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ABSTRACT

Food processing plants are adding value to bulk and intermediate products to sell overseas. The Asian Pacific Rim economies constituted the largest market for consumer food products in 1993. This shift toward consumer food imports in this area is due to more women working outside the home, the internationalization of populations, and dramatic changes in demographics. The important trade factors for the U.S. are: continued success as the most efficient food processors in the world and development of materials and processes to extend the shelf-life of products. The booklet concludes with a student quiz. (EH)

ECONOMIC ISSUES

for Food, Agriculture and Natural Resources

PURDUE UNIVERSITY SCHOOL OF AGRICULTURE FALL 1995, NO. 10

Adding Value to Indiana's Commodities

About the cover: Art for the cover is provided courtesy of the Foreign Agricultural Service (FAS). China set a record of $49 million in direct U.S. consumer food exports, with an estimated $185-200 million re-exported via Hong Kong. While not featured on the cover, this would make China the 10th largest country market for U.S. consumer foods. Particularly popular are snack foods including tree nuts, chips, candies, beverages, french fries and chicken feet.

Robert Tse, in Guangzhou (near Hong Kong) in southern China. Tse is an agricultrual economist for the Foreign Agricultural Service, an agency of the United States Department of Agriculture in Washington, D.C.

The information in this publication is based on a seminar that Robert Tse gave at Purdue University. Tse has a master of science degree from Purdue's Department of Agricultural Economics and a juris doctor from Boston College. He is a global export analyst of U.S. consumer food products, and he tracks and analyzes demographic factors and consumer behavior trends that impact demand and competitiveness of U.S. agricultural exports. Consulted by industry, state departments of agriculture, and other institutions on export market potential, Tse conducts strategic marketing sessions and provides presentations on global markets at industry and university conferences. Product and country market analyses are published in *Agricultural Trade Highlights* and *AgExporter*.

Tse has provided updated technical reports and information to complete this edition of *ECONOMIC ISSUES for Food, Agriculture & Natural Resources*. His professional and technical assistance is greatly appreciated.

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ll 1995, No. 10

Adding Value to Indiana's Commodities

CONSUMER FOOD EXPORTS mean more jobs and a more favorable balance of trade for the United States.

Szechuan chicken, Hunan beef, Peking duck—do these foods sound familiar? Look at a world atlas. These foods get their names from provinces in China.

Americans have learned to like Americanized versions of Chinese cuisine; these dishes have become popular as restaurant and frozen meal items in the United States. Italian and Mexican foods have become even more popular. How did this happen?

The population of the United States reflects the immigration of diverse ethnic groups which have shared their traditional cuisine as they settled throughout the country. Thus, Americans have developed a taste for rice dishes, pizza, and tacos, to name a few.

American foods have also become popular in other countries. Fast-food restaurants have become well-liked around the world, especially among children and teenagers. There are many reasons to applaud the changing tastes of the Japanese, Taiwanese, Germans, Italians, and Russians who have learned to like American foods. The distribution of American fast-food chains often introduces U.S.-style food to other countries, which results in exported products such as beef, chicken, and frozen french fries from the United States.

Food products have traditionally been categorized as bulk, intermediate and consumer foods.

BULK products (corn, wheat, soybeans) are transported in grain ships to other countries where they are converted to livestock feed (using corn), bread (using wheat), or tofu (using soybeans), for use in those countries.

INTERMEDIATE products have had some processing applied to a bulk product, but are not ready for final consumption. For example, oil is extracted from soybeans (a valuable crop raised in Indiana), and then refined to produce a high-quality vegetable oil which is used in a multitude of processed foods. This oil is extracted by pressing the oil from the soybean. The by-product (what's left after the oil is extracted) is a granular substance called soybean meal. Soybean meal is sold to livestock producers who use it as a high-protein additive for cattle and hog feed.

CONSUMER FOODS are foods ready for human consumption. If we follow the example of soybeans (as bulk), soybean meal, a component of cattle feed (as intermediate), then ribeye steak would be a consumer food product. Consumer foods are generally defined as products that are ready to eat or ready to cook. Basically, any product found in the supermarket is a consumer food.

U.S. exports of consumer products are increasing according to studies from the Foreign Agricultural Service (FAS), an agency of the United States Department of Agriculture. Consumer food products show a steady rise as seen in Figure 1, as compared to bulk and intermediate exports. These data are prepared by Robert Tse, an agricultural economist for FAS who earned a master's degree in agricultural economics from Purdue University in 1991.

