucial to the effective and timely implementation of nutrition programs. We do not feel that coordination necessarily has to be accomplished by a central office. The Department enjoys a close working relationship with USDA in nutrition research and public education activities. The Department of Health and Human Services (DHHS) already has an effective mechanism in place in the form of the Nutrition Policy Board to coordinate various departmental activities. This Board is made up of high level representatives of the relevant DHHS/Public Health Service agencies. The Board's charge is to:

1. Develop overall nutrition policy
2. Report on high priority issues to the Assistant Secretary for Health
3. Act as a steering committee for various nutrition programs in the Department of Health and Human Services

The Committee is chaired by the Assistant Secretary for Health.

Questions from Senator Grassley to Dr. Koop

Q. Dr. Koop, you mentioned that the Department is going to publish in 1986 a Surgeon General's Report on Nutrition and Health. I have several questions to put to you about this report.

How are people selected for the departmental Nutrition Policy Board? And is an effort made in selecting them to get a diversity of opinion represented from within the scientific community?

A. The Nutrition Policy Board (NPB) is the major vehicle within the Department of Health and Human Services (DHHS) for coordinating nutrition policy development and program implementation. The board:

- Provides a forum for the regular exchange of information on DHHS nutrition activities.
- Oversees the review and approval of nutrition-related reports requested by the Congress, the Secretary, or other senior officials.
- Facilitates the sharing of DHHS resources allocated to nutrition.
- Provides advice and counsel to the Secretary of DHHS on major policy issues pertaining to nutrition.
- Recommends nutrition-related initiatives to the Secretary of DHHS.
- Serves as a point of contact for nutrition policy matters with other agencies of the Federal Government, as well as relevant non-Federal agencies and organizations.

The members of the Nutrition Policy Board are policy officials from DHHS' agencies that have nutrition programs or oversight responsibility of nutrition activities. The make up of the Board is as follows:

Chairperson: Deputy Assistant Secretary for Health (Disease Prevention and Health Promotion)

Agency representation:

- Alcohol, Drug Abuse and Mental Health Administration (ADAMHA)
  - Deputy Administrator
- Centers for Disease Control (CDC)
  - Assistant Director (Washington)
- Food and Drug Administration (FDA)

- Director, Bureau of Foods

- Health Resources and Services Administration (HRSA)
  - Associate Administrator, Clinical Affairs

- National Institutes of Health (NIH)
  - Deputy Director

- National Center for Health Statistics (NCHS)
  - Director

- Office of International Health (OIH)
  - Director and Surgeon General

- Office of Human Development Services (OHDS)
  - Deputy Assistant Secretary

- Office of Legislation (OL)
  - Deputy Assistant Secretary

Each member represents the position of his or her respective agency. Although the Board acts as a body, various agencies have the lead responsibility for various nutrition activities:

Nutrition Education (HRSA)

Nutrition Research Training (NIH)

Nutrition Services and Manpower (OHDS)

Nutrition Status Monitoring (CDC and NCHS)

Food Safety, Quality and Regulation (FDA)

International Nutrition (OIH)

The Board is designed to utilize and provide input from experts in all areas of nutrition.

Q. What was and is the role of this Board in the development of the Surgeon General's Report on Nutrition and Health.

A. The Nutrition Policy Board acts in an advisory capacity to the Public Health Service and the coordinating staff responsible for producing the Surgeon General's Report on Nutrition and Health. Specifically, the Nutrition Policy Board:

- Identified topics to be included in the Report.

- Reviewed the outlines of each of the chapters contained in the Report.

- Selected an advisory panel of eight nutrition scientists from outside the DHHS to review the Report.

The panel represents expertise from the basic sciences, food sciences, clinical nutrition, nutrition education, and public health nutrition.

- Will make decisions regarding problems related to style or content of the Report which cannot be resolved by the Public Health Service agencies' staff responsible for drafting the Report.

- Will review the final draft of the Report as part of the government clearance process.

Q. Where is the responsibility for preparation of this Report lodged in the Public Health Service and what components of the PHS are doing what in its preparation.

A. Public Health Service agencies were assigned responsibility for preparing various chapters of the Report according to their missions and expertise. The lead agencies, their assignments, and agency contacts are listed in Table 1.

Q. With respect to the review by nutrition scientists across the country, are you making efforts to be sure that a cross-section of nutrition scientists review the Report?

A. Every effort has been taken to ensure that the leading nutrition scientists across the country have been included in the review process of the Surgeons General's Report on Nutrition and Health. In addition to PHS agency review and clearance, technical editing and review by the Nutrition Policy Board and their Editorial Advisory Panel, the Report is being reviewed by approximately 120 nutrition scientists from all areas of the nutrition field--two reviewers for each chapter in two rounds of review. The editorial review consists of the following steps:

1. Chapter drafts were developed through whatever mechanism is preferred by the responsible agency. Collaboration and communication among agencies is encouraged.

2. Preliminary reviews and revisions of each chapter were accomplished within the responsible agency by whatever mechanism is preferred to reach first draft form.

3. A thorough technical edit of each chapter was made as each chapter was received by the Office of Disease Prevention and Health Promotion. The editing suggestions, corrections, and clarifications are being forwarded to the lead agencies and the necessary changes made and approved before the chapters are sent out for scientific review.

4. Outside reviewers were identified for each chapter through nomination by the responsible agencies and consultation with major scientific organizations in nutrition.

TABLE 1

OUTLINE

SURGEON GENERAL'S REPORT ON NUTRITION AND HEALTH

Chapter 1:	Introduction and Summary	*ASH/NPB*
Chapter 2:	Nutrients	*FDA/CFSAN*
Chapter 3:	Dietary Patterns and Practices	*FDA/CFSAN and NCHS/DHES*
Chapter 4:	Obesity	*NIH/NIADDK*
Chapter 5:	Coronary Artery Disease	*NIH/NHLBI*
Chapter 6:	Hypertension	*NIH/NHLBI*
Chapter 7:	Cancer	*NIH/NCI*
Chapter 8:	Diabetes Mellitus	*NIH/NIADDK*
Chapter 9:	Anemia	*NIH/NIADDK*
Chapter 10:	Caries and other Dental Disease	*NIH/NIDR*
Chapter 11:	Gastrointestinal Diseases	*NIH/NIADDK*
Chapter 12:	Renal Disease	*NIH/NIADDK*
Chapter 13:	Skeletal Disease	*NIH/NIADDK*
Chapter 14:	Infections and Immune Disorders	*NIH/NIAID*
Chapter 15:	Nervous System Disorders	*NIH/NINCDS*
Chapter 16:	Behavioral Disorders	*ADAMHA/NIMH*
Chapter 17:	Nutrition in Pregnancy and Infancy	*CDC/CHPE and NIH/NICHD*
Chapter 18:	Nutrition and Aging	*NIH/NIA*
Chapter 19:	Nutrition and Alcohol	*ADAMHA/NIAAA*
Chapter 20:	Effects of Drugs on Nutritional Status	*FDA/CDB*
Chapter 21:	Food Fadism and Fraud	*FDA/CFSAN*

Target audience: nutrition policy makers

Focus: highlights of most recent state-of-the-art research insights, not encyclopedic or a textbook approach

Chapter length: discretion of responsible agencies (5-10 typeset pages is acceptable but not restrictive)

Chapter format (4-21): 3 sections: a) historical context (5-15%); b) highlights of research insights on key issues (70-90%); c) implications for dietary guidance and nutrition policy (5-15%).

5. Upon completion of the revised first draft, the text is being sent to: two designated outside reviewers for each chapter. Editorial advisors and other DHHS agencies with expertise in the subject area for any given chapter are also provided an opportunity to review first drafts of each chapter. All comments will be sent directly to the responsible agency official for incorporation into the second draft.

6. Upon completion of the second draft, the text will be sent to: two additional designated outside reviewers for each chapter, Editorial advisors, the staffing working group of the Nutrition Policy Board and; USDA scientific staff will be provided an opportunity to review second drafts of each chapter.

7. Upon completion of the third and final draft, the full text will be sent for review of: a) editorial advisors to the Nutrition Policy Board; b) DHHS Nutrition Policy Board members; c) PHS Agency Heads; d) normal DHHS clearance channels.

8. Throughout the process a technical contractor will provide editorial, graphic, photocomposition and bibliographic services. All editing changes proposed in the interest of consistency and readibility of presentation will be returned to the responsible agency official for approval.

Q. Are you going to follow the GAO recommendation I cited earlier in my opening remarks to wit: Would a discussion of the different schools of thought about public dietary advice have provided a better context for policy makers as they assess the issues involved?

A. In addressing this question one must consider the objective and purpose of the Surgeon General's Report on Nutrition and Health. The major objective of the Report is to provide policy-makers and health care providers with a review of the science base for the key issues in nutrition and health. The Report will identify the main nutritional issues related to public health and make statements as to their current status in th U.S. population and their relative importance to disease prevention and health promotion efforts in the nation. Using the most recent state-of-the-art research insights, the report will estimate the strength of association between health and various nutritional factors. The report will not make definitive or final judgments regarding nutrition and health. Rather, the focus will be on the identification, discussion, and documentation of key scientific issues important to the formulation of current nutrition policy and public recommendations.

Because of their proximity to the Federal policy making bodies and their involvement in addressing the problems of diet and public health, the scientists of the Public Health Service are in

the best position to identify the major diet and health issues and review and interpret the science base for these problems. Through the mechanism set up for the production and review of the report, both the government nutrition experts and those of the private sector will have major input into the final document. The process allows the report to present a balanced review of the state-of-the-art in nutrition research and a wide range opinions and conclusion on controversial and/or unresolved issues.

Q. Dr. Koop, you said that "physical exercise for adults, especially for the older population, is an objective capable of reducing disease and disability among those over 65."

What do you mean by the "older population" here? And does a person ever become too old to benefit from properly supervised exercise? Can you give us some indication of what we might expect to achieve through exercise among the elderly--some sense of what improvement in function or decline in disability we can expect?

A. Exercise and physical fitness play a central role in maintaining health and wellbeing as we age. While more research will help us fully define the benefits of exercise with older populations, there is substantial evidence that regular, vigorous exercise improves cardiovascular fitness and reduces the risk of heart problems. This is true for all age groups, including those over 65. By beginning slowly, increasing gradually, and having proper supervision most people can safely undertake a beneficial program of activity such as walking or swimming.

Besides cardiovascular benefits, exercise that helps maintain strength and flexibility is important for all people. Stretching, flexing and increasing range of motion can benefit even those in poor health. Special programs have been implemented for people confined to wheelchairs and bed or for those with joint problems such as arthritis. The benefits of increased feeling of well being, greater comfort in everyday activities, sounder sleep, and feeling better about oneself are well documented.

Carefully programmed exercise has been shown to ameliorate muscular and cardiovascular declines previously assumed irreversible and has been shown to reverse the loss of calcium which is associated with osteoporosis.

We have seen the benefits of exercise demonstrated for all older ages and ability levels. It is very important to educate the public and professionals about the importance of exercise in maintaining health and well being.

Q. How about nutrition? What sort of benefit can we expect there? Would you agree with the statement Miss Evans will make on the next panel, to the effect that: "Improved nutrition among the elderly may reduce hospitalization and other health care costs and improve their overall quality of life?"

A. The last twenty years have witnessed a virtual explosion of information regarding the role of diet in the onset of chronic diseases. Research has demonstrated the role of fats and cholesterol in the onset of coronary heart disease, the relationship of salt with hypertension and high fat and low fiber diets with over 30 percent of cancers, and the lack of calcium associated with osteoporosis. We also know the importance of diet in controlling diabetes and other chronic conditions.

We know, for example, that among middle aged and older men, a one percent reduction in blood cholesterol levels results in a two percent decrease in heart attack risk. Thus, those reducing blood cholesterol levels by 25 percent could cut heart attack risk in half.

While more research is clearly needed to continue to quantify the benefits of changing dietary practices and prevention of disease among all age groups, I do believe we could expect a reduction in disease and disability. Much work is needed, however, to educate the public and professionals about how to put this knowledge into practice before the results will be widespread.

The CHAIRMAN. Thank you, Dr. Koop.

Mr. Swengros, we will turn to you at this time. We are going to limit you to 5 minutes and all other witnesses from here on in. We did think it was very important to listen to all that the Surgeon General had to say, because he has really been leading the fight in this area throughout the country. But we also think it is extremely important to have you here, and the work that you and George Allen and others are doing is extremely important to this country.

Mr. Swengros?

Mr. SWENGROS. Thank you very much, Mr. Chairman.

Our chairman, Mr. George Allen, regrets that he could not be here today, and I am flattered to be able to replace him.

The work of the President's Council on Physical Fitness and Sports is generally confined to exercise and physical fitness. However, it recognizes that appropriate nutrition is necessary to fitness, health, and physical performance.

Physical fitness is so vital to good health, productivity and the quality of life, it has been incorporated into the 1990 Health Promotion and Disease Prevention Objectives for the Nation, which were established by the Public Health Service under President Carter and continued under President Reagan.

Two of the 15 topic areas of this program are Physical Fitness and Exercise, and Nutrition. This national emphasis is built around the identification of individual habits and behaviors which are counterproductive and result in poor health, disability, death, loss of productivity, and the related economic cost to this country.

While the interest and responsibility of the PCPFS is related to health, it is important to note that physical fitness is also essential for other aspects of American life, including safe and effective work efforts, leisure pursuits and improved intellectual stimulation.

More of our citizens are exercising than at any other time in our recent history Heart disease statistics have declined. Many more young women are given opportunities in sports and fitness programs. Special populations are participating more. And worksite programs in fitness are growing, both in the private and public sectors.

All of this is good news, and it is significant. But when we look at the segments of the population which exhibit problems that could be overcome or alleviated by appropriate exercise, we can see there is still much to be done.

Seventy-five million Americans suffer from back ailments, which totally disable 2.5 million. Back ailments cost industry $14 billion a year and result in 93 million days of absenteeism. The average annual health care cost for the elderly has risen from $712 in 1977 to $1,526 in 1984.

Obesity is a significant factor in health problems, and some studies indicate as many as 30 percent of our adults are at risk because of their obesity.

The Council's own hearings on youth fitness in 1984 brought out that many children show signs of degenerative diseases; obesity is on the increase; fewer students are in physical education, and less time in the schoolday is given to physical education.

In summary, adequate physical fitness is vital to the health and productivity of individuals. Many Americans are exercising regularly and recent trends in this direction indicate it is a change in our culture and not just a fad.

There are still many Americans who do not exercise adequately. It has been Federal public policy to encourage physical fitness programs and emphasis.

It is respectfully recommended that Congress take an active role in emphasizing the importance of physical fitness in the development of policy, support and leadership to encourage programs in this area; emphasis be directed toward all of America, but priority at this time be for youth, older adults, worksite programs, and the special populations of working women, minorities, and the disabled. Particular attention be paid to leadership personnel in the schools, in youth groups, in retirement homes and aging centers, and at the business site, to be sure that there is adequately experienced and trained instructors to give direction to programs and provide resources to help fitness leaders, whether they be paid professionals or volunteers.

Thank you for this opportunity to testify.

The CHAIRMAN. Thank you, Mr. Swengros.

[The prepared statement of Mr. Swengros follows:]

THE PRESIDENT'S COUNCIL ON PHYSICAL FITNESS AND SPORTS
WASHINGTON, D.C. 20001

SENATE COMMITTEE ON LABOR AND HUMAN RESOURCES

"The Role of Nutrition and Fitness in Public Health"

Testimony from the
President's Council on Physical Fitness and Sports
George Allen, Chairman

November 13, 1985

The President's Council on Physical Fitness and Sports (PCPFS) was established by President Eisenhower because of a concern about youth fitness in America. The Council has been continued by each administration for the past 29 years, but subsequent Presidents have broadened the responsibilities to include programs and initiatives for all ages. These Presidents have believed physical fitness to be important in peoples lives and have given the Council responsibility for developing and coordinating efforts to highlight this priority. The intent has been to establish a national policy view of the administration which states that regular participation in physical fitness and sports activities is important to America and to individual Americans.

The PCPFS defines physical fitness as "the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies. Physical fitness is essential for good health and mental performance as well as for safe and effective performance in physical activity such as household chores, work and recreation."

Research, case studies and clinical observation have shown the following areas to be positively influenced by improved physical fitness:

1. Degenerative diseases such as heart disease, hypertension, diabetes, hypercholesteremia, low back problems and osteoporosis
2. Obesity
3. Mental Health - depression, anxiety, stress
4. Productivity, absenteeism and employee morale
5. Health care costs
6. Mental performance
7. Growth and development of children and youth
8. Dynamic living and the quality of life

In its responsibilities of being a catalyst and promoter of programs and motivation for fitness, the Council works with Congress; the Administration; other government agencies at federal , state and local levels; voluntary organizations; private enterprise; civic groups; and individual citizens. Specific programs and emphasis coming from this effort have touched children and youth, people at the worksite, older adults, adults in general, women and special groups. The enclosed list of on-going projects, programs and services gives an overview of some of these activities. A large majority of this effort is carried out with corporate public service support. Programs come under four general categories:

1. Public Information - articles, booklets brochures, a newsletter and television and radio programs are part of a continuous

public information campaign to increase the public's awareness of the importance of physical fitness;

2. Program Development - cooperative programs with State and local governments, voluntary organizations, professional associations, sport governing bodies, private enterprise and other Federal agencies to promote physical fitness leadership, facilities and programs.

3. Technical Assistance - advisory services in related areas.

4. Special Programs - national conferences and testing, recognition and incentive programs for individuals, institutions and organizations.

While the work of the Council is generally confined to exercise and physical fitness, it recognizes that appropriate nutrition is also important to fitness, health and physical performance. A number of projects which have significant nutrition elements are carried out each year. These efforts always incorporate the emphasis and expertise of offices from other agencies such as the Department of Agriculture, the Office of Disease Prevention and Health Promotion and the National Institutes of Health. In addition, private organizations such as the American Medical Association, the American College of Sports Medicine, the American Alliance for Health, Physical Education, Recreation and Dance and various corporate sponsors have been involved.

Physical fitness is so vital to good health, productivity and the quality of life that it has been incorporated in the health objectives for the nation established by the Public Health Service under President Jimmy Carter and continued under President Ronald Reagan. Two of the major areas in this program of the Public Health Service are physical fitness and exercise and nutrition. This national emphasis is built around the identification of individual habits and behaviors which are counterproductive and result in poor health, disability, death, loss of productivity and the related economic cost to this country. The programs of the Health Objectives of the Nation are designed to establish a cooperative effort between the Federal Government and other government and private entities to prevent disease and promote good health.

While the interest and responsibility of the PCPFS is related to health, it is important to stress that physical fitness is essential for other aspects of American life, i.e., safe and effective work efforts and leisure pursuits and improved intellectual stimulation.

The above-mentioned activities describe the fact that physical fitness has been an important part of public policy. These efforts have received such overwhelming response and support that there is little doubt Americans expect and want this leadership and emphasis from the Federal Government. A recent survey on health care cost containment showed that respondents believe, by a strong margin, that the best way to achieve the highest state of health quality is to make overt efforts to shift the focus of medical plans from acute to preventive care.

More of our citizens are exercising than at any time in recent history, heart disease statistics have declined, many more young women are given opportunities in sports and fitness programs, special populations are participating more, and worksite programs in fitness are growing both in the public and private sectors. All of this is the good news and it is significant. But, when we look at the segments of the population which exhibit problems which can be overcome or alleviated by appropriate and adquate exercise, we can see there is still much to be done.

Some of the evidence that more needs to be done is as follows:

1. 75 million Americans suffer from back ailments which totally disable 2.5 million. Back ailments cost industry $14 billion in 93 million days of absenteeism and disability each year.

2. The average annual health care costs for the elderly has risen from $712 in 1977 to $1,526 in 1984.

3. The economic cost of cardiovascular disease in 1984 was $64.4 billion.

4. Obesity is a significant factor in health problems and some studies indicate as many as 30 percent of adults are at risk because of their obesity.

5. The PCPFS' own hearings on youth fitness in 1984 brought out that many children show signs of degenerative diseases, obesity is on the increase, fewer students are in physical education and less time in the school day is spent on physical education, school dropouts and adolescents arrested for crime have poor fitness levels, performance on fitness tests is poor for large numbers of students, and the school curriculum needs to emphasize fitness more.

In summary:

1. Adequate physical fitness is vital to the health and productivity of individuals.

2. Many Americans are exercising regularly and recent trends in this direction indicate it is a change in our culture and not just a fad.

3. There are still many Americans who do not exercise adequately.

4. It has been Federal public policy to encourage physical fitness programs and emphasis.

It is respectfully recommended that:

1. Congress take an active role in emphasizing the importance of physical fitness and in the development of policy, support and leadership to encourage programs in physical fitness;

2. Emphasis be directed toward all of America, but priority at this time be for youth, older adults, worksite programs, and the special populations of working women, minorities and the disabled;

3. Particular attention be paid to leadership personnel in the schools, in youth groups, in retirement homes and aging centers, at the business site, etc., to be sure there is adequately experienced and trained administrative leadership to give direction to programs and provide resource help to activity practitioners whether they be paid professionals or volunteers.

The PCPFS will be pleased to work with the Senate Committee on Labor and Human Resources to explore ways of implementing these recommendations, or others, which will improve the physical fitness of our citizens.

Respectfully submitted

Ash Hayes

Ash E. Hayes
Executive Director
President's Council on Physical
Fitness and Sports

PRESIDENT'S COUNCIL ON PHYSICAL FITNESS AND SPORTS

On-Going Projects/Programs/Services

Presidential Physical Fitness Award for Youth Aged 10-17
State Demonstration Centers Program for School Physical Education
A Study of the Physical Fitness of American Youth Aged 6-17
FITNESSGRAM - A School Physical Fitness Report Card
A Film and Teachers Guide Program to Emphasize Physical Fitness in School Physical Education
Regional Clinics on Physical Fitness and Sports for Teachers, Coaches, Fitness Leaders, Recreation Personnel, etc.
National Physical Fitness and Sports Month
The 1990 Objectives for a Healthy Nation, Physical Fitness and Exercise
Business and Industry Symposium - A two-day symposium to promote and assist in the development of physical fitness programs in the work place
Governors Councils on Physical Fitness and Sports
Health and Fitness in the Armed Services
National Fitness Coalition in Recreation
Presidential Sports Award
State Games - A cooperative project with the U.S. Olympic Committee and individual State Governors Councils
BIZNET Television Programs
National Women's Leadership Conference and Follow-up
Public Service Advertisement Program - Television, radio, and print ad fitness promotion
Healthy American Fitness Leader Awards Project with Jaycees and Allstate Insurance
Federal Employees Physical Fitness Emphasis
Public Information Mail-outs on various Physical Fitness Subjects
National 4-H Council - Summer Youth Fitness Program
Cooperation with the Navy Department on Youth Fitness
Fitness Calendars - Cooperative project with Shedd Brown, Inc.
Co-Sponsor of Marine Corp Marathon
National Fitness Classic
School Poster on Presidential Physical Fitness Award
News Releases on various Current Fitness Topics
Motivational Posters on Fitness featuring Council Chairman Allen
Council Newsletter
Project Perfect Fit with WRC-TV
Technical Service - Response to a multitude of telephone calls and written requests for information from the general public, news media, professionals in various fields of physical fitness and sports, business and industry, medicine, other government agencies at the local, state, and Federal level, etc.
Speeches at National Conferences/Meetings
Meetings with International Visitors coming through Washington

The CHAIRMAN. Now, there have been a number of reports that American youth are less fit today than in the past. Could you give us your ideas and the ideas of your groups on why this is happening—or is it true?

Mr. SWENGROS. Yes, sir, it is true. A major culprit is the fact of priorities in the school curriculum-staff reductions for teachers of physical education and phys. ed requirements in our schools. And secondarily is all the distractions that young people have after school. If they are not going to be there to participate actively in sports programs that are supervised

The CHAIRMAN. Some have said that fitness programs are predominantly a middle-class phenomenon. Is that true? Is there any reason for it? What can we do to get everybody involved in fitness?

Mr. SWENGROS. I think that it is a middle-class phenomenon for adults. But, I think it is a problem with all economic classes in youth, because they get their primary exposure to physical activity through school physical education programs, and when those programs are diminished, the opportunity for youngsters to participate in supervised exercise also is diminished.

The CHAIRMAN. Now, do little changes in lifestyle, like walking up steps, just plain walking after eating, or at any other time during the day, do they have a significant effect on fitness, or do we have to encourage our young people, or anybody, for that matter, to go into full-fledged exercise programs?

Mr. SWENGROS. There are two options here. One, we prepared a statement for Senator Hawkins' committee on obesity in youth, and we found in the research that even a small amount of physical activity will increase the basal metabolic rate, and that rate will carry over for many hours after the activity, which is an aid to reduction of excess weight through the expenditure of calories.

Dr. Jean Mayer, the president of Tufts University, once said that if you want to maintain ideal body weight, you have to do one of two things—either increase caloric expenditure through exercise, or face a lifetime of hunger.

Now, we think it is important that people learn to exercise and get 300 calories a day of exercise and be able to eat to satisfaction and gain the nutrients and vitamins that are in the food that they eat, and not starve themselves in order to maintain proper body weight.

The CHAIRMAN. Thank you.

Senator Kennedy.

Senator KENNEDY. I would direct my questions, if I could, to Dr. McGinnis. Dr. Koop has left.

The CHAIRMAN. He has headed back to California. He flew all night long to get here, and he is going right back.

Senator KENNEDY. Well, to be very frank about it, if we were going to have time, I would rather have asked him some questions about what the administration is doing on the preventive block grant program for Health Promotion and Disease Prevention.

A lot of the legislation, a lot of this information, we have had for a long time. I can remember back in the late seventies, our committee sponsored with the AMA a proposal on disease prevention and health promotion That resulted in the passage of legislation for the development of various centers around this country, very

similar to the centers that were passed in the cancer program which have been very successful, and those programs have not been funded, and I would have liked to hear from Dr. Koop why.

I would like to know why there has not been greater emphasis by the administration on the block grant program to reach out to the various States in these various areas—in hypertension, in disease prevention and health promotion. Those programs were passed. There was a series of individual statutes that were put together in a block grant program. There has not been the funding for that program. There has not been the effort behind it.

The things we are hearing today are enormously important, very useful, things that the American people ought to hear time in and time out. But we should not delude the American people that we do not know about this program and the needs, or that this is the first time we are coming to address it.

I continue to be distressed by the fact that when we know how to deal with iron deficiency and anemia, we see continued reductions in the WIC Program, and the cutting back on school breakfast and lunch programs, food stamp programs—which the greatest utilizers of those programs are children and generally single women who are heads of household, and disabled people.

We saw even on the vote, which fortunately we were successful on yesterday, about not including the fact that we have home heating, low-income fuel assistance to be considered as an income supplement for those who are getting food stamps—we saw a very substantial group in the Senate who wanted to include that so that people who are in the lowest income levels of our country were going to be denied nutrition.

So I think, Mr. Chairman, it is worthwhile to talk about the importance of the whole range of different behavioral needs of our society and the importance of this for us as a country, but we also have to recognize that we have some areas that we know can directly impact and have an important impact in terms of the goals we hope to achieve, which are being let go.

Dr. McGinnis, that is a long and kind of general comment, and I can become more precise—but I would be interested in whatever you might like to say in terms of defense of the administration in some of those areas. I would like to get them in the record. I did not see them in Dr. Koop's statement, and you are our expert in this, and I would welcome whatever comment you would like to make.

Dr. McGinnis. I am the substitute. I am happy to take that on. It is my job. After all, the word "substitute," comes from the Latin verb, "stituere," which is a derivative of "statuere"—a word that had evolved in to our word "statue." So, freely translated, "substitute" means you take an underling and you set him up. [Laughter.]

Senator Kennedy. You look like you can survive pretty well, and have survived pretty well.

The Chairman. Yes; you are anything but that, Mike.

[Laughter.]

Dr. McGinnis. I am happy to take that one on, because we have a very active program and agenda in prevention. We are moving quite aggressively to implement the goals of the Surgeon General's report, as well as the specific objectives in promoting health and

preventing disease, and we have a vigorous outreach effort to work with States and localities to see that they have similar goals and objectives at that level. Indeed, to one extent another 33 States have already replicated the process at that level.

Senator KENNEDY. Can you provide that for the record, the States which are doing it and the States which are not?

Dr. MCGINNIS. Yes; I will also provide a comprehensive implementation plan that we published 2 years ago, that lists all of the Federal activities in that respect.

[Information supplied for the record follows:]

EXHIBIT 1: DISEASE PREVENTION/HEALTH PROMOTION INITIATIVES BY STATE (As of 10/1/89)

State	Level 1: Dissemination of the 1990 Objectives	Level 2: Preparation of Statewide Health Status Review	Level 3: Disease Prevention/Health Promotion (DP/HP) Mentioned in State of the State Address	Level 4: Innovative DP/HP Programming	Level 5: Attention to Relationships with Local Health Offices	Level 6: Recent Creation of State DP/HP Organizational Unit	Level 7: Installation of New Long-Range Strategic Planning System	Level 8: Statewide or Multi-State DP/HP Conference Convened or Planned	Level 9: Established State Objectives for 1990 or Beyond
Alabama	X	X		X					
Alaska	X								X
Arizona	X		X	X			X	X	X
Arkansas	X								
California	X	X			X				
Colorado	X	X						X	
Connecticut	X	X		X		X			
Delaware	X								
District of Columbia	X			X					
Florida	X			X					X
Georgia	X		X		X		X		
Hawaii	X	X						X[1]	
Idaho	X								
Illinois	X								
Indiana	X								
Iowa	X			X					
Kansas	X		X	X	X				
Kentucky	X			X					
Louisiana	X								
Maine	X	X		X			X		X
Maryland	X	X		X			X[2]		X
Massachusetts	X	X		X					X
Michigan	X		X	X		X		X	
Minnesota	X	X		X		X			
Mississippi	X	X				X			X
Missouri	X			X		X			
Montana	X	X						X[3]	X
Nebraska	X	X	X	X	X			X	X
Nevada				X					
New Hampshire	X	X		X		X	X	X	

See notes at end of table.

EXHIBIT I DISEASE PREVENTION/HEALTH PROMOTION INITIATIVES BY STATE (As of 10/1/85)—Continued

State	Level 1 Dissemination of the 1990 Objectives	Level 2. Preparation of Statewide Health Status Review	Level 3: Disease Prevention/Health Promotion (DP/HP) Mentioned in State of the State Address	Level 4· Innovative DP/HP Programming	Level 5· Attention to Relationships with Local Health Office	Level 6: Recent Creation of State DP/HP Organizational Unit	Level 7: Installation of New Long-Range Strategic Planning System	Level 8· Statewide or Multi-State DP/HP Conference Convened or Planned	Level 9· Established State Objectives for 1990 or Beyond
New Jersey	X	X	X		X			X	
New Mexico	X	X	X	X	X		X		X
New York	X[1]		X						X
North Carolina	X	X			X		X		
North Dakota	X			X		X			
Ohio	X		X	X		X			
Oklahoma	X			X					
Oregon	X	X							X
Pennsylvania	X								
Puerto Rico	X	X							
Rhode Island	X	X		X				X	
South Carolina									
South Dakota	X	X		X					X
Tennessee	X	X		X	X	X	X		X
Texas	X	X		X	X			X	X
Utah	X	X	X	X					X
Vermont	X	X		X		X		X	X
Virginia	X				X			X	X[3]
Washington	X			X	X	X			
West Virginia	X	X		X		X		X	
Wisconsin	X			X					
Wyoming	X			X		X			X

1 Planned for Dec. 1985. 2. Planned for 1985 - 1986. 3. Planned for February 1986.

EXHIBIT 2: SUMMARY OF THE NUMBERS OF STATES ENGAGED IN ACTIVITIES RELATED TO THE 1990 OBJECTIVES (AS OF 10/1/85)

Level and Activity	No. of States*
Level 1: Dissemination of the 1990 Objectives	50
Level 2: Preparation of Statewide Health Status Review	25
Level 3: Disease Prevention/Health Promotion (DP/HP) Mention in State of the State Address	10
Level 4: Innovative DP/HP Programming	31
Level 5: Attention to Relationships With Local Health Office	11
Level 6: Recent Creation of State-Funded DP/HP Organizational Unit	12
Level 7: Installation of New Long-Range Strategic Planning System	8
Level 8: Statewide or Multi-State DP/HP Conference Convened or Planned	13
Level 9: Established State Objectives for 1990 or Beyond	17

* Includes the District of Columbia and Puerto Rico.

Dr. McGINNIS. I will also provide for the record this publication, just out this week, Prevention 1984-85, which chronicles quite extensively the Department's activities in prevention.[1]

But let me address one issue which has been on my mind lately and I think is worth particularly mentioning in this body, and it relates to the signals we get from Congress on prevention. There are various functions the Federal Government can serve in prevention, including those such as agenda-setting; direct services provision; research, and so forth and so on. We have identified about 10 or so of prevention-related functions that the Federal Government has an obligation to perform.

Our view is that two of the most important of these are the research and leadership functions.

Senator KENNEDY. Two things in the NIH bill.

Dr. McGINNIS. I would like to focus particularly on the leadership component, because our research agenda, as you know, is quite active. You will hear about that later, and Congress has paid considerable attention to that.

One of the reasons I would like to give special focus to the leadership function is that, frankly, we get some mixed signals from Congress on that count. The President, in very tough economic times, proposed to maintain the level of funding for the administration's effort to provide leadership in prevention. But the Congress, your own Senate Appropriations Committee, has indicated that they want to cut that budget. So I think I would like to throw that ball back into your court a bit.

Senator KENNEDY. Senator Hatch and I will work to remedy that, won't we Orrin?

The CHAIRMAN. We will. In fact, we are going to do everything we can to overturn the veto on the NIH bill—my bill, if you can imagine.

Go ahead.

Senator KENNEDY. In the NIH, as you are very familiar—and we know what that function and purpose is for the research—included in that were assistant directors in the various institutes in the area of prevention, and I think that is one of the important factors—not clearly that we can do all of this, certainly, ourselves, but that there are things which are proven. There are so many areas of legislation where we do not know what the outcome is going to be, and there are sincere people with differing views who come to completely different conclusions about how to address certain public policy questions.

But it seems to me that on nutrition, we know what is needed, we know how to do it, we know it does have a cost factor. But it is something that we ought to be willing to address.

I would just point out that as I understand the WIC Program now, one-third of the mothers and kids were medically at-risk, and there would have been under the administration's proposal 175,000 fewer women than were served in the last year with the proposal.

So I just want to indicate I completely and enthusiastically support what we are trying to do in terms of the promotion and what

[1] The material referred to was retained in the files of the committee.

we have to expect individuals to do and what we can get States to do, and that is a matter of communicating and getting people to understand the importance of it, and this hearing, I think, plays a significant role. But tied to that there are some extremely important areas of public policy which we ought to also address, and I hope we can keep your eye on both of them.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Kennedy.

Senator Nickles.

Senator NICKLES. Mr. Chairman, I compliment you for the hearing.

I was kind of bothered by one thing that Dr. Koop mentioned, and I regret that he had to leave, but maybe Mr. Swengros or Dr. McGinnis could answer this. I think he mentioned that there had been a decline in the number or percentage of cocaine users in high school, but that decline seems to have leveled out, and I think he said 17 percent, and I think he mentioned 15 percent for marijuana.

Is that correct?

Dr. MCGINNIS. Well, I do not think he specifically said that the level of cocaine use had declined. What he said was that the level of overall drug use, and specifically, as an example, the level of marijuana use had declined fairly consistently over the last 5 years. Indeed, from 1978 to 1982, as an example, the rate of daily use of marijuana among high school seniors declined from 11 percent to 6 percent.

But what has happened is, in our 1985 survey there seems to be a plateauing off of that decline, so our progress seems to be slowing down, if not reversing.

Cocaine use itself has gradually grown across all sectors of society. It is a relatively new phenomenon, and it is a real problem—it is a problem not only for adults, but for children, and not only for the rich, but for the poor as well.

Senator NICKLES. What percentage of high school graduates would be using cocaine? Was it 17 percent?

Dr. MCGINNIS. Seventeen percent have tried it at some point. I do not have the data on the daily use of cocaine. I will be happy to submit that figure for the record.

[Information supplied follows:]

PERCENTAGE OF HIGH SCHOOL SENIORS REPORTING DRUG USE—1985

[Percent]

Drug	Ever used	Used last year	Daily use[1]
Marijuana/Hashish	54	41	4.9
Cocaine	17	13	0.4
Heroin	1	1	0.0
Alcohol	92	86	5.0
Hallucinogens	12	8	0.3

[1] Used 20 or more times in the month before survey

Senator NICKLES. If you would, I would appreciate it. That was just cocaine. What percentage of, say, high school graduates would

have used or experimented with cocaine, marijuana, or other drugs?

Dr. McGINNIS. Again, I will submit the information for the record (see insert). As a rough approximation, about one-third of high school seniors have tried one or another of those drugs at least once.

Senator NICKLES. What percentage would be using them?

Dr. McGINNIS. Using them daily—I cannot tell you that but I will submit it for the record. The High School Senior Survey was just released this week, and I unfortunately had not had a chance to study that myself.

[Information supplied follows:]

NIDA Capsules

Issued by the Press Office of the National Institute on Drug Abuse
5600 Fishers Lane Rockville Maryland 20857
301/443-6245

HIGH SCHOOL SENIOR DRUG USE: 1975-1985

The following tables show the percentage of high school seniors from the classes of 1975 through 1985 who have used drugs of abuse. These numbers were gathered in annual nationwide surveys conducted for the National Institute on Drug Abuse by the University of Michigan Institute for Social Research. The 1985 survey involved more than 16,000 high school seniors from public and private schools.

Ever Used

	75	76	77	78	Class of '79	'80	'81	'82	'83	'84	'85
Marijuana/Hashish	47%	50%	50%	50%	60%	60%	60%	59%	57%	55%	54%
Inhalants [a]	NA	NA	NA	NA	16	16	17	16	16	16	16
Amyl & Butyl Nitrites	NA	NA	NA	NA	11	11	10	10	8	6	8
Hallucinogens [b]	NA	NA	NA	NA	16	16	16	16	15	13	12
LSD	11	11	10	10	10	9	10	10	8	8	8
PCP	NA	NA	NA	NA	12	10	8	8	8	8	8
Cocaine	8	10	11	12	16	16	17	16	16	16	17
Heroin	2	2	2	2	1	1	1	1	1	1	1
Other Opiates	8	10	10	10	10	10	10	10	9	10	10
Stimulants [c]	NA	NA	NA	NA	NA	NA	NA	60	27	29	29
Sedatives	16	16	17	16	16	15	16	15	14	13	12
Barbiturates	17	16	16	14	13	11	11	10	10	10	9
Methaqualone	8	9	8	8	8	10	11	11	10	8	7
Tranquilizers	17	17	16	17	16	16	16	14	13	13	12
Alcohol	88	88	88	88	88	88	88	88	88	88	86
Cigarettes	74	75	76	75	74	71	71	70	71	70	69

Used in Last Year

	75	76	77	78	Class of '79	'80	'81	'82	'83	'84	'85
Marijuana/Hashish	40%	45%	48%	50%	51%	49%	48%	44%	42%	40%	41%
Inhalants [a]	NA	NA	NA	NA	8	8	8	7	7	6	7
Amyl & Butyl Nitrites	NA	NA	NA	NA	7	6	4	4	4	4	4
Hallucinogens [b]	NA	NA	NA	NA	13	11	10	8	8	8	8
LSD	7	8	8	8	7	7	7	8	8	8	4
PCP	NA	NA	NA	NA	7	4	3	2	3	3	2
Cocaine	8	8	7	8	12	12	12	12	11	12	13
Heroin	1	1	1	1	1	1	1	1	1	1	1
Other Opiates	8	8	8	8	8	8	8	8	8	8	8
Stimulants [c]	NA	NA	NA	NA	NA	NA	NA	39	16	18	19
Sedatives	12	11	11	10	10	10	11	8	8	7	8
Barbiturates	11	10	9	8	8	7	7	8	8	8	8
Methaqualone	8	8	8	8	8	7	8	7	8	4	3
Tranquilizers	11	10	11	10	10	8	8	7	7	8	8
Alcohol	88	88	87	88	88	88	87	87	87	88	88
Cigarettes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA indicates data not available
* Indicates less than .5%

Footnotes.
[a] Inhalants - adjusted for underreporting of amyl and butyl nitrites
[b] Hallucinogens adjusted for underreporting of PCP
[c] Stimulants adjusted for overreporting of nonprescription stimulants.

Terms
Ever Used: Used at least one time
Used in Last Year: Used at least once in the 12 months prior to survey
Used in Past Month: Used at least once in the 30 days prior to survey
Daily Users: Used 20 or more times in the month before survey
Source: National Institute on Drug Abuse, Monitoring the Future Study, 1985

C86-1

January 1986

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES Public Health Service Alcohol, Drug Abuse, and Mental Health Administration

OVER →

Used in Past Month

	Class of '75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85
Marijuana/Hashish	27%	32%	36%	37%	37%	34%	32%	29%	27%	25%	24%
Inhalants [a]	NA	NA	NA	NA	3	3	2	3	3	3	3
Amyl & Butyl Nitrites	NA	NA	NA	NA	2	2	1	1	1	1	2
Hallucinogens [b]	NA	NA	NA	NA	6	4	4	4	4	4	4
LSD	2	2	2	2	2	2	3	2	2	2	2
PCP	NA	NA	NA	NA	2	1	1	1	1	1	2
Cocaine	2	2	3	4	6	5	6	5	5	6	7
Heroin	*	*	*	*	*	*	*	*	*	*	*
Other Opiates	2	2	3	2	2	2	2	2	2	2	2
Stimulants [c]	NA	NA	NA	NA	NA	4A	NA	11	8	8	7
Sedatives	6	5	5	4	4	5	5	3	3	2	2
Barbiturates	5	4	4	3	3	3	3	2	2	2	2
Methaqualone	2	2	2	2	2	3	3	2	2	1	1
Tranquilizers	4	4	5	3	4	3	3	2	3	2	2
Alcohol	68	68	71	72	72	72	71	70	68	67	66
Cigarettes	37	39	39	37	34	31	29	30	30	29	30

Daily Users

	Class of '75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85
Marijuana/Hashish	6.0%	6.6%	8.1%	10.7%	10.3%	8.1%	7.0%	6.3%	5.6%	5.0%	4.6%
Inhalants [a]	NA	NA	NA	NA	0.1	0.2	0.2	0.2	0.2	0.2	0.4
Amyl & Butyl Nitrites	NA	NA	NA	NA	0.0	0.1	0.1	0.0	0.2	0.1	0.3
Hallucinogens [b]	NA	NA	NA	N.	0.2	0.2	0.1	0.2	0.2	0.2	0.3
LSD	0.0	0.0	0.0	0.0	.)	0.0	0.1	0.0	0.1	0.1	0.1
PCP	NA	NA	NA	NA	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Cocaine	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4
Heroin	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Other Opiates	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0	0.1	0.1	0.*
Stimulants [c]	NA	NA	NA	NA	NA	NA	NA	0.7	0.3	0.3	0
Sedatives	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Barbiturates	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1
Methaqualone	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Tranquilizers	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Alcohol	5.7	5.8	6.1	5.7	6.9	6.0	6.0	5.7	5.5	4.8	5.0
Cigarettes	29.6	28.6	28.8	27.5	25.4	21.3	20.3	21.1	21.2	18.7	18.5

NA indicates data not available
* Indicates less than 5%

Footnotes

[a] Inhalants adjusted for underreporting of amyl and butyl nitrites
[b] Hallucinogens adjusted for underreporting of PCP
[c] Stimulants adjusted for overreporting of nonprescription stimulants

Terms
Ever Used Used at least one time
Used in Last Year Used at least once in the 12 months prior to survey
Used in Past Month Used at least once in the 30 days prior to survey
Daily Users Used 20 or more times in the month before survey
Source National Institute on Drug Abuse Monitoring the Future Study 1985

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Senator NICKLES. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Nickles.

Senator Metzenbaum.

Senator METZENBAUM. Dr. McGinnis, you addressed yourself to the need to be concerned about nutrition, right?

Dr. MCGINNIS. Yes.

Senator METZENBAUM. How would you rate the nutrition aspect vis-a-vis physical condition and other aspects?

Dr. MCGINNIS. I am glad you raised that, because especially in a hearing like this, I think it is important to point out that fitness is not just one dimension or two dimensions, but that it relates to several dimensions on how we conduct our lifestyles.

Fitness embraces a combination of factors of which some relate to diet and exercise, others relate to alcohol, tobacco and illicit drugs, and still others relate to elements such as stress and mental health. It is important for us to attend to each of those elements, for us as a society to attend to each of those elements, if we are going to be a fit society.

We do not have the data on which to make tradeoffs, in terms of the relative contributions of nutrition or exercise. Clearly, our science base is stronger in the area of nutrition. We have solid indication, as was indicated by Senator Kerry, I believe, in his statement, that dietary factors are important components in 6 of the 10 leading causes of death.

Our indications for exercise patterns [illegible] a little less directly linked to the various health outcomes.

Senator METZENBAUM. Would you then address yourself to the question that bothers me, and that is how one who is concerned about diet is able in today's marketplace to be able to ascertain what is in the products that are being sold. They have a tremendous number of chemical names. If you want to find out the cholesterol content, whether it is polyunsaturated, whether it is monounsaturated, whether it has a high fat content, or what its salt content is, you cannot find out.

Do you believe that if we had more information available on the labels that we might substantially improve the nutrition of people of this country?

Dr. MCGINNIS. We favor increased and better information on food labels, but there is a critical issue here. That is, what kind of information is to be on the labels and how should it be presented?

One of the problems we face when we start to consider developing nutritional labeling policies is, in fact, potentially confusing the consumer even more.

So yes, we need better information provided more effectively on labels. The key question is how we do that.

Senator METZENBAUM. Well, the American Heart Association and the American Cancer Society have participated in the deliberations in the structuring of what they believe is important and relevant, and certainly we who are concerned about labeling would be very receptive to the administration's involvement in discussing what changes, if any, should be made with respect to our proposed legislation

Would you see yourself or the Department helping us to work out the kind of labeling that they think should be placed on products that are purchased in the marketplace.

Dr. McGINNIS. We would be happy to discuss this with you.

Senator METZENBAUM. Would you also be willing to support that it ought to be done on a mandatory basis, to require manufacturers to put their products out with labels that have the appropriate information on them?

Dr. McGINNIS. It depends on the way the statute is worded.

Senator METZENBAUM. But you would be willing to support some kind of legislation to that effect?

Dr. McGINNIS. I cannot say that at this point.

Senator METZENBAUM. I understand.

I thank you very much.

The CHAIRMAN. Thank you.

We want to thank both of you for being here, and unless there are further questions, we will end the discussion at this particular point.

