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Deposit Laws: Answer or Alternative?



Deposit Laws: Answer or Alternative?

Litter has created a costly clean-up problem in the U.S. While all litter cannot easily be controlled by law, 41 State Legislatures have considered mandatory deposit laws to control the litter caused by beverage containers. So far, eight States have passed such laws requiring deposits on one-way and refillable beverage containers.

States with deposit laws have found that beverage container litter has been sharply reduced. However, the laws have also had major adverse effects on food retailers, bottlers, brewers, and container manufacturers.

The U.S. Congress is now considering a Beverage Reuse and Recycling Act, introduced in March 1981 in the Senate and the House. The bill, similar to the State laws, would make beverage container deposits and recycling mandatory throughout the Nation, preempting State laws.

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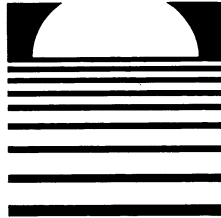
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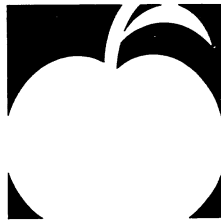
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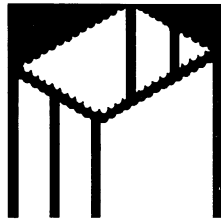
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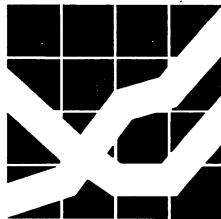
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Deposit Laws: Answer or Alternative?

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Litter—specifically, discarded beverage containers—has created a cleanup problem across the Nation. The Environmental Protection Agency (EPA) estimates that \$300-\$500 million is spent each year to clean up all litter in the United States. But, there may be a way to reduce litter cleanup costs. It's called recycling.

During the past decade, 41 States have considered legislation to reduce beverage container litter and encourage recycling of empty containers. Eight States enacted laws that require deposits on one-way and refillable beverage containers.

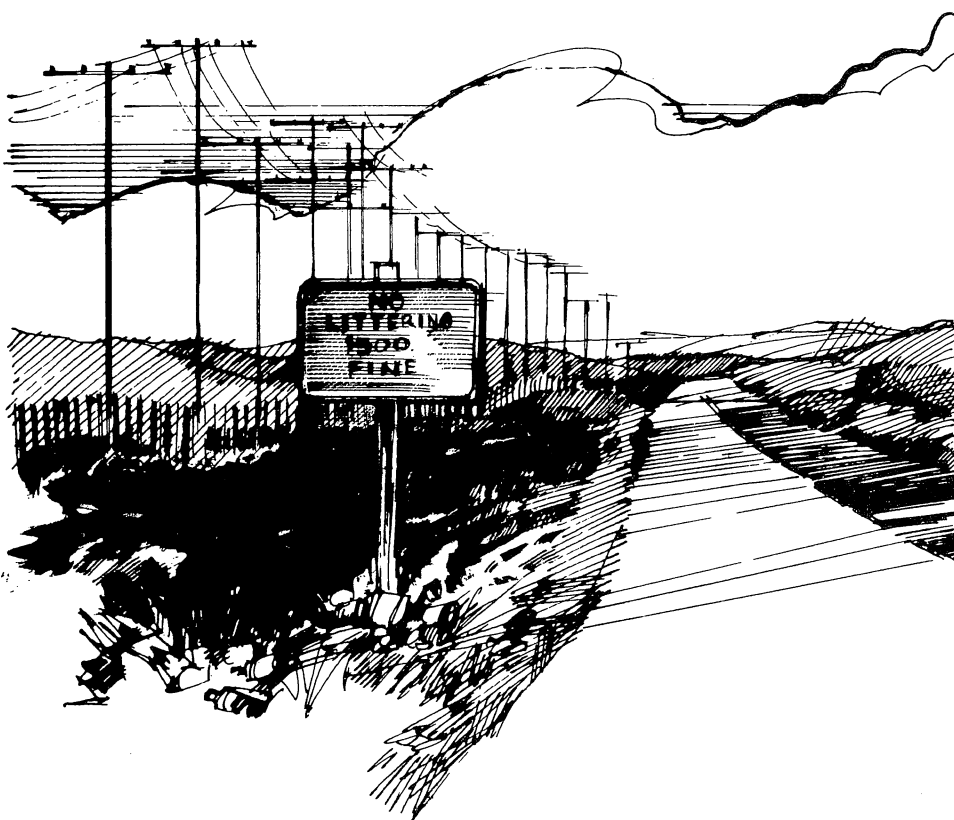
Bills for a national recycling program have been presented in the U.S. Congress each session since 1979. On November 5, 1981, the Senate Committee on Commerce, Science, and Transportation conducted a hearing on Senate bill 709, the Beverage Container Reuse and Recycling Act, which was introduced in March 1981. A companion bill, H.R. 2498, was simultaneously introduced in the House of Representatives.

The provisions of the bills are similar to the State laws but would make beverage container deposits and recycling mandatory throughout the Nation, preempting the individual State laws. No action has been taken on the bills as of this writing. The experiences with State deposit laws may offer insight into possible effects of national legislation.

States with deposit laws have found that beverage container litter has been sharply reduced. However, the laws have had major effects on food retailers, bottlers, brewers, and container manufacturers. Although the firms agree that some form of recycling is needed, they have sought to prevent passage of deposit laws in other States.

Oregon passed the first mandatory deposit law in June 1971 and seven other States—Vermont, Connecticut, Maine, Michigan, Delaware, Massachusetts and Iowa—followed. The major features of their beverage deposit laws and the provisions of the proposed Federal law are summarized in table 1.

Deposits are collected from consumers on all one-way and refillable glass bottles, steel and aluminum cans, and plastic bottles containing carbonated or malt beverages except when the beverages are served in



eating or drinking places. Noncarbonated juices, iced tea, and lemonade are not included. The deposits are refunded when the empty containers are returned to the stores where they were purchased or other stores authorized to redeem them. In some States, retailers redeem containers only of the size, brand, and kind sold by their establishments.

Refillable bottles are cleaned and inspected for physical integrity and sanitary condition and refilled. One-way glass bottles are discarded or smashed and sold for scrap. Cans and plastic bottles are discarded or crushed, baled, and sold for scrap.

The laws do not specify who must originate the deposit fees. Soft drink bottlers generally include the deposit in the prices charged to wholesalers and retailers and refund the deposit when the empties are returned to them. Deposits on refillable beer, ale, and other malt beverages are also included in the brewers' prices. Deposits on one-way bottles and cans containing malt

beverages are usually originated by wholesale distributors who also dispose of the returned empties.

The firms that originate the deposit fees can use the money until it is reclaimed, and they keep all unredeemed deposits. The originating firms also receive revenue from the sale of scrap from one-way glass, steel, aluminum, and plastic containers. In Michigan, aluminum sold for about \$600 per ton, steel \$145 per ton, glass \$32 per ton, and plastic \$40-\$100 per ton in 1979. Those firms that receive no revenue from unclaimed deposits or the sale of scrap may be compensated for handling the empty containers by raising prices or by receiving an allowance from their suppliers. Some States specify a fee to be paid to retailers for handling returned containers (table 1).

Reducing Litter and Solid Wastes

Although data on litter reduction are not always complete or consistent, there appears

to be strong evidence that deposit laws have significantly reduced beverage container litter along highways and in parks. Vermont experienced a 76-percent reduction in beverage container litter after one year of the law. The Maine Department of Conservation reported that beverage container litter along highways decreased about 70 percent after its bottle deposit law was implemented, according to the General Accounting Office (GAO). In Michigan, the number of beer and soft drink containers in litter dropped 87 percent.

Since there are other types of litter besides beverage containers, the laws had much smaller effects on total litter. The volume of roadside litter dropped 35 percent in both Vermont and Oregon. The Maine Department of Transportation reported that total litter was down 15 percent after the first year the law went into effect, and 10 percent the second year. In Michigan, total litter along streets and highways and in recreational areas decreased 10 percent. Hazardous litter, of which bottles and cans are a major part, was reduced by 58 percent in Michigan.

The beverage deposit laws also reduce the volume of solid waste that is disposed of properly. In Oregon, the number of beer and soft drink bottles found in solid waste declined from 174 million the year before enactment of a beverage deposit law to 40 million after the law was in effect—a decrease of 77 percent, according to Senator Mark Hatfield. Michigan and Maine each experienced 6 percent reductions in the total volume of solid wastes after enactment of their deposit laws.

Material Resources

The Office of Technology Assessment (OTA) reported that 6.52, 1.26, and 0.47 million tons of glass, steel, and aluminum, respectively, were used for beverage container production in 1977. A complete shift to a refillable glass system would free 1.3 percent of the Nation's steel and 12 percent of its aluminum for other uses. Total glass use would also decline.

In those States that have beverage deposit laws, a very high proportion of beverage containers are either refilled or recycled from scrap. Generally, the rate of return on all beverage cans and glass bottles is 90 percent

(the rate for plastic bottles appears to be lower but a specific estimate is not available). The Aluminum Company of America (ALCOA) and Reynolds Metals Company have opened major recycling centers in Michigan since the State's law was passed.

Available information indicates that beverage deposit laws reduce energy consumption. The Oregon Legislature reported a net saving of 1.4 trillion BTU's of energy per year as a result of the law, enough to supply heat for 50,000 residents. This estimate takes into account energy savings in the manufacture of containers and the extra energy needed to transport and process empty containers. Recycled aluminum cans reduce energy requirements in can manufacturing by 5 percent. Returnable bottles used about one-third the amount of energy consumed by one-way bottles.

The Federal Energy Administration estimated that a nationwide beverage deposit law would save 144 to 169 trillion BTU's of energy annually—equivalent to 25-30 million barrels of oil.

Effects on Firms

Beverage deposit laws have not been popular with container manufacturers, brewers, soft drink bottlers, wholesale beer distributors, and retailers.

One-way bottles and cans have been replacing refillable soft drink and beer bottles for several years and, at present, account for 70 percent of all containers. According to GAO, mandatory deposit laws reduce the demand for cans, thus explaining the opposition of can manufacturers. Glass bottle manufacturers stand to benefit because glass containers replace metal cans. However, about 65 percent of soft drink bottles are the refillable type after deposit laws go into effect.

Since bottles are typically refilled 10 to 20 times, the total number of bottles needed declines, even after allowing for the substitution of bottles for cans. Relatively more one-way beer bottles have been used since deposit laws were implemented, but this would not be enough to offset the decline in soft drink bottles if a national container deposit law were enacted.

Brewers and soft drink bottlers are concerned that beverage deposit laws will increase their operating costs, leading to higher prices and reduced sales and profits. Higher costs result from transporting, cleaning, inspecting, and handling additional containers. In Michigan, bottlers invested in new bottle washers and bottle filling equipment. The efficiency of delivery trucks dropped 20 to 30 percent due to handling empty containers, and additional trucks were needed. Utility bills for water and energy increased as did diesel fuel and gasoline costs. Wholesale beer distributors bought new and larger trucks to handle the returnables.

Beverage deposit laws also increase retailers' costs. A study done for the Food Marketing Institute in 1980 reported that supermarkets' typical handling costs were approximately 2.37 cents per refillable bottle and 1.94 cents for each one-way bottle and can. Retailers must verify consumers' refund claims, count and bag cans (240 cans per bag in Michigan), and sort bottles into refillable and one-way. Refillable bottles are further sorted by manufacturer.

Additional labor and storage space are required for these tasks. In addition, empty containers often have contaminants, so retailers have had to increase their pest control expenditures. Separate storage areas usually are provided away from foods. Available evidence indicates that there have not been any serious health problems associated with the returned containers.

Effects on Jobs

A major concern about beverage deposit laws is that they may eliminate jobs and cause plant closures. The laws eliminate some manufacturing jobs while creating a greater number of jobs involving the transportation and handling of containers. GAO estimated that 57,000 jobs will be created if national legislation is enacted.

The Oregon State Legislature reported that its beverage deposit law caused 350 production jobs to be lost, while truck driving jobs increased by 140 and warehouse and handling jobs increased by 575 the first year after the law was enacted. This net increase of 365 jobs for the Oregon economy represented \$1.6 million in annual payroll.

About 4,500 additional jobs were created in Michigan as a result of the deposit law. These were mostly low-paying jobs for sorting and handling of containers at the retail level. Some were jobs for truck drivers where additional trucks were needed to handle empties. Approximately 350 production jobs were lost by can and glass manufacturers in Michigan, with some plant closures.

Since beverage container deposit laws reduce the amount of roadside litter and the volume of solid wastes, it is possible that some cleanup jobs are lost, but no data are available on this question.

Effects on Sales and Consumer Prices

No conclusive data are available indicating whether container deposit laws have affected total sales of soft drinks and beer. There is evidence that establishments located near the border of States with deposit laws have lost sales to neighboring States without such laws. The effect of deposit laws on retail prices cannot be analyzed directly since price changes may be attributed to many factors. There also are insufficient data to determine whether the total costs of producing and distributing beverages are higher on one-way containers or refillable containers.

Refillable bottles reduce the amount of metal, glass, and energy required to deliver beverages to consumers. Recycling provides revenue from the sale of scrap metal and glass from one-way containers, and unclaimed deposits are kept by the firms that initiate them. However, filling lines are slower for refillable bottles than for one-way containers and extra labor, space, and equipment are needed to handle the returned empties.

On balance, refillable containers appear to reduce the wholesale cost of beverages but add significantly to costs at the retail level. If the cost savings in bottling exceed the cost increases at retail, container deposit laws would reduce the costs of producing and distributing soft drinks and beer; if not, they would increase the costs of the beverages. The latter appears to be more likely based upon testimony presented before the Senate Committee on Commerce, Science and Transportation, on November 5, 1981.

Table 1. Major Provisions of State Beverage Deposit Laws

Provision	Connecticut	Delaware	Iowa
Effective date	1/1/80	July, 1982 ¹	5/1/79 for liquor. 7/1/79 for all other provisions.
Beverages covered	Beer Malt beverages Mineral water Soda water Carbonated soft drinks	Beer, ale Malt beverages Mineral water Soda water Carbonated soft drinks	Beer Malt beverages Mineral water Soda water Carbonated soft drinks Liquor
Refund value ³	5 cents or more	5 cents or more	5 cents or more
Bans pull-tabs	Yes	Yes	Yes
Bans plastic 6-pack connectors	No	Yes	No
Permits redemption centers	Yes	Yes	Yes
Penalty for noncompliance	None	Civil penalty of not less than \$250 nor more than \$1000 per violation	Misdemeanor—maximum \$100 fine or 30 days
Per container handling fee paid to retailers	1¢	Minimum 20% of deposit	1¢

¹As originally enacted, the law was to become effective 60 days after Maryland and Pennsylvania enacted similar legislation. This restriction was removed in a 1981 amendment.

²Pull-tab containers were banned by an earlier law.

Alternative Plans

Some opponents of both Federal and State beverage deposit laws have proposed alternative litter control and recycling programs. The 1972 Model Litter Control and Recycling Act of Washington State represents one idea which 11 States—Colorado, California, Virginia, South Carolina, Kentucky, Nebraska, Alaska, Tennessee, Louisiana, Washington and Connecticut—are testing (Connecticut also has a beverage deposit law). For Washington State, industries associated with products likely to end up as waste are charged annual

fees—\$10 to \$30 for retailers and up to \$2,000 for wholesalers and manufacturers. These fees, which may vary by State, are used to establish community recycling centers, educational programs to increase public awareness of litter problems, and antilitter law enforcement programs, and to conduct more research into resource recovery and energy generation from wastes.

In Washington State, the Department of Ecology coordinates the program and receives about \$1.5 million a year from the annual fees. In addition to launching a major public education program, the Washington

Table 1. Major Provisions of State Beverage Deposit Laws

Maine	Massachusetts	Michigan	Oregon	Vermont	Proposed U.S. law
1/1/78	1/17/83	12/3/78	10/1/72	9/1/73	Pending
Beer, Ale Soda water Carbonated soft drinks	Beer Malt beverages Mineral water Carbonated soft drinks	Beer, ale Malt beverages Mineral water Soda water Carbonated soft drinks	Beer Malt beverages Mineral water Soda water Carbonated soft drinks	Beer Malt beverages Mineral water Carbonated soft drinks	Beer, malt beverages, mineral water, soda water, carbonated soft drinks
5 cents or more	5 - 10 cents	5 cents ⁴ or more. 10 cents or more	2 cents ⁴ or more. 10 cents or more.	5 cents or more.	5-10 cents
Yes	No ²	Yes	Yes	Yes	Yes
Yes	Yes	No	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Civil penalty not to exceed \$100	Civil penalty not to exceed \$1000	Fine not less than \$100 nor more than \$1000	Civil and criminal penalties depending upon violation	Fine not to exceed \$1000 for each violation	Fine not to exceed \$1000 for each violation
1¢	1¢	None	None ⁵	Minimum 20% of deposit	2¢

³Containers bought outside the State cannot be redeemed in the State.

