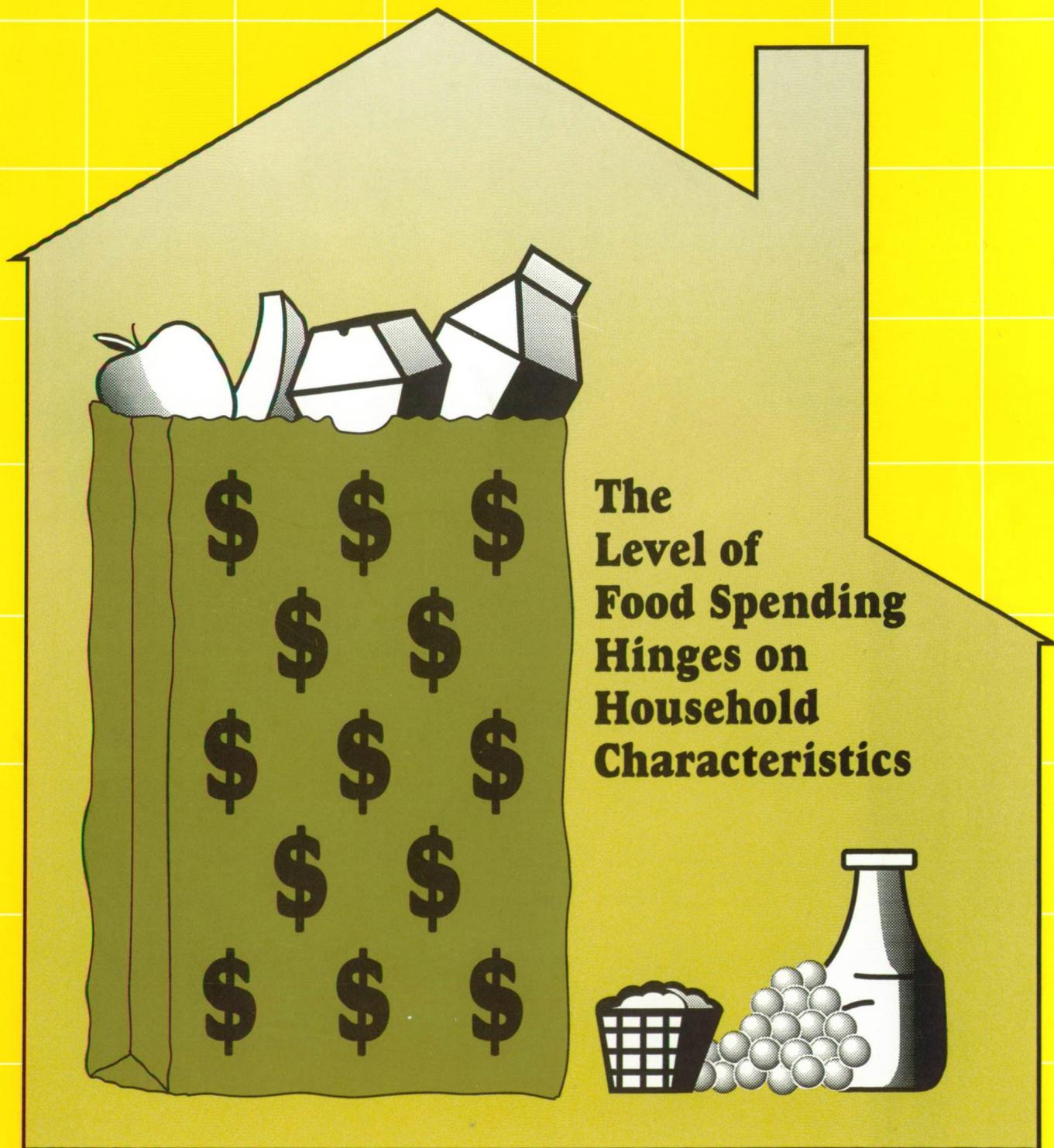


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...Upfront

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Slow Growth in Food Spending Expected

Noel Blisard and James Blaylock
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In 1992, Americans spent for food \$280 billion in food stores and another \$183 billion in food-service establishments. Total real food expenditures, adjusted for inflation, grew 52 percent between 1970 and 1990.

However, food sales are expected to grow more slowly during the 1990's and into the next century. Total real food spending is projected to grow only 31.1 percent between 1990 and 2010, mostly due to slowing overall population growth. Of this amount, spending for food at home is expected to grow 24.2 percent between 1990 and 2010, and expenditures on food away from home would grow 37.4 percent.

While demographic changes have some impact, future per capita food spending will hinge on the growth in personal income and the aging of the U.S. population.

These spending projections are based on combined estimated differences in per capita food spending by demographic groups, along with projected changes in those groups. Included are changes in the age distribution of Americans, regional migration, racial mix, as well as income growth (see box). The resulting changes in per capita food spending are combined with

total population growth to assess the implications for future national food spending patterns.

Bigger Paychecks, More Spent on Meals Out

Expected growth in inflation-adjusted incomes will be the dominant force behind changes in per capita food expenditures. Assuming a 2-percent average annual growth in per capita real income, inflation-adjusted food expenditures are projected to rise almost 15

percent between 1990 and 2010 due to income alone (table 1). Most of the increase will go for food away from home, which is estimated to grow about 24 percent. Expenditures on food for at-home consumption are estimated to grow only 6.6 percent.

Benefiting the most from income growth will be fruit (up 10.5 percent), sugars and sweeteners (up 6.2 percent), and vegetables (up 6.1 percent). Beef and pork will benefit the least (up 3.5 and 1.3 percent, respectively) since consumers spend



The increase in national food spending over the next 20 years is projected to be less than in the past 20 years—31.1 percent between 1990 and 2010, compared with 52 percent in 1970-90.

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proportionally less on these foods as their incomes increase.

Growth in expenditures for dairy products due to rising incomes reflects higher spending on cheese (up 9 percent) and other processed dairy products, such as ice cream and yogurt (up 12 percent). Because cheese and other processed dairy products are favored by more affluent households, purchases of these items should increase as projected incomes rise. These projected increases offset a decline in milk and cream products (down 2 percent).

Other Demographic Changes Have Little Impact

The three demographic characteristics—age, regional distribution, and race—likely will only slightly affect per person demand for food (table 1).

Of these, age distribution will likely have the biggest impact. Slower growth in the population and increased longevity will result in a relatively older population. For example, approximately 47.5 percent of the population in 1985 was under 30 years of age. This figure is expected to decline to approximately 39 percent by the year 2010. Likewise, persons aged 45 years and over accounted for just 31 percent of the U.S. population in 1985, and are expected to represent 41 percent by the year 2010.

A larger proportion of the population over age 45 is projected to increase real per capita food expenditures by just 1 percent over the 20-year period because older Americans will spend more on food at home, but less on food eaten away from home.

An older population would generate higher per capita spending for all major groups of food for at-home consumption. The changing age distribution would produce the largest increases in spending

Table 1

Increasing Incomes Will Have the Biggest Effect on Future Per Capita Food Spending

Food group	Changes in per capita food expenditures, 1990-2010, due to:				
	Income	Regional distribution	Race	Age distribution	Total ¹
	Percent				
All food	14.9	0.1	-0.2	1.0	16.1
Away from home	24.2	.1	-.3	-1.9	21.7
At home	6.6	.1	-.1	3.0	10.0
Beef	3.5	.1	.1	3.7	7.5
Pork	1.3	-.3	.3	4.1	6.2
Poultry	5.3	.1	.7	2.7	9.6
Cereals and bakery	4.7	0	-.2	2.6	7.3
Dairy products	4.7	.1	-.4	1.5	6.0
Fruit	10.5	.1	-.1	3.7	14.8
Vegetables	6.1	.5	-.1	4.3	11.1
Sugars and sweeteners	6.2	.3	-.1	2.4	8.8
Fats and oils	4.6	.2	-.2	4.2	8.9

Note: Estimated percent changes are in real terms (adjusted for inflation). ¹Net adjustment reflecting projected changes in all variables.

for vegetables (up 4.3 percent), fats and oils (up 4.2 percent), and pork (up 4.1 percent). The least impact is expected for dairy products (up 1.5 percent) and sugar and sweeteners (up 2.4 percent) because older Americans will spend less on foods in these two groups, such as milk and candies. Since older households tend to eat out less often than do younger households, spending for food away from home is expected to decline 1.9 percent.

Regional population shifts are expected to continue. The South and West are expected to gain shares of the total population over the next 20 years, while the Northeast and North Central will likely see declines as households migrate from the Midwest and Northeast for jobs or retirement. However, these regional shifts are expected to result in only a slight increase in per capita expenditures, except for pork.

The growing proportion of black households would slightly decrease per capita expenditures because, after accounting for

differences in income and household size, black households spend less on food. However, poultry, pork, and beef would increase somewhat since black households spend more on these foods.

The combination of the three demographic changes and increased real incomes are expected to push up real per capita food expenditures by 16.1 percent. The largest increases for food at home are anticipated for fruit (up 14.8 percent), vegetables (up 11.1 percent), and fats and oils (up 8.9 percent). Dairy products have the lowest growth, up just 6 percent. Pork expenditures are expected to grow just 6.2 percent over the 20-year period.

More People, More Food Spending

Population growth is a dominant factor affecting future food expenditures for the Nation as a whole. According to the Bureau of the Census, nearly 32 million more people will have to be fed in the year 2010 than in 1990.

But although the U.S. population will be larger two decades from now, the population will grow at just over half the rate of the previous 20 years. The U.S. population increased from 204 million in 1970 to approximately 250 million in 1990, an annualized growth rate of 1 percent. Between 1990 and 2010, the population is projected to increase by 0.6 percent a year to approximately 282 million. Therefore, farmers, food manufacturers, retailers, and restaurant operators will not be able to rely on population growth to fuel expansion at 1970-90 rates in industry output or profits.

The growing U.S. population will increase total real food expenditures 31.1 percent between 1990 and 2010 (table 2)—double the increase in per capita expenditures caused by the income and demographic effects. Expenditures on food away from home will increase 37.4 percent, compared with 24.2 percent for food at home.

Table 2
National Food Spending Expected To Grow 31 Percent Over the Next Two Decades

Food group	Change in national food expenditures 1990-2010 ¹
	Percent
All food	31.1
Away from home	37.4
At home	24.2
Beef	21.4
Pork	19.9
Poultry	23.7
Cereals and bakery	21.1
Dairy products	19.7
Fruit	29.6
Vegetables	25.4
Sugars and sweeteners	22.8
Fats and oils	22.9

Note: Estimated percent changes are in real terms (adjusted for inflation). ¹Assumes 2-percent annual income growth, demographic changes, and Bureau of the Census population growth projections.



Expected growth in inflation-adjusted incomes will be the dominant force behind changes in per capita food expenditures—particularly for food away from home.

The estimated percentage increases in table 2 incorporate the projected per capita expenditure changes of table 1 with the projected total population growth. The food groups reported in table 2 represent only at-home consumption. Therefore, total expenditure growth for a particular food group will be higher than our projections if the away-from-home market for that food group grows. The estimates for individual food categories represent a rough estimate of quantity changes because these projections assume real prices will remain constant.

The largest projected increase is for fruit (up 29.6 percent), while the smallest is for dairy (up 19.7 percent). Spending on both sugar and sweeteners and fats and oils is projected to increase about 23 percent. Expenditures on cereals and bakery goods would increase about 21 percent, while vegetables would increase by about 25 percent. Spending on meats and poultry is expected to increase 20 to 24 percent.

Growth in Food Spending Expected To Slow

The increase in national food spending over the next 20 years is projected to be lower than over the past 20 years. Total real food expenditures, which grew 52 percent between 1970 and 1990, will grow only 31.1 percent between 1990 and 2010.

Slower growth in spending on food away from home will outweigh the higher growth expected in at-home food spending. At-home food expenditures will grow 24.2 percent, faster than the 16-percent growth during 1970-90. However, away-from-home food expenditures are projected to grow 37.4 percent between 1990 and 2010, much lower than the 104 percent posted between 1970 and 1990.

It is important to keep in mind the limitations of this type of analysis. Relative prices are not likely to be fixed, as we assumed, but will change as supply and demand con-

Projections Depend on Assumptions

A number of demographic assumptions for 1990-2010 underlie our projections. If these underlying assumptions are not true, then the analysis will over- or understate some of the projected trends.

- According to the Bureau of the Census, the U.S. population will grow from 249.9 million in 1990 to 282.1 million in 2010.
- Blacks will increase from 12.6 percent of the total population in 1990 to 14.1 percent in 2010. (The analysis separates households into black and nonblack.)
- The regional population distribution, expressed as shares of the total U.S. population, will shift: the Northeast will decline from 20.3 percent in 1990 to 19.1 percent in 2010; the North Central will decline from 24.1 to 21.2 percent; the South will increase from 34.6 to 36.7 percent; and the West will increase from 20.9 to 23.1 percent.
- The age distribution, expressed as shares of the total population, will also change: between 1990 and 2010 the proportion age 20-29 years

will decline from 16.2 to 13.8 percent, the proportion age 30-44 years will increase from 18.8 to 27.5 percent, the proportion age 45-64 years will increase from 18.6 to 27.5 percent, and the proportion age 65-74 years will increase from 12.8 to 13.9 percent.

- Inflation-adjusted per capita income will grow 2 percent per year.

We assume that as an individual moves from one population group to another, his or her buying habits immediately take on the characteristics of the new group. For example, someone 70 years of age in 2010 is expected to buy the same kinds of food as a 70-year-old in 1990, all other factors being equal. Likewise, a New England family that relocates to Georgia is assumed to purchase the same foods as their new southern neighbors.

The analysis is based on household spending data collected over a short period of time, and we assumed that all households faced the same relative prices for food and other goods. Although commodity prices and consumer tastes and preferences are important factors influencing food con-

sumption over time, economists generally have little knowledge about the future course of these factors. Unforeseen events, such as droughts, trade wars, or new product introductions, can affect the supply and demand for a particular food, thereby changing its price relative to other foods and other goods. Because these events cannot be anticipated, we assume relative prices and consumer tastes and preferences remain the same as 1988-89 levels.

The same consumption patterns might not exist if relative prices differ. For example, if in 2010 beef became less expensive relative to chicken, we would expect consumers to buy less chicken and more beef. In this case, beef purchases would be higher and chicken purchases lower than our projections.

Other assumptions underlying these projections and are detailed in *U.S. Demand for Food: Household Expenditures, Demographics, and Projections for 1990-2010*, forthcoming Technical Bulletin by William N. Blisard and James R. Blaylock, USDA, ERS.

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ditions change over time. Weather conditions may cause crop failures, which reduce supply and drive up prices. Or, consumer preferences may shift from one food group to another, thereby altering demand.

Also, as individuals move among population groups, their buying habits may not take on the characteristics of the new group, as

assumed. For example, some economists think that as the younger generation ages they will continue to spend more of their food dollars away from home. If this is true, growth in expenditures on away-from-home-food will be greater than we projected.

However, if our assumptions prove correct, the projected food

expenditure patterns will reinforce the long-term movement of resources from agricultural production into other industries.

And, if the assumptions hold true, then the food-away-from-home industry will not continue to experience the rapid growth rates that occurred over the past 20 years. ■

Female-Headed Households Spend Less on Food

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Households headed by single mothers spend less money, but a greater share of their income, on food than do two-parent households. The lower spending is due primarily to their lower income and education levels—more so than to the absence of a male partner. This, however, does not necessarily imply that these households have lower food consumption or nutrition.

The dramatic growth in the number of single-parent households—particularly those headed by a female—has drawn the interest of food marketers and government officials, who are trying to determine if female-headed households have different food spending patterns than other households, and what factors might influence their food spending decisions. Their interest is spurred by the fact that between 1970 and 1988, the number of female-headed households more than doubled from 3.4 million to 8.1 million—a growth from 12 percent to 24 percent of all family groups with children under age 18.

An increasing proportion of U.S. children are raised in female-headed households—an estimated 60 percent of all children born today will spend some of their child-

hood in a single-parent household, most often one headed by a woman.

Nearly a Third of All Female-Headed Households Are Poor

Government officials are interested in learning more about female-headed households for several reasons, including their high poverty rates. Nearly 50 percent of all households in poverty in 1986 were headed by women.

Female-headed households are more likely to be poor than are two-parent households. The Census Bureau estimated that, in 1988, one of every three female-headed households had annual incomes below the poverty threshold (\$9,435 for a family of three, and \$14,305 for a family of five).