But thank you for being here—I might just ask you one other question, Dr. McGinnis, and that is, are the nutritional problems of those less fortunate that we have been chatting about—and that of course, this committee is concerned about, among other committees, but I think the primary committee in the Congress concerned about some of the problems that Senator Kennedy has mentioned—are the nutritional problems that the less fortunate individuals of our society have due primarily to lacking calories or lacking food, or are they due to the types of foods they are eating?

Dr. McGINNIS. The dominant nutritional problem for people throughout our entire society, with the exception of very small segments of the society actually have restricted access to food, but the dominant problem for all society is an overabundance of calories and the wrong kind of calories. As I mentioned——

The CHAIRMAN. So there are plenty of calories, but there is a lot of starch and a lot of alcohol and other things that are complicating it.

Dr. McGINNIS. I think it is important to point out and again, reemphasize something that Dr. Koop mentioned, and that is that 60 percent of black women in this country between the ages of 45 and 64 are overweight according to the last HANES [Health and Nutrition Examination Survey] study. And if you look at the excess deaths among the black and minority populations, you see that a number of the problems they face are related to nutritional imbalances, not to gross deficiencies in access to food, but to the wrong kinds of food.

The CHAIRMAN. Well, thank you so much.

Go ahead, Senator Kennedy.

Senator KENNEDY. Well, Dr. McGinnis, I am going to send you over some of the studies that have been done about hunger in America. If you believe what you just said, I think you really ought to give fair opportunity to examine the work that has been done by a number of different groups about the problems of hunger in America and about the problems of hunger in children in America and the number of children who are living in poverty, with single parent, some who are working and some who are not, and the

whole process of diet in that; and also, the explosion in terms of the use of various soup kitchens and feeding centers, here in this city, and in my own State, in Boston. I was talking to one of the social services directors on Monday in Boston, and they cannot open food centers fast enough, and they are completely overcrowded. And these are not people who are putting coins in machines and popping out potato chips and candybars. These people are desperate, and they are in need, and there is a severe problem in America—now.

And I will give you a chance to make whatever comment, but I think it would be a real distortion to suggest at this hearing that it is just people in lower incomes who are eating the wrong things, and they have access to the right things, because I do not believe that to be the case.

Dr. McGINNIS. I think you are right. I think that would be a distortion of the facts. And I do not want to be mistaken as having said that there are no people in this country who are hungry——

The CHAIRMAN. I would not want to be mistaken, either. We know that is true.

Dr. McGINNIS. That is right.

I think that one of the most important nutritional policy agenda items is indeed developing a better indication of the nutritional status of low-income populations and being able to pinpoint that element of the low-income population—and there is an element—which does not have adequate access to food.

But what I wanted to emphasize was that for most of the low-income populations—and unfortunately, we have a large share of our population which falls into that category—the problem is not access to food; it is the food choices they make. I am not denying the fact that there does exist a problem on hunger.

Senator KENNEDY. Well, we would like to work with you on both of those areas.

Thank you very much.

The CHAIRMAN. Thank you so much. We are grateful for both of you coming, and we will let you go at this time.

Dr. McGINNIS. Thank you.

The CHAIRMAN. I am pleased to introduce our second panel. First, I would like to introduce Ms. Linda Evans. Ms. Evans is a well-known television personality and author of the "Linda Evans Exercise Book: Inner and Outer Beauty." In addition, a recent survey named Ms. Evans as the most-admired woman in America.

Second, I would also like to introduce a very good friend of mine from Utah, Dr. Garth Fisher, director of the Human Performance Research Center at Brigham Young University. Dr. Fisher has coauthored a remarkable book entitled, "How To Lower Your Fat Thermostat." And I have to say that he has been kind enough to give me a number of copies, which I have shared with members of the Senate and elsewhere, which has really helped me in my health and fitness program as well. I do not know of a better sports fitness expert in the country than Dr. Fisher.

The third member of the panel is Dr. Michael Fulton, medical advisor to the Nautilus Sports and Medical Industries.

I would really like to welcome each of you today, and I want to thank you for taking time from your busy schedules, in particular

you, Ms. Evans. You flew here last night, late, and as soon as you are through testifying, you are going to fly back out, and I understand you are going to have to participate in helping to make some "Dynasty" segments even today. So there is no rest for you, and we are very grateful that you have taken the time to be with us, especially under those circumstances.

So we will turn to you and be happy to take your testimony at this time.

STATEMENT OF LINDA EVANS, ACTRESS AND AUTHOR OF "LINDA EVANS EXERCISE BOOK: INNER AND OUTER BEAUTY"; DR. GARTH FISHER, DIRECTOR, HUMAN PERFORMANCE RESEARCH CENTER, BRIGHAM YOUNG UNIVERSITY, AND DR. MICHAEL FULTON, ADVISOR, NAUTILUS SPORTS/MEDICAL INDUSTRIES

Ms. EVANS. Thank you for having me here today.

The subject of fitness and nutrition is one in which I have a particular interest. It is also a subject of importance to all of us, and I feel especially honored to give testimony before this committee.

I am not a doctor or a psychologist, and I do not profess to be either. I am simply a woman who has spent the last 25 years searching for ways to improve and better myself.

Like countless American men and women, I want to be the best "me" I can be—and I believe that fitness plays a vital role in achieving that goal.

Over the years, I have learned a great deal about fitness. Much of it is based on personal experience. I have learned what works best for me and my friends, and I have been taught by the experts, people who have devoted their lives to fitness and beauty.

So first of all, let me say that I applaud this committee for its efforts to promote the importance of fitness and diet in preventing illness.

As a nation, we have become increasingly aware of the importance of exercise and healthy diet in promoting good health. But as a recent government study reports, Americans are not as fit as they think they are; 80 to 90 percent of Americans still do not get enough exercise.

And despite all the medical advice to the contrary, many Americans still overeat. One recent estimate suggests that almost one-third of American men and more than one-third of women are obese, just as they were a decade ago.

I believe that all of us who want to improve ourselves can do so. But it takes work. Looking the very best we can helps us feel positive about ourselves, while staying in shape and keeping healthy gives us the freedom to take our minds off ourselves and enables us to concentrate on the important things in life.

Longer lifespans today have created an older more sedentary population with a greater need to stay fit. Unfortunately, our society is geared toward accepting that as people grow older, their lives are not as valuable; consequently, their lives are less meaningful. I fully believe the opposite to be true. You do not have to fall apart because you are getting older. However, if you accept the idea that

you will begin to fall apart in your thirties, or with middle age, then you probably will.

As a woman in her forties, I have learned that I am capable of changing what I do not like about my life. There are dozens of ways to get into shape, to improve the way we look and how we feel. But before we can change anything, each of us has to make a commitment to ourselves. And most of all, we have to want the end results.

I do not believe that this is just beauty talk. Our doctors are finding increasing evidence to support the value of exercise among the aging.

Just 2 weeks ago at a symposium on nutrition and aging, Dr. William Evans of Tufts University—no relation—reported the result of a study which involved having older people go through a 12-week aerobic exercise training program. "So far, we have discovered two striking things," Dr. Evans says. "One, sedentary older people, especially women, have remarkably low functional capacities, and two, that capacity increases substantially as a result of exercise."

Dr. Evans and others have now established a statewide program in Massachusetts called Fitness after Fifty, or Keep Moving, to encourage people to get involved in exercise.

I think we need more programs like this one established by Dr. Evans and his associates. We also need to pay stricter attention to our diet

Dr. Mary Bess Kohrs of the University of Illinois in Chicago estimates that one-half of the major chronic health problems of the elderly—heart disease, and diabetes—are affected by bad nutrition. Her conclusion: "Improved nutrition among the elderly may reduce hospitalizations and other health care costs and improve their overall quality of life."

Dr. Kohrs believes that the nutritional content and quality of food that an elderly person eats at home are important, and I believe that if we give people sufficient information, they can do a lot to take care of themselves.

There are others much more knowledgeable than I who will bring important information before this committee; yet, so much of fitness and nutrition in public health, the subject of today's hearing, depends on each of us as individuals.

I would like to relate something from my own personal experience. When I was in my twenties, I developed allergies and an asthmatic condition. I visited an allergist, who prescribed shots, at first, twice a week, then 5 days a week, then 7 days a week. I was soon taking cortisone but the condition became worse. This went on for almost a year. I became depressed, frustrated, and discouraged. I was totally unable to work. In desperation I began to read about the subject. I eventually consulted a nutritionist—a remarkable woman named Gladys Lindbergh—who placed me on a carefully regulated diet. Within 6 weeks, all of the symptoms had disappeared, and I was well.

We are fortunate in that our Nation is able to provide the highest level of medical care in this world

But there is a need for more public information about nutrition. Our medical schools are aware of this, and more and more of them

now require courses in nutrition as part of a doctor's basic education.

There is also a need to give this information to our children so that they are better-equipped to live healthier lives when they are older.

There is an important link between the mind, the body and the spirit, and there is much that each of us can do to help ourselves if we have that information.

Life is a gift, an exciting and stimulating adventure. What we do with it depends on how we choose to look at life. It is never too late to change our views or to adjust our thinking and it is certainly never too early.

I hope that this hearing today will lead to the spread of more information promoting fitness, exercise and good nutrition, and I wish the committee well.

Thank you.

The CHAIRMAN. Thank you very much. That was very good testimony. We will go to all three of you, then we will have some questions.

Dr. Fisher.

Dr. FISHER. Thank you, Mr Chairman, committee members, distinguished colleagues and guests.

I am pleased to be here today to testify at this hearing regarding nutrition, fitness and public health. My remarks will be more specifically toward the role of fitness and nutrition as it affects obesity.

The role of exercise in decreasing the risk from certain diseases is well known. Many studies have shown that men whose occupations require them to be active are at a decreased risk from heart disease. A study by Paffenbarger, involving more than 17,000 Harvard alumni, showed a 64-percent decrease in the likelihood of having a first heart attack in those alumni who used at least 2,000 calories a week in exercise programs.

It is possible that the decrease in the incidence of heart disease in America during the past 20 years is related directly to the increased number of people who are exercising regularly.

The role of diet in health has also been documented. For years, the American Heart Association has advocated a diet containing less fat and cholesterol, and recently have suggested that fat levels be decreased to 30 percent of total calories, or less, for all Americans, with decreases to 25 or even 20 percent for people with abnormally high blood fat levels.

The American Cancer Society has also recommended a decrease in the total fat intake. Moderation in the use of fatty foods, the society said, not only reduces chances of getting certain cancers, but is an effective way to reduce daily caloric consumption. In addition they recommend more high-fiber foods, saying that:

> Even if fiber itself may not prove to have a protective effect against cancer, high fiber-containing fruits, vegetables, and cereals can be recommended as a wholesome substitute for fatty foods.

Interestingly, the No. 1 recommendation of the Cancer Society was to avoid obesity. This suggestion was based in part on findings of its own 12-year study of nearly 1 million Americans, which un-

covered higher cancer risks among overweight men and women, particularly those who were 40 percent or more overweight. Other groups have noted the risks involved with obesity.

In the publication, "Health Implications of Obesity," by the U.S. Department of Health and Human Services, a panel of experts concluded that obesity definitely has adverse effects on both health and longevity.

They stated that:

> Obesity is clearly associated with hypertension, hypercholesterolemia, adult onset diabetes, an excess of certain cancers and other medical problems.

This panel agreed that an increase in body weight of 20 percent or more above desirable body weight constitutes an established health hazard and estimated that some 34 million adult Americans have a body fat above this level. Obviously, obesity is a major health issue in America, and to this point in time the problem is getting worse instead of better.

Surveys indicate that at any given time, about 56 percent of the population may be dieting, and estimates from clinics, studies, and obesity specialists indicate that about 95 percent of those who try to lose weight using the traditional approaches are unsuccessful and either fail to lose significantly or regain the weight they have lost within a short period of time. This failure of diets has created an enormous weight control industry which costs the American public billions of dollars each year.

Why is there such a high failure rate? For years scientists, including myself, have taught that obesity is simply a matter of overconsumption. If you are fat, you eat too much, we said. Nothing could be further from the truth. Careful research shows that thin people actually eat more than fat people. One study recorded the intake of two ladies who weighed over 350 pounds at less than 1,000 calories a day.

In fact, it is clear that the body is affected directly by the very act of dieting. A recent study of the weight gain and loss cycle experienced by so many Americans showed that the body takes less time to gain weight and longer to lose excess weight after several cycles of dieting and regaining the weight. Some evidence suggests that body weight is actually controlled by a fat thermostat in the brain much like the thermostat in a home, which resists changes in fat just like the thermostat in the house resists changes in temperature. This idea is substantiated by research showing that dieting actually triggers a decrease in metabolic rate after a few weeks so that the new, lower intake of food will no longer result in weight loss.

How can weight loss be accomplished successfully? The most important component of a successful weight loss program is increased physical activity. It is clear that exercise not only increases the body's caloric expenditure and metabolic rate, but also changes the fat thermostat in the brain to allow weight to be lost more easily. Wild animals are never fat, but when caged, they put on extra weight. Even elite runners, who are always thin, get fatter during the off-season.

The second factor involves decreasing the amount of fat and sugar in the diet. Certain types of food cause fatness, even if excess

calories are not ingested. Dr. Larry Oscai and his associates at the University of Illinois fed two groups of rats exactly the same number of calories for a 60-week experimental period. One group ate regular rat chow, a lowfat, high-fiber food, and the other ate a diet similar to the typical American diet, that is, about 40 percent of the calories coming from fats and 25 percent from sugar. Despite a similar caloric intake, carcass fat averaged 51 percent for the rats eating the fat-rich diet, but only 30 percent for the rats eating regular rat chow.

This study clearly demonstrates that severe obesity can develop in the absence of overeating by simply eating too much fat.

Isn't it interesting that the guidelines for long-term weight control are so much like those suggested by the Heart Association and Cancer Society? The problem comes from the difficulty the public has in adopting the guidelines because of their lack of information concerning exercise and nutrition.

For instance, it is difficult for anyone without a background in nutrition to determine which foods are healthful and which are not. It is clear that people need not only to be informed about the guidelines for healthful living, but to be given specific, easily understood information regarding the day-to-day choices they are required to make.

Surely, with a few changes in approach, major changes can be made in the health of the citizens of this great country.

Thank you very much.

The CHAIRMAN. Thank you, Dr. Fisher.

We will turn to you now, Dr. Fulton.

Dr. FULTON. Thank you, Senator Hatch, for the opportunity to present to you an area that might be a little bit different in regard to what we have heard already this morning.

I would like to talk to you about my experiences in the areas of exercise as they relate to the health, in this case, of the musculoskeletal system.

I think, to understand these concepts, we need to briefly review the anatomy of this area. The functional element of the musculoskeletal system is the joint. We see it here, represented by two bones, in the blue the static restraint systems of ligament capsules, and in the red the dynamic restraint systems of the muscle-tendon unit. It is these areas where forces of our daily activity of sport or of work occur, and if these forces are too great, injury occurs.

This is an example of the forces of modern-day athletics. If you look carefully at the arrow you can see that this athlete is going North and South and, unfortunately, his knee is going East and West. This resulted in an incredible injury called the triad of O'Donoghue, which is complete wipeout of the medial support structures, the anterior cruciate ligament, and the medial meniscus.

I must emphasize the importance of understanding forces about the musculoskeletal system. As far as force versus sport, there are certain areas where we can influence these forces. Particularly making the athlete more skillful, applying rules that will reduce forces, and designing equipment that will dissipate forces. These particular areas influence in the work area as well, and are called collectively the ergonomic studies.

But the one area that sadly has been neglected is actually strengthening the body itself to be able to dissipate these forces. The anatomy that needs to dissipate the forces is bone, ligament, and muscle. These tissues are adaptive tissues; they will respond to exercise principles, because they are made of collagen and myoprotein. This is an electron microscopy slide of the collagen of the capsule, the ligament and the bone itself, and collagen will respond to overload. This is the an electron microscopy slide of myoproteins of muscle, which will respond to overload.

But the key is this: An overload to this system, an overload that is controlled and progressive.

We at Nautilus have worked with these concepts of overload over the last decade and a half, and they are too numerous to go through at this point in time, but they have been the basis for my care of athletic injuries, particularly rehabilitation around the shoulder, the knee, and the low-back areas.

One of the most recent areas I have studied is the low back. Low back pain is very prevalent in our society. Approximately 80 percent of you will have, at one time or another, back pain that will require a physician's care.

Collectively, this particular back problem will cost our society, our health care industry, anywhere from $17 to $33 billion.

When working with research strength testing tools known as tensiometers, I found that healthy backs were incredibly strong, generating as much as 500 pounds of torque. But similarly, looking at the diseased spine, I found it was just as impressively weak. These are the prototype tools I used, and these are simply exercise tools that have the benefit of measuring strength—in this case, of the trunk extensor musculature, and in this case of the trunk flexor musculature.

These tools are hooked to a computer which will then analyze and give us the strength curve. This is what a strength curve looks like. There are two lines, the top being gross force, the bottom being net force. We have extrapolated or taken out the body weight.

This is an example of a very strong back. The force reference on the left is 400 pounds. Along the bottom, you see the range of movement that the spine is moved through.

This is an example of a very weak back. If you will notice the force reference of 100 pounds, and the angles on the bottom again. When we extrapolate body weight in this particular individual, you can see his strength levels were barely able to control his trunk weight.

With these kinds of discrepancies, I felt it was imperative that I explore the benefits of bringing the weakened spine to more physiological strength levels, and seeing the impact on back pain, pure and simple.

I designed a strengthening program, emphasizing the anatomy about the trunk—the rectus abdominus musculature in front, transversus oblique musculature around the side, and the paravertebral musculature from behind.

The machines I used for strengthening were providing controlled, progressive overload. This is a low-back machine for the paravertebral musculature. This is an abdominal machine, for the rectus ab-

dominus musculature, and this is a rotary torso machine for the oblique transversus musculature.

Research individuals were exercised for 3 months with a frequency of three times per week and with brief quality exercise of only 20 minutes per each training session. I then developed a reporting format where I looked at physical criteria and gave points for the amount of strength the individuals had.

I also gave points with regard to the patients' perception of pain, on the basis of a functional activities questionnaire, and with regard to the physician's perception of patients' pain based on medicine use and general clinical examination.

My main emphasis was trying to relate the physical criteria and the patient's perception of pain.

I have 80 patients through the study at this point in time. The first 20 were 11 females and 9 males, with an age range of 25 to 76 years, a median age of 56 years, as would be expected in a Florida population. The diagnosis was predominantly degenerative discs disease. Two patients had herniated lumbar disc documented by CAT scan and EMG. I found over 3 months of very good quality exercise that I was able to improve the trunk-strength of these individuals 50 percent on the trunk extensor side and 31 percent on the trunk flexor side. This is a very meaningful change, and brought these strength levels back to more physiological levels. By doing so, I resolved the back pain in all 20 individuals, and more importantly, maintained and improved their vocational status.

This is an example of one of these patients, a 55-year-old gentleman with a 5-year history of low back pain. He had been told nothing could be done for the particular problem and was about ready to quit his job. The diagnosis was degenerative disc disease. The starting strength levels are demonstrated here. The bottom line is what we are interested in. On the extremes of the bottom line, we see 46 pounds of force on the left and 88 pounds of force on the right. These are the extremes of his strength curve. With 2 weeks of exercise, he had improved his strength levels—69 pounds and 105 pounds are seen in the extremes. At 3 months, he had doubled his strength level, and he had no symptoms of back pain. We were able, fortunately, to follow this patient over an additional period of time. This is a 6-month followup, and he continued to improve in his strength levels, and at the 9-month followup, he has now tripled his strength levels; he has brought his strength up to the physiological level necessary for pain-free functioning

This is a comparison showing the three times increase in his strength.

In summary, I think it is very important we understand the importance of muscle in our exercise programs. It truly is a vehicle by which we stimulate the cardiopulmonary and all other support systems. So often, our programs emphasize just the cardiopulmonary system and indeed cause more problems than benefits, particularly in relation to the musculoskeletal system.

Second, I think it is very critical that we look at the quality of our exercise programs. Unfortunately in this country, where if a little is good, a whole lot is better, this is not the case with exercise. I have been given the challenge early in my professional career, and I continue to accept the challenge of understanding

how little exercise the body needs for maintenance of health, not how much exercise the body can tolerate.

Thank you.

[The prepared statement of Dr. Fulton follows:]

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November 11, 1985

The Honorable Orrin G. Hatch
Committee on Labor
and Human Resources
United States Senate
Washington, DC 20510

Dear Senator Hatch:

I apologize for the delay of this written statement, but your correspondence of October 31, 1985 just reached my office.

I feel that the understanding of quality exercise is a critical cornerstone of preventive health care measures. I have been involved in the research and utilization of aggressive strengthening concepts for the last six years in my clinical practice of Orthopaedic Medicine which has emphasized both the prevention and rehabilitation of musculoskeletal injury.

Injury about the body generally involves the musculoskeletal system and more specifically the joint. The joint is the basic unit of function of the musculoskeletal system and is represented by two bones with articulating surfaces which are stabilized by a static restraint system of ligaments and capsules and dynamic restraint system of the muscle tendon units. It is an interplay of static restraints, the dynamic restraints and the bone itself that dissipates the forces of activities whether they be sporting activities or working activities. If these tissues are not strong enough to dissipate these forces than injury occurs. We must then consider ways of either reducing forces of activities, whether they be sporting or working activities, or strengthening of the musculoskeletal system itself to withstand these particular forces. Fortunately a great deal of attention has been given to the control of forces, particularly in the work environment, also in the sporting environment with changes and equipment design, rules and training of individuals to utilize body parts more safely. Unfortunately strengthening of the musculoskeletal system has been neglected and particularly at the community level.

The musculoskeletal tissues we are interested in strengthening are bone, ligament and muscle. All of these tissues will respond to strengthening concepts because of their biological adaptability. These tissues are predominantely made of the adaptable proteins of collagen, and the myoproteins, which make up muscle. The research animal has shown that all of these tissues will respond to proper exercise, that is to strengthening. Clinical observation of the human model corroborates these findings.

The key to this adaptive change is an overload of these adaptive tissues. This overload must be provided, and can be provided safely, as long as it is controlled. It must be progressive in nature so that adaptation or strengthening to satisfactory levels can be obtained. This overload has been given many names such as stress, resistance, or exercise, but the key still is controlled progressive overload, no matter what the name. There are basic requirements that we have developed at Nautilus Sports/Medical Industries over the last decade and a half that call for controlled progressive overload. These requirements are as follows:

Rotary-form Movement
Direct Resistance
Balanced Resistance
Variable Resistance
Negative Work
Positive Work
Stretching
Pre-stretching
Resistance in the position of full contraction
Unrestricted speed of movement

A brief explanation of these requirements is in order. Human beings are rotary animals as far as our joint function is concerned. It is a combination of rotary movement, through what is known as linkage, that allows linear movement. But for an overload to be controlled, it must be rotary in nature. This overload must be directly applied about the joint of rehab or strengthening interest, and the overload must be balanced and variable, all leading to a more physiologically controlled overload. The weight of the movement must provide for both negative and positive work. In medical terms this applies to the eccentric and concentric contraction of muscle respectively. Simply put, it is very important that we both lift the weight and slowly lower the weight. Lowering, in any weighted movement, is probably the most productive as far as strength improvement is concerned. Stretching, pre stretching, and resistance in the position of full contraction all are necessary for maintenance of maximum flexibility of the joint. And last but most important, whenever any weighted principle is used, the speed of movement is critical. The weight should always be controlled, and this generally means moved slowly.

The Nautilus machine is simply a manifestation of these requirements for properly controlled progressive overload to the musculoskeletal system. The requirements are not exclusive to the Nautilus machine and can be applied with many forms of progressive controlled overload, but it is these requirements that are the important issue.

Over the last six years I have utilized controlled progressive overload with the above requirements in the rehabilitation and prevention of musculoskeletal injury, particularly about the joints of the shoulder, the knee and the lower back.

I have been involved in a rehabilitation program for the low-back area. This is a monumental problem for the physician dealing with the musculoskeletal system. It is estimated that 80% of our population at one time or another will seek medical attention for back problems. A very small percentage of those patients will ever require surgery. Surgical and conservative measures unfortunately have not been predictable in improvement of the symptom of back pain.

With the development of prototype tools for strength testing, known as Tensiometers, we have been able to observe the incredible strength of the trunk musculature, and particularly the trunk extensor musculature of the paravertebrals and the hip extensors in the healthy back. The discrepancy between strength levels of the healthy back and the diseased back were so great it was elected to embark on a meaningful strengthening program for the trunk musculature and try to relate trunk strength to the symptom of low-back pain-a very simple but meaningful relationship. A trunk strengthening program was developed with emphasis on the extrinsic support musculature of the rectus abdominus muscle, (trunk flexors), the lumbar paravertebral and buttocks muscles (trunk extensors) and the oblique and transversus muscles (trunk rotators).

The appropriate exercise apparatus was utilized providing the requirements we have previously outlined. The trunk strengthening program occurred over a three month period. Training sessions were approximately three times a week, 20 minutes per session. Simultaneously a general conditioning program involving the upper torso and lower limb musculature was provided. These patients were evaluated initially, at two weeks, and then after three months with trunk strength measurements taken of the trunk flexors and the trunk extensors. At that observation time the patients were requested to fill out a brief questionaire with regard to functional abilities and their perception of their back pain. A reporting format was then designed by modifications of the low-back rating scale developed by Dr. Thomas Lehmen from the University of Iowa presented in 1982 at the International Back Symposium. This format allowed for objective data collection and comparisons of physical criteria, patient's perception of pain, and physician's perception of pain.

Eighty patients to date have completed the above strengthening program. Of the first 20 patients who had the diagnosis of predominantly degenerative disc disease and two documented cases of herniated intervertebral lumbar disc disease, were able to successfully strengthen the trunk extensor musculature 50% and the trunk flexor musculature 31%. All of these patients had marked improvement in their symptoms as far as perception of pain. More importantly all patients were either maintained or improved in their vocational status. Statistical analysis of this project will be performed when 100 patients have completed the protocol. I submit to you Tensiometer readouts of one of these patients.

I feel this represents a very simple example of the meaningful influence of quality exercise as it ca be utilized to influence a very serious health care problem. Although my experiences to date have been primarily in the areas of musculoskeletal injury, there is obviously a much broader horizon for the utilization of a quality exercise concept in health care. An important area of observation and hopefully future research I am now embarking on is the area of geriatric exercise. I am currently in the process of observing 200 geriatric age group patients in a quality but brief controlled exercise program for a two year period of time. At the conclusion we will compare the health care costs of the 200 exercised patients to 200 comparable non-exercised patients. We will be monitoring the physical parameters of muscle strength, bone density, and cardiopulmonary function during the course of this exercise observation. Understanding the influence of proper exercise on the geriatric physiology will be critical over the next two decades as the largest age group of our population moves from middle to geriatric age. We must understand the value of exercise in maintenance of health in these elderly individuals.

In conclusion the value of proper exercise cannot be underestated. Unfortunately this value is often diluted because of fad and frequently outright fraud. Quality exercise should be understood, should be evaluated and should be utilized in our health care industry.

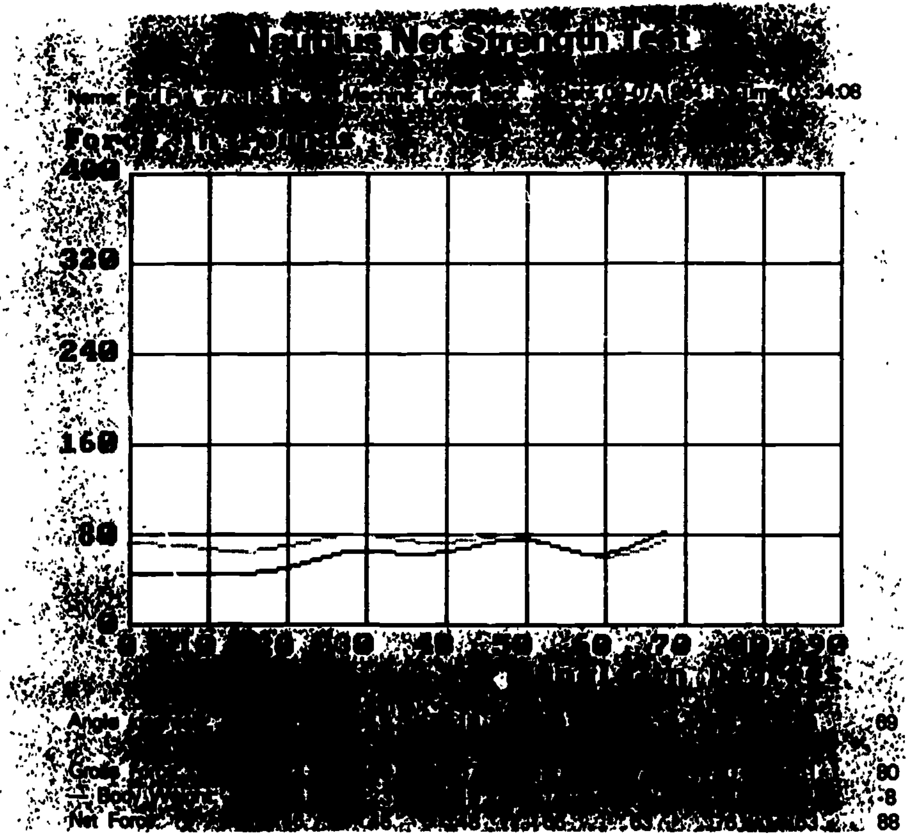
I thank the Committee on Labor and Human Resources for the opportunity to express my viewpoints.

Respectively Submitted,

M.N. Fulton, M.D.
Nautilus Sports/Medical Ind.

MNF/eh

Enclosures



Nautilus Net Strength Test
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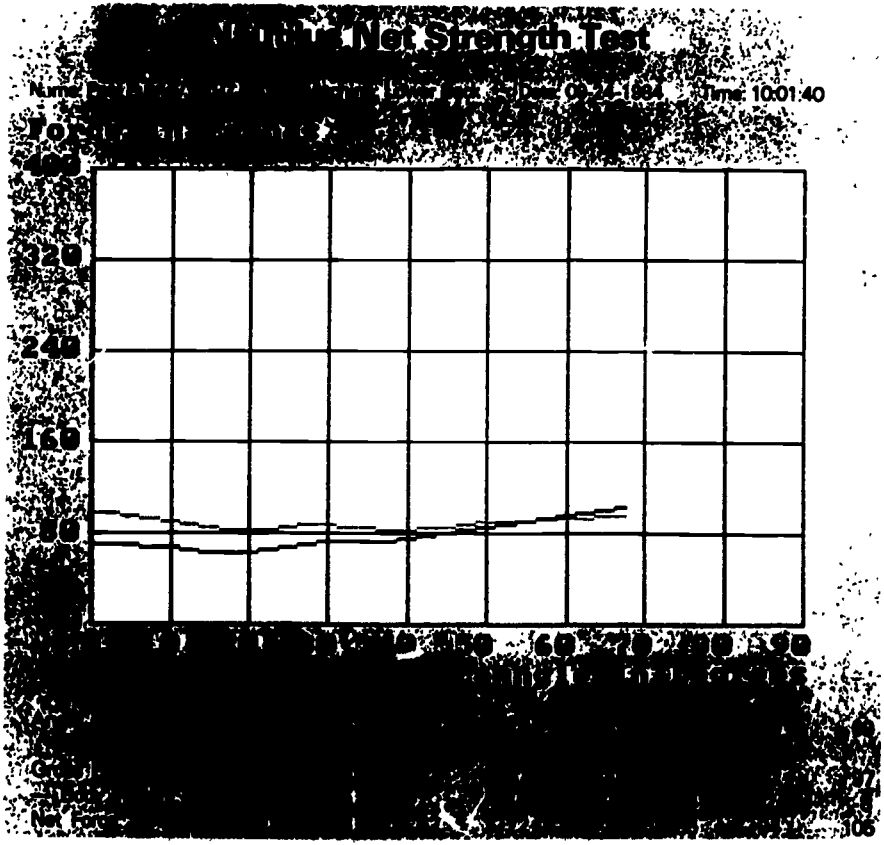
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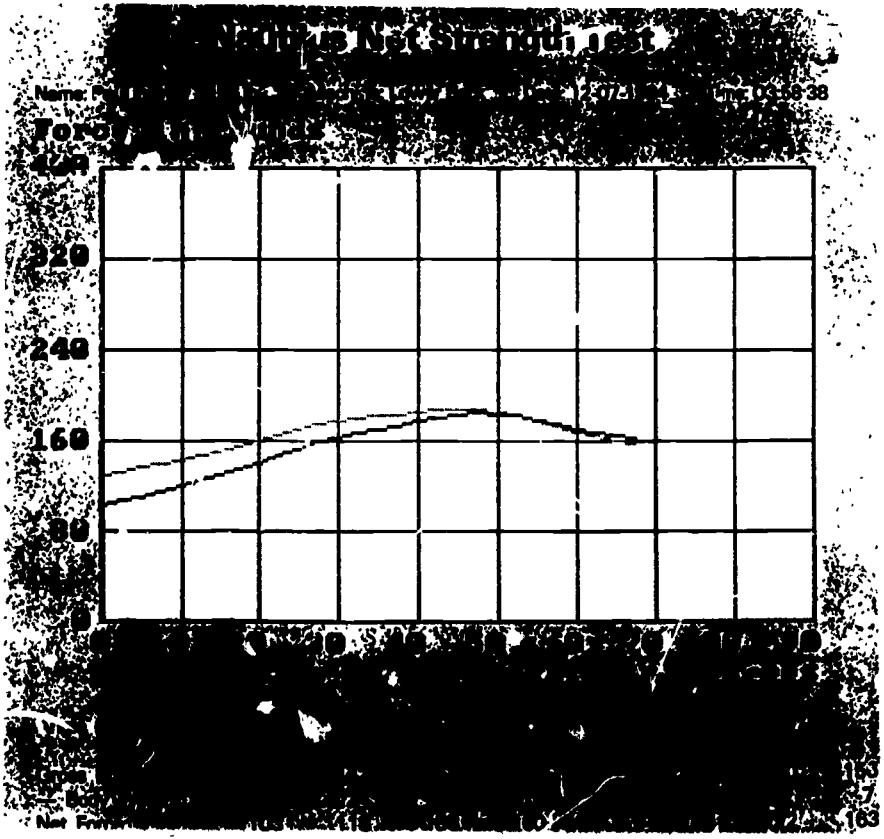
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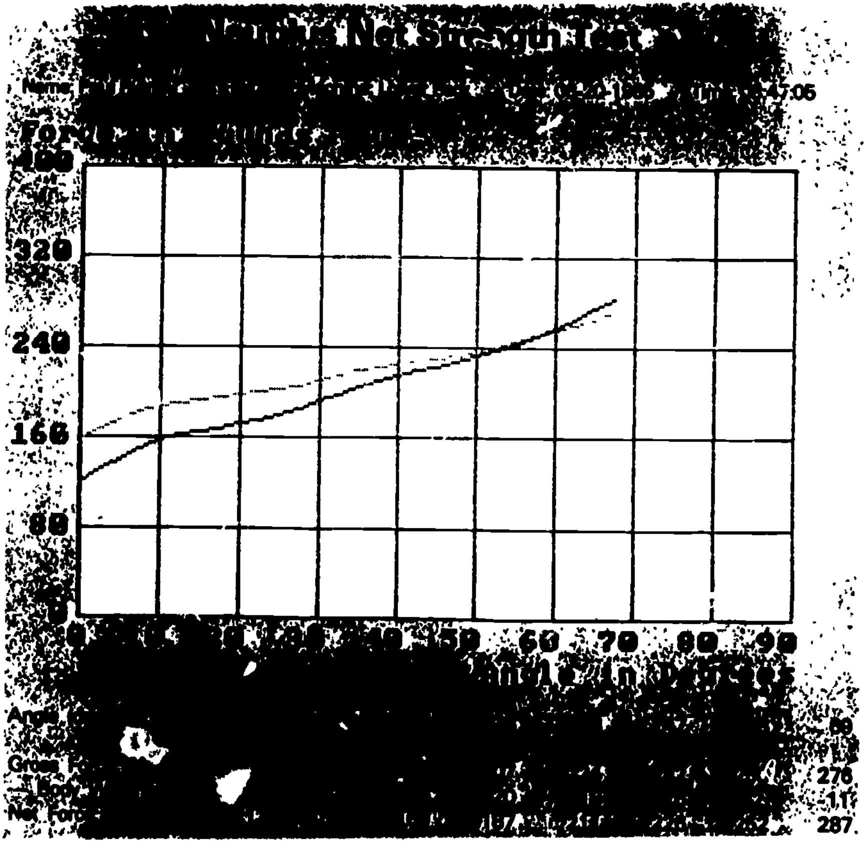

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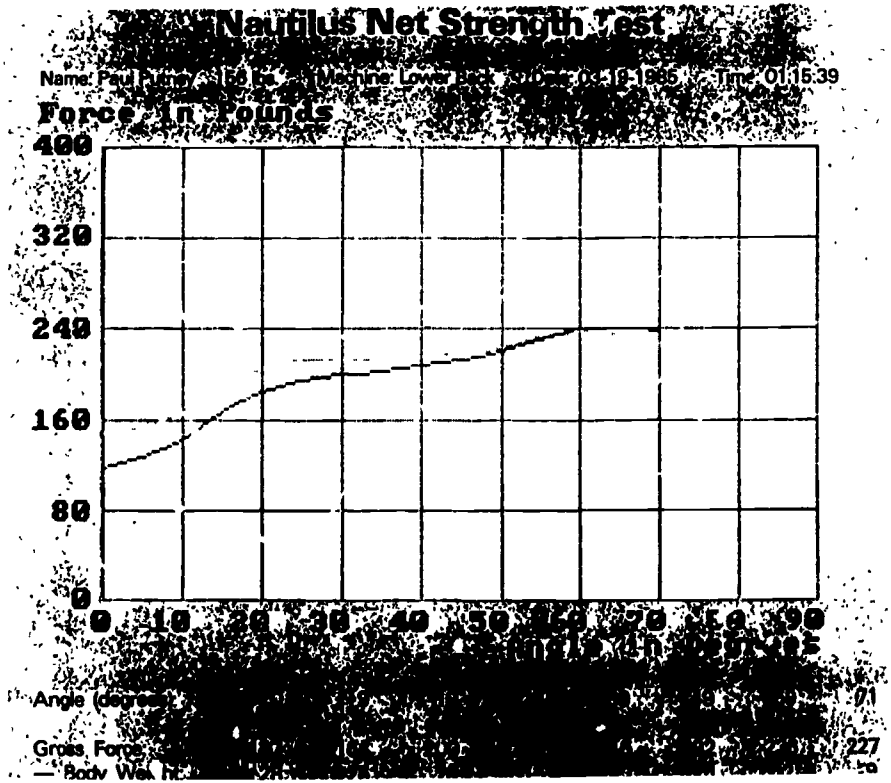
Nautilus Net Strength Test
Force in Pounds
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Angle (degrees)
Gross Force
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The CHAIRMAN. Well, thank you

We appreciate the testimony of all three of you.

Ms. Evans, I would like to ask you, you mentioned that too many Americans are overweight, and they do not exercise enough, and that has basically been the testimony of others here today, and I think will be throughout the day. Most say that they are too busy, they are too tired. But I just note that you have a very demanding work schedule. You flew here late last night, you are flying back now. You are going to be filming parts of "Dynasty" when you get back to California. And yet you find time to exercise, as I understand it.

So I wonder if you would tell us how you manage to find all this time and energy. It might help a lot of us tired, wornout old Senators.

Ms. EVANS. Well, I see it as an investment in myself. It is something that I cannot not do—and not just for the beauty aspect of it. Being in show business will end one day, and I am going to be a woman living her years out, and I see it as an investment in my health.

When I exercise, even though I am tired, I get more energy the next day; I sleep better, and I can eat more—I love all of those. And the benefits work too well for me.

I have a great-aunt who is 90 years old, and she says: "Linda, be good to your body, because when you get to be my age, everything you do not do right is going to come back and get you." And I really am looking to the future, and that is why I am taking care of myself now.

The CHAIRMAN. Well, that is tremendous. It is well recognized that exercise can improve physical appearance, but the real benefit of exercise is the health benefit. Can you comment on that for us today?

Ms. EVANS. Yes; as I said, because I work long hours, and because I get very tired, I have a lot of stress with my work, with the emotions that we have to go through on the show, and exercise helps me release the tension of the day; it helps me get out all of that. So that when I am through working out—and I work out with weights—it only takes me 20 minutes to a half an hour. I work out three times a week. The benefit of that throughout the working week, and emotionally for me, is so wonderful that I just find that it is something I cannot not do for myself.

The CHAIRMAN. Well, thank you.

Dr. Fisher, I have to say that you are one of the biggest inspirations to me, because I was not keeping in as good shape as I should, and then I got hold of your book, and you spent some time chatting with me about it, and of course, I watched you on the golf course and jogging everywhere, and it seems to me you do not do much teaching, you are always exercising.

Dr. FISHER. Right.

The CHAIRMAN. But it really has meant a lot to me. I have lost about 30 pounds—I am too light now, they tell me. But my cholesterol dropped from 243 down to 153 last week, in a matter of just a few years, and I have to tell you that you and some of the things that Nathan Pritikin talked to me about have been very, very helpful to me.

I think your book, "How to Lower Your Fat Thermostat," is one of the truly great books on nutrition and fitness that I have ever read, plus the new cookbook that you have out, which I have been able to give to a few of my colleagues, and promised one just last evening I would give to him.

You provide strong support for those of us who feel deeply about it in this particular area. Do we now know enough to recommend dietary changes for the general public, or do we need more research, first?

Dr. FISHER. We sure do know enough to recommend changes. I do not think we have to prove something beyond a shadow of a doubt before we recommend changes, and I think the testimony I gave is more important in terms of obesity than anything else. And it is interesting to me that we tie this whole thing together, that we realize that what is good for heart disease and cancer is also good for obesity. I think that is a great message that we should take to the American people.

The CHAIRMAN. In your opinion, how effective are dietary changes in reducing blood serum cholesterol?

Dr. FISHER. I think that the key to obesity control is exercise, but I think that exercise cannot work without dietary change. We have done research both ways, where we have looked at dietary change and exercise change, and many people do not respond unless they have both of those changes.

The CHAIRMAN. I do not think most people realize you are 90 years old. [Laughter.].

The Chairman. Do you agree with the current recommendations that cholesterol-lowering diets are only appropriate for a subgroup of the population—maybe those individuals who are at risk for heart and cardiovascular diseases?

Do you agree with that?

Dr. FISHER. Well, I think we have to be careful not to lump cholesterol and fat in the same breath. Sometimes, we talk about cholesterol as if it were fat and fat as if it were cholesterol, and I think there is a difference. I think we have to control the intake of cholesterol specifically, and also the number of calories from fat. And I personally think that the bigger problem is the amount of fat in the diet at this time The food that we eat every day that sometimes seems so good has been adulterated by fat. And I think somehow, we have to get to the food manufacturers the idea that they need to make food more healthful, that they need to lower the amount of fat, because even if we label properly, many people will not understand how to read those labels, even if they are labeled very clearly for most of us.

So I think that we should encourage food manufacturers and maybe even penalize them if they do not follow the guidelines that would lead to greater health.

The CHAIRMAN. Thank you.

Dr. Fulton, you have provided great support for the benefit of using Nautilus health exercise equipment. However, many of our citizens just simply do not have access to do this. In fact we in the U.S. States Senate did not have access to Nautilus equipment until just a month or so ago. You should see some of the awful stuff that we have had to use in our little, tiny gym—which is always listed

as one of the great, big, magnificent perks for Members of the U.S. Senate. I do not think you would even want to use it, but you would now, now that we have the Nautilus equipment, I suppose.

But as I say, many citizens do not have access to Nautilus equipment and may not be able to. What do you recommend for people who do not, and what can they do in their homes or in their local communities?

Dr. FULTON. Well, I think the critical issue is the concept of overload. You do not need a Nautilus machine necessarily to provide the body an overload. There are many other formats, there are many other weighted machines—there are barbells, for instance—and certain activities certainly provide a certain level of overload.

But it must be progressive in nature if we are going to get the changes, particularly of the musculoskeletal system, that are desirable.

One area that I think is very, very important to look at is the area of geriatric medicine, or geriatric exercise, because this is a group that obviously does not stress their system, and a great deal of their health care problems are related just simply to disuse of these systems.

Overload is relative to the group that you are going to be working with. For some people, overload is just getting out of a chair. But you must understand, it need to be progressive in nature, and what tools are available can be used, as long as a good, solid concept is available.

The CHAIRMAN. How much does a 20-minute workout on Nautilus equipment, for instance, improve the cardiovascular system? Some people wonder how that is so, and how does that compare, for instance, with 20 minutes of jogging or swimming?

Dr. FULTON. Well, it is an area—again, I am an orthopedic surgeon by training; I am not an exercise physiologist, and I am not an internist. We do know with observations throughout our facilities that we can get significant change in the cardiopulmonary system with circuit training. We are working, for instance, with a group of elderly ladies who have osteoporosis now, and one of the most remarkable changes they made with good-quality circuit training was their cardiopulmonary fitness change, almost immediately.

Cardiopulmonary fitness. It is possible with circuit training. There is no question about that.

As far as the benefits or comparisons to jogging, jogging has certainly brought a fitness awareness to our country that is commendable. However, it only gives you a steady-state level as far as overload is concerned, and you can only expect so much improvement, particularly as far as the musculoskeletal system is concerned. It is also a fairly high force activity if you consider it accumulatively. So it is very important that people who are jogging simultaneously supplement themselves with a good-quality exercise program involving overload such as weighted machines.

The CHAIRMAN. Thank you.

Senator Simon, we will turn to you.

Senator SIMON. Thank you, Mr. Chairman, and I thank all three of you for your testimony.

Dr. Fulton, first, if I may digress a little from the subject here—and I would be happy to have comments from either of the other two—I notice you had a slide on damage in sports, where you had that football player going one way and his leg going the other. We have a sport in this country called boxing, where 70 percent of those professional boxers end up with brain damage.

Is this something we should continue to tolerate in the United States, or is this something that we really ought to be moving away from? And I recognize this is not the purpose of this hearing, but since you got into this, I am just curious for any reaction you might have.

Dr. FULTON. I think it is important that we have an awareness of the forces of athletic participation. In high force sport there is always a risk of injury, there is no question about it. At face value, the game of football, which is our all-American game, is an insane game as far as forces that the body is exposed to.

As far as boxing is concerned, it is difficult for me to tell you that we cannot perform safely while boxing. But like any other sport, I think the body should be as best-prepared as possible for those forces of the activity. Now, whether boxing requires a change in rules, a change in equipment, to control the forces of the sport, maybe these areas need to be looked at more carefully.

But it is very difficult for me to tell you that a contact sport like boxing should be totally abandoned.

Senator SIMON. A very diplomatic answer, and I thank you for it.

May I ask the three of you—and Ms. Evans, I have to tell you, from talking to my staff, I think I am the only person in the United States who does not watch Dynasty, but I have appreciated your testimony here today—is there any time in the day that is better for you to do exercise than another time?