⁴Lower deposit for State certified bottles (bottles that may be refilled by more than one manufacturer).

⁵Amended July, 1981 so that retailers can refuse to accept contaminated containers.

Source: State Legislative Report, National Conference of State Legislatures, Vol. 6, No. 2, Feb. 1, 1981, in part.

law requires litter bags for all automobiles and boats, fines for littering, and an adequate number of litter receptacles throughout the State.

Available data on the Washington program suggest that total litter has been reduced in the State. Supporters of the law claim that it has reduced litter by 66 percent, although independent verification is not available. The Glass Packaging Institute reported that 641 private recycling centers in Washington processed recyclable materials worth \$90 million and employed over 4,000 persons in 1980.

Another alternative being used is the Clean Community Systems (CCS) campaign, which is a project of Keep America Beautiful, Inc., a national nonprofit public service organization aimed at reducing litter. Implemented in 1976, the campaign aims at changing the trash disposal habits of consumers through strong advertising. The CCS programs operate in cities in 34 States and encourage community involvement by using volunteers. CCS committees meet with community leaders and residents to propose waste management programs for their areas.

Coordinators for CCS estimated that litter was reduced an average of 32 percent in communities that had the program 1 year and 66 percent in communities that had CCS for 5 years.

Tennessee passed another type of compromise proposal in 1981. A gallonage tax on malt beverage producers and a gross receipts tax on beverage distributors will be used to increase trash collection along highways. The law took effect on April 2, 1981 and has a 3-year expiration date. This is an interesting compromise plan because it overcomes food firms complaints about

handling empties and provides an opportunity to see how increased trash collection efforts might compare with other States' container deposit programs in terms of cost and effectiveness.

New Jersey recently adopted a different kind of program to encourage recycling. It does not address the problem of litter in parks and along highways. Rather, it seeks to reduce the amount of waste put in landfills by taxing landfill operators on all material accepted for disposal. Funds generated will be used to support community recycling programs and other related activities.

Conclusions

Beverage container deposit laws have clearly done what they were supposed to do—reduce litter and cut consumption of energy and raw materials. Limited available evidence suggests, however, that the increased costs of labor and equipment needed to handle the empties more than offsets these savings, so that consumers pay more for their beverages when deposit laws are enacted. Further study is needed on this question. No attempt has been made to estimate the aesthetic cost of litter to consumers.

Many consumers may have mixed feelings about mandatory deposits on containers. They often do not like to store the empties and cart them back to the stores, which may explain why one-way containers eroded sales of refillable bottles over the years and why retailers located near the border of States with mandatory deposit laws lose sales to retailers in neighboring States. However, consumers also do not like litter in public places. Given the alternatives of voluntary litter cleanup and mandatory deposit laws, the deposit laws appear to be gaining popularity with voters and with local governments that must cope with litter cleanup and find sufficient landfill space to dispose of trash. In 1981, 38 States considered some type of legislation affecting beverage containers. About 30 States specifically considered mandatory deposits.

Container manufacturers, bottlers, brewers, wholesalers, and retailers, meanwhile, all dislike being forced to collect and dispose of trash and they are likely to continue opposing any legislation that would force them to handle the empties. Due to this

strong opposition, a substitute program may be desirable.

While there is always danger in oversimplification, it appears that the following factors merit consideration in a compromise proposal.

- Most people apparently believe that litter cleanup costs should be borne by beverage consumers rather than by general tax revenues.

- Voluntary litter cleanup programs that appeal to the public's pride in a clean community do not appear to be as effective as buying empties from the public.

- Many people urge that any litter cleanup and recycling program include materials other than beverage containers, claiming that the effectiveness and efficiency of broader programs are diminished when beverage container deposit laws are enacted.

- OTA and others claim that existing waste disposal channels are best equipped to handle trash and extract reusable materials efficiently.

- Food firms do not want to be forced to handle millions of empty containers. The firms are equipped to distribute food to consumers. They are not well equipped to move large quantities of potentially contaminated empty containers back through the distribution system.

An acceptable program alternative may be a program that separates beverage production and distribution from the recycling of the empty containers. One way to accomplish this is to collect a fee (1 cent-3 cents) from bottlers and brewers for each beverage container sold and use the revenues to buy back the empties using regular trash recycling channels. OTA has suggested that it might be more efficient to assess fees of this type directly on container manufacturers.

Fees could vary depending upon the scrap value of the empty containers. Refillable bottles could be exempted entirely since they are already being reused. Redemption centers have already been established in many areas for aluminum cans, and firms would begin to buy other types of containers as well if the empties had a comparable market value.

Compared to mandatory deposit laws, such a program probably would lower prices consumers pay for beverages since recycling

through normal trash handling channels appears to be more efficient than having food marketing firms handle and dispose of the empties. The program could be expanded to include other types of recyclable material if desired. Another advantage of this type of program is that it relies upon positive economic incentives rather than dictating that firms alter their business practices.

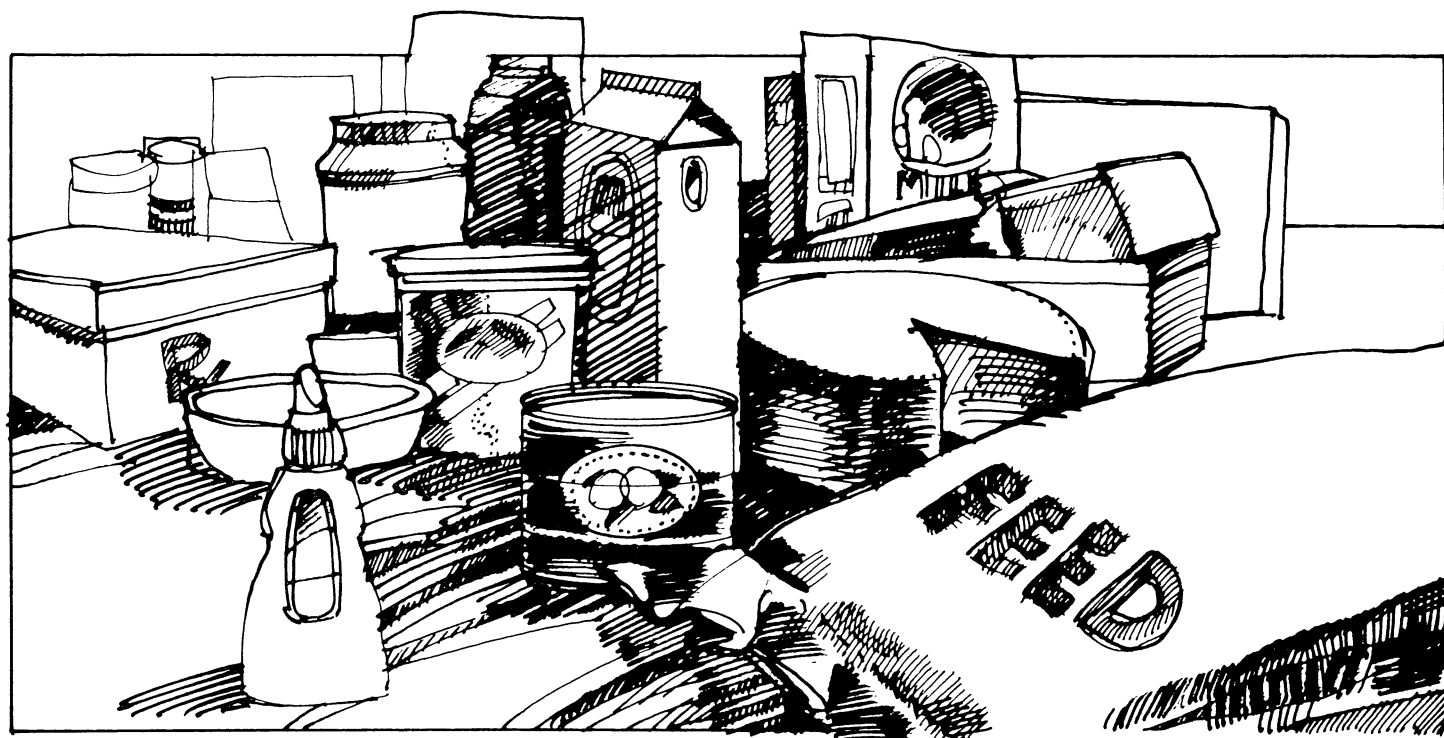
Pressures for legislation will likely remain strong until the litter issue is satisfactorily resolved. Much of the impetus for action is focused at the State and local levels. Unless the States reach consistent solutions, pressure for national legislation will mount. Already some food industry representatives who, in general, are opposed to container deposit laws have urged passage of a national law so they can avoid the costs and other problems that are encountered when they attempt to comply with many different State and local requirements.■

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The Versatile Casein

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In 1980, 152.2 million pounds of casein (a milk protein) were imported into the United States. According to a recent USDA report, 76.2 million pounds were used in food products such as imitation cheeses, baked goods, breakfast foods, coffee whiteners, desserts, and toppings. Another 25.9 million pounds were used in the production of feeds, particularly in calf milk replacers and veal feeds.

These foods and feeds have grown in popularity in the last few years. During this same time, dairy operators have seen their markets for nonfat dry milk (NDM) and other dairy products shrink. Although other factors play an important role in this decline in consumption, dairy producers maintain that their situation would improve if casein imports were restricted. Such restrictions would also affect manufacturers of products using casein, producers of substitute ingredients for casein, consumers of products made with casein, and the Federal Government. To understand these interrelationships, one must first know something about casein—what it is, its extent of its use and importance in the food industry, and the types of policy questions raised by the production and importation of casein.

What Is Casein?

Four-fifths of whole milk's total protein consists of casein. On the average, whole milk consists of 87 percent water, 4.9 percent lactose, 3.8 percent butterfat, 3.0 percent casein, 0.6 percent whey proteins, and 0.7 percent minerals and vitamins. Thus, casein is found in almost all dairy products, varying from 3 percent of total weight in whole milk to 17 percent in cottage cheese and to as high as 33 percent in some hard cheeses, such as Cheddar or Gouda.

Importance in the Food Industry

Casein has been traditionally classified as an industrial chemical, because past use was almost solely in the manufacture of industrial products. Since the mid 1970's, the amounts used in food and feed applications has far surpassed industrial product use. By 1980, over 60 percent of the total was used in the manufacture of food products, 20 percent in feed stuffs, and 20 percent in industrial products.

In many food products, casein is used in the more soluble form of a caseinate. Sodium, potassium, and calcium are common caseinates found in food products. The particular caseinate used in a product depends

on the specific needs of the product. For ease of discussion, both casein and caseinate forms will be referred to as casein in this article.

Nearly half of the casein used by the U.S. food industry in 1980 was used in imitation cheese products. Casein is also used in the production of coffee whiteners, certain bakery products, diet foods, and pet foods. Nonfood uses include the manufacture of medical and pharmaceutical products, calf milk replacers, veal feeds, glues and adhesives, paper coatings, and an assortment of other feed and industrial products.

Casein's ability to bind compounds is a major attribute. In fact, it has been identified as the glue in ancient museum pieces and in wooden backs and frames of Renaissance paintings.

However, it was not until the early 1970's that food industry researchers were able to adopt casein's binding role in the cheese-making process and successfully introduce the first imitation cheese products on the American market. Today imitation cheese manufacturers are the largest users of casein—using an estimated 41.9 million pounds in 1980. Manufacturers of convenience foods, such as frozen pizzas and tacos, and eating places, such as fast food restaurants,

appear to be the dominant users of these cheeses.

Another of casein's important traits is its ability to emulsify fat and other complex chemical compounds. In much the same way as casein mixtures emulsify larger chemical compounds in insecticide sprays, paints, and rubber mixtures, the casein component in many cream substitutes emulsifies the fat component to prevent it from rising to the top. Such substitutes maintain their freshness over time, due largely to casein's ability to remain stable in flavor and in color during storage.

In addition, casein-based coffee whiteners are often in convenient powder form, which increases their appeal to many consumers. Over 12 million pounds of casein were estimated to have been used in 1980 in the manufacture of coffee whitener products.

Although much of casein's use in food products can be explained by functional properties, economic considerations also play a major role in food manufacturers' decisions to use casein over other protein substances. Casein was priced, on a protein equivalency basis, at one-half the price of domestically produced skim milk solids in 1980. This price difference was mainly due to lower milk production costs in casein-exporting countries.

Currently, the principal substitutes for casein in food products, other than domestically produced skim milk solids, are soybean-derived protein substances. Although these proteins can compete with casein on a price basis, certain quality factors, such as their beany flavor and shorter shelf life, make them less desirable. Many others, including fish protein concentrate and single cell proteins, are being developed by U.S. food technologists. However, many of these substitutes await further refinement and/or economic incentives before they can be introduced.

The Production of Casin

In its commercial form, casein is taken from skim milk in a process that leaves the other skim milk solids behind and results in one of the most complete and versatile amino acid forms. It can be recombined with dried whey from cheese manufacturing process to simulate nonfat dry milk (NDM), or

Table 1—U.S. Casein and Casein Mixture Use, 1980

Product	Estimated Total Pounds Used	Percent of Pounds Used in Industry	Cumulative Percentage of Industry Total	Percent of Total Pounds Imported	Cumulative Percentage of Total Imports
FOOD:					
Imitation Cheese	41,850,570	49	49	28	28
Coffee Whiteners	12,330,438	14	63	8	36
Bakery	7,559,484	9	72	5	41
Medical/Pharmaceutical	6,927,237	8	80	5	46
All Others	16,897,293	20	100	10	56
All Food Use	85,565,022	100	100	56	56
Increase in Inventory	10,188,243	—	—	7	63
FEED:					
Calf Milk Replacers	8,097,364	31	31	5	68
Veal Feeds	7,894,661	31	62	5	73
Pet Foods	5,299,140	21	83	4	77
All Others	4,564,119	38	100	3	80
All Feed Use	25,855,284	100	100	17	80
Increase in Inventory	4,041,338	—	—	3	83

used separately to fabricate food items that require only the nutritional and functional characteristics imparted by a protein substance.

Although casein was once isolated from its milkfat and nonfat milk components domestically, U.S. production of casein ended in 1968. Evidently, many market forces were responsible, one of which was the increased attractiveness of NDM production over casein production—due in part to a guaranteed price floor for NDM provided by the

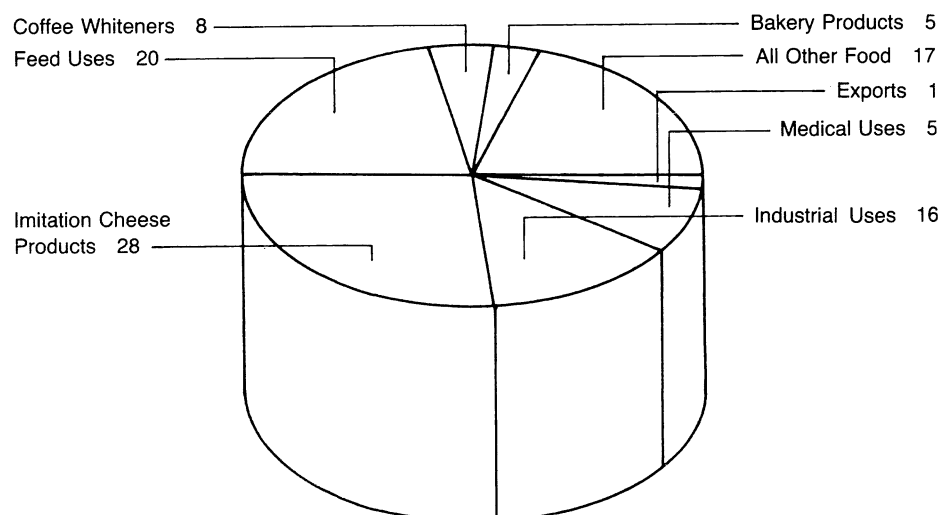
Government's dairy price-support program.

Therefore, all casein is now imported. In 1980, New Zealand supplied half of our casein imports, Australia 12 percent, and the European Community (EC) supplied 28 percent. Imports during 1981 followed roughly this same breakdown, but were down about 22 percent from 1980 levels. The EC has recently regained its former production and export levels, due mostly to increased subsidies to dairy processors in those countries. Still, 3 out of every 4 pounds of

Table 1—U.S. Casein and Casein Mixture Use, 1980

Product	Estimated Total Pounds Used	Percent of Pounds Used in Industry	Cumulative Percentage of Industry Total	Percent of Total Pounds Imported	Cumulative Percentage of Total Imports
INDUSTRIAL:					
Glues and Adhesives	8,056,226	48	48	5	88
Paper Products	7,709,693	46	94	5	93
All Others	882,552	6	100	1	94
All Industrial Products	16,648,471	100	100	11	94
Increase in Inventory	747,630	—	—	1	95
WAREHOUSES, INGREDIENT					
Increase in Inventory	8,150,592	—	—	4	99
EXPORTS	963,420	—	—	1	100

Source: USDA, Casein and Lactalbumin Imports, An Economic and Policy Perspective, AGESS 810520.

