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Price Lags In The Food Sector

Looking at Food...

This issue of the *National Food Review* looks at a variety of food-related topics, ranging from food consumption patterns to energy use in processing foods to food production effects of the Payment-In-Kind program.

The lead article, "Price and Demand Responses in the Food Sector" by Paul Westcott, analyzes the processes through which food prices and demand change. Carlos Sisco's article, "Energy Conservation in Food Manufacturing," looks at the processing sector's efforts to keep a lid on energy costs. Anthony Gallo's "Food Consumption Patterns: Concentration and Frequency" finds some fascinating indications of American eating habits. "Payment-in-Kind—New Life for an Old Idea" by Douglas Bowers examines the history of PIK and its likely impact on food production and prices.

Other articles focus on the design of proposed new nutrient labels, USDA's success in easing animal drug residue problems, and the array of standard *NFR* features.

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Price and Demand Responses in the Food Sector

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Three factors are often cited as determining retail food prices: prices farmers receive for their agricultural commodities; marketing costs for transforming these commodities into food products and delivering them to consumers; and consumer demand for food. However, changes in these factors are not immediately reflected in retail food prices—time is needed for impacts to work through marketing channels to consumers. This primarily reflects the time required to process and distribute agricultural commodities after they leave the farm. Additionally, processors, wholesalers, and retailers may follow marketing practices which delay price changes. And consumers need time to adjust their purchases to changes in income and relative prices of food products.

The interaction of these factors over time determines the magnitude, direction, and timing of retail food price movements. Furthermore, these factors affect the food-at-home and food-away-from-home markets differently. Consequently, price adjustments for food marketed in grocery stores differ from price adjustments for food eaten in restaurants, fast-food establishments, and cafeterias.

Major Food Price Determinants

Food marketing costs account for an average of 72 percent of consumer food expenditures—about 66 percent in grocery stores and about 83 percent away from home. These costs are affected by the general economy and the supply of marketing inputs used in both food and nonfood sectors. To illustrate, a downturn in U.S. economic activity last year resulted in weak demand for petroleum products and plastics. At the same time, supplies of these marketing inputs were relatively large. Consequently, prices for polyethylene resin—the major material used in plastic containers and plastic wrappers—dropped 26 percent in 1982, thereby holding down packaging costs in the food sector.

USDA measures the costs to transform domestically produced agricultural commodities into foods and bring them from the farm to retail markets. The major costs included in the food marketing bill are labor, packaging materials, transportation, before-tax corporate profits, and fuel and power (figure 1).

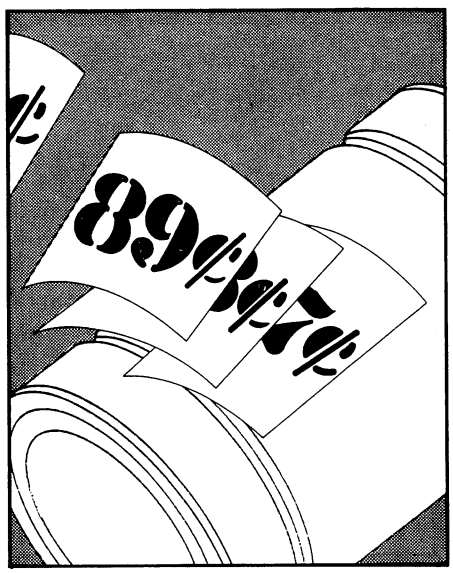
Labor accounts for about 45 percent of the marketing bill, and reflects employee wages, cost of living adjustments, employee benefits, and labor productivity. Packaging costs for paperboard boxes, plastic containers and wrapping materials, and metal and glass containers represent about 11 percent of the food marketing bill. Intercity transportation costs represent 7 percent, and before-tax corporate profits in the food industry account for about 6 percent. Direct-use energy represents about 5 percent of the marketing bill, and includes energy used in food processing factories and retail stores, but does not include fuels for transportation or used in manufacturing packaging materials.

Prices farmers receive for agricultural commodities reflect supply and demand conditions at the farm level and tend to be more volatile than marketing costs. One cause of this price volatility is the frequently crucial role of weather. Cold weather in Florida, for example, significantly reduced supplies of fresh vegetables and citrus fruit in both 1981 and 1982, pushing prices up. In contrast, ideal weather during the 1982 summer growing months in most areas led to record production of wheat, corn, and soybeans, pushing prices down.

Consumer demand reflects numerous factors, including income, tastes and preferences, and prices for nonfood goods and services. To illustrate, when real per capita disposable incomes showed little growth from 1979 to 1982, food demand was weak. This was probably a significant factor causing retail food prices to decline in real terms during this period.

Comparison Between Markets

Consumer expenditures for food eaten at home were about $255 billion in 1982, while expenditures for food away from home were about $95 billion. Significant



differences exist between the two markets and the processes which determine food prices in each.

A food price model developed in the Economic Research Service (ERS) shows that monthly price changes for domestic agricultural commodities affect retail food prices in these two markets differently (figure 2). In the food-at-home market, the largest change in retail prices occurs in the first month following the change in farm-level prices (first lag month), with no significant changes occurring beyond the second lag month. In contrast, retail price changes in the food-away-from-home market are initially small, but increase each period through the third lag month before diminishing through the sixth lag month.

Changes in food marketing costs were also found to affect food-at-home prices faster than food-away-from-home prices in this monthly model. Marketing cost changes were shown to have most of their impact in the initial month for food eaten at home, while effects are distributed through the fourth lag month in the away-from-home market.

Similar price response patterns were obtained from an ERS quarterly food price model. This model indicates that changes in 12 agricultural commodity prices and 6 food marketing costs impact

the food-at-home market faster and initially more sharply than they impact the food-away-from-home market. To illustrate, figures 3 and 4 show the effects on food-at-home and food-away-from-home prices over time resulting from a 1-percent change in cattle and energy prices, respectively.

A change in cattle prices primarily affects food-at-home prices in the initial and first lag quarters, with little impact occurring afterwards. Changes in energy prices have their greatest impact on food-at-home prices in the initial quarter, with smaller effects in the first and second lag quarters and no impact thereafter.

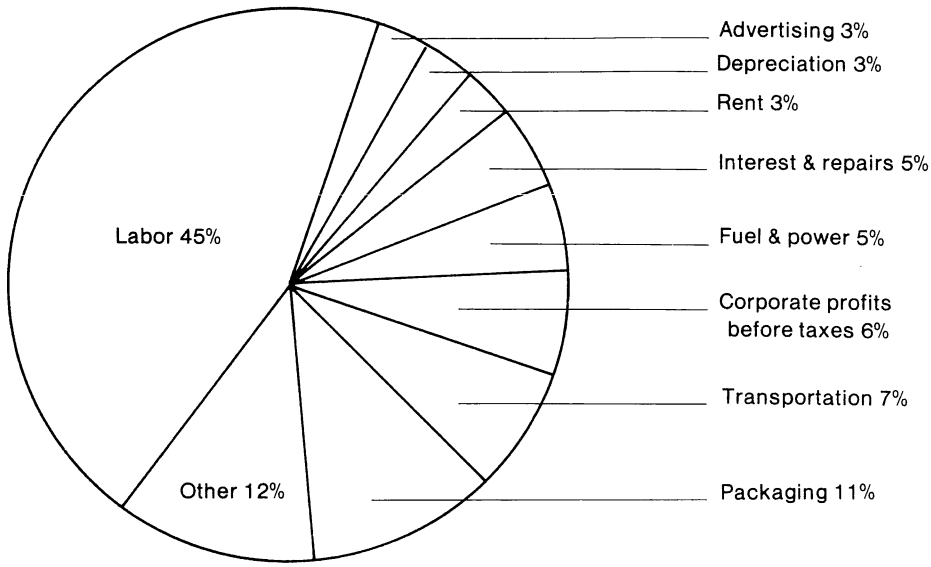
In contrast, changes in cattle and energy prices, which have little impact on food-away-from-home prices in the initial quarter, do have impacts extending through the fourth lag quarter. For both, the effects on away-from-home prices are greatest in the first and second lag quarters; cattle prices have their largest effect in the second lag quarter, while energy prices have their largest effect in the first lag quarter.

Retail food prices react similarly to changes in farm-level prices of the other commodities included in the quarterly model (hogs, broilers, turkeys, eggs, milk, wheat, soybeans, sugar cane, green coffee, fruit, and vegetables), to changes in costs for paperboard and glass bottles, and to changes in wage rates in meat packing plants, grocery wholesaling establishments, and retail food stores.

In another ERS study, conducted by R. M. Lamm, Jr., the effects of income on food demand were investigated. Figure 5 shows significant differences in the lagged impacts on food demand in the at-home and away-from-home markets in response to changes in total food and nonfood expenditures (which typically represent 90 to 92 percent of personal disposable income). This illustrates again that the adjustment process in the food-away-from-home market is distributed more evenly over a longer time period than for food eaten at home.

Demand adjustments in the at-home market are initially greater than in the away-from-home market, but then decline sharply from their peak in the initial quarter and fall below the away-from-home adjustments by the second quarter. In the away-from-home market, the largest demand response is also in the initial quarter, but the impacts decline more

Figure 1. Components of the Food Marketing Bill



Source: USDA, 1982 data.

Figure 2. Change in Retail Food Prices Resulting from a 1-Percent Change in Farm-Level Prices

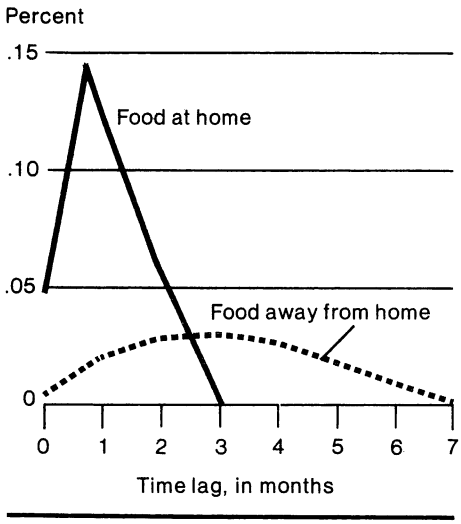


Figure 3. Change in Retail Food Prices Resulting from a 1-Percent Change in Cattle Prices

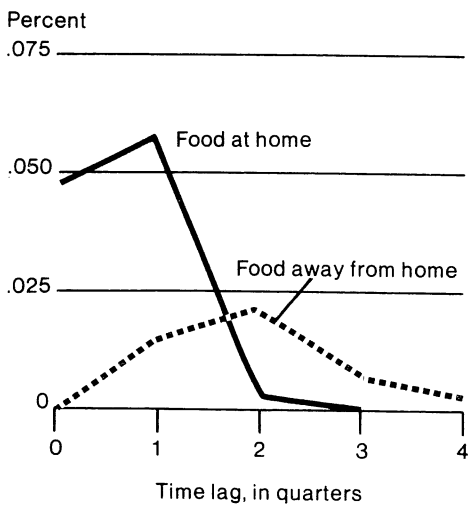
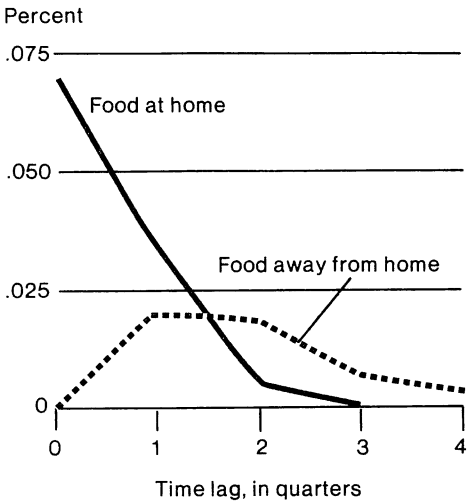


Figure 4. Change in Retail Food Prices Resulting from a 1-Percent Change in Energy Prices



slowly than in the at-home market. Importantly, the study notes, demand responses for food away from home are larger than those for food at home in the long run.

Explanations and Implications

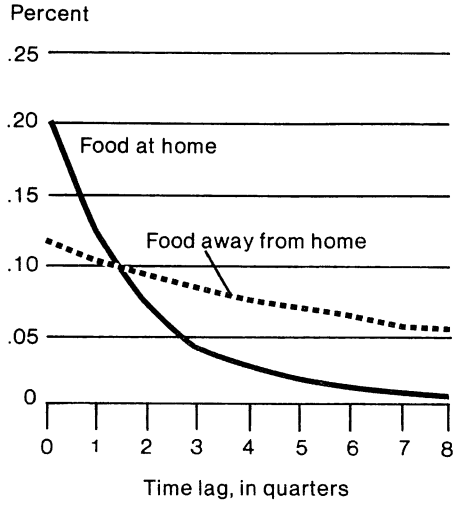
The different price response patterns of food at home and food away from home reflect differences in the two markets. Marketing costs play a relatively larger role for food away from home than for food at home because of preparation and serving costs. Because marketing costs usually vary less than farm-level prices, away-from-home food prices are generally less volatile than food-at-home prices. In contrast, farm-level prices play a relatively larger role for food eaten at home than they do for food away from home; farm-level prices account for 34 percent of food-at-home expenditures, but only 17 percent of food-away-from-home expenditures. This makes grocery store food prices more susceptible to the shortrun volatility of farm-level prices.

Additionally, retail price responses in the away-from-home market tend to be distributed over a longer period. This may reflect pricing practices in restaurants that result in delays in menu pricing changes. For example, menu printing costs may discourage frequent price adjustments in restaurants. In contrast, price changes in grocery stores can be made relatively easily and quickly. This market difference may also contribute to the more volatile nature of food-at-home prices compared with food-away-from-home prices.

The different demand responses to changes in consumer expenditures—which represent changes in income—also reflect differences between the away-from-home and the at-home markets. The Lamm study suggests that demand for away-from-home food may be relatively stable in the short run, reflecting meals purchased at work and previously planned purchases of meals on vacations and on business trips. In contrast, demand for at-home meals may be adjusted more readily in the short run—purchase decisions for food at home are initially more flexible because of the high frequency of trips to grocery stores and the shorter planning time horizon. However, in the long run, away-from-home food purchases adjust more than at-home food purchases because the former is more a luxury.

