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AGRICULTURAL ECONOMICS RESEARCH

A Journal of Economic and Statistical Research in the
Agricultural Marketing Service and Cooperating Agencies

Volume VI

APRIL 1954

Number 2

Supply-Utilization of Agricultural Food Products

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In Consumption of Food in the United States, 1909-52,¹ there is presented for the first time an "index of supply-utilization" of farm products having food use. This new index breaks down the combined utilization of such products, on a farm-value basis, both according to sources of supply and according to use and disposition. The breakdown is given for each year and in terms of time series relative to the base period 1947-49. Current data of the index are now published at regular intervals in The National Food Situation.² This article is a preliminary report by the authors of the new index. It explores some of the uses of the index, suggests further problems to which it may apply, and presents comparative trends among commodity components that were developed in its preparation. Research is continuing toward preparation of a bulletin developing these subjects and extending the index to include non-food farm products.

FOR MANY YEARS agricultural economists have tried to appraise changes in American agriculture. These changes are the net results of complex economic and physical factors which affect the output of our many farm products. Economists realize that only through careful study of past changes can they understand the relative significance of the forces that brought them about and that only with such understanding can they do a reasonably good job of forecasting future changes.

¹ UNITED STATES BUREAU OF AGRICULTURAL ECONOMICS. CONSUMPTION OF FOOD IN THE UNITED STATES, 1909-52. U. S. Dept. Agr., Agr. Handbook 62, September 1953, pp. 2-28.

² UNITED STATES AGRICULTURAL MARKETING SERVICE. THE NATIONAL FOOD SITUATION. Quarterly. Washington, D. C. (Processed.)

Although supply, utilization, and demand for major commodities have been studied at length, there has been no really satisfactory tool to analyze what has happened to all farm products as a coordinated whole. The new supply-utilization index provides such a tool in the case of products that can be used for food. And within the coming year we hope to complete the development of an essential attachment, the sub-index of supply-utilization of farm products having only nonfood uses.

Just what is the new index? How does it work? What is it good for? We can answer the first two questions rather easily. But we have used the index for such a short time that our answer to the last question is based upon rather limited experience and knowledge.

What the New Index Is

The supply-utilization index measures the annual flow of agricultural products from our farms and into the United States from foreign countries, in and out of stocks—to our consumers, our Armed Forces, our Territories, and foreign countries. For all agricultural commodities that have food use it combines data on the basis of farm values, using 1947-49 farm prices for all years. In this way the index provides a measure of changes in quantity in economic terms rather than on the basis of avoirdupois or physical weight. It reflects changes in supply and utilization both of commodities, like potatoes, that are bought by consumers mainly in the raw form in which they are trucked from the farms and of commodities, like soybeans, which reach consumers chiefly in a variety of processed forms. Details of construction of the index are given in the bulletin on food consumption.³

The index has two parts. The first part describes the proportions of the total farm value of all farm products (having food uses) utilized in a given year, say 1952, coming from our own farms, from foreign countries, or out of stocks; and going into stocks, into civilian use or export, or bought by military agencies or the United States Department of Agriculture. Several of these categories were subdivided into food and nonfood use. All of these proportions were derived by comparing the total of the values for every commodity falling into that category with the total value of the quantities of all farm products (having food uses) used in that year. The second part of the index is based on the same data but relates the value aggregate in each category for each year to the average value of all farm food products used in the base period, 1947-49. From these relationships, or from the values for the individual components, we are working out subindexes.

The index accounts for all agricultural crops, livestock, and livestock products which have some food use. These cover approximately 87 percent of the annual 1947-49 farm value of agricultural commodities. Cotton, tobacco, shorn wool, hay, and field seeds have no human food use and are excluded, together with forest pro-

ducts (except maple sugar and sirup), greenhouse and nursery items, fishery products, and spices. Included, however, are major agricultural products not produced domestically but used for food in this country, such as bananas and coffee.

How It Works

Superficially, this index works like any other index that is computed by multiplying base-period prices by changing quantities to get values for each year, which are then divided by average values for the base period. But this index is somewhat unusual in that it also reflects the flow of joint products and byproducts. In constructing the index our main problem was how to give proper weight to processed commodities, such as wheat flour moving into domestic distribution channels. The total farm value of wheat milled for domestic food should not be charged to the food account because another product of the milling operation is millfeeds which in turn move back to farms for livestock feeding. We had to make allowances also for imports and changes in stocks of the processed products.