Product Uses of U.S. Imports of Casein, 1980

casein imported by the United States in 1980 originated in countries outside the EC. For the most part these countries were New Zealand and Australia, two countries which are able to produce milk much cheaper than in the United States, the USDA report found. These lower costs result primarily because of their lower feeding costs due to year-round grazing. One fourth of the imports, primarily from the EC, did not benefit from such an advantage but were heavily subsidized in 1980.

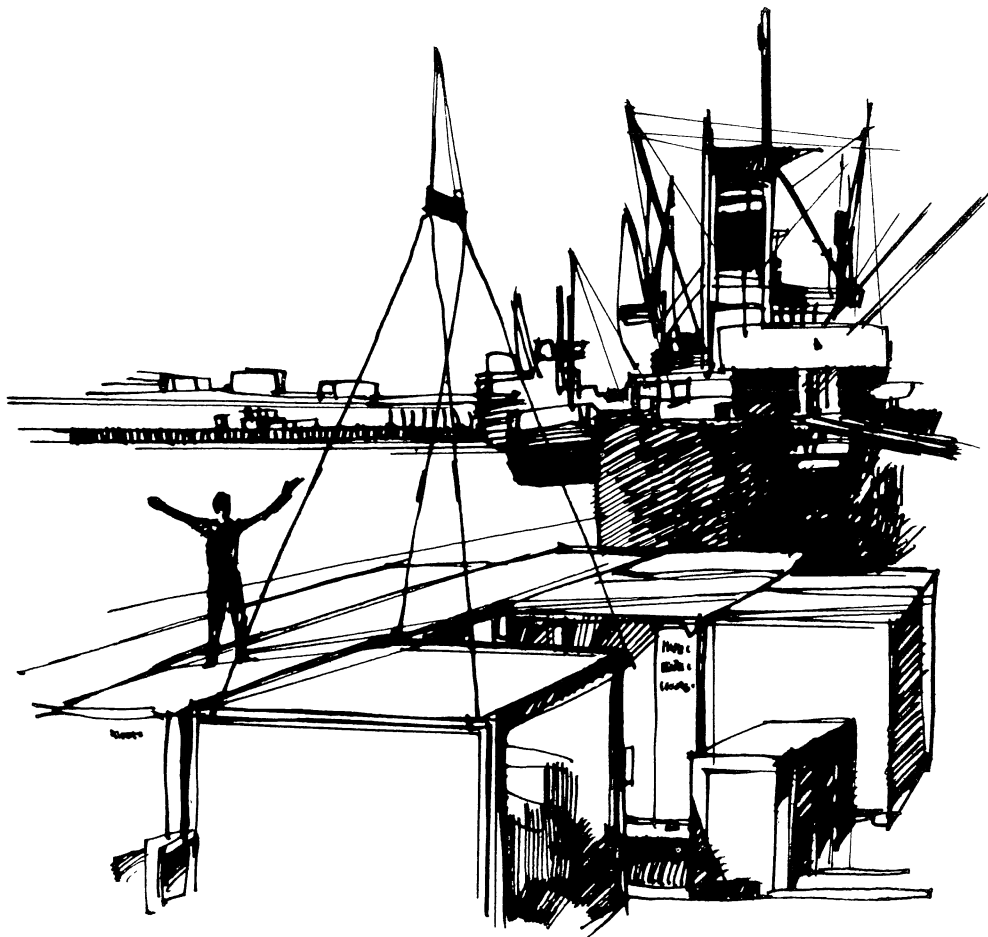
The Casein Question

Because domestic skim milk solids were once used in many current casein-based food products, imported casein is viewed by many as an important depressant on the U.S. commercial demand for skim milk solids. Some dairy groups have seen the reduction in demand as a major factor forcing processors to dry their skim milk and sell it as NDM to the Government.

There is also concern on the part of producers that the natural cheese market is being threatened by imitation cheese sales. In light of the Government's recent record-high levels of dairy product holdings, the question of casein's role in the Government's dairy product removals and holdings becomes particularly relevant.

In response to these concerns, USDA launched a study which found that little, if any, natural cheese is apparently displaced by casein imports, but that more domestically produced skim milk solids would have been consumed if casein imports had not been allowed in 1980. This estimated increase in demand for skim milk solids would have lessened the Government's NDM purchases by about 333 million pounds, saving about \$300 million from the dairy program outlays of \$1.3 billion in 1980.

However, the study also noted that a total elimination of imports is not possible under current international trade agreements. Under the most stringent policy measures and with the 1979-80 casein import level as a representative base for adjusting import levels in the future, the report estimated that Government purchases of NDM would have been reduced by only about \$10 million in 1980.



Policy Options

Existing legislation binds the Secretary of Agriculture to recommend restricting imports of any commodity that materially interfere with the operation of a domestic price-support program. Except in the case of emergencies, the International Trade Commission (ITC) is charged with the responsibility of determining the relationship between import levels of a commodity and interference with the operation of a domestic price-support program before restrictions, if any, can be put in place. Only such an ITC investigation is recognized by our trading partners as justification to impose trade restrictions, which could include a quota restricting imports to as little as 50 percent of representative levels or an ad valorem tariff of up to 50 percent on imported casein. A request to conduct an ITC investigation on casein imports was made by the President on August 10, 1981. Although final determination rests with the President, the ITC commissioners on January 19, 1982, concluded that there did not appear to be sufficient interference to warrant placing import restrictions on casein.

Other complicating issues surround the casein import question. For example, many industry and Government observers of the

casein issue are concerned that a U.S. casein import restriction could be viewed by our trading partners as a unilateral action in revoking trade concessions given to them in prior trade negotiations. Such action could put other trade agreements in jeopardy. There could be retaliation in the form of restrictions on commodities that we export.

Effects of Trade Restriction on Present Domestic Casein Users

In addition to the effects of trade restrictions on the dairy price-support program and casein exporting countries, there would be impacts on food manufacturers using casein and consumers of casein-based food products. A restriction of any type on imports—be it quota or tariff—would cause the price manufacturers pay for casein to rise, causing them to look for substitutes.

With a 50 percent quota, sufficient stocks of casein would still be available for most food processors, although at higher prices, according to the USDA casein report. Direct ingredient cost increases for food products would have risen by \$96 million or more in 1980.

These higher prices would more than double ingredient costs from 1980 price levels. These higher prices would also pro-

mote significant substitution of soybean protein and alternative protein substances for casein where possible, primarily in present nonfood applications of casein. Most food product manufacturers would still find casein a cheaper substitute than domestically produced skim milk solids.

In addition, cost increases for food products made from livestock that were fed casein-based feeds, that is, veal, and for those nonfood products still using casein, that is, certain glues, would raise the total cost of restricting casein imports to an estimated \$115 million. Food manufacturers and casein ingredient processors would likely discontinue production of some products because of expected declining demand caused by the hike in casein prices or lack of capital needed to change their manufacturing processes to use alternative ingredients instead of casein.

Consumers of casein would pay higher prices for casein-based products as ingredient costs rise. Some products could decline in quality as manufacturers substitute lower priced, inferior protein ingredients. Given time, technology could alter these factors.

If a tariff of 50 percent had been imposed on 1980 casein imports, the price of casein would have increased from \$1.20 to \$1.60 per pound. This price increase would have caused substitution of soy proteins and synthetics where possible, but no increased use of NDM or other domestically produced skim milk solids would have resulted. The USDA report concluded that with a 50-percent tariff, consumers would have experienced higher prices for casein-based products (reflecting manufacturers' higher ingredient costs), but the Government would not have reduced dairy program outlays. ■

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U.S. Aquaculture as a Food Source: Its Status and Potential

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Aquaculture—"fish farming" is a common example—fueled by rising fish and seafood prices and limited worldwide production capacity, may become a more important U.S. food source in coming years.

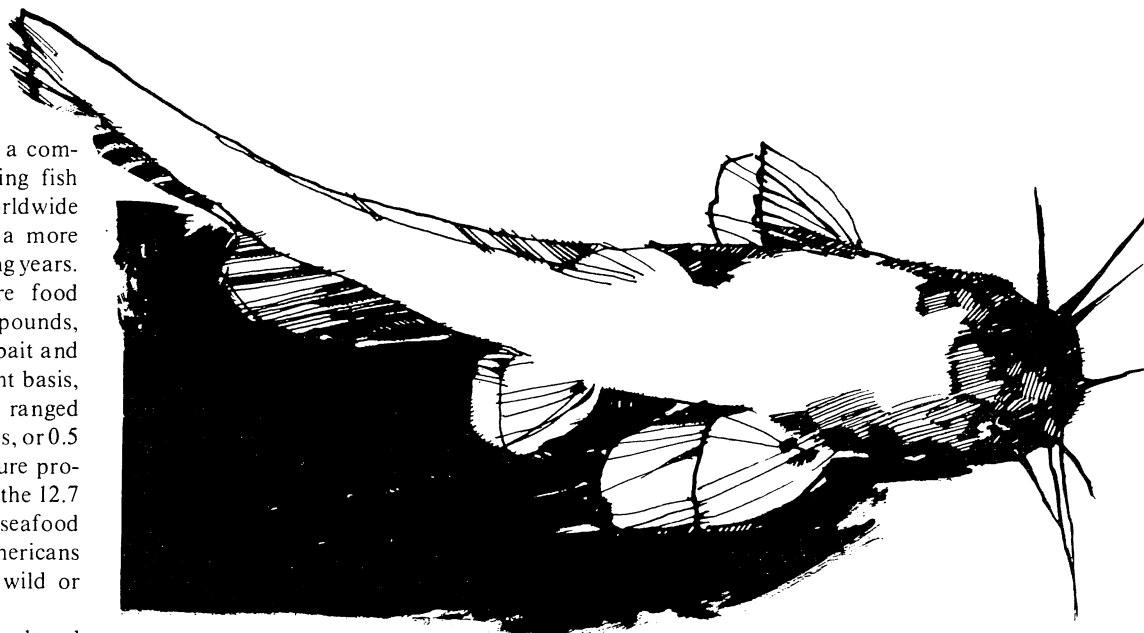
In 1980, total U.S. aquaculture food production exceeded 200 million pounds, not including 30 million pounds of bait and ornamental fish. On a dressed weight basis, U.S. consumption of cultured fish ranged from about 120 to 140 million pounds, or 0.5 to 0.6 pounds per capita. Aquaculture production comprised 4 to 5 percent of the 12.7 pounds per person of fish and seafood (excluding game fish) eaten by Americans that year. The rest was harvested wild or imported.

Worldwide, the Food and Agricultural Organization of the United Nations (FAO) estimated aquaculture output at more than 6 million metric tons in 1975, compared with 60 million tons harvested wild. Asia, with an ancient tradition of aquaculture, accounted for 5 million metric tons—China, the world's largest aquaculture producer, at about 2 1/2 million metric tons, depends on aquaculture

for about 25 percent of its fish supply; the worldwide average is 10 percent.

Aquaculture goes far beyond fish farming. It's defined as the controlled cultivation of animals and plants, including finfish, crustaceans, mollusks, seaweeds, and vegetables. In the U.S., aquaculture primarily produces

fish for human consumption, but it also provides stock for commercial and sport fisheries and raises bait fish and high-valued ornamental fish. The 1980 U.S. aquaculture harvest was valued at around \$225 million. Included in this harvest were several major species:



U.S. Production and Consumption of Cultured Foodfish, 1980

Species	Production ¹		Consumption ²		Consumption per capita	Value ⁴
	Reported	Estimated ³	Reported	Estimated ³		
	(million pounds)				(pounds)	(million dollars)
Catfish	76.7	80-90	46.0	48-54	.20-.24	\$53.6
Trout	48.0	55-60	36.0	41.3-48	.16-.21	37.5
Crawfish	27.5	30	4.1	4.5	.02	23.5
Oysters	23.0	23.0	23.0	23.0	.10	37.1
Salmon	7.6	10	5.7	7.5	.03	3.4
Clams	3.9	3.9	3.9	3.9	.02	10.4
Shrimp	0.3	0.3	0.3	0.3	*	1.2
Other	—	0.5-1.5	—	0.3-0.9	*	0.9
TOTAL	187.0	202.7-218.7	119.0	128.8-142.1	.53-.63	167.6

¹Round (live) weight except for oysters and clams (meat weight basis).

²Dressed (edible) weight.

³Data estimated to account for production in nonsurveyed States or of other species not specifically listed.

⁴Value of sales to producers; best estimate used where reported data unavailable.

*Less than 0.005 pounds.

Catfish. Catfish aquaculture has been centered in the South Central States since it began in the early 1960s. Strong regional demand, suitable environmental factors (climate, water supply, topography, soil), and industrious labor force, enabled producers and processors to overcome large risks and make catfish the largest U.S. aquaculture industry.

Catfish farmers in the 11 surveyed States accounted for at least 90 percent of production and sold nearly 77 million pounds of foodsize fish during 1980, of which Mississippi (74 percent of the total), Alabama (11 percent), and Arkansas (11 percent) produced 73 million.

As of July 1, 1981, 1,069 producers in 15 surveyed States had nearly 69,000 pond acres in commercial catfish production, in contrast with only 2,400 acres in 1963. Over the past several years, farm prices for catfish have generally been significantly above production costs, boosting the rapid growth in the industry.

During 1980, the farm price for catfish averaged 70 cents per pound, compared with production costs of about 50 cents per pound for a large, established producer in the Mississippi Delta. Feed (with corn, soybean meal, and fish meal as primary ingredients) and fingerlings account for 75 to 80 percent of operating expenses in catfish production. Catfish farmers market over four-fifths of their production to processors; a tenth is sold to commercial recreational pond operators and live haulers who buy live fish at the farm for resale; and about 7 percent is sold directly to consumers and retailers.

Aggressive marketing has more than tripled the processors' sales from 10.3 million pounds dressed weight in 1975 to 35.1 million pounds in 1981. Demand is spreading so that farm-raised catfish are now sold everywhere but Northeast and Northwest States—areas where ocean fish are preferred.

Processors marketed 60 percent of the catfish fresh (packed in ice) during 1975-80, but increased sales of frozen fish cut that

portion to about 55 percent last year. Increased sales of frozen fish which are pre-breaded and portion-controlled to hotels, restaurants, and institutions have been largely responsible for increased sales. Processors sell about one-third of their output to each of three outlets: catfish specialty restaurants, food service firms, and retail grocers.

During 1975-79, processed production of catfish harvested wild averaged 4.1 million pounds. (Processors of farm-raised catfish do not handle wild catfish.) Throughout its evolution, the U.S. catfish industry has encountered competition from imports, almost all from Brazil, which peaked at 18.4 million pounds in 1978. Last year, imports probably reached only 10 million pounds. Rising consumer acceptance of farm-raised catfish—despite higher prices—and falling Brazilian production have cut into imports. (Brazilian catfish are harvested wild and marketed as frozen steaks.)

Trout. Trout culture has the longest history among U.S. aquaculture crops, primarily due to its popularity as a sportfish. The need to replenish stocks depleted by fishing and other human activities has led government agencies to cultivate trout. Commercial attempts at trout aquaculture go back half a century.

During 1980, nearly 200 commercial trout farmers harvested 48 million pounds of foodsize trout valued at \$37.4 million. Idaho trout producers, who accounted for 90 percent of this harvest, are typically vertically integrated—in addition to the production facilities they operate hatcheries, feed mills, and processing plants. Other trout-producing areas include the Northwest, the Appalachian and Ozark Mountain regions, and Wisconsin.

Idaho owes its dominance of the trout industry to the Southern Idaho Aquifer, which provides ideal water for trout propagation. Trout in that State are almost exclusively reared in concrete raceways, where flowing water removes wastes and replenishes oxygen, allowing intensive trout production.

Virtually all freshwater trout marketed in the U.S. come from aquaculture. Trout producers in surveyed States (Alabama, Arkansas, California, Georgia, Idaho,

U.S. Annual Per Capita Consumption of Commercial Fish and Shellfish¹

Year	Fresh and frozen	Canned	Cured	Total
		(Pounds)		
1960	5.7	4.0	0.6	10.3
1965	6.0	4.3	0.5	10.8
1970	6.9	4.5	0.4	11.8
1971	6.7	4.3	0.5	11.5
1972	7.1	4.9	0.5	12.5
1973	7.4	5.0	0.4	12.8
1974	6.9	4.7	0.5	12.1
1975	7.5	4.3	0.4	12.2
1976	8.2	4.2	0.5	12.9
1977	7.7	4.6	0.4	12.7
1978	8.1	5.0	0.3	13.4
1979	7.8	4.8	0.4	13.0
1980	7.9	4.5	0.3	12.7

¹Edible weight; excludes game fish consumption.