Female-headed households are heavily represented among the welfare and food assistance population. In 1988, single mothers headed nearly half of all households receiving food stamps. And,



Female-headed households in the study spent an average of \$89.37 per person per month on food, compared with \$105.31 by two-parent households.

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an estimated one-third of the participants in the Women, Infants, and Children Program (WIC) lived in households with no adult male present. Policymakers, therefore, are looking at the food spending patterns of female-headed households in order to develop more effective food assistance programs.

Single-Parent Households Spend Less on Food

Previous Government studies have indicated that, on average, households headed by a single parent spend less per person for food than do other households. For example, one study found that single-mother households spent on average \$76.48 per person per month for food in 1988, or about 76 percent of what two-parent households spent (table 1).

Another study compared food expenditures of all single-parent households (mostly single mothers, although the sample also included single fathers) with two-parent households, and found similar—although smaller—differences. Single-parent households spent on average \$85.25 per person per month for food during 1984-1986, or about 90 percent of what two-parent households spent.

When these single-parent households were separated into poor and nonpoor households, the poor spent less for food. Nonpoor single-parent households, however, actually spent more for food per person than did two-parent households.

Women May Have Different Preferences for Food

Female-headed households may allocate their incomes differently than do two-parent households because there is no male head to influence food consumption patterns or spending decisions.

For example, an earlier study by USDA's Economic Research Service (ERS) found that women in households with a male head consumed significantly larger shares of dietary fat from red meats than did women in households without a male head—even independent of differences in income and education (see "Diet/Health Concerns About Fat Intake" *FoodReview*, Vol. 14, Issue 1, January-March 1991, pp. 16-20). Such difference may have been due to the influence of the male head on household food choices.

Also, women may have different preferences than men in the income allocated to food. Food spending in female-headed households would reflect this difference, along with other factors that may vary, such as how they allocate their time.

Income and Education Determine Food Expenditures

Because few studies have been able to reconcile the effects of dif-

ferences in household characteristics when examining food expenditures, ERS conducted its own analysis. Using data from the U.S. Department of Labor's 1988 Continuing Consumer Expenditures Survey (see box), the study took into account differences in income, education, household composition, full-time work, race, season, and region, and measured their effects on food spending.

Our findings agree with earlier studies that female-headed households spend less per person for food than other households. Female-headed households in the study spent an average of \$89.37 per person per month on food, compared with \$105.31 by two-parent households (table 2). Female-headed households spent \$59.41 on food for home consumption and \$29.95 on food away from home (that is, food prepared in restaurants, fast food places, and other foodservice establishments). In comparison, two-parent households spent \$67.28 on food for home consumption and \$38.03 on food prepared away from home.

Table 1
When Buying Food, Two-Parent Households Outspent Single-Parent Households

Study period	Per capita household food expenditures			
	Two parents	Single parents ¹		
		Total	Poor ²	Nonpoor
<i>Dollars per person per month</i>				
Study 1 (1984-86):				
Total food	94.50	85.25	63.58	103.50
Food at home	68.42	64.58	56.58	71.42
Food away from home	26.00	20.58	7.00	32.08
Study 2 (1988):				
Total food	100.79	76.48	NA	NA
Food at home	64.61	53.13	NA	NA
Food away from home	36.18	23.36	NA	NA

NA = Not applicable. ¹In the first study, single parents include single fathers; in the second study, single parents include only single mothers. ²The 1986 poverty threshold for a four-person household with two children under age 18 was \$11,113, and was \$8,829 for a three-person household with two children under age 18.

Lower incomes and education levels were primarily responsible for the lower food expenditures. Female-headed households had lower incomes and higher poverty rates than did two-parent households. Nearly half of the female-headed households in the study had incomes below poverty levels, compared with less than one-tenth of the two-parent households.

The absence of an adult male income earner among female-headed households was a major factor behind their lower household income. Not only did working women tend to receive lower wages than working men, but only 22 percent of the female-headed households reported having another income earner present in the household—and this was probably a child worker since there was no partner present.

Another reason for the lower income of female-headed households was that those women tended to have less formal education. For example, 20 percent of the women in female-headed households had not completed high school, while only 12 percent of the women in two-parent households lacked a high school diploma. Education is strongly related to earnings and, therefore, to food expenditures.

Education also influenced food spending separately from its effect on household income. Households in which the female head had not completed high school spent less per person per month on food than did similar households in which the female head had completed high school. It has been suggested that individuals with more education tend to be more informed and adventurous in their food selection. They may also be better informed about food safety and nutrition issues, and thus demand higher quality food and food service.

In general, fewer household members, different household composition (such as a larger propor-

Data Drawn From Continuing Consumer Expenditures Survey

To determine how food spending patterns vary between female-headed and two-parent households with children, we examined data from the diary portion of the 1988 Continuing Consumer Expenditures Survey, done by the Bureau of Labor Statistics, U.S. Department of Labor. In the survey, households kept a diary of their food expenditures for 2 consecutive weeks. Approximately 5,000 households were sampled across a 12-month period.

This study is based on data for urban households that provided complete data on food expenditures (2 weeks of data) and had at least one child under age 18. Because of their small numbers, households with extended families, households headed by single fathers, and households living in college housing were excluded from the study.

The final sample consisted of 1,140 households, of which 204 (18 percent) were headed by single women—"female-headed households." The remaining 936 households were headed by a married couple—"two-parent households."

It should be noted that the Continuing Consumer Expenditures Survey collects information about food expenditures—not food consumption. These data include only the value of foods and beverages purchased during the 2-week period—whether eaten or not—and not items used out of the household's own inventories.

To analyze food spending patterns in greater detail, ex-

penditures for food consumed at home were divided into 14 categories. The beef group excludes canned beef. Pork includes all cuts of pork, bacon, ham, and sausages. Poultry includes chicken, cornish hens, turkey, and duck. Other meats include frankfurters, lunch meats, lamb, mutton, goat, and game. Eggs include fresh, powdered, and egg substitutes. Fats and oils include nondairy cream substitutes and peanut butter. Bakery and cereal foods include bread, cookies, crackers, pasta, and rice. Sugars and sweets include sugar, candy and gum, jam, jelly, preserves, fruit butter, syrup, fudge mix, icing, prepared sweets, and artificial sweeteners. Nonalcoholic beverages exclude milk and fruit or vegetable juices. Miscellaneous prepared foods include frozen prepared foods, canned and packaged soup, chips, nuts, condiments and seasonings, olives and pickles, sauce and gravy, salad, dessert, and baby food.

Food prepared away from home could not be separated into categories. All specific food categories discussed in this article refer to food consumed at home.

More technical information behind the findings reported in this article—on the analysis, methodology, and data sources—is available. Just call toll-free from the United States or Canada 1-800-999-6779 and ask for *Food Spending by Female-Headed Households*, TB-1806, by E. Frazao, USDA, ERS, July 1992. (Callers elsewhere, please dial 703-834-0125.)



Differences in which foods are purchased and how much is spent is mainly attributed to differences in household characteristics between female-headed and two-parent households.

tion of preschoolers and a lower proportion of adults in the household), and the preponderance of black households in the group—all characteristics commonly associated with lower food expenditures—also contributed to the lower per person food expenditures of female-headed households.

Overall, female-headed households tend to have fewer members, so they may be less able to take advantage of the savings associated with purchasing larger food packages or buying in bulk.

Full-Time Work Has No Net Effect on Total Food Expenditures

Women in female-headed and two-parent households were similar in age and, interestingly, labor force participation (table 2). However, women in female-headed households tended to work longer hours, and were more likely than their married counterparts to work full-time.

Table 2
Income and Education Behind the Lower Food Spending by Female-Headed Households

Household characteristics	Unit per household	Female-headed households	Two-parent households
Households	Number	204	936
Household size	"	3.03	4.05
Monthly income per household	Dollars	1,404.54	3,415.06
Per capita	"	515.20	888.25
Monthly food stamps per household	"	63.41	6.21
Per capita	"	19.77	1.32
Monthly food expenditures per household	"	253.07	411.78
Per capita	"	89.37	105.31
Food at home	"	59.41	67.28
Food away from home	"	29.95	38.03
Households with other earner present	Percent	22	98
Households in poverty	"	47	9
Households receiving food stamps	"	36	3
Characteristics of female head:			
Age:	Years	34.63	34.66
Race:			
Black:	Percent	25	7
Education:			
Completed high school	"	79	88
Completed college	"	10	21
Employed			
Full time	"	74	76
	"	55	46
Time worked:			
Weeks	Number	40.06	33.92
Hours per week	"	31.14	32.42

This may affect food expenditures, if women who work full-time try to reduce their time in the kitchen and seek help from higher-cost, more convenient sources of food.

In the study, households in which the female head worked full-time tended to spend more for food away from home and less on food at home. Although food away from home typically is considered to be more expensive than food for home consumption, the advent of lower priced fast food fare and the proliferation of relatively more ex-

pensive ready-to-eat frozen meals and fully prepared dishes in grocery stores have shrunk the cost differences. Thus, full-time work alone (holding income constant) had little net impact on total food expenditures.

Spending Patterns Differ Among Food Groups

The largest expenditures among foods for at-home consumption were for bakery and cereal products, milk and dairy products, and miscellaneous prepared foods (fig.

1). These three categories represent over 40 percent of spending on food for at-home consumption for both female-headed and two-parent households.

Female-headed households spent less per person than did two-parent households for each of these three food categories—as well as for most other categories.

Many households, however, did not purchase certain foods for at-home consumption during the survey period. Although most households purchased bakery and cereal products and milk and dairy products, only about half of female-headed households purchased poultry, and less than 40 percent bought fish and seafood (fig. 1). In fact, fewer female-headed households purchased from most food categories than did two-parent households. Economies of scale in food purchasing and preparation may make it easier for larger households to consume a greater variety of foods.

Food expenditures differed somewhat when only households that actually purchased from a food category during the survey period were considered (fig. 2). Among households that purchased beef, for example, female-headed households spent more per person on beef than did two-parent households. However, average expenditures for beef for home consumption were lower among female-headed households as a whole because fewer female-headed households purchased beef (65 percent) than did two-parent households (79 percent) (fig. 2).

Because so many of the households did not purchase from many of the food categories during the survey period, we were interested in determining whether households that purchased from a food category differed in characteristics from households that did not purchase from those food categories. More specifically, we wanted to de-

termine whether having a single female as the head of the household affected whether a food item was purchased during the survey period and, if so, how much was spent on that item.

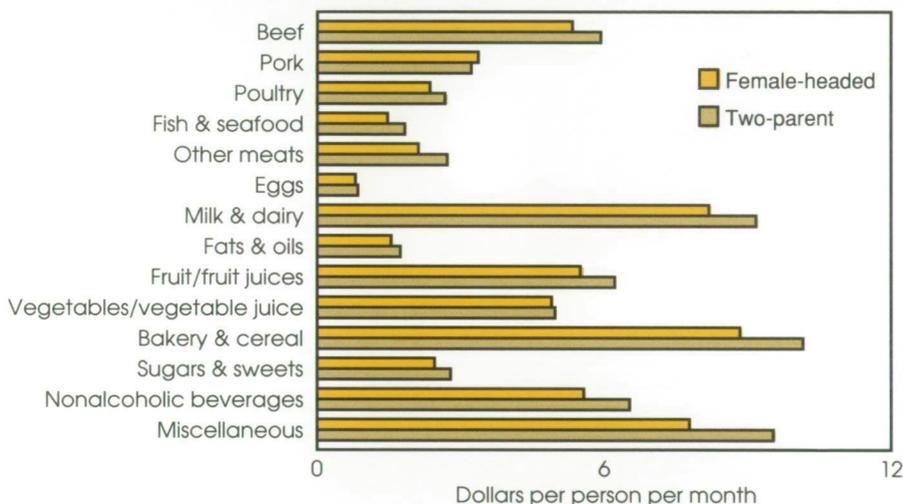
As with total food expenditures, differences in both which foods are purchased and how much is spent can be mainly attributed to differences in household characteristics between female-headed and two-

parent households, such as income, education, household size, and race.

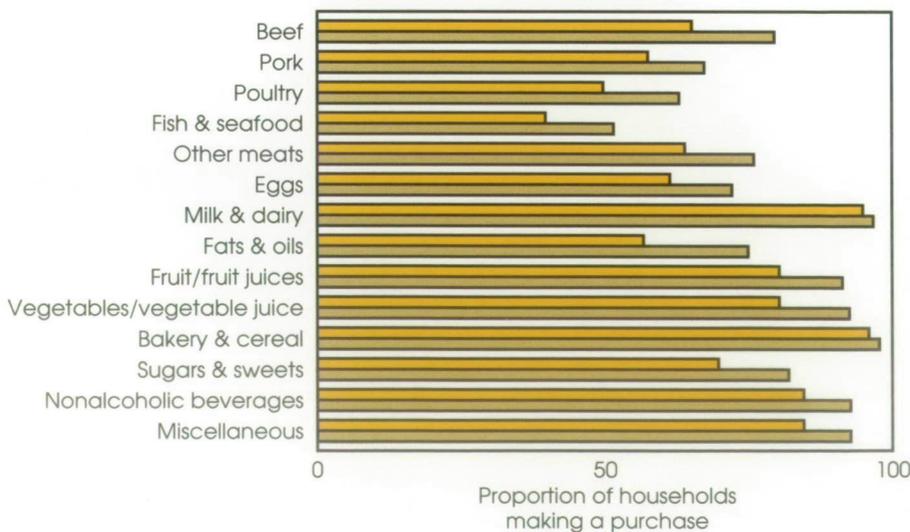
For example, higher income households were more likely to purchase fish and seafood, fruit and fruit juices, and miscellaneous prepared foods for consumption at home. Higher income households were also more likely to purchase food prepared away from home. These same households also tend-

Figure 1
How Food Spending Adds Up for Female-Headed and Two-Parent Households

Female-Headed Households Spent Less on Almost Every Major Food Group...



...Partly Because They Were Less Likely To Buy Most Food Items



ed to spend more on the items they bought.

Full-time work, region of residence, and time of year also affected which foods were purchased and how much was spent. For example, everything else being equal, households in which the female head worked full-time were less likely to purchase beef, pork, fish and seafood, fats and oils, fruit and fruit juices, and nonalcoholic beverages for home consumption than were households in which the female head did not work full-time. Among households purchasing vegetables and vegetable juices and bakery and cereal goods for home consumption, those in which the female head worked full-time spent less.

Interestingly, households in which the female head worked full-time were not more likely than those in which the female head did not work full-time to purchase food away from home. Perhaps the many convenient foods available for at-home consumption, such as prepared frozen meals, compete with the convenience and cost of food away from home.

Whether the household was headed by a single female or by two parents influenced only a few purchasing and spending decisions, independent of other variables. Female-headed households were less likely to purchase fats and oils, fruit and fruit juices, and other meats for consumption at home. Among those purchasing other meats, female-headed households spent less than did two-parent households. Among households purchasing food prepared away from home, female-headed households spent less.

Nutrition Not Necessarily Lower

The finding that female-headed households spent less per capita on food does not necessarily imply that they had lower food consumption or nutrition.

Since the data refer to expenditures and not consumption, lower food expenditures may result from purchasing less food, more of cheaper foods, less of costlier foods (such as convenience foods or more expensive food away from home), or a combination of these.

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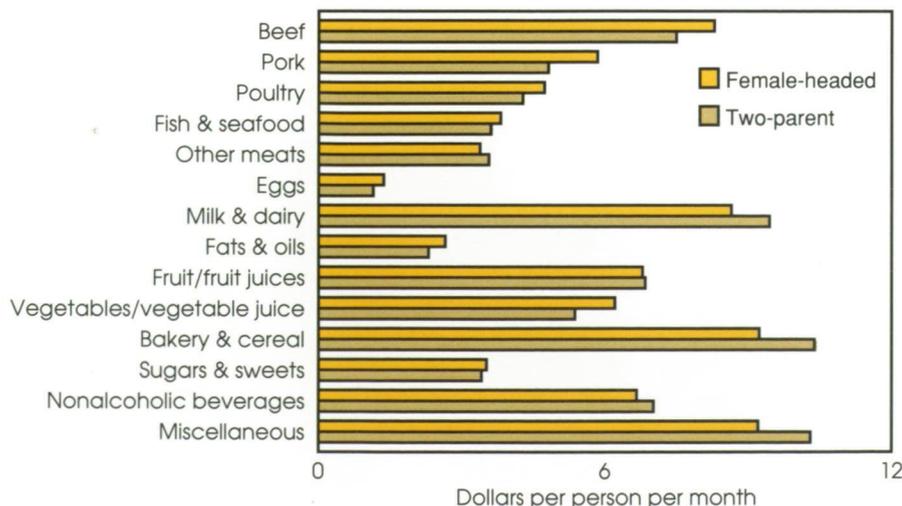
Evidence suggests that lower income households are more efficient food shoppers and obtain more nutrients per dollar's worth of food than are those with higher incomes. For example, according to data from USDA's 1977-78 Nationwide Food Consumption Survey, households with incomes below \$5,000 obtained more calories, protein, and calcium per dollar's worth of food used at home than did households with incomes of \$20,000 and above.

