



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# U.S. Food Sector Linked to Global Consumers

Anita Regmi and Greg Pompelli

The fortunes of U.S. farmers and food processors are increasingly influenced by events in markets around the world. The importance of trade is not new, but as world economies become more interrelated, U.S. agricultural and food processing sectors become more heavily affected by changes in global markets. One of the critical influences on the U.S. food sector is rising incomes and related changes in the diets of consumers around the world.

Many factors determine food purchases, including age, household size, ethnicity, education, geographic location, access to technology, and health attitudes. Nonetheless, income remains the factor with the greatest influence over dietary changes, as it provides the means needed to convert desired-demand for goods into effective-de-

mand for goods. Recent research by USDA's Economic Research Service (ERS) shows that as incomes rise around the world, consumption patterns change in affected countries. Income-initiated dietary changes in high-income nations are relatively small, compared with income-initiated dietary changes in lower-income nations. The World Bank defines high-income countries as those with 1998 per capita Gross National Product (GNP) above \$9,360, middle-income countries as those with 1998 per capita GNP between \$760 and \$9,360, and low-income countries as those with 1998 per capita GNP below \$760. Countries in the low- and middle-income groups are generally considered to be developing countries.

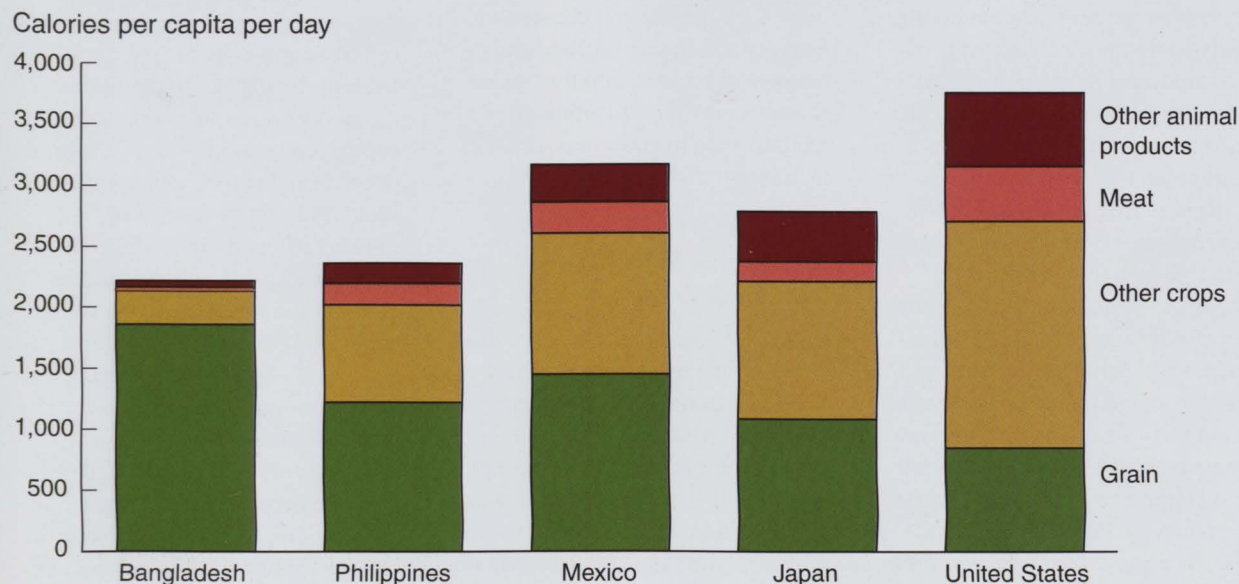
In countries at low-income levels, such as Bangladesh, consumer

Anita Regmi (202) 694-5161 aregmi@ers.usda.gov  
Greg Pompelli (202) 694-5320 pompelli@ers.usda.gov

Regmi is an agricultural economist and Pompelli is a branch chief with the Market and Trade Economics Division, Economic Research Service, USDA.

demand for food is driven by the need for individuals to meet basic caloric requirements, leading to diets mainly comprising carbohydrate-rich products, such as cereals (fig. 1). Increases in income at this level may lead consumers to increase consumption of calorie-rich carbohydrates. In countries at higher income levels, such as the Philippines and Mexico, consumers can readily meet their caloric needs and the demand for food is often shaped by taste, cultural trends, and other social factors, such as increased number of women working

Figure 1—Grains Are the Primary Sources of Calories in Low-Income Countries



Source: The United Nations Food and Agriculture Organization's FAOSTAT database, 2001.