Missouri, Pennsylvania, Washington, and Wisconsin) sold nearly 90 percent of their output to processors. Almost all trout processing occurred in Idaho, as fish produced in other States are usually marketed to fee fish-out operations, live haulers, and consumers. Idaho processors market most of their output as frozen to allow easier and less costly shipment to distant markets.

The processing segment of the farm-raised trout industry is traditionally production oriented, so aggressive marketing hasn't been pursued to expand demand. As a result, low farm prices in recent years gave little incentive to expand production. The price received by Idaho producers during the year ending September 1, 1981 averaged 63 cents a pound, compared with an average 65 cents during the first seven months of 1980. Also, the number of commercial operations in Idaho declined from 31 on August 1, 1980 to 18 on September 1, 1981.

Crawfish. Culture of crawfish occurs mainly in Louisiana and Texas. It began around 1950. Crawfish are a regional and a European delicacy as well as a high-valued bait. The wild harvest, primarily from the Atchafalaya Basin in Louisiana, varies greatly from year to year due to water level fluctuations. Crawfish culture exploits rising demand and dampens effects of yearly and seasonal variations in supply of the wild harvest.

All totalled, there are probably between 60,000 and 70,000 pond acres in crawfish production in Louisiana and Texas. This includes wooded and open-water ponds, as well as land used for rice and crawfish production—either jointly or in rotation.

Although no precise data are available, crawfish farmers in Louisiana and Texas produced an estimated 31 to 34 million pounds last season. Because of an almost total failure of the wild crawfish harvest in the Atchafalaya basin last season, Louisiana producers, who account for 90 percent of the output, received record prices, an average of about 90 to 95 cents per pound.

An advantage to crawfish farmers is the relatively low overhead involved with production. Crawfish generally propagate themselves after the first year, which eliminates the need for costly hatchery operations. Also, in

contrast with catfish and trout, crawfish do not require prepared feeds, and can live on pond vegetation, pasture grass, or rice.

Crawfish are gaining acceptance outside the South, with strong markets for processed crawfish tails in New York, Chicago, and Cleveland. Producers most often market crawfish live directly to restaurants and grocers, who then sell them whole, cooked and spiced.

Although most sales are live, the share of frozen sales is slowly gaining as processing technology improves. Processors cook the fish, pick the tailmeat, and package it for distribution. Treatment with citric acid now prevents fat in the tail from turning purple during freezing—an effect that detracted from product appearance, but not taste. A new mechanical tail picker should improve productivity, once marketing problems are resolved: meat is blanched, not cooked, so it has a slightly different appearance that long-time consumers notice.

Despite such obstacles, price incentive is high: \$10 or more a pound for peeled and cooked tailmeat isn't uncommon. In Louisiana last season, whole crawfish, spiced and cooked, typically sold for about \$2 a pound.

Oysters. Oyster aquaculture occurs through manipulation of the shellfish or its environment to increase production. This includes such bottom-culture practices as scattering cleaned oyster shells on the ocean floor for spat (young oysters) to settle on, culturing spat in hatcheries, collecting and moving spat to grow-out areas, providing bottom-culture environments with silt and predator controls, and off-bottom culture techniques such as growing oysters on strings suspended from rafts, which allows much denser production.

Intensively managed bottom culture can yield about 4,500 pounds per acre, compared with 9 to 90 pounds in public beds with little or no management. In 1980, oyster aquaculture accounted for nearly half of the 49.1 million pounds of U.S. oyster harvest. Most oysters harvested on the West Coast, in Louisiana, and in New York come from private beds.

While cultured oysters taste the same as those harvested from public beds, they enjoy an advantage when sold for consumption raw on the halfshell. Regularly shaped oysters, with shells free of fouling organisms,

are more desirable. While such oysters are rare in nature, this uniformity can be readily produced in aquaculture.

Clams. Aquaculture production of hard clams totaled 3.9 million pounds during 1980, or about 30 percent of total U.S. commercial landings. Clam aquaculture has been encouraged by a chronic shortage of high-valued cherrystone and little neck clams as output declined in traditional production areas. In addition, clams can be grown in virtually any marine bottom they can burrow into, as well as at relatively high densities.

Prices nearly doubled between 1976 and 1980. Cultured clams, generally higher-valued varieties, are usually sold in the shell for consumption raw, steamed, or as specialty items such as clam casino or deviled clams.

Salmon. Aquaculture by Federal and State hatcheries of Pacific salmon supports the second most valuable U.S. commercial fishing industry, as well as an important sport fishery. The U.S. salmon industry harvested 614 million pounds of fish worth \$353 million (ex-vessel value) during 1980. Public hatcheries provide about 40 percent of all chinook salmon, and 46 percent of coho—about a tenth of the U.S. salmon supply. During 1980, private aquaculture harvested 7.6 million pounds of salmon worth \$3.4 million.

Commercial salmon aquaculture is done by ocean ranching and net-pen rearing. With ocean ranching, firms raise salmon to migratory size in freshwater hatcheries, then release them into a river or estuary. These fish swim to the ocean, graze on natural food for 2 to 5 years, then return to their point of release where they are harvested and processed for market. Commercial net-pen rearing cultures young salmon in freshwater hatcheries, then transfers them to floating seawater pens for continued intensive rearing using formulated feed. The fish are harvested and marketed after 9 to 12 months when their weight reaches 1 to 2 pounds.

Marketing varies considerably according to culture method. Salmon produced through ocean ranching—usually weighing 10 to 40 pounds—are marketed similarly to the wild catch. Most are canned, while some are sold fresh as steaks or smoked. In contrast, the much smaller net-pen reared

salmon are sold as fresh or frozen pan-sized fish, competing with rainbow trout.

Consumption

Consumer demand for aquaculture products is growing. Annual per capita consumption of fish and seafood increased from 10.3 pounds in 1960 to 12.7 pounds in 1980. This trend primarily reflects growing sales of food away from home and higher disposable consumer income. About two-thirds of consumer expenditures for fish and seafood occur at restaurants and institutions. In 1980, 62 percent of per capita consumption of fish and seafood was fresh and frozen, 35 percent was canned, and 3 percent was cured.

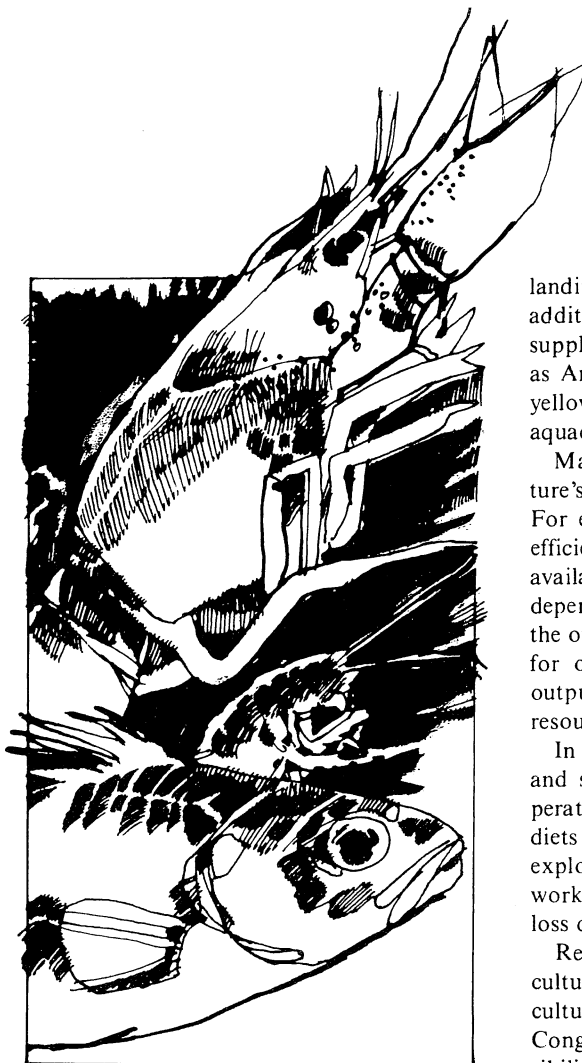
Future of U.S. Aquaculture

This increased consumer demand for fish and seafood comes when many U.S. commercial fisheries—as well as those throughout the world—are at or near their maximum sustainable yields. Future rises in fish and seafood supplies will likely have to come from larger imports, greater use of other species, or through aquaculture. Aquaculture has good potential to meet any increased fish and seafood demand by Americans, as evidenced by the successes of commercial oyster aquaculture, and farm-raised catfish and trout industries.

Two economic trends have strong implications for the future of aquaculture. The retail price index of fish and seafood increased 180 percent from 1970 to 1980, compared with rises of 112 percent for red meats and 76 percent for poultry. The second trend is less positive: per capita fish consumption peaked at 13.4 pounds in 1978, falling to 12.7 pounds in 1980. It appears to have stabilized at around 13 pounds.

If Americans' per person demand for fish and seafood has peaked, this could tend to limit future demand for cultured fish. However, even with a steady per capita consumption, population increases would require greater production—a need which seems to translate into greater aquaculture production. Moreover, a change in consumer preference for cultured fish over wild and imported fish or red meats and poultry would also stimulate production.

The significantly larger increases in retail prices of fish and seafood compared with red



meats and poultry may have contributed to leveling off of per capita consumption. But such price rises also suggest that fish and seafood are luxury items for which people are willing to pay premium prices. This offers economic incentive to aquaculture producers to expand production.

A final implication of the price and consumption patterns is that fish consumption is related to general economic conditions. The sluggish economy and higher gasoline prices in recent years seem to have dampened away-from-home consumption where most fish is eaten, perhaps contributing to the stabilizing of per capita consumption. If so, then favorable economic conditions in the future might increase demand for cultured fish.

Meanwhile, other cultured species may be introduced in the United States soon. Commercial shrimp and freshwater prawn aquaculture in the United States is close to becoming a reality: U.S. firms are already producing such crops in Central and South America. Shrimp is America's most valuable fish and seafood product, with commercial

landings worth \$403 million in 1980. In addition, there is strong demand and limited supply for several finfish and shellfish—such as American lobster, abalone, mussels, and yellow perch—which could create new aquaculture industries.

Many obstacles remain before aquaculture's potential as a food source is realized. For example, technology for economically efficient production of catfish and trout is available, but future output gains will depend on wider consumer acceptance. On the other hand, markets are well-established for oysters, hard clams, and salmon, but output is limited by competing uses of water resources and environmental regulations.

In addition, producers lack the technical and scientific knowledge about water temperature and quality, seed stock availability, diets and nutrition, and other factors to exploit aquaculture's potential. Also, more work needs to be done in preventing death loss due to disease and parasites.

Recognizing the potential of U.S. aquaculture, Congress passed the National Aquaculture Act in September 1980. Although Congress declared that the principal responsibility for aquacultural development rests with the private sector, the Act mandated the establishment and implementation of a national aquaculture development plan by U.S. agencies (primarily the Departments of Agriculture, Commerce, and Interior). It also encouraged government and private sector activities and programs relating to aquaculture development. ■

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The Electronic Scanner Checkout and Item Price Removal

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Item pricing—labeling prices on each supermarket item—is slowly losing ground to coded symbols that can be read by electronic scanners. Today, more than a fifth of the Nation's supermarkets use scanner systems. While the new machines can significantly reduce costs to the retailers and provide marketing advantages, supermarkets are encountering some apprehension among consumers because dropping item pricing removes one source of price information previously available.

Generally, stores discontinue marking individual items when scanners are installed, relying instead on shelf tags to inform customers of prices. Over 1,000 stores, including independents as well as chains, have stopped item pricing.

Supermarkets that are installing Electronic Scanner Checkout (ESC) systems are taking pains to reassure customers by making sure that item price information on shelf tags and on cash register tapes is identical, accurate, and easy to read. Despite some consumer resistance, many chains are finding more than enough incentive to install ESC systems. Industry and USDA studies estimate that dollar savings from eliminating price marking range from 0.2 percent to 0.5 percent of store sales.

Installation of ESC systems eliminates the need for supermarket clerks to affix prices to most individual items and for cashiers to read the price labels. Instead, the laser beam scanner reads the Universal Pricing Code (UPC)—the pattern of bars printed on the package by the manufacturer—and identifies the item, the manufacturer, and the package size. The UPC code for each item is fed into the retailer's computer, which is programed with the price. This information is then printed on the receipt tape and flashed on a display unit for the consumer to see.

Installation of ESC systems in the United States began in 1974. Although adoption was slow at first due to customer resistance and labor unions' fear of job loss, these systems are now being installed at a rate of more than 200 stores per month. In 1977, 205 ESC systems were installed nationwide. Today, more than 5,000 of the Nation's 25,000 supermarkets have the systems and another 3,000 are expected to install them



this year, according to the Food Marketing Institute, a trade association of food retailers.

Benefits of Scanning

Besides reducing labor requirements and speeding checkout, scanners provide abundant valuable information to retailers, manufacturers, and suppliers. Most firms, however, are just beginning to learn how to use this information.

Scanners provide data which are more accurate, timely, and detailed than that generated by the previous cash register system. They provide data on revenue, item movement, taxes, and cash receipts, as well as information on food stamps, coupons, and personal check usage.

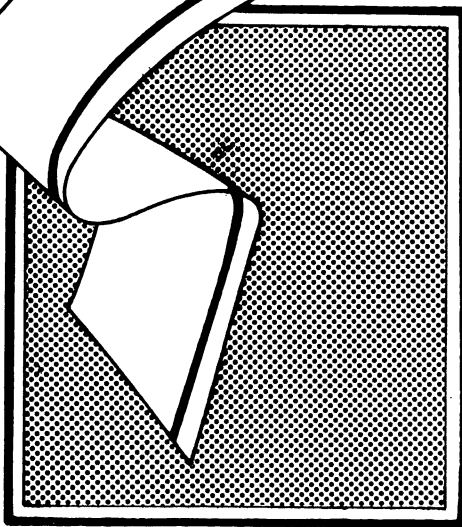
Scanning systems record each item purchased and the time of purchase, enabling retailers to analyze purchasing trends and to schedule workers based on the number of items purchased per time interval. Data on each customer transaction can supply store management with detailed analysis of each checker's performance to

determine who needs training or assistance.

This item movement data can help stores optimize shelf stocking. By comparing item velocity—number of items sold per time unit—to pack size, retailers can improve shelf stocking plans which reduce out-of-stock situations and improve item turnover. Scanning systems can also track inventory and activate automatic reordering of items when minimum inventory levels are reached. This can help retailers reduce the quantity of inventory stored in the back room.

Another use is to help assess the effectiveness of merchandising programs. By enabling the retailer to almost instantly evaluate the impact of advertising and in-store merchandising programs, scanners can help the retailer develop more effective trade and consumer promotions tailored specifically for that store.

Retailers aren't the only beneficiaries of scanner data. Manufacturers and suppliers are beginning to use scanner data obtained from retailers or outside research firms to determine market shares, to evaluate the effectiveness of promotions and advertising,



and to assess the impact on sales due to changes in pricing, packaging, flavoring, coloring, sizing, and other product characteristics.

Item Pricing

Once retailers adopt scanning, they must decide whether to eliminate item pricing. ESC stores have experimented with eliminating item pricing since 1974. Labor unions—which feared loss of jobs—reacted sharply to attempts to eliminate item prices. A 1976 Michigan University study supported by the food retailing industry found, however, that consumers liked the faster checkout systems, but were less aware of prices than when scanners aren't used. When some States began considering legislation to require price marking, most retailers and trade associations agreed to continue to item mark.

Attitudes seem to have changed. Consumers are more familiar with the scanner; labor agreements have generally reassured unions about layoffs due to scanners; and retailers are renewing efforts to entice consumers to accept item price removal. At least 1,200 stores—including hundreds of independents, and small chains, and major chains—have dropped item pricing, according to a USDA estimate based on trade press reports and interviews with industry experts.

Success with eliminating item prices has been mixed so far. Some firms returned to item pricing when they encountered stronger

than expected customer resistance. Other firms found that item price removal worked well in some stores, but not in others. Most chains are eliminating item pricing on a store-by-store or city-by-city basis, depending on reaction of customers and of other competing retailers. For example, some supermarket firms have gained additional business by advertising that they had retained item prices while their competition had dropped them. In some locations, these tactics forced retailers to reinstate item prices.

Consumers may accept the idea of item price removal more readily in stores where scanners have been installed for some time, and where shelf tags are kept current, accurate, and easy to read and understand.