For example, Ms. Evans, you mentioned that you do it to relieve tension which, among other things, may suggest the end of the day is a good time.

Ms. EVANS. Well, sometimes, I have to do it at the end of the day, but I would prefer to work out in the morning, if I have a preference. I seem to have more energy in the morning than in the evening.

Senator SIMON. Do either of the other panelists have a comment?

Dr. FISHER. Research has shown slight differences in the times, but I think it is so small that it is not an important factor at all. I think what has to happen is you have to find a time that fits your daily schedule. And people are more successful who do it at the same time every day that they exercise—say, they exercise Monday, Wednesday and Friday at noon, or whatever other time they can fit it into their schedule, and actually schedule that activity.

Senator SIMON. So theoretically—and you say there is a slight difference—but in theory, what is the best time to exercise?

Dr. FISHER. I really cannot remember the research, but it is so small a change.

Dr. FULTON. Again, I have to agree. I think it is the preference of the individual. I think the important thing is the regular participation in exercise, however it is convenient for the individual.

Senator SIMON. Well, I thank all three of you for your leadership in this area.

Thank you, Mr. Chairman.

[Information supplied for the record follows:]

Nautilus

LOW BACK TREATMENT ALTERNATIVE

PRELIMINARY REPORT

Nautilus computerized tensiometer equipment

INTRODUCTION

During the development and clinical testing of prototype tensiometer machines for the trunk musculature, it became obvious that the healthy back had incredibly high torque capabilities. Forces as high as 500 pounds were observed for the trunk extensors. Just as impressive was the low torque values for the diseased back—as low as negative ten pounds. Because of this great discrepancy, it was decided to observe the relationship of trunk strength to back pain during a meaningful exercise program for trunk strengthening.

PROTOCOL DEVELOPMENT

A Nautilus trur. strengthening format was designed emphasizing the low back, abdominal and rotary torso machines General body strengthening was also performed

A reporting format (rating scale) was modified from the Iowa Low Back Rating Scale (University of Iowa, 1982) This rating scale recorded, 1) PHYSCIAL CRITERIA—points given for units of average force (pounds/average of 8-9 testing positions thru range of motion) and points given for degrees of spine flexibility (both measured by prototype tensiometer) . PATIENT'S PERCEPTION OF PAIN points based on questionnaire 3) PHYSICIAN S PERCEPTION OF PAIN—points based on questionnaire

The strength program was three months in length The reporting format was completed on the initial work-up, two week follow-up, and twelve week follow-up

ORTHOPAEDIC & REHABILITATION CLINIC

Nautilus TRAINING RECORD
LOW-BACK TREATMENT ALTERNATIVE

Name _____

DATE						
LOW BACK						
LEG EXTENSION						
LEG CURL						
HIP ABDUCTION						
HIP ADDUCTION						
ABDOMINAL						
ROTARY TORSO						
CALF RAISE						
ROWING						
ARM CROSS						
LATERAL RAISE						
PULLOVER						
MULTI-BICEPS						
MULTI-TRICEPS						

DIAGNOSIS: _____ THERAPY PROGRAM _____

PROGRESS NOTES: _____

CL-099

ORTHOPAEDIC & REHABILITATION CLINIC

LOW BACK RATING SCALE

PATIENT _____ _____

TOTAL POINTS.	Date	Date	Date
A. Physical Criteria (30)			
B Patient Perception (40)			
C Physician's Perception (30)			
TOTAL (100)			

A. PHYSICAL CRITERIA (30 points)

_____ 1 Goniometer - Total amount of flexion and extension in degrees
Points (one point for every ten degrees - 12 points maximum)

_____ 2 Tensiometer - Total amount of flexion and extension in lb.
Points (18 points maximum)

B. PATIENT PERCEPTION (Part II Patient Periodic Record) (40 points)

_____ 1 Average pain _____ (15 points maximum)

_____ 2 How disabled (10 points maximum)

No disability, able to work full-time 10
Able to work full-time but at lower level 8
Able to work only part-time but at usual level 6
Able to work only part-time but at lower level 4
Not able to work at all 0

_____ 3. Activities you can perform - one point for each YES answer
(15 points maximum)

C. PHYSICIAN'S PERCEPTION (Part III Physician's Periodic Record)
(30 points maximum)

_____ 1 How much pain would you expect for this patient at this time? (10 points maximum)

_____ 2. At the present time, what is the degree of impairment?
(10 points maximum)

_____None 10
_____Mild, but should not affect most activities 8
_____Moderate, can't perform some strenuous activities 6
_____Only light activities, can't perform any strenuous activities 2
_____Severely limited; can't perform most light activities or some activities of daily living 0

_____ 3 Current drugs and daily doses (quantity) (10 points maximum)

Analgesics (occasional use = less than 5 times per week)
Major narcotic, regular use 0
Major narcotic, occasional use 2
Minor narcotic, regular use 4
Minor narcotic, occasional use 6
Non-narcotic, regular use 8
Non-narcotic, occasional use 10

LBRS2/84

ORTHOPAEDIC & REHABILITATION CLINIC

NAME _____

LOW BACK PAIN QUESTIONNAIRE

1 How much pain would you expect on an average day?

No pain or discomfort | Very severe continuous pain or discomfort

2 How disabled are you? Choose the ONE statement below that best describes your current situation and make a check mark to the left of that statement (If you have not been employed, then "work" refers to your usual responsibilities such as running the household or community service positions)

_____ (A) No disability at all - able to work full-time
_____ (B) Able to work full-time, but at a lower level
_____ (C) Able to work only part-time, but at usual level
_____ (D) Able to work only part-time AND at a lower level
_____ (E) Not able to work at all

3. Please indicate below which activities you can (or could if you wanted to) now perform (at least some of the time) and which activities you cannot perform because of your pain problem If you can perform the activity, circle the "YES", If you cannot perform it, then circle the "NO" Give an answer for each activity

	1	2
Walk a mile	YES	NO
Walk up and down stairs	YES	NO
Stoop over a sink	YES	NO
Carry a bag of groceries	YES	NO
Make a bed	YES	NO
Ride in a car	YES	NO
Sit for long periods (in a movie, church)	YES	NO
Visit friends or relatives for an evening	YES	NO
Recreational activities (bowling, dancing, hiking)	YES	NO
Stand for an hour or more (like waiting in line)	YES	NO
Rake leaves or mow lawn	YES	NO
Pick up small children	YES	NO
Sweep floor with a straw broom	YES	NO
Dress without assistance	YES	NO
Cook a meal	YES	NO

LBPQ2/84

SUBJECTS AND RESULTS

Twenty patients completed the three month strengthening program six men females and nine males, ages 25 to 76 years The average age was 39 5 years Diagnoses included degenerative disk disease, herniated lumbar disk degenerative arthritis, lumbar stenosis, and chronic lumbar sprains

Preliminary trends over three months.

50% increase in trunk extensor strength (% change in average strength).

31% increase in trunk flexor strength (% change in average strength).

All patients greatly improved in pain complaints

All patients either maintained or advanced in work status.

Example

P P , 40 year old white male laborer with two year history of chronic low back pain with sciatica Prior treatment epidural injections with no improvement Diagnosis Degenerative disk disease with chronic low back pain Clinical course, complete resolution of symptoms at three months with maintenance of heavy laboring work status 81% increase of average trunk flexor strength and 145% increase of average trunk extensor strength

58-145 O - 86 - 4

ORTHOPAEDIC & REHABILITATION CLINIC

LOW BACK RATING SCALE

PATIENT P.P.

TOTAL POINTS	Date Inital	Date 2 weeks	Date 12 weeks
A Physical Criteria (30)	14.6	17.3	21.2
B Patient Perception (40)	19.0	19.7	39.0
C Physician s Perception (30)	19.0	20.0	29.0
TOTAL (100)	52.6	57.0	86.2

A PHYSICAL CRITERIA (30 points)

1 Goniometer - Total amount of flexion and extension in degrees
_____ Points (one point for every ten degrees - 12 points maximum)

2 Tensiometer - Total amount of flexion and extension in lb
_____ Points (18 points maximum)

B PATIENT PERCEPTION (Part II Patient Periodic Record) (40 points)

_____ 1 Average pain _____ (15 points maximum)

_____ 2 How disabled (10 points maximum)

No disability, able to work full-time	10
Able to work full-time but at lower level	8
Able to work only part-time but at usual level	6
Able to work only part-time but at lower level	4
Not able to work at all	0

_____ 3 Activities you can perform - one point for each YES answer (15 points maximum)

C PHYSICIAN s PERCEPTION (Part III Physician's Periodic Record) (30 points maximum)

_____ 1 How much pain would you expect for this patient at this time? (10 points maximum)

_____ 2 At the present time, what is the degree of impairment? (10 points maximum)

____None	10
____Mild, but should not effect most activities	8
____Moderate, can t perform some strenuous activities	6
____Only light activities, can't perform any strenuous activities	2
____Severely limited, can't perform most light activities or some activities of daily living	0

_____ 3 Current drugs and daily doses (quantity) (10 points maximum)

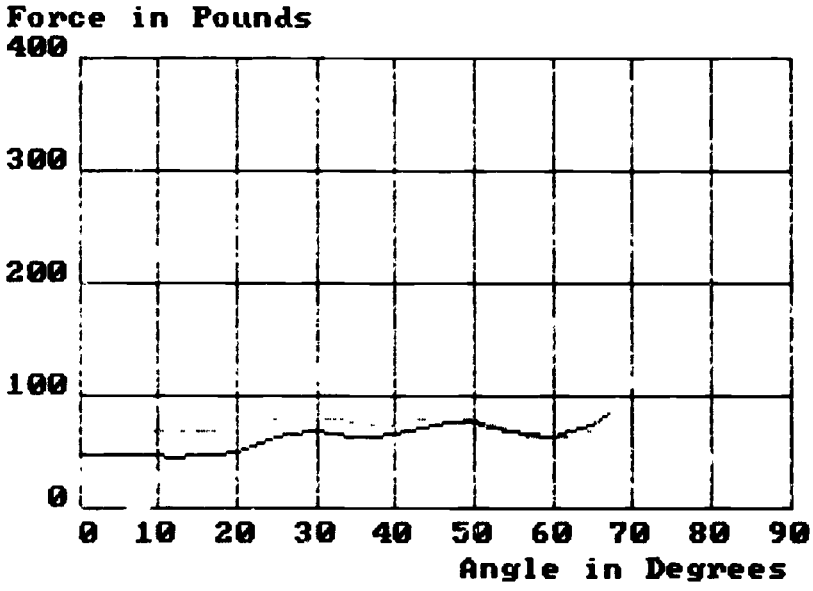
Analgesics (occasional use = less than 5 times per week)

Major narcotic, regular use	0
Major narcotic, occasional use	2
Minor narcotic, regular use	4
Minor narcotic, occasional use	6
Non-narcotic, regular use	8
Non-narcotic occasional use	10

LBR.v2.84

Nautilus Net Strength Test

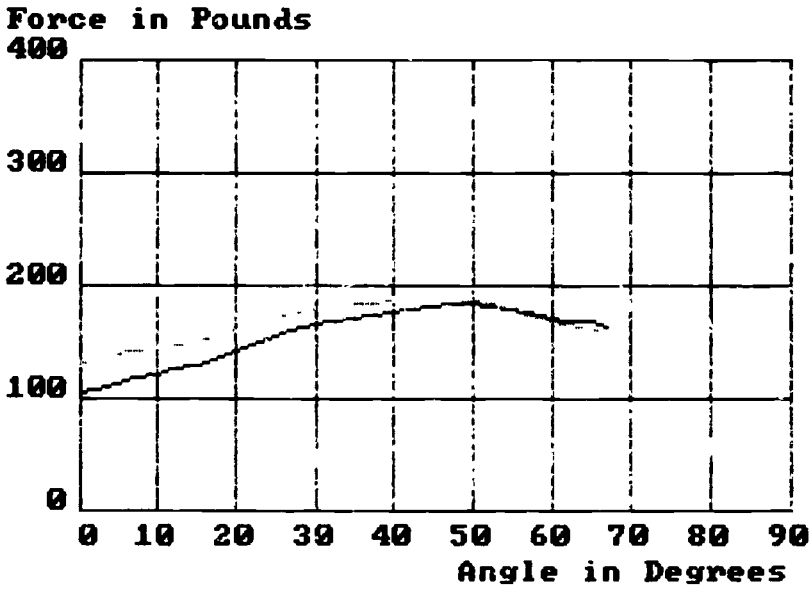
Name:
Machine
Date:
Time:



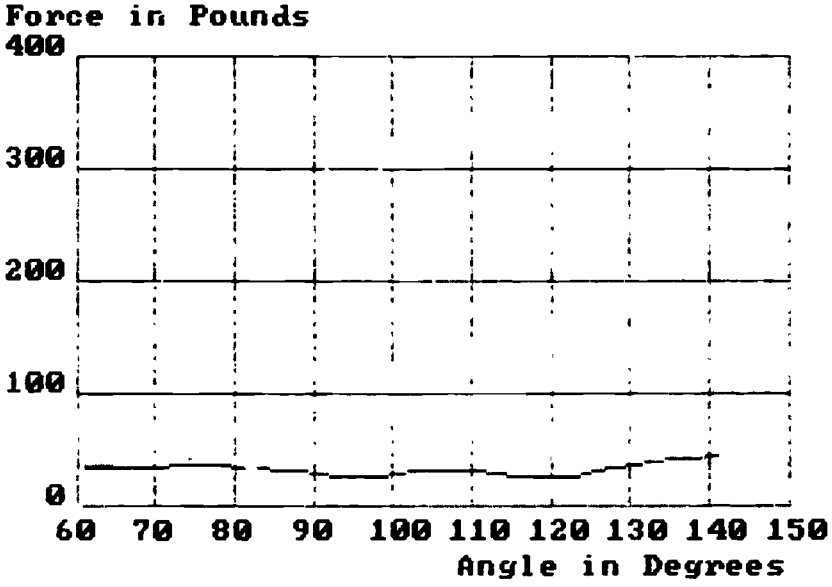
Angle (degrees) :		9	18	29	37	46	57	65
Force:	72	68	67	80	72	80	61	80
-bw	26	23	20	14	9	4	[illegible]	7
Net Force	47	45	47	66	63	76	61	87

Nautilus Net Strength Test

Name: FF 156lbs
Machine: Lower Lat
Date: 04/1/07
Time: 13:58.38

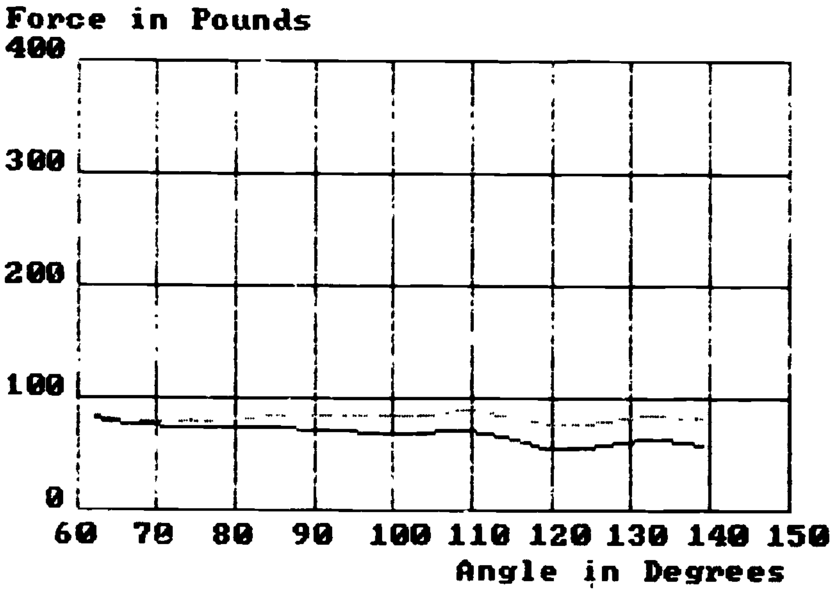


Angle (degrees):	0	5	15	25	39	49	59	66
Force:	130	142	157	175	184	187	170	156
-bw	27	24	20	15	10	4	2	-7
Net Force	103	118	137	160	174	183	172	163


Force in Pounds
400
300
200
100
0
60 70 80 90 100 110 120 130 140 150
Angle in Degrees

Nautilus Net Strength Test

Name: F [illegible]5olbs
Machine: [illegible]bdomina[illegible]
Date: 8[illegible] 1[illegible] [illegible]
Time: [illegible]4: [illegible].5



Angle (degrees):	5[illegible]		[illegible]1	[illegible]	1[illegible]	11[illegible]	[illegible]21	1[illegible]	[illegible]4[illegible]
Force:	[illegible]	[illegible]	80	8[illegible]	8[illegible]	8[illegible]	[illegible]4	8[illegible]	[illegible]7
-bw	1	4	6	1[illegible]	15	18	[illegible]	[illegible]1	[illegible]
Net force	31	[illegible]4	[illegible]2	71	67	68	54	61	55

DISCUSSION

Although a small subject number, trends show large changes can be made in trunk strength of the diseased low back in three months of meaningful exercise. This increase of trunk strength correlates positively with improvement of symptoms of low back pain.

The CHAIRMAN. Thank you, Senator.

I want to thank this panel for being here. Ms. Evans, we know you sacrificed a lot to be here, and it means a lot to us. You have helped us a lot on this hearing today. It is an important hearing. If we can get enough people out there to understand what these people are talking about and what you especially have talked about, it can make a real difference in this country, and in millions and millions of people's lives. We can save lives here, and we can enhance lives, and there are many other things and benefits that we hope will come from this particular hearing. So we are very grateful for you being here. We know you have to fly back, so we will not keep you.

Dr. Fisher, we just want you to know that you have meant a lot to me, personally, and I think a lot to a number of Senators—I would say a pretty good percentage of Senators have a copy of your book, that I have given to them as they have wondered what they can do to stay healthy and strong as they live through this very, very difficult life in the U.S. Senate.

And thank goodness we have Nautilus equipment in the Senate now, I just want to tell you, and I think your presentation will help all of us to want to use it a little bit more, Dr. Fulton.

But I thank all three of you. We really appreciate you being here. Thank you for being with us.

Our third panel will be discussing the role that nutrition plays in the prevention and treatment of cancer.

First, let me introduce a highly respected scientist, Dr. Peter Greenwald, Director of the Division of Cancer Prevention and Control at the National Cancer Institute.

Second, I would like to introduce Mr. John Fink, with Cancer Victors and Friends in Santa Barbara, CA.

Third, let me introduce Dr. Oliver Alabaster, director of cancer research at George Washington University Medical School.

I would like to welcome you all here today. We will turn to you first, Dr. Greenwald, and we are going to limit you to 5 minutes.

I did not state at the outset, but I will state now, that all written statements will be placed in the record as though fully delivered.

We do appreciate summaries, and so I am going to cut you off at 5 minutes, because we are running out of time.

Go ahead, Dr. Greenwald.

STATEMENT OF DR. PETER GREENWALD, DIRECTOR, DIVISION OF CANCER PREVENTION AND CONTROL, NATIONAL CANCER INSTITUTE; JOHN FINK, CANCER VICTORS AND FRIENDS, SANTA BARBARA, CA; AND OLIVER ALABASTER, ASSOCIATE PROFESSOR OF MEDICINE, GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, WASHINGTON, DC

Dr. GREENWALD. My topic is diet and the prevention of cancer. I think we should make a clear distinction between diet related to prevention and that related to therapy. The National Cancer Institute is interested in diet in relation to therapy, but I am going to confine my remarks to prevention.

There is now a general scientific consensus that perhaps 80 percent of all cancer is related to the way we lead our lives—whether

we smoke, what we eat, certain industrial pollutants. Of that, we think that roughly—roughly—35 percent is related in some way to diet, and in particular, the general recommendations we have are to eat a variety of lowfat foods, keep trim, and increase the fiber-containing foods

People are not always aware of what the statistics show. One of the cancers related to diet is cancer of the colon. For example, the country of Finland, not too unlike ours in diet, except they eat much more fiber; in Finland, cancer of the colon is less than one-third as common as colon cancer in the United States.

If you live in Connecticut, your chances of colon cancer are more than 70 percent higher than if you live in Utah.

In our black population, we have had more than a doubling of the death rate from colon cancer over the past 30 years, and now it is about equal to the white population.

The Hispanic population in Los Angeles has only two-thirds the rate of colon cancer as the other white population in Los Angeles.

In fact, one thing we are a bit concerned about is as that Hispanic group strives for better education, better income, and better jobs, they may give up some of the good parts of their diet which is high in fiber.

We know that populations living in Florida, where over 40 percent moved from the Northeast, have a somewhat lower rate of colon cancer than other people in the Northeast from where they moved.

We think these are all related to diet. We also have evidence that changing your diet within your lifetime, even later in life, may have a benefit.

Last year, based on this type of information, the National Cancer Institute began a Cancer Prevention Awareness Program. We should note that what we are recommending is entirely consistent with the recommendations for heart disease and is not associated with any known risks.

While we need continued research, we have an extensive body of knowledge now that eating more fiber is important, that fat is a risk factor, that obesity and alcoholism increase the risk of cancer.

In addition to our guidelines—and I will repeat them again: Eat more fiber-containing foods. By that, we mean any fresh or frozen fruits or vegetables, whole grain cereals and cereal products, the legumes, the peas and beans. Cut down on fat. You can do that from whatever source. Eat fresh fruits and vegetables, and keep trim

In addition to the evidence in the guidelines, we have embarked upon a major new initiative in diet and cancer research. Research is crucially important, both at the basic level, but also at the level of what we can do for people

In the past 2 years, for the first time in history, we have begun human cancer prevention trials. At this time, there are about two dozen such trials in progress Some of these are in an area called chemoprevention. That is, we are adding specific-defined nutrients, such as certain vitamins or synthetic analogues of vitamins, and certain minerals, in randomized clinical trials, to see if we can lower the frequency of cancer.

The CHAIRMAN. Doctor, your time is up. We appreciate it, and your statement is excellent and we will put it in the record.

Dr. Greenwald Thank you.

[The prepared statement of Dr. Greenwald and responses to questions submitted by Senator Grassley follow:]

Statement by

PETER GREENWALD, M.D., Dr.P.H.

Director

Division of Cancer Prevention and Control

National Cancer Institute

NATIONAL INSTITUTES OF HEALTH

PUBLIC HEALTH SERVICE

U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

before the

SENATE COMMITTEE ON LABOR AND HUMAN RESOURCES

November 13, 1985

Mr. Chairman and Members of the Committee:

It is a pleasure to be here today. I would like to discuss diet and its association with the cause and prevention of cancer. The National Cancer Institute (NCI) also is concerned about diet as it relates to good nutrition for cancer patients, but this is a totally different topic and one that I will not cover today. There now is general scientific consensus that about 80 percent of cancer cases appear to be linked to the way people live their lives. For example, whether or not we smoke, the foods we eat, and certain industrial pollutants all affect our likelihood of getting cancer.

The role of diet in the cause and prevention of cancer is particularly important. In fact, the most comprehensive review to date estimates that 35 percent of cancer deaths may be associated with dietary influences. Colon cancer is one type of cancer that is linked to diet.

Few people realize that colon cancer is over three times more common in the United States than it is in Finland; that colon cancer deaths in Connecticut are more than 70 percent higher than in Utah; that the colon cancer death rate in the American black population almost doubled in the last 30 years and now equals that in whites, that Hispanics in Los Angeles have only two thirds of the frequency rate of other whites in Los Angeles; or that people living in Florida--even in areas where 40 percent of the population were born in the Northeast--have substantially less colorectal cancer than their northeastern countrymen. These are just a few examples of cancer differences that we think are linked to diet.

The possibility of preventing colorectal cancer is suggested not only because of the high prevalence in the United States compared to other countries with different eating habits but because of evidence that risk may be lowered substantially within an individual's lifetime by changes in diet. The NCI thinks the main factors increasing colon cancer risk are too much dietary fat and too little dietary fiber.

Because of congressional and public interest in the development of dietary recommendations that could lead to a reduction in cancer risk, the NCI asked the National Research Council in 1980 to evaluate the role of diet in causing cancer and to identify dietary recommendations for the public. We also accelerated our research programs in these areas.

Supported by the Council's report published in 1982--and our own more recent and soon to be published review of dietary fiber and cancer, last year the NCI began a Cancer Prevention Awareness Program. Dietary recommendations that we believe will reduce cancer risk were broadly publicized. It is important to note that our dietary recommendations are consistent with the recommendations proposed to reduce deaths from heart disease, and that these recommendations pose essentially no risk to the public.

In fact, I want to emphasize that--even though we do not know everything we need to know about diet and cancer--our dietary recommendations are based on the findings of hundreds of laboratory, animal and human studies. The results of these studies tell us several things:

- They indicate that populations that consume higher amounts of dietary fiber a day have a lower rate of cancers of the colon and rectum.
- They indicate that eating too much fat may increase the risk of getting cancers of the colon, breast, prostate and endometrium--the lining of the uterus.
- They link obesity with higher risks of developing cancers of the colon, breast, prostate, gallbladder, ovary and uterus.
- They suggest that cancers of the stomach in Colombia and certain other countries may be associated with diets low in vitamin C, and that diets low in vitamin A are associated with higher risk of

cancers of the lung, bladder and larynx (voicebox).

- They establish that heavy drinking of alcoholic beverages, particularly when combined with cigarette smoking, increases the risk of cancers of the mouth, throat, liver, and perhaps other organs.

Therefore, the National Cancer Institute recommends the following dietary guidelines, which are consistent with the joint USDA DHHS Dietary Guidelines for Americans:

1) Eat fiber-rich foods. The average American should try to double the amount of fiber they currently eat. Fiber-rich foods include whole grain breads and cereals, fresh or frozen fruits and vegetables, and dried peas and beans. When possible, we should eat the peel of the fruits and vegetables to get more fiber. Vegetables and fruits contain many important nutrients in addition to fiber.

2) Eat a variety of foods low in fat. Individuals should keep intake low of all fats. To cut fat consumption, individuals may choose such things as low-fat dairy products, low-fat salad dressings and desserts, and poultry without the skin, fish, and lean choices of meat. Trim all visible fat from meats. Food preparation methods are important. The best cooking methods remove or avoid adding fat--for example, microwave cooking, baking, oven broiling, boiling, and stewing. Avoid frying; instead, use non-stick cookware.

3) Eat fresh fruits and vegetables. Individuals should increase the intake of fruits and vegetables containing vitamin A, vitamin C, and beta-carotene. Fresh or frozen dark-green and deep-yellow vegetables, and deep-yellow fruits are rich vitamin sources, and many are important fiber sources as well.

4) Keep Trim. Obesity relates both to caloric intake and physical activity. Actually, people who eat more fiber-rich foods may tend to cut down on fat and calories.

5) If you drink alcohol, do so in moderation. If an individual drinks, one or two drinks a day is generally considered moderate.

In summary, we are suggesting that following a few simple principles may reduce one's cancer risk. This easily can be done with a very varied and tasty diet. The general idea of keeping trim and eating a variety of foods low in fat and high in fiber can be done by almost anyone, without losing the wide cultural, ethnic or other variations in food preference.

Mr. Chairman, I would like to caution that there are things for which it would be premature to make a public recommendation, because there is insufficient scientific evidence on either benefit or safety. For example, we do not now have a recommendation on either fiber supplements or vitamin supplements to reduce cancer risk. The available evidence which shows protective effects is based on an association with foods that are high in fiber and rich in vitamins. Also, our recommendations are intended for persons who are healthy. Others should consult a physician before beginning any diet modification.

This leads me to the final point I would like to make--that the National Cancer Institute is continuing to build its research effort on diet and cancer. We need to learn more about how specific components of the diet either increase or decrease the risk of cancer, and how they may interact.

In addition to large programs in basic research and epidemiological research on nutrition and cancer, human cancer prevention trials are under way as part of our Cancer Prevention and Control Program. One area that shows great promise is called chemoprevention. We are studying whether natural and synthetic agents- in pill or capsule form--can reduce the incidence of cancer. We have about two dozen ongoing different chemoprevention studies of human populations right now. Among the compounds being tested are vitamin A; synthetic retinoids which are derivatives of vitamin A; and a

precursor of vitamin A called beta-carotene. We also are studying vitamin C, vitamin E, vitamin B12 and the B vitamin folate, and the trace mineral, selenium. We know of several hundred compounds which may have some potential for cancer prevention, NCI has started a systematic process of laboratory research to see which of these may merit being brought forward into human prevention trials.

Our goal for chemoprevention research is to see if we can find ways to use these and other compounds to prevent cancer in the population at large or to halt or reverse the development of cancer in people already exposed to cancer-causing agents. What we learn may help those people at high risk of cancer as well as those with certain precancerous conditions.

We also are conducting feasibility studies for two large clinical trials to see if a very low-fat diet can prevent or retard breast cancer. Both of these studies are looking at the effects of diets with total calories made up of 20 percent or less fat. Most Americans now consume about 40 percent of their calories from fat. The level generally recommended for cancer and heart disease prevention is 30 percent of calories from fat. The 20 percent fat level in the studies is so low, in fact, that we also will be testing the feasibility of staying on such diets.

The first of these low-fat diet studies includes about 12,000 healthy women at increased risk of breast cancer. The purpose of the study is to see if we can reduce breast cancer incidence among these high-risk women. This kind of controlled clinical trial gives the most convincing type of evidence. The time from starting a low-fat diet to realizing the benefit also can be tested in such a trial.

The second study includes about 2,000 women who already have been treated for breast cancer. The purpose of this study is to see if low-fat diets can prevent localized cancer from recurring.

Mr. Chairman, that concludes my statement. I have described the background that led the National Cancer Institute to make dietary recommendations, listed those recommendations for you, and highlighted some of our important cancer control research trials to learn even more about how diet can be modified to reduce the chances of getting cancer. I would be glad to answer any questions at th s time.

QUESTIONS FROM SENATOR GRASSLEY TO DR. GREENWALD

You mentioned that the Cancer Institute began a Cancer Prevention Awareness Program and that this effort was, in effect, supported by the report done by the National Research Council in 1982. Let me ask several questions about this.

Q. First, is the Report in question the one entitled, Diet, Nutrition and Cancer?

A. Yes.

Q. Are you familiar with the GAO Report I mentioned in my opening remarks, the one that I and several other senators requested the GAO to do on the two National Academy of Sciences reports Toward Healthful Diets (1980) and Diet, Nutrition and Cancer (1982)?

A. Yes.

Q. According to the GAO, neither of these reports was adopted as National Academy of Sciences positions, and the reports therefore represent the opinions of their authoring groups. Now, I hope I am not getting too petty here, but I want to point this out just for the sake of making sure that those who read your statement in our record don't jump to the conclusion that the study to which you refer as supporting the Awareness Program you mentioned was officially endorsed by the National Academy of Sciences. It is the case, is it not, or at least it is stated by the GAO, that the National Academy doesn't usually, as a corporate entity, endorse studies. Therefore, they are really representing the opinions of the groups which author them.

Q. Would you agree with this assessment?

A. As pointed out by Dr. Frank Press, Chairman of the National Research Council, National Academy of Sciences, in a letter to Science (Vol. 230, December 20, 1985), to ensure accuracy, completeness, and balance in interpretation of scientific data, every National Research Council report is reviewed by specifically appointed independent scientific experts and any professional unit that oversees the work of the panel. A notice at the front of the Diet, Nutrition and Cancer Report states:

> The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the Councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the committee responsible for the report were chosen for their special competences and with regard for appropriate balance.
>
> This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

Thus in my opinion, this is an official Report of the National Research Council. Obviously, any report represents the opinions of the groups which author it.

Q. The GAO Report said that Diet, Nutrition and Cancer, the report you mentioned earlier as supporting your Cancer Prevention Awareness effort, was criticized by "some scientists for making recommendations before studies have been undertaken to prove that dietary changes could reduce the risk of developing cancer: i.e., proof of the recommendation's benefits."

Q. Would you comment?

A. The nature of science is such that there always will be disagreement about how much proof is needed to make public health recommendations. However, there is a very large and convincing body of research evidence supporting the National Cancer Institute's recommendations related to diet and cancer. In addition to the thorough review of the evidence by the National Research Council back in 1982, the National Cancer Institute has continued to assess accumulating research evidence on diet, nutrition and cancer. We feel the body of evidence supports NCI's recommendations. These recommendations are consistent with the "dietary guidelines for Americans" jointly published in 1985 by the United States Department of Agriculture and the United States Department of Health and Human Services. There nearly always is the possibility that new research will change future thinking. However, current NCI recommendations are sound and prudent for the public to follow.

Q. Would you comment on the three statements I quoted from the GAO study's conclusion in my opening remarks? These were: First, that "The scientific evidence required before providing public dietary advice to reduce chronic disease risk is a controversial matter in the scientific community." Second, that: "No standard of scientific evidence has been universally agreed upon for making public recommendations about diet's relationship to chronic disease risk." And third, referring to both National Academy reports on diets, Toward Healthful Diets and Diet, Nutrition, and Cancer, that: "A discussion of the different schools of thought about public dietary advice would have provided a better context for policy makers as they assess the issues involved."

A. As noted in the answer to the previous question, there nearly always are some differences in interpretation of aggregated scientific evidence. While the scientific method has a commonly understood general meaning, you are correct that there is no universally agreed upon standard for reviewing research or for making public recommendations -- whether they be in diet, chronic diseases or many other areas. However, some of the scientific literature does address the question of how best to aggregate evidence. For example, one method that NCI used in reviewing the research evidence was to consider the "criteria for causality" described in the 1982 Surgeon General's Report on The Health Consequences of Smoking. In this way, we felt a reasonable judgment could be made about diet and cancer, just as one had been made about the link between smoking and disease. The Diet, Nutrition and Cancer and previous National Academy reports were not the only sources used in our assessment. In fact, the primary sources were reports of the original investigations themselves. Certainly, we feel that a continued major research emphasis is needed in the area of diet and cancer, but we also believe that the public has a right to be informed about our interpretation of current evidence even while the research continues.

Q. I want to ask a last queation about a specific recommendation made in your statement. On page three you say that "An individual should increase the intake of fruits and vegetables containing vitamin A, vitamin C and beta-carotene."

Now, in the New York Times article I mentioned in my opening remarks, dated October 7, 1985, reporting on the effort of the National Academy of Sciences to produce a revised set of recommended dietary allowances, it states that "Some of the nation's most eminent scientists were in irreconcilable conflict over proposals to alter the recommended levels of certain vitamins and minerals in the human diet."

According to the Times article, the draft report recommended reducing the allowances for . . . vitamins A, C and B6. Dr. Kurt Isselbacher was quoted as saying that the public might get confused if a panel of the Academy recommended higher levels of vitamins A and C in 1982, but not were to recommend lower levels.

Is this an example of what I am driving at with these questions, namely, that there is some controversy here, rather than the ironclad consensus one would infer exists from your testimony?

There is also an implication here that something might be recommended just to keep from confusing the public, rather than because scientific opinion on it has now changed.

Q. Would you comment?

A. Questions about the Recommended Dietary Allowances (RDA) are more appropriately addressed to the National Academy of Sciences. However, one of the issues was whether attention in the RDA should should be given to chronic diseases, including cancer, or just to prevention of deficiencies as traditionally defined. Thus the controversy, at least in part, pertained to whether chronic disease concerns should be addressed by the RDA rather than to the nature of the relationship between specific nutrients and specific chronic diseases. While we rarely expect an "ironclad" consensus, benefits of fruits and vegetables in the diet are extremely well-supported in the medical literature. The human cancer prevention trials sponsored by the National Cancer Institute and now in progress should give us better insight into potential benefits of specific vitamins and dose levels of these vitamins.

The CHAIRMAN. Mr Fink, let us turn to you.

Mr. FINK. Thank you, Mr. Chairman.

I would like to respectfully request that any additional comments to the written text be included in the record.

The CHAIRMAN. Without objection, we will do that.

Mr. FINK. Thank you.

On the written witness list, I am billed as being with the victors and friends of cancer. I am not a friend of cancer. It is the cancer victors and friends.

The CHAIRMAN. I was wondering about that myself. It is friends of cancer victims?

Mr. FINK. Yes, cancer victors and friends.

The CHAIRMAN. Thank you

Mr. FINK. My name is John Fink. I was an actor for 14 years, until 8 years ago, when our 2 year-old daughter was diagnosed as having a rare form of cancer.

When doctors told us her prognosis was not good, my wife and I did what many loving parents would do by looking at anything and everything that we could find which could possibly help her. Our daughter only lived 2 years longer, but we feel that the quality of her short life was enhanced through the use of complementary therapies.

During our search, we were surprised to find many people with cancer alive and well, using natural methods—some, who had advanced cancers and had been told by their doctors to go home and get their affairs in order. Many of these people are still alive today.

This discovery consumed us. For the past 5 years, my wife and I have helped hold together a group in Santa Barbara called "the Cancer Victors," of around 100 members; it is made up of people with cancer, their families and friends. Those who have cancer are controlling it with nontoxic, primarily nutritional methods, used exclusively or in conjunction with conventional treatment. Our work is volunteered, and it constitutes most of my time.

In 1982, I took several trips with two professional researchers, looking at major hospitals, clinics and physicians throughout the United States, Europe, and Mexico, doing work with complementary therapies and investigated the newest avenues of health research, prevention and treatments of cancer and other degenerative diseases.

I brought two extraordinary articles by Dr. Michael Lerner, one of the researchers, from "The Journal of the Institute for the Advancement of Health," which summarize our findings, and I have copies of them with me and will make them available for anybody interested. In short, although we found no "silver bullet" cures, we found people who were reversing or at least holding their cancers in remission through the use of these therapies.

As one outstanding example, we were very impressed with the Bristol Cancer Help Centre in England, officially opened in 1983 by the Prince of Wales. The Centre's program emphasizes a change of lifestyle, nutrition, and stress control, which are often added to conventional treatments and enhance the patient's immune response and powers of self-healing.

It made me sad to read, as I just did in the November issue, the current issue, of "Scientific American," Harvard statistician John

Cairn's article in which he said that of the more than 200,000 American patients receiving chemotherapy, the number of patients being cured could not exceed more than a few percent, and that of the 400,000 deaths each year of cancer, adjuvant treatments now avert only perhaps 2 to 3 percent.

As Prince Charles said while addressing the British Medical Association:

> It is frightening how dependent upon drugs we are becoming and how easy it is for doctors to prescribe them as the universal panacea for all ills. Wonderful as many of them are, it should still be more widely stressed by doctors that the health of human beings is so often determined by their behavior, their food, and the nature of their environment.

In our group in Santa Barbara, we see cancer patients coming back month after month who are keeping their cancer in remission by themselves using natural methods. Many of them are aged. It often requires an enormous determination, will and courage to follow a rigid diet and to do it alone, and their remissions seem anything but spontaneous.

What is tragic is that some of these people have to leave this country to find doctors who will or can monitor and support their progress while using these therapies.

I support groups like the International Association of Cancer Victors and Friends and the National Health Federation, because, among other reasons, they are some of the few organizations supplying this difficult-to-get information about where one can go to get, for example, metabolic therapies, diet therapies, immune therapies and help in mental imagery, to people seeking options, but this isn't enough.

It is time now that every doctor in this country recognizes the importance of nutrition and the mind not only in preventing but in helping to overcome disease.

There is now a wealth of scientific information establishing the link between nutrition and the cause of some major forms of cancer. Clinical practice is showing us that nutrition can be an important complementary therapy.

Congress is to be commended for encouraging in the seventies the National Cancer Institute to set up the Diet, Nutrition, and Cancer Program, and for the creation of the Dietary Goals Report. Now the Congress, you Senators, can further the cause of improved health by calling for new research using nutrition in the treatment of cancer. New methodologies will have to be structured for this clinical research. Dr. Lerner makes some wonderful suggestions on what this research might look for in his second article. It can be done. Thank you.

The CHAIRMAN. Thank you, Mr. Fink. We appreciate your testimony. You have traveled all over the world in your quest to try and do something about this, and we appreciate it, and we really appreciate having you here.

[The prepared statement of Mr. Fink follows:].

STATEMENT BY JOHN FINK

My name is John Fink. I was an actor for fourteen years until eight years ago when our two year old daughter was diagnosed as having a rare form of cancer. When doctors told us her prognosis was not good, my wife and I did what many loving parents would do by looking at anything and everything which we could find that could possibly help her. Our daughter only lived two years longer, but we feel that the quality of her short life was enhanced through the use of complimentary treatments.

During our search we were surprised to find many people with cancer alive and well using natural methods, some who had advanced cancers and had been told by their doctors to go home and get their affairs in order. Many of these people are still alive today. This discovery consummed me. For the past five years I have helped hold together a group in Santa Barbara called The Cancer Victors of around one hundred members made up of people with cancer, their families, and friends. Those who have cancer are controlling it with non-toxic, primarily nutritional methods used exclusively or in conjunction with conventional treatments. My work is volunteerd and constitutes most of my time.

In 1982 I took several trips with professional researchers (1) looking at major hospitals, clinics, and physicians throughout the United States, Europe, and Mexico doing work with complimentary therapies and investigated the newest avenues of health research, prevention, and treatments of cancer and other degenerative diaeases. I have brought two articles by Dr. Michael Lerner, one of the researchers, from the journal the Institute for the Advancement of Health which detail our findings and will make them available for anyone interested. In short, although we found no silver bullet cures, we found people who were reversing or at least holding their cancers in remission through the use of these therapies. As one example, we were very impressed with the Bristol Cancer Help Centre in England, officially opened by Prince Charles. The Centre's program emphasizes a change of life style, nutrition, and stress control which often are added to conventional treatments and enhance the patients immune response and powers of self-healing.

It made me sad to read as I just did in the November issue of Scientific American Harvard statistician John Cairn's article in which he said that of the more than two hundred thousand American patients receiving chemotherapy, the number of patients being cured could not exceed more than a few percent. As Prince Charles said while addressing the British Medical Association, quote, "It is frightening how dependent upon drugs we are becoming and how easy it is for doctors to prescibe them as the universal panecea for all ills. Wonderful as many of them are, it should still be more widely stressed by doctors that the health of human

beings is so often determined by their behaviour, their food, and the nature of their environment", end of quote.

In our group in Santa Barbara we see cancer patients coming back month after month who are keeping their cancer in remission on themselves using natural means. Many of them are aged. It often requires an enormous determination, will, and courage to follow a rigid diet and do it alone and their remissions seem anything but "spontaneous". What is tragic is that some of these people have to leave this country to find doctors who will or can monitor and support their progress while using these therapies

I support groups like The International Association of Cancer Victors and Friends and the National Health Federation because they are some of the few organizations supplying difficult to get information to people seeking options, but this is not enough. It is time that every doctor in this country recognizes the importance of nutrition and the mind not only in preventing but in helping to overcome disease. There is now a wealth of scientific information establishing the link between nutrition and the cause of some major forms of cancer. Clinical practice is showing us that nutrition can be an important complimentary therapy.

Congress is to be commended for encouraging in the 70's the National Cancer Institute to set up the Diet Nutrition and Cancer Program, and for the creation of the Dietary Goals Report. Now the Congress can further the cause of improved health by calling for new research using nutrition in the treatment of cancer. Thank you.

Foot-note

(1)

Michael Lerner, Ph.D. is a MacArthur Prize Fellow at the Institute for Health Policy Studies, University of California San Francisco School of Medicine. He is the President and Founder of Commonweal, and centre for service and research in health and human ecology, in Bolinas, California.
Dr. Sandra McLanahan M.D. is a physician from Charlotteaville, Virginia.

The CHAIRMAN. We have a rollcall vote. I think, Dr. Alabaster, that I had better go make that vote, come right back, because I know we would have to interrupt you in the middle of your testimony. And then we will have just a couple of questions for each of you. If it is inconvenient for any of you, we would understand, if you need to leave, Dr. Greenwald—or can you wait?

Dr. GREENWALD. I will wait, yes.

The CHAIRMAN. OK. Then we will recess for just a few minutes so I can run over and vote, and I will come back as soon as I can.

[Recess.]

The CHAIRMAN. If we could have order. I apologize to you, but when I got there, I found out we had a back-to-back vote, so I stayed, and then I got waylaid on the way over by a television camera, too.

So, Dr. Alabaster, we will turn to you. We note your excellent book, and we look forward to hearing a little more about it.

Dr. ALABASTER. Thank you.

First, I would like to thank the committee for inviting me to this hearing.

There is nothing new about disease prevention. One hundred years ago in Western countries, about half the population was dead before the age of 40. This youthful mortality has now fallen to about 3 percent, very largely as a result of basic preventive measures such as better hygiene, better sanitation, and widespread vaccinations.

In middle-age, about four out of five deaths are now due to cancer, heart disease or stroke, with deaths from cancer almost equaling those from heart disease. Again, prevention offers the greatest hope to reduce this mortality, and changes in the American diet appear to be of critical importance.

Best scientific estimates are that about 80 percent of cancers are caused by environmental factors, which means that cancer is potentially preventable disease. There is also evidence that 60 percent of cancer in women and 40 percent of cancer in men is due to a bad diet.

Yet, as I explain in my book, "What you Can Do to Prevent Cancer," we can now reduce our cancer risk by at least 70 percent if we stop smoking, adopt a cancer prevention diet, and reduce our exposure to known risk factors.

The American Cancer Society now estimates that about one in three Americans will eventually develop cancer, which means that of the 230 million Americans alive today, approximately 70 million will be affected. Of these about 25 million cases could be prevented by relatively simple changes in the national diet and another 25 million cases or so could also be prevented by the elimination of tobacco.

Although nearly every American family will be touched in some way by this dreaded disease, few of us understand what we can do to prevent cancer.

Much of our present understanding of the importance of diet has come from studies of cancer risks in different countries around the world. For example, in Japan, which has a lowfat diet, breast cancer is rare; yet, when Japanese migrants to the United States adopt American dietary habits, their breast cancer rate increases

to that of native Americans within one generation. This implies that the origin of cancer is environmental rather than genetic.

This is not unique to breast cancer. Similar examples can also be found for most common cancers, including those of the colon and prostate.

Another type of study recently conducted in Finland revealed that people with low levels of vitamin E and selenium in their blood have 11 times the cancer risk. Studies such as this raise the question of whether certain vitamin and mineral supplements could be used to reduce our risk of cancer.

Although cancer usually takes many years to develop, the effect of dietary factors is actually in the late stage of the carcinogenic process, so that a cancer prevention diet will produce health benefits quite rapidly

What, then, are the most important dietary changes? First, we must understand that the typical foods we choose each day contain both cancer-causing substances and cancer-preventing substances. We must therefore shift the balance of our diet in favor of foods that are rich in cancer-preventing nutrients. Examples of potential anticancer nutrients are: beta-carotene, or vitamin A, vitamin C, vitamin E, selenium, and possibly folic acid and calcium. In addition, it has been found that the amount of fat and indigestible fiber in our diet influences our risk of getting certain cancers. We should therefore halve our fat intake to about 20 percent of total calories and increase our intake of high-fiber, whole-grain cereals, fruits and vegetables, particularly beta-carotene-rich vegetables, like carrots and squash, and the so-called cruciferous vegetables, like broccoli, cauliflower, and brussels sprouts.