To illustrate this growth, Figure 2 tracks the increase of U.S. consumer food exports and trends through the year 2000. In terms of sales, consumer food exports could reach $26 billion by the year 2000.

From 1987 to 1993, exports of U.S. consumer food products increased nearly one and one-half times, according to Tse. The leading export is red meat, which has increased over $2 billion dollars since 1987. As

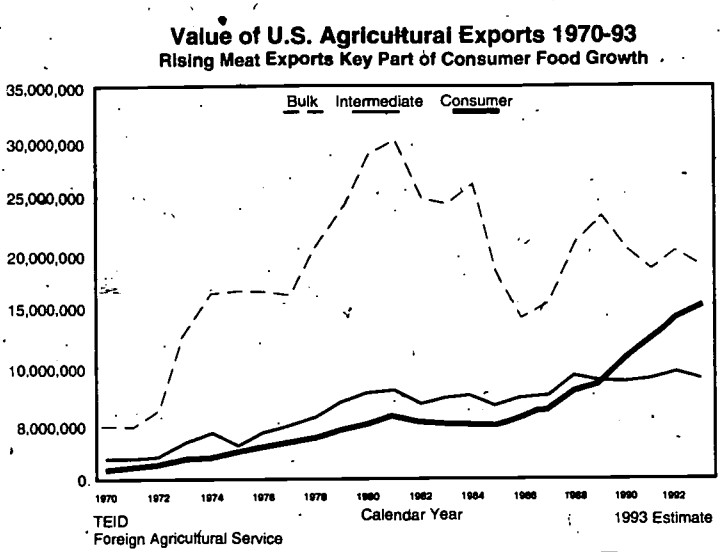
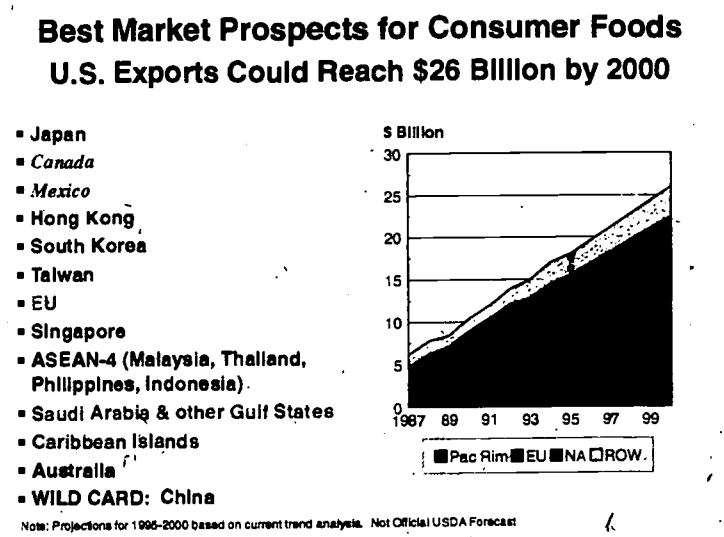


Figure 1

seen in Figure 3 (see page 6), other consumer items highly favored in overseas markets are fresh fruits, vegetables, snack foods, pet food, and poultry. The shift in composition of U.S. agricultural exports from bulk and intermediate products to consumer food products is good news to farm producers, as well as to food processors.

Food processors are adding value to bulk and intermediate products to sell overseas. For

Figure 2



Strong and Broad-Based Export Gains for U.S. Consumer Foods

1994 Closes with Most Products at New Record Highs!

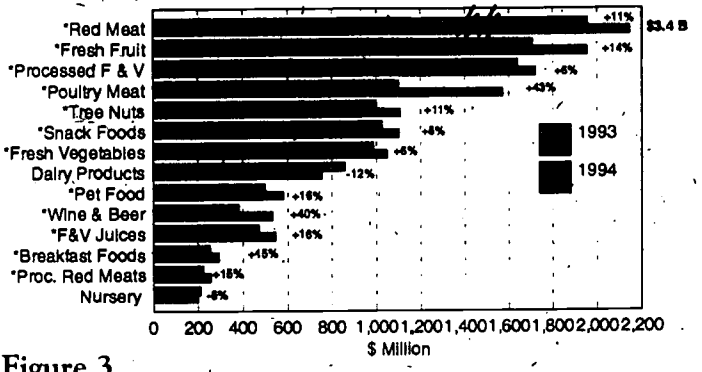


Figure 3

example, cattle producers buy soybean meal (intermediate) to feed animals, which converts to meat. Meat packers buy cattle to process into chilled or frozen beef products purchased by Japanese and Korean supermarkets or fast-food restaurants serving hamburgers in Hong Kong, Moscow, Mexico City, or Tokyo.

