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ABSTRACT

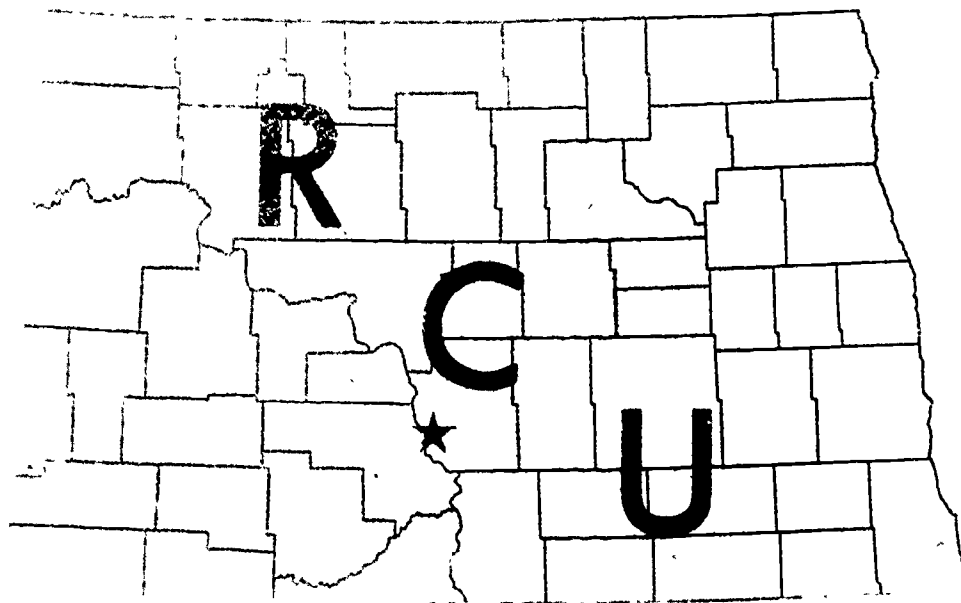
A study was made of the equipment used in different types of food service establishments to aid in the selection of equipment for food service classroom instruction. Food service instruction prepares students for food service positions, thus the equipment installed should be similar to that found in North Dakota food service establishments. Fifty-nine establishments in eight communities were personally contacted. Food service employers were asked to give the manufacturer, size, specific uses, frequency of use, and amount of training time required to operate and care for each item of equipment listed. Based on that information, two lists of recommended equipment were constructed. The first list recommends equipment for food service laboratories used for food service training, and the second is for a consumer-homemaking foods laboratory which provides occupational and consumer-homemaking courses. (Author/NJ)

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RESEARCH
SERIES
NO. 20

Descriptive Study of
FOOD SERVICE EQUIPMENT
Used in Different Types of
North Dakota Businesses



**NORTH DAKOTA
RESEARCH COORDINATING UNIT**
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DESCRIPTIVE STUDY OF
FOOD SERVICE EQUIPMENT
USED IN DIFFERENT TYPES OF
NORTH DAKOTA BUSINESSES

(PROJECT NO. 20)

BETTY ROERS

DEVILS LAKE PUBLIC SCHOOLS
DEVILS LAKE, NORTH DAKOTA

JUNE 1975

in cooperation with
NORTH DAKOTA STATE BOARD
FOR VOCATIONAL AND TECHNICAL EDUCATION
BISMARCK, NORTH DAKOTA

With grateful acknowledgement for the cooperation shown by the food service establishments surveyed. Appreciation is also extended to the North Dakota Home Economics Supervisor, Ms. Majore Lovering and Assistant Supervisor, Ms. Karen Botine. Also, to Dr. Don Eshelby, North Dakota Research Coordinator, and Mr. Jim Hunt, Devils Lake Vocational Director for their assistance with the study. Thank you, also to the Vocational Directors and Home Economics Teachers who made arrangements with food services in their respective towns. All these people made the study possible.

ABSTRACT

A study was made of the equipment used in different types of food service establishments, to aid in the selection of equipment for food service classrooms. It was felt that if the course was to prepare students for food service positions, the equipment installed should be similar to that found in North Dakota food service establishments. Fifty-nine establishments were personally contacted among eight communities, including a sizable area of North Dakota. It is hoped this study will aid in the selection of equipment and be a basis for future curriculum development.

Employers of food services were asked to give the manufacturer, size, specific uses, frequency of use, and amount of training required to operate and care, for each equipment item listed. Based on that information two lists of recommended equipment were constructed. The first list recommends equipment for a food service laboratory used only for food service training, and the second is for a consumer-homemaking foods laboratory which provides occupational and consumer-homemaking courses.

FOREWORD

Food service has been taught in North Dakota secondary schools since 1965. Up to this time the course had been taught in home economics laboratories. At present, space is being allotted for food service in the Multi-District Vocational Education Centers (the space will not be used for consumer homemaking). It seemed that if the course was to prepare students for food service positions, the equipment installed should be similar to that found in North Dakota food service establishments. As a result, a study was conducted to gather information concerning the food service equipment used, as little such data was available. It is hoped this study will aid in the selection of equipment and be a basis for future curriculum development.

The objectives were to survey North Dakota restaurants, cafes, drive-ins, pizza parlours, nursing homes, hospital kitchens and private clubs serving food. The data was collected as a basis for equipping food service rooms at the Multi-District Vocational Centers. Also, the study was to determine what training food service managers feel employees need to operate equipment properly. Upon completion of the study, it is hoped changes or additions can be made to the present Food Service curriculum.

In all, fifty-nine food service establishments were contacted, at Cando, Carrington, Grafton, Devils Lake, Jamestown, Minot, Grand Forks, and Fargo, including a sizeable area of North Dakota.

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METHODS

During the planning of the Devils Lake Multi-District Vocational Educational Center, questions arose as to what equipment was needed in the food service area. Little data was available as to the equipment used by food service establishments. As a result the North Dakota Board of Vocational Education proposed a study be made of the food service equipment used in North Dakota establishments. Upon completion of a survey of food service establishments, two lists of equipment should be compiled. One list of equipment would be recommended for a food service laboratory in a Multi-District Vocational Education Center and the second list would be equipment needed to provide food service training in a home economics classroom.

It was decided that a home economist with experience in food service would be hired for three months (480 hours), to develop the project and serve as director. Approximately 50% of that time would be spent personally contacting food services and the remaining 50% would be spent on developing surveys, working with consultants, writing the final report, and making arrangements for printing the final report. The director was jointly selected by the Devils Lake School District and the State Board of Vocational Education. The Devils Lake School District served as the subcontracting agency to carry out the project. Consultants for the project included the Devils Lake Director of Vocational Education, the State Research and Curriculum Coordinator, and the State Supervisor of Home Economics Education.

The following towns were selected by the State Board of Vocational Education as sites for the study of food service equipment. It was decided that four, six, or ten food service establishments would be visited in each town according to the size of town. Four food service establishments were visited in Cando, Carrington, and Cooperstown-Finley areas. Six establishments were visited in Devils Lake, Grafton, and Jamestown and ten sites in Minot and Grand Forks. In addition, North Dakota State University's food service at Fargo was selected. These towns were chosen to give a variety of size and because of their involvement with secondary food service education.

A survey form was constructed for gathering the information needed concerning food service equipment. The form was designed to answer the objectives for the study. It listed food service equipment and requested size, specific uses, and frequency of use by the food service establishment, and the training required to operate and maintain each piece of equipment.

The list of equipment for the survey form was constructed with the aid of equipment catalogs, and included equipment which was believed to be common to foodservice establishments. That list was taken to local food service employers to examine. Additions they suggested were added to the list.

METHODS - Cont.

The director experimented with different sizes for the form. It was believed it should be as short as possible, as not to discourage the employers with the length, and yet have adequate space for their comments. It was found that the form had seven columns and could be put easier into a horizontal, rather than vertical, standard 8½"X11" paper. To conserve as much space as possible for the employer's comments, the form was typed into an 11"X14" paper and then reduced, thus minimizing the space needed for the typed equipment columns.

