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World Food Consumption Up, But Not Everywhere

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Rapid income growth, especially in China and other Asian nations, boosted world average caloric intake to record levels in many regions during 1990-92, mainly from increased consumption of cereals, meat, and vegetable oils. Average daily food use, measured as the calories available for human consumption (see box for more details), climbed to nearly 2,700 calories worldwide in the early 1990's, rising from just under 2,400 calories two decades ago.

Growth was particularly strong in the developing countries of Asia, led by a 33-percent increase since 1970-72 in caloric intake in China and 13-percent growth in Hong Kong, Malaysia, the Republic of Korea, and Thailand (see box for regional descriptions). In Latin America, a large increase in food availability in the 1970's had slowed by the 1980's, and caloric intake held steady at about the world average. Consumers in the European Union, Canada, the United States, and most other industrialized nations continued to struggle with the health consequences of excess food consumption. An average of 3,500 calories per day was available for consumption to people in these areas, higher than the U.S.

recommended 1,300 to 3,000 calories for consumers over 2 years of age.

Many, however, did not share in the growing food abundance enjoyed in parts of Asia and the industrialized world—particularly those

in the least developed countries. For many people in the poorest countries, undernutrition caused by inadequate energy and/or nutrient intake continues to be a major force behind increased rates of infection

The Food Balance Sheet Data

Food consumption trends for 1970-92 are based on the United Nations Food and Agriculture Organization (FAO) Agrostat database, which includes annual food production, trade, and consumption estimates for most countries and world regions. Per capita food consumption is estimated at the national level using a type of food balance sheet, because the costs associated with individual or household-level food intake surveys are prohibitive for many countries.

Food balance sheets provide information about a country's average per capita daily food supply, based on commodity flows from production to end uses. The total supply of each commodity equals domestic production plus imports and drawdowns from existing stocks. The food balance sheet is not a measure of actual food consumption, because it does not account for losses due to food preparation or waste (from households or institutions). Consumption is estimated from the amount left over after subtracting other uses from

available supplies, such as exports, seed use, livestock feed, food and nonfood manufacturing, farm waste, and marketing waste due to transport and retail losses. Per capita food consumption is then estimated by dividing the total food supply by the resident population of a given country. Estimates are also made for per capita intake of total energy and the individual nutrients of fat and protein.

Food balance sheets are most useful as a tool for measuring long-term trends in national food availability and food composition, and for comparing food use to nutritional requirements. They are also useful for determining the extent to which countries rely on food imports to meet their nutritional needs. However, the national averages presented in the food balance sheet may mask important deviations from trends in energy and nutrient intake among individuals, households, and population groups within a particular country.

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Table 1
Developing Countries' Diets Becoming More Varied, with More Calories From Meat, Dairy Products, and Vegetable Oils