More research is needed on the relationship between food expenditures and the quantity and nutritional quality of the foods purchased. With this information, researchers could investigate how differences in food expenditures translate into actual intakes of food and nutrients for the two types of households.

For further details, see *Food Spending by Female-Headed Households*, TB-1806, by E. Frazao, USDA, ERS, July 1992. ■

Figure 2

Among Those Purchasing Each Food Group, Female-Headed Households Actually Spent More on Several Major Food Groups



Household Characteristics Affect Food Choices

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National trends in food consumption often mask the fact that the eating habits of some American households run counter to those trends.

Food supply data suggest that, overall, Americans are eating fewer animal products and more crop products. Consumption of most crops has increased steadily in the past 20 years, especially grains, fruit, and vegetables. In comparison, Americans are consuming less whole milk, eggs, and red meat. For example, per capita beef consumption in 1991 was about 25 pounds lower than the all-time high of 89 pounds in 1976. These decreases in some animal products have been tempered by increases in the consumption of lowfat milk, cheese, poultry, and fish.

Household characteristics, such as income, type, and size, influence the type and quantities of foods used. For instance, the lowest income households have decreased their consumption of fresh vegetables by 22 percent between 1977-78 and 1987-88, compared with a reduction of 12 percent for the highest income households. Upper income households increased their consumption of poultry, fish, and shellfish by 20 percent during this

period, while poorer households increased consumption by 11 percent.

Between 1977-78 and 1987-88, households with children parented by a single female ("female-headed households") decreased their consumption of most commodity groups, except fruit and vegetable juices and other beverages.

Larger households, containing more children, consume less food per person than do smaller households. Exceptions include fresh

fluid milk, flours and cereals, and sugars—foods prevalent in children's diets.

These changes in food consumption may have implications for the nutrition and health of particular groups. The 1988 *Surgeon General's Report on Nutrition and Health* concluded that diet and health are linked. For example, it is generally agreed that reducing fat intake, particularly saturated fats, can help reduce the risk of health problems, such as coronary heart disease.



Food supply data indicate that Americans have been shifting their eating patterns away from animal products and toward crop products. However, food consumption data suggest that certain households have not followed all the national trends.

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Given knowledge about the health risks from consuming too much fat and the benefits of a diet rich in vitamins, minerals, and dietary fiber, certain socioeconomic groups of Americans may be at a greater risk of chronic diet-related diseases than is the population as a whole. Food program administrators, food and nutrition educators, and health professionals can use information on the eating patterns of different households to target nutrition education and food assistance programs toward high-risk groups.

This article presents results from analysis by USDA's Economic Research Service of the 1977-78 and 1987-88 Nationwide Food Consumption Surveys (NFCS) on household food consumption. In the survey, respondents reported the households' consumption of foods and beverages at home and on picnics and in packed lunches prepared from home supplies. We adjusted the data to account for differences in the number of household members and for meals eaten away from home (see box).

The data in this article reflect the fact that only a single factor influencing the household's food consumption was considered at a time. But many factors—such as income, season of the year, household age, and household composition—combine to influence food consumption. Because these factors vary among households within a group, food consumption within the group is also likely to vary. For example, a single-person household could be a 24-year-old male or an elderly widow. These individuals will likely choose different foods.

Dairy Products

Consumption of most dairy products was down in 1987-88 from 1977-78 levels, except cheese. Cheese consumption increased substantially with income. In 1987-88, households with the lowest income ate about 26 percent less cheese

Table 1

Overall, Americans Are Eating Less Red Meat and Eggs, More Poultry and Entree Mixtures

Food group	Per person change in consumption, 1977-78 to 1987-88	
	Percent	
Dairy (fresh equivalent)	-3.6	
Fats and oils	-12.4	
Flour and cereals	-12.0	
Bakery products	-4.3	
Red meat	-20.8	
Poultry, fish, shellfish	19.2	
Eggs (fresh equivalent)	-24.6	
Sugars, sweets	-18.3	
Potatoes, sweet-potatoes	-10.3	
Fresh vegetables	-15.2	
Fresh fruit	-2.4	
Canned vegetables and fruit	-20.4	
Frozen vegetables and fruit	18.0	
Vegetable and fruit juices	17.1	
Dried vegetables and fruit	-17.1	
Beverages	34.6	
Soups, sauces, gravies	-18.0	
Nuts, condiments	-6.7	
Dinner mixtures	68.5	

than did the Nation as a whole. Households with the highest income ate about 26 percent more cheese. Higher income households generally consumed more dairy

products in both 1977-78 and 1987-88.

Single-person households continued to consume more dairy

Table 2

Female-Headed Households Decreased Consumption of Most Food Groups

Food group	Per person change in consumption, 1977-78 to 1987-88		
	Female-headed households	Two-parent households	Other
	Percent		
Dairy (fresh equivalent)	-9.5	-2.5	-1.5
Fats and oils	-18.7	-11.8	-13.2
Flour and cereals	-19.3	-9.8	-13.9
Bakery products	-10.6	-4.9	-1.4
Red meat	-21.8	-19.1	-24.9
Poultry, fish, shellfish	-3.2	22.6	16.4
Eggs (fresh equivalent)	-26.7	-22.4	-29.5
Sugars, sweets	-7.2	-16.3	-24.9
Potatoes, sweet-potatoes	-10.7	-10.4	-10.1
Fresh vegetables	-28.5	-14.0	-18.1
Fresh fruit	-19.6	-2.3	-3.2
Canned vegetables and fruit	-21.6	-18.6	-24.9
Frozen vegetables and fruit	-4.5	25.0	11.5
Vegetable and fruit juices	10.8	21.3	9.6
Dried vegetables and fruit	-34.7	-11.9	-21.5
Beverages	46.0	28.7	38.1
Soups, sauces, gravies	-36.8	-23.7	-8.0
Nuts, condiments	-.8	-11.2	.8
Dinner mixtures	42.1	57.7	95.9

products per person during the 1980's than did larger households. However, single-person households decreased consumption of cheese about 9 percent, and households with more than one person increased consumption by about 8 percent.

Female-headed households consumed about 10 percent fewer dairy products in 1987-88 than in 1977-78 (table 2). This may be because these households are also consuming less breakfast cereal, which is usually served with milk.

Red Meat, Poultry, and Fish

Consumption of red meat, on average, declined dramatically during the 1980's. Single-person households led the decline by consuming about 31 percent less red meat in the late 1980's than they did in the late 1970's (table 3). In 1977-78, consumption of red meat rose with income, but the opposite

was found in 1987-88. In fact, the poorest households went from consuming about 6 percent less red meat than the national average to about 5 percent more.

Middle income households led the Nation in increases in consumption of poultry, fish, and shellfish (table 4). While poorer households increased consumption of poultry, fish, and shellfish about 11 percent, this is a drop from consuming 6 percent more than the national average to consuming 3 percent less. Female-headed households decreased consumption of poultry, fish, and shellfish about 3 percent. But, two-parent households remained the smallest consumers of poultry, about 8 percent less than did the Nation as a whole.

Eggs

All households substantially decreased consumption of fresh eggs during the 1980's, partly due to press reports on salmonella in im-

properly stored eggs and to their relatively high cholesterol level. Although the poorest households consumed about 8 percent more eggs than did the Nation as a whole in 1987-88, their consumption decreased about 22 percent in the 1980's. The wealthiest households decreased consumption about 29 percent, making them the group with the lowest consumption of eggs. Single-person households maintained the highest per person level of consumption.

Fats and Oils

The survey data show a decrease in the use of fats and oils in the 1980's, while ERS food supply data suggest consumption increased. This disparity probably stems from our assumption in the analysis of the survey data that foods eaten away from home were consumed in the same relative amounts as at home. However, many people eat more fried foods at restaurants and fast-food estab-

Table 3
Larger Households Consume Less Food Per Person—Except Food Prevalent in Children's Diets

Food group	Per person change in consumption, 1977-78 to 1987-88				
	One-person households	Two-person households	Three-person households	Four-person households	Five or more person households
	Percent				
Dairy products (fresh equivalent)	-4.7	-1.3	-4.5	-2.0	-4.7
Fats and oils	-20.2	-9.9	-19.2	-11.3	-12.9
Flour and cereals	-14.5	-10.4	-12.3	-12.0	-9.3
Bakery products	-5.2	.7	-9.2	-4.8	-5.9
Red meat	-30.5	-24.9	-21.4	-18.5	-18.3
Poultry, fish, shellfish	12.2	18.1	13.7	21.5	11.9
Eggs (fresh equivalent)	-36.3	-28.8	-23.6	-22.6	-23.5
Sugars, sweets	-28.1	-20.9	-29.6	-12.9	-6.6
Potatoes, sweet-potatoes	-11.2	-8.6	-17.0	-7.6	-8.9
Fresh vegetables	-24.5	-17.2	-18.0	-20.5	-17.8
Fresh fruit	-4.9	-6.2	-6.1	-8.0	-5.7
Canned vegetables and fruit	-23.6	-25.6	-21.3	-20.2	-19.3
Frozen vegetables and fruit	6.9	3.6	21.7	11.0	21.2
Vegetable and fruit juices	3.0	8.9	13.6	19.1	16.9
Dried vegetables and fruit	-21.9	-16.5	-25.5	-20.7	-8.1
Beverages	23.2	46.0	32.2	26.4	16.1
Soups, sauces, gravies	-6.8	-15.5	-19.2	-30.3	-26.7
Nuts, condiments	2.4	3.6	-7.7	-7.3	-17.9
Dinner mixtures	90.1	89.2	46.6	70.0	42.4

ishments than they do at home. In addition, the fats and oils used as ingredients in commercially prepared bakery products and other foods eaten at home would be reported as bakery products rather than as fats and oils in the survey data.

Single-person and three-person households decreased their consumption of fats and oils relative to the rest of the Nation, while consumption by other sized households remained relatively flat. The largest increase was seen in two-person households.

A look at specific foods suggests people may be changing their food preparation practices as well as their food choices. For example, single-person households decreased their use of shortening (used to fry foods and make desserts) by over 67 percent, but used more salad dressings.

Flours and Cereals

Consumption of flour, cereal, and bakery products declined in the 1980's, according to the survey data. However, as with fats and oils, ERS food supply data suggest consumption increased during the decade. Again, this disparity is probably due to our adjustment procedure used to account for foods eaten away from home. For example, if someone picks up doughnuts on the way to work, the flour in the breakfast choice would be missed in the survey.

The highest income households increased their total use of flours and cereals about 2 percent, despite 39- and 35-percent decreases in their use of flour and flour mixes, respectively. These households increased their consumption of breakfast cereals by over 24 percent.

In female-headed households, consumption of breakfast cereals declined about 9 percent—making them the lowest per person consumers of breakfast cereals. This

may be partially due to the relatively high price of breakfast cereals coupled with the typically low income of these households. Female-headed households also decreased consumption of bakery products about 11 percent, making them the group eating the fewest bakery products.

More Details Available

Changes in Food Consumption and Expenditures in American Households During the 1980's contains more details on the data source, tabulation procedures, and results—as well as more comprehensive information about the consumption and expenditure data from the survey. A joint publication by USDA's Economic Research Service and Human Nutrition Information Service, the full report examines consumption and expenditures for the 19 broad food groups presented in this article, plus 64 more specific food groups.

The full report examines food consumption and expenditures by household size, type, income, race, geographical region, and urbanization area. In addition, tables present the percentage of households consuming each of the 64 food groups in a typical week.

To obtain a copy, call toll-free from the United States and Canada, 1-800-999-6779. Other areas, please dial (703) 834-0125. Ask for *Changes in Food Consumption and Expenditures in American Households During the 1980's*, SB-849.

Fruit and Vegetables

The survey shows an overall decline of fresh vegetable and fruit consumption of about 10 percent during the 1980's. However, overall consumption of dark-green vegetables (including spinach, collards, and kale) increased about 30 percent during the decade, but this varied widely across income groups.

Households generally consumed more fresh vegetables as income rose. For example, the wealthiest households increased their consumption of dark-green vegetables about 75 percent, while consumption by the poorest households fell about 22 percent. An exception was fresh potatoes—consumption generally decreased as income rose.

Frozen vegetable consumption increased about 20 percent in the 1980's, with middle-income households showing the largest increases.

Fresh fruit consumption declined over the decade in all but the wealthiest households, where it increased about 8 percent. The wealthiest households consumed about 40 percent more fresh fruit in 1987-88 than did the Nation as a whole; the poorest households consumed about 27 percent less fresh fruit.

Consumption of fresh fruit and vegetables declined sharply in female-headed households between 1977-78 and 1987-88. Most of the decline was accounted for by light green vegetables and citrus fruit. Female-headed households decreased their consumption of citrus fruit about 49 percent over the decade. This is significant because the data show the consumption of fresh fruit and vegetables, well-known sources of vitamins and nutrients, in these households was already substantially below the national average in 1977-78.

The consumption numbers for fresh fruit and vegetables do not account for total consumption since

USDA's Nationwide Food Consumption Survey

The results presented in this article are based on data from the household portion of the 1977-78 and 1987-88 Nationwide Food Consumption Surveys (NFCS) conducted by USDA's Human Nutrition Information Service (HNIS). The survey contains two parts—household food consumption and individual intakes.

In the household portion, information was collected on various socioeconomic and demographic characteristics of the households, as well as detailed records on the value, type, and quantity of food used from household food supplies. The data provide food expenditures as well as food use for a whole week.

The second component involved specific information about the individuals in the household and detailed records on the types of food—both at home and away from home—for each member of the household over a 3-day period. The value of the foods was not recorded.

This article is based on the household portion to measure consumption of foods brought into the household (sometimes called food use). These data do not reflect actual ingestion. Consumption of food in a dietary sense is measured by the individual intake component of the survey. A forthcoming article will analyze the food expenditure data from the survey.

The survey data contain a wealth of information on the socioeconomic and demographic characteristics of American households and is the only major public survey that couples this information with detailed information on the quantities and

value of foods used in the households. The surveys sampled households in the contiguous 48 States and focused on food consumption at home.

The household survey does have some limitations. Americans have been eating more of their food in restaurants, fast-food establishments, and sandwich shops. The NFCS data include food purchased at food-service establishments, but only if it is carried home for consumption. We assumed household members would consume foods away from home in the same relative proportions as they did at home. This may be a valid assumption for many foods, but not so for others. For example, there has been a dramatic increase in the number of salad bars in restaurants and fast food places over the last decade and people may be eating relatively more fresh vegetables away from home than at home. Therefore, it is difficult to measure actual food consumption using only data on foods eaten at home.

There has been a considerable shift from consuming individual food items to foods in mixtures (such as pizza, frozen entrees, and salads from grocery stores). Overall, households increased their consumption of mixtures by 68 percent. Households participating in the survey can report these foods as mixtures rather than each individual food. This would tend to underestimate the consumption of certain food groups. For example, the pork sausage used on pizza is reported as pizza, not pork—underestimating red meat consumption.

Another drawback is the relatively low response rate. A number of households selected for the surveys chose not to partici-

pate. This may cause statistical bias problems if many households chose not to participate and if there was a systematic difference in their consumption behavior from those who did respond.

For example, if a large portion of single-person households chose not to participate and those households also ate more frozen dinners and less fresh vegetables than did the single-person households that did participate, frozen dinner consumption would be underestimated and fresh vegetable consumption would be overestimated. The lower the participation rate, the greater is the potential of nonparticipation bias. Sampling weights that adjust for nonparticipation were used in the calculations. The response rate was about 57 percent in the 1977-78 survey, dropping to about 37 percent in the 1987-88 survey.

To determine the impact of nonresponse on the NFCS's representation of the U.S. population, HNIS compared descriptive statistics of the 1987-88 survey to several other surveys. Also, a panel of experts evaluated the impact of the response rate on the accuracy of the data. The U.S. General Accounting Office examined the reliability of the data.

All three groups concluded that it is not possible to determine if those not responding to the survey differed systematically from those who did. But, they were concerned about estimates based on small subgroups of people. The subgroups we examined all had over 400 households. For this reason, we believe nonresponse bias has minimal effect on the estimates in this article.