Apart from a low-fat, high-fiber diet, we must remember that certain food additives such as nitrites can be converted by the body into carcinogens, so we should learn to reduce our exposure to them.

Methods of food preparation are important. Barbecuing and smoke-curing can cause carcinogens to form in food, so alternative methods of cooking should usually be employed. Alcohol should also be consumed in moderation.

These dietary recommendations are basically consistent with those of the National Cancer Institute and the American Cancer Society. But what is of special interest is that additional support for these recommendations is also derived from studies of Mormons and Seventh Day Adventists who follow diets that are closer to a cancer prevention diet and who have less cancer and heart disease than would otherwise be expected.

Nevertheless, whatever the limits of our current knowledge, there is compelling evidence that the dietary modifications which would reduce our risk of cancer would also reduce our risk of heart disease and stroke, the other major killer diseases.

If the right dietary changes were achieved, and if we eliminated smoking, we could expect to see about a 70 percent reduction in cancer risk, roughly a 60 percent reduction in heart disease risk, and a substantial reduction in the risk of stroke, the three major killer diseases that will otherwise remain mostly incurable into the next century.

It therefore seems to me that we should adopt a farsighted view and vigorously support the establishment of disease prevention programs that will not only reduce human misery, but also substantially reduce the enormous future costs of medical care.

I would be delighted to answer any questions.

The CHAIRMAN. Thank you so much.

[The prepared statement of Dr. Alabaster follows:]

THE PREVENTION OF CANCER
SHIFTING THE BALANCE OF THE AMERICAN DIET

PREPARED STATEMENT OF OLIVER ALABASTER, M.D.
BEFURE THE SENATE COMMITTEE ON LABOR AND HUMAN RESOURCES
NOVEMBER 13, 1985

THIS STATEMENT IS PARTLY CONDENSED FROM MY RECENT BOOK

WHAT YOU CAN DO TO PREVENT CANCER
SIMON AND SCHUSTER, COPYRIGHT 1985

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WASHINGTON D.C. 20037

THE PREVENTION OF CANCER

Shifting the Balance of the American Diet

It is estimated that 80-90% of cancers are caused by environmental factors, which means that cancer is a potentially preventable disease. In fact, we can now reduce our cancer risk by at least 70% if we stop smoking, adopt a cancer prevention diet, and reduce our exposure to known risk factors in our daily lives.

The American Cancer Society now estimates that almost one in three Americans will eventually develop cancer, which means that of the 230 million Americans alive today, approximately 70 million will be affected. Of these, approximately 25 million cases could be prevented by relatively simple changes in the national diet, and another 25 million cases could be prevented by the elimination of tobacco.

Cancer is second only to heart disease as a cause of death in the United States. However, in the economically productive age group of 25 - 65, cancer causes almost as many deaths as heart disease. Nearly every American family will be touched in some way by this dreaded disease, yet few of us understand what we can do to prevent cancer.

Fortunately, there is evidence that dietary factors influence the late stages of the carcinogenic process, which means that dietary changes will produce benefits quite rapidly. It is thus never too early to make dietary changes, and it is also never too late! Surely, we all have a responsibility to educate the public, and to urge the food industry to market foods that are consistent with public health.

To put the problem into perspective, the known causes of cancer are summarized in Table 1. The range of percentages represent the best scientific estimates of the contribution made by various risk factors to cancer deaths.

Table 1

CANCER RISK FACTORS	PERCENTAGE OF CANCER DEATHS
Diet	40 - 60%
Smoking	25 - 35%
Hormonal Status	about 6%
Infection	1 - 10%
Occupation	2 - 8%
Pollution	1 - 5%
Radiation exposure	2 - 4%
Alcohol excess	2 - 4%
Heredity	1 - 3%
Sexual behaviour	about 1%
Drugs	less than 1%
Geographic environment	variable

CARCINOGENESIS

H Does Cancer Develop?

Since about half of all cancer is related to the presence of dietary carcinogens, insufficient dietary anticarcinogens and too much fat in the diet, and since the rest is mostly due to the presence of environmental chemicals (tobacco smoke) that are taken in by the body, it is worthwhile to consider briefly how these substances are responsible for the induction of cancer. The process of inducing cancer is called carcinogenesis. Because carcinogenesis takes a long time, cancers are more common in older people and in older animals. In terms of the aging American population, we can therefore expect cancer to steadily increase in the coming decades - unless we find a way to put our present knowledge about cancer prevention into practice.

The Early Stages of Carcinogenesis

This usually involves the interaction of cancer-causing chemicals (the carcinogens) with the most important part of the cell which is known as the DNA.

Damage to the DNA that is not severe enough to destroy the cell, may change its 'identity', and that of daughter cells as well. For this DNA damage to occur, most carcinogens need to be present for a long time. Alternatively, cell division may occur before the cell has had time to repair the damaged DNA.

Because carcinogens are often unstable substances, it is more common for a carcinogen to be made within the body, by the body itself. What happens is this. A toxic chemical such as aflatoxin B1 which is found in moldy nuts and corn, is normally broken down or detoxified by an organ such as the liver. During this process, it is converted into the active carcinogen. This means that chemicals, or for that matter dietary constituents, which cannot cause cancer directly, may be converted into carcinogens in the body. If the body has no way to break down the carcinogen or excrete it, it will persist for a long time causing damage to the DNA of cells exposed to it. If it is removed from the body fairly quickly, but is replaced by regular exposure of the body to the parent chemical, the effect will be equivalent.

Although carcinogens that damage DNA are known as mutagens, not all mutagens are carcinogens. Mutagens that initiate the carcinogenic process are called initiators. These initiators prepare the way for the next step in the carcinogenic process.

The Late Stage

This stage is poorly understood even by the experts. The agents involved in this type of carcinogenesis are called promotors. These promotors affect the process by which primitive cells become more specialised (this is called differentiation),

and they also encourage cells to multiply. Some scientists believe that promotors encourage the expression of all the DNA damage that developed during the Early Stage. The implications of this are clear. If we could remove the early stage initiators from our environment, we would mostly protect young people, but if we could remove the late stage promotors from the environment, we could protect everyone.

All the experimental evidence so far suggests that diet mostly affects the late stages of carcinogenesis. What is surprising though, is that apparently normal dietary constituents have actually been shown to increase or lower the incidence of certain cancers initiated by exposure to known carcinogens. The implications of this observation are far reaching.

Without even knowing the detailed chemical composition of the diet, direct evidence has been found that links obesity with cancer in both animals and man. When laboratory animals are fed unrestricted diets they become more obese than their wild counterparts. These obese animals, however, do not only suffer the indignity of being overweight, they actually have a much higher chance of developing 'spontaneous' cancers. Correlations of this kind have also been made with human cancer which will be discussed in more detail later. But there is an encouraging part to this story. When laboratory animals were placed on a restricted diet and lost weight, becoming like their counterparts in the wild, their 'spontaneous' cancer rate dropped to very low levels.

Dietary Carcinogens and Anticarcinogens

Diet is responsible for about half of all cancer, and smoking for about one third, but it is not going to be easy to identify all the dietary factors that should be included or excluded.

In the past, diet-related diseases were discovered by astute observers noticing that one or more nutrients were missing. The most famous example is the disease known as scurvy which is caused by a lack of vitamin C. The success of this discovery then led to an approach to diet research which concentrated only on defining nutrient requirements in terms of the effects of deficiencies. These studies were first done in animals and then in human volunteers. However, it is important to remember that diet-related cancer can be caused by either a relative lack of anticarcinogens or a relative excess of dietary carcinogens, and that the process may take many years to occur. Scurvy, on the other hand, involves only one essential nutrient whose lack is manifested within three months.

After years of studying diet in terms of deficiencies, scientists have recently come to realise something of immense importance: diseases can arise from an abundant and apparently normal diet, consumed over many years! This realization has enormous implications for the control of both cancer and heart disease.

The most obvious ill-effect of a 'normal' diet is usually obesity. This is caused in the vast majority of cases by an excessive calorie intake, particularly if this also occurred in childhood. The harmful effects of obesity have been obvious both medically and socially for many years, and I have already mentioned that obesity carries with it a higher risk of certain cancers. Other ill-effects of a normal diet may not be as obvious. But it has taken us many years to realise that certain vitamins and most minerals, though vital in proper amounts, can be toxic when eaten in excess. This is because it is much easier to see obesity than mineral or vitamin toxicity. Nevertheless, both these dietary problems manifest themselves fairly quickly, usually within a few months. Imagine how much more difficult it is to find dietary factors that produce gradual, insidious effects over many years. This is the nature of dietary cancer.

Now we face a situation in which we have to consider the foods we eat in terms of the balance or imbalance of cancer causing carcinogens (Table 2) and cancer protecting nutrients (Table 3) such as beta-carotene, vitamin C, or selenium. Clearly, we must shift this balance in our favor. But how can we identify which nutrients are most protective and which are most carcinogenic?

Table 2

EXAMPLES OF FOODS THAT CONTAIN NATURAL CARCINOGENS

BLACK PEPPER	MUSHROOMS	CELERY	PARSNIPS
FIGS	PARSLEY	SASSAFRAS OIL	BERGAMOT OIL
MOLDY FOOD	TROUT	LETTUCE	HERB TEAS
COFFEE	TEA	COCOA POWDER	MUSTARD SEED
FAVA BEANS	MUSTARD OIL	HORSERADISH	ALFALFA SPROUTS
COTTONSEED OIL	KAPOK OIL	OKRA OIL	HONEY

Already evidence has been found which strongly suggests that vitamin A deficiency can increase the risk of cancer of the lung, bladder, and larynx in humans; and increase the risk of cancer induced in animals by known carcinogens. Conversely, increasing the intake of vitamin A or beta-carotene can inhibit the action of these carcinogens in laboratory animals. Other studies have shown that

Table 3

POSSIBLE CANCER PREVENTING AGENTS

Beta-carotene (vitamin A)
Vitamin C
Vitamin E
Folic acid
Selenium
Calcium
Fiber

vitamin C can reduce the probability of developing stomach and esophageal cancer in humans, and this cancer-inhibiting effect has also been supported by experimental studies in the laboratory. Recently, a major study in Finland has revealed that people who have low levels of vitamin E and selenium in their blood, have 11 times the cancer risk!

The relationship between diet and cancer has been studied in the laboratory by observing whether suspected substances can mutate bacteria (damage bacteria' DNA), or whether they can transform normal cells into cancer cells. Animal studies then follow which require that the suspected carcinogen be given in large amounts to accelerate the development of cancer.

Obviously, a laboratory test that took twenty years to produce an answer (the time many human cancers can take to develop) would be useless, so a rapid test is desirable. Unfortunately, its very rapidity limits its usefulness as a predictor of cancer in humans.

High doses of carcinogens may have very different effects from low doses spread over many years, making interpretation of data very uncertain. Such laboratory tests are also limited because they ignore the way the body reacts to the substance, and whether the presence of other substances in the diet could influence the final effect. And after all this, we are still left wondering whether a carcinogen which can give rats cancer, can also cause cancer in humans. The ultimate experiment that would prove beyond doubt that a substance can cause cancer in humans cannot be done for obvious reasons, so we are always left with an element of uncertainty. Nevertheless, cyclamate, an artificial sweetener that can cause bladder cancer in rats, has been removed from the American market. Yet, many other potential carcinogens remain in our daily diet, and these must be identified and eliminated.

Another approach to the study of dietary factors and carcinogenesis has been epidemiological. This involves the study of dietary and disease patterns in large numbers of people. The advantage of this approach is that it avoids the problems inherent in extrapolating experimental evidence from animals to humans. Furthermore, these studies often provide very useful directions for more specific research projects. It is unnecessary to go into detail as to how these studies are usually designed and conducted but, as you can imagine, the accurate measurement of food intake is of fundamental importance. In practice, this is easier said than done.

General information on food intake for a whole country is obtained by measuring the rate of disappearance of food that has been produced or imported, and by measuring the amount of different food products that stock each household. At a personal level, people are asked to describe as accurately as possible what they ate during the previous week, month, or year; perhaps even what their diet consisted of in childhood! The data from

these studies are then averaged for each population group, or region, to enable comparisons to be made. What has been found is fundamental to our present understanding of diet and cancer.

Some associations between diet and cancer that have emerged from international studies have not always been confirmed by studies within each country. This is usually because differences in diet between regions within a country are much less than the differences between the countries themselves. However, since studies of migrant populations have shown that cancer is predominantly diet-related and not genetic, these international studies provide very strong evidence to support specific dietary factors as being responsible for many types of cancer. In other words, failure to confirm an international study by one that is conducted within a country, is not an adequate reason to ignore the conclusions of the international study. This is justified because present dietary recommendations, unlike speculative medical treatment, are unlikely to produce more harmful consequences than the dietary anarchy that currently exists, and which many of us take for granted.

This approach is strongly supported by the dietary modifications that have been successfully made by religious communities such as the Seventh-Day Adventists and the Mormons. In both these communities, dietary modifications that were fortuitously similar to the latest scientific recommendations that form the basis of a cancer prevention diet program, have substantially reduced the risk of cancer and heart disease without evidence of harmful effects of any kind.

WHAT IS YOUR CANCER RISK?

It is impossible to give you precise statistical odds on your chances of developing cancer. What is possible is to give you a good idea of the scope of the cancer problem, and to discuss the known risk factors in a way that should help you to minimise your own risk of acquiring this frightening disease.

According to the best available estimates, about 4 million people die each year from cancer, worldwide. In the United States, cancer causes about 20% of all deaths, and this percentage inevitably rises as the average age increases. However, when the influence of increasing age and population growth is excluded, there is no evidence to suggest that deaths from cancer are increasing, with the exception of cancer of the lung which continues to increase at an alarming rate.

In 1983, the predicted incidence [number of new cases] of cancer in the United States was 855,000, with an additional incidence of 400,000 cases of treatable, non-melanoma skin cancer. About 455,000 cancer deaths were also anticipated, despite access to the world's most costly and sophisticated health-care system.

Apart from non-melanoma skin cancer, about 70% of cancers arise in the digestive organs [colon, rectum, pancreas and stomach, liver,

esophagus]; the respiratory system [lung, larynx]; the breasts [in women]; and the genital organs [uterus, ovary, prostate, testis].

To help you to understand the possible influence the major risk factors may have in your life, let us review them in more detail.

INCREASING AGE

.. all species, including the human species, the risk of cancer increases with age. This is because many of the chemicals in our diet or our environment take a long time to induce the cancerous changes, and because the more frequently cells divide, the greater the liklihood that a cancerous change will occur. Although for most human cancers, the incidence increases with age, there are a few specific cancers of childhood where that trend is not evident. Nevertheless, studies from the National Cancer Institute have demonstrated that for every five years of life, there is a doubling of the risk of cancer.

If we consider the influence of smoking on cancer risk, the effect of time is well illustrated. For men between the ages of 55-64, the death rate from lung cancer is five times higher if they started smoking before the age of 15 than if they started after the age of 25 - assuming the same daily cigarette consumption. To an extent the reverse is also true. If you stop smoking, there is a progressive decline in your risk of lung cancer, but it takes 15 years before the risk is equivalent to that of a non smoker!

Age is therefore not a direct cause of cancer, but rather it provides the time required for environmental factors to do their worst.

DIET

The National Academy of Sciences, the National Cancer Institute, and the American Cancer Society have now recognised the importance of diet as a major cause of cancer in the United States. It is estimated that as much as 60% of cancer in women and 40% of cancer in men is caused by dietary factors. It has also been estimated that at least 35% of all cancer in the United States could be eliminated by simple changes in the nation's diet - using our current knowledge of dietary risk factors.

Some aspects of diet have already been discussed. However, factors which are of critical importance include the amount of dietary fat; the amount of dietary fiber; contamination of some foods with molds such as aflatoxin; the presence of certain food additives; the amount of certain vegetables and fruit in your diet; your intake of vitamins A, C, E, and selenium; and the right methods of food preparation.

Although it is difficult to obtain a consensus on a subject as sensitive as the nation's diet, and because economic interests

sometimes threaten to distort rational debate, it is essential that everyone be given the opportunity to understand the scientific evidence, and to choose for themselves.

Details of my cancer prevention diet program are presented in my book WHAT YOU CAN DO TO PREVENT CANCER (Simon and Schuster, 1985). This diet is designed to help people make the right food choices, and to increase their dietary fiber intake while reducing their fat consumption to 20% of calories - instead of the 45% fat calories that is typical of the current American diet!

Finally, whatever the limitations of our current knowledge, it appears that the dietary modifications that will reduce the risk of cancer are fundamentally the same as those that would also reduce our risk of heart disease and stroke - the other major killer diseases.

SMOKING

Cigarette smoking is the major single cause of death from cancer in the United States. About 30% of the deaths from cancer could be prevented if tobacco were unavailable. Instead, 129,000 Americans will die unnecessarily of cancer this year because of smoking. Are not these deaths a national responsibility?

Smoking is directly responsible for 85% of lung cancer deaths, 50-70% of deaths from oral and laryngeal cancer, more than 50% of deaths from esophageal cancer, 30-40% of deaths from bladder and kidney cancer, about 30% of deaths from pancreatic cancer, and a significant number of deaths from cancer of the stomach and cervix!

Since 1910, the annual cigarette production in the United States has increased from 4 billion to 600 billion, bringing with it human tragedy on a grand scale. Despite numerous scientific studies in many countries which have confirmed that cigarette smoking is a major cause of premature disability, disease, and death, our taxes continue to subsidize the tobacco industry - and people continue to smoke.

Apart from cancer, smoking is also a major cause of premature deaths from heart attacks. The result of combining all the health hazards of smoking is that a 25 year old male who smokes 15 cigarettes a day can expect to lose five and one-half years of life! And the more you smoke, the greater the risk.

GEOGRAPHIC ENVIRONMENT

If cancer incidence is examined on an international basis, there is a remarkable variation in the frequency with which different cancers occur. For example, in countries with a high intake of dietary fat, there is usually a higher incidence of cancers of the breast, colon, rectum, pancreas, uterus, prostate, and ovary.

When people migrated from Japan which has a low fat intake, to Hawaii which has a much higher fat intake, the pattern of cancer of the breast, colon, and stomach in these migrants resembled that of the

indigenous population within one or two generations. Intriguingly, studies of first generation, foreign-born migrants to the United States have revealed that during their lifetime, stomach cancer mortality is consistent with the country of origin, while large bowel cancer mortality reflected the country of destination!

Such trends have not only been seen among the Japanese migrants to Hawaii, but they have also been seen among Europeans who migrated to the United States and Canada.

Table 4 summarises the differences in cancer death rates in various countries around the world. Countries are ranked in order of age-adjusted death rates from all cancers per 100,000 population based upon information made available in 1976-1977.

Table 4

INTERNATIONAL CANCER DEATHS

	Males	Females
1.	Uruguay	Uruguay
2.	Scotland	Denmark
3.	Belgium	Scotland
4.	Netherlands	Hungary
5.	Hungary	Ireland
6.	France	England & Wales
7.	England & Wales	Austria
8.	Austria	West Germany
9.	West Germany	Chile
10.	Singapore	New Zealand
11.	Switzerland	Northern Ireland
12.	Denmark	Belguim
13.	Northern Ireland	Netherlands
14.	Hong Kong	Israel
15.	Ireland	Sweden
16.	New Zealand	Costa Rica
17.	United States	Iceland
18.	Poland	Argentina
19.	Argentina	United States
20.	East Germany	Canada
21.	Canada	Switzerland
22.	Australia	East Germany
23.	Chile	Norway
24.	Sweden	Venezuela
25.	Spain	Australia
26.	Norway	Singapore
27.	Japan	Poland
28.	Greece	Hong Kong
29.	Malta	France
30.	Israel	Paraguay

No statistics are available from China or the Soviet Union. But it is thought that the incidence of cancer in China is quite low compared to Western countries.

These countries are listed in decreasing order of cancer mortality. Uruguay which tops the list for both men and women, had 294 deaths per 100,000 males, and 180 deaths per 100,000 females. With the exception of Venezuela and Honduras, male deaths were significantly higher than female deaths. In the United States, for example, there were 213 male deaths for every 136 female deaths in 1976-1977. However, in 1983, 432,500 new cases of female cancer, and 422,500 cases of male cancer were predicted. This means that women generally survive cancer better than men.

When one considers the influence of geography within the United States there are some interesting regional variations.

ESTIMATED CANCER INCIDENCE AND DEATHS FOR 1983
WITHIN THE UNITED STATES

	State	New Cases	Deaths	Death Rate/100,000
1.	District of Columbia	3,200	1,600	260
2.	Rhode Island	4,700	2,400	248
3.	Florida	51,000	26,600	237
4.	Pennsylvania	53,000	27,000	227
5.	New Jersey	32,000	16,400	219
6.	Maine	4,800	2,500	217
7.	Massachusetts	24,000	12,600	215
8.	New York	74,000	37,500	212
9.	Connecticut	13,000	6,700	210
10.	Missouri	20,000	10,500	210
11.	Arkansas	9,000	4,700	203
12.	Nebraska	6,000	3,200	201
13.	Ohio	42,000	21,500	200
14.	Iowa	11,200	5,700	199
15.	West Virginia	7,700	3,900	199
16.	Delaware	2,400	1,200	198
17.	Maryland	16,700	8,600	197
18.	New Hampshire	3,600	1,900	196
19.	Illinois	44,000	22,500	195
20.	South Dakota	2,600	1,300	193
21.	Indiana	20,000	10,400	192
22.	Kentucky	13,600	7,000	191
23.	Kansas	8,700	4,600	190
24.	Alabama	14,300	7,400	186
25.	Oregon	9,800	5,000	186
26.	Wisconsin	18,000	9,000	186
27.	Tennessee	17,100	8,600	184
28.	Oklahoma	11,600	6,000	183
29.	Vermont	2,000	950	181
30.	Michigan	32,000	16,400	181
31.	Mississipi	8,900	4,600	180
32.	North Dakota	2,500	1,200	179
33.	Minnesota	14,000	7,300	177
	California	85,000	44,500	175
	[illegible] Carolina	20,000	10,400	170
	[illegible]siana	14,800	7,600	167

37.	Washington	14,400	7,300	165
38.	Arizona	9,000	4,900	165
39.	Montana	2,600	1,300	162
40	Virginia	17,200	8,900	158
41	Georgia	17,300	9,000	155
42.	South Carolina	9,500	4,900	150
43.	Idaho	2,700	1,400	141
44.	Texas	44,000	22,400	140
45.	Nevada	2,600	1,300	136
46.	New Mexico	3,500	1,800	129
47.	Colorado	7,600	3,900	124
48.	Wyoming	1,300	650	120
49.	Hawaii	2,400	1,200	118
50.	Utah	3,000	1,500	9.
51.	Alaska	600	300	69

These data are not age-adjusted. This means that a state like Florida has a higher cancer death rate because more elderly people retire there. Other states such as Utah have a lower cancer death rate because the diet of Mormons is much closer to a cancer prevention diet than the diet of the rest of the population. Alaska also has lower figures, possibly due to a lower average age or to a diet that is higher in fish; but this is speculative.

RADIATION EXPOSURE

There is no completely safe level of radiation. And since nearly all cancers can be induced by radiation, the level to which we are exposed is of considerable importance. About 3% of human cancer is caused by radiation.

All of us are exposed to what is called background radiation every day. Background radiation comes from cosmic rays and the greater the altitude, the greater the exposure. Some background radiation also comes from the earth itself, but so far no scientific evidence exists that links human cancer to natural background radiation.

The advent of nuclear weapons has resulted in a small increase in background radiation from atmospheric testing, but so far there is no evidence to link this with human cancer, apart from an apparent increase in leukemia among people who lived downwind from the Nevada test site.

Survivors of the atomic bombs that fell on Hiroshima and Nagasaki have shown an increased risk of leukemia, and thyroid, breast and lung cancer.

Some occupations have been found to be particularly hazardous. An increased risk of bone cancer has been found in luminous watch dial painters. And radiologists themselves have an increased risk of developing leukemia and skin cancer. Uranium miners who work with radio-active material, have an increased risk of lung cancer - even if they do not smoke.

Finally, solar radiation is the main source of ultra-violet radiation which can cause skin cancer, particularly in fair-skinned people.

HORMONAL FACTORS

If the ovaries were removed at birth, the risk of a woman developing breast cancer would be virtually eliminated. This illustrates the extraordinary influence that hormones have on the growth and development of cells, and on the risk of them becoming cancerous.

Women who reach the menopause without ever having experienced pregnancy, have a higher risk of breast cancer than those who have been pregnant. And the more children you have had, the lower the risk. If you had your first pregnancy before the age of 20, the risk is lower still. Women who have never menstruated have a three to four fold greater risk of developing breast cancer after the age of 55. But if menstruation starts late in adolescence, or if the menopause is early, the risk of breast cancer is reduced.

The use of birth control pills that are high in progesterone has been shown to increase the risk of breast cancer, but this risk has probably been eliminated by the reduction in progesterone in the low-dose 'mini' pills. Birth control pills may also help to reduce the risk of ovarian cancer, but it is unclear to what extent the changes in hormone strength and balance will influence these effects.

Finally, the use of DES [diethyl-stilbestrol] by pregnant mothers has been responsible for the tragic development of cancer of the vagina and cervix in their daughters during childhood. Of course, this risk factor has now been eliminated.

SEXUAL BEHAVIOUR

Human attitudes to sexuality can influence the risk of cancer. Promiscuity, starting at an early age, is associated with an increased risk of cancer of the cervix. And cervical cancer accounts for approximately 1.5% of cancer deaths.

Interestingly, this disease is also more common in women who have had several children, and less common in women who have had only one child. In fact, this observation may relate more to the number of sexual partners than to pregnancy and childbirth. It is not known whether the risk for women who have only one sexual partner is increased if that partner previously had multiple partners. Nevertheless, in virgins, it is an extreme rarity.

Actually, men cannot entirely escape their responsibilities. For cervical cancer is more common when male partners are uncircumcised. Hygiene is obviously an important factor, since cancer of the penis [a rare disease] occurs only in the uncircumcised.

The outbreak of AIDS [acquired immuno-deficiency syndrome] among sexually active male homosexuals in the early 1980's has led to a dramatic increase in the incidence of an otherwise rare form of fatal cancer called Kaposi's sarcoma. Furthermore, victims of AIDS have an increased susceptibility to infection, particularly with a dangerous, life-threatening form called Pneumocystis carinii. In case you are a complacent heterosexual, you may be interested to know that AIDS is now increasing at the same rate in heterosexuals as in homosexuals.

The cause of this immune impairment among affected homosexuals and heterosexuals is now thought to be due to a retrovirus known as HTLV III, recently identified at the Pasteur Institute in Paris, and also at the National Cancer Institute in the United States. Having multiple sexual partners increases the risk of acquiring AIDS, so clearly this is a risk over which we have considerable control. The recent introduction of a blood test for the AIDS virus will make screening for infection much easier. Yet, we are still uncertain whether all those with positive blood tests will necessarily develop the disease.

Apart from AIDS, male homosexuals are also at an increased risk of developing cancer of the tongue and the anus.

ALCOHOL EXCESS

While a glass of wine each day may actually help to reduce your risk of heart disease, an excessive indulgence in alcohol, especially when combined with smoking is thought to cause about 3% of all cancer in the United States.

Alcohol increases the risk of cancer of the mouth, pharynx, larynx, esophagus, and liver.

OCCUPATION

Although most occupations do not increase your cancer risk, some do. Current estimates suggest that as much as 5% of all cancer in the United States is due to occupational exposure.

Occupational cancers mostly result from exposure to toxic chemicals in manufacturing industries, or from exposure to certain types of dust in mining. The degree of risk can range from minor to major. For example, as much as 20% of male bladder cancer has been attributed to occupational chemical exposure! Some of the better known occupational cancers can be seen in Table 5.

Table 5

SOME OCCUPATIONAL CANCERS

Occupation	Type of Cancer
Rubber workers. Dye manufacturers. Coal gas workers.	Bladder
Asbestos workers. anyone exposed to asbestos.	Lung. mesothelioma. esophagus. stomach. colon.
Glue and varnish workers.	Leukemia.
Cadmium workers	Prostate.
Chromium exposure	Lung.
Radiation exposure in uranium miners. luminisers. radiologists.	Lung. bone. marrow.
Manufacturers of isopropyl alcohol. hardwood furniture makers. leathe workers.	Nasal sinuses.
Nickel refiners.	Lung. Nasal sinuses.
Farmers and seamen. anyone exposed to ultra-violet light	Skin cancer.
Makers of polyvinyl chloride (PVC)	Liver.

Since there are over 50,000 known chemicals with more being added every week. and since only about 500 have ever been tested for their cancer-causing potential. it is obvious that we do not have a clear idea of the risk posed to us by their existence.

INFECTION

Apart from the AIDS virus, other infections are sometimes carcinogenic. For example, hepatitis increases the risk of liver cancer, schistosomes increase the risk of bladder cancer, but bacteria do not directly increase your risk of lung cancer.

However, normal resident bacteria in our intestines often play an important role in the breakdown of dietary carcinogens.

Viruses, on the other hand, have excited a great deal of scientific interest. Yet, there is very little evidence that they play a direct role in the causation of human cancer, despite intensive study during the past twenty five years.

POLLUTION

The air we breathe, the water we drink, and the food we eat are all contaminated to some extent with the products of our civilisation.

Air pollution at its most severe can drastically reduce visibility, irritate the eyes, and precipitate pneumonia in the elderly. The London fog of 1952 killed thousands of Londoners, but not from cancer.

It has been noted that although lung cancer is more common in our cities than in the countryside, it still remains very low among urban non smokers. This observation suggests that air pollutants may work with the chemicals in tobacco smoke to cause lung cancer, rather than directly to cause lung cancer themselves. Yet, if one compares the death rate from lung cancer in the State of Maine with that in New Jersey, the rates appear comparable. Evidently, at least with respect to lung cancer, the pure air in Maine does not confer any benefits over the more polluted air in New Jersey.

Nonetheless, one particular air pollutant which cannot be ignored is asbestos. Even small amounts of asbestos on the clothes of factory workers have been held responsible for the increase in the incidence of mesothelioma [usually a rare form of cancer] among family members. Furthermore, many school buildings around the United States have asbestos insulation which could put the lives of our children at risk if the problem is not urgently rectified.

Water pollution, on the other hand, is still the cause of a great deal of disease around the world. The availability of clean water and proper sanitation has probably done more to improve our health than anything else. In the industrialised countries, we believe that we have the finest, cleanest water available. Unfortunately, this precious resource is being slowly destroyed by industrial pollution which threatens both wild life and human health.

Although anxiety about water pollution as a possible cancer risk was first expressed in 1960, the number of carcinogenic substances appearing in our drinking water continues to rise. Over 700 synthetic organic chemicals have been identified in the American water supply, and about 40 of these are either known or suspected carcinogens! Apart from asbestos fibers which often contaminate the water supply near large cities, other cancer-causing chemicals [vinyl chloride, benzene, and chloromethyl ether] have been found.

Some minerals are also present in our water. Probably the one which has the most certain association w .h cancer is arsenic. In Taiwan, water contaminated with arsenic has caused skin cancer.

Despite the fact that there is little evidence that water pollution has caused human cancer in the United States, this is not a reason for complacency. As the concentration of pollutants increases, the risk of cancer will surely increase too. The new epidemic of cancer in the fish population should be a warning to us all.

In 1984, twelve years after the Clean Water Act, it was noticed that the fish which were returning to once polluted waters such as the Hudson river and Michigan's Torch lake, were suffering from a very high cancer rate. And the fish that were most affected were those that lived nearest to the bottom where the concentration of chemical contaminants is highest.

In the Hudson river, for example, more than 80% of the Atlantic tomcod that are more than two years old have liver cancer. And in Everett harbour, Washington, more than two thirds of the English sole have damaged livers that are usually cancerous.

When water pollutants were concentrated and painted onto the skin of bullheads, many of the fish developed cancer within a year just as wild bullheads do. Although the implications are rather alarming, some fish such as striped bass do not develop tumors in the way the bullheads do, so other factors also influence the effect of chemical pollutants.

What has happened to fish may not happen to man. But alarm over the increased risk of cancer among people whose homes are built on chemical waste dumps, and the implications that this surely has for water pollution, should make us determined to act now rather than wait for human tragedy to occur before making the right decisions.

HEREDITY

Not everyone is at the same risk of developing cancer, no matter what the cause. This is also true for animals that are studied in the laboratory. When you expose a group of laboratory mice to a carcinogen, some of them develop cancer. If you increase the dose of the carcinogen, more of them are affected. Why? The most important reason is that there are subtle genetic differences between them.

Human cancer is caused by a variable mix of hereditary and environmental factors. Heredity is pot luck. The environment you can partially control. However, except for differences in some specific cancer risks for men and women, we usually do not know which inherited characteristics provide vulnerability or protection.

There are a few rare diseases which are inherited, and which predispose to certain cancers. There are also a few families in which, for no apparent reason, there is an abnormally high cancer risk.

However, there are some types of breast cancer, colon cancer, and brain cancer that can be inherited. Some individuals with stomach cancer and lung cancer may also have an inheritable form. For example, the risk of colon cancer or breast cancer can increase as much as twenty to thirty-fold in these families.

In a few instances racial differences can appear to protect against a specific cancer. For example, dark-skinned races are protected from the harmful effects of sunlight and seldom develop melanoma [except on depigmented palms and soles], and orientals very seldom develop chronic lymphocytic leukemia wherever they happen to live. Obviously, these differences must be the result of some genetic rather than environmental difference.

SOCIO-ECONOMIC STATUS

The evidence linking socio-economic status to cancer is limited. Of course, dietary differences between different social and economic groups must certainly exist in the United States.

Studies of two relatively uncommon forms of cancer known as Hodgkin's disease and testicular cancer have revealed that they occur more commonly among those with above average education who are in higher socio-economic groups. Cancer of the colon, the skin cancer called melanoma, and cancer of the uterus are more common, and are also found with greater frequency in these socio-economic groups. So far there is no explanation for these intriguing observations.

In contrast, both esophageal and stomach cancer are more common in lower socio-economic groups in virtually all countries of the world. This is most probably the result of a combination of smoking, alcohol, and a poor diet that lacks an adequate amount of fruit and vegetables.

CONCLUSION

There is a great deal of evidence that we could control our cancer risk and our heart disease risk to a considerable degree. Best estimates are that we could reduce our cancer risk by about 70%, our heart disease risk by about 60%, and our risk of fatal blood vessel disease (stroke) substantially.

Bad nutrition and smoking are by far the major culprits. And they appear to be the major cause of other degenerative disease as well - all of which contribute enormously to the total cost of health care in the United States.

Despite major strides in our understanding of cancer and heart disease, a great deal remains to be done before progress in treatment can adequately control them. In fact, it is highly unlikely that these diseases will be completely curable, even into the twenty first century. Yet, the three major killers - cancer, heart disease, and stroke, are already mostly preventable.

There is no doubt in my mind that enormous long term savings in health care costs would result from a far-sighted policy of disease prevention. This is where the federal government should concentrate more resources. To implement such a policy would require a shift in emphasis in academic institutions away from esoteric research, which will require some new incentives. The food and restaurant industries must also assume some responsibility for the public health - and they will certainly respond to the demands of an educated consumer. Let us, as a matter of urgency, formulate policies that will vigorously apply our present knowledge to the prevention of these common, daadly, diseases that threaten each and everyone of us.

The CHAIRMAN. Dr. Greenwald, what are you doing to educate the public with regard to the dietary guidelines for Americans?

Dr. GREENWALD. The National Cancer Institute has a Cancer Prevention Awareness Program geared just to that. It is in two parts. Last year, the public mass media part was kicked off; it is a nationwide program which includes within it a toll-free telephone number, 1-800-4-CANCER.

More recently, the second part of the program was begun. This focuses on selected populations with particular problems. It began addressing the black population and the needs of that population. It focuses on certain industrial and other groups.

The CHAIRMAN. Your testimony lists several areas, such as vitamins and fiber supplements, where you indicate it would be premature to make recommendations. Do you know when you will be able to make recommendations in those instances?

Dr. GREENWALD. Yes; our opinion now is that most of the evidence comes from looking at populations that get their vitamins and minerals through their diets. That is where we have the research evidence, and that is why we make the recommendations for foods rather than supplements.

Our cancer prevention trials are in progress. The first ones will end in 1989 to 1992, so I think it will be around then when we have more precise answers.

The CHAIRMAN. There are a number of centers, both inside and outside the United States, which offer alternative forms of cancer treatment. Could you give us your opinion of these centers?

Dr. GREENWALD. Well, I think it is very important that people with cancer—and I want to emphasize, we are now on treatment, not prevention—but that people with symptoms or with cancer have the best in diagnosis and state-of-the-art therapy.

Our biggest concern is not having that diagnosis and therapy in order to choose some other unproven method. So that is a major concern.

Where the National Cancer Institute has looked into some of these things, we generally have not felt that the evidence held up. We could not confirm the diagnoses or the claimed results.

The CHAIRMAN. Mr. Fink, how can a cancer patient, from your experience with your daughter and others, distinguish between a cancer center which is doing real research, beneficial research, into the benefits of nutrition and one that is simply preying on the fears and suffering of cancer victims? Can you give us some advice there, because you have had a lot of experience in this area.

Mr. FINK. Well, it is a very good question, Senator, and a very tough one. We looked at a great many places, and all of them to one degree or another seem to have their successful testimonials. They seem to have people who are getting better on those therapies.

You fall into a real gray area, it seems to me, because what happens is there are some people given over to hyperbole that seem to be representing perfectly legitimate, in my estimation, therapies that seem to work, so that casts a credibility problem in that kind of thing.

It is too complex and difficult a question for me to give a really good answer to, but it is a good one.

[Additional information supplied follows:]

ADDENDUM TO PREVIOUS RESPONSE BY MR. FINK

I gave an inadequate and terrible answer to Senator Hatch's question.

To be more specific, in order to find the right clinic or therapy, we encourage each patient to inquire whether that therapy or clinic has been successful in treating his or her type of cancer and whether there are references he or she can contact for information and verification. Equally important in choosing a treatment or therapy are: a patient's financial situation, his/her capacity for self-care, the extent of illness, the necessity for support and the amount required both at the clinic and at home, his/her belief system and prejudices, and without added stress, what changes in diet and lifestyle could be comfortably tolerated. We urge each patient to consider these factors before making a choice.

The CHAIRMAN. OK. Dr. Alabaster, it is becoming clear that diet affects everyone's risks of cancer. Do we know enough, in your opinion, at this point to recommend dietary changes for the general public, or do we need to have more knowledge and more research?

Dr. ALABASTER. I think we do know enough to make recommendations. Any recommendation that is made in 1985 is inevitably an interim recommendation insofar as we may modify those recommendations in the light of future knowledge. But we have to see it in the context, I think, of dietary anarchy which currently prevails in virtually all Western countries. That is, people feel they have the right to eat anything; food manufacturers feel they have the right to produce anything as long as there is demand for it.

I think there is a responsibility that each and every one of us has to make ourselves aware of what we know and to act on our best current knowledge. I think that if we use the argument that we have to have perfect knowledge before we make a recommendation, first of all, this would be unique in human experience, because we make decisions on the basis of what we know every day for all sorts of human activities, and I do not see why recommendations regarding a healthy diet should be any different. I am personally convinced that we should now make recommendations based on what we know, because the recommendations that will benefit cancer risks will also benefit heart disease risks. There is no competition, really, between the two. Although the evidence comes from two different sources, it converges into a common dietary recommendation which I think we can now make.

The CHAIRMAN. I thought it interesting that the increase in cancer in lower socioeconomic groups may be due primarily to smoking, drinking alcohol, and not really eating enough fruits and vegetables or other fibrous materials. Now, these are problems which I think could be solved with education in our society.

Are the current education programs adequate, or do we need to specifically target these groups in order to accomplish a lot?

I notice you are nodding up and down, Dr. Greenwald.

Dr. GREENWALD. I think your observation is accurate, and we need more emphasis. In other words, the groups have to be targeted.

There is also an area of research which I would call "applied" or "cancer control" research that helps us to know what is most effective in reaching those groups and bringing about behavioral

change, and that is, I think, a legitimate sort of a research question, as well.

The CHAIRMAN. Dr. Alabaster.

Dr. ALABASTER. Well, first of all, I would support the idea of targeting groups because clearly, there are major differences in cancer risks around the country. If you look at the District of Columbia and contrast it with Alaska or, for that matter, your own State, there is something like a fourfold difference in cancer rate. So there clearly are major factors in lifestyle and in environmental factors which need to be controlled, and where we can identify it, I think people should be educated.

I am also certain that an educational program has to be substantial to be effective, because we are bombarded daily by food manufacturers and we are pressured by restaurants who have their own ideas about what the public wants and what the public should have. And clearly, the temptations to go the wrong way in terms of diet are enormous.

So that if you view 20 television commercials that are telling you to eat decadent food, and one pamphlet through the mailbox which tells you you ought to eat sensibly, clearly, your diet will not improve.

So I think the scale of education has to be sufficient to have any hope of being influential. Only among the highly educated is there likely to be sufficient self-motivation.

The CHAIRMAN. Well, we are hoping that this type of a hearing will do much to help the public understand that there are some real answers here, and that you people have been giving some real answers.

I want to thank each of you for coming. We appreciate the efforts you have put forth.

Dr. Alabaster, I have not read your book yet. I have skimmed it, but I am going to read it.

Thank you so much. We appreciate having you here.

Our final panel will discuss the role nutrition and fitness play in the prevention of cardiovascular disease.

Our first witness is Dr. Claude Lenfant, Director of the National Heart, Lung and Blood Institute. Our second witness is Mr. Robert Pritikin, the executive director of research and development and the Pritikin Center, and our third witness is Dr. Ernst Wynder, president of the American Health Foundation.

I would like to thank each of you for coming, and I might mention that each of you has had a dramatic impact on me as far as health, health promotion, and disease prevention. And I want to pay particular tribute to Nathan Pritikin, because he came to visit me a number of years ago, and I have to admit that his book, "The Pritikin Promise," among others, was one of the first books that I read before I started on my own dietary approach, or at least my own nutritional approach, along with Dr. Fisher's book, and they have been very influential to me.

Let us start with you, Dr. Lenfant. I am going to limit you each to 5 minutes. I am sorry that it has been such a long day, but that is just the way our lives are, and I apologize for that.

Dr. Lenfant?

STATEMENT OF DR. CLAUDE LENFANT, DIRECTOR, NATIONAL HEART, LUNG AND BLOOD INSTITUTE, BETHESDA, MD; ROBERT PRITIKIN, PRITIKIN RESEARCH FOUNDATION, AND DR. ERNST WYNDER, PRESIDENT, AMERICAN HEALTH FOUNDATION

Dr. LENFANT. Thank you, Mr. Chairman. I am very pleased to be here today to tell you about our views on such important topics as good nutrition and physical fitness

The scientific community and the public both perceive that positive changes in diet and in fitness conditioning offer great promise for promoting health and preventing some cardiovascular diseases.

We at the institute conceive fitness very broadly. It includes maintenance or improvement of health through appropriate physical activity, a proper diet, smoking cessation, psychological balance, and for some segments of the population, compliance to prescribed medical regimens.

Recently, a consensus among scientists has been reached that elevated blood cholesterol puts one at increased risk of heart attack and heart attack death.

The institute is therefore launching this week a National Cholesterol Education Program, in fact, this Friday.

A recent survey tells us that 65 percent of the public say that they have never had their blood cholesterol checked. Our initial efforts in this program will be to tell the public about the implications of high blood cholesterol, encourage people to have their blood cholesterol measured, and if it is high, to see their physician and take the necessary steps to lower it As part of this program, we will also encourage physicians to become more familiar with the implications of elevated blood cholesterol. And indeed, it is a sad thing to note that perhaps 30 to 35 percent of general practitioners are clearly aware of the relationship between increased cholesterol and increased risk of heart disease.

I would like to share with you some recent findings concerning the effect of physical activity and diet with regard to cardiovascular fitness.

There are a number of ways in which physical fitness improves cardiovascular health. Persons who exercise regularly and who are lean tend to have lower blood pressure and better blood lipid profiles than those who are inactive The physically active also probably smoke less or often not at all. Thus, physical activity favorably modifies three major risk factors.

There is ample evidence that habitual vigorous, and I should say even moderate exercise is associated with an overall reduction in coronary heart disease deaths.

As you know, Mr. Chairman, coronary heart disease is the number one cause of deaths in this country. The total number of deaths was mentioned earlier this morning—550,000 a year. And I was reflecting while witnessing this hearing that during the last 2½ hours, probably 150 people in this country died from coronary heart attacks.

Sedentary persons who are hypertensive or obese have a greater risk of cardiac arrest than those who have these risk factors, but are physically active.

However, I should bring up a note of caution. Other evidence suggests that when physical exercise is strenuous, it might precipitate a heart attack, and we have seen during the last few months some examples of sudden heart death in persons who had latent coronary disease.

For this reason, clinical evaluations should be made before older sedentary persons are encouraged to undertake vigorous exercise.

With regard to nutrition, it is well-known that fat accumulates in adipose tissue when consumption of calories is excessive. Plasma cholesterol concentrations rise as the proportion of calories derived from saturated fat increases, and decline when the proportion of calories from polyunsaturated fatty acids is increased.

The awareness of blood cholesterol and the biology of that cholesterol has certainly increased during the last few weeks when two grantees of the institute, Drs. Brown and Goldstein, won the 1985 Nobel Prize for Medicine for their work on the understanding of cholesterol metabolism.

Recently, researchers have also become interested in polyunsaturated fatty acid from fish oil. It has been shown that dietary fish oils and vegetable oils lower concentration of plasma cholesterol and low-density lipoprotein.

As well, an inverse relationship between fish intake and coronary heart disease has been shown in some populations, in Greenland Eskimos, and in a township in the Netherlands.

The CHAIRMAN. Thank you. Dr. Lenfant. Your time is up. We will place the rest of your statement into the record. We appreciate the efforts you have made to be here. I do have some questions for you, though, before we finish.

[The prepared statement of Dr. Lenfant follows:]

Statement by

Claude Lenfant, M.D.
Director

National Heart, Lung, and Blood Institute

National Institutes of Health

on

NUTRITION AND FITNESS

Committee on Labor and Human Resources

United States Senate

November 13, 1985

Mr. Chairman, and members of the Committee, I am very pleased to have the opportunity to speak to this Committee on topics as important as nutrition and fitness, which are both relevant to, and addressed by, programs of the National Heart, Lung, and Blood Institute. Indeed, both the public and the scientific community perceive changes in nutrition and fitness as offering the greatest promise for promoting good health and preventing the chronic diseases that are major public concerns.

In research programs fostered by the Institute, "fitness" is conceived broadly to include maintenance or improvement of health through such behaviors as physical activity, smoking cessation, healthful diets, psychological balance, and, for some segments of the population, adhering to prescribed medical regimens. To the extent that they contribute to improving cardiovascular fitness, these studies have great potential for reducing deaths and disabilities attributable to heart disease.