The key to our puzzle was the idea of allocating the total farm value of the wheat milled according to the ratio of the wholesale or primary market value of each joint- or by-product to the total wholesale value of commodities processed from the wheat. So for 1952 we allocated to the nonfood category \$190 million worth of the wheat that was milled, 17 percent by value. This was done instead of putting the full farm value of wheat milled for domestic food in the civilian food column or using the poundage milling ratio of 72 pounds of flour and 28 pounds of bran and other millfeeds from 100 pounds of wheat.

We used this key to allocate our value data to categories on the supply as well as the utilization side of our index. Thus, we were able to incorporate in the index information on imports of products—oils, for example—without pretending that we also imported the oilseed meal and cake or the whole oilseed equivalent of the oils. This means that the index does not overemphasize the economic significance of imports of oils compared with the domestic output of oilseeds.

³ Op. cit.

Shows Trends in Supply and Utilization

From 1924 to 1953 total utilization of agricultural food products for food and nonfood purposes increased 40 percent. During these three decades the economy went through two major fluctuations in agricultural activity. As table 1 shows, total utilization gradually increased until the depression period of the 1930's, then fell off for several years. It had climbed back to its former level by 1938, and it continued to advance steadily as World War II brought heavy demands upon agriculture. A peak of utilization of agricultural food products was reached in

1944. With the termination of hostilities the index of total utilization began a decline which was reversed in 1949. By 1953 the level of the index had climbed above that of 1944.

Over this 30-year period the internal composition of total utilization was changing. Crops became a smaller percentage of the total value of agricultural commodities used and livestock and livestock products⁴ and imported commodities not produced in this country assumed

⁴ On a gross basis, because the value of livestock products used in a particular year includes that portion added by feeding crops which are counted separately.

TABLE 1.—*Supply-utilization of agricultural food products: Major subindexes, 1924-53*¹
(1947-49 = 100)

Year	Total utilization	Production	Imports	Commercial and USDA exports and shipments	Domestic utilization ²			
					Food			Nonfood
					Total ³	Crops ⁴	Livestock	
1924	74.7	73.2	75.5	85.7	70.5	72.1	70.6	83.9
1925	76.7	74.0	81.4	65.8	71.2	76.9	69.9	92.8
1926	76.1	74.5	87.9	63.9	72.6	78.2	71.0	87.4
1927	77.1	75.0	85.1	73.0	72.1	74.8	71.5	90.6
1928	77.7	76.8	85.3	63.1	72.7	77.8	71.2	93.0
1929	77.9	74.7	94.9	62.3	74.1	80.3	71.9	90.7
1930	76.5	74.1	85.9	49.3	74.2	79.7	72.5	87.5
1931	76.8	77.3	79.5	43.9	74.7	79.3	73.3	88.0
1932	77.2	77.8	71.1	37.1	73.7	75.7	73.4	93.4
1933	76.9	72.6	76.5	28.4	74.3	74.5	74.8	92.1
1934	74.5	68.2	75.6	27.2	75.8	75.2	76.7	78.8
1935	70.8	71.6	96.6	21.0	73.0	81.0	69.1	75.0
1936	75.4	68.1	96.9	19.6	76.0	78.2	74.5	85.4
1937	75.1	77.8	104.9	27.2	77.3	84.1	74.4	78.5
1938	78.3	78.4	86.9	54.1	76.8	80.1	74.9	86.6
1939	81.2	79.4	92.3	41.9	80.4	83.5	78.7	90.7
1940	83.3	83.2	92.3	30.1	83.4	84.3	82.8	92.8
1941	87.7	87.6	104.6	48.1	86.1	89.1	84.7	98.2
1942	95.1	96.6	66.6	74.0	89.6	92.0	90.2	109.3
1943	104.4	99.0	91.1	113.6	94.0	92.0	97.2	127.3
1944	105.6	103.0	110.8	113.0	101.4	99.3	103.8	116.0
1945	103.4	100.7	92.3	101.8	101.5	102.6	102.0	111.8
1946	102.1	101.8	89.3	119.9	99.7	98.5	100.4	107.6
1947	101.7	98.1	93.8	115.5	100.9	100.3	101.8	101.7
1948	97.4	102.4	101.6	88.9	99.0	99.8	98.5	96.2
1949	100.9	99.5	104.6	95.6	100.1	99.9	99.8	102.1
1950	101.4	100.5	107.3	96.7	100.4	94.0	102.8	105.1
1951	104.3	99.1	110.5	137.8	102.6	97.0	104.8	105.7
1952 ⁵	104.2	104.0	110.9	121.6	104.9	96.2	108.5	100.7
1953 ⁵	106.6	105.9	113.6	106.2	108.0	97.0	112.6	100.4

¹ Data in each category are expressed as ratios of their 1947-49 averages, rather than as ratios of 1947-49 total utilization as published in table 2 of Agriculture Handbook 62, "Consumption of Food in the United States, 1909-52," p. 5.