As exports of processed foods continue to increase, U.S. exports of grain and meal shipped to overseas markets in the form of beef, pork, and poultry help enlarge the consumer food export market. Recent analyses by FAS and the agribusiness community conclude that indirect sales are the fastest growing segment of bulk commodity exports, and such sales will become even more important through the end of this century.

Figure 2 (see page 5), also lists the best market prospects for U.S. consumer food exports. Of the top six markets, four are Asian Pacific Rim economies. These markets warrant serious attention for producers and processors when considering new products that serve a cultural niche. The other best market prospects are Canada and Mexico, both part of the American Pacific Rim.

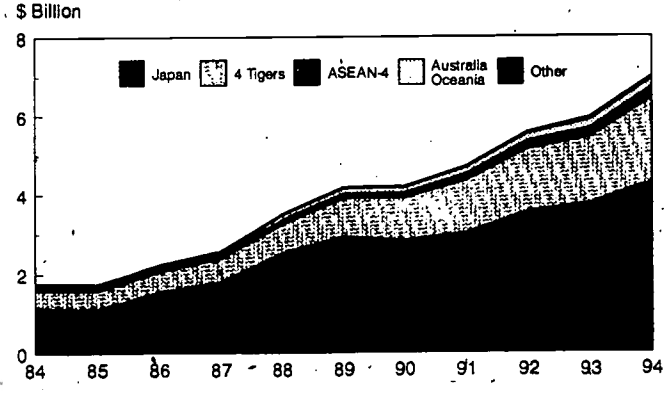
EXPLORING MARKET OPPORTUNITIES: The Blue Diamond Growers Almond Cooperative was interested in generating greater exports to Japan. They developed a packaged product of sliced almonds and dried baby sardines for the Japanese school lunch program. How would you like this item served in your school cafeteria? The Japanese students liked this product; moreover, when they took samples home, their parents liked it even better than the students! Therefore, Blue Diamond established a special niche, and is exporting a larger volume of almonds as a result of studying a culture and deciding how to adapt its product. Looking for increased opportunities through a better understanding of culture and eating habits is a very important part of any business hoping to find new markets overseas.

Let's focus on the Asian Pacific Rim economies (Japan, Hong Kong, South Korea, Taiwan, Singapore, Malaysia, Thailand, Indonesia, Philippines, Brunai, and China), which constitute the largest market ($5.9 billion) for consumer food products in 1993. As shown in Figure 4, the Asian Pacific Rim leads the U.S. export market for consumer foods. Japan is the leader, followed by the "Four Tigers," Hong Kong, South Korea, Taiwan, and Singapore. Even though small, the ASEAN-4 (Malaysia, Thailand, Indonesia, Philippines) is growing. China is known at FAS as the "wild card" (see Figure 5 on page 8). There is a giant potential, but it is unclear how imports will develop in China.

Figure 4

Pacific Rim is Leading Regional Market for U.S. Consumer Foods

Nearly $7 Billion Record in 1994



Best Prospects WILD CARD: *China*

- Direct U.S. exports of consumer foods reaches record $49 million in '94, at least another $240 million transshipped through Hong Kong
- Highest economic growth in Asia, concentrated in coastal provinces
- Target markets: Guangdong Province, Shanghai, Beijing
- Urban population of over 300 million.
- Potential customers estimated at 200 million; 83 million earn 10-40K/yr (PPP-adjusted)
- Brand name conscious
- Rising demand for convenience foods (i.e., canned soup, nuts, chips). Frozen chicken replace fresh
- Spread of fast food restaurants and supermarkets in urban areas
- Trade barriers major impediment

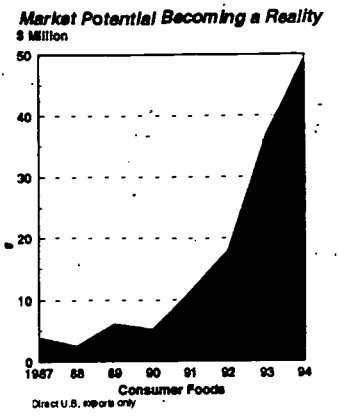


Figure 5

What is driving this shift toward consumer food imports in this part of the world?