We believe that the decline in mortality from heart disease since the mid-1960s is the result of research that has led to more effective treatment as well as to the increased public understanding of behavioral changes affecting the primary risk factors for cardiovascular disease. It is, however, disappointing that heart disease remains the leading cause of death in this country with an economic burden estimated at $60 billion annually. Of the approximately 11.1 million persons with diseases related to atherosclerosis, almost half are under 65 years of age. Moreover, the majority of coronary deaths occur in the first 24 hours after a heart attack. Large reductions in the number of such deaths may only be possible through prevention, to be achieved by improved cardiovascular fitness through reductions in high blood cholesterol and hyper-

tension, and by control of other risk factors, such as obesity and cigarette smoking.

Before discussing in detail some recent research on diet and fitness, I wish to bring to the attention of the Committee a new initiative that we believe holds great promise as a means of reducing and possibly preventing coronary heart disease. Because there has been a growing consensus among scientists that elevated blood cholesterol puts one at increased risk of heart attack and heart attack death, the Institute is in the process of launching a National Cholesterol Education Program (NCEP) modeled largely on the very successful National High Blood Pressure Education Program but with its focus on blood cholesterol. When the blood pressure program began there were important questions to address about when and how to treat. Similar questions are now being posed for blood cholesterol. Information from a 1983 survey tells us that 65 percent of the public said they have never had their blood cholesterol checked. Our initial efforts in the blood cholesterol education program will be to tell the public about the implications of high blood cholesterol, encourage them to have their blood cholesterol measured, and, if it is high, to see their physician and take steps to lower it. As part of this program we will be encouraging physicians to become more familiar with the implications of elevated blood cholesterol, because survey data suggest that physicians attribute less benefit to result from lowering elevated blood cholesterol than does the public.

The Institute plans to appoint a panel which, with input from the coordinating committee of the NCEP, will develop guidelines for physicians who treat elevated blood cholesterol. It is anticipated that they will

be similar to the periodic reports on high blood pressure issued by the Joint National Committee on the Detection, Evaluation and Treatment of High Blood Pressure.

I wish now to discuss briefly some recent research findings relative to diet and physical activity that help to explain how these factors contribute to cardiovascular fitness. One source of such contributions are demonstration projects that apply the findings of research to clinical situations in which recommendations for diet and physical activity are included and sometimes interwoven. This occurs, for example when an intervention goal is to reduce obesity or to prevent its development. This necessitates either choosing foods with fewer calories or increasing physical activity, or -- preferably -- both.

Physical Activity

There are a number of mechanisms by which physical fitness may be able to improve cardiovascular health. The influence may be direct, through exercise, or may be a consequence of modifications in lifestyle that accompany attention to physical fitness. Individuals who exercise regularly are usually lean, tend to have lower blood pressures, and more nearly optimal lipid and lipoprotein profiles than those who are inactive. The physically active also tend to reduce cigarette smoking. These observations suggest that increased physical activity may favorably modify plasma cholesterol, blood pressure and smoking -- three major coronary risk factors.

Physiologic changes produced by exercise training include reductions in heart rate, systolic blood pressure, and myocardial oxygen requirements at rest and at submaximal work levels, as well as an increase in physical

working capacity. These changes are believed to be beneficial for the cardiovascular system because in active persons, compared to the more sedentary, the contraction of the heart expels a larger volume of blood, and rhythm of the heart is more stable. In addition, psychological status is improved and, in patients with angina, there is a reduction of symptoms. Physical activity also seems to increase the amount of fibrinolytic activity so that the blood is more likely to dissolve a clot or prevent formation of a thrombus in a vessel.

There is an increasing body of evidence that habitual vigorous exercise and also moderate, regular exercise (20 to 30 minutes, 3-4 times a week) are associated with an overall reduction in coronary heart disease deaths. Data from investigators at the University of North Carolina, Chapel Hill, indicate that persons with certain risk factors are most likely to benefit from vigorous exercise. Sedentary persons who were also hypertensive or obese had a substantial increase in risk of cardiac arrest compared to those who had these risk factors but were physically active. However, there is some evidence that when physical exercise is strenuous it might precipitate myocardial infarction and cardiac arrhythmia in persons with latent coronary disease. For this reason, clinical evaluation should be considered before older sedentary persons who are at increased risk of coronary heart disease are encouraged to undertake vigorous exercise.

The Institute is supporting basic physiologic investigations of acute and chronic adaptations of the cardiovascular and pulmonary systems to exercise in order to learn the mechanisms involved in the interactions between the respiratory and circulatory systems during exercise. Of special interest are the mechanisms which regulate and limit the oxygen

transport system in the body during exercise. Understanding these processe will contribute to effective treatment of disease in cardiac patients and in patients with chronic obstructive pulmonary disease. It may also lead to important practices to prevent heart and chronic pulmonary diseases.

Some evidence suggests that exercise helps in reducing high blood pressure and stress. Psychologic stresses, which enhance sympathetic activity in the heart and vasculature, produce acute increases in blood pressure, but whether stress plays a role in hypertension development is still unclear. In a recent study, mental stress was associated with sodium and water retention in young men with borderline hypertension or who had hypertensive parents. The Institute is also supporting research to learn whether there is an interaction or possibly a synergism between stress and behavioral challenges such as caffeine, sodium or nicotine, which are known to exacerbate risk, particularly in those who are at high risk for cardiovascular disease.

Nutrition

The association between nutrition and cardiovascular disease is exemplified by the dietary influences on blood lipids. As is well known, there is deposition of fat in adipose tissue when consumption of calories is excessive. This in turn stimulates the body to make more triglycerides (hepatic synthesis) and results in increased levels of plasma triglycerides. Plasma triglycerides can be increased by dietary fat, carbohydrate and alcohol. Whether plasma triglycerides are a risk factor for heart disease is uncertain. Mechanisms for excessive calories to contribute to high plasma cholesterol--an established coronary risk factor--possibly through

lipid metabolism changes, have not been elucidated. Plasma cholesterol levels are often elevated in persons who are obese, and in some lean persons. The major dietary factor that raises blood cholesterol levels is not calories per se, but the calories contributed by saturated fatty acids. In fact, plasma cholesterol rises as the proportion of calories derived from saturated fat increases. Conversely, plasma cholesterol levels can be lowered by including less saturated fat in the diet (choosing lean meat and low-fat dairy products). Polyunsaturated fats (in vegetable oils such as corn oil and safflower oil) lower plasma cholesterol if substituted for some of the saturated fat. It appears unwarranted to completely replace the portion of saturated fat removed from the diet with polyunsaturated fat. Fat whether polyunsaturated or saturated contributes 9 calories per gram compared to about 4 calories per gram for carbohydrate or protein and 7 calories per gram for alcohol. Researchers are studying the effectiveness of other food substances in lowering blood cholesterol. Some of these such as oatbran might be eventually included as part of our diet, others such as pectin (found in apples) or guar gum (used as an emulsifier in some food products) might need to be given in pharmaceutical doses to be effective. However, eating less fat and less saturated fat are changes in diet that can be made today.

Nationwide awareness of advances in our understanding of lipid metabolism and of dietary influences was enhanced when it was announced that two Americans, Michael Brown and Joseph Goldstein, had won the 1985 Nobel Prize for Medicine. Their research has elucidated the role of specialized receptors for low density lipoproteins (LDL) in regulating levels of circulating cholesterol. These receptors project from the surface of

cells, bind circulating particles carrying cholestrol, and remove them from circulation. Because the typical American diet is high in saturated fatty acids, it contributes a higher level of low density lipoprotein than can be handled by the available receptors. Because low density lipoprotein cholesterol in the blood cannot be efficiently removed from circulation, it contributes to the development of atherosclerosis.

Some new research findings are causing scientists to reconsider concepts about certain vegetable oils and fish oils and their associations with heart disease. A study reported in 1985 by investigators at the University of California and University of Texas, showed that--contrary to earlier research--monounsaturated and polyunsaturated fatty acids were approximately equally effective in reducing plasma total cholesterol and low density lipoprotein cholesterol. Although monounsaturated safflower oil was used in this study, a confirmation of these results could give new importance to other monounsaturated fats such as olive oil in cholesterol-lowering diets. Other current research indicates that fish oils, containing fatty acids, that researchers call omega-3, such as found in salmon and mackerel lower concentrations of plasma cholesterol and low density lipoprotein and have the advantage of lowering plasma triglycerides as well. Other research indicates that fish oils influence other biological processes such as blood clotting and platelet stickiness, which could prevent formation of a thrombus in a vessel, and thus relate to a lower risk of heart attack.

An inverse relationship between fish intake and coronary heart disease in the Greenland Eskimos, and among men in the town of Zutphen, Netherlands, (1985) has been postulated to be a consequence of the effect of reduced platelet aggregability and increased bleeding time,

which appear to be stimulated by the omega-3 fatty acids. The complete biologic explanation for this observed inverse relationship between fish consumption and coronary heart disease is not known as yet. Studies are underway to elucidate the influence of omega-3 fatty acids on metabolic processes that affect blood platelet function, thrombosis, and lipid metabolism.

The relationship between diet and blood pressure probably is attributable to the influence of diet on secondary factors that have a role in blood pressure regulation. We know that high sodium intake and obesity are associated with high blood pressure and that changes in sodium and energy (caloric) balance can reduce blood pressure in some persons. Hence, weight reduction for the overweight person and sodium restriction are recommended as nonpharmacologic therapies. Both of these dietary measures are often suggested for those who are at high risk for developing hypertension.

It is possible that other nutrients may be established as important in blood pressure regulation. Presently under investigation by the Institute are the roles of several nutrients, including calcium, potassium, proteins, fats and alcohol.

NHLBI Education Programs in Hypertension and Elevated Blood Cholesterol

The National High Blood Pressure Education Program has been administered and coordinated by the NHLBI since 1972. Over the course of this program, general awareness of blood pressure as a risk factor has increased markedly. There has also been an increase in the number of persons who know their blood pressure levels, and in visits to physicians for treatment of high blood pressure. An impressive decline in the death rates due to heart attack and stroke has occurred over the life of this program. Some epidemiologists

suggest that as much as one-third of the decline in cardivascular mortality might be attributed to improvements in controlling high blood pressure. It is clear that this program has contributed to the cardiovascular fitness of the U.S. population.

These evident successes in our high blood pressure program permit us to view with much optimism the benefits to accrue from the new program addressed to elevated blood cholesterol that I mentioned earlier.

Community-Based Projects

Community-based and school-based projects provide major environmental settings where cardiovascular health research is fostered by the Institute.

The Institute supports three large community projects (Stanford, Minnesota, and Pawtucket). The operational hypothesis is that sensitizing an entire community to behavior which influences cardiovascular risk factors will produce behavioral changes that will ultimately reduce mortality and morbidity from cardiovascular disease in that community.

All projects include some measure of change in dietary patterns, smoking, and exercise in addition to changes in physiological measures of blood pressure and blood cholesterol. A variety of programs are offered to improve behavior relative to exercise habits, cigarette smoking, and diet. Smoking cessation activities have focused on mass media campaigns, community "quit-smoking" contests, smoking cessation classes, and smoking prevention programs in the school. Nutrition education and information have been disseminated through the mass media, a speakers' bureau, and distribution of written materials, as well as food labeling in grocery stores and menu labeling in restaurants. In some projects smoking cessation kits have been offered through local health departments, weight-loss

programs through local adult education facilities, and health promotion programs at the worksite through cooperation with major employers.

The Stanford project is an outgrowth of a smaller community study which demonstrated the potential for community-wide risk reduction and served as a model for subsequent community projects. The Minnesota project is testing the CVD risk interventions in communities of various sizes and adjusting the intervention approach accordingly.

The Pawtucket Heart Health Program, differs from the two other community programs in that the intervention relies primarily on community resources and volunteers, and utilizes only one intervention and one control community. Its specific goals include a 6 percent reduction in total plasma cholesterol, a 6 mmHg reduction in systolic blood pressure, a 2 percent reduction in body weight and a 2 ml/kg/min increase in estimated maximal oxygen intake and a 15 percent reduction in total (fatal and non-fatal) CVD event rates. This innovative project has community-wide support that could be useful in achieving the cardiovascular fitness objectives in Pawtucket.

All three community projects measure the same risk factors and use the same methodology for surveillance of mortality and morbidity. The programs complement each other by testing different approaches to intervention and offer the opportunity to pool data for selected analysis of the community intervention strategy.

School-Based Projects

Health promotion and disease prevention cardiovascular research initiatives in several school-based settings focus on one or more risk factor interventions, predominately nutrition, exercise, and smoking.

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Several racial/ethnic groups are involved, including black, white, and Hispanic populations. The intent is to change environmental and behavioral attributes that are most likely to influence changes in childrens' health behavior. A variety of teaching methods and materials are used involving specially trained classroom teachers and other resource people, and testing peer teaching models or participation of parents or family members.

Only a few of the studies have been completed. The New York and Chicago groups have published reports. The New York "Know Your Body Program," was evaluated in 11 intervention and 11 control elementary schools. The investigators found that after three years of intervention, there were decreases in diastolic blood pressure and in the ratio of total cholesterol to high density lipoproteins in the intervention as compared to control students.

Preliminary results from the Chicago Heart Health Curriculum Program indicate substantial gains in knowledge and some positive changes in attitude. The effectiveness of the "Know Your Body Pro[illegible] originally designed for a suburban white population, is being tested in a Washington, D.C., among black urban children grades four through six. Risk factors include obesity, lack of physical exercise, a diet high in fats and salt, and cigarette smoking.

The opportunity for school-based health-learning to improve cardiovascular health is an exciting prospect. These Institute-supported projects will help provide answers to the feasibility of enlisting and maintaining participation of school staff, students and parents and the effectiveness of that participation.

The combination of a variety of research endeavors extending across the research spectrum from basic science to demonstration projects will enable us to answer important questions about improving cardiovascular fitness for the nation.

In summary, I hope this brief review of some current research demonstrates to you that the Institute is learning more about the nutrients that are most effective in lowering elevated blood cholesterol and in controlling high blood pressure and also learning about the people who can profit most from a regular exercise program. My advice is to follow the guidelines established in the DHHS-USDA Guidelines for Americans. In essence, it is appropriate for many Americans to consider exercising more and maintaining a desirable weight.

For persons who have elevated blood cholesterol levels, more specific advice may be warranted. The Institute is appointing a panel which, with input from the member organizations of the National Cholesterol Education Program, will get into specific information on how and when to treat elevated blood cholesterol.

This concludes my statement. I will be pleased to answer any questions you may have.

The CHAIRMAN. Mr. Pritikin, let us turn to you. We are happy to welcome you here and appreciate the efforts you have made.

Mr. PRITIKIN. Thank you, Mr. Chairman.

According to the American Heart Association, 43.5 million Americans have one or more forms of heart or blood vessel disease, and over 10 million are afflicted with diabetes. In 1984, 202,000 people had bypass surgery. Last year, about $85 billion was spent on the treatment of these diseases.

What can be done to alleviate the human suffering associated with degenerative diseases and lower the Nation's exorbitant health bill, now climbing past $400 billion?

The goal of my presentation here today is to describe what we think is the most sensible and cost-efficient solution to this problem, which we have been using for the last 9 years in our longevity centers.

In our program, along with moderate exercise, we reduce the fat in the diet from the average American intake of 40 percent of calories to 10 percent, and cholesterol intake from about 450 milligrams per day to 100 milligrams or less—in both cases, about one-quarter as much as the average American eats.

These restrictions are not as extreme as they might seem. Dr. William Connor of the University of Oregon recommends that in stubborn cases of high blood cholesterol one should go to a 6 to 7 percent fat-calorie diet if necessary.

In December 1984, the Heart Institute made recommendations which moved in our direction, but we think not nearly far enough. First, they announced that the blood cholesterol of most Americans is undesirably high as a result of the high intake of meat and dairy products.

Second, every American over the age of 2, whether well or sick from heart disease, should make a lifetime change of diet, reducing the intake of total fat from the current U.S. average of 40 percent of calories to 30 percent and cholesterol from 500 milligrams per day to not over 300.

Third, drugs should only be used as a last resort to lower blood cholesterol.

Fourth, drugs should not be given unless accompanied by a strict low-fat diet containing, if need be, as little as 20 percent calories of fat.

Finally, the goal for Americans should be the Japanese level of cholesterol of 180 milligrams per percent, which the Japanese achieve on their national average intake of 20 percent calories from fat.

But what has this dietary recommendation accomplished in the past? The Heart Institute's 1982 $114 million "MRFIT Study" used 30 percent fat and a limit of 300 milligrams of cholesterol per day, but there was no difference in risk of heart disease or death between the experimental group and the control group.

How does the Pritikin Program compare with this? In 1 month on our diet of 10 percent fat-calories, participants experience an average blood cholesterol drop of 25 percent. According to the Heart Institute's general rule, that for every 1 percent drop in blood cholesterol there is a 2 percent drop in heart disease risk, this translates to a 50-percent reduction in the risk of heart disease.

Unlike drug therapy, no side effects are experienced on our program. Unlike a mild fat restriction from 40 to 30 percent, our restriction to 10 percent fat can also achieve a blood cholesterol level of 160 milligrams percent, which according to the Framingham study statistics almost eliminates the risk of cardiovascular disease.

Anyone can go on this diet without the supervision of a doctor, and we routinely prescribe it to everyone who comes to the Pritikin Longevity Centers.

Leaving the center after 3 to 5 years, we see an 80 percent compliance rate amongst those who have heart disease, diabetes, or hypertension. For healthy individuals, over 50 percent comply with the program.

Over 20,000 people in the past 10 years have taken our 13- or 26-day live-in program of instruction on diet and exercise. We found that we can greatly decrease all symptoms of heart disease, including angina. In a 5-year followup study of patients with cardiovascular disease and a recommendation from their personal physician for bypass surgery, 80 percent of these patients avoided the operation—a savings potential of over $3 billion alone, for which I have a poster here. [Poster No. 1.]

Of persons with hypertension, 80 percent achieve normal blood pressure and no longer need to take drugs. The Heart Institute is now recommending drug treatment for hypertension which could cost as much as $20 billion, at least half of which our regimen would save—and we have poster 2 for that. [Poster No. 2.]

We take well over half of all adult-onset diabetics permanently off insulin and oral diabetic drugs—poster 3. [Poster No. 3.]

[The posters referred to above follows:]

200,000 BYPASS OPERATIONS EACH YEAR IN U.S.
IS THERE AN ALTERNATIVE?

	DRUG ALTERNATIVE (CASS STUDY)	PRITIKIN DIET ALTERNATIVE
LENGTH OF STUDY	5 YEARS	5 YEARS
PERCENT SUCCESSFULLY AVOIDING BYPASS SURGERY	12.7%	81%
DEATHS & HEART ATTACKS	18%	10%
ANGINA: YEAR 0	78%	80%
YEAR 4	DRUGS: 55% SURGERY: 32%	32%
HOW MANY AVOIDABLE BYPASSES EACH YEAR?	25,000	160,000
SAVINGS FROM BYPASS AVOIDANCE	$0.5 BILLION	$3.2 BILLION

POSTER # 1

CHOICES FOR 60 MILLION U.S. HYPERTENSIVES

(BLOOD PRESSURE OVER 140/90)

	NIH LIFETIME DRUG THERAPY	PRITIKIN DIET
DRUG COST	$20 MILLION	0
FOOD SAVINGS	0	$30 MILLION
SIDE EFFECTS	FATIGUE, DEPRESSION CHEST PAIN, GOUT, DIABETES, SEXUAL IMPOTENCY, RAISED CHOLESTEROL LEVEL, KIDNEY DAMAGE.	INCREASED PHYSICAL & MENTAL ACUITY

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POSTER #2

11,000,000 U.S. DIABETICS

90% ADULT-ONSET NIDDM: 10% JUVENILE IDDM

600,000 NEW DIABETICS YEARLY

(ADULT-ONSET)

- #3 CAUSE OF DEATH
- #1 CAUSE OF BLINDNESS
- 90% OF ALL AMPUTATED LIMBS (20-30,000)

CAN DIABETICS STOP USING:	*INSULIN*	*DIABETIC DRUGS*
AMERICAN DIABETES ASSOCIATION	0%	0%
UNIVERSITY OF KENTUCKY— ANDERSON DIET	50-75%	95%
PRITIKIN DIET	50-75%	95%

Mr. PRITIKIN Every year, $72 billion is spent on heart disease, and $13.8 billion is spent on diabetes every year. If 80 percent of the heart and diabetic population followed the Pritikin Program, which our compliance data for these individuals indicates is highly possible, $68 billion might be saved. If only 10 percent of them followed the program, we would still see an average saving of $8.6 billion.

However, these tremendous savings will not be seen until people are fully educated in the prevention of degenerative diseases. We are pleased that many major institutions are modifying their nutritional recommendations and are moving closer to what we feel is the optimal dietary program—a 10 percent fat diet.

We feel that this is no time for dilatory half-hearted measures. Why ignore the ancient 10 percent fat diet still used all over the world by populations that do not have our epidemic of heart attacks? Would we recommend that a smoker simply cut back from two packs a day to one? Of course not. 5

The evidence is very strong that the lower the intake of total fat, saturated fat and cholesterol, the more favorable the effect on heart disease, and the greater the opportunity and likelihood for arteries to slowly open up again after being clogged by a lifetime of the over-rich diet which most Americans eat today.

We believe the public should not be left in the dark, in complacent ignorance about the full extent of its safe and effective dietary options to prevent and treat the degenerative diseases of modern Western civilization.

This concludes my oral statement. Further details of our program, and references to the scientific literature which support it, are contained in our written statement.

Thank you very much for this opportunity.

The CHAIRMAN. Thank you. We appreciate it.

[The statement on the Pritikin Program submitted by Dr. Robinson follows:]

THE PRITIKIN PROGRAM

Miles H Robinson, M.D.

In the health field today, the United States is in the midst of a revolutionary return to common sense and basic principles in two matters of the greatest importance: diet and exercise. Enthusiasm for personal exercise is sweeping the country, and improved diet for everyone is not far behind.

Moderate exercise has always been an indispensable part of the Pritikin Program. But the most important feature of the Program is the diet, in which total fat and especially the risky saturated fat and cholesterol are all reduced to about *one-quarter* that of the average rich American diet.

Origin Of The Pritikin Diet

Nathan Pritikin was an inventor with over 25 patents in the fields of chemistry, physics and electronics. His interest in diet began in 1958 when a stress test indicated the presence of ischemic heart disease, at which time he also had a blood cholesterol of 280 mg%. In 1959 he developed chronic leukemia, perhaps caused by exposure to chemicals he used in his work. Unwilling to accept medical advice to lead a life of severely restricted physical activity, he began a study of the literature on epidemiology, clinical medicine, and animal experimentation dealing with modern degenerative diseases to see if he could heal himself.

Noticing that primitive populations do not have coronary heart disease on their cereal-based very low fat diet, he put himself on that diet together with a very slowly increasing regimen of walking and jogging. In about two years his blood cholesterol was down to 120 mg%, he was jogging as much as ten miles a day, and to the surprise of his doctors he passed a stress test without a sign of the previous coronary insufficiency. When he died in February 1985 of complications from the leukemia at the age of 69, an autopsy showed his heart and all blood vessels in nearly perfect condition without any obstructions.[1]

The Pritikin diet is not his invention, but simply the ancient low fat diet of civilized man adapted to fit foods in today's marketplace. This diet is still the norm in most of the third-world, undeveloped populations where arterial and related degenerative diseases are rare. This includes the Tarahumara Indians of North Central Mexico, who have been extensively studied by competent authorities for their remarkable endurance and freedom from atherosclerosis.[2] Their diet was judged "adequate in all nutrients." Its chief sources of calories are corn and beans. Total fat is 12% of calories, saturated fat 2%, protein 13%, and cholesterol intake 71 mg/day.[3]

Similarly, the Pritikin diet achieves its very low content of total fat and cholesterol by restricting meat and dairy products which are high in fat, and emphasizing more grain and vegetables which not only are low in fat but also have a much higher proportion and balance of essential fats. This ensures a very favorable ratio of polyunsaturated to saturated fat (P/S=1.2, compared to the U.S. average of 0.3-0.55. Since fat has over twice the calories per given

weight compared to carbohydrate, a greater weight of food will be eaten on a low fat compared to a high fat diet to get the same calories

Altogether, the diet contains about one-quarter as much total fat (10% of calories instead of 40%), saturated fat (4% instead of 16% of calories), and cholesterol (25-100 mg/day instead of 400-500 mg/day). It has about one-quarter as much salt, and about 4 times more fiber and unrefined complex carbohydrates than the average American diet. The diet meets all official Recommended Daily Allowances.[4]

The intake of cholesterol and saturated fat, both of which for most people are harmful in excess, is greatly reduced because cholesterol is found only in animal food, for example, in meat and dairy products which also tend to be high in saturated fat.

The diet has a high content of fiber, which improves cholesterol metabolism, and the relative bulkiness of fiber encourages satiety and makes it easier to avoid excessive caloric intake. An excess of calories should be avoided, regardless of whether they come from fat, carbohydrate, protein or alcohol, because excess promotes a rise of blood cholesterol and other blood lipids in some people.[5,6]

One or two centuries ago, a 10% fat diet (for brevity, fat percentages refer to calories not weights, unless otherwise specified) was still the norm in the Western world. British authorities estimate that in 1770, the consumption of dietary fat was about 25 grams/day[7], and in 1880, 34 grams/day.[8] These figures amount to 11-15% of calories on a 2,000 calorie diet, or 8-10% of calories on a 3,000 calorie diet.[9]

There have been three undesirable changes in our dietary fat. (a) Consumption of total fat has increased, for example, by 18% from 1909 to 1975.[10] (b) The total of fat in meat, especially beef, has increased. Typical samples of commercial ground beef now contain about 17% fat by weight, while the meat from pasture-fed animals may contain only 3%. (c) The more hazardous saturated fat in meat has increased, and the older more favorable ratio between polyunsaturated fatty acids and saturated fatty has decreased. For example, this ratio in beef today is about 0.08, whereas in the meat of pasture-fed animals it may be as favorable as 0.5, more than ten times higher. The approximate ratio today in lamb is 0.05, pork 0.2, rabbit 0.3, turkey and chicken, 0.5, and herring 1.0.[11] The ratio in vegetable fat is generally very favorable, for example, in wheat and rye it is 3.0[12]

Fats are a mixture of fatty acids and glycerol, and the favorable feature of polyunsaturated fat is that half or more of it consists of the indispensable, vitamin-like essential fatty acids, linoleic and linolenic acids, which humans and other animals are unable to make but must get from food. (See section on diabetes).

It is significant that the primates close to man, the chimpanzee, baboon, and monkey, all routinely consume a 5-10% fat diet both in the wild and in the laboratory. On this diet, they have low blood cholesterols and are resistant to arterial and other degenerative diseases. Furthermore, when these animals are given the American diet atherosclerosis develops in their arteries, and when they are returned to their normal Pritikin-like diet their arteries extensively reopen. For example, an average 61% obstruction of coronary ar-

teries in monkeys produced by a diet of 40% fat regressed to only 20% obstruction upon changing back to their low fat diet.[13] Evidence is accumulating that the same effect occurs in humans.[14] The suitability of the 10% fat-calorie diet for human primates is basically the result of adaptation to the food on this planet as we all came slowly through the evolutionary sieve over millions of years.

Despite the foregoing evidence, the most controversial feature of the Pritikin diet is its very low fat content, especially with respect to an adequate intake of vitamin A which many people today often get largely from dairy products. On the Pritikin diet this is supplied in the form of carotene (pro-vitamin A) in green[15] and yellow vegetables and by the commercially added vitamin A in skim milk if milk is used. The high vegetable and fruit content of the Pritikin diet fits right in with recent recommendations of the National Research Council of the National Academy of Sciences, the National Cancer Institute, and the American Cancer society to eat a diet high in green and yellow vegetables and fruit to supply ample vitamin C and carotene as a measure "likely to reduce the risk of cancer."[16,17,18]

The NRC recommendations also urge an increased consumption of whole-grain cereal products and a reduction of total fat T C. Campbell, one of the authors of the report, said that although they decided to recommend a reduction of total fat from the American average of 40% to 30% of calories, "I would suggest getting it down to about 20%. In China, where I was in June, it's only 9%. So you can go down to 20% and not experience problems." NCI is presently conducting feasibility studies for two large clinical trials to see if a very low fat diet, 20% of calories or less, will prevent or retard breast cancer.[19]

Even stricter diets, as low as 5% fat, have been successfully used in cardiovascular conditions by eminent authorities.[20,21,22] An intake of fat as low as 5% sounds extraordinary, but in Japan, for example, this was the level at the turn of the century.[23] Few people in this country realize how dangerously high the Western intakes of fat and cholesterol have become over the last century, but we are still much better off than in more conservative Britain where the death rate from heart disease over the last decade has not dropped at all, compared to a drop of about 25% in the U.S.[24,25,26,27] Most authorities believe the chief reason for the U.S. drop has been our reduction in dietary cholesterol and saturated fat.

According to William P. Castelli of Harvard Medical School and director of NIH's famed Framingham Study, fully 80% of all cases involving heart disease and cancer are caused by addiction to the bad habits of cigarette smoking, alcohol and drug abuse, and overindulgence in fatty and sugary foods. "Breaking the[se] dependencies would sustain more human lives than can any of our sophisticated medical technology, he says, and it would reduce the nation's health care bill by $240 billion."[28]

What can a regimen like the Pritikin Program do for the nation's enormous health bill, now climbing past $400 billion (11% of GNP and growing at a rate close to 15% annually)[29], and the human suffering which that cost signifies? Nathan Pritikin began his crusade to return people to the old cereal-based 10% fat diet in 1974, when he organized and supervised a controlled study of his diet and exercise program on 38 seriously ill men in the out-patient department of the Veterans Administration Hospital at Long

Beach, California. All the men had advanced atherosclerosis, 80% had had vascular surgery, and most of them had coexisting conditions of hypertension, diabetes, and angina. The experimental group showed great improvement in their medical and physical condition, and these results[30,31] became the basis for the Pritikin Longevity Centers.

Since then, these Centers have educated, treated, and accumulated data on over 25,000 persons who have attended their 13-day or 26-day live-in program. The program has reported greatly increased ability to work and take exercise without bringing on the heart pain called angina. In a 5-year follow-up study of 64 patients with coronary disease and a recommendation for bypass surgery, 80% avoided surgery by attending the Pritikin Center.[32] This suggests a potential saving of over $3 billion a year since over 200,000 bypass operations are done annually at an average cost of at least $20,000 each. [*Poster #1*]. In peripheral vascular disease, the pain produced during walking is reduced by improving blood flow.[33]

The diet is also very effective in persons with hypertension. Around half recover normal blood pressure and no longer need to take drugs.[34,35,36,37,38] NIH estimates that there are 60 million persons in the U.S. who either have hypertension (blood pressure greater than 140/90 mm Hg) or are taking antihypertensive medication and are therefore considered to be hypertensive. Of these, 10.4 million were taking antihypertensive medication in 1983.[39] According to Edward D. Fries of the Veterans Administration in Washington D.C., it costs $500 per patient per year for drug therapy, professional fees, and lab services[40], which is about $5 billion/yr. Applying the Pritikin experience to this figure might save $2.5 billion. If NIH's present plans of drug therapy for hypertension were fully implemented putting many more of the nation's 60 million people on drugs, perhaps 40% of them, this would cost $20 billion, again half of which might be saved by an effective diet and exercise program. [*Poster #2*].

The diet routinely reduces blood cholesterol by about 25%[41,42,43,44,45], a reduction which is very important for the prevention and treatment of cardiovascular disease in general. The average blood cholesterol in the U.S. is about 215 mg%, and about 25% of men and 30% of women have levels of 240 mg% or more. According to Claude Lenfant, Director of the National Heart, Lung, Blood Institute, "If we could reduce the cholesterol in the overall population by 20 to 40 milligrams, I'm sure we'd reduce the heart-attack deaths by as much as one-fourth or one-third."[46] The American Heart Association estimates that the 1985 economic costs of cardiovascular disease will be $72.1 billion. Much of that cost could be saved if the very low fat, low cholesterol, and high fiber diet were widely adopted.

The diet enables well over half of all diabetics to be permanently taken off insulin and oral diabetic drugs.[47,48,49] The American Diabetic Association estimates the economic costs of diabetes for 1985 will be $13.8 billion, so here again large sums could probably be saved if the ancient diet were widely adopted. [*Poster #3*].

A recent report from the National Academy of Sciences stated that the relationship between excess dietary fat and cancer is even more persuasive than the one between diet and heart disease.[50] According to Peter Greenwald, director of Cancer Prevention and Control of the National Cancer Institute, in order to help ward off cancer "The average American should try to double the

amount of fiber ... should keep intake low of all fats ... should increase the intake of fruits and vegetables containing vitamin A, vitamin C, and beta-carotene [pro-vitamin A]".[81] The heavy cost of cancer could thus be reduced by the Pritikin diet which greatly decreases dietary fat, increases dietary fiber, and provides an ample suppl.· of carotene.

For the last ten years the Pritikin program has been getting excellent results with its aggressive dietary therapy for heart disease, hypertension, and diabetes. By contrast, only in the last two years has the National Heart, Lung, Blood Institute moved away from its long standing emphasis on drugs, and substantially toward the low fat diet which we have been advocating. A brief account of this change of policy at the Heart Institute will highlight obstacles to nutritional therapy which are likely to recur unless the public takes an active interest in the matter. But let's first consider the dietary changes which took place earlier.

A Century Of Trial And Error

How did our diet happen to change in the last century to one high in total fat, saturated fat, cholesterol, refined and processed sugars, calories, and salt? A Working Group at the National Heart Institute explained:

> [It is] a recent development largely unique to the 20th century. It is a by-product of ... high-yield agriculture and animal husbandry, and per capita incomes making relatively expensive foods of animal origin generally available. As such, it is a marked departure from the situation that prevailed for most people for millennia, from the invention of agriculture to the late 19th or early 20th century - i.e., subsistence overwhelmingly on grains, starchy tubers, and legumes.[82]

Another and perhaps more basic cause was the invention in 1870 of the high speed Hungarian roller mill for the refining of flour. Until then, only a semi-white, semi-refined flour could be produced by inefficient sifting through cloth, with not nearly so much loss of vital nutrients. Whereas the roller mill is extremely fast and precise in the separation of the various constituents of grain, which include fiber in the bran, vitamins, trace minerals, and the essential polyunsaturated fats. Until very recently, most authorities considered this a marvellous invention. The snowy white flour can be elaborately manipulated by bakers, and it has excellent keeping qualities because there is no fat left in it to turn rancid and too few vitamins and minerals, as well as missing essential fatty acids, to support rampant insect life. The millers also made an additional profit selling the extracted nutrients, bearing the opprobrious name of "offals", to farmers for livestock feed. The short-lived livestock visibly flourished. But the long-term deterioration in human health was so subtle and gradual that it was half a century before medical science noticed the connection and still longer before it took any action. Even today doctors are trained primarily to put out the fires of acute disease rather than given basic education in nutrition.

Over the years, however, many people must have sensed that their vigor and health could not be maintained unless they greatly increased the consumption of animal flesh and dairy products, since eating more of these foods substantially supplied the nutrients which the roller mill had removed

from the ancient cereal "staff of life". Fortunately, or unfortunately, the Western world could afford the extra expense. It costs about $1,500 more per year for a family of four to eat the meat-and-dairy-based American diet compared to the cereal-based Pritikin diet.

It is now quite clear that physicians have been building their therapeutic house largely on the sand of the modern high-fat Western diet, instead of on the rock of the ancient low-fat, cereal-based diet. So it should come as no surprise that the present cost of degenerative diseases is staggering. For example, it is estimated that the annual U.S. cost of treatment and indirect costs of heart disease is $72.1 billion.[53]

How long have authorities believed that the diet of the average American is too rich? Seven years ago, the Office of Technology Assessment of the U.S. Congress recognized that over-consumption of a "luxurious" diet produced major diseases:

> "Today we find that most Americans die of degenerative diseases such as heart disease and cancer. *** The federal Government *has failed to adjust the emphasis of its human nutrition research activities* to deal with the changing health problems of the people of the U.S. *** Like the diseases of nutritional deficiency, the *diseases of overconsumption* appear insidiously in the population, usually in mid to late adult life. ... [they] occur in a setting of affluence and advanced technology which makes possible a luxurious diet."[54] [Emphases supplied].

In other words, it was time for Americans to be given information motivating them to exercise more restraint in the consumption of rich food, such as meat, dairy products, pastries, french fries, and other foods high in fat. Nutritionists commonly define a rich diet as one high in fat and cholesterol.[55]

For at least a decade it has been generally accepted that blood cholesterol levels below 150-160 mg% protect populations from heart attacks. Antonio Gotto, professor of medicine at Baylor College of Medicine in Houston and president of the American Heart Association, stated in a U.S. Senate hearing in 1977, that "In societies where the plasma cholesterol is under 150 to 160 mg%, there is virtually no coronary artery disease or atherosclerosis".[56] He also stated that "If we lower the cholesterol count of everyone in the United States below 150, we could probably wipe out heart disease."[57] Castelli stated in 1979, that "Diet could reverse coronary artery disease in 90 percent of the patients if we got everyone's cholesterol below 150 milligrams percent."[58] The Pritikin guideline for blood cholesterol is 100 plus age and not to exceed 160 mg%.

Authorities from the National Institutes of Health are now convinced that the high consumption of dairy products and meat, especially fatty meat from beef heavily fed on grain in feed lots, causes obstructive plaques to develop inside human arteries.[59] The development of plaques together with a derangement of the blood clotting mechanism (intimately related to the essential fatty acids) causes clots to form on the plaques and further increases obstruction of the arteries.[60] These two bad effects are generally considered to be the major causes of our current epidemic of heart attacks, strokes, and

peripheral vascular disease. A closely related effect is a great increase in the incidence and severity of diabetes. Only now are we beginning to scratch the nutritional surface of many other chronic diseases, including hypertension, arthritis, some major cancers, gallbladder disease, appendicitis, constipation, and gout, in all of which the over-rich, unbalanced American diet plays a leading role.

Dietary Revolution In The Heart Institute

In January 1984, the National Heart, Lung, Blood Institute announced at the "most heavily attended press conference in its history"[61], that its 10-year $150 million cholesterol study had established the general rule of thumb that for each 1% drop of blood cholesterol, a 2% drop in the risk of fatal and non-fatal heart attacks was produced.[62] Heart Institute officials also said, quite inaccurately, that for lowering blood cholesterol the best that diet alone could do was a reduction of 10-15%[63], whereas the drug, cholestyramine[64], which had been used in the Institute's study, could reduce it by as much as 25%.[65]

Why was this an inaccurate claim of drug superiority? The reason was that Heart Institute officials over a year earlier had given a paper[66] in Europe describing four "large-scale diet studies" lasting 2 to 11 years in which diet alone had lowered blood cholesterol by 17% to 29%.[67] By the Heart Institute's new rule of thumb mentioned earlier, these figures are equivalent to a 34% to 58% drop in fatal and non-fatal heart attacks, as good or better than what cholestyramine had accomplished.

This unjustified putdown of nutrition was carried in news media all over the country and even in Europe. Among the fifty press clippings collected by the Heart Institute[68] after its massive press conference, not one stated that diet could be more effective, and only three stated that diet was as good as drugs.

For example, *Newsweek* carried a spectacular graph showing drug plus diet producing a profound drop in blood cholesterol, with placebo plus diet accomplishing practically nothing.[69] The *New York Times Week in Review* stated that "the men placed on the drug-and-diet regime had a much lower rate of heart disease than those who relied on diet and placebo."[70] *UP Story*: "those who took a cholesterol-lowering drug suffered 24 percent fewer cardiac deaths and 19 percent fewer heart attacks than those who tried to lower cholesterol through diet alone."[71] An *AP Dispatch*: "high cholesterol levels that cannot be lowered by diet alone can be helped with drug therapy."[72] *CBS Evening News*: "group receiving the drug had 19 percent fewer incidents of heart attacks".[73] *ABC World News Tonight*: "In every case, those on the drug had the least amount of heart disease."[74] *London Times*: "The drug reduced the concentration [of cholesterol] in their blood by an average of 8.5 per cent ... But diets only reduce the levels slowly, and in best cases by about 3 to 4 per cent."[75]

Time magazine, in its first one-page story in January wrote that cholestyramine cut the heart risk by 50%[76], and in its nine-page cover story in March quoted Robert I. Levy of the Heart Institute that diet could reduce it by only 20-30%.[77]

In August 1984, however, in answer to my criticism that the Heart Institute had ignored its own review paper given in Europe on lowering choles-

terol by diet alone and had thus not given the public and its doctors an accurate account of the drug v. nutrition situation, the Institute prepared a Fact Sheet specifically answering this criticism and acknowledged that diet alone *"can be as effective if not more effective than drugs"* for lowering blood cholesterol.[78]

In December 1984, we were pleasantly surprised to find a Consensus Panel of the Heart Institute charging down the nutritional track with "historic"[79] findings and recommendations. First, the panel announced that the blood cholesterol of most Americans is dangerously high as a result of their very high intake of meat and dairy products.[80] Second, to lower blood cholesterol drugs should be used only as a *"last resort"*.[81] Third, drugs should not be given unless accompanied by a strict low fat diet containing, if need be, as little as 20% calories from fat.[82] Fourth, the Japanese average blood cholesterol level (about 180 mg%, characteristic of their intake of fat at 20% of calories) is probably the goal at which Americans should aim.[83] Finally, every American over the age of two, whether well or sick from heart disease[84], should make a lifetime change of diet, reducing the intake of total fat from the current U.S. average of 40% of calories to 30%, saturated fat from 16% to 10%, and cholesterol (which comes only in animal food), from 500 mg/day to not over 300 mg/day.[85]

As chairman of the panel which made these recommendations, Daniel Steinberg, professor of medicine and director of the Specialized Center of Research on Arterosioscierosis at the University of California San Diego, elaborated on these themes at the press conference with great skill and erudition.

> "If you look at the cholesterol levels in Japanese, you find that on the average their cholesterol levels are much lower than ours, as if the whole curve had been shifted far to the left.[86] What we are suggesting is that their cholesterol level is right and our cholesterol level wrong.[87] *** In other words, almost everybody in the U.S. has a higher cholesterol level than the people in Japan who have the highest levels in Japan. It's amazing that the curves overlap only very slightly.[88] ... one might say our goal ought to be to get levels that are, in fact, like the Japanese. Well, that might be a suitable goal, but I think it's not a feasible goal at the moment at least, so we haven't opted for a radical recommendation, although one could support that for these theoretical reasons.[89] *** Well, I'm almost tempted to say the lower [the blood] cholesterol the better. We've given these targets, but you can tell from what I've told you about the ideal level, which is probably the Japanese level, that I wouldn't discourage any patient from getting below the target level, not at all. That would be fine.[90] *** ... you may be right by your implication that we should perhaps have gone all the way and say, let's get down to the Japanese levels. I think that would be, first not feasible, in a single big jump from our present diet. And, second. it would mean extrapolating more than I think we are prepared to go right now with regard to changes. We want to go slow, and make sure that we maintain a nutritious diet. that

> we are not endangering peoples' health, particularly that of the children, and hence this conservative recommendation."[91]

It should not be concluded that the Japanese are wholly satisfied with their 20% fat diet. For example, they have been concerned about the doubling of their incidence of diabetes in the period when the fat intake tripled.[92] (See section on diabetes).

Most authorities agree that the nutritional quality of a 10% fat cereal-based diet is entirely satisfactory, provided natural unrefined foods are used in reasonable balance. If, however, one tried to maintain this level of fat eating the white flour products with which food technology has long flooded the market, one would probably be forced back eventually to the same plethora of meat and dairy products. These eaten in conjunction with devitalized grain products appear to be a better bargain for health, at least in the short run before what used to be called "inevitable"[93] arterial damage appears in most people on that diet.

Unfortunately, the December panel's "historic" recommendations got very little publicity in the news media. This was partly because they did not have the advance publicity, fanfare, and 39 display posters which characterized the Heart Institute's elaborate press conference the previous January when the drug, cholestyramine, held the stage. Perhaps the news media quite reasonably judged that the country was satiated with cholesterol-lowering. For example, *Time* magazine on the first go-around carried ten pages about cholesterol, including a cover story, in two issues [94,95], but gave only two columns of one page to the Heart Institute's second press conference which put drugs in the category of "last resort."[96] Admittedly, another problem is that the prospect of exercising more restraint regarding a rich diet does not have much appeal, especially if the public has no good information to motivate it. A rich diet is equated with man's triumph over hard times. The fear of losing something in it indispensable for our active brains and hands is matched by a passionate desire to justify the sensual pleasure of it. The use of drugs, however, implies that one can have a rich diet and health as well. The interference with normal bodily functions produced by drugs is considered glamorous high technology, while the refining and devitalizing of the staff of life is accepted as a routine feature of modern life.

The only criticism that can be made of the Consensus Panel's praiseworthy recommendation of December 1984, toward a long overdue reform of the American and Western diet is that the Heart Institute was still not telling the American public that its most powerful dietary option to control heart attacks and degeneration of arteries is not the 30% AHA limit on total fat the Panel recommended for all Americans over the age of two. Nor is it the 20% fat-calorie diet of present-day Japan. The most powerful dietary option is the 10% fat-calorie diet, *half* as much fat as the lowest diet the Institute has ever mentioned to the public -- the diet used by ancient mankind, and still used by most of the undeveloped third-world countries which do not have our epidemic of heart attacks and various other degenerative diseases. Anybody can eat this diet without the supervision of a doctor and it is routinely prescribed for everyone that comes to the Pritikin Longevity Centers.

HYPERTENSION

An excess of fat, sodium (primarily common salt), protein and sugar in the diet and the comparative low intake of potassium characteristic of a heavy meat [illegible] have all been shown to cause hypertension[97], but fat and sodium are the most important factors. Most people appear to be sensitive to an excess of fat and perhaps 25% sensitive to an excess of sodium.

The most obvious way in which a high fat diet produces hypertension is an increased clumping of the red blood cells and platelets and consequent slowing of blood which can be seen in the microcirculation.[98,99] This impairs the ability of the blood to distribute oxygen and other nutrients, and to pick up carbon dioxide and other waste products. Letcher et al[100,101] found that high blood pressure was associated with increased viscosity (decreased fluidity) of the blood, and studies by the Pritikin medical group have shown a reduction in whole blood and plasma viscosity as well as a decrease in red blood cell aggregation, in hypertensives whose blood pressure decreased on the 10% fat diet.[102,103]

USDA and Finnish Studies

James M. Iacona, director of the Western Human Nutrition Center of the U. S. Dept. of Agriculture, has shown in carefully controlled clinical experiments that reducing total dietary fat and increasing the intake of polyunsaturated versus saturated fat (increasing the P/S ratio) lowers blood pressure.[104,105] Iacona's work has been confirmed in two randomized and controlled studies conducted jointly by the USDA and Finland Public Health Institutes.[106,107] The average person who entered the studies was eating a diet with a P/S ratio of 0.25, meaning one-quarter as much polyunsaturated as saturated fat. The study demonstrated that blood pressure dropped sigificantly only in those who lowered their total fat intake from 38% to 23% of calories and increased their P/S ratio to 1.0 (twice the U.S average), thus consuming an equal amount of polyunsaturated and saturated fats. Those who cut their salt intake in half, but did not drop their fat intake and did not increase their P/S ratio had no significant drop in blood pressure. The authors concluded there was an urgent need for nonpharmacological control of high blood pressure.