It was felt when visiting the food service establishments as much information as possible should be gathered but with a minimum of inconvenience to the employer. Thus, an interviewer's form was constructed of questions the director would ask the employer. It asked for background information concerning the food service establishment and management, and for employer's views on aspects of interest to food service education (example - Number of handicapped employed).

Fifteen copies were made of both the equipment survey and the interviewer's forms. These forms were used in a field test. It was tested among six local food service establishments of various types that were not included in the final study.

As a result of the field test, changes were made on both the equipment survey and the interviewer's form. Pieces of equipment of minimum importance were deleted, as it was felt they were burdensome to the employer. Questions on the interviewer's form were rephrased to be more self-explanatory, and therefore gather more reliable data.

Twenty duplications were made of both the equipment survey and the interviewer's form (Both forms are found in the appendix). Additional copies were made later after the survey was conducted in several towns and found successful.

The director constructed a tentative calander for visiting the various towns. The smaller towns nearby were scheduled first, so that in case of error they could be more easily done over. Also when reaching the larger towns the director could concentrate on types of food services not found in the smaller towns.

The director contacted the Vocational Director or Home Economics teacher in each town one to two weeks in advance, and requested that they make appointments with a variety of food service operations in their area. It was felt that a local person should make the original contact with the food service employer, whenever possible, to show that the survey was of interest to the local school system. The appointments were made with the management of the food service. The employer's were told the purpose of the survey and that it would take one-half hour or longer, depending upon the amount of equipment they owned.

METHODS - Cont.

Before contacting the food services, the director met with the Vocational Director or Home Economics teacher who had made the appointments in the area. The local person gave the director the names and addresses of the people to be surveyed.

Food service establishments were contacted personally by the director. It was felt that with a personal visit the forms could be explained and questions could be answered, and more reliable data would result. It was successful as fifty-nine out of sixty of the food services visited were cooperative in completing the survey.

Whenever possible, the director assisted the food service employer in completing the survey forms. It seemed easiest for the employers to show the director their equipment and for the director to write the information they gave into the survey form. More comments were received and miscellaneous equipment were recorded, when the director was able to see the equipment.

The director also filled in an interviewer's form for each food service establishment visited.

Three visits were made on an average day. The majority of visits took one hour. Rush hours were avoided. It is suggested that a minimum of one and one-half hours be allowed between visits, to give time for delays or interruptions during the survey.

When visiting each town the director attempted to visit the designated number of food services for that town. In several cases more were visited. The director decided to visit all the franchise businesses that existed in her local area and avoid spending time on those in other areas. As a result, to still get a variety of types of food services, more than six were visited in Devils Lake. Consequently, fifty-nine food services were visited.

Upon completion of the survey in an area, "Thank you" notes were sent to each Vocational Director or Home Economics teacher, and each food service employer visited.

After visiting the food service establishments in each of the towns mentioned earlier, the information on the equipment survey and interviewer's form was tallied. The information for each piece of equipment was summarized and put into percentages. A basic form was devised to list the findings of the equipment survey. The information from the interviewer's form was also summarized and put into percentages. The original form used for the interviewer's comments was again used to list the findings. Both lists of findings were included in this report under "Findings and Analysis".

The "Introduction" and "Methods" sections of the final report was then written. Next, based on the findings, a list was compiled of

METHODS - Cont.

suggested food service equipment needed in the food service laboratory, and a list of equipment needed to provide training in the occupational home economics classroom. These lists of equipment were included when writing the final section of this report, "Conclusions and Recommendations".

FINDINGS AND ANALYSIS

Interviewer's Form

An interviewer's form was used to gather background information about the food service establishments and personnel visited (a copy of the form is given in the appendix). It is felt that the findings illustrate the scope of the equipment study. The recommended list of equipment for the classroom (taken from the form) was considered when constructing the list of equipment to be installed in food service laboratories. The interviewer's form also gave employer's attitudes toward different aspects of food service education.

The findings of the interviewer's form is ended by briefly listing additional comments of employers.

Number of employees - 1-10 in 26% of the operations visited
11-20 in 21% of the operations visited
21-30 in 17% of the operations visited

Volume (Number of guests served daily) as follows:

33% of food services - 100 - 300 guests /daily
33% of food services - Greater than 500 guests /daily
25% of food services - 300 - 500 guests / daily
8% of food services - 50 - 100 guests /daily
None of the food services had less than 50

Types of food services offered:

<u>Types</u>	<u>% of establishments visited</u>
Banquets	- 25%
Supper Club	- 24%
Health Care	- 20%
Fast Service	- 20%
Family Dining	- 19%
Institutional	- 17%
Catering	- 15%
Snack Bar	- 2%
Pancake House	- 2%

Hours of business - ranged from 7-24 hours /day for 6-7 days /week

FINDINGS AND ANALYSIS

Interviewer's Form - Cont.

Manager's background (including - Manager, assistant manager, supervisor, director, and chef)

Length of employment at present job:

Less than 6 months	-	15%
6 months to 1 year	-	9%
Greater than 1 year to 5 years	-	41%
Greater than 5 years to 10 years	-	24%
Greater than 10 years	-	11%

Prior experience in food service (before held present position):

Less than 1 year	-	23%
1 Year to 5 years	-	26%
Greater than 5 years to 10 years	-	18%
Greater than 10 years	-	33%

Formal training:

Yes	-	48%
No	-	52%

Types of training included - Franchise programs, Motel-Restaurant Management programs, Food Supervisor's courses, and college majors in Home Economics, Dietetics and Food Service Management.

Business employs handicapped at present:

Yes	-	40%
No	-	60%

Positions held - waiter, waitress, car hop, dishwasher, bus boy, pastry helper, vegetable preparer, cook's helper, salad girl, cook.

Most of the food services had employed handicapped persons, either physical or mental, at some time. Others said they never had any one apply, which could easily be true in the smaller towns. Those employers who had handicapped workers, now or in the past, talked favorably of hiring handicapped. It was noted that the mentally handicapped performed well in repetitious tasks, whereas, it was difficult for some

FINDINGS AND ANALYSIS

Interviewer's Form - Cont.

to hold positions with varied tasks. It was also difficult to include the mentally handicapped into dining room positions at nursing homes because of the need to identify different diets for residents.

Should safety in regards to operating equipment be:

Emphasized	-	78%
Touched upon	-	22%
Worker learns by himself	-	0%

It was noted, that those employers that indicated safety was "touched upon" rather than "emphasized" had steady, adult employees.

Five pieces of equipment highly recommended for the classroom. (Below is all the recommendations given by employers.)

Grill	-	29%	Steam Table	-	3%
Deep Fryer	-	29%	Coffee Maker	-	3%
Commercial Mixer	-	27%	Portable Food Warmer	-	2%
Convection Oven	-	17%	Bun Warmer	-	2%
Steam Jacketed Kettle	-	17%	Bun Toaster	-	2%
Meat Slicer	-	17%	Electric Roaster	-	2%
Broiler	-	15%	Stack Oven	-	2%
Microwave Oven	-	15%	Braising Pan	-	2%
Dishwasher	-	14%	Filters	-	2%
Food Chopper	-	12%	Can Opener	-	2%
Range	-	10%	Three Compartment Sink	-	2%
Walk-in Freezer and Cooler	-	8%	Lowerator	-	2%
Garbage Disposal	-	8%	Over-Under Refrigerator	-	2%
Blender	-	8%	Freezer	-	2%
Compartment Steamer	-	7%	Sandwich Unit	-	2%
Cash Register	-	5%	Malt Mixer	-	2%
Grinder	-	5%	Bulletin Board	-	2%
Pressure Fryer	-	5%	Soup Pot	-	2%
Toaster	-	3%	Electric Knife	-	2%
Conventional Oven	-	3%			

Cooking equipment preferred:

Gas	-	56%
Electric	-	21%
Some of both	-	23%

FINDINGS AND ANALYSIS

Interviewer's Form - Cont.