More women are working outside the home. Rising household incomes and more disposable income cause a demand for convenience foods which are affordable. With less time for food preparation and more families eating separately due to busy schedules, there is an increased need for convenience foods. The trade-off between convenience and price is tipped firmly toward convenience. This trend is expected to continue.

Internationalization of populations. The popularity of U.S. culture spreads instantly via satellite television. Programs like *Dynasty*, *LA Law*, *Twin Peaks*, MTV, and Hollywood movies such as *Jurasic Park* and the *Flintstones* flash across the world. American television programs, movies, and music videos are a staple on local TV throughout the world. Where else could you see *Gone with the Wind*, dubbed in Chinese, but on Chinese satellite television in Shanghai? Also, higher standards of living have allowed more people from the Asian Pacific Rim to travel outside their area, and many have visited the United States. Young people (ages 18-35) are the

trend setters. They are the "buyers," and as they return to their homes after visiting and studying in the United States, they take tastes for Western foods back with them. Studies are showing that diets of Pacific Rim people are shifting from rice-based to wheat-based products, especially in the cereal and snack food categories. Pacific Rim children, like their American counterparts, love McDonald's hamburgers and the Colonel's chicken. Children everywhere take their parents to fast-food restaurants.

Demographics have changed dramatically. The number of people living in one household is shrinking, the number of households with a lone resident is increasing, and more people are eating out. This translates to a greater demand for smaller portions.

To gauge possible future demand of convenience food products, FAS tracks the proportion of households with microwave ovens, an indicator of potential markets for convenience and frozen food products. Table 1 shows the percentage of Asian Pacific Rim households owning microwave ovens. These data indicate the market is available, and the opportunity is extensive for frozen and microwavable food products.

The number of Western-style supermarkets and convenience stores is another factor creating an opportunity for storage and distribution of these products. These outlets give exporters a better facility to market products, and the shopper more convenience in purchasing products. These stores also change traditional distribution patterns. The larger supermarkets and chains are able to buy directly from U.S. distributors due to greater volume,

Table 1

Area	Percent of households owning a microwave oven
Japan	80 (or greater)
Hong Kong	50
Taiwan	20 (and increasing)
Taipei (urban sector of Taiwan)	45

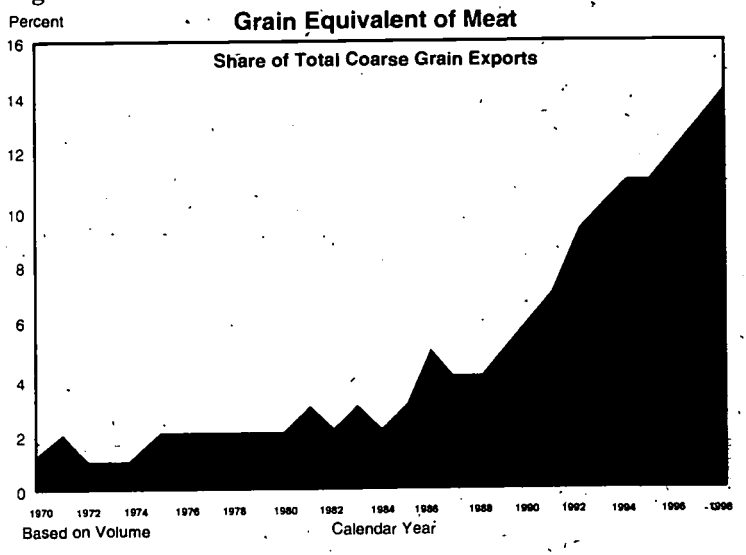
thus eliminating layers of middle marketers in previous distribution channels. The complex distribution systems in many foreign markets have limited U.S. consumer food exports in the past.

INDIANA AGFACT: Of the fast-growing convenience markets, a $100 million item is microwavable popcorn. This is an important factor for Indiana exports since Indiana is the number one producer of popcorn in the United States (1992 U.S. Department of Commerce census).

To address the importance for Indiana exports in light of these changes, FAS measures grain sales in terms of meat exports. Instead of calculating only grain or meal sold directly overseas, the exports of grain and meal shipped in the form of beef, pork, and poultry are measured.