When the 10% fat diet is used (less than half as much fat as Iacona used) together with a P/S ratio of 1.0, a much greater drop in blood pressure can be obtained. In a Pritikin study of 268 hypertensive patients with 216 on antihypertensive drugs, 180 discontinued medication and lowered their blood pressure to 140/90.[108] When 40 of these patients were contacted 3-4 years later, most were still off medication with blood pressures of 140/90[109]

In another study of hypertensives on the Pritikin regimen, 85% of the patients who required medication when they began the regimen no longer needed drugs after 4 weeks, and weight loss was not a factor in the lowering of blood pressure. These data were given to NHLBI in 1977[110], and the Pritikin group published confirmatory studies in peer-review medical journals in 1983[111] and 1985.[112]

Drug Emphasis by the Heart Institute

Despite the favorable results from dietary therapy, the National Heart, Lung, Blood Institute (NHLBI) has consistently emphasized drug therapy. In the last two years NHLBI has taken the unusual step of running regular advertisements in the popular news media, publicizing the view that high blood pressure is incurable[113], and putting great emphasis on taking blood pressure medications for the rest of one's life.[114,115,116,117] An outside contractor is employed to run this campaign, all paid for with taxpayer's money.

The recommendations are aimed at more than 60 million Americans who have either been found to have elevated blood pressure (140/90 mm Hg or greater) or have reported being told by a physician that they have hypertension.[118] NHLBI also created a National High Blood Pressure Education Program that holds a national conference every other year. There are Coordinating Committees in every state of the Union.[119] The Program has declared the month of May as High Blood Pressure Month.

Fifty different drugs are recommended by NHLBI to be used in stepwise fashion.[120] If any one drug fails, another is added or substituted. But the popular thiazide diuretics cause elevated cholesterol and fats in the blood, increasing the risk of atherosclerosis.[121] Side effects of these or other antihypertensive drugs include gout, precipitation of diabetes, loss of potassium, marked hypotension, angina, sexual dysfunction, swelling of the breasts, fatigue, drowsiness, nasal congestion, asthma, insomnia, bizarre dreams, nausea, headache, fluid retention, and diarrhea. Liver damage may be caused by methyldopa and lupus may be caused by hydralazine.

NHLBI considers hypertension the most common disease in the nation, and it can be calculated that if NHLBI's drug program were fully implemented it would cost at least $20 billion/year.[122]

Full Dietary Treatment Neglected

Both the Joint National Committee and the Education Program are headquartered in the National Heart Institute, and the Report of its Joint Committee for 1984 shows just how deeply NHLBI has immersed itself in drug treatment. Twenty-three pages are devoted to drug therapy, and only one page deals with non-pharmacologic methods. The latter are listed as weight reduction; decrease in the use of salt, alcohol, and tobacco; increase in exercise; and behavior modification. There is no mention of reducing total fat. Iacona's work is mentioned but dismissed on the grounds that "There is not yet enough evidence concerning effectiveness of such a dietary change to recommend it for hypertension control."[123]

The nonpharmacologic method most strongly endorsed by NHLBI is weight reduction. Yet, NHLBI's reliance on weight reduction rests chiefly on a single study by Reisin et al, done in Israel.[124] In this study, weight reduction did result in some drop of blood pressure, but not enough to permit a single patient to get off antihypertensive drugs. As described above, Pritikin's results have been shown not to require weight loss.

Physicians reading the Report of the Joint Committee thus do not receive encouragement to treat hypertension with any dietary measure except

salt reduction, so the public is kept in almost complete ignorance of what diet can really do for hypertension. For mild hypertension, there is now widespread agreement that drug treatment is harmful and unjustified. Even advanced hypertension should have a thorough trial of dietary therapy. Walter Kempner at Duke University startled the medical world 30 years ago, when his famous rice diet saved the lives of patients with malignant hypertension and severe kidney disease, and it was also effective in the treatment of patients with diabetic retinopathy. His diet contained only 2-3% of calories from fat and no cholesterol. The advent of antihypertensive drugs stifled the Kempner approach because drugs were so much easier to take and their long term harmful side-effects were not obvious. (See Kempner in section on diabetes).

Americans use more drugs per capita than any other nation, an average of 12 different ones a year for every man, woman, and child in the nation, constituting a three-fold increase in the past 25 years.[125] The public and its doctors should be fully informed of the promise and accomplishments of the low-fat dietary treatment of hypertension. They should not be misguided and led to believe they can be careless with their diet and compensate for that neglect with a pill.

DIABETES

A description of the Pritikin program for diabetes requires a more extensive review. As mentioned earlier, at the turn of the century in Japan the intake of fat was only 5% of calories. At this time, diabetes was so rare in Japan that it was not even listed as a cause of death. This old clue suggests that the chief cause of diabetes is the modern high fat diet -- the same as in the case of heart disease. There is also other old, more cogent, and equally neglected evidence. To this may now be added new studies holding out the remarkable promise that a very low fat diet, not over 10% of calories, will accomplish more in the long run for diabetics than even the discovery of insulin.

New Evidence

James W. Anderson[126], chief of the endocrine-metabolic section of the VA Medical Center and professor of medicine and clinical nutrition at the University of Kentucky College of Medicine in Lexington, and the Pritikin group[127,128], have both shown that when diabetics are put on the ancient diet of civilization, 50-75% of them can be taken off insulin and 95% off oral diabetic drugs.

In a study of 60 diabetic patients who attended the Pritikin Longevity Center's 26-day program, 21 of 23 patients discontinued oral hypoglycemic drugs. Of 17 others on insulin, fasting glucose was reduced from 195 mg% to 145 mg% and 13 discontinued insulin injections. In addition to the significant improvement in their diabetes, blood cholesterol dropped from 225 mg% to 192 mg% and triglycerides from 284 mg% to 186 mg%, which reduced their risk of vascular complications.[129]

A two to three year follow-up study of another group of 69 diabetics at the Pritikin Center showed good compliance with the program and excellent

control of their diabetes. Only 7 had gone back on oral drugs and 4 back on insulin. When the diets of the 16 who remained off oral drugs were compared with the diets of those back on medication, the only significant difference was the percent of calories derived from fat: 11% fat for those off medication and 17% fat for those back on medication.[130]

How could a very low fat diet have this effect? Part of the answer is that on practically every cell in the body there are specialized little pits, called receptors, which grab insulin out of the intercellular fluid and blood and pull it into the interior of the cell, where the insulin instructs the cell to increase its uptake of glucose (sugar) from the blood. Half of the receptors are regularly degraded and replaced by new receptors every 6-7 hours without a change in their total number.[131] A very low fat diet increases the number of insulin receptors and this makes the body cells more responsive, *more sensitive*, to insulin. Conversely, an excess of fat and less importantly of protein (both typical of the rich Western diet), decreases the number of insulin receptors, the cellular uptake of insulin is reduced, and the cells become comparatively *insensitive* (resistant) to the action of insulin. As we shall see, this insensitivity is usually the earliest sign of the onset of diabetes.

It is not known why bathing cells in excess fat decreases the number of receptors. Perhaps carbohydrate in the blood is the main stimulus for production of insulin receptors, and this stimulus is decreased when the ratio of carbohydrate to fat in the blood (reflecting the ratio in the diet) is decreased.

For most of this century in the affluent Western countries, the caloric ratio of carbohydrate to fat in the food has been nearly 1 to 1. In the ancient diet, this ratio is far more favorable for the preservation of sensitivity to insulin, since the ratio is 7 or 8 to 1 (70-80% carbohydrate, 10% fat, and 10-20% protein).

A variety of other receptors are also affected by diet. For example, preliminary studies by Frohlich[132] have suggested that an excess of sodium in the diet may increase the number of beta receptors in the heart which respond to hormones of the adrenaline type. The importance of receptors has recently been highlighted by the award of the 1985 Nobel prize for Medicine to Drs. Michael Brown and Joseph Goldstein for their work on the cellular receptors for cholesterol carried by low density lipoprotein (LDL). Here again, a high intake of fat initiates pathology. The higher the level in the diet of saturated fat and/or cholesterol, the greater the suppression of manufacture of LDL receptors. LDL then builds up in the blood, leading to atherosclerosis in the proportion of the population, perhaps 50%, which is susceptible to atherosclerosis on a high-fat diet.[133]

In the late 1800's, von Mering and Minkowski showed in dogs that destroying the pancreas produced all the symptoms of diabetes. In 1922, Banting and Best isolated the hormone, insulin, from the pancreas. Since insulin is destroyed in the intestinal tract, it must be given by injection, and it has saved the lives of countless severe diabetics who otherwise invariably died in a few years. There seemed to be no question that the essential cause of diabetes was an injury to the pancreas which impaired its ability to produce insulin, although just why and how the pancreas was damaged was not known.

Soon after the discovery of insulin, however, a few alert clinicians noticed that much more was involved in diabetes than a mere inability to produce insulin. Despite the administration of insulin, a slow but severe damage to the vascular system usually proceeded in diabetics, and patients often became less sensitive to insulin. In effect, the use of insulin in severe diabetics converted a quickly fatal disease into a chronic vascular malady, letting diabetics survive long enough to suffer blindness, gangrene, kidney failure, neuropathy, and cardiovascular disease. There is very little convincing evidence that the use of insulin has lessened this progressive damage.[134]

As in the case of narcotic tolerance, the use of insulin tends to dull its effect. Somogyi[135] in 1949 emphasized the fact that large doses of insulin in diabetics produce a need for yet higher maintenance doses. "A vicious cycle is thus set off, leading to severe, often unmanageable, forms of diabetes." Thus, insulin is a two-edged sword. It is sometimes indispensable, but at the same time it raises the requirement and there is the constant risk of overdose forcing blood sugar down to shock levels.

About 90% of diabetics (not the 10% of diabetics who have the severe juvenile type) usually have enough insulin in the blood and frequently an excess, although at times of great stress, such as surgery, they may not be able to produce enough. This was shown by Reaven and others[136,137,138] at Stanford in 1970, following the discovery by Yalow and Berson[139] in 1960 of the immunoassay technique for accurately measuring insulin in the blood. Apparently, in coping with cellular insensitivity, the pancreas produces an excess of insulin and is overworked in the process. Blood sugar stays above normal because even the excess of insulin cannot quite meet the challenge of insensitivity. Stocks and Martin[140] found such insensitivity in 12 of 25 diabetics within a month of their diagnosis of diabetes. Insensitivity is also commonly found in ordinary obesity[141], and can be returned toward normal in 80% of obese persons simply by the elimination of overeating.[142] A major factor in overeating, of course, is a high intake of fat.

Insensitivity to insulin is often found also in *nondiabetic* patients who have vascular disease. John Yudkin, professor of nutrition at Queen Elizabeth College of the University of London, cites studies indicating that the raised blood levels of insulin "may be an early stage, if not the earliest stage, in the development of coronary disease."[143] This link of insensitivity strengthens the view that an excessive intake of fat is the prime cause of both diabetes and coronary heart disease.

Yet most diabetes specialists today ignore the role of a high fat diet and regard diabetes as a mysterious disease the cause or causes of which are usually unknown.[144,145] J. Stuart Soeldner, acting director of research at the Joslin Diabetes Foundation in Boston, has named heredity, viruses, and autoimmunity as the three most likely causes of diabetes.[146]

Since much more than a simple lack of insulin is involved, diabetes has come to be an "umbrella" term[147] for persistent high levels of blood sugar associated with serious disease affecting the vascular and nervous systems of the heart, kidney, eye, extremities, and other organs. The classic symptoms and signs are thought to be largely produced in the end by one of two ways or by a combination of both: (a) a destruction of the beta cells of the pancreas which produce insulin; (b) a decrease in the sensitivity of all cells in the body to insulin.

The destruction of the beta cells is most severe in the juvenile type of diabetes, now called Type I, or insulin-dependent diabetes mellitus (IDDM). This destruction can be caused by many kinds of stress, including viruses, bacteria, chemical poisons, and autoimmune reactions to physical and mental exhaustion. The beta cell destruction and decrease of sensitivity to insulin in these diabetics is usually so great that insulin must be administered to prevent serious illness or death from the eventual breakdown of body tissues. An extraordinary example of chemically caused diabetes occurred in 1975 in the U.S., Korea, and Japan from the accidental consumption of the rat poison pyriminil. Four years later it was withdrawn from the market.[148]

The adult-onset type of diabetes is now called Type II or noninsulin dependent diabetes (NIDDM). Such diabetics are usually obese, but not always, and constitute 80-90% of all cases of diabetes. Their main difficulty is insensitivity to insulin. The category of "non-insulin dependent", however, is actually a misnomer, since many of these diabetics, especially lean diabetics, do require insulin or oral diabetic drugs[149]. However, by using the ancient diet of 10% fat, most of these diabetics, even the lean ones, can be taken off insulin and oral drugs.[150,151,152]

Golden Age?

Some diabetic experts claim that more progress has been achieved in understanding diabetes in the past decade than in all the previous fifty years since the momentous discovery of insulin by Banting and Best in 1921.[153] According to Ronald A. Arky, chief of medicine at Mount Auburn Hospital in Cambridge, Massachusetts, "The past 10 years have been a golden age for diabetes research."[154]

But has it been a golden age for diabetic patients? Stephen Podolsky, chief of the endocrinology and metabolism section of the Boston Veterans Administration Outpatient Clinic, paints a grim picture of the disease:

> Diabetes, with its complications, is now the third leading cause of death in the United States, accounting for over 300,000 lives annually. Diabetes decreases life span by approximately one-third. Approximately 10,000,000 Americans now have diabetes. Because of its hereditary nature, and because it is a family oriented disease, diabetes indirectly affects 50,000,000 Americans. In this country more than 600,000 new cases of diabetes are diagnosed each year, and the incidence of the disease is increasing by 6% a year. Diabetes is now the leading cause of new cases of blindness, and diabetics are 17 times more prone to kidney disease and over 5 times more prone to gangrene. They are twice as prone to heart disease and stroke.[155]

According to NIH, the cost of health care directly attributable to diabetes in 1984 was $13.8 billion.[156] The incidence of diabetes has been steadily increasing world-wide. The number of diagnosed diabetics in the U.S. was 2 million in 1952, 3 million in 1967 (2% of the population)[157], and 9 million in 1979 (4% of the population).[158] The chronicity and vascular complications of diabetes render it one of the most crippling diseases. According to a drug analyst for the brokerage firm of Kidder & Peabody, there are 20 million dia-

betics worldwide. with a potential market for antidiabetic drugs of $1.5 billion; and this market is growing by about 800,000 new diabetic patients a year in the U.S. alone.[159]

It is estimated that eventually 10% of the population will be diabetic, and some authorities say 25%.[160] Diabetes is considered the third-ranking cause of death in the U.S., but may really rank higher than this. It is difficult to judge in how many of the 550,000 coronary deaths a year diabetes plays a major part. Federal statistics show that for the year 1968, diabetes was mentioned on 126,639 death certificates, but only on 27% of them was diabetes listed as an underlying cause of death.[161]

Epidemiology

Epidemiology is the study of the distribution of a disease and its determinants, and it has provided powerful clues leading to high dietary fat as the chief cause of diabetes, just as it does for heart disease. The incidence of diabetes has long been associated with affluent societies which could afford luxurious food. In primitive societies, diabetes and the closely linked atherosclerosis and coronary heart disease are all quite rare.[162,163,164] According to T. L. Cleave, a British naval surgeon with extensive foreign medical experience, "Diabetes is practically unknown amongst the ordinary inhabitants of, for example, China and India, only occurring there in the wealthy inhabitants that live on the Western type of diet", and has not been reported in Bushmen, Hottentots, Laplanders or Australian aborigines.[165] The major difference in their diets from that of the affluent West is a high consumption of unrefined complex (starchy) carbohydrates and a low consumption of saturated fat and total fat. Again, this is essentially the diet of ancient civilization.

With regard to the increase of diabetes in the Third World, Arthur Teuscher[166], chairman of a symposium at the 11th Congress of the International Diabetes Federation, stated that diabetes is linked to increasing migration from rural areas to cities, and is associated with a change in diet and a more sedentary life style.

We referred earlier to the recent recommendation of our National Heart Institute that Americans substantially lower their dietary fat strongly in the direction of the Japanese level. Information from S. Tsuji of the Kobe University School of Medicine and other Japanese and Korean authorities[167] is illuminating. As the Japanese diet and life style have become more Westernized, the incidence of diabetes has steadily increased, by more than tenfold from 1947-80; and the mean fasting blood sugar levels of employees in Tokyo enterprises have increased year by year.[168] By 1957-1960, using sensitive diagnostic methods to pick up "very mild cases of diabetes," the incidence was 1.5% of the population. In 1919, the death rate from diabetes was 2.9 per 100,000, and by 1968 had increased to 6.3. In 1919, the Japanese intake of fat was 4.7% of calories; in 1960, 11%; in 1965, 15%; and in 1967, 17%. These figures from Tsuji and others show that over this period the diabetic mortality doubled as the fat intake went up threefold.

According to Jean Mayer[169], formerly professor of nutrition at the Harvard School of Public Health and now president of Tufts College, a Japanese with diabetes is usually allowed about 350 gram of carbohydrate and 30 gram

of fat per day. Assuming a 1,600 calorie diet, this content of fat is about 17% of calories.

Tsuji reported that Chinese medical customs are similar to those of the Japanese, and that in Taiwan, from 1957 to 1966, the mortality from diabetes rose by 57%, from 1.62 to 2.54 per 100,000 deaths. In the period from 1945 to 1968, the percentage of calories from fat also more than doubled, from 7.8 to 19.5%.

Tsuji regarded diabetes as follows:

> Civilized daily life is considered to promote the occurrence of diabetes. Eating too much and reduced physical exercise are the two main calamities of our civilized life *** we are now astonished at the astronomical number of diabetics in the civilized world. The introduction of civilized life among the Asian people is slowly progressing everywhere, but at a different tempo. This circumstance is thought to be related to the varying epidemiological pattern of diabetes in Asia.
>
> The Japanese people are not particularly immune to diabetes ... The nutritional state of the people, which has an intimate relationship to diabetes, has changed and is still changing in Japan, accompanying the increase in the gross national product after the War, and the daily intake of calories, fats and animal proteins are gradually increasing *** The nutritional habits and the way of living of the Japanese people are now becoming more and more westernized every year.

A British authority[170] agreed:

> Diabetes is a disease of the prosperous ... like obesity and atherosclerosis ... likely to arise in predisposed persons who eat too much and exercise too little.

Fiber And Protein

For good health in general, and especially for diabetics, the carbohydrate in the diet should be largely of the unrefined, fiber-rich, complex (starchy) type as contained in whole grains and vegetables, rather than simple carbohydrates or refined complex carbohydrates as in white bread. Recent studies[171,172] have shown that fiber has the unique property of slowing up the absorption of carbohydrate, and thereby retarding the rise of blood sugar and insulin after a meal. This eases the strain on the beta cells of the pancreas, which then do not have to produce large and sudden increases of insulin during digestion.

As with a diet low in fat, a diet comparatively low in protein also protects cellular sensitivity to insulin. In rats, a low protein diet renders them much more sensitive to insulin and with lower levels of fasting blood sugar. The reverse is true on a high protein diet.[173] Similarly in man, a high protein diet overworks the pancreas to produce large amounts of insulin, equal to or

exceeding the stimulus from glucose, and hypoglycemia may result.[174] In undeveloped countries where diabetes is rare, the intake not only of fat but also of protein is much lower than in Western countries, and the intake of vegetable fiber is three or four times higher.

The nature, function, and even the definition of fiber in food is presently climbing out of a confused state in the field of nutrition and pathology. Fiber in food no longer means simply the string-like strands visible in meat or vegetable food, but also includes *invisible structural* materials in all cell walls. Fiber in plant food is not digestible by the endogenous secretions of the intestinal tract, but is broken down by enzymes secreted by certain bacterial inhabitants of the intestines which play an important role, among other functions, in the control of cholesterol metabolism.[175]

Until about ten years ago, visible vegetable fiber in human food was generally considered unnecessary and often undesirable roughage. Even though it alleviated constipation, it was considered often too coarse for the human intestinal tract. It was not appreciated that the fiber held water in its interstices forming a gel and was actually more protective and curative for the intestinal lining than fiber-poor food, except in cases where intestinal pathology due to lack of fiber has become so far advanced that resupping fiber in the food is not enough to effect a cure.[176]

Fiber was known to contain a good deal of desirable trace minerals, but the coarser whole-grain bread with all its original fiber still had an inferior status, as if it were something like coarse homespun which civilization had fortunately left behind in its continued refinement of the elegant human race. As mentioned earlier, the invention of the high speed roller mill in 1870 made possible the removal of most of the fiber from grains.

In the U.S. a century ago, five times more fiber was consumed, and today rural Africans, who have practically no coronary heart disease, diabetes, cancer of the colon or a variety of other gastrointestinal diseases common in the West[177], eat six times more fiber than Americans.[178] The usual Western intake of dietary fiber is about 15 gm/day, but this can be easily increased four- or fivefold with a variety of foods available on the market today.[179] There is now overwhelming evidence that ample vegetable fiber is indispensable to human health.

T. L. Cleave, of the British naval service, was primarily responsible in the last ten years for moving the medical profession (as distinct from the lay public which moved earlier) out of an unquestioning acceptance of refined foods. For this, just before his death in 1983, Cleave was awarded the Harben medal from the Royal Institute of Public Health[180] and the Gilbert Blane medal for naval medicine from the Royal Colleges. Having observed the diet and health of people in many parts of the world, Cleave[181] wrote a powerful and provocative paper in 1956, unfortunately published in an obscure naval medical journal, entitled "The Neglect of Natural Principles in Current Medical Practice". This was followed up with several recent books[182,183] which convincingly linked the overconsumption of refined food to coronary heart disease, diabetes, and other diseases.

In 1941, while senior medical officer on the battleship *King George V*, Cleave reported his use of unprocessed wheat bran to alleviate the widespread constipation aboard naval ships caused by white bread and the relative dearth

of vegetables and fruit, especially during wartime.[184] In his preoccupation with the serious shortcomings of refined food, however, Cleave saw little harm in the current high intake of animal fat in the Western world. His defense of this at least served the useful purpose of helping to hold back an uncritical substitution of polyunsaturated vegetable oils which at high intakes have hazards of their own, such as an increased incidence of gallbladder disease[185] and cancer.[186,187]

Cleave inspired other English doctors, especially Burkitt[188,189], and Trowell[190,191], to pursue further studies on the importance of unrefined food. Both Burkitt and Trowell had worked for many years with natives who were on primitive diets in Uganda and did not have coronary heart disease and Western gastrointestinal diseases. They were thus prepared to appreciate the full force of Cleave's epidemiological arguments. Burkitt carried the message in many lectures in the United States ten years ago. Nathan Pritikin was aware of their work, and both Burkitt and Trowell have been on the Board of Medical Advisers of the Pritikin Research Foundation since 1975. Burkitt, for whom Burkitt's lymphoma is named, was particularly interested in the protective effect against cancer of diets high in complex, fiber-rich carbohydrates and low in fat, while Trowell pursued evidence that lack of fiber was an important factor in the etiology of diabetes and coronary heart disease.

In addition to acting as a special food for bacteria which exert some control over cholesterol metabolism, fiber provides a sensation of satiety which tends to curb over-eating. The water-holding bulkiness of fiber produces a regular movement of more liquid contents through the intestine which prevents constipation. Relatively dry hard masses do not accumulate in the colon, especially in the normal diverticula. Carcinogenic substances are diluted and do not linger so long against a particular area of the delicate mucosa. Lack of dietary fiber is heavily involved in the causation of a wide variety of gastrointestinal conditions which include constipation, gallbladder disease, anal disorders, irritable bowel syndrome, appendicitis, diverticulitis of the colon[192], Crohn's disease[193], and cancer of the colon. All these conditions are rare or absent in the natives of Africa and other undeveloped countries on their low fat, high fiber natural diet.

The many roles of dietary fiber in relation to health are but one more example of the interlocking network of functions with which the human animal has adapted to the food in its environment over eons of time. We now see more clearly the risk of disturbing our ancient relationship with natural food produced by our passage through the evolutionary sieve.

Tolerance of High Dietary Fat

In view of the strong epidemiological association of diabetes with a high fat intake, it is astonishing that Western textbooks on diabetes have made so little mention of even the possibility that a high intake of fat might be a cause of diabetes. Bertrand Lowenstein's excellent book for his diabetic patients published in 1973 was a rare exception.[194] This lack of interest is probably due to the reluctance of Western civilization to face the idea that there could be anything wrong with its rich and tasty diet high in fat.[195]

The usual recommendation of diabetes specialists today regarding fat seldom goes further than the standard recommendation for heart patients, that is, to cut down from the usual American figure of 40% to 30-35% of calories

from fat, evenly divided between monounsaturated, polyunsaturated, and saturated fat, and even this recommendation is made with an eye only on the atherosclerosis to which diabetics are exceedingly prone. Some diabetic clinics allow an uncontrolled fat intake, so long as body weight is controlled.[196]

The 1978 edition of the Joslin Diabetic Manual[197] stated that a diabetic may have 40% of his calories from fat, although it adds that "in recent years, the tendency has been to prescribe diets that are more generous in carbohydrate (45 to 50% of calories) and lower in fat." But this increase in carbohydrate is still far below the Pritikin level of 80% and the level in countries where the incidence and severity of diabetes is low.

Note that all calories come from either fat, carbohydrate, or protein, and that simple arithmetic determines that when the total calories and protein are kept constant as is usually the case, calories from fat go down as those from carbohydrate go up, and vice versa.

The 1971 edition of Joslin's *Diabetes Mellitus*[198], a large textbook of over 880 pages, was quite extravagant in its praise of fat:

> **The Value of Fat to the Diabetic.** In the first 20 years of this century, fat provided far more than 40% of the diabetics patient's calories. It is surprising how readily individuals would eat two or three times this amount. Far more significant is the fact that our Quarter Century Victory Medal Diabetics, with their sound bodies and superb eyes and arteries, were exposed in the first few years following onset of their diabetes to diets proportionately much higher in fat than those of today[199].

It would be hard to find a more unscientific, rapturous, promotional statement than this. What are the pertinent numbers? What did the "Victory Medal Diabetics" really eat? This statement has apparently been deleted from the next and latest (1985) edition of the book, but the authors' tolerance of a high intake of fat has scarcely changed. Although the new text mentions the current recommendation of the American Diabetic Association[200] of 30% of total calories from fat, the text states that the Joslin Clinic uses "a little more fat ... 30 to 40% fat with adjustment for individual needs."[201] Note that up to 33% more fat is considered "a little more."

The 1971 Joslin text defended its enthusiasm for fat partly on the ground of a needed content of essential fatty acids:

> Fat, once valued chiefly for its high caloric value in the diabetic diet now has a more important place since it has been determined that the lack of certain essential fatty acids results in genuine nutritional deficiency, and therefore a small amount of fat is essential. Probably about 35-40% of the calories in the average American diet is provided by fats although this varies widely.

This linking of total fat with a sufficiency of essential fatty acids (EFA) is an inadequate view of the situation, because a large amount of indiscriminate dietary fat does not guarantee an adequate intake of EFA.

Furthermore, even after ingestion of EFA their utilization may be depressed when there is heavy competition from an excess of non-EFA fats (saturated, monounsaturated, and non-EFA polyunsaturated fat), all of which compete for the limited supply of fat-metabolizing enzymes in the body.[202,203,204,205]

In the ancient diet, the EFA suffer much less competitive inhibition from other fats, because the total fat is low and the polyunsaturated/saturated fatty acid ratio (P/S) is high, 1 or more, compared to the U.S. average of 0.4.[206] Hugh Sinclair, professor of nutrition at Oxford, believes that the ratio of EFA to non-EFA in the food is much more important than the actual dietary amount of EFA.[207] There is also competition *within* the EFA, between linoleic and linolenic acids, so there may be some advantage in consuming fats with a ratio of linoleic to linolenic near the normal ratio in human fat of 10:1. This ratio in food oils ranges from soy oil, 7:5; olive oil, 11:1; corn oil, 70:1; safflower oil, 159:1; and sunflower oil, 198:1.[208]

The EFA (including their derivatives which our bodies do make, by lengthening the carbon chain of the EFA) are very important constituents of practically every cell in the body, especially in the brain, nervous and vascular systems. They have a wide range of functions as companions of cholesterol in cell membranes. When not sufficiently available, the body substitutes inferior fatty acids in place of the EFA, with subtle and far-reaching deterioration in function. The EFA are also the starting point for synthesis of the newly discovered prostaglandins which exert profound control over many bodily functions, including the clotting of blood. Research has been active in Europe exploring the role of linolenic acid and its derivatives (known as the Omega-3 family from the position of the first double bond in the carbon chain) which appear to prevent blood clots in the coronary arteries (coronary thrombosis). For example, Sinclair[209] has long been interested in the Greenland Eskimos who have a prolonged clotting time and rarely have heart attacks on their native diet of seal and fish. Their diet has a high content of fat and cholesterol, but its EFA are dominated by the linolenic acid family. A similarly lengthened clotting time has been produced in controlled experiments on Europeans by feeding them a diet high in the linolenic acid group. Senator Weiker has been urging a reluctant NIH to conduct research on the health benefits of fish oils.[210]

Holman[211] thirty years ago pointed out that in diabetes the requirement for EFA is greatly increased, related to the rapid turnover of fat in that disease. Presumably, inadequate utilization of EFA from competitive inhibition on the customary Western diet high in fat also plays a role in both diabetes and cardiovascular disease.

The question has often come up as to which fatty acids are essential and how much of them we need. According to the majority of authorities worldwide, the EFA are linoleic acid and linolenic acid, although in the U.S. there has long been a tendency to consider linoleic acid as the only EFA. Perhaps this has been partly due to the problem linolenic acid has posed for the food industry, in that its greater unsaturation makes it deteriorate much more easily. The food industry often solves this problem by hydrogenation (frequently stated on food labels), that is, converting some of the EFA, especially the linolenic constituent, into a saturated fat.

Various studies in both animals and man have concluded that the requirement for EFA ranges from 0.5 to 5% of total calories, depending on

age.[212,213,214] Some authorities[215,216,217,218,219] estimate that the EFA requirement for adult man is about 100 mg/kg body weight/day. This amounts to about 2.5% of total calories On the ancient diet of 10% fat with less competition from other fats, it may well be that the EFA are better utilized and that a lesser intake of them will suffice.

The remarkable uncertainty about the EFA requirement is well shown by the recommendations for infants which vary from 0.5% of calories (Alfin-Slater and Aftergood[220]) in the U.S., to 5% of calories, *ten times as much* in Holland.[221] Crawford[222] in England believes that infants may benefit from as much as 4.5% of calories.

Svennerholm[223] in Sweden considered the levels in pooled breast milk in that country, amounting in percentages of total calories to 3.5% for linoleic, 1.2% for linolenic, and 0.5% for arachidonic, to be suboptimal for EFA; and yet infant mortality in Sweden is among the lowest in the world. Bernsohn[224] of the Neuropsychiatric Research Laboratories of the VA hospital in Hines, Illinois, called the low levels of linolenic acid in American breast milk "particularly striking."

Dramatic evidence of the essentiality of linolenic acid was obtained by Holman[225,226] in an unusual case of a 6-year old child which lost most of its intestine from a gun-shot wound and had to be fed exclusively by the intravenous route. In this child, the requirement for linolenic acid needed to reverse obvious signs and symptoms of neurological and other pathological malfunctions was 0.5% of calories, the same as that for the rapidly growing tissues of the female rat. Note this is only for linolenic acid. The requirement for the linoleic acid component of the EFA is five to ten times more.[227] Also, the requirement of either is more efficient by intravenous administration since that avoids what may be considerable destruction of the EFA in the intestinal tract.[228]

History of Low Fat in Diabetes

The phenomenon of resistance to insulin caused by a high fat diet in both diabetics and normal persons has been known for fifty years, long before insulin receptors were discovered. But so great has been the devotion to the modern luxurious high fat diet by both the public and diabetes experts alike that fat largely escaped present-day incrimination as a major cause of diabetes until Nathan Pritikin arrived on the scene. The astonishing history of this is worth considering since only by knowing where diabetes science has been can we fully sense where it may go.

The damage caused by excessive dietary fat was recognized in the 1920's and 1930's by Geyelin[229], Sansum[230], and Sweeney[231] in the U.S.; Adlersberg and Porges[232] in Germany; Kabinowitch[233,234,235,236,237,238,239,240] in Montreal; and Himsworth [241,242,243,244] in England. These pioneers are now nearly forgotten advocates of a high carbohydrate, low fat diet for diabetes. In 1935, the opening words of one of Himsworth's papers[245] were that "*It is now securely established that the glucose tolerance of a healthy individual is determined by the composition of the diet which he has been receiving.*" In the same year, Geyelin had concluded that the increased effectiveness of insulin on a high carbohydrate diet was "*chiefly dependent on the degree to which fat is curtailed.*" [Our emphases].

Rabinowitch

Beginning in 1930, the papers of Rabinowitch showed a remarkable grasp of an enlightened treatment of diabetes, as valuable now as when they were written almost fifty years ago, and quite prophetic of the trend today which Nathan Pritikin has pursued so effectively. Rabinowitch treated thousands of diabetics in his clinic at the Montreal General Hospital, and gradually shifted his dietary regimen from one high in fat in the years 1923 to 1926, intermediate in fat in 1927-1930, and finally to the diet which he found most successful: one high in carbohydrate and comparatively low in fat (20-24% of calories), and calories also reduced for the purpose, he said, of always keeping the patient in a lean condition. His original papers have to be read to appreciate the depth of his scholarship and skill.

To make sure his diabetic patients were not embarked on the vicious circle of receiving too much insulin, producing insensitivity to insulin, and in turn requiring more insulin, Rabinowitch began treatment of all but the most severe diabetics with what he called a "ladder" regimen. Foods and fluids of little caloric value were given for three days, followed by a gradual caloric increase on a low fat diet, with insulin only as needed. In this manner, the patient's *sensitivity to insulin was not damaged by excessive fat*, and in the ensuing months his carbohydrate tolerance on the low fat diet almost invariably improved.

Rabinowitch's program probably faded out because of a general lack of knowledge about the importance of crucial nutrients in *unrefined complex* carbohydrates little used in that day. Nevertheless, the success he had in the treatment of diabetes came from his appreciation of many fundamental hazards facing the diabetic which are the subject of active research today. For example, he recognized the danger of using insulin to overfeed the diabetic, the loss of sensitivity to insulin produced by excessive dietary fat, the improvement in protein metabolism when dietary fat is kept to a minimum, and the need for exercise to improve carbohydrate tolerance.

Himsworth

The work of Rabinowitch was experimentally confirmed and enlarged in controlled clinical experiments by Sir Harold Himsworth[246] at the University College Hospital in London beginning in 1934. He seems not to have been aware of Rabinowitch's work since he did not refer to it. Himsworth explored the relationship of fat and carbohydrate. He showed that feeding a high fat, low carbohydrate diet for a week to healthy young men produced a startling loss of tolerance to carbohydrates, shown by the glucose tolerance test.

Himsworth[247] proved in his controlled experiments that increasing the fat in the diet at the expense of carbohydrate decreased a patient's sensitivity to insulin, thus increasing the amount of the hormone that had to be injected. When he injected insulin into healthy young men on a high fat diet, their blood sugar did not drop as low as when they were on a high carbohydrate diet. In other words, on the high fat diet the body cells were more resistant (less sensitive) to the effect of insulin. From his experiments on men and animals, Himsworth concluded:

> Those diabetic conditions which bring about improvement of sugar tolerance are always associated with an increased susceptibility of the organism to insulin, whilst those which cause impairment of sugar tolerance are invariably accompanied by a decreased susceptibility.
>
> It is now securely established...that the sugar tolerance of healthy individuals was *impaired* by administering a low-carbohydrate high-fat diet, whilst it was *improved* when a high-carbohydrate low-fat diet was taken. [Emphases supplied].

In a careful statistical study of 143 diabetics and 258 controls, Himsworth found that the majority of diabetics prior to the onset of diabetes preferred diets containing an excessive proportion of fat compared to the controls.[248]

It has taken almost fifty years to get even a slight acceptance of Himsworth's view that the ability of the body to control the level of sugar in the blood constantly changes in response to the proportions of carbohydrate and fat in the diet. We now know the role of the dynamic receptor mechanism. But this is scarcely as important as altering our procedures in diabetes to conform with what we have already known for fifty years about the hazards of excess dietary fat.

Kempner

No account of the use of a low fat diet in the treatment of diabetes should overlook the famous rice diet introduced by Walter Kempner at Duke University in 1939. Kempner designed his diet for the treatment of advanced nephritis and hypertensive cardiovascular disease, but he also used it with great success in severe diabetes and stubborn obesity.

The diet contained 2-3% of calories from fat, 5% from protein, low salt (250-400 mg/sodium/day), no cholesterol, and 2,000 calories. 50% of its calories came from table sugar, and the other ingredients were only white rice, fruit, and fruit juices, supplemented with multivitamins and iron. This austere diet, with only a third the fat and one-half to one-third the protein compared to the varied and palatable Pritikin diet, was eaten with unprecedented benefit by Kempner's desperately ill patients for years at a time.

Kempner had his eye not on the very low fat content of his diet, but primarily on the low protein, in order to spare damaged kidneys, and on the discovery by Otto Warburg (whose assistant and associate Kempner had been) that kidney function could be reversibly or irreversibly altered by changes in the oxygen concentration of the blood. Kempner's working hypothesis[248] was that a failing kidney was like an oxygen-starved kidney, unable adequately to excrete the breakdown products of animal protein. He reasoned as follows:

> ...the ordinary mixed diet may contain constituents which increase the production of these "abnormal", harmful substances by the diseased kidney cells.
>
> Starting from this *working hypothesis*, we have tried to compensate metabolic dysfunction by replacing the

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> ordinary mixed diet with a diet limited to rice, sugar, fruit, and fruit juices, supplemented by vitamins and iron. [Italics in original].

Thus, Kempner theorized that the end-products of vegetable protein would be much easier than those of animal protein for the injured kidneys to excrete. He may have chosen rice because of its bland nature, rice-broth being an old demulcent remedy for diarrhea. He used white rice, but held that any kind would do, perhaps because vitamin supplements could replace many of the nutrients present in unrefined rice. Salt was reduced to a minimum. Allen[250] more than a decade earlier was the first to describe the beneficial effect of a low sodium diet for hypertension, but as Skylar points out Allen's observations were not generally accepted until Kempner's work appeared.

Beginning in 1939, Kempner's diet produced spectacular results which astonished physicians all over the world.[251] Unusual improvement and sometimes cure took place in patients critically ill with malignant hypertension, far advanced kidney disease, serious heart disease, diabetes and diabetic retinopathy, and extreme obesity.[252] Many months or several years of the diet were often required for these results, but never before had any treatment been effective in malignant hypertension: "Patients who at that time would have died in all other hospitals had a reasonable chance of survival if they came under Kempner's care."[253] Today, knowing the *interlocking nature* of these diseases, we can understand the scope of therapeutic benefit produced by the rice diet, very low in fat, cholesterol, and protein.

Blood sugar and insulin requirements in diabetes fell, arterial pulses returned in peripheral vascular disease, blood cholesterol and triglycerides fell precipitantly, cholesterol-containing xanthomas of the skin disappeared[254], and incorrigible obesity was corrected. Kempner was also one of the first to urge exercise in the treatment of cardiovascular disease.

Kempner methodically followed up the unexpected effects of the diet on various systems of the body. In many of his patients, there was a reversal to normality of essential hypertension, cardiomegaly, electrocardiographic abnormalities, hemorrhagic exudative retinopathy, and failing kidney function.[255,256]

Kempner's results in diabetic retinopathy (documented with many impressive retinal photographs) were extraordinary. In a series of 44 patients with "specific" retinopathy (aneurysms; punctate, preretinal vitreous hemorrhages; waxy exudates; retinitis proliferans), there was progression of lesions in 9 cases; improvement in one eye but progression in the other in 7; no change in 15; improvement in 13. In 19 cases in which the patients had hypertensive, arteriosclerotic or renal retinopathy (papilledema, hemorrhages, exudates, venous thrombosis), the lesions progressed in 3, did not change in 5, but improved in 11 cases.

Kempner minced no words about the difficulty of his rice diet, as may be read in his second paper on the subject. It was, he said, monotonous, does not taste good, and can never become popular. It must be eaten *quite a while* before its full effect becomes apparent. It becomes *worthless* if modified to please the patient's taste before such time as substantial improvement has

occurred, and *strict adherence* must be re-instituted if laboratory evidence of disease recurs. "There is," he said, "only one excuse for such therapy: it helps."

Kempner found that depending on the patient's progress, the rice diet could be eventually and *cautiously* modified to include vegetables, small amounts of lean beef, chicken, liver, or a few eggs.

Note the discipline required for the remarkable success of this regimen. It is as if the deranged metabolism of serious illness could not get out of its rut and back on the road of health unless it were shaken up by a major and sustained change of the internal environment, the reflection of a major and sustained change of diet. This kind of discipline can often be obtained only in a controlled environment, as in the Pritikin Longevity Centers and their 26-day sessions. That length of time has been found practical and effective not only for substantial metabolic rearrangement, but also for educational and psychological preparation to continue an improved lifestyle of diet and exercise.

Kempner's results were soon widely confirmed.[257] Why, then, did not his rice diet of fifty years ago, low in fat, cholesterol, protein, salt, and calories immediately become a great starting point for determined restriction of these dietary constituents in the treatment of both cardiovascular disease and diabetes?

There were several reasons. Medical astonishment was closely matched by medical disbelief and pessimism. Hadn't this work come out of Duke University, notorious for its fascination with extra-sensory perception? How could there be a future for such a strange diet? The use of vitamin and mineral supplements suggested that it was an inadequate diet on which to live for the rest of one's life. And would not most patients rather have almost any disease and risk death than follow such a diet? It seemed unreasonable to both doctors and laymen to deny patients a wide range of apparently wholesome American foods, especially at a time when much more information was coming in about the benefits of vitamins and trace minerals. Kempner's rice diet became a regimen that a rare diabetes specialist might use only as "a measure of desperation" (see section on Kelly West below).

The final blow to interest in Kempner's diet was the almost simultaneous discovery of the marvels of sulfonamides and penicillin, which saved many otherwise hopeless cases of infectious diseases. These successes inspired chemists in the drug industry to synthesize an avalanche of new drugs. In the forefront were powerful new antihypertensive drugs, which lowered blood pressure quickly and were far easier to administer than a rice diet.

The pendulum was swinging irresistibly away from common sense to high technology, pampering the hope which springs eternal in the medicating breast that by administering some added chemical, we can enjoy a luxurious diet. But this means that drug toxemia is added to fat toxemia, and decades may pass before we discover prohibitive side effects of a drug. The temptation is strong, even in chronic conditions where there is time for deliberation, to use drugs recklessly without first making an intelligent effort to correct a faulty lifestyle.

Frylag Paa or Fire

Fifty years ago, if trying to eat more carbohydrate and less fat as recommended by Rabinowitch and Himsworth, and essentially limited at that time to refined grain products as the major source of carbohydrate energy, *a diabetic simply could not be adequately nourished for an extended period of time.* Decreasing fat while increasing *refined* carbohydrates was jumping out of the frying pan of excess fat into the slow and subtle fire of not enough vitamins, trace minerals, fiber, and essential fatty acids. The diabetic patient and his mentors were unknowingly trapped between the devil of harmful fat and a sea of emasculated carbohydrates.

We can see now that this dilemma arose simply from a thoughtless and reckless tampering with food in its natural state. Contemplating this disaster, Cleave[258] liked to quote Horace: "You may drive out Nature with a pitchfork, but she will ever hurry back to triumph in stealth over your foolish contempt."

Diabetes specialists ever since have been in the same predicament as heart specialists, trying to treat the diseases of their specialty without making a significant change in the over-rich diet of the Western world. As mentioned earlier, their therapeutic house has been built not on the rock of the ancient natural diet of civilized man, but on the sand of artificially refined carbohydrates and on excessive intake of fat.

Low Fat Diets: Forty Quiescent Years

For almost forty years after the work of the early pioneers, only sporadic attempts were made to use a low fat diet in diabetes. During this time, the most significant work was reported in 1955, by Singh[259] from India. Singh had a great advantage, awareness of which is not indicated in his report: he worked in a part of the world where low fat diets, often associated with vegetarianism and therefore high in fiber, are much more common than in the West. Singh referred to Rabinowitch and Himsworth, and put 80 insulin-dependent diabetics on a diet of 11-12% fat, 27-30% protein, and the balance carbohydrate (character not described), and confirmed what constitutes the revolution in the treatment of diabetes today. After as much as 18 weeks on this diet, all but 12 patients could be taken off insulin entirely, and for the remainder the dose was substantially reduced. Glucose tolerance and fat tolerance improved, but *"unless the low-fat diet is kept up for a long time, the diabetic tendency reappears but it can be recontrolled* *** With improvement in symptoms, the glycosuric condition, and general health in a short space of 3-6 weeks, *most patients did not mind the comparatively slight inconvenience of adjusting themselves to the low-fat diet and were fully cooperative."* [Emphases added].

The importance of Singh's experiments and conclusions can hardly be over-emphasized. He recognized the labile nature of diabetes and its relation to excess dietary fat. He emphasized the persistence with which the diet had to be followed in order to achieve his remarkable results. He pointed out the ease with which his Indian patients adhered to a regimen of only 11-12% fat.

Most Western authorities still cannot accept the idea that such a low intake of fat is reasonable and practical. For their patients, and no doubt for themselves and kindred as well, they have long built their therapy around the

Western rich and luxurious diet of 40% calories from fat. Singh's success with his patients, who stayed with equanimity on a diet as low in fat as the Pritikin diet, also throws doubt on the criticism of NIH authorities that Americans would not give up their present rich diet long enough to get any benefit from a diet of 10% fat.

This criticism was first made by Robert I. Levy, Director of the National Heart, Lung, Blood Institute, after sending a team of experts to observe the Pritikin Center in 1976.[360] Studies, however, have since shown[361,362,363] that compliance with the program after a person leaves a Pritikin Center is 50% or better. This is surprisingly good considering the difficulties of pursuing a 10% fat-calorie diet in a cultural milieu where health authorities do so little to make it known, much less encourage it. As mentioned earlier, government health authorities have never told the public about the option of a 10% fat diet.