² Includes military as well as civilian utilization.

³ Includes coffee, tea, bananas, and other commodities not produced domestically, as well as crops and livestock.

⁴ Excludes items not produced domestically.

⁵ Preliminary.

greater importance. This change reflected a shift in utilization from lower cost crop products to higher cost livestock products and imported foods.

At the same time, changes were taking place in the relationships of production, imports, food use, and the other supply and disappearance categories to total utilization. The overall index and the subindexes measure these changes satisfactorily.

PRODUCTION.—Domestic production⁵ usually supplies 90 to 95 percent of the annual total utilization of agricultural food commodities. The low contribution of production in 1934 and 1936 reflects the effect of drought on current farm production and the reliance on past production. As a result of the cutback during the midthirties, production of agricultural food commodities for food and nonfood use in 1939 was only 8 percent higher than in 1924. Meanwhile, our population had increased 15 percent. With the threat of impending war a reality in Europe, then in the Pacific, our farmers expanded their output in each of the 5 succeeding years. A poor corn crop in 1947 pulled per capita production down noticeably, although it was still higher than in any previous year except those of the full mobilization period. Since 1947 per capita production has continued slightly below the wartime peaks attained in 1942-46; large outputs of agricultural food products have been offset by the postwar acceleration in the rate of population growth.

⁵ Our concept of farm production includes production of crops for use as seed and feed counted in the year they are harvested. Our figures include feed crops for all classes of livestock but exclude hay and pasture. Some duplication arises because the quantity used for seed in a given year turns up again as a part of production in the following year. Similarly, production of feed is later recounted in the form of milk, eggs, and live animals marketed (where production of livestock is considered to be the live weight of animals slaughtered in each year). But no adjustments were made for these duplications because the purpose of the index is to provide a measure of the flow of goods produced by agriculture to the agricultural system itself (internal transfers) and outside the agricultural system (external transfers) in terms of the quantities used each year. It is an index of total utilization, not net output. See Agriculture Handbook No. 62 [op. cit.] for further details.

Production of crops that have food uses shows greater fluctuations than that of livestock and livestock products, especially in the years before World War II. Because of wartime demands and sudden postwar adjustments in Government takings and price controls, production of livestock and livestock products varied much more during the 1940's than in the previous two decades. Generally, the ups and downs in crop production preceded turns in livestock and livestock products by about 1 to 2 years.

FOREIGN TRADE.—Except for 1945 to 1947 (and then only because of military-civilian feeding) this country imported more agricultural food products than it exported. The import balance grew larger from 1924 to 1937, then declined slightly. Even with the wartime expansion in exports under the lend-lease program and the contraction of imports because of enemy operations and use of commercial ships to carry military materiel, this country was a net importer until 1945. When exports under the military-civilian feeding program were added to those handled through commercial channels and to deliveries by the United States Department of Agriculture for United Nations Relief and Rehabilitation Administration and other relief and economic assistance programs, we found that in 1945-47 more farm products that had food uses were exported than imported. Also, in many countries agricultural production was in a chaotic state at the end of the war, a condition that shifted trade out of normal patterns for several years.

During the last 30 years imports have supplied 5 to 10 percent of the total quantity of farm food products used in this country each year. They were most important in 1935-37, years in which domestic production was relatively low. Submarine attacks and other war developments in 1942 reduced imports to the lowest rate since World War I, but in the next 2 years they recovered to a considerable extent. Then in 1945-47 this country imported less because of the disruption in world markets mentioned earlier.

Imports in relation to annual utilization are no more important now than they were 30 years ago, but their volume has increased greatly. The principal cause of this increase is the rise in our demand for commodities not produced in

this country—such items as coffee, tea, cocoa beans, and, to a lesser extent, bananas and certain tree nuts and oils.

From 1924 to the late 1930's our exports had a definite downtrend, dropping to less than 2 percent of our annual flow of farm food products in the midthirties. Much of the decline was in wheat, pork, and lard. The quantity of agricultural food products exported rallied sharply during World War II and the postwar period from prewar lows and surpassed previous highs. During the war years, three-fourths of our exports were shipped by the United States Department of Agriculture under various aid programs. In the last 2 years—1952 and 1953—most of our exports and shipments moved through commercial channels; only 10 percent of the total was handled by the Department, principally surplus-disposal.