Table 4

Upper Income Households Increased Their Consumption of Poultry, Fish, and Shellfish by 20 Percent, While Poorer Households Increased Consumption by 11 Percent

Food group	Per person change in consumption, 1977-78 to 1987-88		
	Lowest income households	Middle income households	Highest income households
	Percent		
Dairy products (fresh equivalent)	0.3	-4.7	-7.7
Fats and oils	-10.9	-5.5	-13.6
Flour and cereals	-15.7	-13.0	1.7
Bakery products	-1.2	-4.2	-3.4
Red meat	-11.4	-20.6	-31.0
Poultry, fish, shellfish	11.1	24.7	20.0
Eggs (fresh equivalent)	-21.5	-20.5	-28.6
Sugars, sweets	-6.6	-22.4	-18.3
Potatoes, sweet-potatoes	-5.1	-6.6	-9.5
Fresh vegetables	-22.2	-12.9	-12.4
Fresh fruit	-5.9	-10.1	7.8
Canned vegetables and fruit	-14.9	-15.0	-29.8
Frozen vegetables and fruit	-1.4	18.4	11.3
Vegetable and fruit juices	24.3	27.6	11.4
Dried vegetables and fruit	-28.3	-26.9	-5.1
Beverages	37.1	33.7	25.4
Soups, sauces, gravies	-31.2	-8.2	-7.0
Nuts, condiments	3.0	-7.3	-2.6
Dinner mixtures	37.4	63.1	113.8

canned and frozen items are a separate category. However, the consumption trends for canned or frozen fruit and vegetables were similar to the fresh produce.

More and more fruit and vegetables are being consumed in mixtures, such as frozen prepared dinners and pizza. Further research into the amount of fruit and vegetables in mixtures is needed before we can determine if overall fruit and vegetable consumption has decreased as indicated by the survey data for fresh fruit and vegetables.

Sugars and Sweets

Consumption of sugars and sweets declined about 18 percent in the 1980's. But this figure does not include, for example, sugar used in soft drinks or presweet-

ened breakfast cereals. Decreases were larger in middle- and higher income households than in the lowest income groupings (table 4). Consumption fell about 25 percent in households without children. While consumption of sugars and sweets declined about 7 percent in female-headed households, they still consumed about 10 percent more than the national average.

Beverages

Increased beverage consumption in the 1980's was led by a 68-percent increase in soft drink consumption by female-headed households. However, households without children maintained the highest consumption levels for beverages as a whole and overtook other households as the largest consumers of soft drinks.

Fruit and vegetable juice marketers enjoyed a strong increase in the

consumption of their products, particularly in two-parent households. Households without children, however, still led the way in juice consumption, by consuming about 15 percent more than the national average.

Implications

Food supply data indicate that Americans have been shifting their eating patterns away from animal products and toward crop products. However, food consumption data suggest that certain households, such as low-income Americans, have not followed all the national trends.

Food choices are determined by many socioeconomic characteristics of the household, as well as prices of food and cultural eating habits. Recognizing these influences and identifying the factors affecting food choices will help policymakers develop more effective farm and nutrition education programs.

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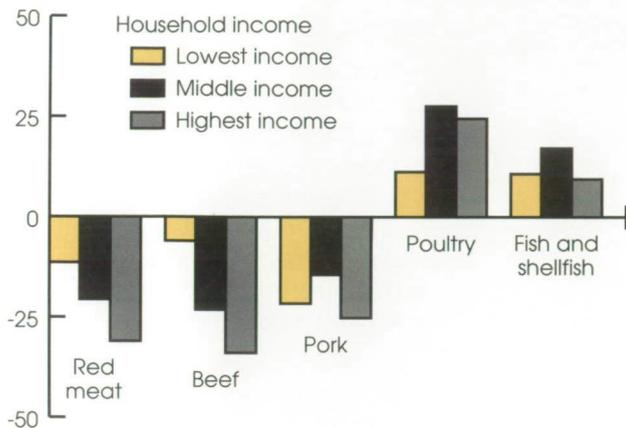
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Changes in Food Consumption...At a Glance

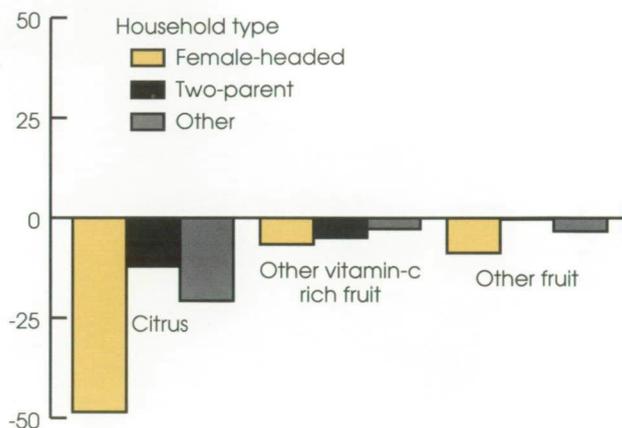
A Look at Specific Foods Within Major Food Groups Suggests Not Only Changes in Food Consumption, But Also the Influence of Demographic Characteristics

Meat, Poultry, and Fish

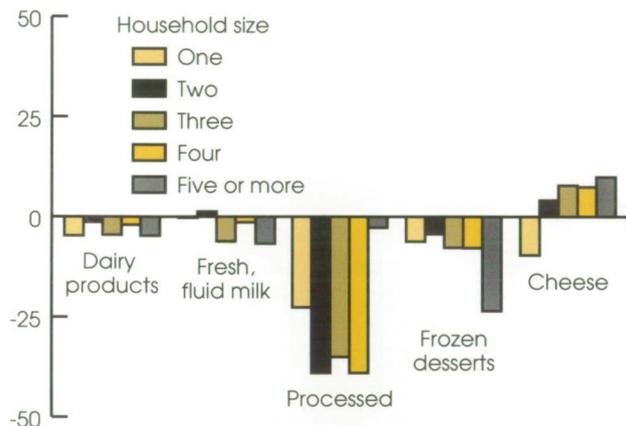
Per person percent change, 1977-78 to 1987-88



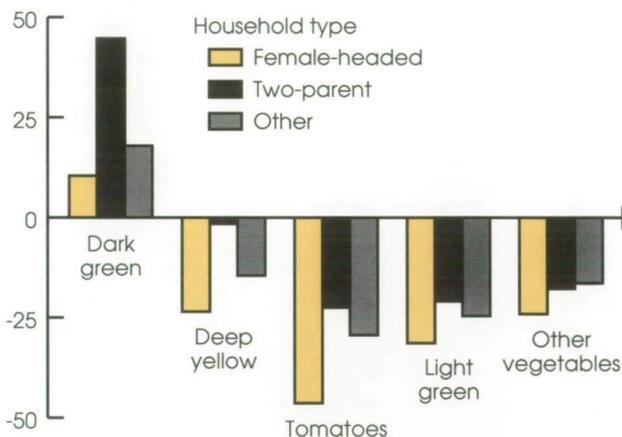
Fresh Fruit



Dairy Products



Fresh Vegetables



Americans Are Eating More Rice

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Although rice has not historically been a major item in the American diet, U.S. consumption is on the rise and is expected to continue increasing during the rest of the 1990's.

Continuing to move rice away from merely side-dish status at meals will be the fast-growing Asian-American and Hispanic-American populations, improved health awareness among consumers coupled with a perception of rice as a healthy food, greater convenience in preparing rice, tastiness of rice with many entrees, a large variety of prepared rice dishes and flavored mixes available, a greater number of restaurants serving rice dishes, and adaptation of rice by-products (such as brokens, rice bran, and rice-bran oil) to new consumer uses.

Prior to the 1989/90 market year for rice, more rice was exported from the United States than was eaten or used in beer by Americans each year. In the 1990's, however, U.S. rice exports have shown little long-term growth, and domestic use has exceeded exports. Today, domestic consumption is outpacing population growth, leading to continued growth in per capita use.

Growth in use will likely be strongest among processed products—specifically packaged rice mixes—as demand for prepared foods continues to grow. Use of rice in pet food should continue to expand, as premium high-quality lines see greater sales as the economy picks up. Growth will also likely remain strong for certain specialty rices, such as brown rice, as consumers demand fiber-rich foods.

Use Soars, Diversifies Since the Late 1970's

During the 1970's, total U.S. rice consumption (including imports, which were minute during that period) grew 27 percent. But in the 1980's, consumption rose 76 percent. Per capita consumption, including brewers' use, was nearly 22 pounds in 1991—double the amount in 1975. If present growth rates continue, per capita use



U.S. consumption of rice is on the rise and is expected to continue increasing during the rest of the 1990's. If present growth rates continue, per capita use should be at least 25 pounds by 1995.

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should be at least 25 pounds by 1995.

U.S. rice consumption is divided into three categories: direct food use, processed food, and beer. Direct food use is the largest category and includes regular milled white rice as well as specialty rices, such as parboiled, precooked, precooked-parboiled, precooked-parboiled brown rice, brown rice, and aromatic rice (see box).

The share of the domestic rice market going to direct food use has averaged almost 59 percent during the last decade, while that going to processed food has expanded from 14 to over 21 percent. Brewers' share has declined from 25 to under 20 percent.

Trend Will Likely Continue With Changing Ethnic Mix

As the number of Americans who eat rice as a primary staple in their diet increases, direct food use could expand in the 1990's at a greater pace than during the 1980's.

Asian-Americans and Hispanic-Americans consume more rice per person than does the U.S. popula-

tion as a whole. Some consumer surveys indicate that, in certain localities, Asian-Americans eat up to 150 pounds of rice a year, compared with the national average of around 18 pounds. Currently the fastest growing ethnic group in the United States, Asian-Americans have contributed to the increasing per capita rice consumption.

Asian-Americans accounted for 43 percent (2.48 million people) of total immigration into the United States from 1981 to 1989. The number of Asian-Americans in the United States doubled in the 1980's, rising from 1.6 percent of the population in 1980 to about 3 percent in 1990.

Hispanic-Americans are the Nation's second fastest growing population group, increasing 53 percent during the 1980's. Hispanic-Americans accounted for 9 percent of the total U.S. population in 1990.

African-Americans also eat more rice per capita than the national average, and their numbers are growing faster than the population as a whole. The African-American population expanded 13.2 percent between 1980 and 1990, to constitute 12.1 percent of the Nation.

Specialty Rices Have Become More Popular

Direct food use of rice expanded faster in the 1980's and early 1990's than during the previous 15 years. And, consumption of domestically grown specialty rice has risen at a faster pace than regular milled white rice.

Domestic specialty rices' share of direct food use rose from 18 percent, or 3.4 million hundredweight (cwt) in 1980/81, to about 21 percent (6 million cwt) in 1990/91. These figures would be even higher if they included imported specialty rices and specialty rices used in processed foods. Such imports, which came to almost 3.5 million cwt (milled basis) in 1990/91, have been expanding.

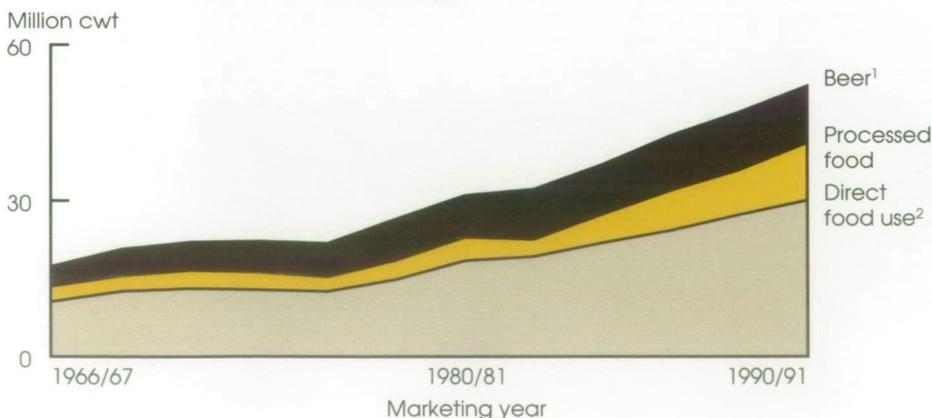
Growth over the last decade has been strongest for brown rice and parboiled (including precooked-parboiled) rice. These two specialty rices are perceived as nutritious, rich in vitamins and minerals, an aid to good health, and good sources of fiber.

Parboiled

Parboiled rice is soaked as rough rice in water, drained, and then heated, typically by steaming. In this process, nutrients that would normally be lost during milling are retained in the kernel of the rice. All parboiled rice is southern long grain. Parboiled rice has superior milling qualities—fewer kernels are broken in the process—compared with regular milled white rice.

Although it takes more time, parboiled rice is also easier to cook than regular milled white rice, disintegrates less during cooking, remains better separated, and sticks together less. Parboiled rice retains its shape, texture, and taste longer after cooking than does regular milled white rice. These are important properties for restaurants that place food under heat lamps or in

Figure 1
U.S. Rice Consumption Has Soared Since the Late 1970's



¹Treasury Department data. ²Includes imports, specialty rices, and regular milled white rices.

Separating the Different Types of Rice

Aromatic Rice

These scented rices include basmati and jasmine rice.

Basmati rice has a distinctive odor when cooked, has a desirable taste, doubles its grain length, and the grains remain completely separate. Basmati rice is grown mostly in the Punjab area of central Pakistan and northern India, and is mainly bought by higher income Middle Eastern countries and the United States. Basmati rice is sold at prices roughly double those for long-grain rice.

Also includes jasmine rice, which is a fragrant rice preferred by much of the Asian community in the United States. Jasmine rices cook soft, moist, and clingy. Almost all jasmine rice imports are from Thailand.

Brewers' Rice

The smallest size of broken rice fragments. Used in making pet foods and as a source of carbohydrates in brewing.

Brokens

Kernels of rice that are less than three-fourths of the length of the whole kernels. Brokens are used in beer, processed foods, and pet foods.

Brown Rice

Whole or broken kernels of rice from which only the hull has been removed. Brown rice may

be eaten as is, or may be milled into regular-milled white rice. Cooked brown rice has a slightly chewy texture and a nutty flavor. The light brown color is caused by the presence of seven bran layers, which are very rich in minerals and vitamins—especially the B-complex group.

Head Rice

Whole kernels of milled rice. The kernel must be at least three-fourths the length of a whole kernel.

Parboiled Rice

Rough rice soaked in warm water under pressure, steamed, and dried before milling. Parboiled rice cooks up fluffier and sticks together less than does regular milled white rice. Desired by consumers who like a chewy and wholesome taste, but takes longer to cook than regular milled white rice.

Precooked Rice

Rice that has been cooked and dehydrated after milling. This reduces the time required for cooking. Includes quick-cooking rices, instant rices, and boil-in-the-bag rices.

Rice Bran

The outer cuticle layers and germ directly beneath the hull. This is removed during the milling process. Rice bran is rich in protein and natural B-vitamins.

Rice oil is extracted from rice bran.

Rough Rice

Also called paddy rice, is harvested, whole-kernel rice with the hull remaining. Rough rice is sold to mills for dehulling and polishing.

Second Heads

Fragments of grains broken during milling, which are at least one-half as long as whole kernel but less than three-fourths. This is the largest size of broken rice.

Grain Sizes

Rice in the United States is produced and marketed according to three Government-established grain size and shape types—long, medium, and short. The length/width ratio is 3.0 or more for long-grain rice, 2.0-2.9 for medium-grain rice, and 1.9 and below for short-grain rice.

Long-grain rice accounts for about 70 percent of U.S. rice production, medium-grain almost 30 percent, and short-grain less than 1 percent. Most long-grain rice in the United States is grown in the southern producing area (Arkansas, Louisiana, Mississippi, Missouri, and Texas). Over half of all medium-grain rice comes from California, with Arkansas and Louisiana providing most of the remainder. Almost all short-grain rice is produced in California.

microwaves, as well as for use in canned soups and frozen dinners.

Total consumption of parboiled rice (including precooked-parboiled rice) increased from 2 million cwt in 1980/81 to 4.2 million in 1990/91. Precooked-parboiled rice

showed the only growth in this product category since 1988/89.