Most people, after a thorough trial, find the very low fat, low cholesterol diet palatable, and with food of high quality often come to prefer it. Time is needed for the taste buds to recover from the previous habitual onslaught of excess fat, sugar, and salt - rather like ears recovering from the high decibels of hard rock music and again able to appreciate more moderate sounds.

A few years after Singh's work, Van Eck[364] and Ernest[365] tried restricting fat in the diet of diabetics to about 10% of calories for periods up to 2 1/2 years. However, information about the nature and fiber-content of the carbohydrate which they used was scanty or not recorded. In general, the diabetics did surprisingly well in their experiments. There was improvement in retinopathy and a lowering of blood cholesterol took place, with no increase in the requirement of insulin.

One of the few papers suggesting a dietary etiology of diabetes appeared in 1972, entitled "Can Diet Be Responsible for the Initial Lesion in Diabetes?" Significantly, it came from the heart of Africa where low dietary fat and high complex carbohydrate are the rule. The authors were Wapnick et al[366] at the Godfrey Huggins School of Medicine in Salisbury, Rhodesia. They tested three groups of men: African cleaners, African students, and Europeans. The range of diets covered native, intermediate, and Western types. They found, as one would expect, that fasting blood sugars and glucose tolerance tests (GTT) verged toward the diabetic type the more one moved from the native diet high in complex carbohydrates and low in fat to the reverse of this diet as used by the partially Westernized students and Europeans.

Wapnick found that blood insulin values during the GTT were the lowest in the cleaners, higher in the African students, and still higher in the Europeans. One may conclude that the natives, who have a low prevalence of diabetes on their customary diet, keep their blood sugars low and under excellent control, and do not need to secrete much insulin for the hormone to perform its functions in tissue cells which retain their normally high sensitivity to insulin.

"An Analysis Of Failure"

In 1973, a remarkable paper appeared entitled "Diet Therapy of Diabetes: An Analysis of Failure," by the late Kelly West[367], professor of medicine

at the University of Oklahoma. West eloquently described the faltering attempts of diabetes specialists to absorb the lessons of the past with respect to the advantages of high carbohydrate, low fat diets. But as usual in the specialty of diabetes, his primery emphasis was on carbohydrate, and in the excerpts below we have put the concomitant change of fat in brackets as a cross reference, and also italicized two key phrases:

Misunderstandings and Uncertainties
About the Effects of Carbohydrates

> In 1949, as a measure of *desperation*, I prescribed a rice diet for a severe diabetic with malignant hypertension. Although dietary carbohydrate was increased approximately three fold [thus decreasing fat threefold], there was no increase in insulin requirement. Like many other physicians who had this experience, I was reluctant either to accept fully the implications or to follow up the findings adequately ... In the process of preparing a publication of this "discovery," I was surprised to find that very similar experiments had been done before 1935 by Himsworth, with the same results. *Over and over again, this phenomenon had been rediscovered and subsequently forgotten or disregarded.* [Emphasis added].
>
> I hope that the evidence cited above and the authoritative endorsement of diets containing more liberal amounts of carbohydrate [less fat] will lead physicians to reconsider their dietary strategies. But history has shown that it is extremely difficult for physicians, dieticians, and patients to give up the notion that carbohydrates are bad for people with too much sugar in their blood. To most it just does not seem logical that carbohydrate would be so well tolerated.

West pointed out the difference in the diet of the undeveloped countries associated with less damage to the blood vessels:

> The large [blood] vessels of the diabetics who have lived in disadvantaged countries, and who have received little or no medical attention, usually look much better than those of our patients who have had the "advantage" of consuming the traditional diabetic diets of North America and Europe.

Regarding the connection between obesity and diabetes, West stated that in affluent societies most diabetics are fat people, that weight reduction has a "profoundly advantageous effect" increasing the desirable sensitivity to insulin, and "thus, in some ways, the problem of achieving weight reduction is the most important challenge in the therapy of diabetes." But West failed to mention that in populations around the world it is those who have a low intake of dietary fat and a high intake of unrefined carbohydrates who have the least problem with obesity.

West pondered the disinterest of diabetic specialists in dietary therapy:

> I suspect that a major reason for the de-emphasis of diet therapy is the *insecurity of physicians with a method of therapy concerning which they know little*". [Emphasis added].

West went so far as to characterize this reluctant de-emphasis of diet as "prejudice" on the part of Western diabetic experts. The tide, however, was beginning to turn, quite possibly in no small degree due to West's forthright criticisms.

In 1974, Gulati, Rao and Vaishnava[268] in New Delhi, referred to Singh's work of twenty years earlier, and announced they were forsaking their usual 30% fat diet for diabetics, because they got better results with a 15% fat diet. They also mentioned that there was clear evidence that Asiatics on their traditional carbohydrate-rich diets "have a significantly lower incidence of vascular lesions[269], compared with American and European patients on traditional diets." Note again the preference for designating the diet in terms of carbohydrate rather than fat, a diversionary practice which started almost with the discovery of sugar in the urine and which strongly persists to this day.

Baird and Strong[270] in 1975, emphasized the importance of restricting fat in the diet for diabetics, but they allowed a very wide range of fat. They stated that the diet should be restricted in energy, relatively low in fat, relatively high in protein and starch, and sucrose should be omitted. This recommendation of less than 40% fat-calories or 50-150 grams of fat per day was too loose to be effective. The average U.S. consumption today is about 160 grams[271]. With 9 calories per gram of fat, 150 grams of fat amount to 45% fat-calories on a 3,000 calorie diet, and 54% on a 2,500 calorie diet.

In the same year, Douglas[272] reported that increasing the raw, unprocessed foods in the diets of 2 diabetics greatly decreased their insulin requirements. Jacobson and Hastings[273] a year later, using a high fiber and predominantly raw food diet (which tends to be very low in fat), reported performing the very unusual feat of taking a brittle ("juvenile" type) diabetic first off 80 units of insulin and then off oral diabetic drugs. They had similar results with 2 other diabetics. One of these patients claimed he found "nuts, oils, seeds, soy beans, peanuts and whole milk toxic to his system." All these foods, of course, are high in fat.

In 1977, Farinaro, Stamler, and colleagues[274] quoted with approval part of West's "over and over again" paragraph cited above, and described their experiments on 150 grossly obese coronary-prone men, in which a decrease of total dietary fat, from 40.5% to about 32%, improved glucose tolerance.

The authors referred to much other research showing the favorable effect of high carbohydrate low fat diets on glucose tolerance:

> These data are supplementary to, and fully in accord with, observations that have been *accumulated worldwide for more than half a century*. [Emphasis added].

They cited Himsworth's experiments, but did not mention his last paper[376] which described the simultaneous sharp drop in the British intake of fat and in diabetic mortality during World War II, and Himsworth's suggestion that this evidence was consistent with the theory that the ingestion of fat caused diabetes.

Farinaro et al pointed out that decreasing saturated fat and cholesterol "almost inevitably leads to a decreased proportion of total fat in the diet", and that scientific organizations concerned with both diabetes and cardiovascular disease are moving toward a diet which is:

> ... moderate in total fat ... effective both for long-term reduction of elevated serum cholesterol, triglycerides and weight and for maintenance and enhancement of prognostically favorable plasma glucose levels ... These developments - aspects of the continuing efforts to bring the coronary epidemic under control - may already be playing a role in the welcome downswing in U.S. mortality rates from coronary heart disease and all causes in recent years.

Here again, we have the gingerly approach to the awful thought, which very few medical scientists since Himsworth seem to have expressed frankly, that high dietary fat common in the U.S. and other Western countries may be an important *cause* of diabetes.

By 1980, perhaps typical of the position in which diabetic specialists found themselves is a quotation from Ronald M. Arky[378], professor of medicine at Harvard Medical School and a past-president of the American Diabetes Association. He referred to the "the lack of substantial progress in the treatment of this disorder for over 50 years ... the marked increase in the prevalence of the disorder in the years 1965-1973", but goes on to say that "In fact, the perpetual controversy about the relative quantities of carbohydrate and fat is superfluous." Yet, in his conclusion, he emphasized that the plasma cholesterol of diabetics should be controlled (no levels given), and that the easiest way to do this is an "emphasis on foods with lower fat content".

So far as a high fat diet is concerned, Arky deprecated this only because it represented "concentrated calories", and he allowed fat to the extent of 35% of calories. More recently, he was quoted[377] as recommending slightly less fat (30-35%), but reiterating that the most important determinant for all types of diabetes is the number of calories consumed, not the amount of protein, fat, or carbohydrate; that diabetics should consume the same foods eaten by other family members; and that only simple carbohydrates need to be limited.

With regard to increasing carbohydrate and decreasing fat, no diet can permanently succeed if it neglects a single link in the chain of indispensable nutrients, which includes vitamins, trace minerals, essential fatty acids, and dietary fiber. Sooner or later the body will subtly rebel, and signal its rejection of *overconsumption*, and/or *unnatural* foods, and/or *improper proportions* of the constituents of foods by the development of ostensibly mysterious diseases.

Subtle diseases are understandably very difficult to recognize when the causal circumstances have become a way of life. In the U.S. and other West-

ern countries, not only are refined foods almost universally consumed by the public, but they also constitute the stock-in-trade of diets used in almost all medical research. Furthermore, the most elaborate and best financed medical research is conducted or controlled by the federal government, which finds it difficult to criticize and regulate the largest industry in the country --- the production and distribution of food. This industry, for various reasons, has a heavy financial stake in refined foods. They have a longer shelf life. They are less susceptible to chemical spoilage (for example, a lower content of the very labile polyunsaturated essential fats), and to consumption by insects which, like humans, have difficulty living on them. As a result of the selective breeding of plants, various agricultural techniques, processing, storage, and other practices aimed primarily at economic efficiency, the flavor of many modern foods is intrinsically insipid or otherwise unattractive. To counteract this as well as make the food more attractive, the industry has drifted into adding salt, sugar, fat, and artificial flavors, which tend to cover up any basic inferiority. The public as a whole is but little aware of these practices and their serious effect on health. The swing to natural, wholesome, unadulterated food has only just started.

Pritikin And Anderson

Over the years small numbers of diabetic patients have greatly benefited from a diet in which fat was low, even 3% of calories as in the Kempner diet. But no large scale trial involving a diet containing as little as 10% of calories in fat got under way until 1976, when Nathan Pritikin started his Centers. By using an *unrefined* very low fat diet, he remedied the insurmountable defect in the diets of Rabinowitch, Himsworth, and Kempner of almost half a century ago, and fully confirmed and enlarged what was found by those pioneers and their contemporaries.

Before Pritikin established his Centers, his initial success with a few diabetics was so unusual that in an effort to persuade diabetes establishments to try his diet, he contacted various universities and clinics. Stanford University was interested, but informed him he would have to pay the cost, which would be $30,000. Pritikin asked for 60-90 days to raise the money, but after he had done so was informed that in the interim other research projects had intervened and that his project had too low a priority to be undertaken. Subsequently, Pritikin offered the money to the University of Washington and to the Sansum Clinic in Santa Barbara but to no avail. Pritikin gave copies of his monograph, "Diabetes: Prevention and Cure", to the chief investigator at these institutions in the hope of arousing interest. The monograph included a review of the work of Rabinowitch and Himsworth and had been submitted without success in 1973 to a publisher of medical books.

In March of 1974, Pritikin presented his concepts at a joint meeting of the International Academy of Metabology and the American Academy of Medical Preventics in Miami. This, together with an announcement in the Journal of the AMA[278], aroused enough interest so that he had soon enlisted some thirty physicians around the country to try his program on their patients.

In April, Pritikin read a report of a talk given by James W. Anderson, chief of the endocrine-metabolic section of the VA Medical Center and professor of medicine and clinical nutrition at the University of Kentucky Medical College, at a symposium on carbohydrates in Atlantic City. Since 1967, Anderson had been working on the reaction of normal people and dia-

betic patients to increased carbohydrate in the diet, using the usual American diet of refined foods, to which he added table sugar or glucose to increase the total of carbohydrate. Essentially, he repeated the experiments of Himsworth, but used higher doses of simple carbohydrates over longer periods of time and measured blood insulin by radioimmunoassay which was not possible in Himsworth's time.

In 1973, Anderson[279] had reported, just as Himsworth had shown almost forty years earlier, that a diet high in refined sugar or glucose either did not impair or else actually improved the glucose tolerance test (GTT) in a group of 13 normal young men, and that this effect extended to extremely high intakes of these simple carbohydrates. His control diet was a typical American diet of carbohydrate at 40% of calories, fat 43%, and protein 17%.

With regard to incriminating dietary fat, Anderson at this time went so far as to remark that "The observed deterioration [of the GTT] seems to be related to the high fat content of the diet," but his main conclusion was the same as Himsworth's, simply that a high sucrose diet leads to improvement of the glucose tolerance in normal subjects.

Pritikin suggested to Anderson that they collaborate on the use of the Pritikin diet in a controlled study on Anderson's diabetic patients. This was done at the VA hospital in Lexington, Kentucky. Pritikin drew up a protocol for the study and arranged for its funding. The protocol specified that calories would be allocated to protein 12%, fat 10%, and complex carbohydrate 78%, later modified to protein 16%, fat 9%, and complex carbohydrates 75%. In 1976, Anderson[280] published a report of the 13 diabetics in this study. Since then, in many other studies Anderson[281,282,283,284,285] has been using this diet, which he has named the HFC (high-carbohydrate, high-fiber) diet, and he has settled on a composition of protein 19%, fat 11%, and carbohydrate 70%.

After an initial period on 11% fat-calories, Anderson's policy is to relax the fat restriction to as much as 25% calories from fat in diabetics who can tolerate it, but he finds that even as little as 20% may not be low enough initially to produce "an optimal response", for example, a 50% drop in insulin requirements. With regard to the more severe problem of lean diabetics, workers both at the Pritikin Center[286,287] and Anderson[288] have published studies demonstrating that on an approximately 10% fat diet, 75% of lean diabetics can be taken off insulin in 4 weeks, without any change in weight. Over periods of 18-20 months, Anderon has not had to restart insulin, even on lean diabetics.

Pritikin used a diet of less than 10% fat in 60 patients, consisting of all the Type II diabetics, including 18 lean diabetics, who had attended his Longevity Center over a five-month period, whereas Anderson used an 11% diet in 15 selected lean diabetics. It remains to be determined whether Anderson's relaxation of the fat restriction from 11% to as much as 25% is as safe from the standpoint of the vascular complications of diabetes as Pritikin's restriction of fat to 10% or less of calories

As mentioned earlier, the insulin resistance of obese diabetics is usually attributed to the obesity, because it regularly improves when they lose weight[289,290]. But the majority of lean diabetics also have insulin resistance which also improves on a fat diet of approximately 10% of calories. This

suggests that insulin resistance in both obese and lean diabetics is really due to the ingestion of too much fat, just as it was originally proposed by pioneers in the field fifty years ago.

Since the publication of Anderson's data, the American Diabetes Association (ADA) for the first time in fifty years has now changed its dietary guidelines[291]. During most of that time, the ADA had restricted carbohydrates and allowed fat ad lib. The new ADA guidelines recommend up to 60% complex carbohydrate and as little as 20% fat. As usual, actual figures for the touchy subject of fat are not given, so one has to make a simple calculation to arrive at the actual percentage of calories for fat. For example, the ADA guidelines state that 12-20% of calories in the diet should come from protein, with 50-60% from carbohydrate, and "fat should make up the difference." Taking the highest figures for protein and carbohydrate, 20% and 60% respectively, simple calculation shows that one would be left with 20% fat. But a figure that low seems to be incomprehensible or incredible to specialists in the field. Friedman[292] in Goodhart & Shils' textbook of nutrition, has interpreted the ADA recommendation as suggesting 30-38% fat-calories, and the anonymous authorities upon whom Newsweek recently relied came up with a figure for its readers from the ADA of 30-35%[293]. According to the ADA guidelines, simple sugar should still be avoided, and the "starches should be 'complex' carbohydrates such as rice and cereals." Perhaps advice to avoid table sugar and use cereals was about the heaviest shock which the diabetes establishment could bear.

Anderson served on the ADA Committee which laid down these new guidelines, but was apparently unable to persuade the Committee to say anything about what might be accomplished by a diet as low in fat as 11% of calories, which is the level he uses to get 75% of lean diabetics off insulin[294]. Even though the ADA for fifty years had advocated a high intake of fat of 40% calories or more, along with a severe restriction of carbohydrates, it still refused to accept or acknowledge the responsibility for this error. For example, speaking through a reviewer in an issue of *Diabetes Care*:

> A high carbohydrate diet of high fiber content has been recommended by many investigators for meal-planning programs in the treatment of diabetes. It must be emphasized that *this concept is not revolutionary*. It was enunciated many decades ago by Himsworth (Clin. Sci 1:3, 1933 and others). [Their reference, our emphasis].

Thus, the ADA disparaged the low fat diet on the astonishing grounds that it had been known since 1933! As if to avoid facing or accepting this dietary revolution, the ADA took the position that the revolution, then or now, is trivial. What the ADA did not say is that for all this time it had ignored Himsworth and his contemporaries and that the ADA had been the strongest force *against* the adoption of a diet any lower in fat than the usual Western diet of 40% of calories.

Mann[295] of John Radcliffe Hospital in Oxford recently stated that "it is no longer justifiable to prescribe a low-carbohydrate diet for maturity-onset diabetes". H. C. R. Simpson and others[296] at the Diabetes Research Laboratories of Oxford, have concluded that a high carbohydrate leguminous fiber diet improves *all* aspects of diabetic control, and that restriction of carbohydrate is unnecessary and may well be preventing both insulin-

dependent and non-insulin-dependent patients from achieving better control of their diabetes.

In the Simpson studies, there were five times as much fiber in their experimental diet, achieved by the use of wholemeal bread and beans, compared to the control diet (97 gm vs. 17 gm). Their experimental diet was 18% fat, with a P/S ratio of 1.1, while the "traditional diabetic diet" they used as the control was 40% fat with a P/S ratio of 0.3. The total blood cholesterol on the experimental diet was significantly lower in both kinds of diabetes.

Simpson and Mann had joined the ranks of the few recent authorities making reference to Himsworth's work of fifty years ago, but there was still strong skepticism about how much could be accomplished for diabetes by a diet high in complex carbohydrates and low in fat. In 1980, they stated that "We know of no published data suggesting that truly insulin dependent patients can have their insulin withdrawn as a result of *any* dietary modiication." [Italics theirs]. This statement was made before Anderson's report[297] on the use of the 11% fat, complex carbohydrate diet for the withdrawal of insulin in lean diabetics.

Much hangs on their definitions of "truly" and of "dietary modification". On the one hand, the damage to the islets of the pancreas may, indeed, be too great ever to permit the withdrawal of insulin therapy. On the other hand, what might be the reparative effect of therapy continued for years, if need be, as Kempner did, using a diet really low in fat? As to modifications of diet, how wedded are modern medical investigators to the processed foods of today? Finally, how many treatment regimens lasting for years will be carried out with Kempner's or Pritikin's dedication?

The wave of the future for the low fat, high fiber diet in diabetes was recently indicated by DeLawter[298] when he referred to Anderson's HFC (high fiber, high carbohydrate) diet for diabetes as "the ultimate in dietary management." He further stated:

> Certainly the carbohydrate restricted diets we so often hear mentioned for the diabetic patient further upset the metabolic state and tend to increase body lipids. Except in the mildest type II diabetic patients, the "free diet" approach must be condemned. A new era of the proper meal plan in the management of the diabetic patient is gradually becoming appreciated.

In summary, what Pritikin, Anderson, and others have done in the last ten years was simply to put diabetic patients on the ancient, natural, low fat and high complex carbohydrate diet of the technologically undeveloped populations, where diabetes has long been known to be absent, rare, or of mild degree.

Recent experimental work on a breed of Chinese hamsters which invariably develop diabetes, has added dramatic evidence in support of the view that a high intake of dietary fat is a prime cause of diabetes. Mark Connell and George Gerritsen[299] in the Upjohn Laboratories, said to have the only colony of Chinese hamsters in the world which predictably produce diabetic offspring, have found that maintaining these animals on a low fat diet of 9% calories will postpone the onset of diabetes indefinitely. Even

feeding a low fat diet for a short time permanently lessened the severity of the diabetes and delayed its onset.

Most startling of all, feeding the dams a diet either high in fat (25% of calories) or low in fat (9%) determined the severity of the diabetes in the *offspring*. With dams on the low-fat diet from conception onward, and with their pups continuing on this diet throughout their lives, the pups remained clinically normal and did not develop diabetes although they did show abnormalities in glucose tolerance.

The significance of these findings for human diabetes can hardly be over-estimated. They indicate that in diabetes, just as in heart disease, cancer, and a great many other diseases, a weakness or predisposition with respect to a disease may be inherited, but environmental factors (in this case a high fat diet) may be of overriding importance. A high fat diet probably constitutes an abnormal burden on the bodies of most people. It might be compared to the burden of driving a car 100 miles an hour. At this speed, any hereditary unfitness for this burden would be likely to come to the fore and precipitate an accident.

In genetics, as in most things, there is usually a trade-off which enables Nature to keep an eye out for the future needs of humanity, or to warn us of undesirable cultural trends. The disadvantage of a predisposition toward diabetes is likely to be offset by some other desirable quality, just as lack of a particular skill may be compensated by increased sensitivity or judgment in some other department. Another basic principle was well expressed by Brock[800]: "We are what we are born, but we also are what our environment allows our genotype to become." Or as Ancel Keys[801] put it, "though heredity may be a factor, it is not dominant enough to make most people prisoners of their genes."

It seems clear that in the field of diabetes, as well as in atherosclerosis and cancer, there has been too much grasping at hereditary straws out of a blind and obstinate refusal to see anything wrong with the luxurious Western diet. The crucial question is this: if most of our population were to eat a low fat, low cholesterol, high fiber, natural diet, would diabetes and atherosclerosis amount to little more than a medical curiosity?

Orthodox Research on Diabetes

What areas of research on diabetes are considered the most promising by experts in the field today? A great deal of attention is being given to the home monitoring of blood glucose levels. Using new and simple techniques, a finger is pricked four or more times a day and a drop of blood is tested by the patient. This can achieve a tighter control of the level of blood sugar and theoretically reduce the precocious damage in the vascular system of the eyes, heart, brain, kidney, and extremities to which diabetics are very susceptible. But results are still equivocal.

A few years ago, portable pumps were developed which are worn by diabetic patients to provide a continuous subcutaneous infusion of insulin, imitating more closely the natural and constant secretion of insulin by the pancreas. Richard Mahler[802], at the Eisenhower Medical Center in Palm Springs, has called this "the biggest breakthrough in diabetes control since

1922" when insulin was discovered. But the pumps have generally not aroused such enthusiasm. According to Philip Felig, professor of medicine at Yale, such intensive therapy does not halt vascular damage once it has already started.[303]

Considerable publicity has also been given to biosynthetic human insulin, produced by inserting human insulin into the hereditary structure of bacteria. However, an initial clinical trial has indicated that this new insulin is not superior and may be inferior to either bovine or porcine insulin, as well as likely to remain higher in price.[304]

Efforts have been made to transplant part or all of a healthy pancreas into diabetic patients. In the last fifteen years, 17o diabetics have received such transplants. As of 1982, 19 of these, all done since 1977, were functioning, but those were transplants of only segments of the pancreas.[305]

Currently much in favor for research is the theory that diabetes may be an autoimmune disease, in which the body's own cells are rejected and damaged by one's own system of immunity designed to protect against foreign substances. William C. Blackard[306], chairman of the committee on professional education of the American Diabetes Association, recently stated that "The study of the human immune system is probably the most exciting area of research today offering hope for diabetics in the future." According to George F. Cahill, Jr.[307], "There's no question that immunological intervention will work in this disease, but it's going to take some time before we know exactly which type will work best." Meanwhile, we would ask, why not vigorously investigate the 10% fat diet?

Great hopes have been aroused that drugs might be developed to protect the beta cells from these antibodies, like drugs that were developed to prevent a patient's immune system from rejecting organs transplanted from other persons. Authorities, however concede that presently available methods to alter the autoimmune response in diabetics are crude and more dangerous than the diabetes itself.[308] The most prominent drugs used to suppress the immune system, when organs are transplanted from one individual to another, are the adrenal cortical steroids, which are known to exacerbate diabetes.[309]

Furthermore, it isn't clear to what extent the autoimmune reaction in diabetes is merely an accompanying or secondary effect of a more basic cause[310] such as chemical poisons, viruses, excessive fatigue, and psychological stress, any of which can trigger diabetes.

All the foregoing avenues of research on diabetes are either modest refinements of current techniques or adventures into rather abstruse areas. Such research is greatly encouraged by the new tools of modern biochemistry but is very likely to overlook simple and more important causes hiding behind long habit.

In Conan Doyle's famous story, The Purloined Letter, a team of private detectives repeatedly searched a house in vain for a compromising love letter, after which Sherlock Holmes pointed out the letter to Dr. Watson, casually folded in plain view on the mantelpiece. Likewise, in diabetes could there be an important cause which is so commonplace that it has been overlooked? A wealth of evidence, going back fifty years, is telling us that at the root of the diabetic mystery is the need for much less fat, and much more fiber, as found

in the ancient human diet dominated by unrefined, complex carbohydrates. How much longer, to use the words of Kelly West, must this be "rediscovered and subsequently forgotten or disregarded"?

The Gamble

Given our modern lifestyle and the type of food in the marketplace, what level of dietary fat produces the greatest longevity and freedom from disease? Will the goal of maximum health and longevity be achieved with the 30% fat diet which the Heart Institute's Consensus Panel recommended in December 1984, the 20% now used by Japan, or the 10% of ancient man? What about the 15-30% fat diet, rich in monounsaturated fat from the olive, in Crete, Greece, Yugoslavia, Spain, and southern Italy, where coronary heart attacks are much less frequent than in the U.S.? The government research establishment has not yet shown nearly enough interest in providing an answer to these questions.

Who stands to lose the most if the current gamble on 30% fat, or even 20%, turns out badly? It will certainly be the elderly, who do not have the remaining years which younger people have, to swing over later to a less rich diet much lower in fat and cholesterol and achieve at least some unclogging of the arteries which can be induced in other primates. As mentioned earlier, such unclogging has been conclusively shown to occur in animal primates close to man in which atherosclerosis has first been experimentally produced by feeding them the current American diet, and then regressed by returning the animals to their normal diet of 5-10% fat.

Commercial Opposition To The Ancient Diet

The forces against a 10% fat diet are considerably greater than can be justified by a commendable conservatism which quite wisely questions any major change in such a basic feature of lifestyle as diet. Powerful economic interests exert great control over government policy and clinical research, and they tend consciously or unconsciously to resist dietary change. These are the food, drug, and medical industries which all have a heavy stake in the status quo, whether it be high-pressuring people to eat more luxurious food than is good for them, or using expensive drugs and surgical operations to patch up diseases caused by the overconsumption of improper food. With the best of intentions, captains of industry in these fields are bound to have prejudices in favor of the status quo which deny nutrition its rightful position in the care of health.

A rather active revolving door between government health agencies and commercial interests also stands in the way. For example, Theodore M. Cooper, former Director of the National Heart, Lung, Blood Institute, became executive vice-president of Upjohn Pharmaceutical Co.[311] Herbert L. Ley, Jr., former chief of the FDA, is now a consultant to the drug industry.[312] Sherwin Gardner, former deputy commissioner of FDA, became a vice-president of the Grocery Manufacturers of America.[313] Prior to appointment as FDA Commissioner in 1981, Arthur H. Hayes' faculty position at Penn State Medical College was fully funded in the amount of $67,000, including bonuses, by Hoffman-La Roche, the maker of Valium.[314] Howard Robbins, former head of the FDA's bureau of foods, became vice-president of the National Soft Drink Association.[315] Many other examples could be given.

The fact that officials move between government and industry does not by itself mean that they violate the public trust, but does make it difficult to believe that government officials can evaluate objectively the therapeutic merits of nutrition versus drug therapy.

Finally, it must be admitted that any of us in this profligate age are naturally reluctant to forego dietary indulgence. Peer pressure is strong. The only antidote for this is full information, so that our intellect rather than our taste buds are in control. It is just as important that gastronomic appetites defer to arterial health, as that late-coming drivers at 4-way stop signs defer to earlier drivers in order to ensure social health. Intelligent restraint has always been the hallmark of civilization and the doorway to shared freedom and avoidance of distress. But restraint cannot operate without full information, and the public is only beginning to get this from our most powerful and knowledgeable government health agencies.

The Goal

The goal of the Pritikin program is to show the public that there is a rational, low-cost, safe and effective dietary option for the prevention and treatment of major common diseases which often does not involve the substantial risks and costs of either drugs or surgery. The link between a luxurious high fat, high cholesterol diet and heart disease, hypertension, diabetes, and cancer is strong. The high tech modalities of drugs and surgery will always have an indispensable and last-resort role in acute or advanced diseases, but they should not dominate the scene. Intelligently applied nutrition puts the body in the best position to prevent, ameliorate, or cure many common diseases.

We believe the time is long past for dilatory half-hearted measures. The present-day misery and cost of cardiovascular disease and diabetes - to mention just these two - is intolerable. Why ignore the ancient diet containing fat at 10% of calories still used all over the world by undeveloped populations that do not have our epidemics of degenerative diseases?

This is not to say that the Heart Institute should now urge everyone to go on a 10% fat diet, much as we think widespread adoption of at least near this level of fat would be of great benefit to the health and pocketbook of the American public.

We ask merely that citizens should not be left in the dark about the full extent of their dietary options to prevent and treat the degenerative diseases of modern Western civilization. It is the responsibility of democratic government to give the public the evidence from epidemiology, clinical studies, and animal experimentation which bears on the causes of these diseases. Each individual will then have some real power to decide just what program of diet and exercise is desirable and feasible for his or her own health.

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The CHAIRMAN. Dr. Wynder, my old friend, welcome.

Dr. WYNDER. Senator Hatch, as the concluding speaker, let me say how lucky the public is to have you as congressional leader for the area of health promotion.

The CHAIRMAN. Thank you.

Dr. WYNDER. I am convinced that we will never have preventive medicine in this country unless we politically want it.

I, of course, agree with the statements made by various speakers. Perhaps the one point that needs further emphasis is that hyperlipodemia is also a problem in our children. In studies in Westchester and the Bronx, more than 40 percent of the children had cholesterol levels over 170 milligrams percent, a level already considered by a recent NIH Conference on Atherosclerosis as at moderate risk.

It is clear that our health habits begin early in life—be they in exercise, be they smoking, be they substance abuse.

The question now before us is: What are we going to do about it? As scientists, we discover. As scientists, we need to apply. And I can tell you, after 35 years in this field, that application is often more difficult than the discovery itself.

We suffer from the illusion of immortality. As physicians, we go into the field as healers for which we get economic and academic rewards. So if I were to be the health czar of this country, what would be my three recommendations for application?

First, is the establishment of a mandatory school health education program as part of the curriculum, starting in kindergarten. In the "Know Your Body Program," developed with funds from the National Heart, Lung, and Blood Institute and the National Cancer Institute, and with programs that we do in other countries, as well, we have already created a "Health Passport" for 6-year-olds, who have already high cholesterol, suffer from obesity and early rise of blood pressure. Thus, our first goal, would be to improve the health behavior of our children. Also, we know that our children have perhaps a greater influence on us than we have on them, so the "Know Your Body" or similar types of health education programs in schools, should become mandatory for schools everywhere.

The second recommendation relates to the American Health Foundation Food Plan. It lowers the cholesterol and the dietary fat intake below that recommended by the American Heart Association, at 25 percent of total calories from fat, and 200 milligrams cholesterol, and calls for an increase in fiber to 35 grams per day. We need to point out, of course, that while cholesterol is key for coronary disease, it is not so for cancer. In our cancer research we find, similar to what Dr. Lenfant indicated, also some benefit for fish oil, as well as for olive oil.

I appeal to the American food industry to lower the fat content of dairy products, to lower the fat content of meat products. I call this product modification.

The third point relates to a slogan as shown in the last slide that says, "Nobody takes better care of you than you." We are grateful that you gave us the opportunity to determine the cholesterol levels of U.S. Congressmen. If everyone had as low a cholesterol level as you do, Senator Hatch, coronary disease in this Congress would be very much lower. Through the technology today, we can determine blood cholesterol at very low cost, in 3 or 4 minutes. It is

our goal that by 1990, some 50 million Americans will have an adult "Health Passport" which tells you in 16 concise pages what you ought to know about coronary artery disease, how you can detect cancer early in life.

Let me say this in conclusion: I have often been asked what really is the goal of preventive medicine. The goal of preventive medicine is to help people die young as late in life as possible. This is medically desirable, it is fiscally necessary, and with your help, Senator, we can succeed.

Thank you.

[The prepared statement of Dr. Wynder follows:]

TESTIMONY BEFORE THE

SENATE NUTRITION COMMITTEE HEARINGS

GIVEN BY

ERNST L WYNDER, M.D.

PRESIDENT, AMERICAN HEALTH FOUNDATION

320 EAST 43RD STREET

NEW YORK, NY 10017

NOVEMBER 13, 1985, WASHINGTON, D.C.

Large-scale epidemiological studies, supported by extensive experimental evidence, have established that many chronic diseases, including most cardiovascular diseases and many types of cancer, are caused by our lifestyle, particularly in terms of what we eat, drink, and smoke. For some time we have known that cardiovascular disease, particularly atherosclerosis, is caused largely by the excess amount of fat, cholesterol and salt and, to a lesser extent, the excess of total calories consumed by our sedentary population. More recently, we have determined that excessive fat intake is also causally related to the etiology of cancers of the breast, prostate and colon, and also likely to be responsible for cancers of the ovary, endometrium, kidney and pancreas.

The time has come to act on these dietary excesses and prevent the adverse effects which result in a metabolic overload and the ultimate increased incidence of morbidity and mortality in our population. Those who want to maintain the nutritional status quo in this country would in fact condemn our children to ultimately suffer from the same avoidable diseases that affect us today.

As scientists, we need to uncover those factors which bring about disease and then work with you who shape public policy to apply these discoveries. We recognize that application is often more difficult than the discovery itself, yet, without application, the discovery itself would have been in vain. Our prescription for redirecting the nation's

nutritional pattern may appear to some to be nothing less than a "dietary revolution," but it is in fact a prescription that is consistent with and reflective of the natural metabolic norms of our biological system.

The nutritional prescription involves three measures:

- Educate the public as to what constitutes a "healthy diet" for an essentially sedentary population. The American Health Foundation has, for instance, developed a Food Plan designed to reduce the excessive intake of dietary fat, salt, cholesterol and total calories, while at the same time increasing the intake of vegetable proteins, fruits and vegetables and certain types of fiber. Such a food plan should be accompanied by increased physical activity and could best be accomplished if food manufacturers, both in terms of agricultural products and food processing, collaborate towards realizing these goals. We believe that the nation's food producers have the capacity to modify the content of foods in a more healthful direction, and that this can be achieved in an economically feasible manner.

- Educate the public about the importance of knowing their own cholesterol level, much as we have educated

them about high blood pressure. For instance, the American Health Foundation recently launched a "Know Your Cholesterol" program in New York and here in the congress during which an individual receives an inexpensive but accurate cholesterol test and keeps an ongoing record this information in a "Health Passport" -- a document that provides valuable information on the prevention of both coronary artery disease and the major types of cancer, and also makes succinct dietary recommendations. One of our mottoes is "Nobody Takes Better Care of You Than You," and this idea is facilitated by knowledge contained in the Health Passport. With programs such as this, the public can better understand the major risk factors that adversely affect health and learn what specific measures can be undertaken to reduce those risk factors. The medical profession should insure that all Americans have access to such knowledge, which of itself serves to motivate people to undertake preventive actions which in turn can lead to a reduction of avoidable disease.

- Educate our children early in life that chronic disease and disease in general is preventable, and that good health is the responsibility of each of

us. One way to promote this awareness would be to mandate school health education starting in Kindergarten. With support from the National Heart, Lung and Blood Institute, as well as the National Cancer Institute, the American Health Foundation has developed the "Know Your Body" school health education program which begins with a simple health screening in the first grade. Many studies have shown that elevated cholesterol levels are already prevalent in young children. This indicates that these children will be at particularly high risk for coronary disease when they reach adulthood. In one of our studies, over 40% of children aged 8-10 had serum cholesterol levels of 170 mgs and above, a level already placing them at moderate risk for atherosclerosis according to a recent consensus on arteriosclerosis held by the National Institutes of Health. Epidemiological evidence has shown a high correlation between serum cholesterol levels in children and adult mortality for coronary artery disease in various parts of the world. School health curricula must, of course, do more than teach children about nutrition - they must also teach them about smoking, alcohol abuse, illicit drugs, the importance of physical activity, and be aimed in general at increasing the self-esteem of each child.

Children must also be given the tools necessary to make healthful choices. As the slogan holds, "give me a fisn and I eat for a day - teach me how to fish and I eat for a lifetime." Accordingly, we hope to "innoculate" our children with good health behaviors for a lifetime.

Teaching our children how to protect their health must receive the same priority as the teaching of reading and arithmetic. As part of this effort, we must train our teachers in health education and carefully evaluate and grade the progress of these programs on an annual basis. Our program includes yearly Health Tests involving attitude, knowledge and behavior that can hopefully develop into a universal test so as to regularly evaluate what children in all schools know about health and how they relate to what they know. The establishment of school health education programs deserves your support - philosophically, politically and fiscally.

Finally, may I say that hearings, like research, should be judged by outcomes. Thus, the success of these hearings on nutrition can only be gauged in terms of what progress is made toward fulfilling the objectives I have outlined today.

Preventive medicine represents the ultimate form of medical care. When successful, it reduces avoidable

illness, thereby increases youthful longevity, and also reduces the economic burden so flagrantly associated with unnecessary disease and death. Preventive medicine is unique in that its practitioners are not only scientists and physicians, but teachers, businessmen, communicators and, yes, even legislators. As another slogan holds, it should be the function of the medical profession to "help people die young as late in life as possible." If we act together upon what we are discussing at these hearings today, we can bring the idea behind this slogan into reality.

The CHAIRMAN. Let me start with you, Mr. Pritikin. You recommend a 75-percent reduction in dietary intake of cholesterol. What effect do you believe this would likely have on one's serum cholesterol level?

Mr. PRITIKIN. We get an average drop in our 4-week program of 25 percent——

The CHAIRMAN. Is that an average drop?

Mr. PRITIKIN. An average drop in blood cholesterol of 25 percent. However, if you stay on the Pritikin Program your cholesterol level will go much further down. Mine is typical. My level is 130. And it will end up below 160.

The CHAIRMAN. Is that right? Now, there is increasing awareness that calcium deficiency is a problem with Americans. The major dietary source for calcium, of course, is dairy products, which we have looked at throughout most of our lives. Now, since you recommend a reduction in dairy products as part of your program, how do people get the requisite calcium in their diets?

Mr. PRITIKIN. You can obtain calcium from many other sources. There is bok choy, the green, leafy vegetables, that have high amounts of calcium.

But there is another concern about calcium depletion in the bones which is caused by a high-protein diet, which has been known to chase calcium out. There is a lot of evidence to indicate that if you are on a moderate—protein diet instead of a high-protein diet, your ability to retain calcium is much improved.

The CHAIRMAN. Thank you.

Dr. Lenfant, you say in your testimony that the public should check with their doctors and have them check their cholesterol levels, and if high, they should take steps to do something about it. Now, who should have their cholesterol levels checked, and how successful are the steps to lower it?

Dr. LENFANT. We feel that any individual who, for some reason or another, is identified as being in a possible risk category should certainly go forward and get his or her cholesterol checked.

But in addition, as you know, Mr. Chairman, if you enter the office of a physician, your blood pressure is going to be measured, a urine sample will most likely be collected, and probably a blood sample will also be taken for all kinds of things except cholesterol. We would advise that the physicians make cholesterol measurement routine at this time. Equipment, such as the model we have out in the hallway, will certainly facilitate that.

The steps which are recommended to lower cholesterol are first a dietary intervention. We are not, however, advertising a punitive diet, but rather a diet which is prudent, moderate, and balanced, and if this does not succeed—which is most likely in individuals who have a very high cholesterol—then pharmacological interventions are warranted.

The CHAIRMAN. What is the Heart, Lung, and Blood Institute doing to educate physicians concerning the current knowledge about cholesterol?

Dr. LENFANT. As I mentioned in my statement, we are initiating this week the National High Blood Cholesterol Education Program, which will include physicans as a target group. We are going to assemble a large number of experts who will review all the issues

and prepare reports which will be widely disseminated. We feel that within a short period of time, we will be able to reach nearly all the practicing community.

The CHAIRMAN. Dr. Wynder, these children's educational materials that you have pointed out in your charts, are they available today?

Dr. WYNDER. We are testing these programs out in various parts of the United States.

The CHAIRMAN. Are they having a good effect, in your opinion?

Dr. WYNDER. We show in our research studies that we can lower cholesterol, we can reduce smoking habits. But what we have learned since our first study is that what we need to do is to do the program in an entire school.

In a recent editorial, we pointed out that if we want to succeed in changing the health habits of our children, we need more than the school program. We need the media. Linda Evans' presence here gave a good example of how the public relates to examples as in Hollywood.

We need the churches, we need the politicians, we need the parents.

There is another slogan that explains well what we try do for children: "Give me fish, and I will eat for the day; teach me how to fish, and I will eat for a lifetime."

These children are teachable. It is a question of whether we have the will and the way. We have just conducted a know your body pilot program for China. We probably run our best know your body program in Israel, in both Hebrew and in Arabic. We are conducting a pilot program in Germany and in Italy. If I were a politician, I would bet on the children, because these children can be indoctrinated for good health behavior.

We hope—since, of course, education is a State matter and fortunately or unfortunately, not a Government matter, that somewhere, the Government can help or induce the States to provide better school health education for our children and test them, as we do, year after year.

The CHAIRMAN. Well, I want to thank you and the American Health Foundation for making the know your cholesterol program available today here in the Capitol.

What effect do you believe diet really has with regard to cholesterol level? In other words, how much is due to environmental factors and how much is due to maybe other factors such as genetics?

Dr. WYNDER. It is evident that in respect to genetics, for better or for worse, we are born with the genes that our parents gave us and this, we cannot control. But we can control the environment both externally and internally. Studies by the National Heart, Lung and Blood Institute have shown that for every 1 percent drop in serum cholesterol, we gain a 2-percent drop in mortality from coronary disease.

So we need to emphasize that we need to reduce the cholesterol levels in our adult population which you have heard today is extraordinarily high. In the screening we do here at the Capitol in Know Your Cholesterol, programs as we did on 15,000 New Yorkers in May, we find that more than one-third of adults have levels that are above 200 milligrams percent and 220 milligrams

percent for respective age groups. A level over 180 milligrams percent already puts adults at some risk. Therefore, the ideal level for adults would be 160 milligrams or less.

As Dr. Lenfant indicated, coronary artery death is the leading cause of death in our society; the risk factors, hyperlipodemia, smoking, and blood pressure are well-established. We are not making headway on treatment for atheroscerosis as much as we would like to. The answer certainly lies in prevention. We are not born to die from heart disease, nor are we born to die from any cancers. Most of these diseases are manmade and can those be also prevented by our action.

The CHAIRMAN. Thank you.

Senator Dodd?

Senator DODD. Thank you very much, Mr. Chairman.

Other members of the committee came to see Ms. Evans; I came to hear the three of you. So thank you very much.

Dr. WYNDER. Thank you. We appreciate that.

The CHAIRMAN. We have heard a lot of moaning and groaning by him, though, for having missed her. [Laughter.]

Senator DODD. I am particularly interested in your last point, Doctor, and I would ask your two copanelists to comment, as well. I agree with you about the preventive side of these things, in children, particularly. And you mentioned the schools and churches and so forth. But we are up against an awful battle. I mean, I do not normally turn on the television on Saturday morning. It is usually by accident, that I believe it is Friday morning or something. But you get this children's programing, which I gather is watched by millions, apparently, and the advertising and the products that are sold on those shows are hardly what one would call nutritious. And because children have such an influence over their parents in buying practices—cereals, candies, and the like—you can work your head off all day long in school, in church, and every other place, and given the amount of television time that a child watches in this country, I think someone once mentioned to me a fairly recent statistic—and I have a hard time saying it, because I do not want to believe it—but in the neighborhood of 5 hours a day is the average consumption of television time for an American child. And obviously, they are watching programs that are geared to them. And again, the advertising and the suggestions of products just run directly contrary to everything you have suggested and everyone else has.

I do not know if you have any suggestions as to how you deal with it. Certainly, producers are not going to legislate in those areas. I do not know how you do that. But because the marketplace is so consumer-sensitive, we have seen in the past where consumer movements have had profound effects on what the producers of products are making and selling.

I wonder if you have any suggestions as to how we might get to that, because frankly—and you can maybe tell me otherwise—but with all of the good advice you can get, no one has yet figured out how to beat that particular onslaught that we face. It is out there. And maybe you will tell me that what they are pitching on television and elsewhere is really rather nutritious; I suspect it is not, in

most cases. But if that is the case, how do we get around that particular problem?

Dr. WYNDER. I appreciate your comments. Not only do we have a difficult time in prevention, but we have a lot of forces against us, and television is one of them.

A year ago, we asked the chairman of Matel Toy Co. to join our board, and he agreed, water has now created for us spokes-characters that speak about good health behavior for children.

We hope to launch them on Sunday morning television. That is exactly where we ought to be. And I do not know whether a fairness doctrine exists for morning television for children, but we would like to have the opportunity to go to morning television and show children what good health behavior can do.

Obviously, we must do this in some attractive way. Therefore, we went to the toy industry, who know how to do that. Clearly, we have got to get television on our side, I highly agree with you. I do not know whether this is possible that we should get some free time on commercial television for this purpose.

Senator DODD. Let me ask you this. Is there such a thing as sugar addiction in children—I do not mean addiction in the same sense as cocaine or heroin, but I mean, there is sort of a sugar fix that children build up.

Dr. WYNDER. We develop our taste habits very early in life. We all remember when we were very young and Mother said to us, "Now, if you are a good boy, you get a chocolate cookie." We all remember that, and every one of you smile, and your mouths probably water, as you think about the chocolate cookie.

So it is a question of habituation. I know children who have been brought up on a slice of carrots, and they have learned to like them. We have got to reach the parents, that they are in part or largely responsible for the behavior of our children, including what they eat.

Senator DODD. My mother tried brussel sprouts and lima beans, and it never worked.

Dr. LENFANT. I would like to inject a somewhat different viewpoint into this discussion, Senator. Sure enough, the television broadcasts a number of messages which sometimes are not those that we would like to hear. But it does this because it is supported by an industry.

I would like to say to you that the food industry, with which we have worked extensively during the last year, before initiating this program last Friday, has demonstrated a high degree of cooperation for all of the things that we wanted to do.

One food industry which was considered to be dead against all of these things we want to do, the Egg Producers of America, in fact, is now working with us and cooperating to reach the goals that we have in mind. Some 2 or 3 weeks ago, the egg industry had their national convention in New Orleans, and my staff was down there, talking to them, and we were making blood cholesterol measurements in all the participants.