Figure 6 shows how export action of bulk grain has increased from about three percent in terms of meat exports in 1987 to 11 percent in 1993-94. The oilseed meal equivalent of meat is even greater (Figure 7), increasing from six percent to 18 percent during the same time period. Both direct and indirect categories (feedstuffs and meat) will continue to rise over the next several years, according to FAS projections. According to Tse, failure to

Figure 6



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No. 10 Export Advantage—Adding Value to Indiana's Exports ***Fall 1995***

United States' agricultural exports are shifting from bulk grain and meal commodities to high-value fresh or frozen meat and poultry products. Find out what is causing this shift, what well-established and new world markets are emerging, and what this means for the food processing industry in the United States.

quantity_____

No. 9 Food Processing and Marketing—New Directions, New Opportunities ***Spring 1995***

Through a joint effort of economic analysis and technology, the dying tomato processing industry in the Midwest, which had lost a major comparative advantage to California, was revitalized. Discover how the process of aseptic processing allowed the tomato industry to greatly increase its economies of scale and become the most competitive in the world.

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No. 8 **Using Economics and Genetics to Produce Leaner Pork** ***Spring 1994***

A careful study of swine genetics and efficiency of production factors has helped producers select breeding stock to provide leaner meat without increasing production cost. This issue helps students understand the concept of net present value.

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No. 7 **Strategic Marketing for Agribusiness** ***Winter 1993***

By understanding the marketing planning process and the economics of consumer buying decisions, managers of food and agricultural businesses can make better decisions to help their businesses become more profitable. In a case study format, this issue helps students understand the concept of demand elasticity.

quantity_____

No. 6 **Economic Development for Communities** ***Winter 1992***

Explore with students how successful economic development in a community involves an effort to export products and services to other communities, states, or nations and thus import dollars to the community.

quantity_____

No. 5 Agricultural Chemical and Fertilizer Storage Rules—Costs and Benefits of Insuring Cleaner Water for Indiana *Fall 1991*

Better understand costs of complying with regulations to ensure containment of chemical spills in relation to environmental costs. The concept of a public good is illustrated in this issue.

quantity_____

No. 4 Economic Effects of Technological Advances in Agriculture *Fall 1990*

A better understanding of agricultural economic concepts helps Americans become better food buyers, be more knowledgeable about food values, and appreciate their relatively cheap, high-quality food supply. Study how the use of biotechnology has microeconomic implications for the animal industries and consumers. Supply and demand curves illustrate the determination of the pork price, and quantities produced and consumed as a result of one biotechnical development in the swine industry.

quantity_____

No. 3 International Trade in a Global Environment *Spring 1990*

Many factors affecting U.S. trade are beyond our control. However, the United States and its citizens do control macro economic policy, trade policy and domestic farm policy. Market, command and traditional economies, opportunity cost, along with other trade concepts including GATT (General Agreements on Trade and Tariffs), are discussed.

quantity_____

No. 2 **Commodities Trading—An Essential Economic Tool** *Fall/Winter 1989-90*

This issue discusses the use of commodities trading (futures contracts and options) as an important economic tool to benefit both buyers and sellers in today's agricultural and natural resources marketing environment.

quantity_____

No. 1 **Value Added—Adding Economic Value in the Food Industry** *Spring 1989 (first in the series)*

The concept of value added is discussed using the pork product, sausage, to add value by making frozen pizzas. Questions discussed include jobs created by value added processes and using value added to calculate Gross Domestic Product.

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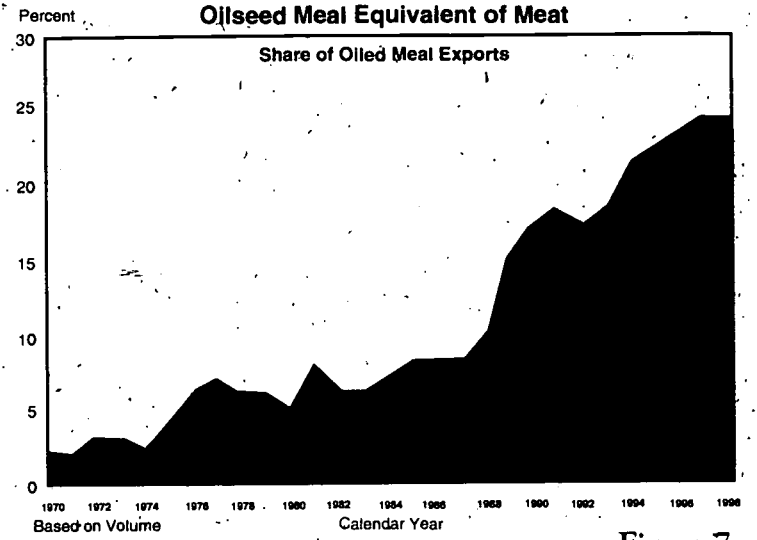