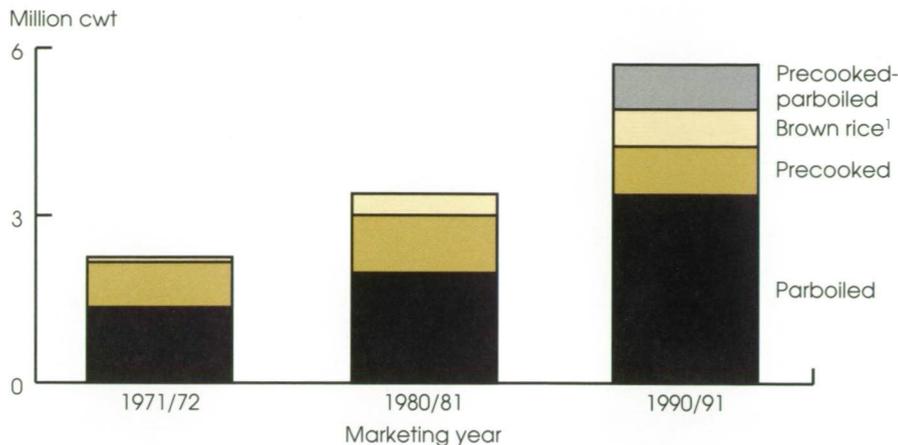
Precooked

Consumption of precooked-regular milled white rice (including instant) has dropped from over

1 million cwt in 1980/81 to about 870,000 cwt in 1990/91. Once precooked, the rice may have an inferior taste and texture compared with regular milled white rice. Due to improved quality, precooked-parboiled rice has replaced some

Figure 2

The Rising Popularity of Parboiled and Brown Rice Pushes Up Consumption of Specialty Rices



Note: Precooked-parboiled rice was not included in the survey questionnaire until 1986/87.

¹Includes brown rice used in processed foods in 1990/91.

sales of precooked rice. Sales of pre-cooked-parboiled rice, with its superior taste and cooking qualities, have expanded from 72,000 cwt in 1986/87, to over 800,000 cwt in 1990/91. Boil-in-the-bag types of precooked rices account for some of the precooked market.

Brown Rice

Consumption of brown rice expanded from 375,000 cwt in 1980/81 to 808,000 in 1990/91. Brown rice retains the bran layer that is removed during the complete milling process, thus containing more fiber and nutritional qualities.

This factor explains much of the growth in sales during the 1980's. Consumption of brown rice could grow faster if research is successful in extending its shelf-life without changing the texture or appearance.

Rice Bran

Rice bran is a good source of dietary fiber, with many health benefits. Some rice bran cereals are on the market, but these account for a very small portion of rice cereals.

Most rice bran is used in livestock feed rather than for human use, because the removal of the bran layer from the grain causes the oil in the bran to turn rancid very quickly. Rice bran can be stabilized to prevent rancidity by commercially heating the bran in an extrusion cooker.

Some recent studies have shown that rice bran oil, which is found in rice bran, can lower cholesterol in humans. Rice bran oil may be able to be used in place of vegetable oils, but U.S. supplies are small and most is imported from Japan. This market could expand significantly in the future if evidence relating lower cholesterol with consumption of rice oil is substantiated.

Riceland Foods, Inc., headquartered in Stuttgart, Arkansas, recently joined with two Japanese firms to extract, refine, and market rice bran oil in the United States. The new facilities to extract and process oil are scheduled to begin operations during the summer of 1994.

Rice bran oil has been viewed as a superior oil in Japan for many

years, due to its taste and stability. It is used in Japan in rice cookies, potato chips, and in household cooking oil.

Aromatic

Aromatic rices produced domestically remain a very small portion of total specialty rice consumption, accounting for under 100,000 cwt in 1990/91. These sell at prices 2 to 3 times higher than regular milled white rice. However, use of domestic aromatic rice has grown much faster than total rice—virtually doubling from 1988/89 to 1990/91. Many industry participants believe this product category has continued to expand.

And, if current efforts by U.S. researchers are successful in developing domestic aromatic varieties capable of competing with imported aromatic rice, this product category could expand substantially.

About 90 percent of imported specialty rices is jasmine, and the remainder is mostly basmati. Imported jasmine rices are mostly purchased by recent immigrants from Asia. Sales of these rices have risen each year since 1980/81, and will continue expanding as this ethnic group grows. Most jasmine rices are imported from Thailand; and most basmati rice comes from Pakistan and India.

Processed Food Use Shows Fastest Growth

Processed food is the fastest growing market for U.S. rice. From 1980/81 to 1990/91, this use of rice expanded from 4.5 million cwt to 12.2 million cwt. Processed foods' share of U.S. rice consumption has grown from about 14 percent in 1980/81 to nearly 22 percent in 1990/91.

Package mixes and pet foods have been the fastest growing processed markets for rice in the 1990's. These two products together ex-

Table 1

Package Mixes and Pet Foods Are the Fastest Growing Processed Rice Products

Market year	Cereal	Soup	Baby food	Package mixes	Pet food	Rice cakes	Candy	Frozen dinners	Total ¹
1,000 cwt									
1971/72	2,102	646	141	421	-	-	-	-	3,455
1972/73	2,372	367	150	210	-	-	-	-	3,174
1973/74	2,789	103	117	151	-	-	-	-	3,414
1974/75	1,837	210	124	227	-	-	-	-	2,507
1975/76	1,921	106	145	331	-	-	-	-	2,849
1978/79	2,090	157	157	1,096	-	-	-	-	3,717
1980/81	2,588	147	133	1,366	-	-	-	-	4,491
1982/83	2,503	176	152	221	-	-	-	-	3,342
1984/85	3,577	241	316	567	-	-	-	-	5,438
1986/87	4,800	76	233	1,505	426	288	147	61	7,630
1988/89	3,937	119	172	1,705	1,338	707	220	89	8,621
1990/91	4,415	117	445	3,172	2,065	411	105	240	12,194

Note: - Product not included in survey questionnaire. ¹Includes rice not included in any specific category.

panded over 2 million cwt between 1988/89 and 1990/91, accounting for the bulk of the nearly 3-million-cwt growth in food use during that time. Use in baby food and frozen dinners also experienced strong growth, but the volume expansion was less due to their smaller amounts.

Cereal

Cereal, the major processed product for rice, accounted for over 35 percent of all rice used in processed food in 1990/91. Medium- and short-grain rice account for most of the rice used in cereal. Rice cereals are mainly the ready-to-eat type, including rice flakes, puffed rice, shredded-rice, and several multigrain cereals.

Although almost stagnant during the late 1960's and 1970's, rice use in cereal expanded rapidly through the middle of the 1980's, as many new cereal products with rice were introduced and as consumption of traditional rice cereals expanded. Cereal accounted for the bulk of the growth in processed food use of rice during that time. From 1986/87 to 1990/91, however, rice use in cereal has averaged 4.5 million cwt a year.

Packaged Mixes

Use in packaged mixes, sometimes called flavored rice mixes, has continued to expand since the early 1980's, growing from under 400,000 cwt in 1984/85 to almost 3.2 million cwt by the early 1990's. Variety, ease in cooking, desirable taste, and ability to quickly add new flavors to product lines have contributed to growth. Almost all rice used in package mixes is high-quality, southern long-grain. In addition to regular milled white rice, packaged mixes also use small amounts of brown rice, fried rice, and parboiled rice.

Pet Food

Use of rice in pet foods (mostly for dogs) jumped from 426,000 cwt in 1986/87 to over 2 million cwt in 1990/91. Many industry participants believe this market for rice has continued to expand.

Pet foods containing rice typically command premium prices. Rice is more expensive than other grains, and it is used in pet foods for desirable quality attributes. Pet food uses mostly broken rice, a by-product of milling, which currently sells at around half the price of

head rice. Pet foods also use small amounts of rice flour.

Baby Food

A traditional processed food use of rice, baby foods, began to significantly expand in the early 1990's after two decades of stagnant sales. In 1990/91, baby foods used around 445,000 cwt of rice—mostly rice flour—a record high, more than twice the amount 2 years earlier. Baby foods are the largest user of rice flour. Rice-based baby foods are an important substitute for children who are allergic to wheat.

Rice Cakes

The amount of rice used in rice cakes climbed from 288,000 cwt in 1986/87 to about 411,000 cwt in 1990/91. First introduced to U.S. consumers in the mid-1980's, rice cakes are a nutritious snack and are low in calories, cholesterol, and fat.

Numerous efforts to add flavored lines—such as apple cinnamon, "nacho-cheese," and sesame—and improve eating quality have kept this item an important component of processed food use. However, the inclusion of non-rice

items in rice cakes has slowed the growth of rice use in rice cakes even as total rice cake sales have grown.

Frozen Entrees

Use of rice in frozen dinners has also grown since the late 1980's, but these products use substantially less rice than do package mixes and pet foods. Frozen dinners used over 240,000 cwt of rice in 1990/91, almost exclusively high-quality southern long grain. This compares with about 90,000 cwt in 1988/89.

Soup and Candy

Soups used 117,000 cwt of southern long-grain rice in 1990/91, about the same as in 1988/89. Many soups use parboiled rice for superior cooking qualities and longevity in cans. Use of rice in candy remained around 105,000 cwt in 1990/91, and has shown no growth in the 1990's. Some other minor outlets for rice include rice pudding, and certain confectionery uses.

Brewers' Use Remains Flat

The fastest and only growing market for domestic rice from the mid-1960's through the mid-1970's was for brewing. Beer producers historically used mostly broken rice. However, recent upgrades in acceptable standards for rice used in beer have shifted much of the demand away from brewers' rice to sorted second heads and whole grain rice.

Larger stocks of rice and fewer alternative uses for broken rice in the mid-1980's made rice an attractive ingredient in beer. However, this category of rice use has not grown since the late 1980's. Stagnant total sales of beer, increasing popularity of light beers, and use of rice in premium beers whose sales have been slowing are reasons behind the stagnation.

During the 1980's, brewers' use of rice rose 35 percent, the slowest growth rate of the three major categories of rice use. And, brewers' use of rice has actually dropped slightly since 1988/89. Its share of

domestic rice consumption dropped from 25 percent in 1980/81 to under 20 percent in 1990/91.

East and West Coasts Are Biggest Markets for Rice

State and regional data provide a profile of direct food use shipments of rice, about 59 percent of total shipments (such data do not exist for processed or brewers' uses).

In the mid-1950's, New York, Louisiana, and California together accounted for over 38 percent of direct food use of rice in the United States. Consumption of rice has since spread somewhat across the United States. In 1990/91, almost 82 percent of all direct food use of rice occurred in four regions which border either the Atlantic, Pacific, or Gulf coasts (fig. 3). These regions have large, ethnically diverse populations and contain large urban centers.

Per capita consumption of rice varies greatly, among regions and States within regions. The Pacific (California, Washington, Oregon, Alaska, and Hawaii) had the highest per capita direct food use in most years from the late 1960's through 1988/89. Per capita direct food use was 17.2 pounds in 1990/91, up from 16.7 in 1988/89.

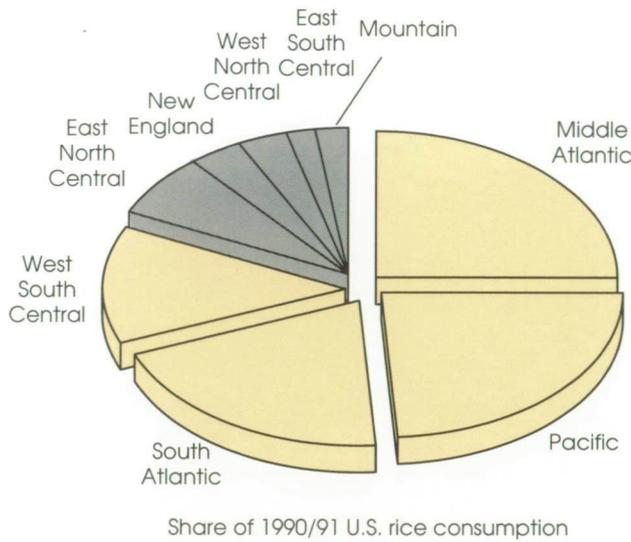
California and Washington have accounted for most of the growth in per capita consumption on the continental Pacific coast. However, Hawaii has the highest per capita rice consumption among the 50 States—over 50 pounds in 1990/91.

The Middle Atlantic (New York, New Jersey, and Pennsylvania) had the highest per capita use, at 18.8 pounds, up from almost 17 pounds 2 years earlier. This region's large urban centers, with ethnically diverse populations and internationally oriented restaurants, accounted for much of the growth in rice consumption. In

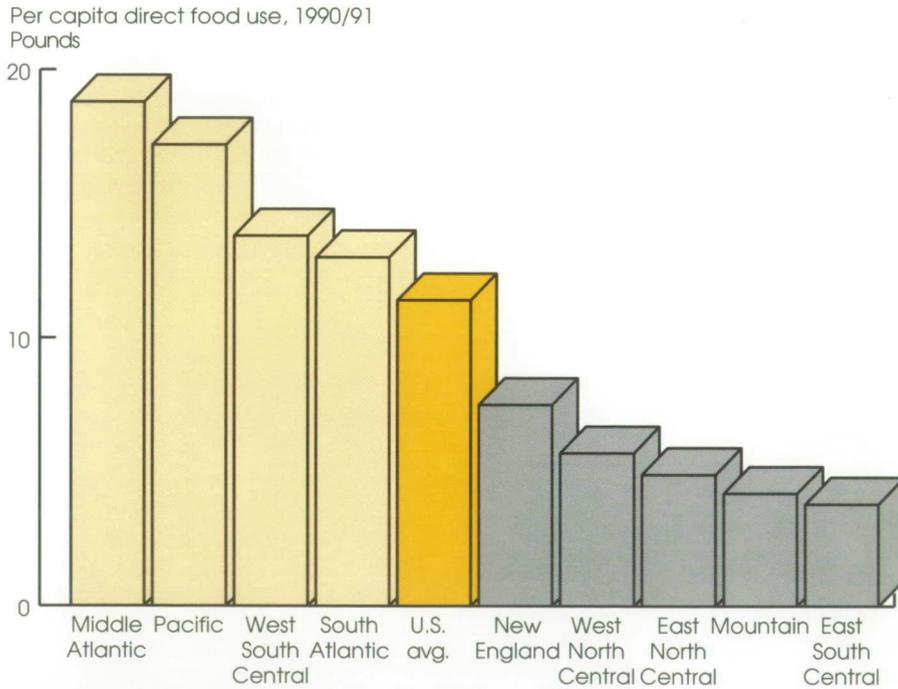


During the 1970's, total U.S. rice consumption (including imports, which were minute during that period) grew 27 percent. But in the 1980's, consumption rose 76 percent to nearly 22 pounds per capita in 1991.

Figure 3
Most Rice Is Consumed Along the Coasts...



...And, These Regions Have the Highest Per Capita Consumption



New York and New Jersey, direct food use exceeded 23 pounds a person.

Although the West South Central (Louisiana, Texas, Arkansas, and Oklahoma) consumed the most direct food use rice per person from 1955/56 through the 1960's, per capita use in this region

was 13.8 pounds in 1990/91, third among the regions. In 1956/57, Louisiana had the highest per capita direct food use of rice in the Nation at over 35 pounds—compared with the national average of about 5 pounds.

Greater consumption of package mixes and flavored rice dishes,

which are counted as processed food uses of rice, and migration of people with low per capita rice consumption into this region explain why sales have not grown as fast in the West South Central region as along the Atlantic and Pacific coasts.

The South Atlantic (Maryland, Delaware, Virginia, West Virginia, District of Columbia, North Carolina, South Carolina, Georgia, and Florida), with a per capita direct food use of 13 pounds, ranked fourth. South Carolina, District of Columbia, Florida, and North Carolina all had per capita direct food use of rice well above the national average of 11.4 pounds. Per capita consumption of rice in West Virginia was extremely low compared with the rest of the Nation.

Per capita rice consumption in the South Atlantic was essentially flat during the 1970's, and growth was modest even through the early 1980's. But the greater recent migration of Asian-Americans and Hispanic-Americans into this region—along with emphasis on health, convenience, and tastiness; a large African-American population; and consumer willingness to try new products—combine to explain growth of rice sales in the South Atlantic as well as nationwide.

Per capita direct food consumption of rice in the other five census regions was well below the national average. New England (Massachusetts, Vermont, Rhode Island, Maine, and New Hampshire), at 7.5 pounds, was the highest among the remaining regions. However, Massachusetts' per capita food use of over 13 pounds was substantially higher than in the region as a whole. In addition, some of the reported rice shipments to the Middle Atlantic region may have been further shipped to New England for final consumption, thus slightly overstating per capita use in the Middle Atlantic and understating per capita use in New England. ■

World Vegetable Oil Consumption Expands and Diversifies

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Spurred by income and population growth in developing countries—as well as rapidly expanding food processing industries in Asia and other developing areas—the global growth in consumption of vegetable oils is outpacing that of most other agricultural products. Consumption of vegetable oils worldwide grew at an average annual rate of 4.2 percent over the past decade.