Region	Total foods	Cereals	Starchy	Fruits	Sugar	Meat	Milk	Fish	Vege-	Animal
			roots and pulses	and vegetables	and sweeteners	and poultry	and other dairy	and seafood	table oils	fats ¹
		Average calories per person		Percent of total calories						
World:										
1970-72	2,384	50.7	10.5	4.3	8.7	6.1	4.2	.8	5.7	2.8
1980-82	2,540	51.8	8.4	4.3	8.6	6.4	4.1	.8	7.0	2.5
1990-92	2,683	51.7	7.3	4.4	8.4	7.0	4.0	.9	.1	2.1
Industrialized countries:										
1970-72	3,139	27.1	5.1	5.3	14.0	12.5	8.6	1.6	9.5	6.4
1980-82	3,221	26.3	4.3	5.2	13.1	13.2	8.7	1.6	10.7	6.1
1990-92	3,404	26.0	4.3	5.6	13.1	13.3	8.5	1.8	12.3	5.1
United States and Canada:										
1970-72	3,222	18.7	3.9	4.9	18.1	16.4	10.6	.7	10.5	6.4
1980-82	3,326	19.6	3.6	5.4	16.6	15.6	10.1	.7	12.0	6.2
1990-92	3,642	22.1	3.7	5.9	16.6	14.5	9.9	.9	12.8	5.1
European Union:										
1970-72	3,234	26.1	6.3	5.7	11.6	12.4	8.5	1.1	10.2	7.6
1980-82	3,344	24.6	5.4	5.5	11.1	8.9	1.0	10.9	7.5	7.5
1990-92	3,493	23.3	5.1	6.1	10.8	14.8	8.8	1.2	13.4	6.3
Eastern Europe:										
1970-72	3,343	41.1	7.2	3.7	10.5	8.5	8.1	.6	5.1	.3
1980-82	3,431	37.2	6.0	4.2	10.8	10.6	7.9	.6	6.3	.5
1990-92	3,285	36.6	5.5	4.0	10.8	11.3	8.2	.6	7.1	.4
Developing countries:										
1970-72	2,147	60.7	12.7	3.9	6.4	3.4	2.2	.6	4.2	1.0
1980-82	2,352	60.7	9.8	4.0	7.0	4.0	2.4	.6	5.7	1.1
1990-92	2,520	59.3	8.1	4.0	7.0	5.1	2.6	.7	7.0	1.1
Africa developing:										
1970-72	2,159	47.6	21.3	5.9	4.7	2.7	2.4	.6	7.0	.9
1980-82	2,257	48.3	18.3	5.7	6.0	2.8	2.8	.7	.4	1.0
1990-92	2,256	48.7	19.5	5.6	5.6	2.7	2.5	.6	.5	0.8
North Africa:										
1970-72	2,312	60.8	3.3	5.2	8.9	2.3	2.9	.3	9.6	1.6
1980-82	2,854	58.1	3.7	4.9	10.4	2.3	3.2	.4	10.9	1.8
1990-92	3,124	57.8	4.2	5.2	9.9	2.5	3.1	.4	11.0	1.5
Asia developing:										
1970-72	2,094	66.7	11.2	3.1	5.2	2.8	1.7	.6	3.3	.9
1980-82	2,315	66.9	8.4	3.4	5.5	3.5	1.8	.6	4.8	1.0
1990-92	2,542	64.7	6.1	3.6	5.9	5.0	2.2	.7	6.1	1.0
Latin America developing:										
1970-72	2,503	39.0	12.5	6.2	15.7	7.5	5.2	.5	6.1	2.2
1980-82	2,730	38.2	9.5	5.4	16.7	8.1	5.5	.5	.9	2.1
1990-92	2,737	38.3	8.0	5.2	16.2	8.1	5.4	.5	11.0	2.0
Least developed:										
1970-72	2,020	60.5	15.9	4.2	4.2	2.6	2.3	.7	4.0	.6
1980-82	2,046	60.7	16.2	4.2	3.6	2.5	2.6	.6	4.7	.6
1990-92	2,043	62.2	15.3	4.0	3.4	2.3	2.3	.6	5.3	.5

Notes: ¹Includes butter, lard, fish oils, and edible tallow. Source: Selected commodities from FAO Agrostat database.