Gas was preferred by employers for its fast heat. It also is more economical than electricity in some areas. Loss of electricity will not affect the production of the food service with gas.

On the other hand, those that preferred electric heat felt it was more constant - easier to control, cleaner, less dangerous, and more economical in some areas.

Those employers who preferred some of both, electric and gas, generally preferred electric fryers and gas grills and stoves.

Interest in Food Service Education

No interest	-	4%
Fairly interested	-	55%
Very interested	-	41%

Employee roles observed: Dishwasher, bus boy, waiter/waitress, salad girl, cook, and baker.

Comments (given by the employers) :

Stainless steel counters for ease in cleaning and sanitation.
Stainless steel shelves preferred to galvanized, as galvanized will corrode.

Small equipment - should be stainless steel as it is better quality.

Portable equipment, whenever available for ease in transporting and cleaning.

Storage racks on wheels - preferred.

Consider use and placement of equipment before ordering. Purchase high quality equipment - cheap equipment is more costly in the long run. (Do not rely on cost figures as a guide to quality) Repairs are very expensive in time and money. Order equipment from nearby location, if possible, it will be easier to get service and parts. Inquire about service policies before ordering equipment.

FINDINGS AND ANALYSIS - Cont.

Food Service Equipment Survey

The following pages of this report give the findings of the food service equipment survey. Before reading those findings a few explanations would like to be given concerning the terms used.

Each piece of equipment begins with the column headed, "Amount Used". The employers of food service establishments were asked to rate the equipment 1 - 4, according to the frequency of use of that item. The numbers 1 - 4 represented, (1) - Once weekly, (2) - Several times weekly, (3) - Once daily, and (4) - Several times daily. It should be explained that if an item was given a (4) and is stated in the findings as "Several times daily", it would be used a minimum of several times daily and could be in constant use. At times pieces of equipment were used less than once weekly which was noted on the survey form. In the findings "Once Weekly" and "Less than once weekly" were combined. The findings list the percentages for the various amount of use for each piece of equipment.

"Training Required" refers to the amount of training needed for a person new to food service to operate and clean that piece of equipment. At the beginning of the study employers were asked to check those items which required training. This was difficult, as it was debatable what would be considered training. Therefore, the director changed it from a check to a range of 1 - 3. Employers were told that the numbers 1 - 3 represented, (1) - no instruction or brief instructions; (2) - an experienced employee showing the new person, several times, the techniques for operating and cleaning; and (3) - an experienced worker accompanying the new person for two days or more, or at least supervision while operating and cleaning the equipment. The numbers 1 - 3 were briefly stated in the findings as (1) "Brief Instructions", (2) "Several Demonstrations", and (3) "Guidance for extended time". In some cases it seemed as if training was not a factor, for example, coolers and freezers, then N/A (not applicable) was written. Otherwise, the choices of 1 - 3 given the majority of times by employers were put into the findings. If two choices were close in frequency, they were both given.

Employers felt training was needed for different reason. For example, a meat slicer employers felt needed supervision because of the danger factor. Whereas, for a convection oven, operating the machine was easy, however, new people had to learn how to convert the times and temperatures used with a conventional oven to that for a convection oven. These reasons were stated under the column headed, "Training Objectives".

Next was listed all the uses given by employers for that piece of equipment.

FINDINGS AND ANALYSIS - Cont.

Food Service Equipment Survey

Comments included the actual percentage of kitchens visited that had that piece of equipment and the size most often found. If a brand of equipment was stated, it was made not as a recommendation but as an observance. Any other information that employers gave which was of interest to the study of equipment, was stated.

At the end of the list of equipment is given a miscellaneous list. These are equipment items not listed on the survey form but were seen by the director when visiting the food service. The number of food services that the items were seen at is given in the first column. These items will not be installed in a secondary food service program at present, but the information may be used by secondary programs, post secondary programs, and food service employers.

MIXER

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
73% Several times daily	Several demonstrations	Various uses Operation of machine and attachments
17% Once daily		
6% Several times weekly		
4% Once weekly or less		

USES

Mix - cakes, cookies, breads, desserts, pancakes, waffles, pastries, dumplings, meat loaf, sandwich spreads

Whip - toppings, eggs, potatoes (instant and cooked), butter

Blend - salad dressings, dry milk

COMMENTS

Mixers were found in 86% of the kitchens visited. Of these mixers 94% were commercial mixers and 6% were home models. However, home models were usually in addition to a commercial model.

The size of mixer most often found (47%) was the twenty quart. Smaller sizes are not adequate for mixing breads.

(56% of the mixers were Hobart and 17% were Kitchen Aid, which is a smaller model made by Hobart)

MEAT GRINDER

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
37% Several times weekly	Several demonstrations	Various uses
37% Once daily		
19% Once weekly or less		
7% Several times daily		

USES

Grind - meat, vegetables, onions, carrots, celery, sausage, etc.

Crumb - bread, etc.

Grate - cheese, etc.

Shred - cabbage, etc.

COMMENTS

Mechanical devices for grinding were found in 37% of the kitchens visited. Of those, 68% were attachments to mixers and 32% were individual machines.

BLENDER

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
60% Once daily	Brief instructions	Various uses
20% Several times daily		
20% Several times weekly		

USES

Puree - meats for Nursing Home residents & hospital patients
Mix - malts, spaghetti sauce, thickenings

COMMENTS

Blenders were found in 18% of the kitchens visited. Of those blenders, 55% were two or three speed commercial blenders and 45% were four or seven speed non-commercial models.

VEGETABLE CUTTER or CHOPPER

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
42% Several times weekly	Several demonstrations	Various uses
37% Once daily		
21% Several times daily		

USES

Slice - potatoes, carrots, etc.
Chop - onions, celery, peppers, eggs, meat, etc.
Grate - potatoes (for hash browns), carrots, cheese, etc.
Shred - cabbage, lettuce

COMMENTS

Mechanical devices for vegetable chopping and cutting were found in 53% of the kitchens visited. Of those devices 29% were attachments to mixers and 71% were individual machines.

(55% of the individual machines were Hobart)

Individual cutters were of the following types:

- 36% - buffalo choppers
- 32% - vertical cutters
- 9% - small vertical cutters by Robot Coupe
- 23% - Qualheim cutters

MEAT SLICER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
60% Several times daily	Several demonstrations	Safety precautions
18% Once daily	or guidance for extended	
12% Several times weekly	period of time	
10% Once weekly or less		

USES

Slice - Meats - cold-cuts, roasts, ham, sausage, steaks, ribs, etc.
Vegetables - pepper rings, tomatoes, cabbage, onions,
potatoes, carrots, lettuce, large pickles, etc.
Bread

COMMENTS

Meat slicers were found in 68% of the kitchens visited.
36% had 10" blades
31% had 12" blades
8% of the slicers were automatically fed
Those kitchens without meat slicers used electric knives for their purposes.
(59% of the meat slicers were Hobart)

BAKER'S TABLE

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
57% Several times daily	* N/A	* N/A
43% Once daily		

USES

Mixing and rolling doughs. Used as a cutting board. Used for food preparation.

COMMENTS

Baker's Tables were only found in 15% of the kitchens. The remaining establishments did not have specifically designed baker's tables but use other tables or counters (the majority being stainless steel) for those purposes.

Stainless Steel tables are preferred by Health Standards do to sanitation factors.

* - Not applicable

BAKER'S SCALE

No baker's scale was seen. However, most food service operations own and use small scales for portion control.

COMPARTMENT STEAMERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
75% Several times daily	Several demonstrations	Various Uses
19% Once daily	or guidance for	Safety precautions
6% Once weekly	extended time	

USES

Reconstituting foods (frozen).