**Staple food products, such as cereals, account for a larger share of the total food budgets in low-income countries, where consumer demand for food is driven by the need to meet basic caloric requirements.**

Credit: ERS.

outside their homes. Income growth among consumers in these countries may lead them to substitute staple foods with more expensive sources of calories, such as meat and fruits and vegetables, and products popularized by cultures in developed countries.

In countries at yet higher income levels, such as the United States, Japan, and Western Europe, consumer demand for food may be influenced by demand for leisure and other social concerns. Affluent consumers at this level of income can easily meet their nutrient needs, and income growth raises food expenditures through purchases of more expensive foods, not larger quantities of food. Food expenditures increase as consumers pay higher prices for labor-saving, ready-to-eat products or for products produced in manners consistent with consumers' social values (such as concern for the environment or animal welfare).

Recent ERS analyses of 1996 International Comparison Project data indicate that low-income countries spend about 47 percent of their total budgets on food, compared with richer countries that on average spend about 13 percent of total budgets on food. Staple food products, such as cereals, account for a larger share of the total food budget in low-income countries. Also, food purchases by consumers in low-income countries are more responsive to food price and income

changes. For example, for every dollar increase in income, consumers in Tanzania, a low-income country, spend about \$0.54 on additional food purchases, while consumers in the United States, a higher income country, spend \$0.02 on additional food (table 1). Low-income country responses to food price changes, however, may not always be perceptible because consumers in those countries are likely to substitute lower priced products within a food group when prices rise. For example, when the price of wheat increases, low-income consumers may substitute corn for wheat, while many middle-income consumers may switch to products outside the cereal group, such as meat or horticultural products. For high-income consumers, food is a small part of the total household budget, and food price changes may lead to small or no adjustments in the composition of food consumed.

### **Meats and Fruits and Vegetables Substitute for Low-Value Staples**

How a country's income is distributed has important implications for changes in a country's food purchases and trade. When a developing nation's income is held by a wealthy minority of the population, increases in national income may not translate into effective demand for different foods. Richer citizens may spend their higher in-

come on vacations and other leisure activities, while poor citizens are likely to use their income increases to buy more meat or fruits and vegetables. In developing nations with more even distribution of income, national income changes have a greater effect on food demand as the shifting food preferences, however slight, are magnified by a much larger portion of the population. Thus, increased incomes for large shares of populations in lower income nations offer greater potential trade opportunities for producers of high-valued foods and the ingredients used to make those products.

Urbanization and improved transportation and infrastructure facilities have greatly contributed to changes in global food consumption and trade patterns. Per capita food availability on a global basis increased from about 2,300 calories per day in 1961 to almost 2,800 calories per day in 1998. In addition to changes in food availability, the basic sources of calories have changed, with animal and horticultural products accounting for a growing share of total calories consumed at the expense of root and tuber crops, such as cassava and sweet potatoes (table 2). Per capita global availability of meat and fruit and vegetables increased more than 60 percent between 1961 and 1998, while the supply of roots and tubers decreased over 21 percent. World cereal supplies increased almost 17 percent during the same period.

In high-income countries, per capita food supplies (an indication of consumption) of both cereals and roots and tubers decreased between 1961 and 1998, while the supplies of meat and produce increased substantially. With the exception of supplies of roots and tubers, food supplies substantially increased in middle-income countries over the same period. In low-income countries, where hunger remains a concern despite recent economic gains, decreases in root and tuber supplies were more than offset by significant increases in per capita supplies of all other food

types between 1961 and 1998. Cereal supplies increased almost 32 percent in low-income countries and 12 percent in middle-income countries. These increases can be partially attributed to increased demand for livestock feed, resulting from the increased demand for meat.

Between 1961 and 1998, per capita meat supplies increased over 300 percent among low-income countries, from 11.7 to 48.9 pounds, and about 75 percent among middle-income countries, from 50.0 to 87.7 pounds. Per capita meat supplies among high-income countries rose 58 percent over the same period, from 119.5 to 189.2 pounds. The income elasticity for meat—a measure of the responsiveness of the quantity of meat demanded to a change in income—is higher for poorer countries. Thus, when income increases 1 percent in both low- and high-income countries, poorer countries increase their expenditures on meat by a larger amount than wealthier countries (fig. 2). For example, following a 1-percent increase in income, con-

sumers increase their expenditures on meat by 0.86 percent in Tanzania, 0.72 percent in Thailand, 0.58 percent in Argentina, and 0.22 percent in the United States.