Table 2
Cereals Remain a Staple Food in the Developing World

Region	Cereals	Starchy roots and pulses	Fruits and vegetables	Sugar and sweeteners	Meat and poultry	Milk and other dairy	Fish and seafood	Grams per capita ¹	
								Vegetable oils	Animal fats ¹
-----Pounds per capita-----								-----per capita-----	
World:									
1970-72	328.0	180.7	237.9	46.6	56.5	143.7	22.9	15.3	7.3
1980-82	356.4	157.4	259.3	49.4	62.2	152.3	23.8	20.0	7.2
1990-92	375.2	141.7	281.2	51.6	69.1	154.6	28.3	24.7	6.4
Industrialized countries:									
1970-72	247.9	162.3	412.6	99.2	162.0	412.0	55.8	33.5	22.3
1980-82	247.4	145.9	430.3	96.3	177.6	446.7	55.5	39.1	22.0
1990-92	258.2	149.1	492.1	102.9	191.1	469.4	66.9	47.2	19.0
United States and Canada:									
1970-72	182.0	137.3	420.4	129.3	238.0	516.2	33.0	38.1	23.0
1980-82	196.6	128.5	469.7	126.0	236.5	515.5	36.3	45.2	23.2
1990-92	243.6	141.4	571.8	142.1	253.2	565.0	49.4	52.5	20.7
European Union:									
1970-72	254.6	212.8	434.5	85.2	152.7	430.6	48.4	37.2	27.5
1980-82	249.3	190.6	446.3	83.8	180.4	500.1	45.3	41.3	28.0
1990-92	242.4	187.9	523.6	85.2	192.4	522.9	54.0	52.8	24.3
Eastern Europe:									
1970-72	420.9	262.9	312.5	80.1	126.1	410.1	18.4	19.5	30.7
1980-82	392.1	219.8	367.9	83.8	161.3	430.7	18.4	24.4	32.4
1990-92	352.0	199.5	342.2	80.1	164.5	394.3	18.0	26.3	30.6
Developing countries:									
1970-72	346.7	183.0	187.7	31.3	25.3	61.7	14.0	10.1	2.5
1980-82	381.2	158.4	215.6	37.3	32.1	74.4	16.3	15.3	2.9
1990-92	399.8	138.7	236.3	40.3	41.7	83.9	20.5	20.0	3.1
Africa developing:									
1970-72	275.0	335.0	217.8	23.5	25.9	61.0	15.1	17.0	2.1
1980-82	291.3	304.2	222.6	30.9	28.0	74.1	18.4	21.4	2.5
1990-92	293.5	328.8	219.4	28.7	27.0	68.6	15.7	21.6	2.1
North Africa:									
1970-72	408.4	39.8	260.0	46.8	24.7	91.0	7.4	25.0	4.7
1980-82	478.0	60.6	322.3	67.2	31.1	125.8	12.7	35.1	6.3
1990-92	518.6	79.3	391.4	70.5	37.9	138.0	15.2	38.8	6.0
Asia developing:									
1970-72	371.3	152.5	167.4	24.7	18.3	44.1	13.6	7.9	2.0
1980-82	412.3	129.7	203.0	29.0	24.7	54.0	15.4	12.4	2.4
1990-92	438.6	99.1	231.0	33.9	37.3	68.9	21.8	17.6	2.9
Latin America developing:									
1970-72	262.6	208.0	287.5	88.9	73.9	187.5	15.4	17.3	6.0
1980-82	284.2	166.2	287.4	102.9	87.3	215.8	19.5	27.6	6.4
1990-92	286.6	139.7	289.7	100.2	91.3	208.0	18.7	34.2	6.2
Least developed:									
1970-72	318.2	219.6	142.3	19.0	21.2	49.5	16.8	9.1	1.5
1980-82	322.2	229.0	138.7	16.4	20.9	56.6	13.8	11.0	1.5
1990-92	329.1	221.3	131.5	15.6	19.7	51.0	14.9	12.1	1.2

Notes: ¹Includes butter, lard, fish oils, and edible tallow. Source: Selected commodities from FAO Agrostat database.

and infant mortality, reduced productivity, and shortened lifespans. The United Nations Food and Agriculture Organization (FAO) estimates that 350 million to 500 million people in the least developed countries in 1992, over two-thirds of their population, consumed too little food to meet their energy needs. Between 1970-72 and 1990-92, food consumption in the least developed countries remained stagnant at about 2,000 calories per day. Low incomes (averaging less than \$400 per capita per year), rising food prices due to changing agricultural policies, and poor access to productive resources with which to grow food are the most frequent causes of undernutrition in the poorest countries.

Worldwide, Rising Incomes Lead to New Food Choices

Despite continued undernutrition in most of the least developed countries, total food consumption increased and the type of foods consumed changed considerably in other developing countries—particularly in China—due to their rising incomes, increased urbanization, and growing dependence on food imports. Diets in developing countries typically have been heavily based on carbohydrates, with 60 percent or more of calories obtained from “starchy staples,” such as cassava, sweet potatoes, corn, barley, and sorghum. As incomes rise above subsistence levels, diets tend to diversify into more expensive and higher protein grains, such as wheat and rice. Additional income growth expands dietary variety, including consumption of higher value foods, such as fruits, vegetables, animal products, and processed foods—among them fats and oils, baked goods, beverages, and confectionery products.

Cereals Remain a Dietary Staple

Cereals continue to be an inexpensive source of calories and nutrients, with consumption in most developing countries remaining at a fairly steady 60 percent of calories during the past two decades. This is about twice the share common in most industrialized countries. In the wealthiest nations, high incomes support the consumption of rela-

tively more expensive sources of calories, including meats, dairy products, and fresh fruits and vegetables.

Despite the continued prominence of cereals, important shifts have occurred in other components of the diet. While starchy roots remain an important source of calories in many of the least developed countries, including Sub-Saharan Africa, they accounted for only 5 percent of total energy in developing countries as a

World Economic Regions

Countries of the world are grouped according to economic regions defined by the United Nations Food and Agriculture Organization.

Developed Countries

Industrialized countries—United States, Canada, Japan, the European Union-12 (Belgium-Luxembourg, Denmark, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal, Spain, and United Kingdom), Australia, Austria, Finland, Vatican City, Iceland, Israel, Liechtenstein, Malta, Monaco, New Zealand, Norway, South Africa, Sweden, and Switzerland.