These study results have implications for policymakers. Retail prices and demand for food eaten at home respond faster and more sharply than the longer, relatively smooth response patterns in food-away-from-home markets. Therefore, policies that affect farm-level prices, marketing costs, or consumer incomes and expenditures can be expected to affect food-at-home demand and prices in a relatively fast and volatile nature, while impacts on food-away-from-home demand and prices can be expected to be smoother, but distributed over a longer adjustment period. □

Figure 5. Change in Consumer Food Demand Resulting from a 1-Percent Change in Consumer Expenditures



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Food Consumption Patterns: Concentration and Frequency

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How much variation exists in consumption of food items by individuals? How frequently are individual items consumed? Answers to these questions can offer valuable insight for food marketing, farm production, and nutrition research.

If researchers can determine what portion of the public accounts for most of the consumption of a given food item, marketing strategies can be targeted for these key customers, perhaps creating a greater demand for the farm commodities that are ingredients of that item. At the same time, nutrition researchers could better identify the scope of potential diet-related problems.

Such insight can be gained from analysis of only one of three USDA sources of data on how much of given food items Americans consume on an individual basis:

- "Per capita consumption" or disappearance is derived by adding food production, imports, and beginning stocks, and then subtracting exports, ending stocks, and nonfood use. The resulting annual food disappearance is divided by the population to yield an estimate of per capita food disappearance.
- The 1977-78 Nationwide Food Consumption Survey of Households listed foods brought into the home and used during a 2-week period by about 15,000 households.
- The Nationwide Food Consumption Survey of Individuals (NFCS) measured what 31,000 individuals actually ate or drank during a 3-day period, using interviews. Participants were selected to mirror the U.S. population composition.

The latter survey is the only measure of actual per capita consumption. It included foods eaten at home and away from home. The household survey covers only at-home consumption, while disappearance data offer little insight into consumption of specific food items. Only the intake data provides a means of estimating how often a food is eaten and by what proportion of the population.

Even so, the 3-day intake data have limited reliability because of the shortness of the test period. Although the 3-day samples were taken at different times to capture weekly and seasonal variations in food consumption, results may have been different had sessions been longer. Nevertheless, the data are useful indications of frequency and concentration of consumption.

Very sharp variations exist in the frequency with which different food items are consumed. The survey discloses which items were consumed on 1, 2, or all 3 days of the survey (table 1).

Some foods are eaten daily by many of the respondents. Nearly 6 out of 10 participants ate bread or dairy products daily. Another one in four ate bread 2 of the 3 days, while another one in six ate dairy

Table 1. Frequency of Consumption of Selected Foods

Food items	Portion of respondents consuming food each day	2 of 3 days	1 of 3 days
	Percent		
Coffee	39	6	5
Tea	16	10	12
Soft drinks	15	15	20
Dietary soft drinks	2	2	4
Beer	2	2	4
Wine	1	1	3
Eggs	10	16	29
Butter	6	8	17
Margarine	11	13	19
Bread	58	25	11
Cake	2	6	17
Cookies	—	2	9
Donuts	1	2	9
Crackers	2	6	18
Candy	1	3	13
Pasta	—	1	10
Rice	2	4	13
Cold cereals	12	14	17
Peanut butter	2	3	11
Red meat, poultry & fish	61	27	9
Red meat	21	34	30
Beef	6	22	39
Pork	6	14	31
Poultry	1	9	33
Chicken	1	7	31
Turkey	—	1	5
Fish	—	4	21
Milk	55	16	12
Ice cream	2	6	16
White sugar	19	11	14
Hamburgers & cheeseburgers	—	1	9
Frankfurters	—	2	15
Bacon	3	6	17

— less than 0.5 percent
Source: Nationwide Food Consumption Survey, 1977-78

Table 2. Portion of Respondents Consuming Selected Foods at Least 1 Out of 3 Days

More than 75%		Between 50 and 75%		Between 25 and 50%		Less than 25%	
Bread	93	Coffee	51	Tea	38	Dietary soft drinks	8
Red meat	85	Soft drinks	51	Butter	31	Cookies	12
Milk	83	Eggs	54	Margarine	43	Donuts	10
Potatoes	75	Lettuce	51	Cake	26	Candy	13
				Crackers	26	Pasta	11
				Cereal	44	Rice	19
				Poultry	43	Peanut butter	15
				Fish	25	Ice cream	24
				Bacon	25	Hamburgers	10
				Salad dressing	44	Frankfurters	15
				Tomatoes	28	Cabbage	10
				Orange juice	36	Carrots	5
				Sugar	44	Celery	5
						Cucumbers	6
						Onions	8
						Broccoli	6
						Apples	16
						Bananas	17

Source: Nationwide Food Consumption Survey, 1977-78

products that often. People tended to drink coffee daily, or not at all. About 4 in 10 consumed coffee each day, but almost half did not drink it at all. Only about 1 in 20 drank it 1 or 2 days out of 3.

Only one in five of the respondents ate meat daily, but two in three consumed meat items 1 or 2 days. Virtually no one ate fish or poultry daily, but a third ate poultry 1 day. Most ate eggs, but only once in 3 days.

Most sweets and snacks were eaten only 1 of 3 days, as were hamburgers and cheeseburgers, and pasta dishes. Only one in six respondents drank tea and soft drinks every day.

Consumption Patterns

Several clear patterns emerge from survey results showing the percentages of participants eating a given item at least 1 of 3 days:

- The four items consumed by at least three of four surveyed Americans were bread, milk, meat, and potatoes. Bread was the most widely consumed item, as

93 percent of the participants ate it at least 1 of the 3 days (table 2).

- Half consumed coffee, soft drinks, eggs, and lettuce (the only vegetable with a high frequency of consumption).
- About 3 out of 7 ate sugar, poultry, cereals, and margarine.
- Items least frequently consumed included individual fruits and vegetables, snack foods, and grain products such as rice and pasta. Apples and bananas, with about one respondent in six consuming them, were the leading fruits. Most individual vegetables were eaten by less than 1 in 10 during the 3-day period.

With many food items, a high portion of consumption is accounted for by a very small percentage of the population. Take baby food as an example. According to the weekly survey, the participants' households purchased an average of 6 ounces of baby food per week. On a per-person basis, this is about 2 ounces weekly—less than 7 pounds annually. However, almost all of this item is consumed by infants, so baby food use would be highly concentrated among a few households.

A way of measuring concentration is to determine what portion of a food item is consumed by 1 percent of the most avid eaters, or those at the 99th percentile. Those in the 1st percentile would be the

Table 3. Consumption Concentration of Selected Foods

Food items	The highest 1 percent of consumers: Account for ___ out of every 10,000 Americans	Account for ___ % of U.S. consumption	Consumption concentration ratio
Dietary soft drinks	7	4.79	64
Candy	13	5.25	40
Hamburgers & cheeseburgers	10	3.77	38
Pasta	15	5.02	34
Peanut butter	11	3.99	36
Rice	19	4.93	26
Cheese	40	7.89	20
Frankfurters	18	3.54	20
Bacon	25	4.77	19
Cakes	25	4.65	19
Butter	31	5.86	19
Fish	25	4.49	18
Cookies	31	5.13	17
Sugars	43	5.23	12
Margarine	38	3.99	11
Tea	45	4.90	11
Salad dressing	24	2.44	10
Ice cream	43	4.33	10
Cereals	44	5.50	13
Soft drinks	51	4.53	9
Poultry	43	3.35	8
Chicken	39	3.31	8
Turkey	6	3.53	59
Coffee	51	3.99	7
Eggs	54	3.52	7
Milk	83	3.73	4
Red meat	87	3.73	4
Beef	67	3.77	6
Pork	50	4.57	9
Bread	94	3.13	3

Source: Nationwide Food Consumption Survey, 1977-78

least avid eaters. Since many Americans do not consume any given item at all, a percentile of users would be well less than 1 percent of the total population.

For example, 93 percent of NFCS survey participants consumed no dietary soft drinks. Each percentile of users, then, comprised only 0.07 percent of the U.S. population (1 percent of 7 percent) or 7 out of 10,000 Americans. A percentile of bread users, the most widely-consumed item with 94-percent use, equaled 0.94 percent or 94 of every 10,000 Americans.

For comparison purposes, researchers devised a "concentration ratio" based on the amount consumed by the top percentile of users. The more widely consumed an item is, the lower its concentration ratio.

Useful Findings

By determining consumption concentration (table 3), manufacturers can consider whether to tailor marketing approaches for a relatively small, unique clientele group, or for a broader cross section of the public. According to survey results, the top percentiles accounted for between 3 and 8 percent of consumption of food items. However, the concentration ratios varied widely, even if the percentage of consumption accounted for by the top percentile was identical.

For example, the top percentile of hamburger and cheeseburger eaters ate 3.77 percent of all hamburgers and cheeseburgers consumed—a relatively modest amount. However, since only 10 percent of participants ate these products, the consumption concentration ratio (number per 10,000 users) was a very high 38. At the other extreme, the top percentile of milk drinkers accounted for 3.73 percent of consumption—about the same as for hamburgers and cheeseburgers. However, since a much higher portion of the population drinks milk, the concentration ratio was only 4.

Three clear patterns emerge from an examination of selected foods in the survey:

- Foods with a concentration ratio of less than 10—those with more evenly distributed consumption—were the more basic staples such as bread, red meats, eggs, coffee, and poultry. Soft drinks constituted the only exception.
- The middle category (10-20 concentration ratio) included cereals and sugars, fish, tea, margarine, cookies, butter, and bacon. Almost all of these items had higher portions of nonconsumers than did low-concentration items.
- High concentration items were largely hamburgers and cheeseburgers, and snack foods such as candy and dietary drinks. □

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Energy Conservation in Food Manufacturing

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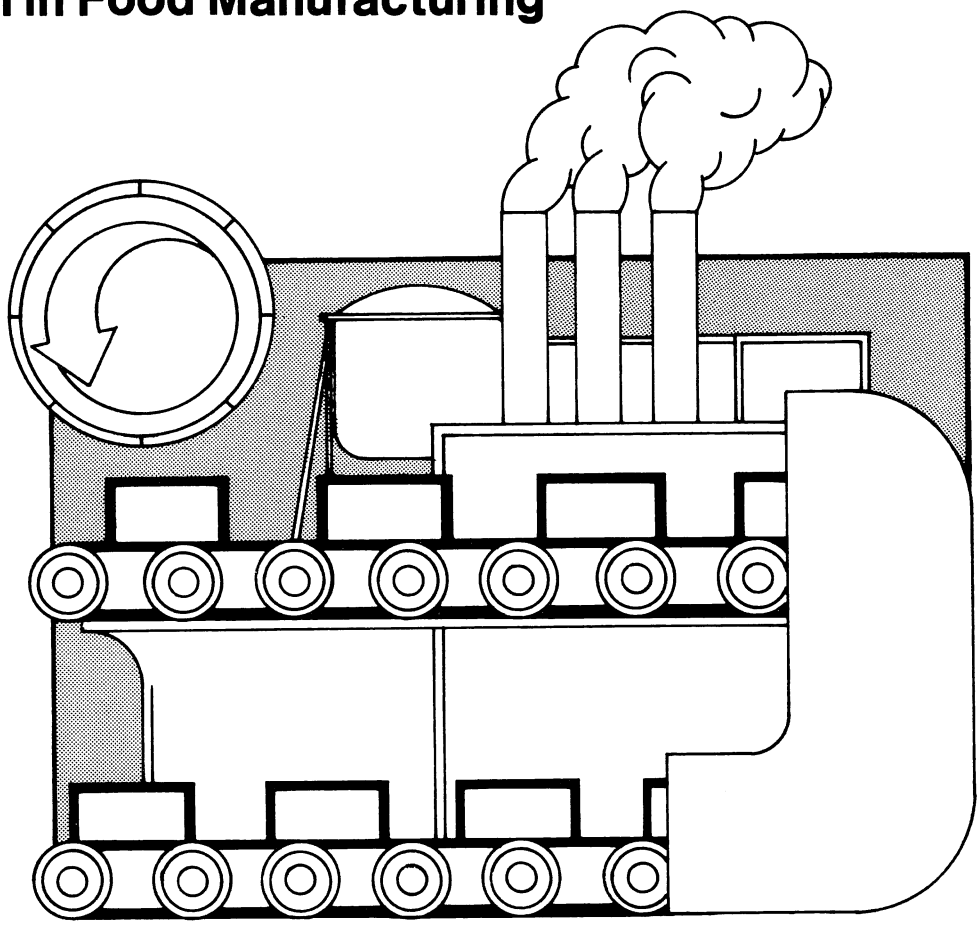


Food manufacturing accounts for 1 to 2 percent of all energy consumed in the United States and 7 percent of all energy used in the total manufacturing sector. Natural gas, fuel oil, and coal are the major boiler fuels used to generate heat, while electricity operates refrigeration, lighting, motors, and conveyors used in food manufacturing.

Total fuel consumption by the food manufacturing industry rose from 764 trillion British Thermal Units (BTU's) in 1954 to 948 trillion in 1980. However, evidence indicates that the industry can conserve substantial amounts of energy. Between 1972 and 1976, the industry surpassed the former Federal Energy Administration's target of 15-percent energy savings by 1980 compared to energy use in 1972. Recent data published in the *Census of Manufactures* and by the Federal Reserve Board indicate a continued decrease in energy use per unit of output in 1977-80.

During 1954-71, energy conservation occurred through the replacement of numerous small, older food manufacturing plants with larger, more energy-efficient ones and the adoption of energy-efficient technology in existing plants. In contrast, from 1972 to 1980, overall industrial prices for energy (coal, natural gas, fuel oil, electricity) increased 64 percent after adjusting for inflation, resulting in a decrease in energy use per unit of output.