Similarly, poorer nations exhibit greater responsiveness in produce consumption to income and produce price changes. For example, following a 1-percent decrease in fruit and vegetable prices, consumers increase their expenditures on produce over 1 percent in Tanzania, 0.86 percent in Morocco, and 0.08 percent in the United States (fig. 3).

### U.S. Food Sector Faces Competition in Growing World Economy

Although rising global incomes strengthen the influence of global consumers on food demand, especially consumers in low- and middle-income countries, these gains in income do not necessarily translate into guaranteed gains for the U.S. food sector. Local agricultural industries in these countries have the ability to produce some of the

goods consumers demand as diets change due to income growth. As countries meet their increased needs for high-value foods, U.S. exports of those foods face increased

**Table 1—Poorer Countries Spend More of Additional Income on Food**

Countries	Food expenditure from \$1 additional income
	Dollars
Tanzania	.54
Indonesia	.31
Albania	.30
Philippines	.27
Venezuela	.25
Turkey	.21
Mexico	.20
Poland	.19
South Korea	.13
Greece	.11
France	.07
Canada	.05
United States	.02

Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

**Table 2—World Supply of Meat and Produce Has Risen**

Countries	1961	1970	1980	1990	1998	Change, 1961-98
	Pounds per capita					Percent
<b>Cereals:</b>						
Low-income countries	283.3	326.7	346.3	381.6	373.5	31.8
Middle-income countries	275.6	288.8	308.4	313.5	308.2	11.8
High-income countries	269.6	246.3	236.6	238.2	248.9	-7.7
World	298.3	317.0	329.8	352.8	348.8	16.9
<b>Roots and tubers:</b>						
Low-income countries	45.2	47.2	40.1	32.6	35.5	-21.5
Middle-income countries	32.2	31.1	27.3	25.8	28.9	-10.2
High-income countries	38.4	34.0	32.2	32.2	32.6	-15.1
World	41.9	42.1	35.9	30.9	32.8	-21.7
<b>Fruits and vegetables:</b>						
Low-income countries	158.3	113.6	143.3	200.2	240.0	51.6
Middle-income countries	259.0	282.9	332.5	345.9	356.9	37.8
High-income countries	336.6	390.0	411.8	476.6	493.2	46.5
World	223.8	228.8	246.5	218.7	373.0	66.7
<b>Meat:</b>						
Low-income countries	11.7	16.8	22.0	32.4	48.9	317.9
Middle-income countries	50.0	59.3	74.1	83.1	87.7	75.4
High-income countries	119.5	142.9	167.8	177.9	189.2	58.3
World	54.0	62.8	71.0	74.1	86.9	60.9

Note: The world average may not necessarily reflect the average of the three country groupings because many of the former Soviet and Yugoslav countries are excluded in the groups.  
Source: United Nations Food and Agriculture Organization Food Supply Data, 2001. Countries are grouped according to the World Bank definition.

competition; however, demand for ingredients used to produce these foods may increase. For example, growing feed needs in livestock sectors around the world, due to growth in global meat demand, have resulted in increased U.S. soybean exports.

Growth in global meat demand has also expanded trade in meat products, including exports of U.S. meats. For example, U.S. meat exports have increased to the Philippines, Mexico, and Japan. These countries reflect a broad range of incomes and development. As their