Eastern Europe—Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia.

Developing Countries

Africa—North Africa (Algeria, Egypt, Libya, Morocco, and Tunisia) and Sub-Saharan Africa, excluding South Africa.

Asia—Near East, including Iran, Iraq, Saudi Arabia, and Turkey; South Asia, including India; other Asia, including China, Hong Kong, Korean Republic, Malaysia, Singapore, the Philippines, Thailand, and Vietnam.

Latin America—The Caribbean, including Cuba; Central America, plus Mexico; and South America, including Brazil.

Oceania—Central and South Pacific islands of Oceania, including Papua New Guinea and New Caledonia. Excludes Australia and New Zealand.

Least Developed Countries

(these are the lowest-income developing countries)

Africa—Benin, Botswana, Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, The Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sierra Leone, Somalia, the Sudan, Sao Tome Principe, Tanzania, Togo, Uganda, Yemen, Zaire, and Zambia.

Asia—Afghanistan, Bangladesh, Bhutan, Cambodia, Laos, Maldives, Myanmar, and Nepal.

Latin America—Haiti.

Oceania—Central and South Pacific islands of Kiribati, Samoa, Solomon Islands, Tuvalu, and Vanuatu.

whole during 1990-92. Their share in the diet declined in most world regions. Significant declines also occurred in the consumption of vegetable-based protein foods, including dry beans, peas, and lentils.

Changing Role for Animal Products

Starchy roots and vegetable-based protein alternatives to meat (such as pulses) are increasingly being replaced with fats—primarily in the form of vegetable oils used in food processing and home cooking—and with more expensive and relatively high-fat animal products, including meats, eggs, and dairy foods. Between 1970 and 1992, consumption of animal products, primarily meat, grew 65 percent in developing countries to 10 percent of total calories. Growth was strongest in the developing countries of Asia where consumption doubled since 1970. Consumption of animal products held steady at about 17 percent of total calories in Latin America, where meat is an important part of the diet

in countries with large livestock sectors, such as Brazil and Argentina.

Health concerns related to excess consumption of total fats, saturated fat, and cholesterol caused a small reduction in animal products' share of the diet in industrialized countries to 31 percent of total calories, due primarily to a decline in the use of eggs and animal fats. Use of meat and dairy products continued to rise, however, accounting for over 20 percent of total energy intake in 1990-92.

Among industrialized countries, the exception to this trend was Japan, where a near doubling of meat intake and a 20-percent increase in the use of eggs increased animal products' share of total energy intake from 16 to 21 percent of total calories between 1970 and 1992. In Japan, fish, seafood, and oilseed products (derived primarily from soybeans) accounted for nearly 40 percent of total protein intake during 1990-92, compared with about 11 percent in other industrialized countries that obtain most of their protein from meats and dairy products.