Vegetables, potatoes (brown or cook), dumplings, rice, cooked eggs, soup, chicken, turkey, weiners, lobster, and heating left-overs.

COMMENTS

Steamers were found in 28% of the kitchens visited. The different size steamers found were as follows:

37% - Two compartment

31% - Three compartment

32% - One compartment (circular openings)

It is important to have the proper steam hook-up. Several food services noted that their steamers were not hooked-up properly and lost efficiency.

STEAM JACKET KETTLE

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
64% Several times daily	Guidance for extended	Various uses
27% Once daily	time	
9% Several times weekly		

USES

Cook - Vegetables (frozen and canned), stew, soup, chili, casseroles, gravy, cooked eggs, cooked cereal, noodles, barbecues, weiners, coffee, and etc.

Saute - all foods

Heating - leftovers, etc.

COMMENTS

Steam jacket kettles were found in 29% of kitchens visited. They were most often found in hospital and school food services. It is believed that the 20 quart kettle is being installed in many new restaurants.

The size most often found was the twenty quart.

Kettles are available in a variety of types. They are either a stock pot with a drain or tilting. They may be either fully jacketed or half jacketed. It was preferred that the fully jacketed kettles have low sides or tilt to prevent workers from receiving burns. Tilting was also advantageous when cleaning. There was no considerable difference in the number of fully - or half jacketed kettles found.

VERTICAL OR STACK OVEN

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
72% Several times daily	Brief instructions	Control Temperatures
21% Once daily		
7% Less than once weekly		

USES

Baking - pastries, breads, cakes, etc.

Browning & Roasting - meats

Sealing - steaks, roasts, etc.

(All of baking that is done in a conventional oven.)

COMMENTS

Vertical ovens were found in 24% of the kitchens visited.

The stack ovens ranged in size from one to four ovens per unit. Of those ovens, 54% were approximately 33" wide and 46% were approximately 42" wide.

The height of the top oven seemed to be a critical factor. In some cases they were too high for the worker to comfortably reach into the oven.

PIZZA OVEN

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
80% several times daily	Brief instructions	Control temperatures
20% Several times weekly		

USES

Bake - pizza, etc.

COMMENTS

Pizza ovens included both the small ovens designed for frozen pizzas and the pizza ovens used in pizza parlours. Of the kitchens visited, 8% used pizza ovens.

The small ovens for frozen pizza were on counter models and the majority held one pizza. The larger pizza oven used in pizza parlours resembled a stack oven with approximately a 40" width.

CONVECTION OVENS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
84% Several times daily	Several demonstrations or guidance for extended time	Converting baking times and temperatures
11% Once daily		
5% Several times weekly		

USES

Breads, rolls, cookies, cream puffs, garlic toast, pastries, grilled sandwiches, casseroles, vegetables, potatoes, pizza burgers, dressing, and etc.

Chicken, barbecued ribs, roast, hamburgers, meat loaf, drumsticks, bacon, pork patties, precooked beef patties, halibut, & etc.

COMMENTS

Convection ovens were found in 25% of the kitchens visited. However, when employees were asked for specific equipment they would highly recommend for high school food service class rooms, convection ovens ranked fourth of a list of thirty-eight suggested equipment items. Those pieces of equipment which were rated above the convection oven were commercial mixers, deep fryers, and grills.

Single ovens were found most often (70%). The remaining ovens were double ovens.

Convection ovens are made with two types of doors, those opening to the side or those opening up and down. Ovens are made with one or two doors, of the kitchens visited, all had two doors. 78% of the employers interviewed preferred the doors which opened to the sides. Advantage given for the doors opening to the sides, was the greater ease of reaching into the oven. Whereas doors opening up and down, the lower door can be used for resting pans on as they are put in or taken out of the oven, and also these doors take less space.

MICROWAVE OVEN

<u>Amount Used</u>	<u>Training Required</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Cooking utensils suggested for use in oven

USES

Thaw - frozen foods

Warm - rolls, buns, pie, hot chocolate, soup, sandwiches, spaghetti, lasagne, and precooked foods

Cook - finish off medium well and well done steaks when number of steaks are to be served at one time to a group.
Meat if guest does not want it fried.

COMMENTS

Microwave ovens were found in 28% of the kitchens visited. They were found in businesses (such as restaurants & drive-ins) rather than nursing homes, hospitals or school kitchens. The microwave ranked seventh in the list of thirty-eight recommended equipment items. It was also mentioned that a microwave may minimize the need for other equipment such as a bun warmer or a soup pot.

100% of the microwaves seen were commercial models which are heavy duty and faster than home models. Wattage of commercial ovens range from 600 - 700 watts to 2000 watts or greater. Higher wattage gives greater speed.

BROILER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
83% Several times daily.	Brief instructions	Control Temperature
9% Several times weekly		
8% Less than once weekly		

USES

Broil - steaks, pork chops, fish, lobster, crab, kabobs, etc.

Toast - garlic toast, english muffins

Brown - fish, potatoes

COMMENTS

Broilers were found in 39% of the kitchens visited. The majority of broilers were found in restaurants or supper clubs. Very few were found in hospitals, nursing homes, schools, and fast food service establishments.

Of the above broilers 76% were closed units and 24% were open char broilers.

Only 13% of the broilers were part of a commercial range. The remaining were individual units.

A variety of sizes were found. The broilers ranged in width from:

35%-24" - 29"

40%-30" - 35"

25%-36" or greater

RANGE

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
90% Several times daily	Brief instructions	Control temperatures and cleaning technique
6% Once daily		
4% Several times weekly		

USES

General cooking purposes.

Potatoes, vegetables, soups, hash browns, deep frying, poached and scrambled eggs, etc.

COMMENTS

Ranges were found in 80% of the kitchens visited. Of those ranges 42% had closed burners and 35% had open burners. 23% of the ranges had both closed and open burners. The closed burners are safer (on gas ranges) but the open burners have faster heat.

The size on range most often found (46%) was the 36" with one oven.

Next, was the double range with two ovens (29%).

DEEP FAT FRYERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
78% Several times daily	Several demonstrations	Safety precautions
9% Several times weekly		Cleaning techniques
9% Once weekly		
4% Once daily		

USES

Fry - french fries, onion rings, seafoods, fish, chicken, breaded veal, donuts, etc.

Brown - fish, oysters, etc.

COMMENTS

Deep fat fryers were found in 76% of the kitchens visited. Fryers were least often found in hospitals and nursing homes.

The fryers ranged in sizes from a capacity of 15lbs. to greater than 80lbs. of shortening or oil. The size most often found was 20 or 30 pound capacities.

It was generally felt that electric deep fat fryers were easier to clean, whereas, the gas fryers had quicker heat recovery.

PRESSURE FRYER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Guidance for extended time	Safety precautions

USES

Fry - chicken, fish, seafood, pork chops, steak, potatoes, etc.

COMMENTS

Pressure fryers were found in 12% of the kitchens visited.

The fryers were found in fast service food operations. They put out a product of equal or better quality to that of the deep fryer, in a less amount of time.

The size of fryer most often found had a capacity to cook 24 chicken pieces at one time.

ROTISSERIE

No rotisserie was seen during the survey. One was seen during the field testing at a snack shop in a shopping center. It was used for broiling weiners and warming buns. It held sixteen weiners.

TOASTER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
95% Several times daily 5% Once daily	Brief instructions	Cleaning techniques

USES

Toast - bread, english muffins, and buns

COMMENTS

Toasters were found in 76% of the kitchens visited.

Of those toasters seen, 82% were commercial, four slice and 24% were conveyor toasters. The personnel of the kitchens visited felt that commercial toasters had more constant heat patterns than the non-commercial models.

(67% of the toasters were Toast Master)

GRILL

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
79% Several times daily 11% Several times weekly 5% Once daily 5% Once weekly	Several demonstrations	Cleaning and care

USES

Steak, hamburger, ham, bacon, sausage, liver, browning chicken, swiss steak, etc.
French toast, pancakes, eggs, american fries, grilled sandwiches, toasting buns, etc.