Energy Use Profile

Coal declined in importance from 254 trillion BTU's in 1954 to 102 trillion in 1980 because of stricter air quality standards and, prior to 1973, declining real (inflation adjusted) prices for fuel oil (table 1). Conversely, over the same period, natural gas use increased from 267 trillion BTU's, or 35 percent of total energy consumption, to 485 trillion BTU's, or 51 percent of total energy use in food manufacturing.

The increase in natural gas use between 1954 and 1973 reflected a small decline in real gas prices prior to 1973 and increased use of energy-efficient gas boilers. In addition, the transmission and

Table 1. Use of Selected Fuels in the Food Manufacturing Industry, Census Years[1]

Fuel type	1954	1955	1962	1967	1971	1974	1976	1977	1978	1979	1980
						Trillion BTU's					
Total fuel oil	119	147	123	102	120	128	168	186	192	125	102
Distillate oil	NA	NA	32	47	63	67	72	72	74	46	34
Residual oil	NA	NA	91	55	57	61	96	96	118	79	68
Coal	254	198	200	150	102	69	75	77	91	74	102
Natural gas	267	249	336	353	489	471	444	426	417	448	485
Electricity	41	54	63	83	121	127	133	136	138	136	140

NA = not available.
[1]More recent data on total energy consumption in food manufacturing are not available.

Source: U.S. Bureau of Census. *Census of Manufactures.* U.S. Government Printing Office, Washington, D.C., Census Years. 1954-1980.

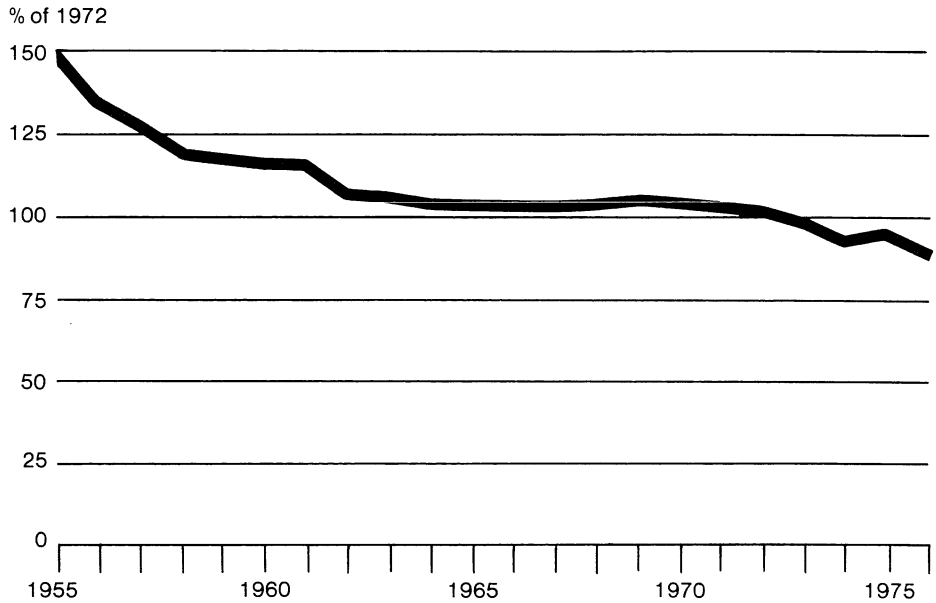
distribution network for natural gas increased substantially from 451,000 miles of pipe in 1955 to 897,000 in 1973, making gas available throughout the United States. However, during 1973-79, real prices for industrial natural gas rose 123 percent, and periodic shortages in the interstate market reduced consumption 8 percent.

Shortages of gas during the 1970's, the decline in coal use, and the overall growth of the food manufacturing industry raised fuel oil use from 119 trillion BTU's in 1954 to 192 trillion in 1978. However, since 1978, its use has decreased 47 percent because of the increase in reliable supplies of gas.

Food manufacturers use residual and distillate fuel oils. Residual is the heaviest and least expensive, and is what remains after the lighter and more preferred oils (distillate numbers 1 and 2) have been boiled off in the refinery process. The proportion of distillate and residual oil used changed after 1974 as food manufacturers sought to minimize the effects of the rising cost of oil caused by the Arab oil embargo of 1973-74. Distillate oil accounted for 67 trillion BTU's, or 53 percent of total oil use in 1974; however, by 1980, residual oil accounted for 68 trillion BTU's, or 67 percent of the total.

Unlike coal, natural gas, and fuel oil, electricity is used primarily as a source of mechanical or physical energy in refrigeration, lighting, product movement, grinding, and sorting. Use of electricity increased 241 percent from 41 trillion BTU's in 1954 to 140 trillion in 1980. Moreover, electricity's share of total energy used in food manufacturing increased from 5 percent in 1954 to 14 percent in 1980, reflecting the general inability to substitute boiler fuels for electricity in food manufacturing.

Figure 1. Index of Energy Use per Unit of Output for the Food Manufacturing Industry



Source: Lutton, Thomas. "An Econometric Analysis of Inter-fuel and Inter-Factor Substitution in the Food Processing Sector," Ph.D. dissertation, University of Maryland, 1980.

Energy Efficiency

In 1975, Congress passed the Energy Policy and Conservation Act (EPCA), which required the Federal Energy Administration (FEA) (now the Department of Energy) to develop energy efficiency improvement targets for each of the 10 largest energy-consuming manufacturing industries, including food manufacturing. The FEA established a target of 15-percent energy savings for the food manufacturing industry by 1980 compared to energy use in 1972, measured by energy use per unit of output.

USDA economist Tom Lutton found that from 1955 to 1976, energy use per unit of output in food manufacturing decreased at an annual average rate of 3 percent (figure 1). Also, from 1972 to 1976, energy use per unit of output decreased 17 to 20 percent. Thus, within 1 year after the FEA 1980 target was established, the industry actually surpassed it, indicating substantial energy conservation.

Energy conservation by the food manufacturing industry continued over the 1977-80 period. The *Census of Manufactures* reports energy use decreased 1.1 percent in that period, while the Federal Reserve Board's industrial output index shows production increased approximately 8 percent. The decrease in overall energy use as output expands points to further gains in energy conservation.

One of the causes of the increased energy efficiency in the 1954-71 period was increasing returns to scale. That is, greater efficiency for large capacity plants. The introduction of better technologies and the exit of old, less energy efficient manufacturing plants during this period also contributed to greater efficiency. In contrast, energy price increases appear to have been the primary factor encouraging energy conservation between 1972-80. Real industrial fuel oil, natural gas, and electricity prices rose 127, 117, and 30 percent, respectively, between 1972 and 1980. There is no evidence of major changes in technology or returns to scale during that period. The decline in energy

use per unit of output appears to have been due primarily to the substitution of nonenergy inputs such as capital improvements for conservation practices as energy prices increased.

Food manufacturers adopted a variety of successful conservation measures during the 1954-80 period, including: properly insulating steam lines, replacing inefficient energy intensive equipment, improving various management practices, and raising boiler/furnace efficiency. Since the easiest and most cost effective types of energy conservation have already been adopted, future substitution of nonenergy inputs for energy inputs may be more limited, particularly if energy prices do not rise relative to prices of nonenergy inputs.

Natural Gas Efficiency

Between 1954 and 1980, natural gas use in the food manufacturing industry increased 82 percent as real gas prices fell and the geographic availability of gas increased. Consequently, natural gas is the preferred energy input not only in food manufacturing, but the entire industrial sector as well.

Currently, gas prices are being partially deregulated according to a schedule established by the Natural Gas Policy Act of 1978 (NGPA). Energy analysts project that this may double real industrial gas prices by 1985. Such increases could have significant effects on food manufacturers who use 7 percent of the natural gas consumed in the industrial sector and 16 percent of all gas used in the food and fiber sector. Higher food manufacturing costs would push up consumer food prices. The extent of the increase in manufacturing costs and food prices depends on the ability of manufacturers to pass the higher costs onto consumers and to substitute other, less expensive, inputs for natural gas and introduce further energy conservation measures.

The substitution of other fuels for natural gas may occur as gas prices rise, resulting in a decrease in gas per unit of output relative to other energy/output ratios. Similarly, nonenergy inputs may be substituted for energy inputs to conserve energy and restrain food manufacturing costs and manufactured food prices.

Evidence suggests that for the 1954-71 period, natural gas use per unit of output increased for each of the nine major product groups that comprise the food manufacturing industry, largely as a result of abundant low cost supplies of natural gas. However, over the 1972-79 period, gas use per unit of output decreased dramatically, reflecting the substitution of fuel oil for natural gas. A study by the private Development Planning and Research Associates (DPRA) found that in 1972, two-thirds of the total energy used in food manufacturing was in the form of steam generated by boilers which can burn alternative fuels. The American Boiler Manufacturers reported that all of the boilers sold from 1965 to 1975 had multiple fuel burning capacity.

Implications

Future conservation of energy by the food manufacturing industry could be very limited if, as forecast for the next 3 to 5 years, the inflation-adjusted price of oil remains constant or declines relative to gas. Under these conditions, oil might well be substituted for gas in boiler fuel operations, decreasing gas per unit of output.

As relative input prices changed over the past 30 years so did input/output ratios. The extent of these adjustments to reduce energy costs are limited by technology. If the future price of natural gas increases relative to other input prices, it is reasonable to expect inputs such as capital equipment and fuel oil to be substituted for natural gas. Technological limitations could slow the rate of substitution. Moreover, if interest rates remain relatively high, investments in more energy-efficient capital equipment would be lowered despite investment tax credits. This would slow the substitution of capital for energy and dampen the growth in energy conservation. However, analysis indicates even when the substitution potential is zero, the maximum increase in consumer food prices as a result of gas deregulation would approach 1 percent.

With over 20,000 U.S. food manufacturing plants with varying potentials for conservation, the potential for gas substitution likely exists. Firms may well substitute fuels, adopt new energy saving technologies as they become available, and build larger and more efficient plants which will foster natural gas conservation and lower relative production costs. Such events would minimize the effect of higher gas prices on consumer food prices. □

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Payment in Kind—New Life for an Old Idea

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The payment-in-kind (PIK) program, recently put in effect for several 1983 crops, gives a new twist to an old idea—paying farmers with agricultural commodities instead of cash to reduce excess Government stocks.

If successful, the PIK program will strengthen farm prices without having much effect on consumer prices and should reduce both the number of bushels acquired under Federal price support activities and the amount of tax money that must be spent for storage and price supports. Retail food prices for 1983 are expected to advance only 2 to 4 percent compared with 4 percent last year. Market supplies of commodities included in the program (wheat, corn, grain sorghum, rice, and cotton) should not be much lower than last year, since farmers will sell the commodities they receive for land taken out of production. For the 1984 fiscal year, USDA expects to save about $3 billion on its price support operations, mostly from lower storage costs.

Surplus production has become one of the most serious problems facing American agriculture in recent years, lowering farm income, forcing greater reliance on uncertain export markets, and raising Government expenditures. Consumers, like farmers, have a vested interest in seeing surpluses brought under control before they detract from U.S. agricultural efficiency, which keeps supplies adequate and prices reasonable. With this in mind, let's take a look at PIK and how it evolved.

The new program launches a twofold attack on the problem—it, along with two previously announced diversion plans, substantially diminishes the acreage planted in the commodities where surpluses are greatest and lowers the Government's stocks by making payments to farmers in the same crops that they ordinarily grow. Some 82 million acres—about 35 percent of recent plantings—have been pledged for retirement this year.

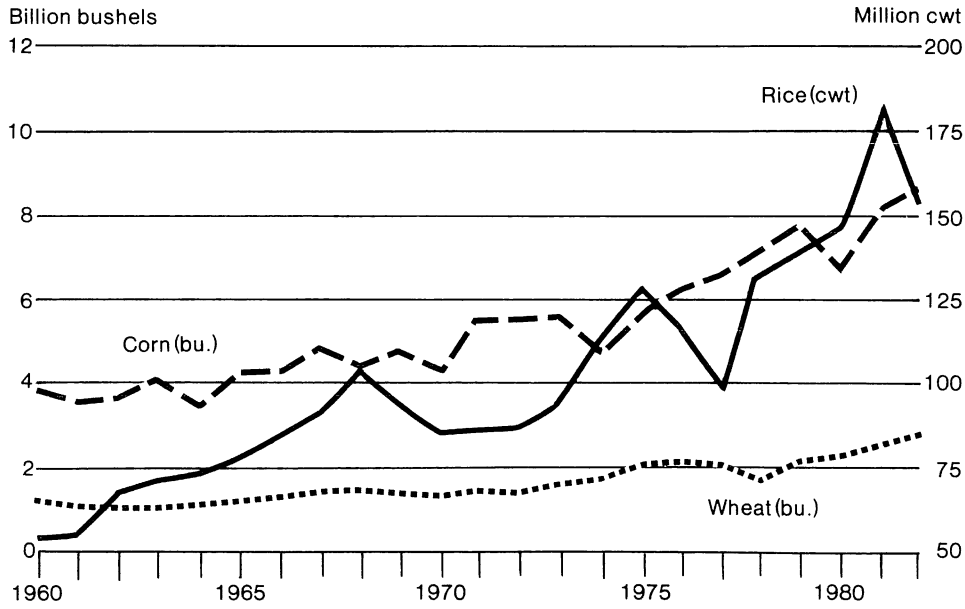
Payments in kind became necessary because of the deteriorating economic position of farmers and the rapid escalation of Federal expenditures for agricultural programs. A surge in exports beginning with the Soviet grain sale of 1972 caused a shift in USDA programs. Instead of aiming to prevent surpluses, the Government began to encourage all-out production. Farmers prospered as prices rose well above support levels. Total Government payments to farmers dropped from nearly $4 billion in 1972 to below $1 billion a year in the mid-1970's. Toward the end of the decade, however, prices declined as production increases outstripped demand.