Consumption of vegetable oils also was buoyed by relatively low prices during the late 1980's. Prices have been held in check by high U.S. soybean oil stocks and abundant world supplies of other oils, particularly palm and rapeseed oil.

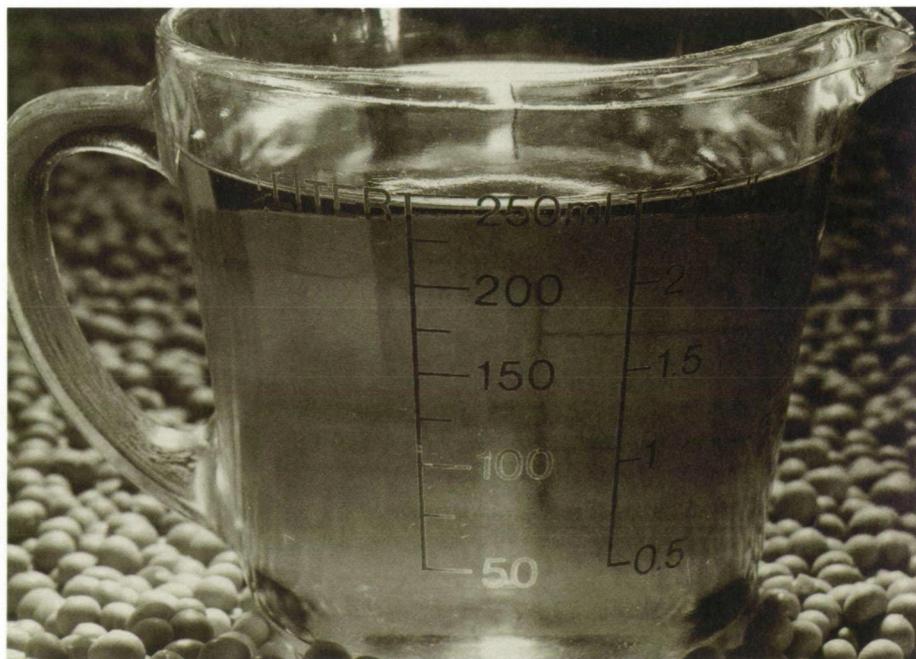
Recent Policies Expand Production

Vegetable oils are derived from oil-bearing crops, such as soybeans, rapeseed, palm kernel, and olives. Oilseeds also yield protein meals, which are used with grains in livestock feeds because of their relatively high protein content. Both oil content and protein levels of meal differ, depending on the specific oilseed.

Since the 1950's, soybean oil has been the leading vegetable oil in production and in use worldwide. However, world supplies of other vegetable oils, notably palm and rapeseed, have been growing, gradually reducing the relative importance of soybean oil. This growth can be attributed to the more competitive prices of other oils, but also to many countries'

policies during the 1980's to promote domestic production of oilseeds and foster self-sufficiency in vegetable oils.

The European Community (EC) and Indian policies stimulated the production of oilseeds, particularly rapeseed, through a system of government supports which guarantee producers minimum prices for production. Rapeseed production in



World growth in consumption of vegetable oils—at an average annual rate of 4.2 percent over the past decade—is outpacing that of most other agricultural products.

The author is an agricultural economist with the Commodity Economics Division, Economic Research Service, USDA.

the EC grew 12 percent annually in the 1980's, and growth in India exceeded 8 percent. This compares to the 3-percent annual growth rate for overall world oilseed production. Similarly, differential export taxes and export subsidies in Brazil and Argentina have fostered expansion in those countries' exports of oilseed meals and oils.

The recent resolution of a trade dispute between the United States and the EC over EC oilseed subsidies, however, could lower EC oilseed production in the near future (see box for provisions of the agreement).

United States Dominates World Oilseed Market

The U.S. soybean industry drives both the U.S. and the world oilseeds markets. Accounting for approximately one-quarter of world oilseed production, U.S. soybean output leads prices and production prospects in other export-oriented oilseed producing countries. The United States is a major player in world export markets for soybeans and meal, accounting for 66 percent of world trade in soybeans and 20 percent of soybean meal.

But the U.S. share of world markets for soybeans and products—meal and oil—has eroded significantly since the 1970's. While the volume of U.S. soybean and soybean meal exports remained relatively high over the 1980's, increased competition—particularly from Brazil and Argentina—reduced the market share of both U.S. soybean and meal exports by around 16 percent. Similarly, U.S. exports of vegetable oils, mainly soybean oil, have declined substantially since the early 1980's, dropping from 15 percent of the world market in 1978 to an estimated 6 percent in marketing year 1993/94.

While soybeans make up most of U.S. oilseed production, production of cottonseed, sunflowerseed,

and peanuts is also growing. Although canola generates much interest, it constitutes but a small fraction of U.S. oilseed production, amounting to less than 1 percent of total oilseed area in 1992 (155,000 acres).

World Trade in Vegetable Oils Shifts

With government policies stimulating large production of oilseeds and influencing trade patterns, the composition of world vegetable oil markets is changing. While soybean oil continues to dominate world consumption of vegetable oils, competing oils dominate the growth in vegetable oil trade (fig. 1).

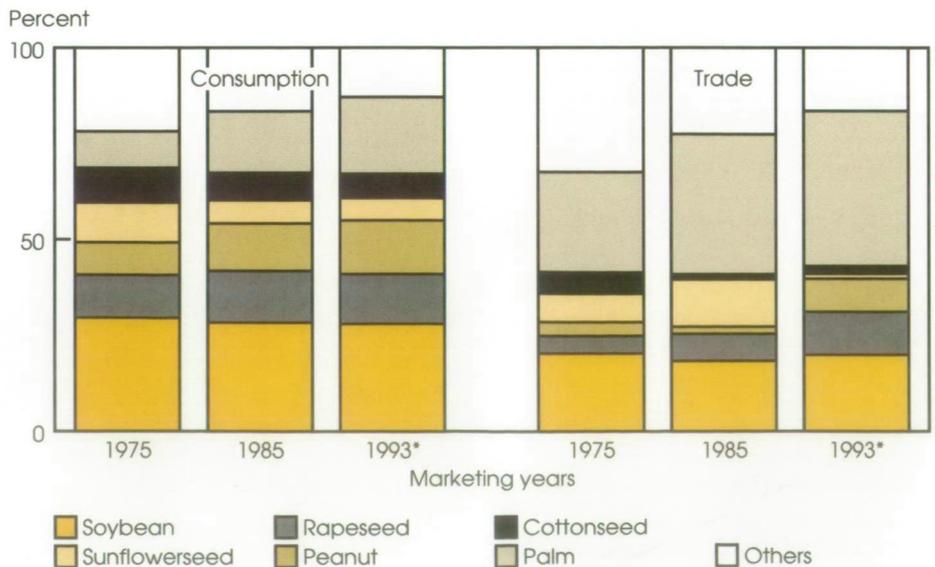
Competitors include palm oil and oil from the "soft" oilseeds (so called because they yield more oil), such as rapeseed and sunflowerseed. Oil from these soft seeds, particularly edible rapeseed, are getting more interest in developed countries due to their perceived health benefits.

EC-U.S. Oilseed Agreement To Reduce EC Oilseed Growing Area

On November 20, 1992, the United States and the European Community (EC) averted a potential trade war when they agreed to resolve an oilseed dispute over the EC's subsidies on oilseeds.

The key feature of the agreement limits the EC's oilseeds growing area, starting in marketing year 1994/95, by mandating a reduction in support payments to oilseed producers if acreage planted exceeds a maximum separate base area. This is reinforced by an agreement to reduce planted area by the general arable crops setaside percentage, or at least by a minimum of 10 percent in the following year.

Figure 1
Growth in World Trade in Soybean Oil Is Outpaced by Other Oils



*Forecast.

Canola oil, derived from edible rapeseed, has the lowest saturated-fat content among all major vegetable oils. Edible rapeseed contains approximately 40 percent oil, compared with soybeans' 18 percent. Sunflowerseed, another soft oilseed, has a higher oil content of 44 percent. Sunflowerseed oil also is low in saturated fats. Consequently, both canola and sunflowerseed oils tend to command a price premium over other oils, especially in the United States where they occupy niche markets due to their perceived health benefits.

U.S. Changes Fueled by Health Concerns

U.S. canola oil imports increased ten-fold between 1985 and 1992, from 40,000 metric tons to an estimated 400,000 metric tons. Canada, one of the largest producers of canola, accounted for an average of 85 percent of U.S. canola oil imports.

Canola is the name given to seed, oil, and meal derived from the rapeseed plant that has been bred to reduce erucic acid and glucosinolates—elements that present potential health risks to humans

and reduce the palatability and nutritional value of meal as a live-stock feed. "Canadian oil-low acid" rapeseed is commonly known as canola, and the term in many cases is used interchangeably with "edible rapeseed." In most parts of the world, high-erucic-acid rapeseed varieties continue to be produced for human consumption. However, the low-erucic-acid varieties are becoming increasingly popular and have come to dominate production in Europe and Canada.

In January 1985, the U.S. Food and Drug Administration granted "GRAS" (generally recognized as safe) status for low-erucic-acid rapeseed oil. Prior to that time, there was no domestic U.S. rapeseed production, and food companies could not use canola oil in their products.

Heightened concerns about the quantity and composition of dietary fat intake have stimulated interest in vegetable oils that are low in saturated fat. While all vegetable oils are cholesterol free, many vegetable oils have relatively low levels of saturated fats, compared with palm oil which contains 51 percent (fig. 2).

Palm Oil Trade Up, Despite Health Concerns

Health concerns about the high level of saturated fat have caused the United States to reduce imports of palm oil. Allegations that tropical oils (such as palm) are detrimental to health resulted in numerous U.S. food companies replacing tropical oils in their products. U.S. imports of palm oil dropped from a high of 277,000 tons in 1985 to an estimated 105,000 tons in 1992/93. The EC continues to be the major importer of palm oil.

However, developing countries are hampered by foreign exchange constraints and thus continue to buy palm oil, which is less expensive. Consequently, palm oil's market share has expanded from 26

Americans Consuming More Canola and Olive Oils

Oils and fats have traditionally been a major component of our daily food intake, with dietary fat constituting an average 37 percent of Americans' total calories.

Fats and oils are usually divided into animal and vegetable fats. Consumption of animal fats—such as butter, lard, and edible tallow—has remained stable. Vegetable oils, low in saturated fats, are capturing a rising percentage of our total fats and oils intake. Health officials encourage Americans to eat less saturated animal fats and cholesterol. Vegetable oils accounted for 86 percent of the 14 million pounds of fats and oils consumed by Americans in marketing year 1991/92. Soybean oil, corn oil, and cottonseed oil accounted for 82.5 percent of total domestic vegetable oil supplies.

Since the early 1960's, nutritionists have raised concerns about the quantity and composition of Americans' dietary fat intake. These were reinforced by the 1988 *Surgeon General's Report*

on Nutrition and Health urging Americans to lower their intake of fat—especially saturated fat—and cholesterol. Attention was focused on the composition of fats, such as polyunsaturated, monounsaturated, and saturated.

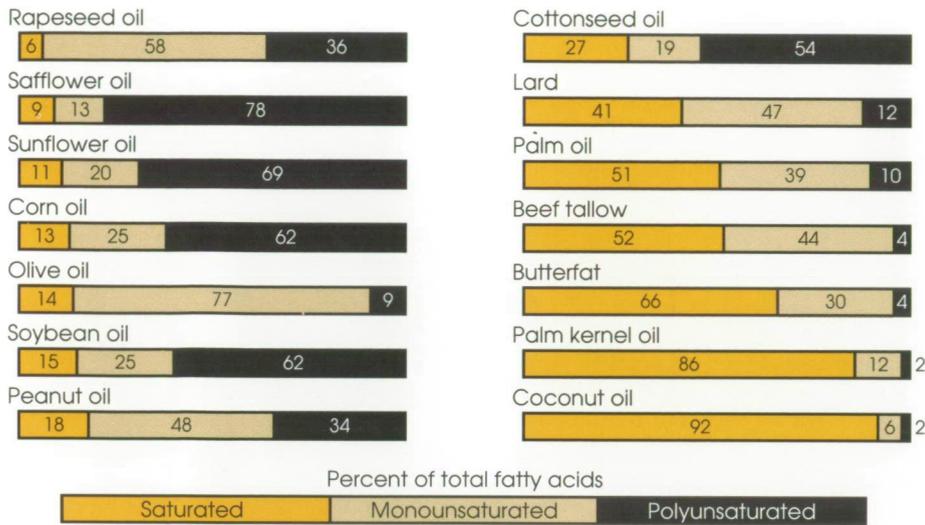
These concerns created a fertile environment for the industry to aggressively market vegetable oils, such as canola and olive oil, to meet some of the nutritional concerns. Canola, safflower, sunflower, corn, olive, and soybean oil all contain far less than palm oil's over 51-percent saturated fat content.

Consumption of canola oil in the United States grew more than 200 percent between 1987 and 1991, while that of olive oil grew by more than 300 percent between 1980 and 1991. Despite tremendous growth, however, these oils still account for less than 6 percent of U.S. vegetable oil consumption.

—For more information, contact George Douvelis, (202) 219-0840.

Figure 2

Rapeseed Oil—Known as Canola—Has the Lowest Saturated Fats of All Vegetable Oils



Source: USDA's Human Nutrition Information Service, Agricultural Handbook No. 8-4.

percent of total world vegetable oil exports in 1975 to over 40 percent in 1992/93 (fig. 1).

With much of the growth in vegetable oil consumption occurring in developing countries (fig. 3), palm oil will likely continue to expand its market share in the 1990's.

However, palm oil is derived from oil palm trees, whose slow maturation constrains rapid expansion in production—unlike other oilseeds, which are planted and harvested annually. Palm trees mature and bear fruit in about 5 years. Over the next 30-35 years, the trees yield palm oil from the flesh of the palm fruit (the seed from the same fruit produces another type of oil—palm kernel).

Palm oil is used in a variety of prepared foods, such as vegetable shortenings, frying-oil blends, frozen desserts, margarines, and coffee whiteners. It also has nonedible applications, mainly soap and oleochemicals (chemical compounds used for industrial purposes). While palm oil contains a much higher level of saturated fat than do other oils, it is often preferred

because of its lower price and unique technical characteristics. Palm oil can withstand high heat without smoking and resists oxidation (which contributes to a longer shelf-life with no change in color or odor).

Malaysia and Indonesia produce about 85 percent of world supplies of palm oil and account for the bulk of the global exports. Both are aggressively marketing palm oil through long-term credit deals and joint ventures with customers, such as palm oil refineries overseas to encourage purchases of crude palm oil.

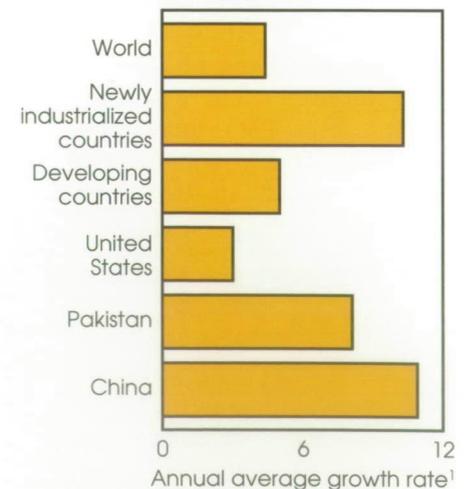
The United States Promotes Vegetable Oil Exports

Expanding oilseed production in South America, the EC, China, India, Malaysia, and Indonesia increased competition for U.S. oilseeds and oilseed products in the 1980's. As a result, U.S. vegetable oil exports began to fall, prompting the U.S. Government to launch a variety of programs in the mid-1980's to promote U.S. exports and

challenge competitors who subsidize their exports. These programs include the Export Enhancement Program (EEP), which provides bonuses to U.S. exporters to help them sell U.S. vegetable oil at competitive prices on the world market. Similarly, the Cottonseed and Sunflowerseed Oil Assistance Programs (COAP and SOAP) stimulate exports of U.S. cottonseed and sunflowerseed oil in designated countries. U.S. vegetable oil exports are also promoted through credit guarantee, food aid, and market development programs (including the Foreign Market Development Program and the Market Promotion Program).