As well, the meat industry has responded dramatically to the public health needs. Today the meat industry can produce a meat which is much leaner, does not have the quantity of saturated fat that it had in the past. I think there is a revolution and we have

all reasons to believe that with the continued pressures from society, further changes will take place in the direction that you and I would like to see.

Senator DODD. Before you respond, Mr. Pritikin, let me ask you to comment on something else. One of the major problems—I think there is an assumption, first of all—well, not an assumption; it is legitimate, I think—that poor children—and of course, one out of every four now in this country falls into the poverty area, between the ages of 0 and 18 in the United States—in fact, the poorest segment of the population of the United States are young. We are the only industrialized country in the world with that unique distinction. And obviously, people who are poor in many cases are less well-educated, less well-informed about many things, not the least of which would be diet. And the particular problems we face with that constituency, a growing constituency in this country, and there, where the quality of food—the assumption, I think, is on many people's part that nutritionally better food costs a lot more, that to prepare a vegetarian dinner is a lot more expensive than to put on a meal of what would be the normal staple of a fatty hamburger and some potatoes.

Would you comment on that, in addition to what else I have asked?

Mr. PRITIKIN. Senator, first of all, with regard to children, I think if we could serve low-cholesterol, low-fat food in school lunches for all children, that that would be a good start in the educational program. As I recall going through school, and I am sure you do, too, there was a lot of cheese, eggs, fat, and meat. And I think it is very difficult to educate young people to a proper diet if the school, which is the authority and respect they get, is giving them that kind of program. I think that is where it should start.

Senator DODD. What about the cost of a nutritious meal?

Mr. PRITIKIN. Well, we have done a brief analysis on it, and if you do not eat the expensive foods, processed foods, and just go onto a semi-Third World type of diet of starches, potatoes, rice and vegetables, we have calculated about a $1,500-a-year-less grocery bill on an annual basis, and I would be happy to give you our evidence for that.

Senator DODD. I would like to see that. I think that would be helpful.

Mr. PRITIKIN. I will definitely send it to you.

Senator DODD. Thank you.

Mr. Chairman, I have an opening statement, and I would just ask unanimous consent that that be made a part of the record.

The CHAIRMAN. Without objection, we will put it in the record, and we will also keep the record open for any written questions any member of this committee would like to submit to any witness who has testified here today and any subsequent material supplied for the record.

[Additional material supplied for the record follows:]

PRITIKIN RESEARCH FOUNDATION

December 20, 1985

The Honorable Christopher Dodd
U.S. Senate
Washington, DC 20510

Sir:

On November 18, 1985, I testified before the Committee on Labor and Human Resources that a family of four on the Pritikin Diet would save about $1500 per year in food costs over a family of four on the conventional American diet.

Responding to your request for documentation of this claim, I hereby submit two alternative calculations, attached to this letter as Appendix 1 and Appendix 2. Data for this type of comparison must inevitably be inexact due to several assumptions one must make in order to manipulate the food consumption information that is available. In addition, prices and consumption patterns will vary due to regional and seasonal differences. However, within these constraints, it can be demonstrated that the Pritikin diet is inherently less expensive than the conventional diet in this country.

The single largest caloric exchange that occurs when adopting the Pritikin diet is the reduction in the amount of animal protein consumed, from 11.2 ounces/day (total of beef, pork, lamb, veal, fish, chicken, and turkey) to 3.5 ounces/day (primarily chicken, turkey, and fish, with some lean red meat), and the corresponding increase in the consumption of complex carbohydrates (primarily grains as well as some legumes and vegetables). An approximation of this exchange can be illustrated by altering the average U.S. consumption levels for meat and grain, as demonstrated in Appendix 1. By replacing 100% of beef and pork consumption with the caloric equivalent in grain, the resulting diet contains 3.6 ounces of animal protein per person per day (mostly fish, chicken, and turkey), and utilizes grains as the single largest source of calories. This is a rough approximation of the Pritikin diet.

[1] U.S. Statistical Abstract, 1985. Table no. 146: Per Capita Consumption of Major Food Commodities: 1960 to 1983.

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Using 1983 data, the yearly savings for four people resulting from the substitution of grain for beef and pork (but following a conventional diet in all other respects) is $1,311.80 (see Appendix 1).

An alternative approach to the macroeconomic analysis is to conduct an actual market basket survey, based upon one-week shopping lists for four people on the conventional American diet and for four people on the Pritikin diet. The results of this comparison are produced as Appendix 2 and show a yearly savings of $1,362.40 for four people on the Pritikin diet.

Clearly, substantial cost savings on the Pritikin diet are to be expected because grain is replacing meat as the primary caloric source. With sixteen pounds of grain and soy required to produce a single pound of beef,[1] it is hardly surprising that the cost of food will rise sharply with the consumption of meat.

The ramifications of reduced meat consumption in this country extend far beyond the direct food savings obtained on the consumer level, which I have dealt with here in a rather simplified fashion in order to make the key point that food costs will drop sharply as grains are substituted for meat. Extensive macroeconomic analysis of the wide-ranging benefits of a Pritikin-type diet has been conducted by researchers associated with the Pritikin Research Foundation, who are currently preparing the material for publication. Their research, which includes a more detailed and sophisticated analysis of comparative food costs (adjusted for seasonality, etc.) points to the high level of meat production in this country, requiring an enormous amount of our water, grain, and arable land, as having a potentially severe adverse effect on the American standard of living and the availability of natural resources, including water, land, and timber. We would be happy to provide the results of this work to you.

Sincerely,

Robert Pritikin

[1]USDA, Economic Research Service, Beltsville, MD.

RP/ct
CC to all Senators on Committee on Labor and Human Resources

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APPENDIX 1. SUBSTITUTION OF GRAIN FOR BEEF AND PORK

A. Price of beef per pound:

$$\frac{\$56.3\text{ billion}^{[1]}}{(226.5\text{ million people}^{[2]})\,(106.5\text{ lbs/person}^{[3]}) - 1.93\text{ billion lbs}^{[4]}}$$

= $2.54

B. Price of pork per pound.

$$\frac{\$35.3\text{ billion}^{[5]}}{(226.5\text{ million people}^{[2]})\,(66.2\text{ lbs/person}^{[6]})}$$

= $2.35

C. Yearly per capita calories from beef

(263 cal/100 gm[7]) (106.5 lbs/person[3]) (28.35 gm/oz) (16 oz/lb)

= 127,051 calories/person

D. Yearly per capita calories from pork:

(300 cal/100 gm[8]) (66.2 lbs/person[6]) (28.35 gm/oz) (16 oz/lb)

= 90,085 calories/person

E. Amount of grain required to replace beef and pork:

Grain must be added to replace beef calories (127,051/person) and pork calories (90,085/person), a total of 217,136 calories. Grain, a carbohydrate, contains approximately 4 calories per gram (dry weight). To supply 217,136 calories therefore, 54,284 grams of grain, or 119.67 lbs, must be consumed per person per year.

F. Price of grain products required to replace beef and pork:

$$\frac{\$40.2\text{ billion}^{[9]}}{(226.5\text{ million people}^{[2]})\,(217.7\text{ lbs/person}^{[10]})}$$

= $0.82/lb

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G. Cost of beef and pork for four persons:

Beef: ($2.54/1b) (106.5 lbs/person[3]) (4) = $1082.04

Pork: ($2.35/1b) (66.2 lbs/person[6]) (4) = 622.28

Total beef and pork cost. $1704.32

H. Cost of grain for four persons·

Grain: (119.57 lbs) ($0.82/1b) (4) = $392.52

I. Savings by substituting equal calories of grain for beef and pork:

$1,704.32
- 392.52
$1,311.80 Total savings

Footnotes

[1]U.S.Statistical Abstract, 1985. Table no. 1150, p. 652. Figure is for year 1983.

[2]US. Statistical Abstract, 1985. Figure is for the year 1980.

[3]U.S.Statistical Abstract, 1985. Table no. 196, p. 121. Figure is for the year 1983.

[4]U.S. Statistical Abstract, 1985. Table no. 1188, p. 668. Figure is for the year 1983. (Thia adjustment is required because consumption levels given in Table no. 196 are for both imported and domestic beef, whereas expenditure levels in Table no. 1150 is for domestic beef only. This adjustment removes imported beef from the consumption figure.)

[5]U.S.Statistical Abstract, 1985, Table no. 1150, p. 652. Figure is for th year 1983.

[6] U.S. Statistical Abstract, 1985. Table no 196, p. 121. Figure is for the year 1983.

[7]Bloch, Barba.a. The Meat Board Meat Book. New York: McGraw-Hill, 1977. Page 15. (Beef ranges from 163 calories/100 gm for extra

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lean ground beef to 421 calories/100 gm for stew meat (chuck). The figure of 263 calories/100 gm is for medium fat ground beef.)

[8] Bloch, Barbara. The Meat Board Meat Book, p. 152. (Pork ranges from 205 calories/100 gm (cured, butt end) to 684 calories/100 gm (bacon). The figure of 300 calories/100 gm is used as a representative value for all pork products.)

[9] U.S. Statistical Abstract, 1985. Table no. 1150, p. 652. Figure is for the year 1983.

[10] U.S. Statistical Abstract, 1985. Table no. 196, p. 121. Figure is for the year 1983.

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APPENDIX 2. MARKET BASKET COMPARISON

A. Cost of conventional diet per year for four people

Estimated cost was derived using consumption data fr USDA for 1977,[1] the most recent year that information on nationwide food consumption patterns is available. Prices were obtained by a survey of the Lucky Supermarket located at 450 East Cypress Avenue, Redlands, California, on Thursday, December 5, 1985. Prices for food groups were generated by averaging prices for a representative sampling of items within each group. Base price data for items included in each food group are shown as Appendix 2.1.

Food Group[2]	Consumption/Week (in lbs)	Price/Lb (in $)	Total Weekly xpenditure (in $)
Milk, cream, cheese[3]	8.34		7.00
Milk	6.38	0.23	1.47
Cheese	1.96	2.82	5.53
Meat	4.78	2.52[4]	12.05
Eggs[5]	0.66	0.78	0.51
Legumes	0.12	0.44[6]	0.05
Nuts	0.13	4.74[7]	0.62
Vegetables	5.09	0.56[8]	2.85
Fruits	3.94	0.59[9]	2.32
Grains	2.16	0.27[10]	0.58
Fats, oils	0.70	1.02[11]	0.71
Sugar, syrup, jelly, candy	0.83	1.51[12]	1.26
Soft drinks, desserts	0.34	1.03[13]	0.35

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Total cost per person per week·	28.30	
	x 4	people
Total cost per four persons per week	113.20	
	x 52	weeks
Total cost per four persons per year	$5886.40	

B. Cost of Pritikin diet per year for four people

Estimated cost was derived using a consumption table based upon the Pritikin diet "exchange system" (modified from its 2000-calorie base to bring the calories up to the 2475-calorie intake of the typical American in 1977[14]). The calorie ratio of the resulting diet is 10.6% fat, 15.3% protein, and 74.0% carbohydrates (mostly complex), which falls within the parameters of the Pritikin diet (5-10% fat, 10-15% protein, and 70-80% carbohydrates). Prices were obtained by a survey at the Lucky Supermarket located at 450 East Cypress Avenue, Redlands, California, on Thursday, December 5, 1985. Prices for food groups were generated by averaging prices for a representative sampling of items within each group. Base price data for items included in each food group is shown in Appendix 2.2.

Food Group[2]	Consumption/Week (in lbs)	Price/Lb (in $)	Total Weekly Expenditure (in $)
Milk (nonfat)	7.44	0.20	1.48
Meat	1.53[15]	2.28[16]	3.48
Legumes	4.83	0.44[6]	2.13
Vegetables	9.94	0.56[8]	5.57
Fruit	10.36	0.59[9]	6.11
Grains	4.70	0.27[10]	1.27
Eggs[5]	0.66	0.78	0.51
Apple juice concentrate	0.44	0.96	0.42

Total cost per person per week:	20.97	
	x 4	people
Total cost per four persons per week.	83.88	
	x 52	weeks
Ttoal cost per four persons per year	$4361.76	

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C. Yearly savings of Pritikin diet over conventional American diet for four people

Cost of American diet (from A):	$5,886.40
Cost of Pritikin diet (from B):	4,361.76
Total savings:	$1,524.64

Footnotes

[1] USDA Nationwide Food Consumption Survey, 1977-78, 48 conterminous states, Spring, 1977 (preliminary).

[2] Food group headings are taken from the USDA Nationwide Food Consumption Survey, 1977-78.

[3] For purposes of this comparison only, consumption totals for this group were assumed to be 0.75 gallons (6.38 lbs) of milk per person per week at $1.95/gallon ($0.23/lb) and the remainder, 1.96 lbs, in cheese (50% jack, 50% cheddar). Cream was omitted to simplify the calculations, on the assumption that it is consumed in small amounts relative to milk and cheese.

[4] Price calculated on the premise that meat consumption consists of equal portions of bacon, sausage, bologna (sliced), salami (whole), ham (sliced), hot dogs, liver (calf), ham (whole), rump roast, rib roast, round roast, ground beef (chuck), ground beef, porterhouse steak, sirloin steak, pork loin ribs, pork chops, flank steak, round steak, chicken (whole), turkey breast, trout (fresh), turbot (fresh), tuna (can), salmon (can, pink), and salmon (fresh).

[5] Large whole eggs.

[6] Price calculated on the premise that legume consumption consists of equal portions of lentils, split peas, and pintos.

[7] Price calculated on the premise that nut consumption consists of equal portions of almonds, peanuts, cashews, walnuts, and pecans.

[8] Price calculated on the premise that vegetable consumption consists of equal portions of cabbage, carrots, celery, cauliflower, kale, lettuce, tomatoes, onions, and bell peppers.

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9 Price calculated on the premise that fruit consumption consists of equal portions of apples, pears, bananas, grapefruit, tangerines, cantaloupe, lemons, oranges, pineapple, and strawberries.

10 Price of whole wheat flour was used for purpose of this comparison.

11 Price calculated on the premise that oil and fat consumption consists of equal portions of three different shortenings (Lady Lee, Crisco, and Harvest Day) and seven different oils (Lady Lee, Mazola, Crisco, safflower, Wesson, Puritan, and olive).

12 Price calculated on the premise that consumption of this group consists of equal portions of table sugar, syrup, jelly, and candy (individually wrapped).

13 Price calculated on the premise that consumption of this group consists of equal portions of soft drinks, canned punch, and frozen prepared desserts.

14 The figure of 2475 calories consumed daily by the typical American in 1977 is calculated by assigning caloric values (taken from USDA Handbook #456, issued November 1975) to the amount of each food group consumed as reported in USDA Nationwide Food Consumption Survey, 1977-78. Base data provided in Appendix 2.3.

15 This figure is based upon the 3.5-ounce total daily intake of meat, poultry, and fish allowed in the Pritikin maintenance diet.

16 Price calculated on the premise that meat consumption consists of equal portions of flank steak, round steak, chicken (whole), turkey breast, turbot (fresh), trout (fresh), tuna (can), salmon (can, pink), and salmon (fresh).

APPENDIX 2.1 BASE PRICES FOR EACH FOOD GROUP, CONVENTIONAL DIET

Food Group	Unit of Measure	Price (in $)	Price per Pound	Weekly Per Capita Consumption (in lbs)	Weekly Per Capita Cost (in $)
Milk, cream, & cheese					
Milk	gallon	1.95	0.23	6.38	1.47
Cheese	lb	2.82	2.82	1.96	5.53
Meat					
Bacon	lb	1.49	1.49		
Sausage	lb	1.99	1.99		
Bologna (sliced)	lb	2.38	2.38		
Salami (whole)	lb	4.54	4.54		
Ham (sliced)	lb	4.24	4.24		
Hot dogs	lb	1.89	1.89		
Liver (calf)	lb	1.34	1.34		
Ham (whole)	lb	3.79	3.79		
Rump roast	lb	2.99	2.99		
Rib roast	lb	3.99	3.99		
Round roast	lb	2.97	2.97		
Ground beef (chuck)	lb	1.39	1.39		
Ground beef	lb	1.79	1.79		
Porterhouse steak	lb	3.59	3.59		
Sirloin steak	lb	1.99	1.99		
Pork loin ribs	lb	1.95	1.95		
Flank steak	lb	4.46	4.46		
Round steak	lb	1.99	1.99		
Chicken (whole)	lb	0.49	0.49		
Trout (fresh)	lb	2.59	2.59		
Turbot (fresh)	lb	2.19	2.19		
Tuna (can)	lb	1.76	1.76		
Salmon (can, pink)	lb	2.36	2.36		
Salmon (fresh)	lb	1.69	1.69		
Turkey breast	lb	2.99	2.99		
Pork chops	lb	2.59	2.59		
Average ($65.41/26)			2.52	4.78	12.05
Eggs (large, whole)	dozen	1.17	0.78	0.66	0.51

APPENDIX 2.2 BASE PRICES FOR EACH FOOD GROUP, PRITIKIN DIET

Food Group	Unit of Measure	Price (in $)	Price per Pound	Weekly Per Capita Consumption (in lb)	Weekly Per Capita Cost (in $)
Milk (nonfat)	gallon	1.70	0.20	7.44	1.48
Meat					
Flank steak	lb	4.46	4.46		
Round steak	lb	1.99	1.99		
Chicken (whole)	lb	0.49	0.49		
Trout (fresh)	lb	2.59	2.59		
Turbot (fresh)	lb	2.19	2.19		
Tuna (can)	lb	1.76	1.76		
Salmon (can, pink)	lb	2.36	2.36		
Salmon (fresh)	lb	1.69	1.69		
Turkey breast	lb	2.99	2.99		
Average	(20.52/9)		2.28	1.53	3.48
Legumes (average from Appendix 2.1)			0.44	4.83	2.13
Vegetables (average from Appendix 2.1)			0.56	9.94	5.57
Fruit (average from Appendix 2.1)			0.59	10.36	6.11
Grains (average from Appendix 2.1)			0.27	4.70	1.27
Eggs, large, whole	dozen	1.17	0.78	0.66	0.51
Apple juice concentrate	oz	0.06	0.96	0.44	0.42

Food Group	Unit of Measure	Price (in $)	Price per Pound	Weekly Per Capita Consumption (in lbs)	Weekly Per Capita Cost (in $)
Legumes					
Lentils	14 oz	0.57	0.65		
Split peas	28 oz	0.61	0.35		
Pintos	lb	0.325	0.325		
Average	($1 325/3)		0.442	0.12	0.53
Nuts					
Almonds	oz	0.30	4.80		
Peanuts	oz	0.13	2.08		
Cashews	oz	0.532	8.51		
Walnuts	oz	0.183	2.93		
Pecans	oz	0.299	4.78		
Average	($23.10/5)		4.62	0.13	0.60
Vegetables					
Broccoli	lb	0.39	0.39		
Cabbage	lb	0.39	0.39		
Carrots	lb	0.25	0.25		
Celery	lb	0.49	0.49		
Cauliflower	lb	0.98	0.98		
Kale	lb	0.39	0.39		
Lettuce	lb	0.79	0.79		
Tomatoes	lb	0.98	0.98		
Onions	lb	0.25	0.25		
Bell pepper	lb	0.69	0.69		
Average	($5.60/10)		0.56	5.09	2.85
Fruits					
Apple	lb	0.59	0.59		
Banana	lb	0.29	0.29		
Cantaloupe	lb	0.49	0.49		
Grapefruit	lb	0.59	0.59		
Lemon	lb	0.87	0.87		
Orange	lb	0.59	0.59		
Pear	lb	0.69	0.69		
Pineapple	lb	0.42	0.42		
Tangerine	lb	0.79	0.79		
Average	($5.32/9)		0.59	3 94	2.32
Grains					
Whole wheat flour	oz	0.017	0.272	2.16	0.56

Food Group	Unit of Measure	Price (in $)	Price per Pound	Weekly Per Capita Consumption (in lbs)	Weekly Per Capita Cost (in $)
Fats, oils					
Shortening					
Lady Lee	oz	0 047	0.75		
Crisco	oz	0.05	0.80		
Harvest Day	oz	0.034	0.54		
Oil:					
Lady Lee	fl oz	0.038	0.61		
Mazola	fl oz	0.05	0.80		
Crisco	fl oz	0.06	0.96		
Safflower	fl oz	0.078	1.24		
Wesson	fl oz	0.059	0.94		
Puritan	fl oz	0.066	1.06		
Olive	fl oz	0.159	2.54		
Average	($10.24/10)		1.02	0 70	0.71
Sugar, syrup, jelly, candy					
Sugar:					
C&H	5 lbs	1.59	0.318		
Wans	5 lbs	1.59	0.318		
Average	($0.636/2)		0.318		
Syrup:					
Karo light corn syrup	16 fl oz	1.09	0.78		
Aunt Jemima	24 fl oz	2.45	1.18		
Mrs. Butterworths	24 fl oz	2.35	1.13		
Average	($3.09/3)		1.03		
Jelly:					
Smuckers Strawberry Preserves	18 oz	1.93	1.72		
Welch's Concord Grape Jelly	18 oz	1.26	1.12		
Smuckers Sweet Orange Marmalade	18 oz	1.39	1.24 1.36		
Average	($4.08/3)				
Candy:					
M&M Plain	1.69 oz	0.35	3.31		
Snickers	2.0 oz	0.35	2 80		
Milky Way	2.10 oz	0.35	2.67		
Hershey's Milk Choc.	1.45 oz	0.35	3.86		
York Peppermint Pattie	1.5 oz	0.35	3.73		
Kit Kat	1.5 oz	0.35	3 73		
Average	($20.10/6)		3.35		
Average of sugar, syrup, jelly, and candy			' 51	0.83	1.26

Food Group	Unit of Measure	Price (in $)	Price per Pound	Weekly Per Capita Consumption (in lbs)	Weekly Per Capita Cost (in $)
Soft drinks, desserts					
Soft drinks:					
7 Up	67.6 fl oz	1.99	0 43		
Pepsi	67.6 fl oz	1.99	0.43		
Dr. Pepper	67.6 fl oz	1.49	0.32		
Coca Cola	67.6 fl oz	1.15	0.25		
Average ($1.43/4)			0.36		
Canned punch:					
Hi-C	46 fl oz	0.99	0.32		
Hawaiian Punch	46 fl oz	1.09	0.35		
Average ($0.67/2)			0.34		
Desserts:					
Sara Lee French Cheesecake	23.5 oz	3.15	2.14		
Sara Lee Walnut Coffeecake	11.5 oz	2.29	3.29		
Pepperidge Farm German Chocolate Cake	17 oz	2.26	2.13		
Pepperidge Farm Apple Fruit Squares	10 oz	1.29	2.06		
Mrs. Smith's Pumpkin Custard Pie	26 oz	3.76	2.31		
Average ($11.93/5)			2.39		
Average of soft drinks, canned punch, and desserts			1.03	0.34	0.35

APPENDIX 2.3 AVERAGE DAILY CALORIC INTAKE IN THE UNITED STATES, 1977

a. Average caloric intake was calculated by determining the caloric equivalent provided by the amount of each food group consumed by the average American in 1977, according to the USDA Nationwide Consumption Survey, 1977-78, 48 Conterminous States, Spring, 1977 (preliminary). Data on the caloric value of foods was obtained from USDA Handbook # 456, issued November, 1975.

Food Group	Unit	Calories/Unit	Amount Consumed per Week (in lbs)	Calories per Week
Milk, cream, cheese				
Milk[1]	gallon	2715.34	8.34	2665.60
Meat, poultry, fish (medium fat)	lb	1240	4.78	5927.20
Eggs	lb	653.90	0.66	431.57
Legumes				
Lentils	190 gm	646		
Chick peas	200 gm	720		
Pintos	190 gm	663		
Average	193 gm	676.3	0.12	190.98
Nuts				
Almonds	142 gm	849		
Cashews	140 gm	758		
Peanuts	144 gm	838		
Pecans	104 gm	742		
Walnuts	125 gm	785		
Average	131.8 gm	799.8	0.13	357.67
Vegetables				
Broccoli	lb	118		
Cabbage	lb	109		
Carrots	lb	19[illegible]		
Celery	lb	77		
Cauliflower	lb	122		
Kale	lb	177		
Lettuce	lb	64		
Tomatoes	lb	91		
Onions	lb	172		
Bell peppers	lb	100		
Average		122.1	5.09	621.49

Food Group	Unit	Calories/Unit	Amount Consumed per Week (in lbs)	Calories per Week
Fruit				
Apple	lb	263		
Apricot	lb	217		
Banana	lb	386		
Grapefruit	lb	90.8		
Mango	lb	299		
Cantaloupe	lb	136		
Watermelon	lb	118		
Orange	lb	157		
Strawberries	lb	168		
Average		203.87	3.94	803.23
Grains				
Whole wheat flour[2]	lb	1513.33	2.16	3268.79
Fats, oils	lb	1447	0.70	1012.90
Sugar, syrup, jelly, and candy[3]	lb	1747.90	0.83	1450.76
Soft drinks, desserts[3]	lb	1747.90	0.54	994.29
Total per capita calories consumed per week				17,324.48
Total per capita calories consumed per day				2,474.93

[1]To simplify calculations of calories consumed, entire average consumption in this group was assumed to be milk

[2]To simplify calculations of calories consumed, entire average consumption in this group was assumed to be whole wheat flour.

[3]To simplify calculations of calories consumed, entire average consumption in this group was assumed to be sugar.

B. In order to construct a consumption table for the Pritikin diet at 2474.93 daily per capita calories, the standard 2000-calorie Pritikin diet was modified by increasing consumption of grains, vegetables, and fruits so that the total caloric allocation between fat, protein, and carbohydrate remained within the Pritikin parameters of 5-10% fat, 10-15% protein, and 70-80% carbohydrates. Meat and milk consumption was not raised because the 2000-calorie diet already accounts for the maximum intake permitted of those items. Pritikin diet adjustments are shown as Appendix 2.4. Please also see the attached material on the Pritikin diet exchange system, which forms the basis of food group allocations for the Pritikin diet.

APPENDIX 2.4 PRITIKIN DIET MODIFIED TO INCREASE DAILY CALORIES TO 2475

Daily Exchange	Grams of Protein	Grams of Carbohydrate	Grams of Fat	Calories
Meat (3.5 oz)	24.5	0	7.0	161
Milk (nonfat, 16 oz)	16.0	24	0.4	164
Vegetables (14 exchanges)	16.16	70	3.50	375.14
Complex carbohydrates (14 grain exchanges, 5 legume exchanges)	38.0	285	15.20	1428.80
Fruit (8 exchanges)	trace	80	3.20	348 80
	94.66	459	29. 30	2478.74
	x 4 cal/gm	x 4 cal/gm	x 4 cal/gm	
	378.64 calories	1836 calories	263.7 calories	
	(15.3%)	(74 0%)	(10 6%)	

Standards

	Protein	Carbohydrate	Fat
Meat (based on flank steak, 1 oz)	7.0	0	2.0
Milk (per 8 oz, nonfat)	8.0	12.0	0.2
Vegetables (1 exchange = ½ cup raw)	1.2	5 0	0 25
Complex carbohydrates (1 exchange = 2.5 tbsp of whole wheat flour)	2.0	15	0.8
Fruit (1 exchange = 1 small fruit	trace	10	0.4

THE EXCHANGE SYSTEM OF NUTRITION

Exchange lists have proved to be the simplest approach to teaching nutrition to laypersons. Food and nutrition tables in great detail are readily available in bookstores and are certainly invaluable to professionals in the diet field, but the level of accuracy needed to maintain your good diet can be served by the lists provided in this book. Those who are diabetic will have been familiar with such lists for some time and will note the similarities--and some distinct differences.

In the food lists which follow, all foods allowed on the Pritikin diet are grouped according to the amounts of carbohydrate, protein and fat and the calories they contain. At the beginning of the first five lists you will find the number of calories for the portion sizes shown:

LIST	CONTAINING
1. Fruit Exchanges	primarily carbohydrates
2. Vegetable Exchanges	carbohydrates and small amounts of protein
3. Complex Carbohydrate Exchanges	larger amounts of carbohydrate and protein
4. Dairy Exchanges	nearly equal amounts of carbohydrates and protein
5. Protein Exchanges	protein and small amounts of fat
6. Miscellaneous Exchanges	items which do not fit readily into any of the first five categories
7. Avoid At All Times	items to AVOID AT ALL TIMES

An exchange is a specified amount of a certain type of food as shown on the lists. One exchange may be exchanged for any other specified amount on the same list. For example:

> In the Fruit Exchange list, one small apple is listed as one Fruit Exchange and so is 1/4 of a 6 inch canteloupe. If you are allowed 1 Fruit Exchange after dinner you could take a small apple OR you may want only 1/2 of an apple and 1/8 of a cantaloupe, which together would be 1 Fruit Exchange.
>
> 1 Complex Carbohydrate Exchange may be 1 slice of bread or it may be 1/2 cup of cereal. If you want both the bread and cereal for breakfast, you may have 1/2 slice of bread and 1/4 cup of the cereal, totalling 1 Complex Carbohydrate Exchange.

As you become more familar with the lists, it becomes steadily more easy to plan your own diet. You will learn how to apply this information to preparing your own meals and planning your own menus when you entertain.

LIST 1 - DAIRY EXCHANGES

Each portion contains: 12 g. Carbohydrates
8 g. Protein
Trace Fat
80 Calories

1% or less:
Milk.....8 oz.
Buttermilk.....8 oz.
Yogurt.....6 oz.
Evaporated skim Milk.....4 oz.
Dry curd cottage cheese...2 oz.
100% skimmed milk cheese..2 oz.
Uncreamed cottage cheese..2 oz.
(pot, hoop, baker's)
Non-fat powdered milk.....1/3 cup

LIST 2 - VEGETABLE EXCHANGES

Each portion equals 1 cup raw and 1/2 cup cooked, and provides approximately 25 calories.

Artichoke, whole, base and ends of leaves (1 small)
Asparagus
Beans, green or yellow
Beets
Bok choy
Breadfruit (1/4 cup)
Broccoli
Brussels sprouts
Cabbage
Carrots (medium) 1
Cauliflower
Celery
Celery root
Cilantro
Chayote
Chicory
Chilies
Chinese cabbage
Chives
Collard
Coriander (Cilantro)
Cucumber
Eggplant
Endive
Escarole
Garlic (1/4 cup)
Green onion tops
Greens*: beet, chard, dandelion, spinach, rhubarb
Horseradish, prepared (1 tbs)
Jerusalem artichokes
Jicama
Kale
Leeks
Lettuce
Lima beans, baby (1/4 cup)
Mint
Mushrooms
Mustard (fresh)
Okra
Onions
Parsley
Pea pods, Chinese
Peppers, red and green
Pimento
Poke
Radishes
Romaine lettuce
Rutabagas
Shallots
Spinach*
Sprouts (assorted)
Squash: spaghetti, summer, zucchini
Tomato (medium) 1
Tomatoes, canned in juice, unsalted
Tomato juice, unsalted
Tomato paste, unsalted (3 tbs)
Tomato sauce, unsalted
V-8 juice, unsalted (2/3 cup)
Water chestnuts, medium (4)
Watercress

* Limit to occasional use because of high oxalic acid content.

Vegetables not on this list will be found listed with the Complex Carbohydrate Exchanges.

LIST 3 - FRUIT EXCHANGES
(fresh, dried, frozen or canned without sugar or syrup)

Each portion provides approximately 40 calories. Only those items which are capitalized may be used on the Regression Diet.

APPLE.....1 small (2" diameter)
apple juice or cider.....1/3 cup
applesauce, unsweetened.....1/2 cup
APRICOTS, FRESH.....2 medium
apricots, dried.....4 halves
BANANA.....1/2 small
BERRIES (BOYSENBERRIES, BLACKBERRIES, RASPBERRIES, BLUEBERRIES).....1/2 cup
CANTALOUPE.....1/4 (6" diameter)
CHERRIES.....10 large
cranberries, unsweetened.....1 cup
CRENSHAW MELON.....2" wedge
dates.....2
date sugar.....1 tablespoon
FIGS, FRESH.....1 large
figs, dried.....1 small
fruit cocktail.....1/2 cup
GRAPEFRUIT.....1/2 small
grapefruit juice.....1/2 cup
GRAPES.....12
grape juice.....1/4 cup
GUAVA.....2/3
HONEYDEW MELON.....1/8 (7" diameter)
KIWI.....1 medium
KUMQUATS.....2
LEMON JUICE.....1/2 cup
LIME JUICE.....1/2 cup
LOQUATS.....3
MANDARIN ORANGES.....3/4 cup
MANGO.....1/2 small
NECTARINE.....1 small
ORANGE.....1 small
orange juice.....1/2 cup
PAPAYA.....3/4 cup
PASSION FRUIT.....1
passionfruit juice.....1/3 cup
PEACH.....1 medium
PEAR.....1 small
PERSIMMON, NATIVE.....1 medium
PINEAPPLE, FRESH.....1/2 cup
pineapple, canned without sugar.....1/2 cup
pineapple juice.....1/3 cup
PLANTAIN.....1/2 small
PLUMS.....2 medium
POMEGRANATE.....1 small
PRUNES, FRESH.....2 medium
prunes, dried.....2
prune juice.....1/4 cup
raisins.....2 tablespoons
STRAWBERRIES.....3/4 cup
TANGERINE.....1 large
WATERMELON.....3/4 cup

LIST 4 - COMPLEX CARBOHYDRATE EXCHANGES (Continued)

FLOURS

Arrowroot	2 tablespoons
Buckwheat flour	3 tablespoons
Cornmeal	3 tablespoons
Cornstarch	2 tablespoons
Matzo meal	3 tablespoons
Potato flour	2 1/2 tablespoons
Rice flour	3 tablespoons
Rye flour, dark	4 tablespoons
Whole wheat flour	3 tablespoons

GRAINS CEREALS AND PASTAS

Barley, cooked	1/2 cup
Cornmeal, cooked	1/2 cup
Cracked wheat (bulgur), cooked	1/2 cup
Grapenuts	1/4 cup
Grits, cooked	1/2 cup
Kasha (buckwheat groats), cooked	1/3 cup
Macaroni, whole wheat, cooked	1/2 cup
Noodles, rice, cooked	1/2 cup
Noodles, whole wheatm cooked	1/2 cup
Oatmeal, cooked	1/2 cup
Pasta, enriched white, cooked	1/2 cup
Pasta, whole wheat, cooked	1/2 cup
Rice, brown, cooked	1/3 cup
Rice, wild, cooked	1/2 cup
Roman Meal, cooked	1/2 cup
Rye cereal, cooked	1/2 cup
Shredded Wheat	1 large biscuit or 1/2 cup spoon-size
Steel cut oats, cooked	1/2 cup
Uncle Sam's Cereal	1/2 cup
Wheatena, cooked	1/2 cup
Zoom, cooked	1/2 cup

LIST 5 - PROTEIN EXCHANGES

Protein exchangea must be limited becauee of their increased choleeterol and fat content. The amount of protein allowed varies depending on whether you are on the Regression or Maintenance program. While certain cute of beef are acceptable, remember that their total fat content ie higher than fieh or poultry and frequent conaumption ie not advised. To reduce the percentage of fat in beef, alwaye purchaee Grade: Good inetead of Choice. Alao, aek your local butcher if he hae or knows where to purchaee grazed or range-fed beef. While this type of meat may be slightly tougher than grain-fed, the fat content is markedly lower.

REGRESSION AMOUNT	MAINTENANCE AMOUNT
3 1/2 oz/week	3 1/2 oz/day

Beef 55 calories per ounce

Poultry (without skin) 55 calories per ounce

Freeh fish 37 calories per ounce

Shellfieh 37 calories per ounce

Beans: (37 calories per ounce)

Soy beans (cooked)
Tofu

Note: Although soybeane do no contain any choleeterol, they are higher in fat than any other legumes. (30% of the calories in the form of fat.) Therefore they should bc selected in place of meat, fish and poultry, not in addition to meat, fish and poultry.

LIST 6 - MISCELLANEOUS EXCHANGES

The following food items may be used in addition to the exchanges in the specified amounts:

ITEM	AMOUNT	CALORIES
Sapsago (green) cheese	1-2 tbsp/week	-
Egg whites	7 a week	17 each
Unsweetened fruit juice concentrate	1 oz (2 Tbsp)/day	60/oz.
Unprocessed bran	1-3 Tbsp/day as needed	9/Tbsp
Soy sauce or Dijon mustard	1 tsp/meal	4/tsp
Chestnuts	unlimited	14/nut
Seeds (as seasoning only)	less than 1/8 tsp/day	-
Teas: chamomile, red bush or linden	moderate amount	-
Gelatine, plain	1 oz/wk (4 envelopes)	95/oz

LIST 7 - AVOID AT ALL TIMES

Fats, oils
Butter, margarine
Nuts
Egg yolks
Salt: seasoned, onion, garlic, celery, MSG
Animal skins
Organ meats
Olives
Avocado
Alcoholic beverages
Coffee, decaf, teas other than above
Sugar, honey, molasses, corn syrup
Sorbitol, mannitol
Saccharine
Seeds (except as seasoning - less than 1/8 tsp/day)

"MEAT" COMPARISON CHART

This chart is not necessarily a complete listing of all the acceptable meat, fish and poultry, but a selection of the most popular choices. The values given are for a portion size of 3½ oz (100 grams). Items listed above the double lines are the preferred choices.

MEAT SOURCE	FAT (g)	CHOL (mg)	CALORIES	% CAL FROM FAT
Haddock	.09	60	77	1%
Red Snapper	.23	39	93	2.5%
Cod	.3	50	76	3.5%
Abalone	.25	54	49	4%
Sea Bass	.5	54	96	5%
Tuna, H_2O Packed	.9	63	126	6%
Pike	1.0	87	88	10%
Sole	.8	42	68	10%
Squid	.9	44	84	10%
Halibut	1.2	50	97	11%
Flounder	.8	50	67	11%
Scallops	1.4	52	112	11%
Chicken, White	4.9	87	163	27%
Clams	1.6	49	78	18%
Lobster	1.9	84	91	19%
Trout, Brook	2.1	55	101	19%
Turkey, White	3.8	76	175	20%
Oysters	2.2	50	90	22%
Swordfish	4.0	68	138	26%
Salmon, Pink	4.7	34	119	28%
Beef, Round	6.0	90	188	29%
Chicken, Dark (Prefer White)	6.5	87	171	34%
Beef, Flank	7.3	90	195	34%
Lamb Loin Leg	7.0	99	184	34%
Lamb, Lean	7.0	99	186	34%
Turkey, Dark	8.2	[illegible]	202	36%
T-Bone Steak	10.2	90	222	41%
Rump Roast-Good Grade	9.2	90	189	44%
Beef, Chuck	9.4	90	189	45%
Veal, Rump & Round	11.2	101	215	46%
Sardines	8.6	120	160	48%
Pork, Loin	14.1	88	252	50%
Beef, Lean Ground	15.0	90	245	55%
Crab	3.0	100	94	29?
Shrimp	.8	160	90	8%

1. The term "meat" refers to meat, fish and poultry.
2. Maximum amounts used: Flank Steak 3½ oz (100 gr.) contains 90 mg of cholesterol and 7.3 gr of fat. Items registering more than this in either category are not recommended.
3. Additions: a) Seafood: Oysters, Clams, Scallops, Squid, Mussels
   b) Beef: Lean Round Steak
4. Recent research validates that the cholesterol content of the mollusks is quite low and that the other sterols in these seafoods are not atherogenic.
5. While the revised values for the cholesterol in shrimp may be lower than the original figures, the amount is still quite high, and therefore not a suitable choice.
6. New research indicates that the level of 84 mg of cholesterol in lobster is not representative of all species of lobster. Some varieties contain well over the Pritikin maximum. Information especially on American Lobster is not available, so for now, lobster remains as an acceptable choice. It should be selected less frequently and perhaps heart patients should avoid altogether.
7. The fat content of salmon varies. Some types have up to 52% of calories from fat. Even at this higher level it is still considered an acceptable choice.

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Prepared Testimony

for the

Committee on Labor and Human Resources:

Hearings on Nutrition and Fitness in Public Health

United States Senate

Washington, D.C.

on

November 27, 1985

by
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The Honorable Senator Orrin G. Hatch, Chairman

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Mr. Chairman and members of the Subcommittee:

My name is Terry L. Bazzarre. I am an Associate Professor in the Department of Food and Nutrition, School of Home Economics, The University of North Carolina at Greensboro. I am also the director and founder of the RESHAPE program. Thank you for the opportunity to present testimony on behalf of the American Home Economics Association regarding the contributions of professional nutritionists and dietitians who are taking an active role in the development of community-based, nutrition education - lifestyle management programs. Such programs are aimed at reducing the mortality and morbidity of chronic diseases such as cardiovascular heart disease, hypertension, diabetes and obesity, and the health care costs and economic losses associated with these diseases, and most importantly, to improve the quality of life for participants in these programs.

The traditional approach to health promotion and disease prevention programs has centered around the delivery of services provided by physicians. Unfortunately, physicians in the U.S. receive little, if any, training in nutrition and health education. In addition, physicians must often direct their energies towards the treatment of acute care medical problems in both hospital and clinic settings. Physicians have consequently encouraged members of other professional health disciplines (such as nutritionists and dietitians) to play an increasingly active role in the delivery of health services. Through their academic training, nutritionists and dietitians are particularly well-suited to encourage the development of "healthier" behaviors. Students in nutrition/dietetics programs are required to take coursework in chemistry, biochemistry, anatomy and physiology that is identical to coursework required of pre-med majors. Additionally students take courses in psychology, sociology, education and child-family relationships. Finally students are required to take a range of courses in nutrition sciences, applied nutrition and food service management.

Nutritionists have come to recognize that it is difficult to change dietary habits among adults and children, and that traditional approaches to modifying food intake are largely unsuccessful. Thus, new strategies for modifying eating behavior are being developed and tested. The RESHAPE program is an example of the development and testing of new strategies for improving health through dietary modification. The problem of changing food habits has been approached through the process of lifestyle management and decision making. Since dietary concerns are only one example of problems that can be addressed in lifestyle management, the RESHAPE program has developed a multidisciplinary approach that includes goal setting and achievement, physical fitness and stress management. Professionals including exercise physiologists, psychologists, education counselors and the physician-director of the university student health center have all participated in various aspects of the development of this program.

The goals of the 12-week RESHAPE program are to favorably alter risk factors for chronic diseases (i.e., coronary heart disease, hypertension and diabetes). To date, about 250 individuals have been screened for program participation. Screening includes a review of each applicant's personal and family medical history, the measurement of weight, body fat and blood pressure, and the collection of a fasting blood sample for determination of total cholesterol, HDL-cholesterol and iron status. All individuals over 35 years of age as well as all individuals with a known medical history of heart disease, angina, hypertension and/or diabetes are required to obtain

physician's clearance prior to participation.

During the 12-week program, activity sessions which include walking and jogging are conducted three times each week and a 1 1/2 hour lifestyle management workshop is conducted weekly. The basic premise of the program is that weight control is only one component of wellness, and that efforts to achieve optimum health occur through appropriate lifestyle management practices. Furthermore, the program differs from traditional weight control programs in several ways. First, participants and staff work to facilitate the reduction of excessive fat stores rather than simply a reduction of body weight, since rapid body weight losses through severe food restriction results in weight losses due to dehydration and muscle wasting rather than the reduction of fat stores. Second, participants develop an aerobic fitness program in order to create an energy deficit since most overweight individuals consume the same or fewer calories as do "normal" weight individuals but tend to be significantly less active. Third, subjects are motivated to consider dietary and other health changes because they feel better about themselves as a consequence of becoming more physically and emotionally fit. Participants universally express surprise and satisfaction because they have more energy, not less. Finally, participants become aware of the need to develop a healthy medical profile by reducing risk factors associated with obesity through diet, exercise and lifestyle management.

The participants learn at the orientation meeting at the beginning of the program that our staff functions to help them make positive choices regarding everyday decisions that affect one's health and nutritional status. Many participants in RESHAPE have said that they weren't aware of the range of alternatives to foods offered at "fast food establishments." Thus, many participants learn to recognize the opportunity for positive (healthy) choices that occur throughout each day.

The results of research data collected from participants demonstrates the importance of consistent attendance during the program and of attending newly developed health habits. Body weight, body fat, cardiovascular fitness, blood pressure and blood cholesterol are all favorably reduced by participants who have good attendance records. Participants have ranged in age from 11 to 76 years, and have included individuals from a wide range of occupations including physicians, clinical psychologists, nurses and dentists. Physicians, psychologists and health directors from corporations in the Greensboro community are referring individuals to the program. The State Medical Director for Vocational Rehabilitation has approved the program as a service provider for clients of Vocational Rehabilitation Programs. It is clear that the local medical community recognizes the success and service of the RESHAPE program.

While the RESHAPE program is an example of a credible, medically-approved fitness program staffed by professionals, there are many entrepreneurs offering diet-fitness programs that are primarily concerned with making a profit. Many such programs are operated by staff with no certified instructors or counselors. A major concern that I have which is shared by many health professionals is that many individuals in commercial diet-fitness establishments refer to themselves as "nutritionists," "dietitians," and "exercise physiologists" because they have either read a book on the subject, taken a course in nutrition or exercise physiology or simply because they have a personal interest in fitness. Such individuals are not prepared by appropriate professional training and certification, and they represent a

danger to consumer health. Thus, I would like to encourage you and the distinguished members of your committee to consider the need for legislation regarding requirements for public and private diet-fitness programs. The American Home Economics Association, the American Dietetic Association, The American Medical Association and the American Collete of Sports Medicine have all developed standards of education and practice that should be considered in the development of staff/operations guidelines for diet-fitness programs.

Since many private programs are expensive and emphasize physical conditioning rather than health, there is also a need to consider legislation that would provide health-diet-fitness programs for the poor, for children through public instruction and for the elderly. The health of the elderly of tomorrow is dependent upon the development of healthy lifestyles among the children of today.

Thank you Mr. Chairman, and the members of your committee for the opportunity to share my experiences and concerns regarding nutrition and fitness. Should you need additional information regarding the RESHAPE program, I would be pleased to provide it.

The CHAIRMAN. We think that this hearing has been a very important hearing. We think many people will hear about it all over the world, as they should, and we hope that as a result of hearings like this, we will advance the cause of health promotion and disease prevention by leaps and bounds, and get people all over the world to start realizing that you can do something about your health, you can do something about preventing disease in your own individual lives and those of your families and friends.

Some have felt that I have gotten so interested in this that I have almost gotten obnoxious about it, because I am constantly pushing ideas that I have heard from each of you, and I will constantly do it. So if I am obnoxious, then I guess that is just the way I am going to have to be, because I believe that the testimony we have had today has been very, very beneficial and very helpful, not the least of which has been the testimony of the three of you.

So with that, will end these remarkable hearings and hope that many people will gain from the experiences we have had here today. I certainly have, and I am sure anybody else who will take the time to look and read and see will gain as much.

Thank you so much. We appreciate it.

We will recess until further notice.

[At 1:10 p.m., the committee was adjourned.]