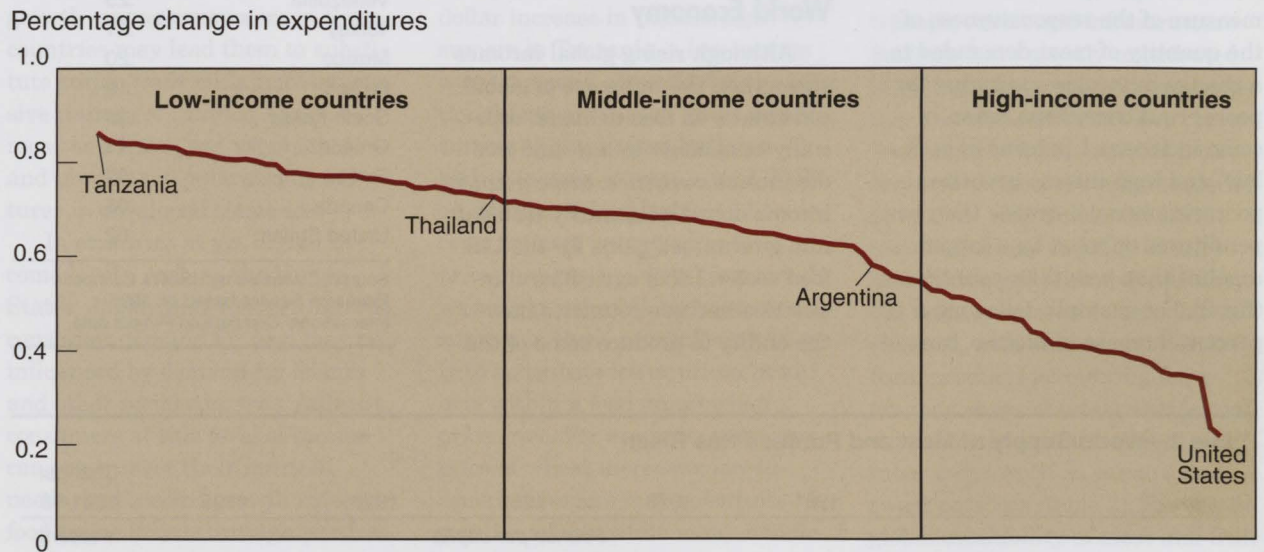
economies have grown, composition of U.S. exports to the countries has also changed (fig. 4). Although other factors influence food export levels, income-initiated dietary changes among consumers, particularly in the Philippines and Mexico, have caused red meat and poultry to grow in share, in terms of value, of U.S. agricultural exports to these countries.

As countries have prospered, particularly countries in Asia, they have also expanded domestic meat production (table 3). Expansion of meat production has led to in-

creased global demand for feed grains, with many countries turning to imports to meet their feed needs. For example, feed imports by China increased almost 70 percent in value during 1992-2000, while imports by Mexico increased almost threefold during the same period. The United States is a major feed grains supplier but must compete with firms from other nations, such as grain-rich countries in North and South America, for export sales.

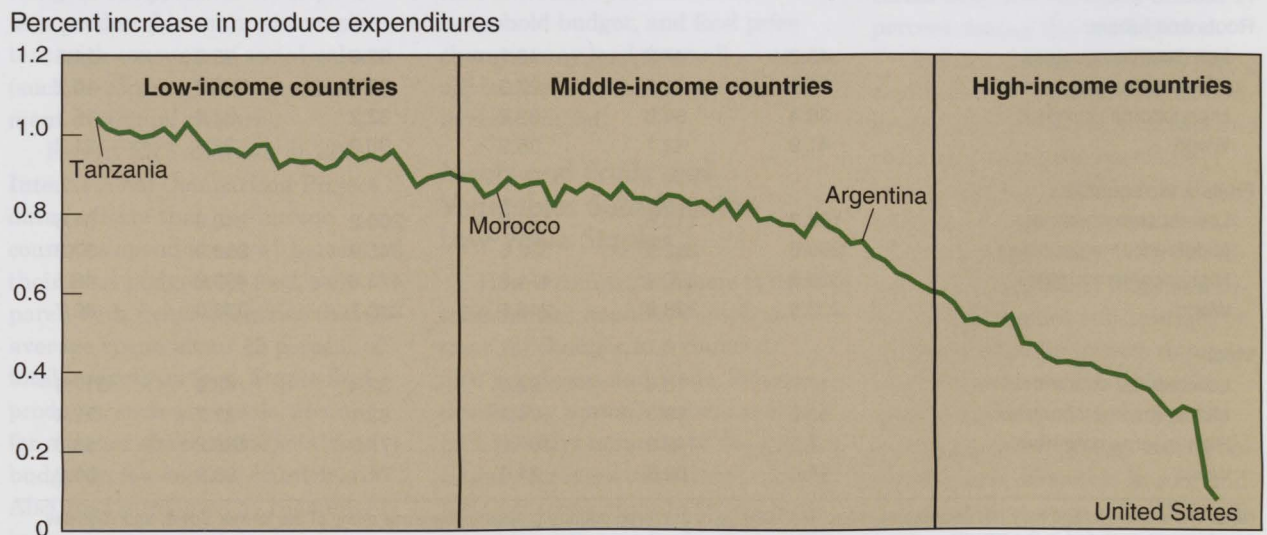
When U.S. firms compete in international markets, international