Supported by these programs, U.S. vegetable oil exports are on the rise again. Government-assisted sales accounted for a high of 87 percent of total vegetable oil exports in marketing year 1987/88. Large outlays for these marketing programs, combined with relatively high prices for competing oils, buoyed exports of U.S. vegetable oils in 1991/92 and 1992/93.

Figure 3
Asia Dominates Growth in Vegetable Oil Consumption



Note: Newly industrialized countries are Taiwan, South Korea, Hong Kong, and Singapore.
¹1975 to 1993.

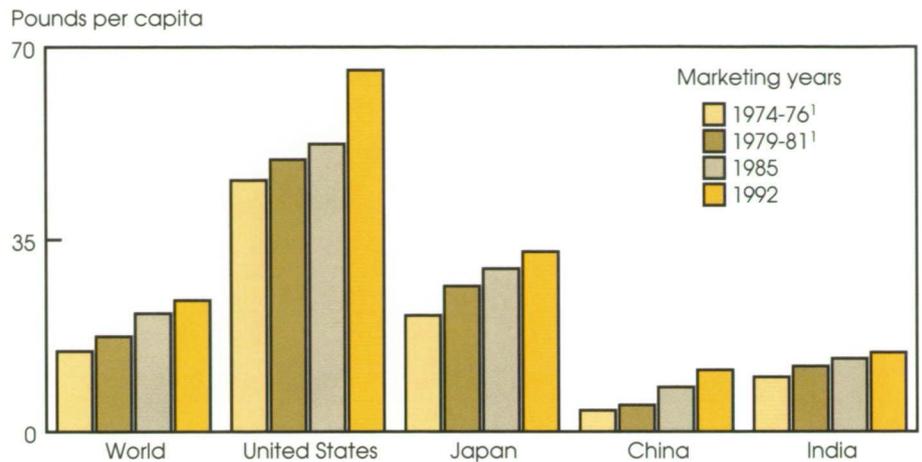
Food Processing Industries Expand Global Demand

The United States and the EC continue to be the largest consumers of vegetable oils, accounting for approximately one-third of world consumption. However, growth in demand is strongest in the newly industrialized countries in East Asia and in developing countries, such as China, India, and Pakistan (fig. 3). Developing countries are consuming more vegetable oils because of rapid growth in population and income. As incomes increase, preferences shift toward more processed foods and more food prepared away from home.

Vegetable oils are an important ingredient in processed foods and food prepared in foodservice establishments. Growth of food processing industries in developing countries is anticipated to strengthen demand for vegetable oils. While lower priced palm oil will supply much of the higher demand in the short term, escalating health concerns about saturated fats may constrain long-term demand and strengthen demand for other types, such as soybean, canola, and sunflowerseed oils.

Future increases in demand for vegetable oils may depend heavily on what happens in China—the world's second largest vegetable oil importer. Until 1985, China was self-sufficient in vegetable oil production. Since 1986, however, consumption has substantially outpaced production, and vegeta-

Figure 4
Per Capita Consumption of Vegetable Oils Indicates Room for Growth in China



¹Average.

ble oil imports—led by palm oil from Malaysia—have soared from 114,000 tons in 1980 to a forecast 1.4 million tons in 1993/94.

Chinese consumption of vegetable oils, estimated in 1992/93 at 11.2 pounds per capita, has expanded dramatically since the mid-1970's due to growth in population and per capita income. However, China's per capita consumption is still substantially below the world level of 23.9 pounds per year, and far below the U.S. level of 65.8 pounds (fig. 4). Given China's low per capita consumption of vegetable oil compared with that in developed countries, there is considerable potential for increased consumption of oils.

China's Government is promoting food processing industries (which produce, for example, instant noodles, crackers, cookies, and traditional Chinese pastries) in rural inland areas close to major crop growing areas in an effort to increase rural industrial development. The growing food processing sector, stimulated by market reforms and increased liberalization of imports (which lower prices

for inputs) should trigger increasing demand for vegetable oils.

Interest abounds in investing in food processing industries in the newly industrializing countries of Asia and elsewhere. Such investment provides opportunities for greater vegetable oil trade, as food processing industries expand and require more vegetable oil inputs.

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Export Promotion Programs Help U.S. Products Compete in World Markets

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Global competition for consumer food dollars is fierce. Governments and agricultural producers from many countries fund and implement sophisticated export promotions costing hundreds of millions of dollars. The mix of government and industry involvement differs by country, but the objective remains the same: to increase agricultural exports.

The United States participates in trade negotiations and implements a variety of export programs to develop global markets for U.S. products. Bilateral and multilateral trade agreements help U.S. exporters increase market access to certain foreign markets by reducing import quotas and tariffs. U.S. export market-development programs assist exporters to counter subsidized competition and help importers finance purchases of U.S. agricultural products. The U.S. Government also collaborates with agricultural producers and processors to increase global consumers' awareness of the quality of U.S. products. This last group of programs is categorized as nonprice promotions.

Nonprice Promotions Aim to Broaden Global Interest in U.S. Products

Producer organizations and private firms use a mix of strategies to promote U.S. products overseas. Nonprice export promotions fall

into three primary categories: trade servicing, technical assistance, and consumer promotions.

Trade servicing encompasses basic sales activities to acquaint importers and dealers with U.S. product attributes and to help them procure U.S. commodities.



U.S. exporters face a multitude of obstacles in highly competitive world markets, including subsidized prices, tariffs and other import barriers, foreign-exchange constraints, and a lack of awareness of U.S. products.

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Activities include sponsoring visits by potential foreign government and private customers to the United States to learn about U.S. production capability and reliability as a supplier, publishing articles in trade journals, distributing promotional materials to foreign food buyers, and other activities to develop relationships with trade and industry representatives in the importing country. Trade servicing is an ongoing, integral aspect of marketing U.S. agricultural products.

Technical assistance teaches prospective overseas customers about specific uses for U.S. agricultural commodities. Activities include livestock nutrition programs featuring U.S. feeds, training in new milling and baking technologies using U.S. wheat, and instructing butchers about U.S. meat cuts. Technical assistance activities contribute to long-term market-development efforts.

Consumer promotions aim to expand global retail demand for U.S. products. Major activities include instore demonstrations and displays, media advertising, and consumer-related campaigns.

Export promotion activities directed to consumers may promote brand as well as generic products. Generic promotions attempt to expand sales of U.S. commodities (such as beef or raisins), while brand promotions advertise a particular company's product. For some products, U.S. origin is a significant identification for consumers. But for other products, labels bearing U.S. company names and communicating characteristics of U.S. products are needed.

Nonprice export promotion activities are conducted primarily by organizations of commodity producers, State departments of agriculture, and private companies. Producer organizations, such as the National Dairy Board and the Florida Department of Citrus, have had the primary responsibility for

generic advertising and promotion in the United States.

USDA Assists Nonprice Market-Development Efforts

The U.S. Government contributes to the funding and operation of nonprice promotion efforts to benefit a wide range of U.S. agricultural producers and processors. Government promotion funds are provided through two major programs—the Foreign Market Development Program (FMDP) and the Market Promotion Program (MPP). In 1993, USDA provided these two programs with over \$180 million for export market-development activities for U.S. agricultural products.

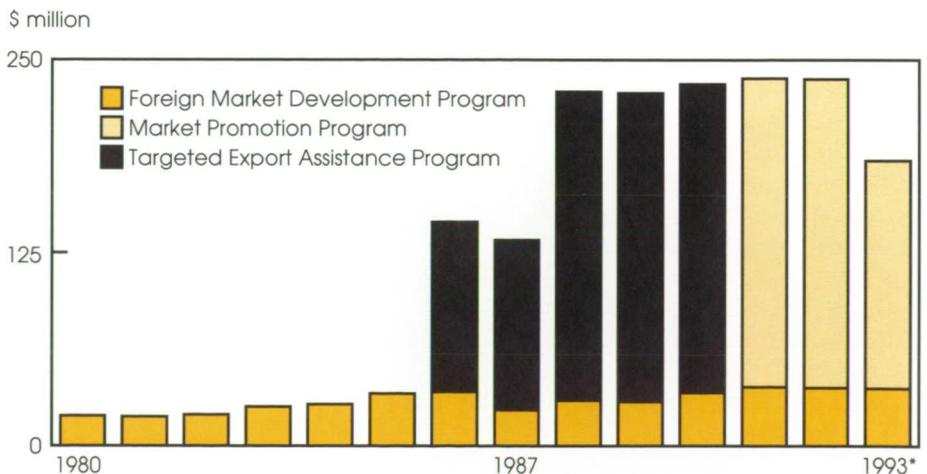
With the advent of the FMDP in 1955, USDA began its unique partnership with industry to develop export markets. The FMDP remains a staple of USDA's market promotion efforts. Federal funding for the FMDP changes little from year to year, averaging over \$30 million annually from 1986 through 1993.

Congress approved the Targeted Export Assistance (TEA) program, the first large-scale nonprice export promotion program, in 1985 to counter the adverse effects on U.S. agricultural commodity exports of unfair trade practices by other countries. In 1990, the MPP replaced the TEA program. The MPP emphasizes market development, but gives priority to commodities whose exports have been curbed by other nations' unfair trade practices.

TEA program allocations of \$110 million from 1986 through 1988 rose to \$200 million in 1989 and 1990. In 1991 and 1992, MPP allocations continued at \$200 million, but dipped to \$147.7 million in 1993.

Implementation of the TEA and MPP boosted total Federal funding for export market promotion from \$35 million in 1985 to more than \$235 million in 1992 (fig. 1). With higher Federal funding, more organizations participated in the non-price promotion programs, and concerns heightened about accountability, industry's share of promotion costs, and allocations to large U.S. companies and foreign firms.

Figure 1
USDA Boosts Funding for Nonprice Promotions



*Estimated.

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For fiscal 1994, the President's budget proposal holds MPP funding constant at \$147.7 million and lowers FMDP funding by \$10 million (almost a third of the current program level).

Producer assessments provide the majority of funds for domestic generic promotions. For export promotions, producer assessments and other industry contributions are combined with Government funding. For the FMDP, USDA's Foreign Agricultural Service (FAS) provides about one-third of the cash and resources used for the program. Producer assessments and industry contributions (including foreign industry) make up the remaining two-thirds. USDA's share of promotion funds is much larger for the MPP. FAS requires producer organizations to contribute a minimum of 5 percent of the funds for MPP generic promotions and to match Federal funding for brand promotions. Some producer organizations contribute much more.

USDA Contributes to Brand and Generic Promotions

Nonprice export promotion programs promote brand as well as generic products. Only a small amount of FMDP funding goes to brand promotion, but 30-40 percent of MPP promotions are for brand products.

Under the MPP, eligible U.S. agricultural cooperatives and companies may be reimbursed for up to 50 percent of approved promotion costs for specific brand products when USDA determines that brand promotion is the most effective promotion strategy.

Producer marketing organizations, such as the Raisin Advisory Board, may award portions of their MPP allocations to U.S. companies, such as Sun Maid, for promotions in countries where consumers respond better to the U.S. brand name than to a generic marketing effort. In most cases, these firms

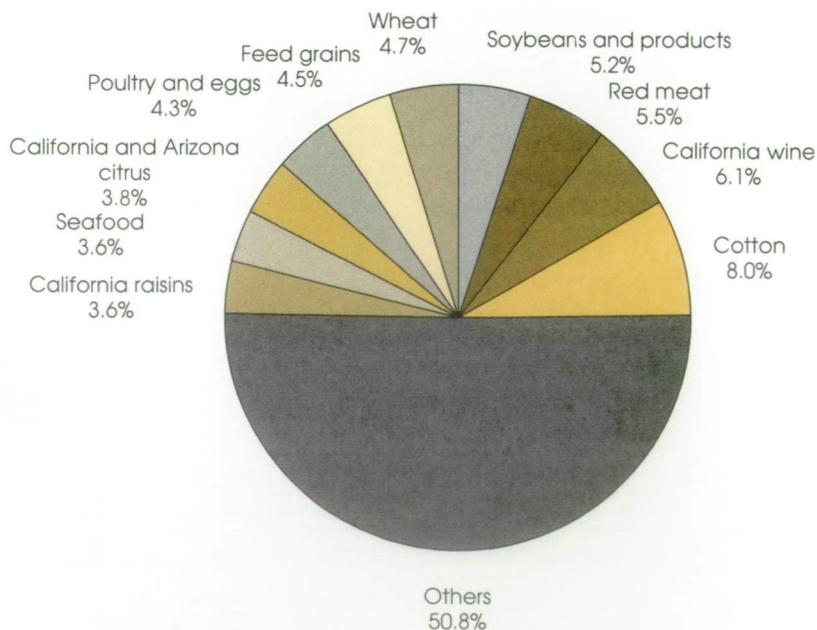
must match Federal funds. U.S. producer marketing organizations also may grant funds to a firm in the importing country to market their product under a combination of the firm's brand name and a U.S.-origin label.

A Variety of Products Promoted

USDA's nonprice promotion programs assist marketers of myriad commodities and products. Under the FMDP and MPP, no one commodity received more than 8 percent of fiscal 1992 funding, and the top 10 commodities together accounted for 49 percent of total funding (fig. 2). High-value products—fruit, vegetables, tree nuts, livestock, seafood, packaged grocery items, and other processed products—account for over 80 percent of USDA funding for nonprice promotion.

Cotton is the largest single commodity receiving market promo-

Figure 2
Top 10 Commodities Receive Only Half of Total FMDP and MPP Funds¹



¹Based on planned budgets for 1992. Source: USDA's Foreign Agricultural Service, Planning and Evaluation Staff.

tion funds. Cotton producers participate in both FMDP and MPP promotions. In fiscal 1992, cotton promotions accounted for 8 percent of FMDP and MPP funding combined, or \$18.6 million. Cotton promotions advertise high-fashion cotton clothes to consumers in developed countries and educate cotton spinners in importing countries about the qualities of U.S. cotton. Following cotton, other products receiving more than \$10 million in fiscal 1992 were California wine, red meat, soybeans, and wheat.

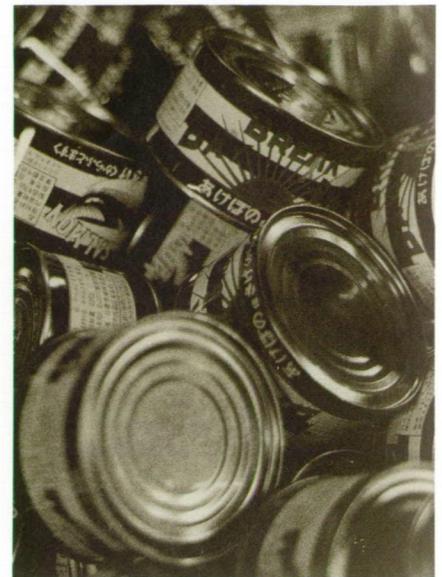
The largest group of products promoted under FMDP and MPP include fruit, vegetables, tree nuts, and wine. These commodities represented 39 percent of the \$235 million budgeted for nonprice promotions in 1992 (fig. 3) California wine, Arizona and California citrus, and raisins were 3 of the top 10 products promoted in fiscal 1992.

Red meat, seafood, poultry, dairy products, and livestock re-

ceived 16 percent of Federal FMDP, MPP, and TEA funds in 1992. Red meat, poultry and eggs, and seafood promoters were among the top 10 promoters under Federal nonprice programs in fiscal 1992.

While the MPP has emphasized promoting high-value products, the FMDP has focused primarily on grains and oilseeds. In part because of this, soybeans, wheat, and feed grains were the fourth, fifth, and sixth top commodities promoted under the FMDP and MPP, accounting for about \$33 million in fiscal 1992. Soybean promotions under the MPP have highlighted soybean oil and other soy products rather than soybeans and meal.

Grocery items promoted by regional associations of State departments of agriculture have claimed an increasing share of MPP promotions since 1986. These often champion small companies seeking overseas markets. USDA funding for these highly processed, con-



High-value products—fruit, vegetables, tree nuts, livestock, seafood, packaged grocery items, and other processed products—account for over 80 percent of USDA funding for nonprice promotion.