COMMENTS

Grills were found in 90% of the kitchens visited. Of those grills 36% were top of the range models and the remaining were individual models.

The grills were found in a variety of sizes ranging from 18" X 24" to greater than 48" X 30". The most common size was the 36" X 30".

It was felt that the electric grills had more constant heat and the gas grills had quicker heat recovery.

COFFEE MAKERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% several times daily	Brief instructions	Operation of machine

USES

Coffee and hot water

COMMENTS

Coffee makers were found in 58% of the kitchens visited.

Coffee makers can be leased or owned. Leasing is more convenient if the food service is of small volume but for a large volume operation buying the machine is generally more economical. The companies that loan machines have different policies as to the terms involved.

The five burner coffee maker was found most often (65%) in the operations visited.

The majority of coffee makers had direct water hook-ups. Only 6% had the type of coffee maker where the water was poured into the machine.

(65% of the coffee makers were Bunn - O - Matics.)

COFFEE URN

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
88% Several times daily	Brief instructions	Operation of machine
6% Once daily		Coffee proportions
6% Several times weekly		

USES

Cook - coffee

Hold - coffee and hot water

COMMENTS

Coffee urns were found in 29% of the kitchens visited. Of those urns the majority were found in hospitals and businesses which served banquets.

The urns ranged in size from 5 gallons to 12 gallons. The most common size was the 9 to 10 gallon model.

COFFEE PERCOLATOR

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Coffee proportions

USES

Percolate - coffee

Hold - coffee and hot water

COMMENTS

Percolators were found in 15% of the kitchens visited. They were most often found in nursing homes.

The percolators ranged in size from 36 cup to 100 cup.

ICE MAKER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% several times daily	Brief instructions	Machine maintenance

USES

Ice - cubed or flaked

COMMENTS

Ice makers were found in 69% of the kitchens visited.

The capacity of ice makers ranged from 25lbs to greater than 200lbs. 50% had a capacity of 100 - 200 lbs.. 16% of the food services had on counter ice dispensers.

The cubed ice is preferred for water and soft drinks. However, the flaked ice can be used for both beverages and displays.

MALT MIXER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
94% Several times daily 6% Several times weekly	Brief instructions	Operation of machine Cleaning techniques

USES

Mix - malts, shakes, etc.

COMMENTS

Malt mixers were found in 36% of the food services visited. The majority were found in restaurants and drive-ins.

The 3 spindle malt mixer was the size most often found.

(65% of the mixers were Hamilton Beach models.)

HOT CHOCOLATE DISPENSER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Mix and hold - hot chocolate

COMMENTS

Hot chocolate dispensers were found in 22% of the food services visited.

Dispensers can be bought or leased

ICE CREAM COOLER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Hold - ice cream, sherbet, shrimp, chicken, meats, etc.

Cool - Sundae glasses, ice cream dishes, etc.

COMMENTS

Ice cream coolers were found in 42% of the food services visited. In some cases, they were used as additional freezers to store frozen foods.

The size most often found was the 40" - 48" length by approximately a 30" width.

SOFT DRINK DISPENSER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Operation of machine

USES

Dispense - pop

COMMENTS

Of the food services visited, 54% had soft drink dispensers. Those dispensers were found in businesses rather than hospitals and nursing homes.

The dispensers may be leased or bought.

Pop dispensers may use either pre-mix or post mix. When pre-mix is used the syrup and carbonation is contained in one tank. Whereas, the post mix tank supplies only the syrup and the owner must furnish carbon dioxide tanks.

JUICE DISPENSERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Filling machine

USES

Dispense juice

COMMENTS

Juice dispensers were found in 20% of the food services visited.

The size of dispenser most often found (50%), held one flavor with a 4 - 5 gallon capacity.

92% of the dispensers had visual displays of the continuous mixing.

REFRIGERATED SHOWCASE

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Hold - pies, salads, toppings, puddings, cakes, jello, cheesecake, juices, coffee creamers, etc.

COMMENTS

Showcases were found in 24% of the food services visited. They were generally 3' - 4' wide and 3' - 4' high.

SOFT SERVE FREEZERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
80% Several times daily	Several demonstrations	Cleaning Techniques
20% Once daily		

USES

Serve - soft serve cones, shakes, sundaes, splits, a la mode, etc.

COMMENTS

Soft serve freezers were found in 12% of the food services visited. They were used by a number of different types of food services such as fast service, restaurants, and schools.

A variety of accessories and sizes of soft serve freezers were found. The freezers had one or more flavors. Some models having more than one flavor, combined several flavors into one serving, giving an attractive, unusual ice cream treat.

Some models had malt mixers attached. These, in some instances, were the only malt mixers used by that food service.

Other models of freezers had refrigerated compartments for holding ice cream toppings.

All the freezers seen were self-supported models. However, smaller capacity, on counter models, are available.

REFRIGERATOR AND/OR COOLER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training objective</u>
100% Constant Use	* N/A	* N/A

USES

Store - dairy products, fresh fruits, and vegetables, meats, salads, , desserts, leftovers, rolls for raising, beverages, etc.

Thaw - frozen foods.

COMMENTS

Reach-In refrigerators were found in 90% of the kitchens visited. Of those 62% approximately, were commercial models.

The size of refrigerator most often found was the single model with one full length door. Next, was the double refrigerator (32%) with the majority having two full length doors and the remaining models having three or four doors.

Walk-in coolers were found in 80% of the kitchens visited. Of those 7% had reach-in doors.

A wide range of sizes for walk-ins existed. After grouping the sizes, it was found that the following percentages of kitchens owned each size:

- 37% - 5'-8' X 5'-8'
- 18% - 9'-12' X 9'-12'
- 8% - Greater than 12'X12'

The majority of employers strongly recommended walk-in coolers opposed to reach-in refrigerators. The reasons given were that walk-ins offer a greater amount of available space and that bulky items (such as cases of vegetables) can be stored.

SANDWICH UNIT

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Cleaning Techniques

USES

Hold - relishes, garnishes, dressings, coleslaw, potatoe salad, cheese, etc.

COMMENTS

Sandwich units were found in 19% of the kitchens visited. 60% of those units were 18"-24" X 24"-30".

FREEZERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Constant use	* N/A	* N/A

USES

Store - meat, seafood, fish, french fries, vegetables, fruit juices, breads, rolls, cakes, pies, ice cream, toppings, etc.

COMMENTS

At least one freezer was found in every kitchen visited. Below is given the percentage of kitchens using each type of freezer:

66% - walk-in
30% - uprights
22% - chests

Upright freezers were preferred to chest freezers for inventory purposes, however, chest freezers (per cubic foot) will hold a larger amount of food.

Walk-in freezers were strongly recommended by employers for greater space and storage of bulky items. They ranged in size as follows:

52% - 4'-8' X 4'-8'
34% - 5'-9' X 10'-12'
10% - 10'-12' X 10'-12'
4% - Greater than 12' X 12'

MILK DISPENSERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Operation of machine

USES

Dispense - milk

COMMENTS

Milk dispensers were found in 42% of the food services visited. Of those, 64% held two 5-6 gallon cartons of milk.

In the past, milk dispensers were furnished by the dairy businesses, however, that policy was discontinued. A food service may still have a milk dispenser furnished if it was installed before the policy changed.

PORTABLE FOOD WARMER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
74% Several times daily	Brief instructions	Techniques of retaining food quality
11% Once weekly or less		
7% Several times weekly		
7% Once daily		

USES

Hold - meat, vegetables, potatoes, gravies, soups, stews, chili, barbecues, etc.

COMMENTS

Portable food warmers were found in 44% of the kitchens visited. Of those warmers 65% were self-supporting units and 35% were on counter models. Included in the on counter models were units similar to steam tables and soup warmers.