In the early 1980's, export demand began to weaken because of the strong dollar, worldwide recession, and unusually large surpluses overseas. The value of U.S. farm exports fell 10.7 percent in 1982. USDA estimates that, without PIK, by the end of the 1982/83 production year U.S. stocks of wheat would be double and feed grains (corn, grain sorghum, barley, and oats), cotton, and rice would be triple their 1980/81 levels. Net farm income has dropped from $25.1 billion in 1981 to a projected low of $20.4 billion in 1982. Corn and wheat that brought $2.70 and $3.88 per bushel as recently as 1980 were selling for just $1.98 and $3.43, respectively, in October 1982. Low income combined with high interest rates have put farmers in a credit squeeze.

Meanwhile, the cost of USDA's price support operations soared. After passing the $1 billion mark again in 1977, payments to farmers topped $3 billion in 1982. Commodity Credit Corporation (CCC) acquisitions increased at the same time, as prices fell below support levels.

To address these problems, the Department chose PIK in preference to other options because it will simultaneously reduce expenditures, production, and stocks while holding out the hope of higher prices for farmers. Moreover, PIK is more in line with the Administration's preference for a more market-oriented agriculture because, while price supports

Figure 1. Annual U.S. Production of Wheat, Corn, and Rice



Source: U.S. Department of Agriculture.

will continue, farmers will be given an unusual number of options for the planting and disposal of their crops.

The Old PIK

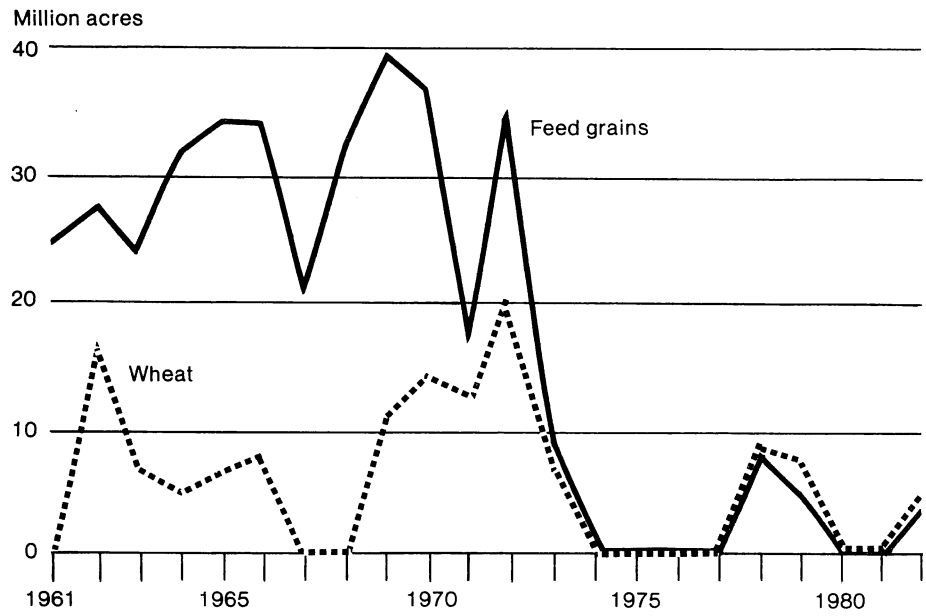
PIK is not a new concept, nor does it address a new problem. In the late 1950's and early 1960's, agriculture also had to contend with massive surpluses. High Government price support policies in the 1950's had encouraged farmers to produce far more than the market could absorb. Despite a decline in supports and an acreage diversion ("Soil Bank") program in the late 1950's, production of feed grains had continued to climb.

Partly to address the surplus problem, Secretary of Agriculture Ezra Taft Benson began using payments in kind in 1956 by shifting the subsidy paid to wheat export firms from cash to kind. Feed grains, cotton, and rice followed in 1958, dry milk products were added in 1962. But this form of PIK did not do enough to reduce Government holdings, and by the late 1950's the CCC's corn inventories had grown to a record 1.26 billion bushels. To make a substantial dent in Government stocks, a domestic PIK program linked to a reduction in acreage would be necessary.

In 1961, Secretary Orville Freeman revived an idea that had been tried briefly in the 1930's—converting Government price supports to in-kind payments. Farmers participating in price support programs who agreed to idle more than 20 percent of their corn and grain sorghum acreage would be entitled to receive a payment in kind for their additional diversion. This proposal aroused quite a bit of controversy because the Secretary also requested sweeping authority to release CCC stocks at market prices instead of the higher rate mandated by law. Many farmers feared that large sales of grain by the Government would severely depress market prices.

As finally passed by Congress, the Feed Grain Program of 1961 set up a payment-in-kind arrangement for corn and grain sorghum producers which permitted those diverting 20 percent of their 1959 base acreage to take an additional 20 percent out of production for a payment in kind equal to up to 60 percent of their normal yield. Farmers were paid with negotiable government certificates which could be redeemed for the commodity itself or for its cash value, in which case the CCC sold the grain at market prices. The great majority of farmers chose to receive cash.

Figure 2. Land Diverted from Production, Feed Grains and Wheat



Source: U.S. Department of Agriculture.

The 1961 Feed Grain Program attracted enough participants to take over 25 million acres out of production. This amounted to a 19-percent drop in planted corn acreage and a 27-percent drop in planted grain sorghum acreage between 1960 and 1961. In 1962, PIK was expanded to include barley and, in 1963, oats. From 1962 on, a total diversion of up to 50 percent was allowed and even price supports began to be paid partly in kind. The Food and Agriculture Act of 1965 renewed PIK for several years. In 1970, after CCC inventories had been at satisfactory levels for several years, PIK was allowed to expire. A PIK cotton program was also in effect briefly between 1965 and 1967.

The payment-in-kind programs of the 1960's were generally successful. The amount of land planted with crops in the program remained well below pre-PIK levels in most years. Total production, though, did not drop as much as originally hoped because in the early and mid-1960's average yields per acre advanced sharply for many crops due to use of better seeds, more fertilizer, and the fact that farmers usually selected their poorest lands for diversion. This was especially true for corn where the 1960 average yield of 54.7 bushels per acre jumped to 73.8 bushels by 1965. As a result, after an initial drop of 7.9 percent, corn production actually increased slightly between those years even though farmers harvested 16 million fewer acres.

The effect of PIK on prices is harder to determine. Critics charged that the CCC kept farm prices low by selling payment-

in-kind grain at whatever the market would bring. Average prices did remain low through the 1960's. But, because of production controls, smaller inventories, and higher foreign demand, prices after 1961 regained part of the ground lost in the late 1950's. Corn, for example, sold for $1.29 a bushel in 1956, slid to $1 in 1960, and then recovered to $1.17 in 1964. Grain sorghum brought $1.15 per bushel in 1956, $0.84 in 1960, and $1.05 in 1964. The story for barley and oats was similar. Cotton, though, fell in value between 1964 and 1966 despite the short-lived cotton PIK program. Had the PIK diversion program not been in effect, higher production would have put prices under greater pressure. Meanwhile, farmers within the Government's price support program enjoyed a solid increase in returns—from $1.06 per bushel of corn in 1960 to $1.25 in 1964 and $1.35 in 1967. Other price supports went up in a similar fashion. PIK's effect on consumer prices appears to have been small.

The New PIK

The new PIK program is much like the one from the 1960's, but with some important differences. As before, payments in kind are made for a voluntary withdrawal of acres from planting over and above the diversion required to receive price supports. In addition to the mandatory diversion of 20 percent for most crops, participants can also idle between 10 and 30 percent more of their wheat, corn, grain sorghum, rice, or cotton land for payments in kind.

But, unlike the earlier PIK, this one promises to be a true payment in kind. Whereas the great majority of farmers in the 1960's cashed in their PIK certificates and let the CCC market the grain, now farmers must actually take delivery of the commodity at their farms or at a local elevator. This is much more practical now than in years past because today more commodities are stored on the farm instead of in off-farm elevators. Farmers will receive their commodities at their normal harvesttime, either from the nearest elevator with Government owned stocks or from their own storage facilities if they have crops under loan. The Government will pay delivery charges.

Incentives for joining the PIK program are substantially greater now than before. In fact, this may be the most attractive diversion program ever offered farmers. Participants will receive 80 percent of their normal yield for PIK acreage except for wheat where, because much of it was already in the ground when the program was announced, payment will equal 95 percent of normal yield. This compares with a maximum for feed grains of 60 percent in 1961 and just 50 percent in subsequent years. In addition, farmers not immediately selling their PIK commodities will be paid storage costs for up to 5 months after delivery.

Federal crop insurance against natural disasters has also been made more attractive to participants. The $50,000 payment limit per farmer that normally applies to price support programs will not affect PIK payments. Furthermore, farmers in the new PIK program had an option unavailable before—they could submit bids to retire their whole planting of PIK crops. For 1983, 22 million acres have been signed up under this provision.

The results of the PIK program are difficult to predict but past experience and the administration's projections give at least a good idea of what is likely to happen. Production of PIK crops is expected to drop between 17 percent for grain sorghum and 33 percent for corn from last year, substantially higher than in the 1960's. These figures include both PIK and the regular diversion program announced last year. Whether production falls that much, PIK will certainly bring a sharp drop in Government-held stocks. Indeed, the payments in kind are substantial enough that the plan is not expected to be needed after 1984. The Administration projects that the fall in production combined with smaller surpluses of commodities will bring somewhat higher farm prices by next year. Wholesale prices of most PIK commodities have already risen since the program was announced in January. Overall retail food prices, though, will probably not increase more than 2 to 4 percent in 1983 and supplies should be adequate. In addition are the projected budget savings of $3 billion in fiscal year 1984. Not only will the CCC spend less for storage, it will not have to face the problem of how to dispose of deteriorating crops when market prices are well below the level at which the CCC is ordinarily required to sell them.

Another benefit will be in conservation. At a time when environmentalists have become increasingly concerned about the effects of full production on farm land, PIK and related diversions should remove some of the most fragile land from cultivation and put it into conservation uses.

The impact of PIK on local economies is more debatable. Seed, fertilizer, and farm implement producers and dealers have expressed concern that smaller plantings will hurt their businesses. In the case of the financially troubled farm machinery manufacturers, the result could be continued sluggish equipment sales for another year. But in the 1960's, when about as much acreage was affected, complaints about the effects of PIK on farm suppliers seem to have been rare. Overall sales of farm machinery and fertilizer grew steadily during the 1960's. Moreover, this PIK program has safeguards to prevent too much land from being taken out of production in any one area—no more than half the base acreage for any crop can be retired in any one county. If it works as hoped, farm income will be higher, not lower, and local businesses should ultimately benefit. □

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A New Nutrient Label?

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USDA and the Food and Drug Administration (FDA) are studying several new nutrition label formats which would give consumers information in a form that is easier to read and understand.

Formal discussion about the need for nutrient labeling began at the 1969 White House Conference on Food, Nutrition and Health. Regulations were drafted over the next few years and went into effect in 1975. FDA requires nutrient labeling only on products to which nutrients are added or about which claims relating to nutrition are made. Other products may voluntarily include nutritional information on their labels.

USDA does not have its own nutrient labeling regulations for processed meat and poultry products, but uses FDA's format or an abbreviated version on a voluntary basis. USDA maintains the same nutrient labeling regulations as FDA's for egg products.

Nutrient labels on products regulated by FDA must list serving size, number of servings per container, number of calories per serving, the quantity of macronutrients (protein, fat, and carbohydrate) expressed in grams per serving, and the amount of eight nutrients (protein, vitamin A, vitamin C, thiamine, riboflavin, niacin, calcium, and iron) expressed as percentages of the U.S. Recommended Daily Allowance (U.S. RDA). Declaring quantities of 12 additional vitamins and minerals is voluntary (figure 1). USDA uses this same format and also allows an abbreviated one listing just the quantities of macronutrients and calories on meat and poultry products.

In 1978, FDA's Food Labeling and Package Surveillance Survey found that over 44 percent of the dollar volume of packaged processed foods sold in retail stores carried nutrient labeling. Approximately one-third of all national brands of those products surveyed had nutrient labeling.

Current Label Flaws

In 1979, USDA, FDA, and the Federal Trade Commission (FTC) concluded that the current nutrient label could be more understandable and useful to consumers. Several problems with the nutrient label have been pointed out by experts and confirmed by recent consumer surveys:

- Many concepts on the label are complex. Terms such as riboflavin, thiamine, niacin, and U.S. RDA are not likely to be understood by most consumers.
- The different measurements (household measures, grams, percentages of U.S. RDA) used on the label may be confusing or make the comparison of nutrients complicated.
- The quantity of information presented on the label may be an overload for most consumers. If too much information is presented, consumers are unable to absorb, comprehend, and use it in making nutrition-related product evaluations.
- The information on the label is not organized for optimal communication. It is not grouped by type of information, and elements of public health concern are not emphasized.

Creating a simple and effective nutrient label is complicated for several reasons. Nutrition is a young science and, therefore, much disagreement exists among professionals. New discoveries, ideas, and possible links of various dietary elements to health problems are constantly coming to light. But nutrition is an area where many factors interact and it may be difficult to prove cause and effect. While an average or optimal intake can be suggested, a large number of variables play roles in any given individual's nutrient needs, including age, sex, body size, metabolism, genetic makeup, state of health, and degree of physical activity.

Still, an individual consumer wants the nutrition information that relates to his or her specific health needs and concerns. For example, consumers with heart disease may be particularly concerned with a food's fat and cholesterol content, while those with hypertension may be concerned with sodium content.

The problem of selecting information to present is compounded by the varied audience receiving the information. Consumers have different degrees of concern and expertise about nutrition and varying abilities to read, understand, and incorporate nutrition information into their behavior patterns.

Designing A New Label

Since 1978, USDA, FDA, and the FTC have conducted a series of opinion surveys of food industry people, professional nutritionists, and consumers, to better understand problems with the current food labeling, including the nutrient label, and to get suggestions for changes. In 1979, the three agencies published tentative positions on food labeling in the Federal Register and requested written comments from the public.

In 1980, Robert P. Gersin Associates, a New York design firm, was awarded a contract by FDA to design an array of nutrient labels that are simple, clear, and easily understood. The firm designed several formats after consultation with nutritionists and experts in the food industry. The goal was to devise technically accurate formats that minimize presentation cost, invite use by consumers, are applicable to all food products and packages, and are adaptable to future needs. A final decision about a design will be made later after further research.