**Figure 2—Poorer Countries Have Larger Increases in Meat Expenditures With 1-Percent Increases in Income**



Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

**Figure 3—Poorer Countries Make Bigger Expenditure Increases for 1-Percent Decrease in Produce Price**



Source: Estimated by USDA's Economic Research Service based on 1996 International Comparison Project data.

standards of competitiveness replace local/national comparisons, and prices paid for agricultural commodities often reflect these standards. A major concern of U.S. producers is that globalization will lead to decreased market shares and increased price pressures on domestic commodities. For example, fresh citrus producers worry that the increased availability of fresh citrus from Australia, Israel, and Spain has led to a decline in their share of the domestic market. Citrus growers feel the increased availability of imported fresh fruit, especially in winter months when fruit from the Southern Hemisphere is also in season, has placed downward pressure on the prices they receive. At the same time, the United States exports a significant share of the fresh citrus crop each year. In 2000, U.S. citrus growers exported over a third (37 percent) of the fresh grapefruit crop, more than a fifth (22 percent) of the fresh lemon crop, and over a quarter (27 percent) of the fresh orange crop. Thus, export revenues for fresh citrus are an important contribution to growers' returns.

### Macroeconomic Factors Complicate Global Prospects

Foreign markets will be one source of future sales growth for the U.S. food sector. Hence, global macroeconomic conditions are important along with domestic market conditions. Changes in global macroeconomic factors, such as economic growth rates of U.S. trading partners and currency exchange rate levels, can overshadow increased global consumer interest in U.S. food products and ingredients. Slowing economic growth can temper demand for food, especially high-value products, and U.S. products become more expensive in other countries when the U.S. dollar appreciates against local currencies.

U.S. domestic macroeconomic conditions also affect U.S. food export prospects. Because the United States accounts for about a quarter of the world's economic activity, the

health of the U.S. economy affects the rest of the world's economies, especially those nations that export goods and services to the United States. The recent U.S. slowdown provides evidence of the U.S. economy's effect on growth around the world. Slower U.S. growth had led to a drop in U.S. imports and slowdowns in the economies of nations that rely on U.S. purchases. Reduced sales of goods to the United States means that countries have fewer funds to buy U.S. foods and ingredients.

Just as increased global growth generates marketing opportunities for U.S. exports, slower global growth reduces trade opportunities and changes the composition of U.S. agricultural exports. For example, during the Asian financial crisis in the late 1990s, Asian households increased rice consumption and reduced purchases of high-value foods. This consumption pattern change adversely affected exports to Asian countries, a major market for U.S. food products. Reduced sales to Asian markets resulted in U.S. agricultural exports declining 23 percent in real terms between 1997 and 1999. Once the financial crisis passed and Asian



economies began to grow again, Asian consumers returned to diets with greater amounts of high-value products and U.S. exports to the region increased.

Relative exchange rates also affect trade opportunities because exchange rates affect prices faced by importers. Thus, a strong (appreciating) dollar can reduce the ability of the U.S. food sector to compete in global markets and increase opportunities for competitors. For example, between 1996 and 2001, U.S. soybean prices at Gulf of Mexico

**Growing feed needs in livestock sectors around the world, due to growth in global meat demand, have resulted in increased U.S. soybean exports.**

Credit: ERS.