For example, in 1980, Publix, a large Florida chain, began item price removal in all of its stores. The program wasn't well accepted, even though shelf tags were used and customers were supplied with grease pencils to mark prices on items if they desired. Public officials indicated they did a poor job of keeping shelf price tags accurate and current. Consumer group opposition and introduction of legislation to make item pricing mandatory may also have influenced the firm's decision to return to item pricing. However, the firm still has plans to eventually remove the prices.

In contrast, a study of Los Angeles grocery stores using ESC systems and item price removal since September 1980 found a very low complaint level, about 20 complaints per million customers in those stores.

Giant Food, the largest chain in the Baltimore-Washington area, was the Nation's first food chain to equip all stores with scanners. Last April, Giant dropped item pricing with little consumer opposition, perhaps largely due to its careful maintenance of accurate, highly visible shelf tags, and its policy of giving free any item in which the shelf price is lower than the scanned price.

Pros and Cons of Item Price Removal

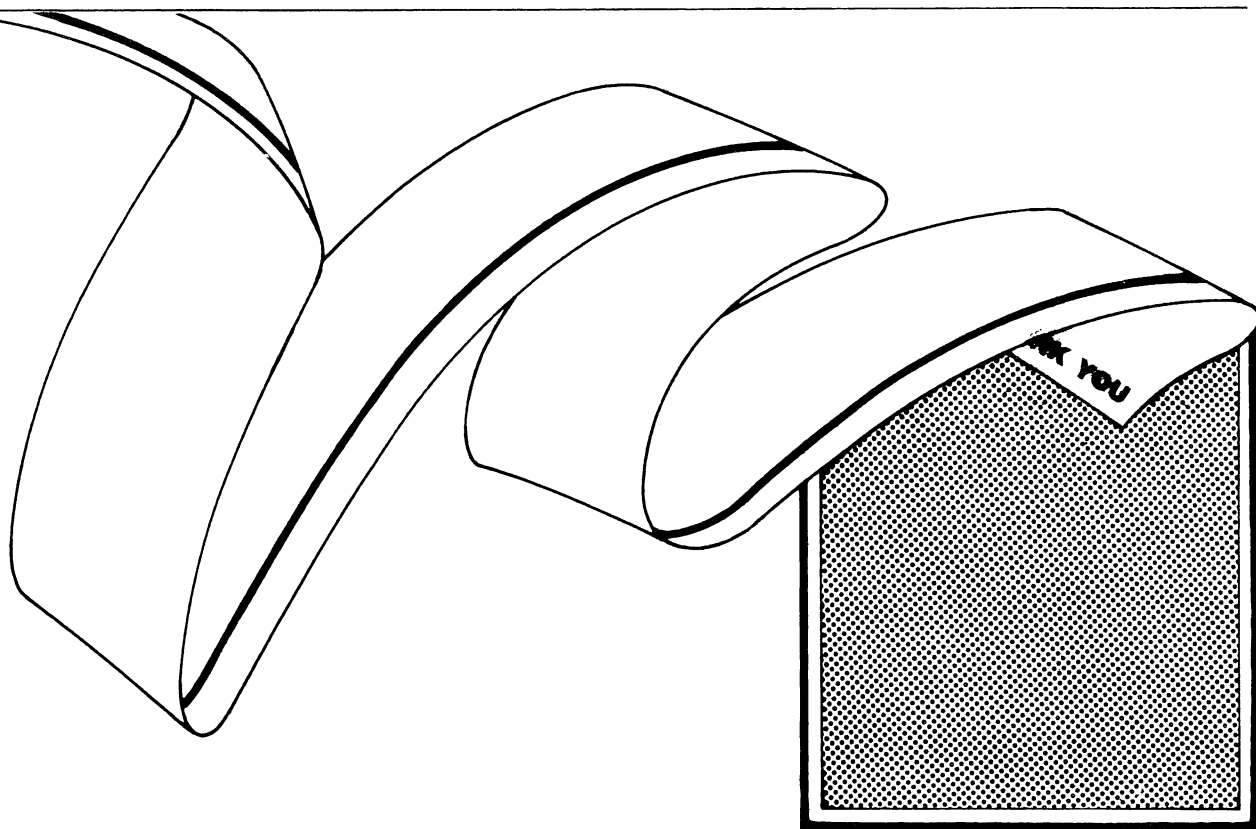
Item price removal reduces operating expenses significantly for the retailer. Industry estimates put savings at 0.2 to 0.5 percent of store sales, and a study conducted for USDA estimated 0.3 percent savings. The USDA study used time and motion

studies to measure the labor requirements in a typical supermarket for alternative methods of price marking individual items. This labor would be foregone by eliminating item pricing, thus producing a savings in labor costs.

In a Giant Food study, two of its Maryland supermarkets with ESC systems were analyzed—one with and one without prices on individual items. Giant concluded that savings by eliminating item pricing amounted to 0.45 percent of total store sales. However, only half of those savings were attributed to original price marking, while the rest came from not having to re-mark prices on items already on the shelf when price changes occurred. The price change is just entered into the computer's memory. In stores using item price marking, new price tags must be placed over old labels for the items already on the shelf to make them consistent with shelf price labels. Placing a new price tag over the old is a potential source of consumer complaints about price increases.

Depending on pricing strategies and competitive pressures in individual markets, some of these savings could be passed to consumers. The Public Interest Economic Center, a research organization, found in a 1975 study that item price removal could save consumers 0.1 to 0.2 percent of average annual food expenditures. Another benefit to shoppers is that elimination of item pricing gives retailers greater incentive to provide more accurate, up-to-date shelf tags that can be easily read. In stores without item pricing, customers are quick to notice and complain when shelf tags are not in place, consistent with register tapes and advertised specials.

Although consumers like the more detailed register tape offered by ESC systems, many are concerned about the loss of individual pricing information which could make them less alert to price trends, price levels, and economic value choices. With individual item prices removed, it is more difficult to make price comparisons at different points within the store (canned peas versus frozen peas, for example). Shoppers also find it harder to refer to prices on previously purchased items in deciding what to buy in the future unless they keep their register tapes.



Despite time saved in checking out through scanning systems, many consumers say actual shopping time is increased because it takes longer to match products to shelf prices and to compare prices at different points in the store. If customers prefer to mark prices on items using grease pencils, even more time is required.

Legislation

As scanner systems became more widespread, local, State, and Federal governments considered legislation to require individual price marking. So far, six States have passed mandatory item pricing legislation: Connecticut, Michigan, Minnesota, New York, Massachusetts, and California. Most States exempt items which never carried an item price such as unpackaged produce, cigarettes, and candy bars.

Other exemptions include small packages under three ounces and prices under thirty cents. Michigan, Minnesota, New York, and California allow retailers to choose not to individually price mark an additional specified number of products. Michigan, Minnesota, and New York also exempt small grocery and specialty stores. Although offenders in many instances are fined, some laws give the offender time to comply. Enforcement is usually done by State Department of Agriculture agents or the State attorney general's office.

Conclusion

The debate over eliminating item pricing isn't whether item price information should be provided, but how it should be provided—on the product or simply on the shelf and on cash register receipts. Consumer acceptance of different forms of pricing varies widely. Retailers have found that customer support is required if item pricing is to be dropped from products.

Consumer education efforts to show customers how to effectively use pricing information provided by ESC system stores may build consumer trust. Stores already using scanners must continually monitor the shelf tags to ensure that they're accurate, readable, and that they provide readily accessible price information for their customers.

By eliminating item price marking, retailers can reduce labor costs by about 0.3 percent of sales. For a supermarket with \$6 million in yearly sales, this savings would amount to about \$18,000 per year. With over 8,000 supermarkets expected to have scanning systems by the end of 1982, about a third of the Nation's supermarkets will have both the incentive and capacity to drop individual item pricing.

However, some consumers and consumer organizations will likely continue seeking legislation requiring item price marking. State legislators must determine whether the value of mandatory item pricing outweighs the cost savings of eliminating it. ■

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Expenditures on Nutritious Foods

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A 1977 U.S. Senate report found American consumers tended to be confused about nutritional needs and took unnecessary health risks because of the foods they chose to eat. Health professionals fear that this behavior is more common among certain age groups. If so, nutrition educators can target their efforts to those groups that can gain the largest benefits.

In 1979-80, a USDA economist and two University of California (UC) economists completed a study that helped to confirm the nutritionists' suspicions. The study analyzed food purchases of households with different compositions to determine what foods each type of household would buy as their incomes increased.

This study found that if a childless household with the wife over 40 years of age received an increase in income, a greater proportion of relatively more nutritious foods would be purchased for at-home consumption. Households where the average age of the children was over 17 years would spend the greatest portion of an increased income on relatively less nutritious foods. In fact, as the average age of children in households increases, a greater portion of an income increase is spent on foods that make up less nutritious components of the diet.

The implications are that older people without children would spend additional income on nutritious foods and thus need less nutrition education, whereas, relatively less nutritious foods have more appeal to teenagers and young adults who may benefit from increased nutrition education efforts.

The researchers reached these conclusions by classifying households according to seven life cycle stages (see table 1). They classified different households at various stages of life, not the same households moving through the different stages. The second year of the 1972-73 Consumer Expenditure Survey, the most recent in this series, conducted by the Bureau of Labor Statistics served as the data source for income and expenditures.

Respondents to the survey answered questions about their before-tax income and food-at-home expenditures on specific food items. The researchers divided at-home food expenditures into three groups: all food; relatively more nutritious foods; and relatively less nutritious foods. This classifica-



tion was based upon an analysis of the nutritive composition of the food items.

"Nutritious" food had to contain percentages of the 1974 Recommended Daily Allowance (RDA) requirement for four or more nutrients equal to or greater than the proportion of the energy (calories) provided by that food, or these foods had to contain certain percentages of the requirements of two or more nutrients in twice the proportion for that food.

This definition of nutritious was the recommended definition from a 1976 survey of a sample of members of the Society for Nutrition Education. In the USDA-UC study, the eight key nutrients used for food selection were folacin, vitamin B-6, pantothenic acid, magnesium, vitamin A, calcium, iron, and vitamin E. The presence of these key nutrients in sufficient amounts are indicators of the adequacy of a larger group of essential nutrients. Furthermore, if a person consumes the suggested daily intake of these key nutrients from natural foods and follows a few other dietary suggestions, then,

the diet is considered to be adequate in approximately all essential nutrients.

The income and expenditure data were then adjusted using an adult-equivalent scale, thereby excluding variations in age and sex of household members on food expenditures and income. The adult equivalent scale provides a specification similar to per capita, but accounts for differences in household composition by converting all household members in each life cycle stage into a standard adult male unit. Food expenditure-income relationships were then estimated.

Elasticity Comparisons

In the USDA-UC study, the researchers used a more general mathematical procedure than is normally used to represent food expenditure-income relationships. The estimates of the income elasticity at the average income and expenditure for all seven life cycle stages for all food, and nutritious foods are reported in table 3. Here, income elasticities measure the responsiveness of food-at-home expenditures to increases in income. For all food, the highest income elasticity derived was for stage 4. The implication is that households will spend a greater proportion of an increase in income on all food when there are teenagers in the household.

For relatively more nutritious foods, the income elasticity was highest for stage 6 (no children present and the housewife was over 40 years of age), indicating that older households without children will spend a greater proportion of additional income on relatively more nutritious foods. For foods that are relatively less nutritious, the income elasticity was highest for life cycle stage 5, when the average age of the children is over 17 years. In other words, households having older children and young adults spend, on the average, the greatest proportion of additional income, for relatively less nutritious food.

Generally, as households move from "single persons" to "married with small children" (under 6 years), they spend a greater portion of an increased income on each of the three food expenditure classifications. This increased food expenditure response continues for relatively less nutritious foods throughout child-rearing ages and decreases for older person-households

Table 1. Life Cycle Stages

Life Cycle Stage	Contents
0	all not included in groups 1 through 6, i.e., single men, single women, etc.
1	no children are present and the housewife is 40 years of age or less
2	average age of children is less than 6 years
3	average age of children is between 6 and 12 years
4	average age of children is between 12 and 17 years
5	average age of children is over 17 years
6	no children are present and the housewife is over 40 years of age

when children are gone. However, for all foods and foods that are relatively more nutritious, the food expenditure response is more volatile. When children are between 6 and 12 years, there is a noticeable decline in the income elasticity for these two food classifications. This response rises and reaches a peak when children are in the teenage years, declines again when children are over 17 and increases for older-person households.

Postscript

Since this study was done, information from the USDA Nationwide Food Consumption Survey 1977-78 (NFCS) and an early 1980 ERS Nationwide Consumer Study (ERS-NCS) have supported these conclusions. Young adults and women in particular seem to be at a nutritional risk in both surveys. The NFCS survey data show that young adults, aged 15 to 22 years, now consume more soft drinks than any other age group. Young women, ages 19 to 22, were below their 1980 RDA for the average intake

Table 2. Average Annual Household Income and Food Expenditures At Each Stage of the Life Cycle

Life Cycle Stage	Income	All Food	More Nutritious Food	Less Nutritious Food
			\$	
0	6,603.96	1,207.92	1,037.68	170.24
1	12,610.41	2,025.05	1,740.28	284.77
2	11,369.33	2,885.97	2,478.17	407.80
3	12,901.33	3,743.19	3,187.67	564.52
4	14,002.51	4,009.24	3,511.75	587.49
5	14,716.19	3,461.66	2,958.41	503.25
6	10,551.08	2,570.11	2,203.64	366.47
All	11,316.97	2,772.01	2,372.26	399.75

Source: 1972-73 Consumer Expenditure Survey, U.S. Department of Labor, Bureau of Labor Statistics.

Table 3. Income Elasticities for All Food, Relatively More Nutritious, and Less Nutritious Food

Life cycle stage	All food per adult equivalent	Relatively more nutritious food per adult equivalent	Relatively less nutritious food per adult equivalent
All	.050 ¹	.048	.049
0	-.009	-.011	-.025
1	.005	-.013	.025
2	.063	.058 ²	.071
3	.046	.036	.071
4	.101	.094	.074
5	.083	.077	.077
6	.096	.098	.043

¹Income elasticities measured at the mean value of income and consumption for each of the life stages.

²An income elasticity of .058 indicates that if income for stage 2 households increased by 10 percent, then their expenditures on relatively more nutritious foods per adult equivalent would increase by .58 percent. A negative income elasticity indicates a decrease in expenditures when income is increased.

of 6 nutrients—calcium, iron, magnesium, vitamin A, vitamin B, and thiamin. ■

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Three Kinds of Frankfurters: Retail Demand

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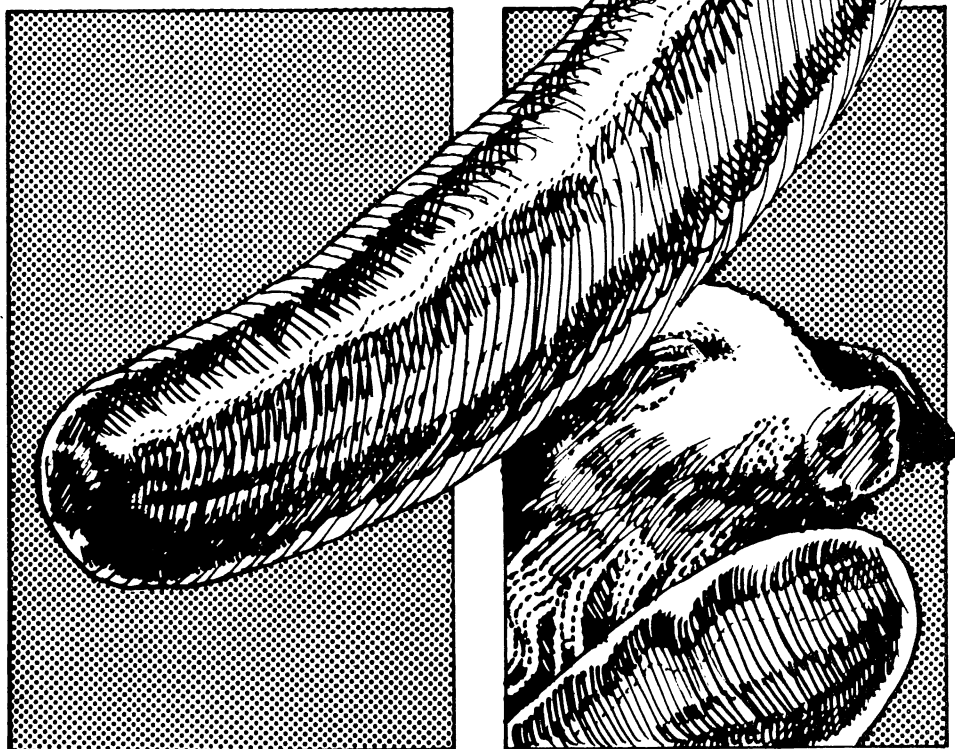
Until recently, only two types of frankfurters were popular with consumers, those made primarily with minced beef and those made with a combination of minced pork and other red meats. But, in the 1970's, several manufacturers introduced poultry franks—frankfurters made from minced turkey and chicken, which seem to have caught on in the retail market.