Proposed Changes

The sample label used to display the suggested modifications was the nutrient label from a frozen pizza (figure 1).

The specific changes that were recommended to correct the flaws of the existing label include:

- Combine "nutrition information per serving" and "serving size-¼ pizza" to "nutrients per ¼ pizza," and eliminate statement of "servings per container" from nutrient label.
- List protein content only once. Currently, it is listed in both grams and percentage of U.S. RDA.
- Change the term "percentage of U.S. Recommended Daily Allowances" to "percent of daily allowance."
- Make optional the listing of some micronutrients that are now mandatory—riboflavin, thiamine, niacin, and those present in the product at less than 2 percent of the U.S. RDA.
- Add information of public health

Figure 1. Present Format for Nutrient Label . . . and Format with Suggested Changes

Nutrition Information Per Serving	
Serving Size	¼ Pizza
Servings per Container	4
Calories	240
Protein	9g
Carbohydrate	35g
Fat	7g
Percentage of U.S. Recommended Daily Allowances (U.S. RDA)	
Protein	20%
Vitamin A	15%
Vitamin C	8%
Riboflavin	10%
Thiamine	8%
Niacin	10%
Calcium	10%
Iron	6%

Present Format

Nutrients Per ¼ Pizza

Calories	**240**
Fat	7g
Protein	9g
Carbohydrate	35g
Sodium	640mg
Percent of Daily Allowance	
Vitamin A	15%
Vitamin C	8%
Calcium	10%
Iron	6%

Simplified Numerical/Numerical (Format 1)

Figure 2. Other Alternative Formats Being Considered

Nutrients Per ¼ Pizza

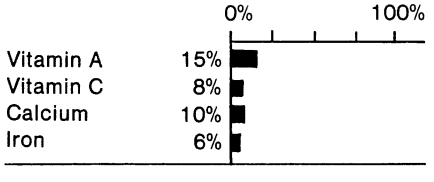
Calories	**240**
Fat	7g
Protein	9g
Carbohydrate	35g
Sodium	640mg
Rating of Daily Allowance	Rating:
Vitamin A	Good
Vitamin C	Fair
Calcium	Fair
Iron	Fair

Simplified Numerical/Verbal (Format 2)

Nutrients Per ¼ Pizza

Calories	**240**
Fat	7g
Protein	9g
Carbohydrate	35g
Sodium	640mg

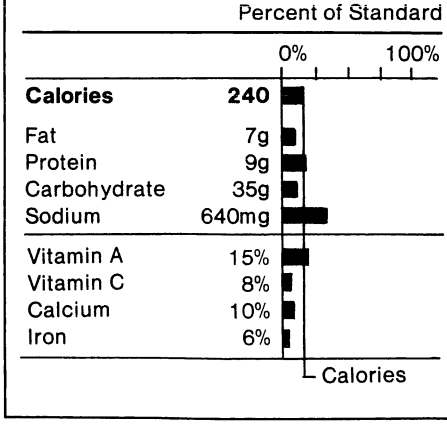
Percent of Daily Allowance



Simplified Numerical/Graphical (Format 3)

Nutrients Per ¼ Pizza

Percent of Standard



Simplified Graphical/Graphical (Unitary Nutrient Density) (Format 4)

concern to the label, such as the sodium content of the food.

- Rearrange some information. For example, put calories and fat at top of label.
- Group information by category, perhaps using lines to separate, making individual nutrients easier to find.
- Encourage the emphasis of high priority items such as calories by perhaps using bold face print.

In addition to considering these modifications, the design firm also looked at several methods of presenting the information using different combinations of words, numbers, and graphs, as well as different bases of calculating the amounts of various nutrients contained in products—the amount of iron per serving, per calories, or per 100 grams. A verbal scale as used in format 2 (figure 2) might rate the "daily allowances" of various nutrients by using terms such as none or trace, fair, good, very good, and excellent. Graphic displays like the one used in format 3 (figure 2) might use pie charts or bar graphs.

Problems arise with the current method of expressing nutrients per serving because serving sizes vary. The other two systems of expressing nutrient content, "nutrients per calories" and "nutrients per 100 grams" of the food, are somewhat more complicated. The "nutrients per calories" approach is a nutrient density method which relates a food's content of each of several different nutrients to its calorie content. This should let the consumer know whether the food contains "empty" calories or whether those calories are "full" of the vitamins and minerals required by the body. Expressing the amount of nutrients contained in 100 grams of a food seems inappropriate in the United States where the metric system is not in common use and most consumers would find it difficult, if not impossible, to even conceptualize 100 grams of food.

One option incorporates a nutrient density approach while disclosing the absolute amounts of the nutrients in the food (in grams, milligrams, and percentages of U.S. RDA). In proposed format 4 (figure 2), horizontal bars are drawn parallel to a standard and a vertical line is drawn through the whole label where the calorie line hits the standard. Thus consumers can easily compare the calories provided with the nutrients provided. While this approach may give consumers an idea of which nutrients may be found in good supply in different foods, it also has at least one drawback. Consumers would have to be educated that for some nutrients listed on the label, such as sodium and fat, limited consumption may be desirable. Therefore, the consumer's aim is not necessarily to meet 100 percent of the standard for all of the nutrients listed on the label.

There is also a problem with presenting nutrient information as a percent of a "standard," since a U.S. RDA does not exist for some nutrients. Format designers suggested augmenting the U.S. RDA with standards for fat, carbohydrates, and sodium from the National Academy of Sciences. However, the same confusion could arise over these standards as consumers have already expressed about U.S. RDA's: Where do they come from? What do they mean? How do they apply to me?

Testing Proposed Formats

FDA and USDA plan to test the four experimental nutrient labels on panels of consumers to determine if they are significantly easier to understand and use than the present label. A major related concern is that of information overload—too much information may be presented on the present label. One objective of FDA's planned consumer research is to determine the optimum amount of information consumers can absorb.

The consumer testing phase of the research plan includes the use of an eye camera to measure the effectiveness of various formats by determining what the eye focuses on, the length of fixation, and the sequence of fixations. This will disclose whether double checking of information occurred, and which information was not focused upon at all. To aid in understanding the information obtained from the eye camera experiments, participants will be questioned on nutrition knowledge and interest, diet-related health problems in the immediate family, use of nutrition information, and perhaps other health or lifestyle questions that could provide insight.

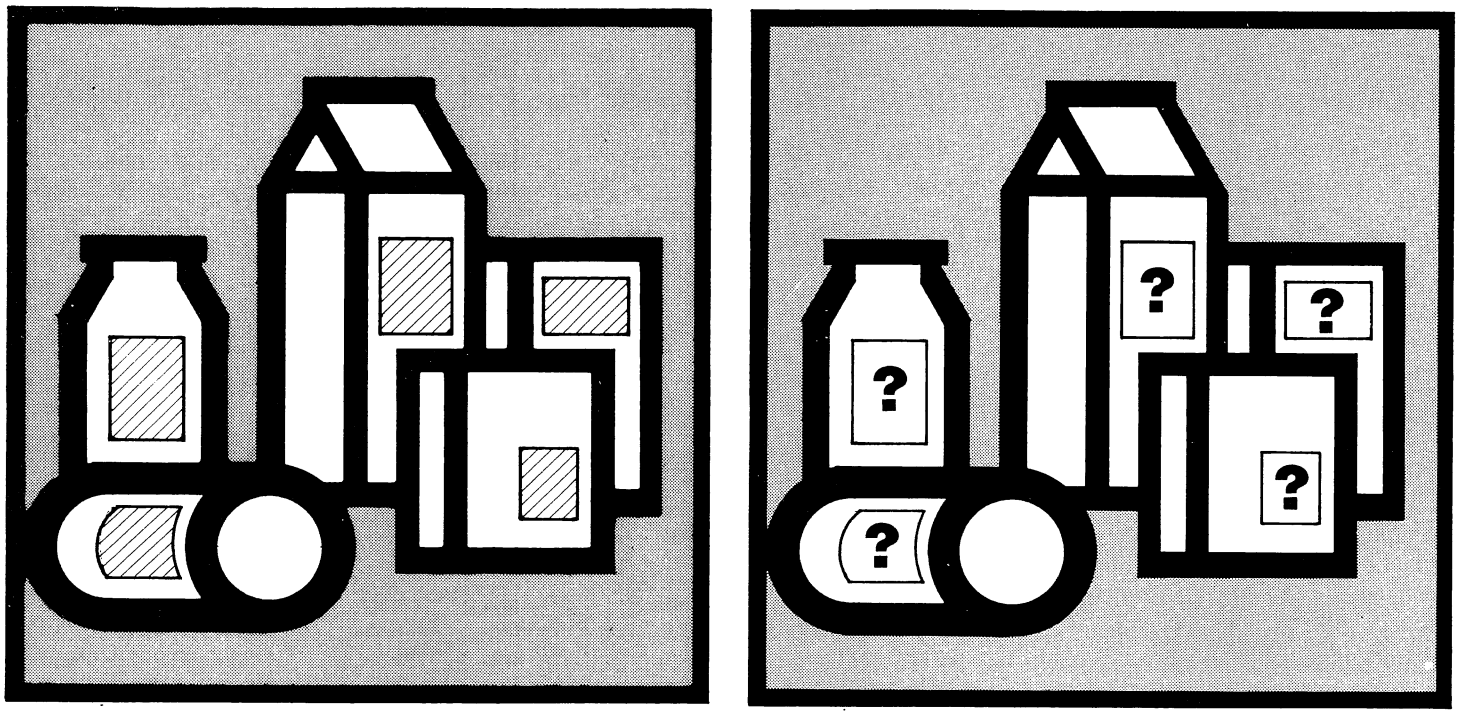
Approximately 800 consumers will be tested, including people with urgent health-related needs for nutrition information, those with a high interest in nutrition, those with a limited ability to process and use the information, and people who have a "typical" interest in nutrition.

Current plans are to finish the consumer research phase of the project around the fall of 1984. At that time, if one or more alternative formats are found to be significantly better than the current one, FDA and USDA will begin to work with food processors to test market the format or formats. It will be 3 to 4 years before a formal proposal for a new format is issued and perhaps several years before it is put into general use, if at all. If the results of this research indicate that the current label is more comprehensible and useful than any of the alternatives proposed, no change will be made.

Economic Considerations

It is difficult to estimate the cost of implementing a new format for nutrient labels. One important consideration is the length of time food processors have to comply with a new regulation. If a new format was required on all nutrient labels within a few months, costs could be up to five times more than if food processors were allowed to phase in the new label over several years.

It would be far less expensive if food processors were allowed to implement the new design as they routinely change their product labels. Meat and poultry processors do this once every 2 years on average, with all labels being changed within 8 years. If processors are changing labels to meet their own needs, the marginal cost of adding or changing the nutrient format at the same time could be a small fraction of the base cost. Redesigning labels and recasting the plates used to print the labels is estimated to cost between $300 to



$500 per label for meat products. Each additional change made at the same time can increase costs by another $100 to $200 per label.

Other factors that play a role in determining the costs of any nutrient labeling system include the number of different nutrients listed, which specific nutrients are to be listed, and the required accuracy of the information. The more nutrients listed, the more expensive the program becomes. The cost of analyzing food for nutritional content varies, with some nutrient tests being more expensive than others. Greater accuracy in nutrient declarations raises the cost of nutrient labeling by requiring more frequent product sampling and testing and increased record keeping. However, new and less expensive techniques for measuring nutrient content are being introduced on the market. But, many small-scale food processors may find nutrient analysis extremely expensive for the small volumes of specific products processed at one time.

An alternative to the continuous testing of products by each processor is using information from nutrient data banks. The establishment of such banks is initially costly. Information in data banks is pooled from a variety of sources. Nutrient content analyses are done on the same products grown or processed in various locations by different farmers and manufacturers. Average values for the nutrient content of these foods are established and entered into the bank for common use by all processors. One problem is that there are so many different food products that it would be a nearly impossible task to include information on all of them. Information from data banks would not be as accurate as that obtained from continuous monitoring of specific products, but it would be much cheaper over the long run, especially for small-size food processors. Several nutrient data banks currently exist at universities, in governments, and in industry, but at this time they are not yet generally used for nutrient labeling.

Any system of nutrient labeling, especially one with a simpler, more comprehensible format, provides benefits to the consumer, the processor, and perhaps even to the retailer. Consumers benefit in different ways depending on how they use the information. Some would benefit economically by using specific information to help prevent or control the severity of certain health problems, such as obesity or hypertension. Others may simply want to comparison shop to get the most nutrients for their food dollar or choose the more nutritious from two similar food products.

Processors and perhaps retailers could merchandise products on the basis of their nutrient content or the part they could play in a balanced diet. Firms providing such information may benefit from an image of caring about the public health, as seems to be happening with voluntary sodium labeling. Also, consumer confidence in a firm's products may be enhanced by the amount of nutrient information provided by the processor or retailer about these products.

However, findings from the current research on label formats will determine whether shoppers will see a new nutrient label in the grocery store sometime in the next 3 to 5 years. □

Regulating Animal Drug Residues

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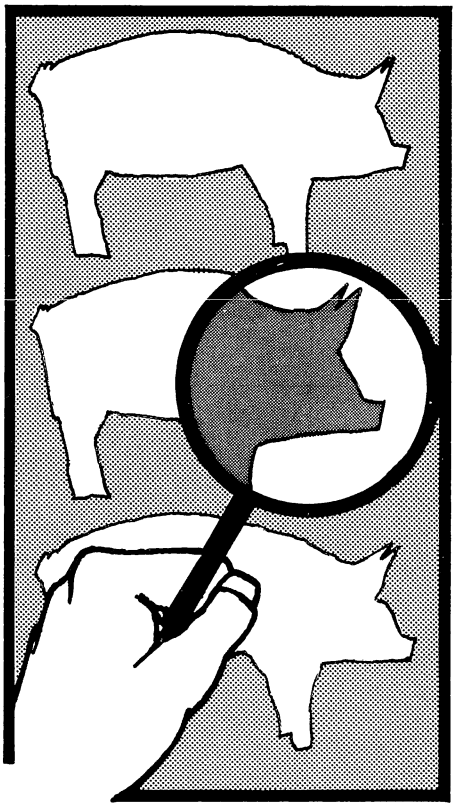
The USDA and the Food and Drug Administration (FDA) are constantly seeking new ways to reduce the cost of administering food safety programs while assuring the public of a safe food supply. Of particular concern are residues in red meat and poultry from growth promotion drugs fed to animals. Although these drugs reduce production costs and prices consumers pay for meat, residues may remain in meat tissue in amounts potentially hazardous to consumers. FDA has established maximum residue levels and compliance and enforcement strategies to prevent residue-contaminated meat from being sold. USDA is responsible for meat inspection and detecting residues. Administering these programs can be quite expensive.