The self-supporting portable warmers ranged in size from one to four full pans (12" X 20") 37% of those warmers held three pans and another 37% held four pans.

The majority (36%) of the on-counter warmers held one round pan with a capacity of 1-2 gallons.

When employers were asked if they preferred to use portable steam warmers with or without water the majority preferred without water.

STEAM TABLE

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
85% Several times daily	Brief instructions	Techniques of retaining food quality
9% Once daily		
3% Several times weekly		
3% Once daily		

USES

Hold - meats, vegetables, potatoes, gravies, soups, stews, chili, hot cereal, etc.

Warm - toast, buns, any precooked foods

COMMENTS

Steam Tables were found in 56% of the food services visited. It should be noted that that figure does not include portable food warmers which are used for similar purposes.

A variety of sizes of steam tables were found. Some tables held only the rectangular steam pans, while others held both rectangular and round pans. The size most often found (35%) held four full (12" X 20") rectangular steam pans.

59% of the steam tables required moist heat and 18% required dry heat. The remaining 23% could be used with water or without water.

DISHWASHER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Several demonstrations	Operation of machine Cleaning and care of machine

USES

Wash - Dishes, tray, etc.

COMMENTS

Mechanical dishwashers were found in 81% of the kitchens visited.

Of those dishwashers only one was an undercounter commercial model and that was found in a fast service kitchen, where few dishes were used. That model was not recommended as it did not have a drying cycle.

Dishwashers were of the following types:

- 63% - single tank, door type machines
- 17% - flight type machines
- 15% - Rack conveyor machines
- 5% - under counter model

HOSE ATTACHMENT

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Spraying off - dishes, wastepaper baskets, garbage barrels, etc.

COMMENTS

A hose attachment of some type was used in 63% of the kitchens visited.

Of those 89% were commercial models and the remaining were self - constructed with hose and sprayer nozzles purchased from hardware stores.

BOOSTER WATER HEATER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Heat water - for dishwasher rinse cycle

COMMENTS

The rinse water of a dishwasher is required to reach 180 degrees F to meet health standards.

The majority of food services have booster water heaters if they have dishwashers. 80% of the heaters had a capacity of 15 - 25 gallons.

Alternatives to a booster heater are, converters or mixers on the central water heater or steam injected into the dishwasher.

SCULLERY AREA

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
96% Several times daily 4% Once daily	Brief instructions	Cleaning techniques

USES

Cleaning - pots, pans, preparatory dishes, mugs, etc.
- vegetables, and fruits.

COMMENTS

The majority of kitchens visited had areas designed for scullery. The remaining kitchens used their general dishwashing area for that purpose.

97% of the scullery areas were stainless steel. Stainless steel, three compartment sinks are encouraged by the health department.

Scullery areas had the following number of sinks:

- 53% - three sinks.
- 42% - two sinks
- 5% - one sink

With the following lengths for sink and counter space:

- 70% - 7' - 10'
- 17% - 4' - 6'
- 13% - 11' - 15'

It was recommended by employers that a garbage disposal be installed in the scullery area.

SINK HEATER

Sink heaters were found in 3% of the kitchens visited. They were used in the scullery area as a means of sanitizing pots and pans.

BUS CARTS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Storing - clean and soiled dishes.
Transporting - clean and soiled dishes, food, etc.
Serving - hold foods in serving lines

COMMENTS

The majority of kitchens visited had some type of bus cart. The one most often found (69%) was the stainless steel, three shelf with each shelf measuring 17" X 28". The next most popular was also stainless steel with three shelves, however, they measured 24" X 30".

DISH CARTS AND DISPENSERS

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	* N/A	* N/A

USES

Store and transport dishes

COMMENTS

Dish carts or dispensers were found in 17% of the kitchens. (Bus carts used for those purposes were not included). Only mobile dispensers were included.

Carts or dispensers were found in different forms. Of those, 67% were the self leveling dispensers ("lowerators") and the remaining were dish carts. 60% of the dispensers contained two cylindrical compartments for storage of specific dinnerware such as cups, saucers, dinner plates, etc. The remaining dispensers had four cylindrical compartments or held dish racks.

The majority of carts had approximately the following dimensions:
24" width X 30" length and a 30" depth.

The carts seen did not have dividers, however, dividers are available.

Employers preferred the dispensers because of less breakage and the carts for greater storage capacity.

FAT FILTER

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
66% Once daily	Several demonstrations	Operation of machine
20% Once weekly		
7% Several times weekly		
7% Several times daily		

USES

Filter - shortening from deep fat fryers and pressure fryers

COMMENTS

Mechanical devices for filtering shortening were found in 15% of the kitchens visited. Of those, 33% were part of the electric deep fryer and 67% were individual machines.

64% of the kitchens visited used non-mechanical devices for filtering shortening. Of those 88% used the cone-shaped filters.

HOOD OVER COOKING AREA

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Several demonstrations	Cleaning techniques

COMMENTS

A hood is required above the cooking areas, which include grills, fryers, broilers, and ranges.

The majority of food services had the open mesh type of filters, which could be taken out and put through the dishwasher for cleaning.

GARBAGE DISPOSAL

<u>Amount Used</u>	<u>Training Requested</u>	<u>Training Objective</u>
100% Several times daily	Brief instructions	Care and operation of machine

USES

Dispose - foods

COMMENTS

Garbage disposals were found in 68% of the kitchens visited. Several employers of those kitchens without disposals, recommended they be installed.

Commercial, heavy duty disposals were suggested. The majority of disposers were either commercial 3/4 HP or commercial 1 1/2 HP.

MISCELLANEOUS EQUIPMENT

Food Services	Equipment	Amount Used	Training Required
3	Coffee Grinder	Several times daily	Brief instructions
3	Meat Tenderizer	Several times weekly	Several demonstrations
6	Meat Saw	80% Several times weekly 20% Once daily	Guidance for extended time
1	Patty Maker	?	?
7	Vegetable peeler	50% Once weekly 25% Several times weekly 25% Once daily	Brief instructions
1	Breading Machine (Makes bread crumbs and coats food)	Several times daily	Several demonstrations
1	Thaw Box	Several times daily	Brief instructions
3	Proof Box	Once or more daily	Brief instructions
1	Retarder	Once or more daily	Brief instructions
2	Dough Roller	Several times daily	Guidance for extended time
1	Bread Molder	Several times daily	Several demonstrations
2	Bun Maker	Once daily	Brief instructions
1	Donut Dispenser	Once daily	Brief instructions
1	Scale-O-Matic (Divides dough into specified weight)	Several times daily	Brief instructions
1	Bun Slicer	Once daily	Brief instructions
3	Bread Slicer	Several times daily	Several demonstrations
2	Drip Coffee Maker	Several times	Brief instructions
2	Braising Pans	Once Daily	Guidance for extended time
1	Dessert Kettle (Steam jacket with fast cooling)	Several times daily	Brief instructions

Miscellaneous Equipment - Cont.

<u>Food Services</u>	<u>Equipment</u>	<u>Amount Used</u>	<u>Training Required</u>
4	Revolving Oven	Several times daily	Brief instructions
4	Pass-Through Oven	Several times daily	Brief instructions
0	Recon-Vector Oven ? (Seen at North Dakota Hospitality Convention. Cooks slow, no movement of air, heat coils around oven.)		?
0	Pressure Barbecuer ? (Seen at North Dakota Hospitality Convention. *"Char real hickory wood under pressure to force the hickory flavor throughout meat")		?
4	Donut Fryer	Once daily	Several Demonstrations
2	Waffle Irons	Several times daily	Brief instructions
2	Electric Can Opener	Several times daily	Brief instructions
2	Hot Water Measure (Measures water and when reaches amount desired, shuts off water)	Several times daily	Brief instructions
3	Pot & Pan Washer	Several times daily	Several demonstrations
3	Glass Washer	Several times daily	Guidance for extended time
1	Cart Washer	Several times daily	Several demonstrations
1	Garbage can Washer	Once daily	Several demonstrations
1	Sterilizer	Several times daily	Several demonstrations
1	Mobil Sink	Several times daily	Brief instructions
1	Pollution Packer	Several times daily	?
1	Pan Racks or Files (Pan storage)	Several times daily	N/A
8	Food Conveyors (Hospitals and nursing homes)	Several times daily	Brief instructions
3	Hot/Cold Boxes	67% Several times daily 33% Once daily	Brief instructions
2	Food Service Carts (Holds plates ready for serving)	Once or more weekly	Brief instructions

* Smokaroma (brochure) Leefac, Inc. Boley, Okla. 74829

MISCELLANEOUS EQUIPMENT - Cont.