In fact, poultry franks have increased in popularity from a 5.2-percent share of the market in 1978 to a 10.1-percent share in 1980. The gain was at the expense of beef frankfurters whose market declined from 38.8 to 28.9 percent, while the share for franks made from pork and other red meats increased from 55.9 to 61 percent.

From 1978 to 1980, annual sales of pork-type frankfurters increased from 494 million pounds to 545 million pounds; poultry sales went from 462 million pounds to 904 million pounds; while sales of beef frankfurters slipped from 343 million pounds to 258 million pounds.

Also, over that 3-year period, the average price for beef frankfurters rose 5.8 percent, while the price for those made with pork and other red meats increased 2.5 percent. The price of poultry franks fell 2.2 percent.

The price relationships among the three types of frankfurters significantly affected sales. Consumer income plays a minor role in determining sales because of the small amount, less than 1 percent of disposable income, spent for frankfurters. The weather plays a more important role. As might be



expected, more frankfurters are sold in the summer.

Economists use the concept of demand elasticity to measure how much of a product consumers would likely buy given a change in the price of the product or the price of its substitute, or a change in the consumers' incomes. These elasticities are called the direct price elasticity, the cross-price elastic-

ity, and the income price elasticity, respectively. If the absolute value of a demand elasticity is larger than one, demand is said to be elastic. If the demand is elastic, then total sales of a product may increase when its price declines, and salespersons or producers would be more than compensated for the lower price through increased sales, provided general market conditions stay the same.

A study analyzing bimonthly frankfurter sales and prices between June 1977 and November 1980 indicates that the direct price elasticity for beef frankfurters was -2.3. This meant that a 10-percent increase in the price of this product would, on the average, lead to a 23-percent decrease in sales. The elasticity factor for the poultry type was -1.7 percent which meant that if the price of poultry frankfurters rose by 10 percent, sales would decrease by 17 percent.

For other meat frankfurters, the elasticity rating was -1.0 which meant that a 10-percent increase in price would cause a 10-percent decline in sales.

The relatively large direct price elasticities for beef and poultry frankfurters (-2.3 and -1.7) indicate that consumers are likely to

Table 1. Market Change and Changes in Real Prices of Frankfurters, 1978-80

YEAR	MARKET SHARE			PRICE CHANGE (%)		
	Beef	Poultry	Other Meats	Beef	Poultry	Other Meats
	Percent					
1978	38.9	5.2	55.9	12.6	5.5	12.2
1979	34.6	8.5	55.9	7.1	-2.2	3.3
1980	28.9	10.1	61.0	-2.2	-9.8	-7.9
Average	34.0	8.0	58.0	5.8	-2.2	-2.5

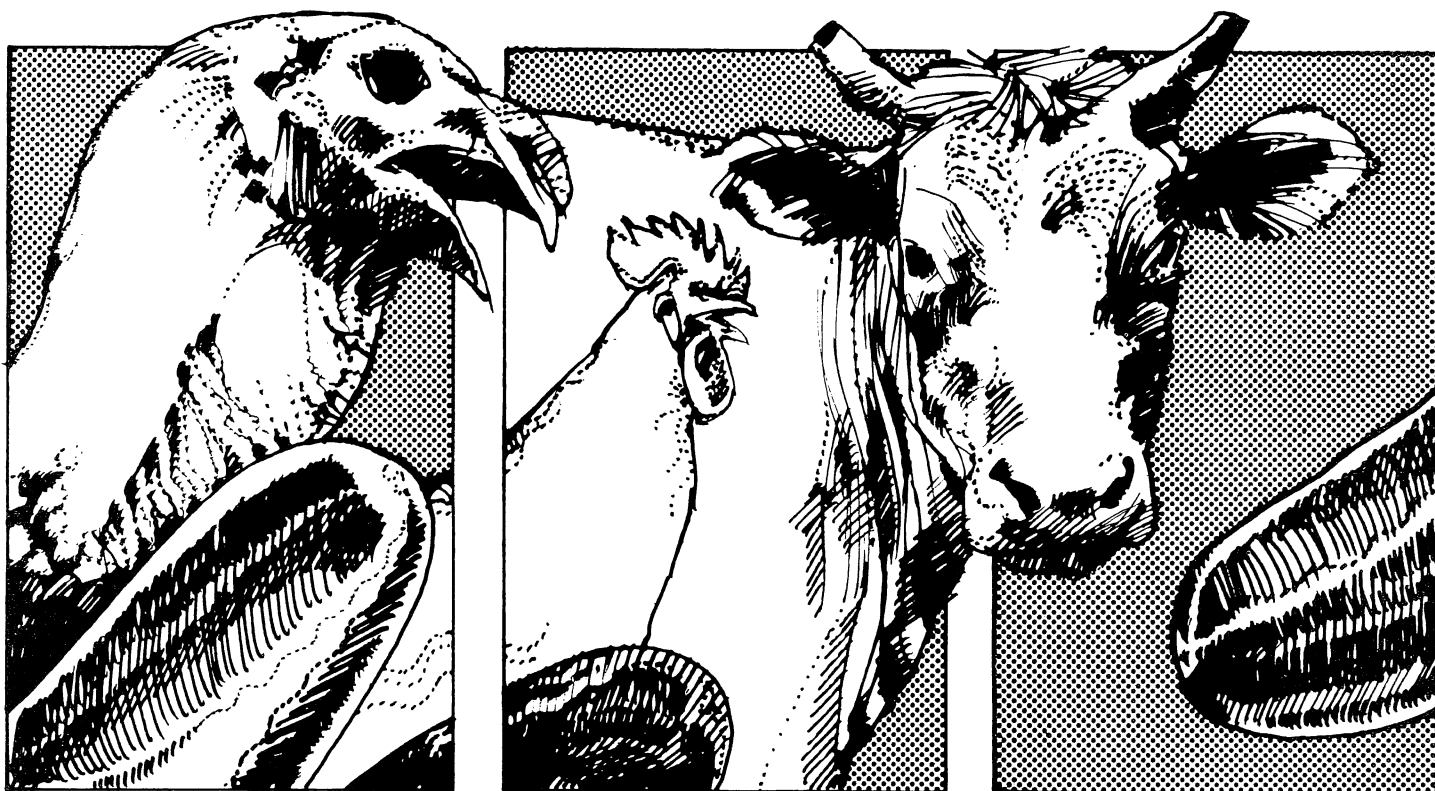


Table 2. Estimates of Elasticities for Frankfurter Demand¹

One Percent Change	Percent Change In Sales		
	Beef Franks	Poultry Franks	Other Meat Franks
Beef Frank Price	-2.3	4.3	.2
Poultry Frank Price	1.1	-1.7	.2
Other Meat Frank Price	1.6	-2.8	-1.0
Total Food Expenditure	.2 ³	1.3 ³	1.0
Temperature Index ²	.4	—	.5

¹Bi-monthly average June 1977-November 1980.

²Population weighted U.S. average degree fahrenheit in hundredth unit.

³Statistically insignificant at 95 percent probability level.

substitute one for the other, or other substitutes (such as luncheon meats), when the price of beef franks or poultry franks rises. However, if the price of one type were to decline significantly, sales would likely increase disproportionately, thus offsetting what might have been a loss of retail revenue related to the lower price. This conclusion assumes an otherwise stable economic atmosphere.

For other meat frankfurters, total revenue of retailers may not change when the price changes, because sales respond in an equal but opposite direction to price change under generally stable economic conditions.

When prices of comparable products change, consumption levels also change. This is measured as cross price elasticity. The study found a cross price elasticity between beef frankfurters and those made with poultry of 1.1. This meant that a 10-percent increase in the poultry frankfurter price caused an 11-percent increase in beef frankfurter purchases. The same percentage increase in the price of other meat frankfurters would increase beef frankfurter sales by 16 percent.

A rise in beef frankfurter prices, on the other hand, would not have a symmetric effect because changes in product prices indirectly change the consumer's real income and influence sales of substitutes differently. A 10-percent increase in the beef frankfurter price would, on the average, induce consumers to purchase 43 percent more poultry frankfurters.

A preliminary study indicated that changes in total income are negatively related to frankfurter sales. However, when this demand is measured with respect to changes in total food expenditures rather than total income, sales of other meat frankfurters would change by the same percentage as changes in food expenditures.

Frankfurter sales are highly seasonal. In the winter, sales of beef frankfurters decline by approximately 36 percent from summer levels. For other meat frankfurters, the decline in sales is about 40 percent. Weather's gradual effect, estimated by the national average temperature, (31°-71° F), indicates that when the temperature increases by 10 percent, frankfurter sales average a 4- to 5-percent increase. ■



The Current Food Situation and The Outlook for 1982

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A number of important developments in the last two years affected the food and agricultural sector and will continue to have important implications for food prices, consumption, and consumer expenditures in 1982. The drought-reduced harvest of 1980 was followed by a record grain crop in 1981; the 1980 restrictions on crop exports to the Soviet Union were followed by larger Soviet imports last year; and following several years of declining production, the cattle cycle "bottomed out" in 1980 and beef production has been increasing. Declines in Gross National Product made 1980 and 1981 recession years; a January 1981 freeze in Florida pushed up domestic prices for fruits and vegetables; a turn-around in world sugar production caused a drastic fall in raw sugar prices last year; scheduled April dairy price support increases were eliminated; and a new farm bill evolved.

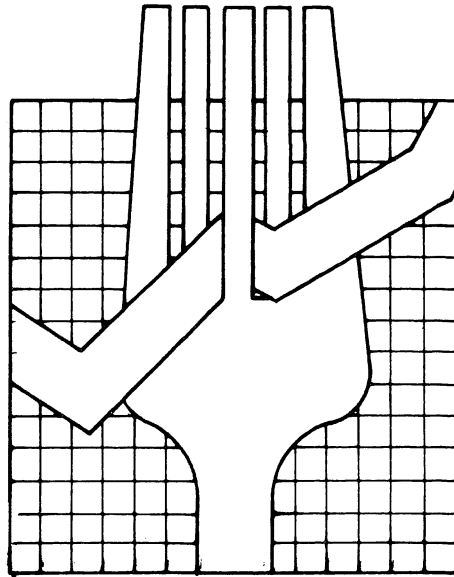
Food Market Developments in 1981

The 1981 rise in retail food prices was 7.9 percent. This compares with an 8.6-percent increase in 1980, and is the third consecutive year that food prices rose less than prices for nonfood goods and services. Marketing costs accounted for about three-fourths of last year's food price rise, while only about one-eighth was attributed to a higher farm value. The remainder was due to higher costs for fish and imported foods.

Food Product Highlights

Meats and poultry. Commercial beef production in 1981 increased about 3 percent from the 1980 level. Increased beef production, along with a rise in veal production and a slight increase in lamb and mutton production, was partly offset by a 6-percent decline in pork production, leaving 1981 total red meat production only slightly above the 1980 level. But given population increases, per capita red meat consumption declined last year.

The post-war expansion of the chicken and turkey processing industry continued last year, and it appears that per capita consumption exceeded the previous record of 61 pounds. Increased chicken consumption in recent years has been strongly supported by brand merchandising and the spread of specialized fast-food restaurants.



Eggs. In contrast, egg production was down for the second consecutive year. Per capita consumption continued a downward trend, falling to the lowest level in the post-war era.

Dairy products. Milk production in 1981 increased about 3 percent, reflecting increased output per cow and a larger number of milk producing cows. Output of most dairy products rose as well. Importantly, public and private cold storage stocks of butter increased sharply, while cheese stocks were up more than a tenth. This was largely a consequence of the dairy price support program which encouraged expanded production. The decision to abandon scheduled April 1 increases in dairy price supports resulted in virtually no movement in retail prices for dairy products through the summer months of 1981 as relatively large stocks and continued large production kept farm-level prices relatively stable.

Sugar. A collapse of raw sugar prices started in late 1980 and continued through most of last year. Two factors were primarily responsible—increased world sugar production, which recovered in response to the initial surge of sugar prices in late 1979; and increased production of high-fructose corn syrup, which food manufacturers increasingly substitute for refined sugar. The decline in raw sugar prices was an important factor holding down retail prices for sugar, desserts, ice cream, and soft drinks.

Fruits and vegetables. The January 1981 freeze in Florida drove up prices for orange

juice and orange juice concentrate and substantially reduced domestic supplies of tomatoes. As a consequence of the freeze, orange juice production was higher in January but reduced in later months. Frozen orange juice concentrate prices rose sharply through the spring and for the year averaged nearly a fifth higher than in 1980.

Tomato production was reduced and prices rose sharply in late winter. However, by May, tomatoes from plantings made in February after the freeze began to reach consumers and retail tomato prices fell. Nonetheless, as a result of the freeze, fresh vegetable prices in 1981 averaged 18.7 percent higher than in 1980.

Fish. Fish consumption in 1981 (including game fish) continued a decade-long pattern of stability, holding near the 1980 level of almost 17 pounds per person. Retail prices for fish and seafood rose 8.3 percent.

Coffee. Retail coffee prices declined substantially last year, largely in response to increasing international supplies. Although per capita coffee consumption may have risen some, it has trended downward over the last three decades. In recent years, cocoa and tea consumption have also declined.

Food Marketing Costs

Marketing costs account for almost two-thirds of every consumer dollar spent on food. Prices for marketing inputs rose about 11 percent last year, directly accounting for most of the increase in retail food prices.

Labor. Food sector labor costs averaged about 10.5 percent higher last year compared with 1980, primarily because of an 11-percent increase in wages for food retailing workers. Rising wages are principally due to cost-of-living adjustments and deferred wage increases provided by many union contracts. Larger payments for employee benefits, greater employer contributions to Social Security, and an increase in the minimum wage also added to labor costs.

Packaging. Prices for packaging materials used in food manufacturing and processing averaged about 7.5 percent above the 1980 level. Increases were held down by moderate price rises for polyethylene resin—the major material used in plastic containers and packages. This also partly offset a 12-percent rise in glass container prices, an increase partially attributable to a significant boost in

industry labor costs. Rising production costs contributed to a 10-percent rise in paper and paperboard prices.

Transportation. Transportation costs in 1981 averaged about 9 percent higher than in 1980. General rate hikes and fuel surcharges to cover higher operating expenses were primarily responsible.

Energy. Diesel and fuel oil prices rose about 24 percent because of crude oil price increases in the fall of 1980 and decontrol of domestic crude oil prices in early 1981. Electricity and natural gas prices increased 14 percent, but coal prices were up only 7 percent.

Outlook for 1982

Relatively large agricultural supplies will limit farm-level price increases in 1982, and

the farm value of domestic food production will probably rise only about 1 to 4 percent. However, food marketing costs will rise 8 to 10 percent and be the major source of food price inflation in 1982. These increases imply that grocery store food prices will be up 5 to 8 percent with a 6-percent rise being most likely. Prices at restaurants, cafeterias, and fast-food chains are expected to rise 6 to 9 percent this year. Combining these forecasts, retail prices for all food in 1982 will probably increase 5 to 9 percent, with current conditions suggesting a rise of about 7 percent. This increase would be below 1981's increase of 7.9 percent and represents a significant decline from the double-digit increases of 1978 and 1979 (see table).

Conditions required to push retail food prices to the upper bound of the forecast

range would be extremely poor weather, larger than expected export demand, and greater than anticipated price increases for food marketing costs. On the other hand, extremely good weather, low export demand, and a lower rate of marketing cost inflation would push the change in retail food prices to the lower end of the forecast interval.

Food Product Outlook

Meats and poultry. Last year's record corn crop will hold down livestock feeding costs in 1982, providing some stimulus for increased beef and poultry production. Increases will be small, however, as continued high interest rates discourage placing animals in feedlots. Pork production will decline from the 1981 level as producers continue to react to losses

Table 1. Changes in the Consumer Price Index (CPI) for Food 1978 through 1981, and 1982 Forecasts

Component	Relative importance in food CPI	Change in				
		1978	1979	1980	1981	1982 (Forecast)
Food	100.0	10.0	10.9	8.6	7.9	5-9
Food away from home	30.7	9.0	11.2	9.9	9.0	6-9
Food at home	69.3	10.5	10.8	8.0	7.3	5-8
Cereals and bakery products	8.7	8.9	10.1	11.9	10.0	7-8
Beef and veal	9.8	22.9	27.3	5.7	0.9	4-7
Pork	4.7	12.9	1.5	-3.4	9.3	6-9
Other meats	3.0	17.8	14.7	3.8	4.3	4-7
Poultry	2.3	10.3	5.0	5.1	4.1	2-5
Fish and seafood	2.3	9.5	9.8	9.2	8.3	5-7
Eggs	1.3	-5.5	9.5	-1.8	8.3	2-5
Dairy products	9.3	6.7	11.6	9.8	7.1	2-4
Fresh fruits	2.4	19.4	12.4	6.2	5.4	10-12
Fresh vegetables	2.8	7.9	2.9	8.9	18.7	1-3
Processed fruits and vegetables	4.5	10.5	8.6	7.0	12.0	10-12
Sugar and sweets	2.9	12.2	7.8	22.9	7.9	3-5
Fats and oils	1.9	9.5	8.0	6.6	10.7	2-4
Nonalcoholic beverages	7.6	5.7	5.0	10.6	4.2	3-5
Other prepared foods	5.8	8.0	10.1	10.8	10.3	7-9

Data for 1978, 1979, 1980, and 1981 are from the Bureau of Labor Statistics.

experienced over much of 1981. Higher per capita beef and poultry consumption will be more than offset by declining pork consumption, leading to a decrease in total domestic meat consumption. Increased beef and poultry supplies will hold down retail price increases for these foods in 1982, while the decline in pork production will lead to larger increases in retail pork prices.