In response to widespread excessive sulfa drug residue levels in swine in 1977, food safety regulators successfully used research and education to lower residue violation rates. Combined with increased inspection efforts, this approach was far less expensive and disruptive to markets than a drug ban or more complex changes in livestock marketing rules.

USDA and FDA worked with the swine, drug, and animal feed industries to eliminate the unacceptably high occurrence of sulfa residue violations so that swine producers could continue to use this important drug but consumer safety would not be jeopardized. The program identified the cause of the residue violations, educated producers in proper use of sulfa drugs to avoid illegal amounts of residues, and reduced the violation rate from 15 percent of tested swine to about 4 percent by 1981. Thus this program reduced overall consumer exposure to illegal sulfa residues for an estimated public expenditure of between $2.8 million and $4.8 million, with minimal adverse economic impacts on the swine and pork markets.

Drug Residue Regulation

Animal drugs—antibiotics and synthetic antibacterials—improve feed efficiency (the amount of weight gain per unit of feed) for livestock and poultry and



speed weight gains. The drugs also allow farmers to raise animals in large-scale confinement operations by suppressing outbreaks of diseases. Today, a high proportion of U.S. livestock and poultry raised for meat receive drugs, usually as an additive in feed.

If residue levels are too high, a person eating the meat could experience an allergic or toxic reaction, or possibly build up resistance to drugs helpful for human disease treatment. Tolerance levels—the maximum legal limits for residues—guard against excessive drug residue levels. For some drugs, an analytically zero tolerance level is mandated.

The law mandates that regulators ensure adequate food safety. FDA requires that animal drug manufacturers conduct certain tests needed to judge the drug's safety and efficacy and to establish tolerance levels and other conditions of use. FDA is responsible for ensuring that livestock and poultry producers and feed manufacturers comply with the rules designed to prevent residue violations. USDA meat and poultry inspectors randomly sample carcasses for residues.

Sulfa drugs have a long history of use in livestock production. Sulfamethazine and sulfathiazole are used in combination with other drugs for health protection and efficient production of swine. During the late 1970's, 70 to 80 percent of U.S. swine received a sulfa drug. Sulfamethazine was more extensively used than sulfathiazole because it is more effective. However, it is also much more likely to cause residue violation problems because it stays in the hog's system longer.

Many Violations

In the fall of 1977, USDA monitoring revealed that 15 percent of the slaughtered hogs sampled for sulfa drugs had residue levels above the legal maximum of 0.1 part per million (ppm). While sulfamethazine—the drug involved in over 99 percent of the sulfa residue violations in swine—is not known to be dangerous to humans at low levels, the high proportion of slaughtered swine containing illegal amounts was a concern.

Initially, regulators suspected that producers widely violated FDA regulations requiring that a swine's diet be free of sulfamethazine during the 15 days prior to slaughter. But, many producers indicated that they hadn't used the drug or were using it according to directions. Producers who had marketed swine found to be in violation suffered financially because they could not sell additional animals until a sample of five swine was tested and found to be in compliance.

Because sulfa residue violations were so numerous, regulators had to decide what corrective measures to implement. One set of options centered on restricting the availability of the sulfa drugs. Three types of bans were possible: a general ban on the use of sulfa feed additives, a ban of only sulfamethazine, or a restriction on sulfa additive use to the starter feeds fed to swine before they reach 40 to 50 pounds in body weight.

A USDA study predicted that a ban of the growth promotion use of sulfa combi-

nation drugs and the nitrofurans, another antibacterial, would cause a 5 percent reduction in the supply of hogs the first year and a 5 percent increase in hog prices. After 5 years, price differences of hogs with and without the ban would drop to approximately 1 percent. The Congressional Office of Technology Assessment, in a similar study, predicted that a ban of several feed additives (including the sulfa drugs) used by swine and poultry producers would decrease pork consumption by 2.5 percent and increase barrow and gilt prices approximately 10 percent over an 11-year period.

Under a universal ban, pharmaceutical producers of the sulfa combination feed additives would be the big losers. A ban would eliminate three sulfa products comprising over 50 percent of the swine feed additives market.

In contrast to a ban of both sulfas, only the popular sulfamethazine could be banned. Sacrifices in disease control and growth promotion would be less than with a ban of all sulfa drugs. A sulfamethazine ban would minimize consumer exposure to sulfa residues. But this option had the drawback that only one company imported or manufactured the competing drug, sulfathiazole.

Restriction of sulfa additives to feeds fed to swine at the early stages of growth would effectively extend the sulfa withdrawal time by 80 days prior to slaughter, more than enough time for a residue to be assimilated by the swine's body. However, this approach didn't deal with contamination in swine that results from drug carryover in feed handling equipment or from environmental sources such as manure.

An alternative option to banning sulfa consisted of increasing the tolerance level for sulfa drugs in swine from 0.1 ppm to 0.3 ppm or more, in effect defining the problem out of existence. It was argued that a slight increase in legal tolerances would reduce costs of regulatory compliance to hog producers and feed manufacturers without endangering public health. The FDA declined to raise tolerance levels without more complete experimental evidence and is currently conducting long term toxicity tests.

The third approach was to modify swine marketing and food safety inspection rules by:

- instituting mandatory inspection of all swine for sulfa residues;
- requiring an animal identification system for swine; and
- giving USDA quarantine powers on farms over swine believed to be contaminated.

These changes would decrease public exposure to sulfa contamination by requiring mandatory testing of swine instead of sampling only a small portion of the total. Inspectors and slaughterers would be able to trace ownership of contaminated swine to the responsible producers. This would eliminate the problem of all producers sharing part of the financial losses for condemned carcasses not traceable to their producers and identify where corrective measures are needed. Quarantine authority would prevent marketing and movement of suspect animals until they could be tested for residues.

The first two changes in swine marketing and inspection would have added many millions of dollars to public and private costs because at that time relatively simple and inexpensive methods had not been developed, tested, and adopted. Granting USDA quarantine powers raised difficult questions about how much authority the Government should properly exercise at the farm level.

The Sulfa Task Force

Food safety regulators tried to identify an option, short of banning sulfa feed additives for swine, that would lower residue violation rates but allow farmers to use this valuable production aid. They decided that another option—establishing a task force to increase producers' awareness of the residue problem and means of preventing violations—was more attractive. Also, producers had been complaining about the existing enforcement effort and in many cases didn't understand the causes of their residue violations.

So in 1978, USDA began an 18-month cooperative program with FDA to work with the swine, animal health, and animal feed industries to control the sulfa residue problem but permit continued use of these drugs for swine production. To encourage industry participation, FDA temporarily suspended its enforcement program, although swine residue sampling was intensified by USDA. The Sulfa Task Force conducted a research program to find the causes of residues and means of prevention, then followed up with a massive education program for the involved industries.

The researchers found:

- a very small amount of sulfa drug in swine feed can result in illegal residue levels;
- drug-free feed needed to finish raising swine for slaughter is easily contaminated because sulfamethazine in powder form is electrostatic and clings to metal feed-mixing, conveying, and storage equipment where it builds up until dislodged;
- sulfa-contaminated manure in rearing and holding pens can produce illegal residue levels; and
- programs to prevent sulfa contamination of feed and the environment of swine would reduce residue violations.

Furthermore, researchers were successful in developing simple and inexpensive sulfa residue detection methods that have the potential for widespread use to test feed, swine, and meat tissue on the farm and in slaughtering plants. Longer term research to determine whether sulfa residues in pork are a hazard to human health is still in progress.

The Sulfa Task Force employed a generally cost-effective combination of research, extension, and sampling procedures. The Cooperative Extension Service disseminated information to hog producers about sulfa problems, management procedures for preventing residues, and corrective steps to take in the event of a regulatory violation. FDA did not ban the use of sulfa or penalize offenders who participated in the program.

Increases in swine sampling for residues along with the associated publicity, on the other hand, contributed to producer expectations of increased costs of sulfa violations if they didn't participate. Sulfa violation rates dropped from between 10 to 15 percent in 1977 to 4 percent in 1981. The decrease in violations was adequate to defer any further regulatory actions to stop the use of sulfa drugs in swine feeds. The FDA suspects no significant health problems from current violation levels, although long term toxicity testing is still under way.

Industry Involvement

Four industries were involved in the sulfa case: the animal health industry that manufactures the feed additives containing sulfa drugs, the commercial feed industry that mixes the drugs into livestock feeds, the swine industry that uses the medicated feeds, and the meat packing industry that buys swine for slaughter and further processing. Each has a different type of economic interest in sulfa drugs—as products, as inputs into a production process, and as contaminants. The firm's economic interest in sulfa drugs naturally influences its interests in and reaction to animal drug regulation.

FDA, which has jurisdiction over the commerical feed industry, did not directly impose new standards on the companies producing the feed additives to solve the feed-mixing contamination problem. Neither did FDA sponsor new research into alternative mixing techniques. Only after swine producers decreased use of sulfa-medicated feeds did the animal health industry undertake research into ways to prevent problems of feed contamination. In 1981, after approximately 9 months of research, each of the three companies manufacturing sulfamethazine feed additives independently discovered a way to granulate the drug and end the electrostaticity problem.

Feed firms have only limited concern about the drug as a contaminant when no product liability problem occurs. However, USDA's increased sampling of swine identified more producer violations. This fact, combined with the evidence that contaminated feed was an important source of the problem, made the feed industry more conscious of the need to take measures to reduce drug-contaminated feeds.

Many feed firms adopted a variety of quality control procedures to cut down on sulfa contamination, including sequencing feeds so that drug-free feeds are mixed before feeds containing sulfa drugs, cleaning equipment more frequently and thoroughly, and switching from sulfamethazine to the less electrostatic sulfathiazole. However, many companies continued to mix sulfamethazine.

The swine industry was the focus of regulation and public scrutiny in the sulfa case. Interviews with swine producers in Michigan and Kansas indicated that the educational effort of the Cooperative Extension Service combined with increased USDA sulfa monitoring encouraged many hog producers to make at least marginal adjustments in their sulfa handling practices. They reported using less sulfa drugs, switching to water medication, or using the drugs for disease treatment only.

Interviews with swine buyers and meat packers revealed that this industry was not overly concerned about sulfa contamination in hogs. Meat packers faced minimal costs associated with sulfa residues and little risk from purchasing sulfa-contaminated hogs because sulfa residue testing was not done in the plant but, instead, samples were sent to regional labs. Tested animals were sold as usual except in cases of swine produced by farmers who had been found in violation previously and had to demonstrate compliance to inspectors. Many packers expressed the opinion that changes in marketing rules, such as quick, in-plant sulfa screening tests and an animal identification system, could increase the industry's concern because of the potential for disruptions to orderly marketing and potential economic losses.

Present Program

USDA continues to monitor slaughtered swine for sulfa residues. The agency is continuing to develop new, quicker test methods for detecting sulfa and other drugs in animal feeds, live animals, and meat tissue. Field testing of some of these simple and less expensive methods is expected to take place this year. If the field tests are successful, farmers, feed manufacturers, and inspectors will be able to take immediate measures to correct violations, reduce the potential for condemnation losses in the market place, and further improve the safety of food.

Last year, USDA's Cooperative Extension Service, working with industry groups, initiated the National Residue Avoidance Program to develop production management systems to reduce drug residue violations in all livestock and poultry. Information on ways to minimize drug residues will be developed and disseminated nationally to producers and other interested groups. □

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Food Spending And Income

Americans' disposable (after tax) personal incomes increased about $145 billion in 1982, over $15 billion more than did their expenditures on goods and services, according to U.S. Department of Commerce preliminary (February 1983) estimates.

Disposable Personal Income (DPI) exceeded an estimated $2,173 billion last year, while Personal Consumption Expenditures (PCE) topped $1,970 billion (table 1). Both DPI and PCE were about 7 percent higher than in 1981, thus consumer expenditures continued to take about 91 percent of DPI.