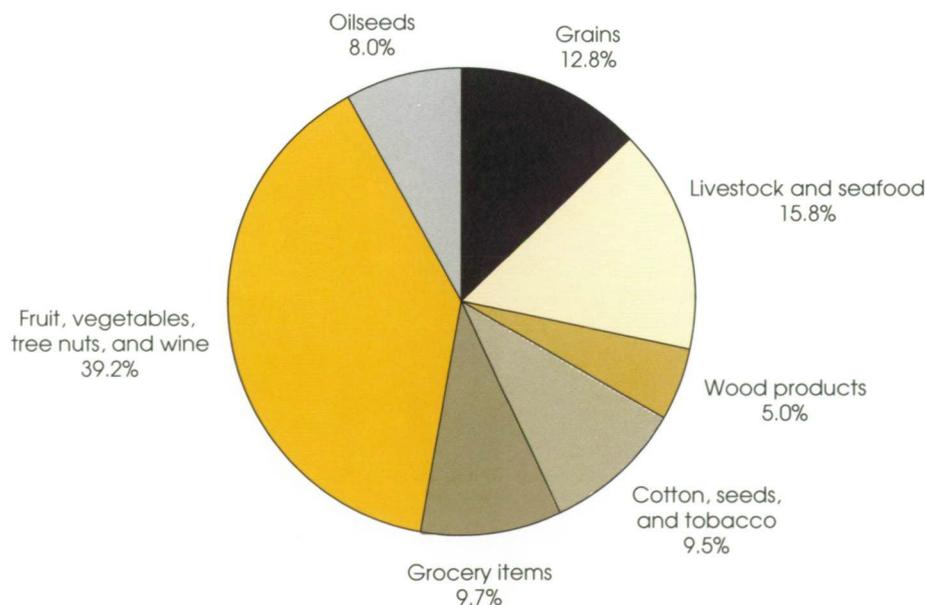
sumer-ready products rose from \$4 million in 1986 to \$23 million in 1992.

USDA also has increased support for the promotion of decorative hardwoods and other wood products. Nonprice promotions of decorative hardwoods rose from \$3 million in 1986 to \$12 million in 1992. Forest product marketers use the funds to build and show models of wood-frame buildings, wood floors, and furniture demonstrating the characteristics of U.S. wood products.

Promotions Target Growing Consumer Markets

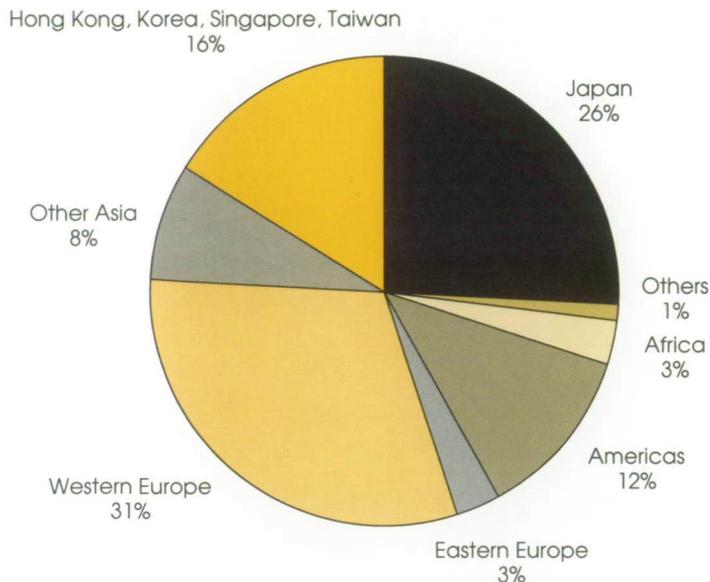
U.S. agricultural products are focused on specific country markets. In 1992, 73 percent of market promotion funds went to promote U.S. products to consumers in Japan, Hong Kong, Korea, Singapore, Taiwan, and the countries of Western Europe (fig. 4). Since 1991, however, promoters have begun to focus on markets closer to home,

Figure 3
Fruit, Vegetables, Tree Nuts, and Wine are Chief Recipients of FMDP and MPP Funds¹



¹Based on planned budgets for 1992. Source: USDA's Foreign Agricultural Service, Planning and Evaluation Staff.

Figure 4

Promotions Focus on Developed Asia and Western Europe¹

¹Based on planned budgets for 1992.

Source: USDA's Foreign Agricultural Service, Planning and Evaluation Staff.

particularly in Mexico, Canada, South America, and the Caribbean. Other prime targets include middle-income Asian countries, oil-rich Middle Eastern countries, Eastern Europe, and the former Soviet Union.

Promoters of high-value products (such as horticultural products; red meat; poultry; and processed dairy, grain, and oilseed products) and packaged grocery items (such as specialty corn chips) have focused on the developed Western European and Asian countries. Promoters of unprocessed, bulk commodities (such as grains and oilseeds) have directed their efforts toward developing countries, which have the greatest potential for growth.

The FMDP has focused on both developing and developed coun-

tries, while TEA and MPP funding has been concentrated in middle-income and developed countries. The bulk of the brand marketing activities went to attract more consumers in developed countries in Western Europe, Asia, and North America. Generic promotions have been spread among developed, middle-income, and developing countries.

Promoters of Agricultural Products Face Marketing Challenges

As growth in U.S. consumer demand levels off, producers and exporters are increasingly focusing on export markets. For example, as trade barriers are reduced in some Asian countries, increasing consumer demand may provide additional long-term markets for some U.S. products, such as red meats, fruit, and vegetables.

USDA's support for nonprice export promotion has benefited U.S.

agricultural producers and food processing companies. Exports of high-value products soared in the late 1980's and early 1990's, partially in response to market promotion efforts. Nonprice export promotion programs represent USDA's chief source of assistance for many high-value products.

However, promoters of U.S. agricultural products face changing consumer preferences and growing competition. Educating consumers about the characteristics of U.S. products does not necessarily boost U.S. exports. As in the United States, some marketers have found consumers who prefer their product to all others—and are willing to pay more for it. However, other consumers can be fickle, never attaching to any particular brand or product.

The United States is not alone in its funding of nonprice promotion. Other governments establish marketing firms to promote agricultural products and help companies with market research, advertising, and sale financing. For example, the Société pour l'Expansion des Ventes des Produits Agricoles et Alimentaires (SOPEXA) is a private company funded by the French Government, producer assessments, and French companies to promote French agricultural products in 15 countries. German promotion efforts are spearheaded by a central association of producer organizations, and Australian efforts are financed through both the government and commodity marketing boards (such as the Australian beef, wheat, and wool boards). Most governments support generic promotions, but many help fund brand promotions when shown to be more effective. ■

The Child and Adult Care Food Program Lends Unique Support

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The Child and Adult Care Food Program (CACFP) provides money and food to non-residential child care and adult day care centers and family day care homes to serve nutritious meals and snacks. In June 1992, the program served 1.6 million children at 186,400 sites and 30,800 adults at 1,060 sites.

During the 1980's, this program had the largest growth of all food assistance programs. Between 1981 and 1992, total costs increased nearly threefold, from \$339.7 million to \$1.1 billion (table 1).

Recognizing the Need

The Child and Adult Care Food Program was established to provide Federal funds to initiate, maintain, and expand food service for children, the elderly, and impaired adults in nonresidential care facilities.

The program was originally authorized in 1968 as the year-round phase of the Special Food Service Program for Children, which also included the Summer Food Service Program. In 1975, the CACFP was separately authorized

for 3 years as the Child Care Food Program under Section 17 of the National School Lunch Act. Congress permanently authorized the program in 1978.

Helping With Support

The program provides Federal funds to reimburse the care provider for meals and snacks

served under the program. There are no requirements for State or local governments to match those funds.

The program is administered at the Federal level by USDA's Food and Nutrition Service (FNS). Local programs are administered jointly by State agencies and local sponsors. In States which do not administer the program, FNS does so



The Child and Adult Care Food Program had the largest growth of all food assistance programs during the 1980's.

The author is an agricultural economist with the Commodity Economics Division, Economic Research Service, USDA.

directly through its regional offices. State agencies receive Federal funds for administrative expenses, according to a formula based on past program expenditures.

Reimbursement for local administrative costs for child and adult care centers are assumed to be included in the per meal rates established each year. Each family day care home must be administered by a public or private nonprofit sponsoring organization, which is responsible for maintaining and enforcing Federal and State regulations and for preparing a consolidated monthly reimbursement claim for all the homes it sponsors. A separate reimbursement payment, based on the number of homes sponsored, is made to these organizations for administrative expenses.

Cash reimbursements are established annually for each breakfast, lunch, or supplement served. Federal reimbursement is provided for up to two meals (breakfast, lunch, or supper) and one supplement or snack per day per child or adult. Children in child care centers for eight or more hours a day may be served an additional meal or snack. Commodities or cash in lieu of commodities are also provided for lunches and suppers.

Reimbursement rates differ for child and adult care centers and for family and group day care homes.

Child Care Centers

Licensed or approved nonresidential, public or private nonprofit child care centers are eligible to participate. Head Start Programs, settlement houses, and public neighborhood centers are some examples.

Private, for-profit centers may participate if they received funds under Title XX of the Social Security Act for 25 percent or more of their enrollees or 25 percent of their licensed capacity. The Social

“...The differences in the regulations between centers and homes reflect the great differences in organization, structure, and size of the operations, as well as the ... nature of the care provided...”

Security Act provides discretionary monies to the States, which can be used to fund various social welfare activities, including child care, to assist low-income and needy people.

A study conducted for FNS in 1988 estimated that 35 percent of

all licensed child care centers participated in the program in 1986. In fiscal 1992, over 25,000 centers participated.

Reimbursement rates for meals and snacks served in centers are based on the household size and income of the individual child. The rates are the same as those provided to schools through the National School Lunch and Breakfast Programs. A child from a family of four with an annual income of \$18,135 or less is eligible for a free meal. Children from a family of four whose annual income is between \$18,136 and \$25,808 are eligible for a reduced-price meal. Those whose family income exceeds those limits must pay full price.

Family Day Care Homes

To participate in the CACFP, family day care homes must meet State licensing requirements, or must be approved by some State or local agency when no licensing requirements exist. They also must be sponsored by a public or private organization that will assume responsibility for ensuring compliance with Federal and State program regulations and that will act as a conduit for reimbursement funds paid to the day care providers.

Family day care providers are reimbursed at a flat rate for each meal or snack served. The rate falls between the free and reduced-price rate available to children at the more institutionalized child care centers. No income eligibility criteria are applied to the children in participating family day care homes. However, such criterion is applied to the day care provider's children. Meals served to the provider's own children are reimbursable only if the provider's income does not exceed 185 percent of the poverty level.

The differences in the regulations between centers and homes

Table 1
The Child and Adult Care Food Program Growing, in Both Participation and Costs

Fiscal year	Meals served Million	Program costs Million dollars
1981	546.5	339.7
1982	492.7	324.3
1983	536.4	355.8
1984	590.5	406.7
1985	640.4	452.1
1986	678.3	496.2
1987	725.1	547.7
1988	789.3	692.4
1989	862.0	691.7
1990	966.4	811.7
1991	1,062.0	943.8
1992	1,181.6	1,096.2

reflect the great differences in organization, structure, and size of the operations, as well as the direct, personal, and informal nature of the care provided by the home day care provider. Family day care homes are usually small care facilities—a typical provider cares for five or six children. The average child care center, on the other hand, enrolls between 50 and 100 children, and is usually administered by a manager. Virtually all family day care providers are women. Family day care homes tend to be shorter lived than the centers, which are usually ongoing, and relatively stable institutions.

In 1986, a survey conducted for FNS estimated that 75 percent of all licensed family day care homes

participated in the program. However, the report also estimated that over two-thirds of all such day care providers were not licensed. In fiscal 1992, over 165,000 day care homes participated.

Adult Day Care Centers

In 1987, certain adult day care centers became eligible to participate in the Child Care Food Program. The official title of the program was changed in 1989 to reflect the adult care component.

Eligible for participation are public and private nonprofit centers which provide nonresidential adult day care to chronically or functionally impaired adults or the elderly age 60 or over. Also, private, for-profit centers may participate if at least 25 percent of their enrolled eligible adults are Title XIX or Title XX Social Security beneficiaries.

Centers in the program provide day care to frail and elderly adults

to relieve families from constant caregiving, and thus avoid premature or unnecessary institutionalization. These centers must be licensed or approved by Federal, State, or local authority to provide services to the chronically impaired, to disabled adults over age 18, or to the elderly less than 24 hours a day. The centers must maintain professional management responsibility for all services.

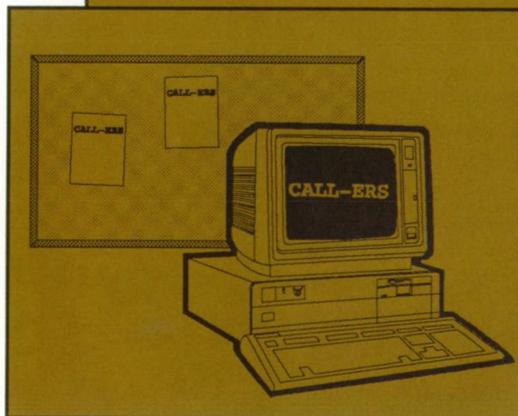
Reimbursement rates and eligibility criteria for free and reduced-price meals and snacks for adult day care centers are the same as those for child day care centers. In 1992, this program served over 30,000 adults a day at 1,200 centers. ■

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Americans spent \$570 billion for food in 1991 and \$85 billion for alcoholic beverages. Away-from-home meals and snacks captured 45 percent of the U.S. food dollar in 1991, up from 39 percent in 1980 and 34 percent in 1970. This annual

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Food Costs...From Farm to Retail in 1992

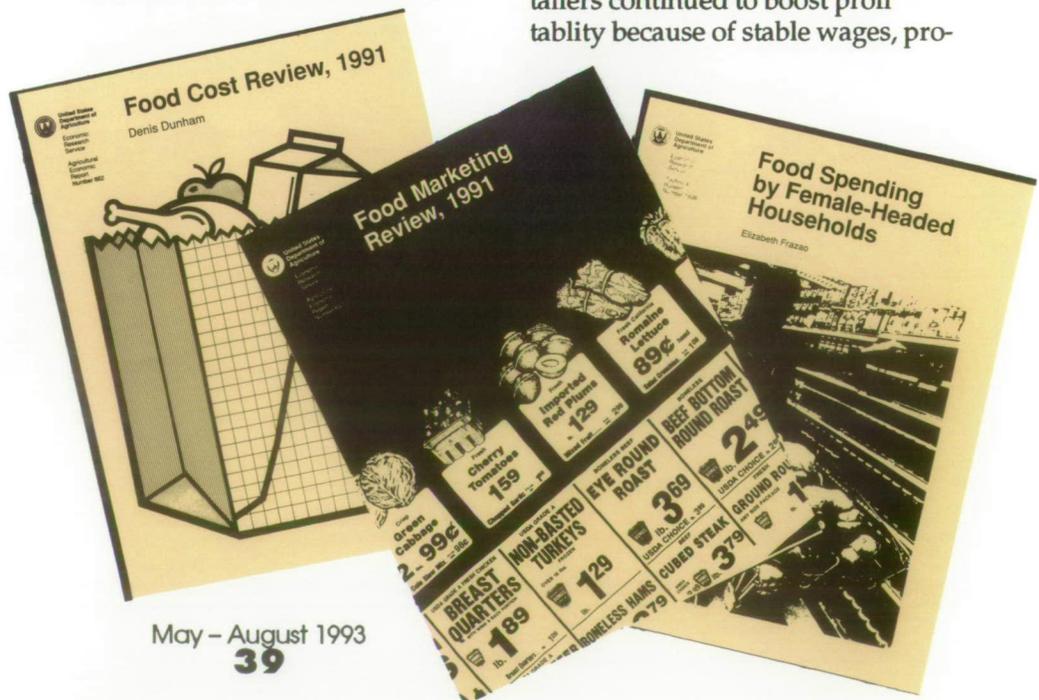
Large food supplies and softened demand slowed the rise in retail food prices in 1992 to an average 1.2 percent above 1991 prices, less than half the 1991 increase. Prices increased slightly in grocery stores, by 0.7 percent, and in restaurants, by 2 percent. This report analyzes food cost changes and explores how the food dollar is distributed among farmers, food processors, and marketers.

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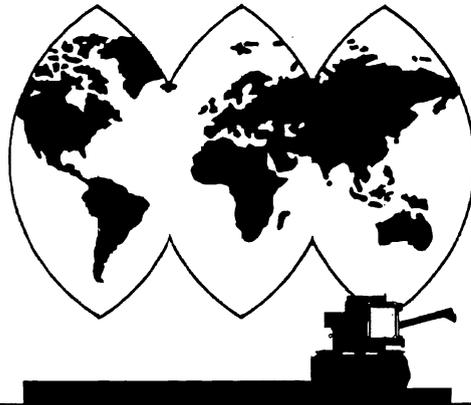
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