<u>Food Service</u>	<u>Equipment</u>	<u>Amount Used</u>	<u>Training Required</u>
9	Hot Food Cabinets (Size - single, 6' high holds 35 - 40 bun pans (18" X 26"))	60% Several times daily 20% Several times weekly 20% Once weekly	Brief instructions
2	Soup Warmer (Warms one or two servings of canned soup)	Several times daily	Brief instructions
2	Coffee Warmer	Several times daily	Brief instructions
1	Coffee Thermos	Once weekly	Brief instructions
4	Coffee Dispenser	Several times daily	Brief instructions
1	Bun Steamer	Several times daily	Brief instructions
2	Mug Coolers	Constant Use	Brief instructions or Several demonstrations

CONCLUSIONS & RECOMMENDATIONS

Fifty-nine food service establishments were personally contacted in North Dakota. Data was compiled on the equipment used in those food services. Information was collected from employers concerning frequency of use, size, specific uses, and training required to operate and clean each item. Based on that information two lists of equipment were constructed to be used as a guide when developing occupational food service laboratories (this facility will be used only for food service training). The second list recommends equipment to be added to a consumer homemaking foods laboratory which also wishes to provide occupational training.

The equipment lists were arrived at through a process of elimination. Only the equipment commonly found in the food service establishments or that were highly recommended by employers were considered. Due to the limited use of the equipment in a classroom situation, items which employers felt required minimum training to operate and were not essential to food preparation were often deleted, for example, milk dispensers. Thought was also given to the nutritional value of foods and on that basis a pop dispenser was deleted. With those factors in mind the lists of equipment were constructed.

The list of equipment for a consumer homemaking foods laboratory is shorter than the list for a food service laboratory. It was assumed that the consumer foods room would have equipment previously installed which could be used for food preparation, for example, ranges. Space was also a consideration, therefore, an undercounter dishwasher was recommended.

No recommendation was made as to gas or electric equipment. It is suggested that the comments concerning utilities given by the employers surveyed, and found in "Findings and Analysis" pages 7-8 of this report, be reviewed. The cost of utilities in the community must be considered, as in some areas gas is more economical while in others electricity is. Therefore, the choice of utility depends upon the cost in the area.

It is felt that the recommended lists of equipment will be valuable to educators concerned with equipping a food service laboratory. Installing equipment similar to that used in North Dakota food service establishments will aid in providing students with simulated experiences and adequate training for food service employment.

RECOMMENDED EQUIPMENT

In preparing the lists of recommended equipment, the first priority was the % of kitchens visited which had each equipment item. The majority of equipment items listed below were found in 50% or more of the kitchens. Some of the cooking equipment suggested did not reach 50% because of the various equipment used for similar purposes, for example, different ovens. In these cases, the items highly recommended by employers or items which employers felt required more training to operate were chosen. On that basis, the recommended lists of equipment were constructed to be used as guidelines to food service programs.

RECOMMENDED EQUIPMENT FOR A FOOD SERVICE LABORATORY

MINIMUM NEEDS

1. Mixer - commercial, 3 speed with doughhook, 20 quart
2. Vegetable cutter or chopper - small vertical cutter or attachment to mixer with shredder plates
3. Meat slicer - commercial, heavy duty enough to cut cheese, 9"-10" blade
4. Convection oven - doors opening to the side, with stand, single oven (Convection ovens were highly recommended by employers and are advantageous to classes because of the limited time period).
5. Microwave oven - commercial model, approximately 1000 watt
6. Broiler - open char broiler, 20" X 24"
7. Range - commercial, black finish with closed burners or French plates, 36" with one oven
8. Deep fat fryer - counter or self-supported unit, approximately 25lbs. fat capacity
9. Grill - counter or self-supported unit, 36" width X 30" depth
10. Toaster - 4 slice
11. Refrigerator/Cooler - one walk-in cooler with reach in door on one side and walk-in on another side, (Highly recommended by employers), one undercounter non-commercial model, (to be installed in waitress station).

(OR)

one commercial refrigerator, one undercounter refrigerator, double, 2 doors. (To be installed in waitress station)

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RECOMMENDED EQUIPMENT FOR A FOOD SERVICE LABORATORY - Cont.

MINIMUM NEEDS - Cont.

12. Freezer - one upright, non-commercial, 30 cubic feet
13. Portable food warmer - electric with 3 temperature controls, moist or dry heat. (Portable warmer may be used as soup warmer, bun warmer, and for holding foods. Portable unit more useful to class room unit than steam table.) 3 openings (holds standard 12" X 20" steam pans)
14. Dishwasher - two door, commercial, single tank
15. Booster water heater - 15kw or larger
16. Pre-rinse unit - (hose attachment) - commercial, 6' hose connection
17. Scullery area - stainless steel, 3 compartment sink, sink and drain-boards 8' - 10' length
18. Bus carts - 4 stainless steel, heavy duty casters, open carts, three 17" X 28" shelves or 2 bus carts and 2 dish dispensers open, 2 cylinders
19. Garbage disposal - (in dishwashing area) commercial. 3/4 h.p.
20. Hood over cooking area - must cover cooking equipment, 10' length (for equipment listed above)
21. Work tables - 4 stainless steel with three drawers and shelf, 30" X 4' or 5' or 6'. (These were not included in the survey, however, the majority of food services had stainless steel. Stainless steel is recommended by health standards)

ADDITIONAL RECOMMENDED NEEDS

1. Steam jacketed kettle - with steam hook-up or self contained, 20 quart (Steam jacketed kettles were highly recommended by employers. Presently found mostly in schools and hospitals, in the future it is believed it will be common to restaurants.)
2. Coffee maker - with direct hook-up, 3 burners (Might possible be loaned)
3. Ice maker - on counter model, 45 - 50 pound daily
4. Malt mixer - 1 spindle

RECOMMENDED EQUIPMENT TO BE ADDED TO CONSUMER HOME MAKING FOODS LABORATORY

(Equipment may be divided into "Minimum Needs" and "Additional Recommended Needs", however, it would depend upon the equipment available in the foods laboratory.)

1. Mixer - commercial, 3 speed with doughhook attachment, 20 quart
2. Vegetable cutter or chopper - attachment to mixer with shredder plates or small vertical chopper
3. Meat slicer - commercial, heavy duty enough to cut cheese, 9" - 10" blade
4. Steam jacketed kettle - self contained, 20 quart, (Jacketed kettles were highly recommended by employers)
5. Convection oven - doors opening to the side, with stand, single oven. (Convection ovens were highly recommended by employers and advantageous to classes because of the limited time period.)
6. Microwave oven - commercial model, approximately 1000 watt
7. Broiler - open char broiler, 20" X 24"
8. Deep fat fryers - on counter model or self-supported, approximately 25 pound capacity
9. Grill - on counter model or self-supported, 30" X 36"
10. Toaster - 4 slice
11. Coffee maker - 3 burner
(OR)
Coffee perculator - 55 cup
12. Reach-in cooler - commercial
13. Freezer - non-commercial, upright, 30 cu. feet or larger
14. Dishwasher - commercial, undercounter
15. Booster water heater - 5 kw
16. Bus carts - 2 stainless steel, heavy duty casters, open carts, three 17" X 28" shelves
17. Garbage disposal - 3/4 h.p.
18. Hood over cooking area - over cooking equipment

RECOMMENDATIONS

In conducting a similar study of food service establishments the director would like to make a few recommendations.