While the percentage of income used for PCE was the same as in 1981, the proportions going to components of PCE did change. Of the DPI, 44.5 percent was spent on services—up 1.4 percentage points from 1981. In contrast, the percentage of DPI allocated to nondurable goods declined from 36.2 to 35.1, and the por-

Table 1.—Personal Consumption Expenditures, Annually, 1975-82

Item	1975	1976	1977	1978	1979	1980	1981	1982[1]
				Billion dollars (Current)				
Total personal consumption expenditures	976.4	1,084.3	1,204.4	1,346.5	1,507.2	1,667.2	1,843.2	1,971.3
Nondurables	407.3	441.7	478.8	528.2	600.0	670.4	734.5	762.0
Food, beverages, and other groceries[2]	250.3	270.5	291.9	321.8	362.1	398.5	435.9	461.6
Food exc. alcoholic beverages	185.2	200.4	217.4	240.9	272.2	300.0	329.1	349.7
At home	139.4	149.3	160.4	177.0	199.8	221.5	242.9	255.0
Away from home	45.8	51.2	57.0	64.0	72.5	78.4	86.1	94.7
Alcoholic beverages	28.4	30.1	32.5	34.9	39.3	43.7	46.2	47.5
At home	18.5	19.4	20.7	22.0	24.8	27.7	28.8	29.3
Away from home	9.9	10.7	11.8	12.9	14.5	16.0	17.4	18.2
Cleaning and household supplies	12.4	13.2	14.3	15.7	17.6	19.4	21.4	22.5
Toiletries	9.5	10.2	11.2	12.3	13.6	14.7	16.1	16.9
Tobacco	14.8	16.5	16.6	18.0	19.3	20.7	23.1	25.0
Drugs	11.0	11.9	12.9	14.2	15.8	17.1	18.6	19.6
Clothing and shoes	69.6	75.3	82.6	92.4	99.1	104.7	114.6	118.7
Gas and oil	40.4	44.0	48.1	51.2	66.6	87.0	96.8	93.7
Fuel oil and coal	8.2	9.8	10.7	11.9	16.1	19.0	19.7	17.6
Other	27.8	30.2	32.6	36.7	40.4	44.1	48.9	50.9
Durables	132.2	156.8	178.2	200.2	213.4	214.3	234.6	242.5
Motor vehicles and parts	55.8	72.6	84.8	95.7	96.6	89.7	98.6	106.0
Furniture and household equipment	53.5	59.1	65.7	72.8	81.8	86.3	93.4	92.8
Other	22.9	25.2	27.7	31.7	35.1	38.3	42.6	43.7
Services	436.9	485.7	547.4	618.0	693.7	782.5	874.1	966.8
Housing	149.8	166.5	185.9	209.6	236.1	266.0	295.3	324.6
Household operation	63.3	71.6	81.1	90.1	99.3	111.7	128.9	144.4
Transportation	33.2	38.6	46.4	51.2	56.3	62.9	65.4	70.2
Personal care	10.7	11.3	12.6	14.0	15.2	16.6	17.4	17.3
Medical care	73.7	83.3	96.5	108.4	124.1	143.5	170.9	194.7
Personal business service	52.2	55.6	60.7	72.6	83.7	93.7	99.8	109.5
Recreational services	20.9	23.4	26.0	29.3	31.7	35.2	38.6	41.9
Other	33.1	35.5	38.3	42.8	47.3	52.9	57.7	64.2
Savings	94.3	82.5	78.0	89.4	96.7	106.2	130.2	142.7
Disposable personal income	1,096.1	1,194.4	1,314.0	1,474.0	1,650.2	1,824.1	2,029.1	2,173.4

[1] Preliminary.
[2] Contains some items not normally purchased in grocery stores.

tion going for durable goods fell from 11.6 to 11.2 percent.

A significant change in consumer expenditures for nondurable goods was a $3.1-billion decrease for gasoline and oil. This occurred despite a 3-percent increase in consumption; however, the gasoline and oil, and fuel oil and coal categories showed price declines, the only ones to do so.

Also within the nondurable group, Americans spent more for both at-home and away-from-home food last year as both consumption and prices increased. Food consumption increased approximately 2 percent despite the price increases, primarily because population grew by 2.2 million, an increase of almost 1 percent. Even so, per capita food consumption also increased slightly since overall inflation and after-tax income increased more rapidly than food prices—making food a comparatively better buy.

Overall, the proportion of DPI spent for food at home fell from 12 to 11.7 percent, continuing a decline that began in 1975. For the first time since 1979, the proportion of income set aside for food away from home increased—from 4.2 to 4.4 percent. □

Table 2.—Personal Consumption Expenditures, Annually, 1975-82

Item	1975	1976	1977	1978	1979	1980	1981	1982[1]
				Billion dollars (Constant 1972)				
Total personal consumption expenditures	780.2	823.1	864.4	903.2	927.6	930.5	947.7	957.0
Nondurables	308.2	321.9	333.4	344.4	353.1	355.8	362.4	365.0
Food, beverages, and other groceries[2]	185.4	193.4	199.6	201.7	206.7	210.6	212.2	214.0
Food exc. alcoholic beverages	132.3	139.7	145.2	146.1	149.3	152.6	154.2	157.4
At home	97.7	103.5	107.5	107.0	109.4	113.3	114.7	116.1
Away from home	34.6	36.2	37.8	39.1	39.9	39.3	39.6	41.3
Alcoholic beverages	24.7	24.4	25.4	25.7	26.8	27.6	27.2	26.6
At home	15.5	15.8	16.4	16.5	17.3	17.8	17.4	16.9
Away from home	9.1	8.6	9.0	9.2	9.5	9.8	9.8	9.7
Cleaning and household supplies	8.2	8.0	8.0	8.3	8.6	8.5	8.5	8.4
Toiletries	7.4	7.5	7.8	8.1	8.4	8.4	8.3	8.0
Tobacco	12.9	13.7	13.1	13.5	13.7	13.6	14.1	13.7
Drugs	9.7	10.0	10.2	10.4	10.8	10.7	10.6	10.0
Clothing and shoes	60.9	63.8	67.5	73.6	76.7	78.0	82.7	84.1
Gas and oil	25.6	26.8	27.7	28.3	27.4	25.7	25.7	26.5
Fuel oil and coal	4.2	4.6	4.4	4.7	4.7	4.0	3.5	3.1
Other	22.4	23.3	24.0	25.7	26.7	26.8	27.7	27.2
Durables	112.7	126.6	138.0	146.8	147.2	137.1	140.0	138.7
Motor vehicles and parts	47.5	57.3	63.5	66.9	62.6	53.8	54.2	55.6
Furniture and household equipment	45.9	48.9	52.9	56.5	60.4	60.1	61.6	59.1
Other	19.3	20.4	21.5	23.4	24.2	23.2	24.3	24.0
Services	359.3	374.7	393.0	412.0	427.3	437.6	445.2	453.3
Housing	128.3	134.9	141.3	148.5	154.8	159.6	162.6	165.4
Household operation	49.9	52.0	55.1	57.8	60.1	61.5	63.5	64.1
Transportation	29.6	30.8	32.7	34.0	35.0	34.1	32.4	32.5
Personal care	8.4	8.1	8.3	8.4	8.3	8.2	7.8	7.3
Medical care	59.8	62.9	66.6	68.6	71.7	74.4	78.6	80.3
Personal business service	41.1	41.9	43.3	46.3	48.5	50.2	49.9	50.9
Recreational services	17.9	19.1	20.4	21.8	22.2	23.1	23.8	24.5
Other	24.4	25.0	25.3	26.6	26.7	26.6	26.7	28.2
Disposable personal income	875.8	906.8	942.9	988.8	1,015.7	1,018.0	1,043.1	1,055.2

[1]Preliminary.
[2]Contains some items not normally purchased in grocery stores.

Table 3.—Allocation of Disposable Personal Income, Annually, 1975-82

Item	1975	1976	1977	1978	1979	1980	1981	1982[1]
				Percent				
Total personal consumption expenditures	89.1	90.8	91.7	91.3	91.3	91.4	90.8	90.7
Nondurables	37.2	37.0	36.4	35.8	36.4	36.7	36.2	35.1
Food, beverages, and other groceries[2]	22.8	22.6	22.2	21.8	21.9	21.8	21.5	21.2
Food exc. alcoholic beverages	16.9	16.8	16.5	16.3	16.5	16.4	16.2	16.1
At home	12.7	12.5	12.2	12.0	12.1	12.1	12.0	11.7
Away from home	4.2	4.3	4.3	4.3	4.4	4.3	4.2	4.4
Alcoholic beverages	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.2
At home	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.3
Away from home	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8
Cleaning and household supplies	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
Toiletries	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8
Tobacco	1.4	1.4	1.3	1.2	1.2	1.1	1.1	1.2
Drugs	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9
Clothing and shoes	6.3	6.3	6.3	6.3	6.0	5.7	5.6	5.5
Gas and oil	3.7	3.7	3.7	3.5	4.0	4.8	4.8	4.3
Fuel oil and coal	0.8	0.8	0.8	0.8	1.0	1.0	1.0	0.8
Other	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3
Durables	12.1	13.1	13.6	13.6	12.9	11.7	11.6	11.2
Motor vehicles and parts	5.1	6.1	6.5	6.5	5.9	4.9	4.9	4.9
Furniture and household equipment	4.9	4.9	5.0	4.9	5.0	4.7	4.6	4.3
Other	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
Services	39.9	40.7	41.7	41.9	42.0	42.9	43.1	44.5
Housing	13.7	13.9	14.1	14.2	14.3	14.6	14.6	14.9
Household operation	5.8	6.0	6.2	6.1	6.0	6.1	6.4	6.6
Transportation	3.0	3.2	3.5	3.5	3.4	3.4	3.2	3.2
Personal care	1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.8
Medical care	6.7	7.0	7.3	7.4	7.5	7.9	8.4	9.0
Personal business service	4.8	4.7	4.6	4.9	5.1	5.1	4.9	5.0
Recreational services	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9
Other	3.0	3.0	2.9	2.9	2.9	2.9	2.8	3.0
Savings rate	8.6	6.9	5.9	6.1	5.9	5.8	6.4	6.6
Disposable personal income	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Preliminary.
[2] Contains some items not normally purchased in grocery stores.

Domestic Food Programs

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(202)447-8489

U.S. food and nutrition programs began with emergency distribution of surplus food during the 1930's and grew into a system of food assistance programs totaling $15.7 billion in Federal outlays in fiscal 1982. Much of the growth in the programs occurred in the 1970's in response to Federal policies which encouraged participation. In contrast, current program operations reflect efforts to reduce Federal expenditures while retaining adequate nutritional aid for those most in need. To reduce costs, policymakers are trimming programs that extend back to the Great Depression.

Federal food assistance began in 1935 with the distribution of commodities acquired under government price support activities. The foundations for many of the current food assistance programs may be found in the direct distribution, school lunch, school milk, and food stamp programs of the 1930's. These programs grew out of Federal efforts to support farm prices and income, but they were abolished or severely limited by food shortages and rising farm prices of World War II. A school lunch program, however, was continued in the 1940's by supplying schools with cash payments to cover part of the cost of local purchases of nonsurplus food for lunches.

The National School Lunch Program (NSLP) was permanently authorized in 1946 to "safeguard the health and well-being of the Nation's children, and to encourage the domestic consumption of nutritious agricultural commodities." In 1947, approximately 6.6 million children received lunches at a Federal cost of $70.4 million, compared with 25.8 million children in 1981 at a cost of $2.4 billion.

The Special Milk Program was reestablished in 1954 to ease the growing surpluses of dairy products by increasing the consumption of fluid milk by children. Originally funded through the Commodity Credit Corporation (CCC), it has been funded as a USDA child feeding program since fiscal year 1962. Conversion to a child nutrition program assures that funding is independent of the quantity of surplus dairy products held by the CCC.

Other programs were initiated as pilot programs in the 1960's and later permanently authorized. The Food Stamp Program (FSP), for example, which provides participants with stamps to buy food through regular market channels, began as a pilot operation in 1961 and was made permanent by the Food Stamp Act of 1964. In 1965, total Federal expenditures for this program were $32.5 million. The School Breakfast program was created by the Child Nutrition Act of 1966 and was made permanent in October 1975.

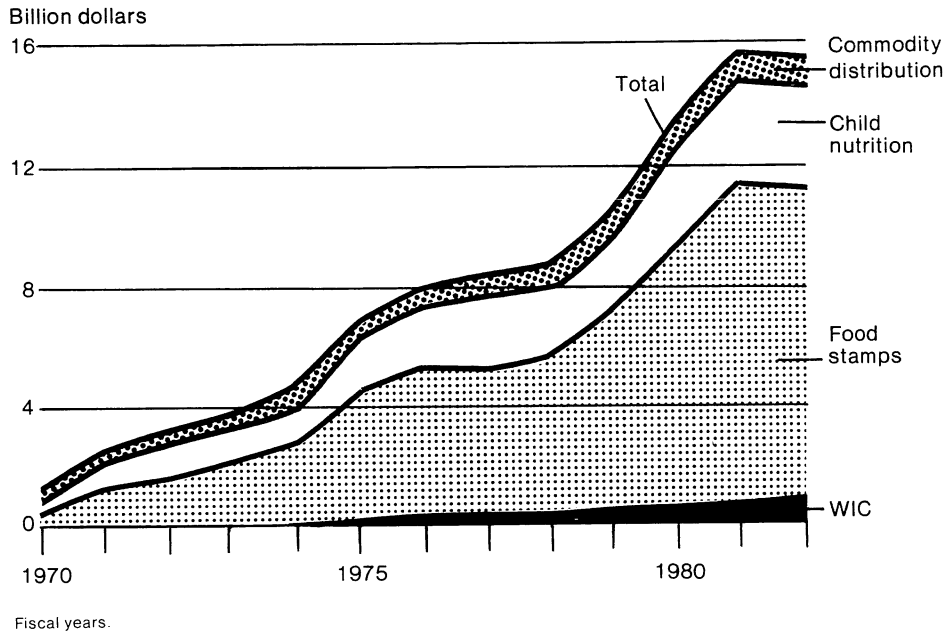
The 1970's were the beginning of an integrated system of Federal food assistance. Until then, food programs were primarily aimed at removing surplus commodities to help support farm prices and income. Growing awareness of domestic hunger in the late 1960's began to change that policy objective. Food programs began to be regarded as a form of income assistance to improve the diets of poor families and children.

As a result, emphasis shifted from supplementing diets with donated commodities to providing nutritionally balanced meals in many of the child nutrition programs. The FSP became the national approach to general food assistance in 1974 with the requirement that all counties offer the program. In addition, national standards for many of the programs replaced a mix of State and local regulations, guaranteeing uniform eligibility requirements and benefits.

These and other changes designed to make the programs more responsive to the needs of the low-income population contributed to the dramatic growth in the number of recipients and cost of Federal food assistance in the 1970's. Figure 1 illustrates the dominant theme of food assistance in the 1970's: the encouragement of participation and the liberalization of program benefits. Funding for the programs rose from $1.5 billion in fiscal year 1970 to $10.5 billion in 1980, an increase of 700 percent. Taking into account increases in benefits due to inflation, program costs rose over 300 percent.