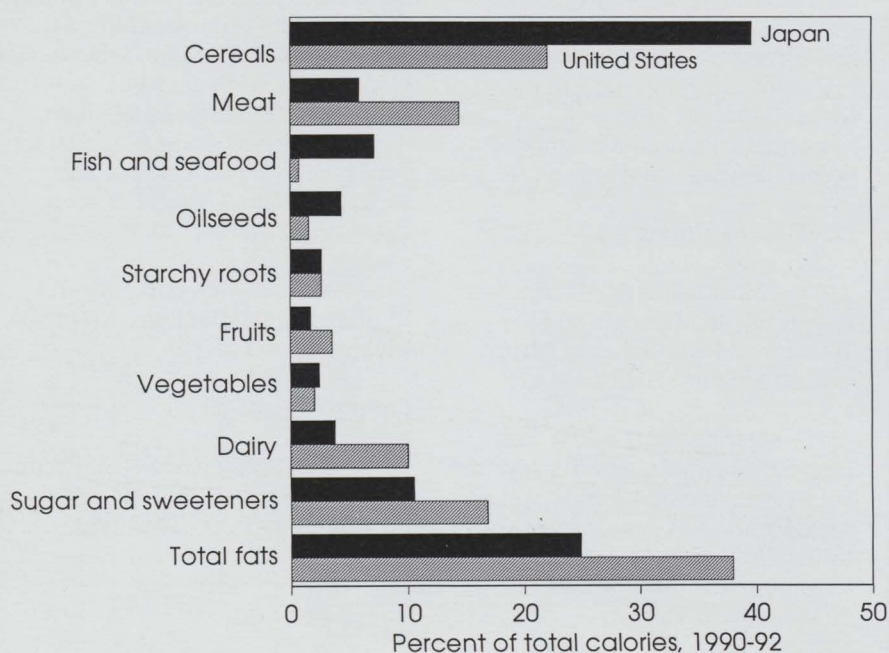
Wide Gap Still Exists Among Countries

In most countries, meats continue to act as a complement to grain and vegetable-based dishes rather than as the main component of the meal. Even in China, where meat consumption has more than doubled since 1970 to 62 pounds per capita, intake is below 3 ounces per person per day, compared with more than 8 ounces in industrialized countries. Meat remains an inaccessible food for a significant portion of the world's population. In 1990-92, people in the least developed countries consumed less than 20 pounds of meat per capita annually, compared with 253 pounds in the United States and Canada.

Low per capita incomes, poorly developed livestock sectors, lack of foreign exchange with which to import feed grains, and the high cost of meat relative to other foods limit meat consumption in many developing countries. Even in developing countries with well-established poultry industries, such as Turkey, the average consumer price for fresh broiler meat was about \$1.40 per pound in 1992, compared with a government-subsidized price of 5 cents per pound for wheat macaroni, a staple food. Annual per capita income in Turkey was just under \$2,000 in 1992. In comparison, fresh whole broilers and macaroni in the United States sold for about the same price per pound in 1992—between 87 and 86 cents each—according to the U.S. Bureau of Labor Statistics. The \$23,400 average per capita income in the United States (more than 10 times the average income in Turkey) made both products accessible to most American consumers.

A gap between developing and developed countries also exists in the consumption of fresh and processed fruits and vegetables. Although per capita fruit and vegetable consumption more than dou-

Figure 1
U.S. Diets Differ Considerably From Those in Japan



bled in China and other developing Asian countries during the past two decades, declining use in Sub-Saharan Africa and Latin America kept fruit and vegetable intake at a constant 4 percent of total calories across all developing countries. With annual per capita use of 236 pounds in 1990-92, consumption was less than half that of industrialized countries where fruits and vegetables account for about 6 percent of total caloric intake. For many low-income countries, particularly in the least developed regions of Africa and Asia which have limited land and water resources for growing input-intensive fruits and vegetables, these foods are a relatively expensive source of calories. In order to supplement domestic production, a developing country would have had to pay more than \$550 on average to import a metric ton of oranges from the United States and nearly \$800 for the same quantity of fresh tomatoes, according to FAO data for 1993. By contrast, a metric ton of a cereal staple such as wheat, rice, or corn would have cost about \$125.

Fat Intake on the Rise

Strong growth in the consumption of vegetable oils across all regions offset a decline in the use of animal fats in the industrialized countries, raising total fat consumption to 67 grams per person per day. During 1990-92, fats accounted for about 18 percent of total calories in developing countries, 36 percent in all industrialized countries, and nearly 40 percent in the European Union.

In China and other developing Asian nations, fat consumption grew by nearly two-thirds to about 48 grams daily—17 percent of total calories. Fat intake totaled 14 percent of total calories in the least developed countries. However, fats accounted for a slightly higher share of calories in Africa, due to more frequent use of meats and vegetable

oils in the higher income countries of North Africa. Federal nutrition guidelines in the United States rec-

ommend that most adults limit fat intake to no more than 30 percent of total calories for good health.