Eggs. Egg consumption will also likely decline in 1982. Retail egg prices are expected to rise 2 to 5 percent.

Dairy products. Cheese consumption is expected to continue rising, and butter consumption may increase, as well. Large supplies of dairy products and the change in the price support program will probably hold increases in dairy product prices below the average rate of increase for all foods.

Fruits and vegetables. Fresh fruit production last fall was lower than in 1980. The fall apple harvest was small in the Northeast and Great Lakes regions because of cold weather in the spring of 1981, and production of pears and grapes last year was also lower. Smaller fresh market Florida citrus supplies are available this winter because of tree damage during the January 1981 freeze and the impact of the January 1982 freeze. These production declines could lead to an increase in retail prices for fresh fruits of 10 to 12 percent in 1982. Retail prices for fresh vegetables are expected to rise 1 to 3 percent this year. Potato production in 1981 was larger than in the previous few years, while dry edible bean production was up almost a fifth. Winter vegetable production this year was reduced by the January freeze in Florida, although imports from Mexico may be partly offsetting.

Lower contracted acreage for processed vegetables, especially tomatoes, will push up prices for processed vegetables. Production of Florida frozen concentrated orange juice was reduced by the January 1982 freeze, although large carry-over stocks and the potential for continued large imports from Brazil will moderate the impact of the freeze. Also, large supplies of canned fruit will limit retail price increases for processed fruits.

Other foods. Farm-level prices for other foodstuffs are not expected to rise much in 1982. Record 1981 wheat and rice crops will keep farm-level prices for these products

low. Large carry-overs of vegetable oils, large soybean and peanut crops, and a continued recovery in world sugar production will keep prices for oils and sugar low.

Food Marketing Costs

Labor. The most important factor contributing to higher food marketing costs in 1982 will be rising employee compensation in the food sector—nearly half of all food marketing costs are employee wages and benefits. Labor costs last year averaged 10.5 percent higher than in 1980. But several factors suggest a slowing of labor cost increases in 1982, with a 9 to 10 percent rise likely. One limiting factor is that the minimum wage will not rise this year as it has the past 4 years. This will particularly affect the food service industry. Also, increases in employer contributions to Social Security will be much smaller than in 1981.

In addition, major collective bargaining contracts covering 315,000 workers in food retailing and manufacturing are to be renegotiated in 1982. In 1981, contracts covering only 280,000 workers were negotiated. The largest contracts involve the meat-packing industry and the California fruit and vegetable processing industry. Retail clerk and meatcutter contracts in many metropolitan areas will also be renegotiated throughout 1982. Importantly, only moderate wage demands are expected, largely because of the relatively low inflation rate over the last half of 1981, the anticipated slow growth in the economy during early 1982, and the likelihood of wage concessions by unions to protect jobs. The slowing inflation rate also means smaller cost-of-living wage adjustments.

Packaging. Prices for packaging materials and containers are expected to increase 7 to 8 percent in 1982, close to the 1981 increase. Higher manufacturing costs are expected to push prices for paperboard and paper products up 9 to 10 percent. However, smaller price increases are likely for metal, glass, and plastic containers because of the low rate of capacity utilization in the container industry, partially reflecting some food manufacturing firms producing their own containers.

Transportation. Transportation costs for food products are expected to increase 8 to

10 percent in 1982. Rail freight charges will rise faster than inflation as rates are adjusted to reach an "adequate revenue" level as specified in the Staggers Act of 1980. Additionally, the less restrictive regulatory environment will permit surcharges to cover higher costs for deliveries on low volume lines. Increases in trucking rates will be limited by more competition resulting from a loosening of industry regulations. Collective bargaining agreements with the Teamsters and increases in fuel costs also will be important in determining trucking rates.

Energy. Energy costs for food manufacturers and retailers are expected to rise less than the general inflation rate, although small increases in prices for petroleum products will be a restraining factor. World petroleum supplies are large and petroleum demand is expected to decline because of slow economic growth and increased substitution of alternative fuels. Coal prices will likely rise more than the inflation rate, primarily because of increased demand and higher labor costs resulting from the 1981 collective bargaining agreement with the United Mine Workers. Higher coal prices and increasing financing costs will push electricity prices up more than the inflation rate. Natural gas prices will move up substantially as a consequence of decontrol—the Natural Gas Policy Act of 1978 decontrolled some wellhead prices and much of the resulting price increases will be passed through to final users. ■

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Food Spending and Income

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The Nation's personal consumption expenditure (PCE) for all food during the third quarter of 1981 was at a seasonally adjusted annual rate of \$340 billion. This expenditure rate was 2.2 percent above the previous quarter and 11.5 percent above the third quarter of 1980. However, adjustment of food expenditures for population and price increases reveals that expenditures were actually slightly below that for the previous quarter and only 2 percent above the 1980 level.

At home food eating once again increased at the expense of away-from-home eating for the third consecutive quarter. The PCE for food at home increased to a new high of \$251 billion on an annual rate—2.7 percent above that of the previous quarter and 11.2 percent above the third quarter of 1980. But current retail food prices, adjusted for price inflation, have advanced 2.5 percent and 8 percent, respectively, from those two periods. Consequently, the Nation's real food at home expenditure was only slightly above that of the second quarter and 3 percent above the level in the third quarter of 1980. The portion of disposable personal income spent on PCE for food at home remained unchanged from the previous quarter at 12.3 percent.

Higher unemployment and stagnant growth in disposable personal income continued to weaken consumer expenditures in the Nation's eating places. Expenditures for away-from-home eating was at an annual rate of \$89.3 million, a little less than 1 percent above the second quarter and more than 12 percent above the third quarter of 1980. But restaurant prices advanced more rapidly—1.5 percent between the Spring and Summer 1981 quarters. Consequently, real expenditures dropped about 1 percent. Per person expenditures, adjusted for price increases, dropped even further—3 percent from the last quarter, and about the same as the third quarter of 1980.

Consumer expenditures for wine, beer, and alcohol were at an annual rate of \$45.9 billion in the third quarter of 1981, compared with \$44.9 billion in the same quarter a year earlier. The percent of disposable personal income spent on alcoholic beverages has gradually declined for the past five quarters to 2.2 percent.



The third quarter showed a sharp contrast from the previous quarter in expenditures for alcoholic beverages to be consumed at home versus away-from-home. Expenditures rose to an annual rate of \$28.8 billion for at-home consumption, a gain of almost 4 percent, and actually represents a slight gain when prices are adjusted for inflation. But the softening food away-from-home market, which accounts for the bulk of the alcohol-by-drink sales, remained unchanged from

1981 Food Spending Highlights

The Department of Commerce released preliminary fourth quarter 1981 and full year 1981 income and food spending data as this issue went to press. The next issue of NFR will contain a detailed analysis of these trends. The Department of Commerce emphasised that the estimates are subject to revision.

- The Nation's Personal Consumption Expenditures (PCE) for food rose to \$337 billion in 1981, an increase of about 11 percent over 1980. But only about 2.5 percent of this increase was real food price inflation of about 8.5 percent accounted for the remainder.

- Per person food spending for 1981 reached \$1,465, about 10 percent above 1980. Even after adjusting for price increases, food spending per person rose 1.5 percent.

- Annual Disposable Personal Income (DPI) for 1981 was slightly over \$2 trillion, an increase of about 10.5 percent above 1980. After adjusting for population increases and inflation, DPI was 1 percent higher than in 1980.

- PCE for food-at-home rose 10.8 percent over 1980 to \$247 billion in 1981. Over 8.5 percent of that increase was due to higher grocery store food prices, and another 1 percent reflected population growth. Real per person food-at-home spending (adjusted for inflation by using 1972 dollars) rose a little more than 1 percent from 1980 to 1981. The portion of DPI allocated to grocery store food expenditures rose from 12.2 percent to 12.3 percent, but was still below the decade high of 12.7 percent in 1975.

- PCE for food away from home averaged nearly \$90 billion in 1981 or 11.7 percent above 1980. About 9 percent of that increase was due to higher prices, and another 1 percent was due to population growth. Nevertheless, real per person food away from home spending, a measure of real volume growth, rose 1.5 percent following the drop in 1980.

Table 1. Personal Consumption Expenditures: Quarterly, Seasonally Adjusted at an Annual Rate

Item	1979				1980				1981		
	I	II	III	IV	I	II	III	IV	I	II	III
Billion Dollars (Current)											
Total personal consumption expenditures	1454.1	1478.0	1529.1	1582.3	1631.0	1626.8	1682.2	1751.0	1810.1	1828.1	1887.2
Nondurables	571.8	586.4	611.5	639.2	661.1	664.0	674.2	703.5	726.0	736.3	750.5
Food, beverages, and other groceries ¹	347.8	356.3	364.9	381.2	389.1	391.9	403.2	418.0	431.4	436.1	447.8
Food exc. alcoholic beverages	262.0	268.2	274.6	288.2	294.1	295.8	305.2	316.4	327.4	332.8	340.2
At home	190.9	197.0	201.7	210.0	214.1	217.5	225.6	232.7	238.5	244.2	250.9
Away from home	71.1	71.2	72.9	78.1	80.0	78.3	79.6	83.7	88.9	83.6	89.3
Alcoholic beverages	37.1	37.8	39.7	40.9	42.2	42.6	42.5	44.0	45.0	44.9	45.9
At home	23.5	24.1	25.5	26.0	27.2	27.1	27.0	27.6	28.3	27.7	28.8
Away from home	13.6	13.7	14.2	14.9	14.9	15.4	15.5	16.3	16.7	17.2	17.1
Cleaning and household supplies	16.8	17.3	17.8	18.5	18.8	19.1	19.8	20.4	20.8	21.4	22.9
Toiletries	13.0	13.4	13.8	14.3	14.5	14.6	15.0	15.7	16.1	16.4	16.6
Tobacco	18.9	19.7	19.1	19.4	19.6	19.8	20.8	21.5	22.0	22.5	23.1
Drugs	15.1	15.6	16.1	16.5	17.1	17.4	17.8	18.7	19.1	19.4	19.6
Clothing and shoes	95.8	97.0	100.3	102.5	102.2	102.3	105.3	109.4	113.4	115.8	117.5
Gas and oil	60.6	63.2	72.1	77.6	89.4	90.9	85.3	90.5	93.5	92.4	95.1
Fuel oil and coal	13.1	14.9	17.9	18.1	18.8	19.2	20.7	20.5	20.5	21.0	21.0
Other	39.4	39.5	40.3	43.1	44.5	42.2	42.0	46.4	48.1	48.8	49.4
Durables	212.5	207.4	213.3	216.1	220.9	194.4	208.8	223.3	238.3	227.3	237.9
Motor vehicles and parts	100.1	91.7	94.7	95.4	100.6	77.5	87.0	94.6	105.4	93.4	183.5
Furniture and household equipment	78.0	80.1	82.4	83.8	83.6	81.3	84.6	88.9	92.3	92.4	93.1
Other	34.4	35.6	36.2	37.0	36.8	35.6	37.2	39.8	40.6	41.6	49.4
Services	669.9	684.2	704.3	737.0	749.0	768.4	799.2	824.2	845.8	866.5	898.8
Housing	231.4	238.1	244.9	253.0	259.8	267.3	275.7	285.3	293.6	302.1	310.9
Household operation	96.1	96.4	99.5	102.7	104.2	109.3	116.1	116.9	118.1	123.4	131.1
Transportation	54.4	56.5	58.2	59.9	61.4	61.6	65.8	67.5	67.6	67.9	69.7
Personal care	15.0	15.2	15.6	16.2	16.7	16.8	16.7	16.9	17.4	17.6	17.6
Medical care	120.4	122.2	125.0	129.8	135.3	141.2	145.0	152.8	159.9	165.6	173.5
Personal business service	76.6	78.7	81.6	84.3	87.6	87.5	92.3	95.9	95.3	97.1	100.3
Recreational services	30.4	30.8	31.7	32.8	33.8	34.5	35.5	36.2	37.3	37.5	38.0
Other	45.5	46.2	47.7	38.3	50.4	50.2	52.0	52.8	56.6	55.2	57.5
Savings	83.8	90.9	89.3	80.7	86.4	110.0	111.4	97.6	88.9	106.6	103.3
Disposable personal income	1580.2	1612.8	1663.8	1710.1	1765.1	1784.1	1840.6	1897.0	1947.8	1985.6	2041.7

the previous quarter. Expenditures were essentially constant at an annual rate of \$12 billion and actual declined by 3 percent when price and population increases are taken into account.

Personal consumption expenditures for other grocery items in the third quarter of 1981 showed increases from the previous quarter. The PCE for tobacco products showed another sharp increase for the fifth consecutive quarter—reaching an annual rate of \$23.1 billion. Expenditures for cleaning and household supplies also was up sharply to an annual rate of \$22 billion while toiletry expenditures rose slightly to an annual rate of \$16.6 billion.

Other Personal Consumption Expenditures

Total Personal Consumption Expenditures were at a seasonally adjusted annual rate of 1.9 trillion during the third quarter, a 3-percent increase from the second quarter, but less than 1 percent when adjusted for the 2-percent inflation factor. A sharp rise in PCE for motor vehicles and parts, housing, medical care and household operation accounted for the bulk of this increase. Real nondurable goods purchases rose less than .5 percent, while real PCE for the service sector was up less than 1 percent.

Disposition of Income

The Nation's disposable personal income was at an annual level of \$2,041.7 billion during the third quarter, up 3 percent from the second quarter, but showed little change on a real per person basis.

The portion of this income spent on food was about 16.7 percent, essentially unchanged from the second quarter and only slightly higher than the same quarter a year ago. About 12.3 percent was allocated to food at home while 4.4 percent was spent on food away from home. The portion of disposable personal income spent on nondurables fell for the second consecutive quarter to 36.8 percent. Durables accounted for 11.7 percent, and services accounted for 44 percent. ■

Table 2. Allocation of Disposable Personal Income: Quarterly, 1981

Item	1981		
	I	II	III
	[Percent]		
Total personal consumption expenditures	92.9	92.1	92.3
Nondurables	37.3	37.0	36.8
Food, beverages, and other groceries ¹	22.1	22.1	22.0
Food exc. alcoholic beverages	16.8	16.8	16.7
At home	12.2	12.3	12.3
Away from home	4.6	4.5	4.4
Alcoholic beverages	2.3	2.3	2.3
At home	1.5	1.4	1.4
Away from home	0.9	0.9	0.8
Cleaning and household supplies	1.1	1.1	1.1
Toiletries	0.8	0.8	0.8
Tobacco	1.1	1.1	1.1
Drugs	1.0	1.0	1.0
Clothing and shoes	5.8	5.8	5.8
Gas and oil	4.8	4.7	4.7
Fuel oil and coal	1.1	1.1	1.0
Other	2.5	2.5	2.4
Durables	12.2	11.4	11.6
Motor vehicles and parts	5.4	4.7	5.0
Furniture and household equipment	4.7	4.7	4.6
Other	2.1	2.1	2.0
Services	43.4	43.6	43.9
Housing	15.1	15.2	15.2
Household operation	6.1	6.2	6.4
Transportation	3.5	3.4	3.4
Personal care	0.9	0.9	0.9
Medical care	8.2	8.3	8.5
Personal business service	4.9	4.9	4.9
Recreational services	1.9	1.9	1.9
Other	2.9	2.8	2.8
Savings rate	4.6	5.4	5.2
Disposable personal income	100.0	100.0	100.0

¹Contains some items not normally purchased in grocery stores.

For an alternative measure of U.S. food expenditures see "Total Food Expenditures Reach Nearly \$300 Billion" in this issue.

Domestic Food Programs

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The USDA food assistance programs provide food or food coupons to low-income persons, helping them to achieve a more adequate diet. With the exception of the Food Stamp Program (FSP), the USDA programs are designed to meet the specific needs of segments of the low-income population. For example, the National School Lunch and School Breakfast programs provide nutritious meals to children of high school age and under.