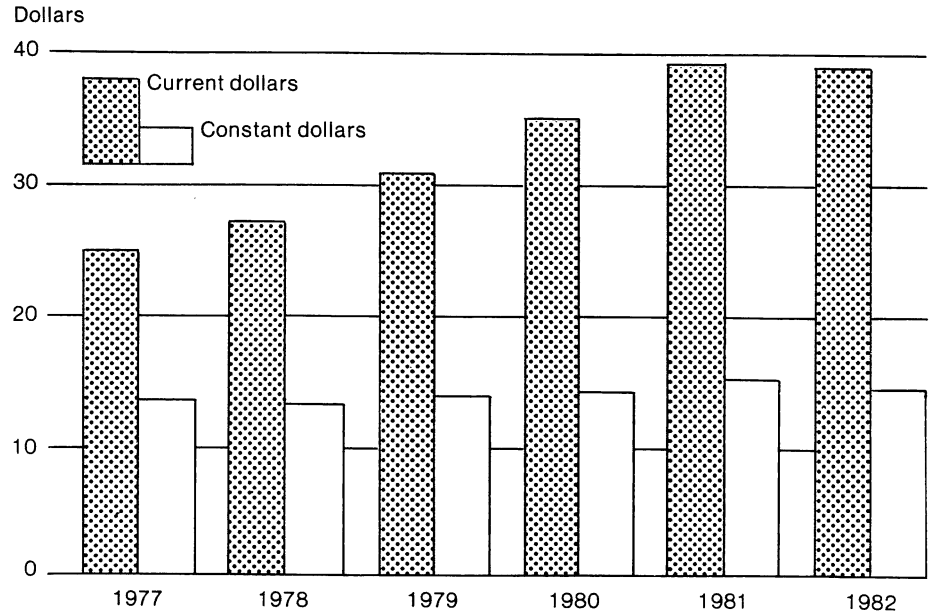
Federal cash expenditures for the five child feeding programs rose from more than $420 million in 1970 to nearly $2.7 billion in fiscal 1980. The FSP exhibited

Figure 1. Federal Expenditures for Domestic Food Programs



the largest growth in program size, increasing from 4.3 million recipients at a cost of $550 million in 1970, to an average of 17.7 million recipients at a cost of $6.5 billion in 1980. This represents a growth in Federal expenditures for the program of over 1,000 percent. Adjusting for increases in costs due to inflation, program expenditures rose by over 500 percent. The effect of inflation on food stamp benefits is further illustrated in figure 2. The actual value of per-person benefits rose from $24.71 in 1977 to $39.30 in 1982. In contrast, the value of benefits, adjusted for inflation, increased from $13.22 in 1977 to only $14.25 in 1982.

Figure 2. Average Monthly Food Stamp Bonus per Person



1982 estimated. Bonus is portion of food stamp allotment received free. Purchase requirement was eliminated in early 1979; thereafter, bonus equals total food stamp allotment. Constant dollars (deflated by CPI for food at home) are 1967 dollars.

New Directions for Food Aid

Current efforts to reduce Federal expenditures are reflected in an increasing number of legislative changes in program eligibility and benefits. The stated intent is to focus food assistance on those deemed most in need, while reducing Federal outlays. The result has been, for many of the programs, the first significant decreases in participation and funding levels in over a decade.

The Omnibus Budget Reconciliation Acts of 1981 and 1982 and Title XIII of the Agriculture and Food Act of 1981 have significantly changed the scope and operation of the food stamp and child nutrition programs. In general, the legislation mandates stricter income eligibility criteria, reduces the frequency of cost-of-living adjustments, lowers the subsidies for the child feeding programs, and increases efforts to reduce fraud and abuse.

Provisions affecting the NSLP have contributed to a decline in average participation from 27.1 million children in fiscal 1980 to 23.1 million in 1982. Reduced Federal subsidies have led schools to charge higher prices for lunches, usually up 15 to 25 cents. In addition, the maximum charge for a reduced-price lunch has doubled from 20 to 40 cents.

Other changes contributing to decreased participation in the NSLP include stricter eligibility criteria for free and reduced-price meals and a 1981 provision which limits participation in the child nutrition programs by private schools to those with an average annual tuition of $1,500 or less per child. Approximately 2,700 schools dropped out of the school lunch program between March 1982 and a year earlier as a result of these program changes.

Stricter eligibility guidelines have also been instituted for the FSP. Other cost-cutting measures instituted for the program include: a temporary reduction in the rate at which benefits are adjusted to reflect changes in food costs; a reduction in administrative expense payments to States that fail to reduce underissuances, invalid eligibility decisions, and payment errors sufficiently; elimination of benefits under $10 during the first month of an applicant's eligibility; prorating initial month's benefits; and a delay in adjustments in the standard, medical, and child-care deductions.

The results of the changes in the food assistance programs may be seen in the annual expenditure and participation data (figure 1). The Federal cost of the food assistance programs fell from $15.9 billion in 1981 to $15.3 billion in fiscal 1982. The cost of the FSP fell slightly from $10.6 billion to $10.4 billion. Expected savings from the program changes have been partly offset by cost-of-living adjustments in benefits and increases in participation due to a deteriorating employment situation.

Expenditures for the NSLP declined from $2.4 billion in fiscal 1981 to $2.2 billion in 1982 in response to program changes. This represents an 8.4-percent decrease in program costs. The cost of the Child Care and Summer Food Service Programs fell by 8.7 and 15.5 percent, respectively.

The largest percentage decrease—78.7 percent—occurred for the Special Milk Program where expenditures fell from $100.3 million to $21.3 million. This was in response to a provision which limits program operation to schools not offering the NSLP or other meal service author-

:ed under the Child Nutrition Act of 1966. As a result, the number of schools, child-care institutions, and summer camps participating in the program decreased from 85,490 in March 1981 to 2,270 in July 1982.

Only two programs, the Special Supplemental Food Program for Women, Infants, and Children (WIC) and the Commodity Supplemental Food Program (CSFP), showed increases in funding between fiscal year 1981 and 1982. Both programs provide nutritional benefits to pregnant and nursing mothers and children up to 6 years of age. Food and administrative costs for the WIC program increased because of greater program participation and a change in the funding formula for administrative costs (*NFR*-20). Participation in the CSFP increased 8.3 percent from 114.8 million in fiscal year 1981 to 124.3 million in fiscal year 1982. Greater amounts of commodities have been made available through the program, thereby increasing the number of persons who can participate. □

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Wayne Rasmussen and Gladys L. Baker. *The Department of Agriculture.* New York: Praeger Publishers, 1972, pp. 135-140.

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Food and Nutrition Legislation

Darrell Hofland
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Since the 98th Congress convened January 3, congressional committees have dealt with many food and nutrition related bills.

The following are some major bills that were under consideration this spring:

Food Safety/Labeling

H.R. 17—Rep. Neil Smith (IA)

To amend the Federal Food, Drug and Cosmetic Act to require that certain foods intended for human consumption be labeled to show the amount of sodium and potassium they contain.

H.R. 83/H.R. 2174—Rep. Cardiss Collins (IL)/Rep. William Hughes (NJ)

To amend the Federal Food, Drug and Cosmetic Act to make the adulteration of retail food, drugs, and cosmetics carried out for the purpose of causing death or injury a federal crime.

H.R. 299—Rep. Robert Roe (NJ)

To amend the Federal Food, Drug, and Cosmetic Act and the Fair Packaging and Labeling Act and to otherwise require the labels on foods and food products to disclose all of their ingredients and any changes in their ingredients, their nutritional content, accurate weight data, storage information, their manufacturers, packers, and distributors, their unit prices, and to provide for uniform product grading and prohibit misleading brand names. Currently, much of this information is supplied only voluntarily.

H.R. 968/S. 89—Rep. Thomas Foley (WA)/Sen. Orrin Hatch (UT)

To amend the Saccharin Study and Labeling Act to extend by 24 months the period during which the Secretary of Health and Human Services may not prohibit or restrict the sale or distribution of saccharin or products containing saccharin.

H.R. 1563—Rep. Berkley Bedell (IA)

To amend the Federal Meat Inspection Act to require that imported meat and meat food products containing imported meat be labeled "imported," and to require that certain eating establishments serving imported meat inform customers of that fact.

Food Stamps/Elderly

H.R. 664—Rep. Edward Roybal (CA)

To amend the Food Stamp Act of 1977 to require that individuals who are elderly and disabled and who live in certain types of group living arrangements be treated as individual households for the purpose of identifying food stamp recipients.

H.R. 695/H.R. 1022—Rep. Arlan Strangeland (MN)/Rep. Philip Crane (IL)

To provide that each State must establish a workfare program, and require all residents who are receiving benefits or assistance under the Aid to Families with Dependent Children, food stamp, and public housing programs to participate in the program, as a condition of the State's eligibility for Federal assistance.

Food Assistance

H.R. 1396—Rep. Barbara Kennelly (CN)

To require the Secretary of Health and Human Services to provide a grant to administer a demonstration program for assisting communities and nonprofit organizations in providing emergency food and shelter.

H.R. 1590—Rep. Leon Panetta (CA)

To give emergency feeding centers priority in receiving Commodity Credit Corporation (CCC) commodities and to fund the commodity distribution program. Currently, emergency centers receive commodities only after international commitments and CCC sales have been made.

S. 17—Sen. Robert Dole (KS)

To expand and improve the domestic commodity distribution program by further utilizing government-owned stocks for food assistance to the needy. In addition to the free dairy products currently distributed, USDA would also be required to donate surplus wheat, rice, corn, and other foods if available.

School Lunches/Nutrition and Children

H.R. 7—Rep. Carl Perkins (KY)

To make permanent the appropriation authorizations for nutrition, education and information program, supplemental food programs, and state administrative expenses under the National School Lunch Act and Child Nutrition Act of 1963. USDA's authority to purchase commodities for school lunch programs when CCC commodities are not available would also be made permanent. Currently, appropriations for these programs must be debated every couple of years.

H.R. 904/S. 302—Rep. Bob Traxler (MI)/Sen. Donald Riegle (MI)

To amend the Child Nutrition Act of 1966 to permit eligibility in the special milk program to schools which participate in a meal service program. Under present legislation, schools cannot participate in both programs at the same time.

H.R. 1162—Rep. Mario Biaggi (NY)

To amend the National School Lunch Act to require that the Secretary of Agriculture provide funding for distributing, processing, and handling agricultural commodities made available under Section 14 (dealing with the commodity distribution program) to schools. At this time, there is no funding for these activities.

H.R. 1513—Rep. Biaggi (NY)

To amend Section 14 of the National School Lunch Act to require USDA to make all CCC-held commodities not obligated available for distribution in the National School Lunch Program within 60 days after passage of this act. Under existing laws, only dairy products are available for distribution in the National School Lunch Program. □

Couponing's Growth in Food Marketing

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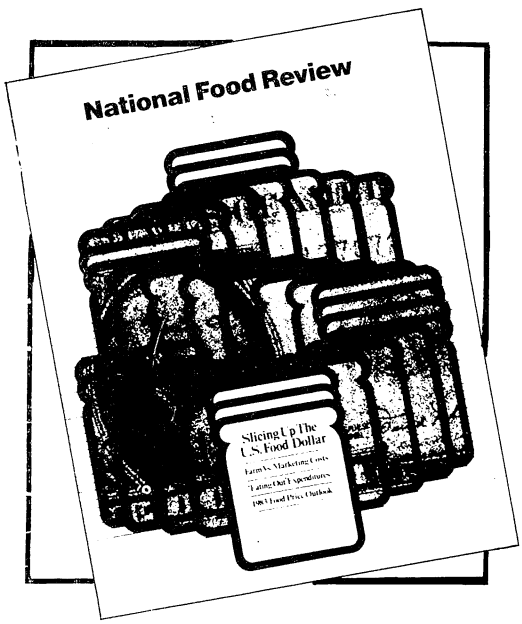

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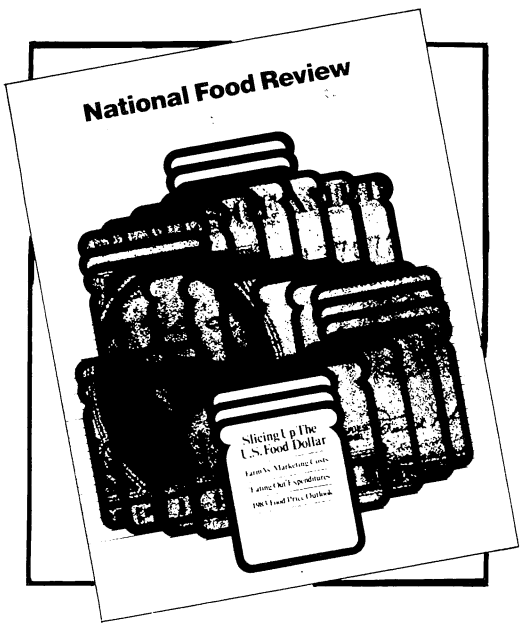

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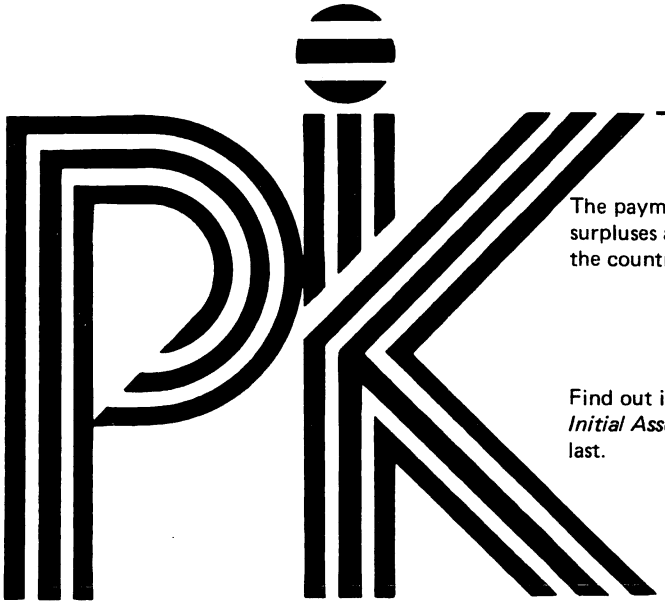

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