Figure 2
Developing Countries Eating a More Varied Diet Than Two Decades Ago

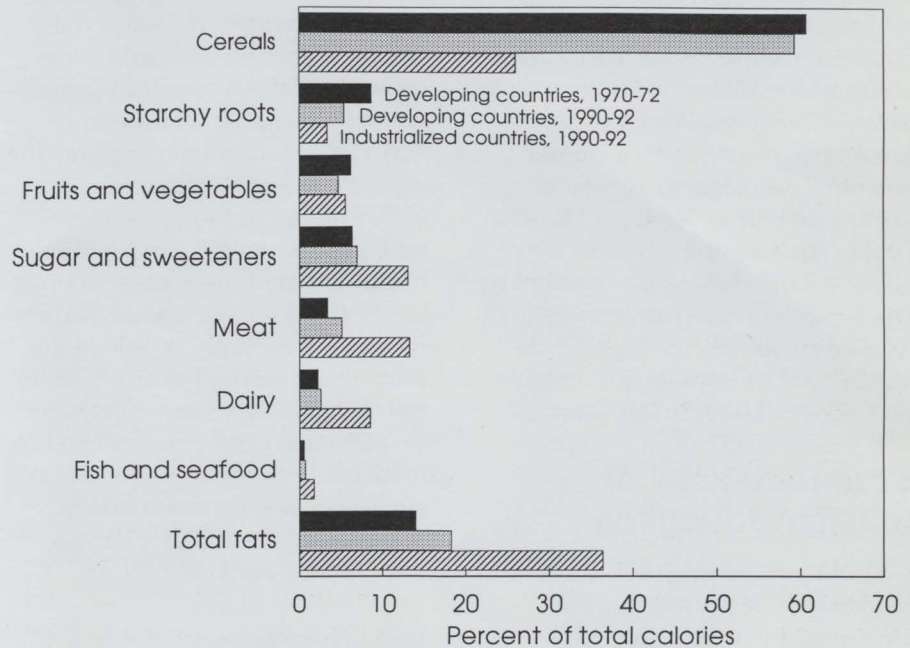
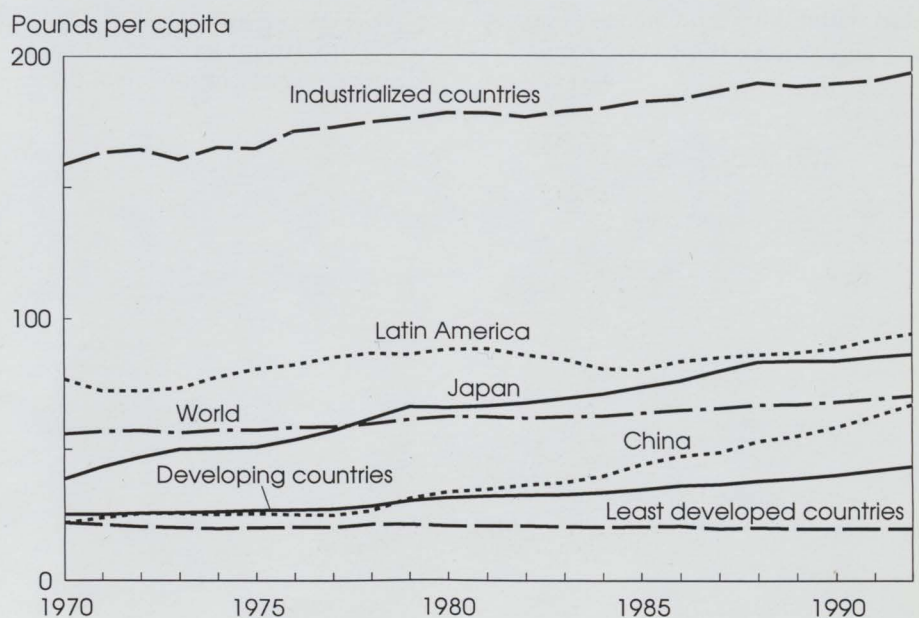


Figure 3
Meat Consumption on the Rise—in Areas That Can Afford it



Source: FAO Agrostat Database.

A growing food processing sector helped make vegetable oils the fastest growing food in the developing countries of Asia and Latin America, with use more than doubling in both regions between 1970 and 1992. Vegetable oils now account for nearly 40 percent of total fat intake in developing countries, compared with about 34 percent in industrialized regions where animal products are still the primary source of fat. Among developed countries, use of animal fats, such as butter and lard, was highest in Eastern Europe and lowest in Japan. Eastern Europeans consumed a daily average of about 8 teaspoons of animal fats per person daily during 1990-92, while consumption in Japan averaged about 1 teaspoon, mirroring that of developing Asian countries.

Expanded Role for Nutrition Education

While income growth has reduced hunger and improved nutrition among many populations in developing countries, higher incomes do not always result in improved nutritional status. In industrialized nations, overnutrition, caused by eating too many calories particularly from fat and saturated fats, is associated with a high prevalence of obesity and chronic diseases, such as

coronary heart disease, hypertension, adult-onset diabetes, and some forms of cancer. As incomes rise and diets in low-income countries move closer to those in industrialized nations, the incidence of diet-related diseases is likely to rise.

Obesity, for example, is becoming a major health concern in parts of the developing world—especially among higher income, urbanized consumers in low-income countries across Asia, Africa, and Latin America. Educational programs that discourage overconsumption of calories, fats, and low-fiber foods will be important in improving the health status of these populations as the demand for Western-style diets increases. For many people in the developing world, however, undernutrition and the many infectious diseases that can be precipitated by inadequate energy and nutrient consumption, will continue to be a major public-health problem for the foreseeable future. ■

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