Figure 7

include these indirect sales underestimates the total export value of grain and meal.

In order to create a more accurate picture of total exports, all three categories should be considered. In 1993, consumer foods accounted for 34 percent of total U.S. agricultural exports, up from 12 percent in 1980. Since 1985, consumer food exports increased an average of 16 percent each year. In 1994, the value of consumer food exports is expected to set another record for the eighth consecutive year. Projected trends indicate that consumer food exports could be equal to bulk exports in value by the end by the year 2000 (see Figure 1).

Countries with purchasing power for consumer food will buy these products at the lowest available cost. According to McKinsey & Company, an independent research firm, the United States is the most efficient producer of processed foods in the world (see Figure 8 on page 12).

Japan has a competitive advantage in steel and automobiles, while the Philippines, Taiwan, Indonesia, and China have a competitive advantage for textiles and clothing. Consumers throughout the world will shop for

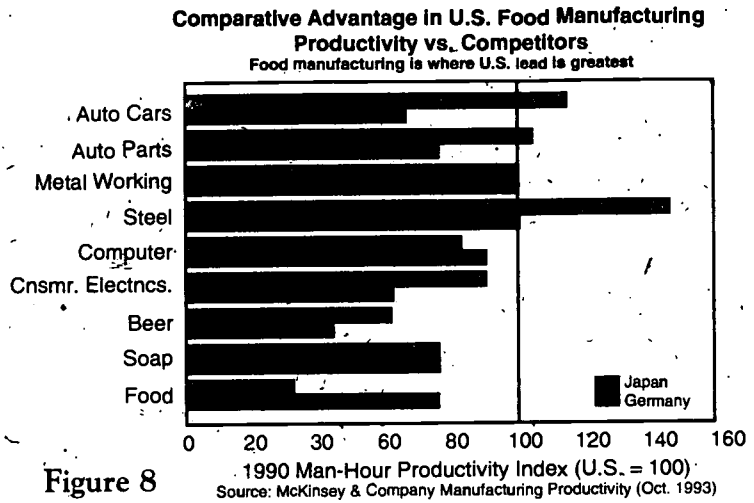


Figure 8

value. Therefore, the United States has the competitive advantage in selling processed food products at a very favorable cost.

An important trade factor for the U.S. is to continue being the most efficient food processors in the world. At Purdue University, the Department of Food Science, and Department of Agricultural and Biological Engineering play an important role in supporting this effort through research to keep this technology at or ahead of demand. Phillip Nelson, department head, cites two projects that Purdue's Department of Food Science recently developed to help assure this competitive position. Both of these processes involve "aseptic packaging," a process of fast application of heat to the food product, a quick cool down, and placement of the product in sterile air-tight storage containers. This process extends the shelf life. Aseptic processing of the following two products has allowed food manufacturers to benefit from this research pioneered at Purdue.

Eggs. In the past, a liquid egg mixture has been shipped and stored frozen until needed. Shipping and storing frozen products is an expensive process. The Purdue aseptic processing and packaging allows the egg

mixture to be refrigerated (not frozen) for an extended time. This is more convenient and less costly to U.S. food processors making snack cakes and cookies for export.

Tomatoes. The Purdue "aseptic" process allows processors to store diced tomatoes at room temperature in 55-gallon drum-size plastic bags awaiting processing. These diced tomatoes are used to make salsas, pizza sauce, catsup, and other tomato-based products for export.

By maintaining the highest food processing effeciency in the world, food companies will be less likely to move plants overseas, as other industries have done, but rather to process in the United States (adding value) and then export the products.