**Table 3—Meat Production Expanded More Rapidly in Developing Countries Since 1980**

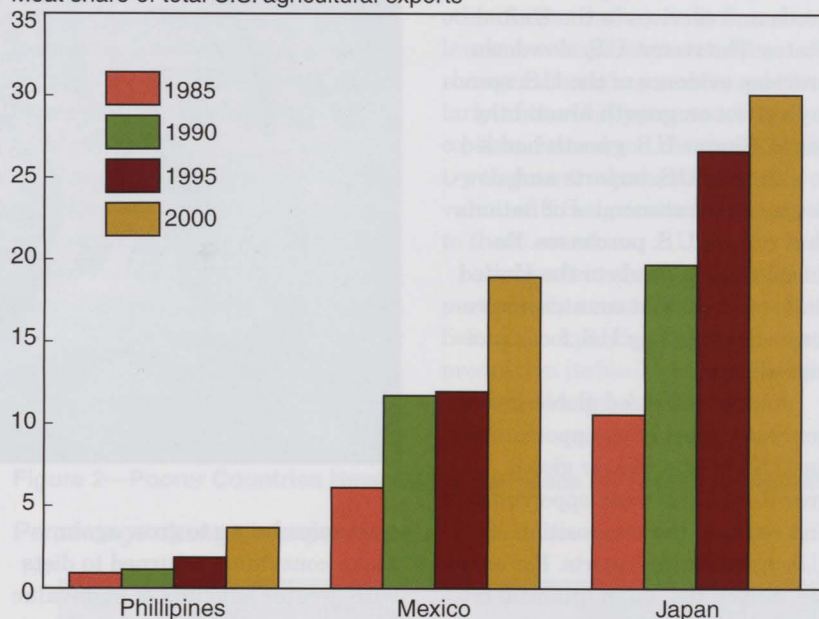
	Share of world total			Annual change 1980-98
	1980	1990	1998	
	<i>Percent</i>			
North America	20	18	18	2.13
Western Europe	22	19	16	1.14
Oceania	3	2	2	1.44
Total high-income OECD	45	39	36	1.61
East and Southeast Asia	4	4	5	4.97
South Asia	3	3	3	4.07
China	11	17	26	8.09
Near East	2	3	3	3.99
Asia and Near East	19	27	38	8.00
South America	9	9	10	3.28
Rest of world	27	25	16	-2.9
World	100	100	100	2.76

Note: OECD denotes member countries of the Organization for Economic Co-operation and Development.

Source: United Nations Food and Agriculture Organization FAOSTAT database.

**Figure 4—Meat Exports Account for a Growing Share of Total U.S. Agricultural Exports to Selected Countries**

Meat share of total U.S. agricultural exports



Source: *Foreign Agricultural Trade of the United States*, USDA's Economic Research Service.

ports, prices traditionally used to approximate U.S. export prices, fell from \$7.88 to about \$5.35 per bushel. However, when traders converted U.S. soybean prices into Korea's currency, the won, U.S. soybean prices actually increased almost 8 percent during August 2001 because Korea's currency depreciated against the dollar at a higher rate than U.S. prices declined.

### Global Consumers Important to Future U.S. Food Sector Growth

Global per capita GDP grew about 2.6 percent in the 1990s, with low- and middle-income countries registering higher growth rates of 4 percent and 3 percent, respectively, and high-income countries registering growth rates of 2 percent. Increased purchasing power among consumers in developing countries has been accompanied by faster rates of population growth in these countries compared with developed countries, leading to greater demand for food.

Although developed countries also experienced income growth and slight increases in population, growth in food demand in these countries is smaller relative to developing countries.

In addition to increased demand for food, developing countries will also undergo changes in the composition of food demanded. The developing countries, which accounted for about one-half of the world's urban population of 1 billion in 1960, are expected to account for over four-fifths of the world's urban population of almost 5 billion in 2020. Along with urbanization, income levels, education, lifestyles, and food availability are expected to change in developing countries, resulting in greater demand for variety and labor-saving food products.

Therefore, future economic prospects for the U.S. food sector will be partially tied to income gains in low- and middle-income nations. Consumers in high-income nations around the world will con-

tinue to purchase U.S. goods, but the changes in consumption patterns will largely reflect consumer preferences for quality and labor-saving products, and not increased consumption. Rising incomes in low- and middle-income countries, however, will generate increased demand for many food products and create significant market opportunities for the U.S. food sector because even small dietary changes will aggregate into large changes in demand, as each change will be multiplied by millions of people. International competition and macroeconomic events may cloud the gains, but changing global consumer demand will be an important component of future gains in the U.S. food sector.

### References

- Henderson, D.R. et al. (eds.). *Globalization of the Processed Foods Market*, Agricultural Economics Report No. 742. U.S. Department of Agriculture, Economic Research Service, September 1996.
- Lang, T. "The Complexities of Globalization: The UK as a Case Study of Tensions Within the Food System and the Challenge to Food Policy," *Agriculture and Human Values*, Vol. 16, No. 1, 1999, pp. 169-85.
- Langley, Suchada (ed.). *International Financial Crises and Agriculture*, Agriculture and Trade Report WRS-99-3. U.S. Department of Agriculture, Economic Research Service, March 2000.
- Martin, M.A. "The Future of the World Food System," *Outlook on Agriculture*, Vol. 30, No. 1, 2001, pp. 11-19.
- Regmi, Anita (ed.). *Changing Structure of Global Food Consumption and Trade*, Agriculture and Trade Report WRS-01-1. U.S. Department of Agriculture, Economic Research Service, May 2001. **FR**