Low-Income Mothers

USDA's Food and Nutrition Service (FNS) administers two programs that provide food assistance to low-income pregnant, postpartum and breastfeeding women and to infants and pre-school children:

- The Commodity Supplemental Food Program distributes federally purchased commodities to States which in turn donate the foods to eligible women and children.
- The Special Supplemental Food Program for Women, Infants and Children (WIC) provides participants either with vouchers redeemable for specified foods at participating food stores or with a food package prepared according to Federal guidelines.

Under both programs, participants receive foods selected to meet particular nutritional needs. These foods include iron-fortified formula, cereal that is high in iron, fruit juices, cheese, eggs, and fortified milk. (See Fall 1981 *NFR*.)

As the unique needs of specific subgroups become apparent, the foods provided, as well as the method of delivery, have been altered. In 1978, FNS, with a grant from the Community Services Administration, developed a demonstration project to improve services for migrant workers participating in the WIC program. The goal of the project was to ensure continuity of benefits for migrants as they moved into new areas by issuing certification cards which describe the nutritional needs of the participant and the nutrition education received.

A dramatic increase in the number of refugees coming into the United States from Southeast Asia resulted in an increased need for information materials in WIC clinics serving Southeast Asians. The information

is designed to help local clinic staffs explain the program and encourage the use of foods new to the Asian diet.

Native Americans

The Food Stamp and Food Distribution programs provide nutritional aid to Native Americans. The Food Stamp Act of 1977 allows for the dual operation of both Food Stamp and Food Distribution programs when requested by the tribal organization.

Households may apply for either the Food Distribution Program or the Food Stamp Program. They may not, however, participate in both programs simultaneously. In 1981, the Food Distribution Program served low-income families on 75 Indian reservations in 18 States, and in the Trust Territories of the Pacific Islands.

A number of problems, however, complicate the delivery of benefits to the approximately 1 million Native Americans. About half of them live on reservations in remote areas with limited grocery facilities, making food purchasing difficult and inhibiting participation in the Food Stamp Program. The smaller selection and higher prices in reservation stores reduce the buying power of food stamps. Meat and fresh fruit and vegetables, for example, are frequently unavailable or are too expensive.

The practice of certifying applicants and issuing stamps at county welfare offices has also contributed to low participation because eligible people have difficulty getting to the offices. Issuing food stamps by mail, however, is permitted and may encourage greater participation.

Before the advent of the Food Stamp Program, commodity donations were the only form of food aid available to needy families. The direct distribution of foods is again becoming the primary means of providing food assistance to Native Americans.

New Federal regulations allow recognized tribal organizations to run their own food distribution programs and, under special circumstances, their own food stamp programs. Certification for these programs, therefore, may be obtained on the reservation, eliminating the need to travel long distances to county welfare offices. Further, program participation rates may be improved by permitting applicants to be certified by

members of their own tribal organization.

Those eligible for donated foods include Native Americans living on or near reservations, and other persons who live on the reservations. In addition, households must qualify on the basis of monthly incomes.

Eligible households receive approximately 70 pounds of food per person each month under the Food Distribution Program. Food packages include dry beans, canned meat, cheese, flour, rice, oats and dehydrated potatoes, as well as canned fruits and vegetables. New regulations also allow participants some degree of choice in the commodities they receive. For example, two types of canned meat and five kinds of fruit juices are offered.

The Elderly

In fiscal year 1980, USDA contributed \$48.3 million in cash and \$17.5 million in foods to the Department of Health and Human Services' (HHS) nutrition programs for the elderly. USDA supplies donated foods or cash to nonprofit meal services for the elderly funded under the Older Americans Act of 1965. The amount of food or cash that USDA provides is based on the number of meals served in the program and the level of assistance per meal authorized by legislation.

HHS gives grants to State agencies on aging, which designate area agencies on aging to plan and coordinate the local nutri-

Federal Cost of USDA Food Programs

Item	1978	1979 ¹	1980	1980				1981	
				1	2	3	4	1	2
				Million Dollars					
Food Stamps									
Total Issued	8347	7111	8997	2224	2258	2263	2252	2846	2811
Bonus Stamps	5261	7108	8997	2224	2258	2263	2252	2846	2811
Food Distribution ³									
Needy Families	13.7	22.2	24.3	4.7	5.9	6.9	6.7	6.7	6.7
Schools ⁴	577	720	910	301	219	155	236	304	241
Others ⁵	64	85	107	27	32	28	21	26	28
Child Nutrition ⁶									
School Lunch	1877	2101	2392	749	560	308	775	775	576
School Breakfast	191	243	308	91	73	42	102	106	83
Special Food ⁷	246	288	334	53	77	138	67	75	100
Special Milk	139	146	139	48	37	19	35	35	27
WIC	422	569	783	175	192	183	233	232	205
Total ⁸	8790	11283	13995	3672	3454	3143	3727	4406	4077

¹Annual totals computed from monthly data beginning with 1979. Previously obtained from quarterly data supplied by FNS.

²Preliminary.

³Cost of food delivered to State distribution centers.

⁴Includes Summer Food Service Program.

⁵Includes supplemental food, institutions, elderly persons.

⁶Money donated for local purchase of food. Excludes nonfood assistance.

⁷Includes Child Care and Summer Food Service programs.

⁸Excludes those food stamps paid for by the recipient. Do not add due to rounding.

Food Programs Update

The value of food stamps issued under the Food Stamp Program during the second quarter of 1981 was \$2.8 billion—up 24 percent from the second quarter of 1980. This increase may be partially attributed to increased participation. Preliminary data show an average of 22.7 million persons participated in the Food Stamp Program in the second quarter of 1981, an increase from the 21.6 million persons that participated during the same period in 1980. Average monthly benefit per person rose from \$34.85 in the second quarter of 1980 to \$41.29 during the second quarter of 1981.

Participation in the Special Supplemental Food Program for Women, Infants, and Children (WIC) has grown slightly, with second quarter 1981 participation at 2.0 million people. A year earlier, participation averaged 1.9 million people. The cost of the program during the period rose by 6.8 percent.

An average of 86,000 needy families received \$6.7 million in commodity assistance under the Needy Family Program during the April-June quarter of 1981. The Nutrition Program for the Elderly supplied \$17.0 million in commodity assistance or cash in lieu of commodities to needy elderly people.

Federal cash expenditures for the child feeding programs rose from \$753 million in the second quarter of 1980, to \$782 million during the second quarter of 1981. Cash payments for the National School Lunch Program (NSLP) represented about 73 percent of total cash expenditures during the second quarter of 1981, while cash payments for the School Breakfast Program represented about 11 percent. Expenditures for the Special Milk, Food Service Equipment Assistance, Child Care Food, and Summer Food Service programs accounted for the remaining 17 percent of the total cash expenditures for the child feeding programs.

An average of 21.1 million children received a total of 1.0 billion lunches through the

NSLP in the April-June quarter of 1981. About 426 million of these lunches were served free and 78 million were served at reduced prices. Participation in the School Breakfast Program during the quarter averaged 3.3 million children. About 400 million half pints of milk were served under the Special Milk Program during the April-June quarter of 1981.

Food Stamp Amendments

The Agriculture and Food Act of 1981 (P.L. 97-98) was signed by the President on December 22, 1981. This Act, which provides the basic framework for U.S. food and agricultural programs, also contains new food stamp rules. The Act authorized \$11.3 million for the Food Stamp Program (FSP) in fiscal 1982. To reduce program costs, a scheduled April 1, 1982, cost-of-food adjustment in food stamp allotments will be postponed until October 1, 1982. The October 1982 adjustment will reflect changes in food prices between October 1980 and June 1982. In early 1982, Congress will most likely consider reauthorization of FSP appropriations for fiscal 1983 through 1985, along with the periods upon which cost-of-food adjustments will be made.

Other FSP changes included in the Agriculture and Food Act of 1981 are:

- Additional penalties for food stamp fraud and increased incentives to States to reduce errors.

- Permission for all localities to establish workfare programs for food stamp participants. Under workfare, able-bodied participants are required to accept public service jobs and work in return for their food stamps. In November 1980, local jurisdictions in 16 States had workfare projects.

- Extension of pilot cash-out projects through September 1985. These projects allow States to pay food stamp benefits in cash, rather than stamps, to households in which all members are elderly or receive Supplemental Security Income benefits (SSI). Currently, cash-out projects are being conducted in 8 sites throughout the country.

tion programs. Area agencies on aging provide nutrition services in schools, community centers, churches, public housing, and other places located within walking distance of the homes of the majority of local elderly persons. These centers provide hot or cold meals at least once a day, 5 or more days a week. The centers provide transportation to and from the sites for the elderly who need it. The centers also provide home-delivered meals for persons who cannot attend the communal dining facilities. The meals are provided free of charge to eligible persons. Others are required to make some contribution toward the cost of their meal.

Nonprofit meal services for the elderly which are not funded by HHS, may not receive cash payments. However, they do qualify as charitable institutions and therefore may receive some USDA foods. Again, the amount of food received depends upon the number of meals served.

In addition, USDA authorizes nonprofit meal services to accept food stamps as payment for meals served to elderly or disabled participants. Supplemental Security Income (SSI) recipients and people 60 years of age or older and their spouses, plus mentally and physically handicapped people, and others who cannot adequately prepare all their meals.

The food stamp participant must also meet the requirements for participating in these special meal programs, and the meal delivery service or dining facility must be authorized to accept food stamps. In December 1980, there were 2,638 nonprofit communal dining services, and 1,472 nonprofit meal delivery services in the Nation accepting food stamps.

Meal service at social centers or schools is an important source of both nutrition and companionship for many elderly persons. Home delivery of meals enables many elderly and physically or mentally handicapped persons to continue living in their own homes. ■

Total Food Expenditures Reach Nearly \$300 Billion

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Food expenditures in the United States reached \$294.3 billion in 1980, according to the USDA series on food expenditures. This exceeded 1979 expenditures mostly because of higher food prices. Preliminary indications suggest another 10-percent increase in 1981. The series includes all food consumed in the United States by civilians and by the military, regardless of who paid for it. Also included are meals paid for on business expense accounts, those served in hospitals, institutions, and prisons, and food grown for home consumption.

The \$294.3 billion figure differs from the \$302.9 billion reported by the Department of Commerce in their personal consumption expenditure series, which does not include business or institutional expenses or non-farm home food production. The figures from the two series differ partly because the Department of Commerce figures for

grocery store food sales are much higher than those used in USDA's series.

The Commerce Department series used census figures where food sales accounted for about 85 percent of total grocery store purchases. In USDA's series, trade industry figures, indicating food and alcoholic beverage sales of about 72 percent, were used. (See NFR-16, pp. 16-19, and AER 431 for further discussion.)

Highlights of the USDA food expenditure series include the following:

- Expenditures for food eaten at home totaled \$183.0 billion, up 10.8 percent from 1979 and 53 percent from 1975.

- The money spent on meals and snacks at eating places, institutions, etcetera, totaled \$111.2 billion, an increase of 8.8 percent from 1979 and 69 percent from 1975.

- Money spent for alcoholic beverages, consumed both at home and away, rose 7

percent to \$48.2 billion, up 51 percent from 1975.

- Sales of food by grocery stores and other food stores were \$161.3 billion, up 11.2 percent from 1979.

- Restaurants, fast food places, and other eating and drinking establishments sold 71 billion dollars worth of meals and snacks, 64 percent of the value of food consumed away from home.

This total food expenditure series has been revised, taking into account newly available data from the 1977 economic censuses and other sources. Most of the revisions have occurred in the 1973 figures and following. For a complete description of this series, see *U.S. Food Expenditures, 1954-78. New Measures at Point of Sale and Type of Purchaser*, Agricultural Economic Report No. 431, August 1979. For more data, write to Alden Manchester, room 246, GHI Building, ERS, USDA, Washington, D.C. 20250.

Table 1. Expenditures for Food and Alcoholic Beverages

Year	Food for off-premise use			Meals and snacks			Alcoholic beverages			
	Sales	Home production, donations	Total	Sales	Supplied, donations	Total	All food	Packaged	Drinks	Total
Million dollars										
1955	41,314	3,994	45,308	12,950	2,270	15,670	60,978	5,457	5,068	10,525
1960	49,424	3,630	53,054	16,191	2,973	19,164	72,218	7,198	5,734	12,932
1965	56,602	3,277	59,879	22,115	3,538	25,663	85,542	8,963	6,662	15,625
1970	73,441	3,526	76,967	33,677	5,118	38,795	115,762	12,934	9,069	22,003
1971	77,366	3,518	80,884	35,892	5,520	41,412	122,296	14,092	9,527	23,619
1972	82,416	3,832	86,248	39,346	5,927	45,273	131,521	15,291	10,486	25,777
1973	93,050	4,784	97,834	44,525	6,611	51,136	148,970	16,412	10,948	27,360
1974	107,204	5,245	112,449	49,701	7,949	57,650	170,099	17,915	11,624	29,539
1975	114,597	5,220	119,817	57,040	8,859	65,899	185,716	19,352	12,673	32,025
1976	121,611	5,241	126,852	64,487	9,604	74,091	200,943	20,965	13,612	34,578
1977	129,336	5,607	134,943	71,495	10,496	81,991	216,934	22,213	14,773	36,985
1978	142,432	6,000	148,432	79,676	11,703	91,379	239,811	23,755	16,684	40,440
1979	158,786	6,418	165,204	89,154	13,100	102,254	267,458	26,632	18,430	45,062
1980	176,156	6,877	183,033	96,736	14,495	111,231	294,264	29,150	19,096	48,246

Table 2. Expenditures For Food For Off-Premise Use

Year	Food stores ¹	Other stores ²	Home delivered, mail order	Military outlets ³	Farmers, manufacturers, wholesalers	Total sales	Home production, donations	Grand total
Million dollars								
1955	34,266	1,565	3,577	338	1,538	41,314	3,994	45,308
1960	42,088	1,965	3,228	565	1,578	49,424	3,630	53,054
1965	49,076	2,294	2,631	972	1,629	56,602	3,277	59,879
1970	65,480	2,384	2,383	1,381	1,813	73,441	3,526	76,967
1971	69,161	2,498	2,373	1,506	1,828	77,366	3,518	80,884
1972	73,984	2,605	2,400	1,616	1,811	82,416	3,832	86,248
1973	83,749	3,103	2,270	1,866	2,062	93,050	4,784	97,834
1974	97,127	3,586	2,208	2,109	2,174	107,204	5,245	112,449
1975	104,049	4,127	1,952	2,238	2,231	114,597	5,220	119,817
1976	110,510	4,738	1,861	2,191	2,311	121,611	5,241	126,852
1977	117,564	5,499	1,723	2,213	2,337	129,336	5,607	134,943
1978	129,718	6,116	1,610	2,367	2,621	142,432	6,000	148,432
1979	145,009	6,822	1,519	2,500	2,936	158,786	6,418	165,204
1980	161,297	7,558	1,386	2,650	3,265	176,156	6,877	183,033

¹Excludes estimated sales to restaurants and institutions.

²Includes eating and drinking establishments and trailer parks.

³Commissary stores and exchanges.

Table 3. Expenditures for Meals and Snacks

Year	Eating and drinking places ¹	Hotels and motels ¹	Retail stores, direct selling ¹	Recreational places ²	Schools and colleges ⁴	All other ⁵	Total
Million dollars							
1955	8,490	809	1,468	313	1,390	3,200	15,670
1960	10,505	1,028	1,716	421	2,082	3,412	19,164
1965	14,444	1,409	2,162	522	3,062	4,054	25,663
1970	22,617	1,894	3,325	721	4,475	5,863	38,795
1971	24,070	2,079	3,626	762	4,990	5,885	41,412
1972	26,588	2,375	3,911	832	5,370	6,197	45,273
1973	30,706	2,615	4,308	963	5,597	6,947	51,136
1974	34,643	2,829	4,712	1,167	6,293	8,006	57,650
1975	40,461	3,152	5,098	1,369	7,076	8,743	65,899
1976	46,354	3,692	5,457	1,511	7,846	9,231	74,091
1977	51,923	4,030	5,882	1,748	8,375	10,033	81,991
1978	58,055	4,821	6,331	2,002	9,028	11,142	91,379
1979	65,293	5,595	6,897	2,275	10,014	12,180	102,254
1980	70,954	6,035	7,467	2,620	10,787	13,368	111,231

¹Includes tips.

²Includes vending machine operators but not vending machines operated by other organizations.

³Motion picture theaters, bowling alleys, pool parlors, sports arenas, camps, amusement parks, golf and country clubs.

⁴Includes school food subsidies.

⁵Military exchanges and clubs; railroad dining cars; airlines; food service in manufacturing plants, institutions, hospitals, boarding houses, fraternities and sororities, and civic and social organizations; and food supplied to military forces and civilian employees.

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