In the past, trade barriers in the form of tariffs restricted some exports. Since the mid-1980s, economic trade liberalization and technological developments have favored the export of meat products relative to feed grains. The General Agreement on Tariffs and Trade (GATT) and its successor organization, The World Trade Organization (WTO), continue to press for reducing agricultural trade barriers. This would provide the United States and other agricultural-exporting countries the opportunity to help establish policies to increase export opportunities for agricultural products. The Beef-Citrus Agreement with Japan and South Korea opened two markets for U.S. meat exports, and thereby lowered the cost of U.S. meat through lower tariffs. The North American Free Trade Agreement (NAFTA) opened trade opportunities with Mexico, a rapidly growing market (see Figure 9 on page 14).

This growth of consumer power in Mexico and Canada, and the rising influence of the prosperous urban middle-class consumers of the Asian Pacific Rim constitute a giant opportunity for U.S. food producers and processors.

More Jobs in Rural America. It is estimated that the shift toward greater exports of high-

value foods such as chilled pork from Delphi, Indiana, and corn chips from Frankfort, Indiana, has a major and beneficial implication for the rural economies of the United States. A measure often used to show growth in any economy is the number of jobs created. Growing exports for fresh and frozen red meat and poultry increase a domestic demand for feed grain and oilseed meals. The income multiplier effect from high-value exports is greater than from bulk commodity exports (2.88 versus. 1.86).

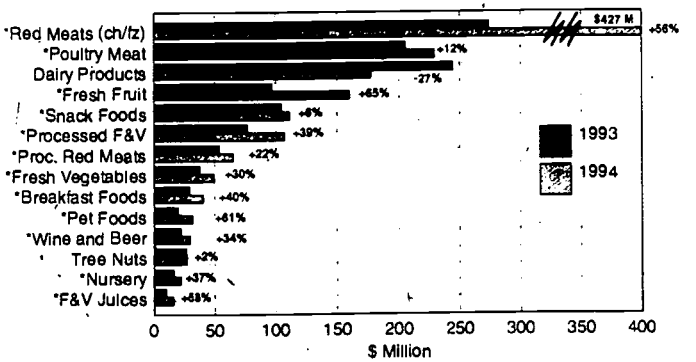
The *multiplier effect* is exemplified in meat exports. Meat processing plants generate increased business for companies engaged in packaging, refrigerating equipment, and wrapping products to produce a high-quality meat product for export.

This means dollar-for-dollar, high-value exports generate more jobs than exporting bulk commodities. Two recent analyses conducted by Cargill, Inc. and Dermot Hayes, professor at Iowa State University, conclude that if the United States exported meat rather than feed grains used to produce meat, U.S. agricultural employment would increase approximately 50 percent.

Figure 9

Mexico Emerges as Third Largest Country Market for U.S. Consumer Food Exports

Double-Digit Growth Led to Numerous New Records In '94



Note: * Indicates record exports in '94

This study also estimates that meat exports already generate approximately 200,000 jobs. This represents 10.5 percent of all jobs in the meat, poultry, and dairy industries. Finally, the continued growth of U.S. meat exports creates 20,000 to 30,000 new jobs each year. Because the meat and poultry processing industries are located in rural areas throughout the United States, these additional jobs have a major positive impact on U.S. rural communities.

Summary

Agricultural exports are shifting in form from bulk grain and meal commodities to high-value fresh or frozen meat and poultry products. The impact of this shift for Indiana, for example, is that hogs can be produced using Indiana-grown corn (adding value to the corn) and exported as meat products.

The United States is one of the most competitive processors of food products in the world, and it is important that its food companies continue this competitive edge. This helps assure that processing plants continue to find it more profitable to process foods in the United States, and export the processed product, rather than build processing facilities overseas.

Purdue University is providing an important component in the food chain by developing the newest technologies for food processors to stay competitive in world markets.

Raw food materials produced in rural areas represent good news for communities in Indiana, as well as the rural United States. Many processing plants are located near farms and the commodities they produce. Jobs are created helping to revitalize rural communities, adding value to export markets for the United States.

Providing new and expanded export markets for corn and soybeans—important economic crops for Indiana—is significant for rural areas in the state. As demand for meat exports and other value-added products increases, jobs are created

in a community. This has a ripple effect, as added employment for the value-added industry also creates demand for goods and services required to support the industry. Together, this demand for exported goods serves to revitalize communities.