First, make whatever forms are used for the study very explicit. Whenever possible give the person being surveyed a choice of answers, rather than having them give their own answers. This will enable the survey to take less of the employer's time and make it easier for the investigator to tabulate answers.

Give a range of answers to the person being surveyed, for example, several times daily - once daily - several times weekly - once weekly. It is easier to get employers to respond when they are given a range of choices, rather than "yes" or "no" or "check if applies", etc. People are hesitant choosing between two extremes, because there are always exceptions. Therefore, a range of answers increases the reliability of the study.

It is suggested that the investigator tally the information periodically throughout the study. In this type of study it would not harm the reliability, and could be advantageous in that it would reveal something that is being missed or something that is difficult to tabulate.

It is important to allow adequate time for each appointment. It was found that a minimum of 1 1/2 hours should be allowed for each visit. Many tips were learned from the employers when time was available to converse before or after the survey. Comments were often made by employers as to planning of kitchens, ordering equipment, uses of equipment, and objectives of a food service class.

FUTURE STUDY

For future study, the information gathered from the food service equipment survey could be tallied separately for businesses and non-profit establishments. The information might be more valuable for a post-secondary food service program which would emphasize either food service businesses or institutional food preparation. Also, the results may have been of greater value to food service employers.

More information could be gathered about the equipment recommended by this study for food service laboratories. Descriptions could be given of the different models available for each equipment item listed. Comparisons could be made of the equipment sizes, materials of construction and prices in relation to specific uses and durability of the equipment. A study of this type would aid both food service employers and educators in purchasing food service equipment.

Food service curriculum could be examined and changes and additions could be made, based on the information gathered from this food service equipment study. It is felt that the results given from the equipment survey form (found in "Findings and Analysis") would be helpful. The amount of emphasis to be given concerning the operation and care of equipment, could be determined from the comments of employers as to the frequency of use, and amount of training needed to operate each equipment item. Curriculum could be examined to see if the training objectives suggested by employers are included, if not, this should be added. Curriculum should include teaching the skills which were listed by employers as uses for each equipment item. Instructional materials could be developed as a result of this study.

After the food service program has been in progress for a number of years, a follow-up of the students could be made. It would check to see if the equipment at the food service laboratory was adequate in preparing students for food service positions.

It is felt that this study of "Food Service Equipment Used" in "Different Types of North Dakota Businesses", will be followed by other studies to constantly improve the food service programs.

APPENDIX

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INTERVIEWER'S FORM

Name of business or organization _____

Address: _____
Street City State Zip Code

Number of employees _____

Volume (no. served): < 50 () 50 - 100 () 100 - 300 () 300 - 500 () >5

Types of Food Services offered: Family dining () Supper Club () Fast Service
Institutional () Public Cafeteria () Health Care () Banquets () Catering
Hours of Business _____

Manager's Background:

Length of employment at present job _____
Prior experience in food service (no. of yrs.) _____
Formal training Yes _____ or No _____

Business employs handicapped at present Yes _____ or No _____
Number employed _____ Position(s): _____
Equipment operated: _____

Should safety in regards to operating equipment be
_____ Emphasized _____ Touched upon _____ Worker learns by himself

Five pieces of equipment highly recommended for classroom:

Cooking equipment preferred: _____ Gas _____ Electric _____ Some of both

Interest in Food Service Education.
_____ No interest _____ Fairly interested _____ Very interested

Employee roles observed:

Other Comments:

Equipment	Manufacturer's Name (Code Listed below)	Size	Specific Uses	Amount used Cont'd.	Training Cont'd.	Comments
Deep Fat Fryer						
Griddle						
Range -Open top -Closed top						
Pressure Fryer (Broaster)						
Electric Roaster						
Rotisserie						
Toaster						
Coffee Maker						
Coffee -Percolator -urn						
Ice Maker						
Cold Drink Dispenser (Pop)						
Juice Dispenser						
Refrigerated Show Case						
Ice Cream Cooler						
Milk Mixer						
Ice Chocolate Dispenser						
Dishwasher						
Hose Attachment						
Garbage Disposal						

Survey of Food Service Equipment

Source used by Baker's Table
 Baker's Table code listed below
 which equipment which re-
 quires training to operate
 Comments

Equipment	Manufacturer's Name (Code listed below)	Size	Specific Uses	Comments
Refrigerator				
Freezer				
Food Cutter or Chopper				
Meat Grinder				
Meat Slicer				
Mixer				
Blender				
Baker's Table				
Baker's Scale				
Convection Oven				
Vertical Oven (stack)				
Pizza Oven				
Micro Wave Oven				
Compartment Steamer				
Steam Jacketed Kettle				
Broiler				

Equipment	Manufacturer's Name (Code listed below)	Size	Specific Uses	Amount used Conc'd.	Training Conc'd.	Comments
Bus Cart						
Sink Heater						
Rooster Water Heater						
Sculery Area (sink and counter)						
Fat Filter (nutroliator)						
Hood over Cooking Area						
Steam Table						
Portable Food Warmer						
Bun Warmer						
Bun Toaster						
Other:						

* Amount used by business: (1) Once a week (2) Several times weekly (3) Once a day (4) Several times daily
 Code for Manufacturers: (H) Hobart, (V) Vulcan, (K) Keating, (B) Blodgett, (T) Toastmaster,
 (BA) Blakelee, (W) Wells, (S) Star



SURVEY OF ROOF SERVICE EQUIPMENT

Equipment

Manufacturer's Name
(Code listed below)

Sirs

Specific Uses

Comments

(Amount used by business
code listed below
Check equipment which re-
quires training to operate)

FOOD SERVICE ESTABLISHMENTS ASSISTING WITH THE STUDY

Cando, North Dakota

Durum House
Rest Haven Manor Nursing Home
Towner County Hospital

Carrington, North Dakota

Carrington High School
Carrington Holy Family Guest
Home and Hospital
Chieftain Motor Lodge and Restaurant
Fireside Inn
Golden Acres Manor Nursing Home

Cooperstown and Finley, North Dakota

Andy's Cafe
Coachman's Supper Club
Cooperstown Hospital
Top Taste Bakery (Finley)

Devils Lake, North Dakota

A & W Drive-In
Artclare Motel
Barrel Drive-In
Country Kitchen
Dairy Queen
Elks Lodge
Good Samaritan Nursing Home
Happy Hour Cafe
Kentucky Fried Chicken
Lunch Box
Lake Region Junior College - Food
Service
Lake Region Lutheran Nursing Home
Mayer Cafe
Ranch House
Snack Shop - Holiday Mall
Tastee Freeze
White House Restaurant

Fargo, North Dakota

North Dakota State University
Food Service
Auxiliary Food Service
Residence Hall
West Dining Center

Grafton, North Dakota

Family Inn
Grafton State School
Kentucky Fried Chicken
Lantern Room
Legion Club
Sunset Home
Unity Hospital

Grand Forks, North Dakota

Bonanza Sirloin
Colonial Pancake House
Golden Hour Restaurant
Grand Forks Schools (Central
Food Service)
Italian Moon
Ramada Inn
Shakey's Pizza Parlour
University of North Dakota
(Smith Hall Food Service)
(Wilkerson Hall Food Service)
Valley Memorial Nursing Home
Yankee Whaler

Jamestown, North Dakota

Central Dakota Nursing Home
Crippled Children's School
Jamestown College
Jamestown Hospital
Mac's Restaurant
White Drug

Minot, North Dakota

American Legion
Holiday Inn
King's Food Host
Magic City School
Mac Donalds
Minot State College
Newberry's Cafeteria
Riverside
Trinity Hospital
Village Inn Pizza Parlour