Bill Schiek

William A. Schiek also contributed valuable insight and technical analysis to this publication. As an assistant professor of agricultural economics at Purdue University, Schiek's special areas are agribusiness management and agricultural marketing. His research focuses on questions related to improving efficiency in food marketing and distribution as well as on marketing and firm-level decision making in food business. Schiek teaches undergraduate and graduate courses in international marketing and marketing research methods.

Quiz

1. According to the 1990 study of McKinsey & Company (Figure 8), which of the following productivity statements are true?
   A. The U.S. is equal in productivity to Japan and Germany in metal working.
   B. German beer is produced more efficiently than either Japanese or U.S. beer.
   C. Soap is produced about as efficiently in Germany as food is in the U.S.
   D. The U.S. is more efficient than either Germany or Japan in processing food.
   E. A and D are correct.
   F. All of the above are correct.

2. According to the FAS (Foreign Agricultural Service), a group of economies is referred to as the Four Tigers. Why do you think this name is used?
   A. There are many endangered species of tigers running wild these countries.
   B. These economies have increased standards of living allowing them to purchase processed food goods from the U.S. at a rapidly growing rate of speed.
   C. China, Malaysia, Philippines, and Thailand are the fastest growing economies in the entire Pacific Rim.
   D. B and C are both correct.

3. Which of the following explanations of "shift in the composition of U.S. agricultural products" best describes meat exports?
   A. The process of exporting intermediate products such as soybean meal allows farmers in Japan to grow better quality pork by feeding this meal to their hogs.
   B. The U.S. is exporting more and more bulk corn by growing cattle in the U.S., processing meat products and exporting meat to overseas markets.
   C. The U.S. is providing valuable technology by exporting food processing equipment to overseas markets.
   D. The U.S. is losing overseas markets by moving processing plants to countries in order to take advantage of lower labor costs.
   E. Only A and B are correct.

4. According to FAS projections, which of the following are true?
   A. Both direct and indirect categories of feed grains are expected to continue to rise over the next several years.
   B. Projected trends indicate that consumer food exports could be equal to bulk exports in value by the year 2000.
   C. If projections hold true, U.S. sales of consumer food products by the year 2000 will be more than four times the volume exported in 1984.
   D. Only A and B are correct.
   E. A,B,and C are all true.
   F. None are true.

5. Which of the following are considered Pacific Rim Countries?
   A. Japan, South Korea, Phillipines, and Mexico.
   B. Japan, China, Thailand, and Indonesia.
   C. Mexico, Canada, and Japan.
   D. Japan and the Four Tigers.
   E. All of the above.

6. Which of the following has NOT had an effect on growing markets in the Asian Pacific Rim countries?
   A. The Asian people's desire to eat rice-based snack products.
   B. Families eating separately.
   C. More people living alone.
   D. The viewing of *LA Law* and *The Flintstones*.
   E. Travel to the United States.
   F. The number of households owning microwave ovens.

7. How does the Department of Food Science at Purdue University help the United States maintain a comparative advantage in processed food products?
   A. By developing high-quality products that companies can replicate by mass production to sell to overseas markets.
   B. By advising fast-food restaurants on which products to provide to their overseas customers.
   C. By giving nutritional advice to countries overseas.
   D. By developing efficient processes that will allow food manufacturers to compete with other countries' processed food products.

8. FAS is
   A. Food Agricultural Science, a department of the USDA.
   B. An agency of the USDA providing information to help U.S. companies better understand overseas markets.
   C. Foreign Agricultural Service, a division of USAID to help combat unfair trade practices.
   D. All of the above are true.

9. The North American Free Trade Agreement (NAFTA)
   A. Has opened trade with Canada, allowing Canada to recently surpass Japan as the number one importer of U.S. processed food products.
   B. Is already failing because Mexico does not have a strong enough middle class population to support many purchases of U.S. food exports.
   C. Has already shown a positive impact on U.S. trade with Mexico because of recent increased standards of living in Mexico.
   D. None of the above are true.

10. Asceptic processing and packaging developed at Purdue University has been a big help to food manufacturers by
   A. Allowing Purdue's name to appear on the packaging.
   B. Allowing packaged products to be stored a longer time without spoiling.
   C. Developing tankers to transport fresh food products in a similar way that oil is transported.
   D. Providing new products that can be test marketed in overseas markets.
   E. All of the above are true.

ANSWERS: 1-E, 2-B, 3-B, 4-D, 5-E, 6-A, 7-D, 8-B, 9-C, 10-B

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