STOCKS.—Information regarding food stocks is far from complete. We have no data on holdings of major foods (except sugar) by retail stores, and little information on stocks held by wholesalers or processors outside cold storage warehouses and some special types of grain storage facilities. But the situation is better than it looks at first glance, because the Department of Agriculture now gets reports on most of the storable commodities whose stocks can change significantly from year to year. Coverage has improved greatly during the period included in the index. These facts explain why we operated with changes in stocks rather than with actual stocks in the computation of the index. In most years the changes amount to less than 3 percent of the flow of farm food products. Big swings in stocks occurred in 1934-37 and in 1948. The index data disclose unusually large annual accumulations of stocks in 1937 and 1948. The earlier year preceded a recession in the whole economy and the last quarter of 1948 marked the beginning of the 1949 deflation.

DOMESTIC FOOD AND NONFOOD USES.—Domestic use of agricultural food products for food and nonfood purposes during the period covered by this index accounted for at least 94 percent of total annual utilization; in 1936 such use reached a high of 99 percent. From 1924 until the end of World War II, about one-third of the commodities having any food use

was used for nonfood purposes.⁶ Since 1946 nonfood use has decreased about 10 percent, mainly because of a drop in the percentage of annual utilization going for feed. So between 1924 and 1953 nonfood use rose only 20 percent, but food use went up 50 percent.

During the period for which the index shows a gain of more than 50 percent in food use, the total population of continental United States expanded 40 percent. The net gain in per capita food use amounted to slightly more than 9 percent. When members of the Armed Forces are excluded from these figures, the net gain for the 30 years is fractionally lower because their takings average higher than the consumption rate of civilians.

As we look at trends in the food category of the supply-utilization index, a basic change in utilization patterns stands out. Crop products represent a smaller share—10 percent less in postwar than in prewar years—and livestock and livestock products a larger share of our food utilization. In the last 5 years per capita civilian food utilization of crops was at its lowest level in 30 years, with the exception of a period in the early thirties, but utilization of livestock and livestock products remained well above prewar levels, and only slightly below the peaks of 1944-47.

Most nonfood use of agricultural food products is for feed and seed, both for future output. Of the 31 percent of annual total utilization that went for nonfood purposes in 1924, feed accounted for almost 26 percent, seed for 2 percent, and the remaining 3 percent went for soap, drying oils, leather, and other minor items, and a small quantity for production of alcohol and alcoholic beverages. In 1952, slightly less than 27 percent went for all nonfood uses—more than 21 percent for feed, about 1½ percent for seed, 1 percent for alcohol and alcoholic beverages, and the remaining 3 percent for miscellaneous purposes. Although some of the data we used in working up these estimates were derived in a roundabout way, we think the estimates give reasonable approximations of rela-

⁶ These include utilization for seed, feed, industrial alcohol, alcoholic beverages, leather, soap, drying oils, and other miscellaneous uses, as well as some waste and loss at the farm level.

tive magnitudes between uses and of trends in the various categories. During the period of the index they show that feed and seed took progressively smaller shares of annual utilization, that the share of alcohol and alcoholic beverages increased, and that other nonfood uses remained about the same.

Crop products, of course, contribute the largest share to nonfood uses as they are the chief sources of feed and seed. Since the period of World War II, the nonfood use of livestock and livestock products has declined to considerably lower rates, owing largely to a drop in the quantity of skim milk used for feed (and wasted) and a reduction in the use of pulled wool. At the same time, nonfood uses of crops are well above prewar rates so that they now make up four-fifths of total nonfood use of domestic products compared with three-fourths in 1924-42.

The index data on seed utilization show no appreciable change in the quantities used since 1924, but in 1947-51 crop production averaged more than 30 percent above the 1924-28 average. Improved seed and better production practices contributed to lowering the seed-production ratio. Over the period there was a great increase in the quantity of all fertilizer used per acre.

The tremendously increased use in agriculture of tractors, motortrucks, and automobiles brought about a great reduction in numbers of horses and mules on farms—more than 70 percent in 30 years. Replacement of horses and mules had several significant effects. It made available for food production some 60 million acres of cropland, including acreage of hay, formerly used for turning out feed for farm and nonfarm horses and mules. In 1924, a fifth of all grain and roughage-consuming animal units were horses and mules; in 1953 only 5 percent fell into this category. Feed thus diverted from producing power to producing food amounted to an estimated 20 million tons of grain and 21 million tons of hay and silage, or about 15 percent of all concentrates and 19 percent of all hay and silage fed in 1951-52.

These data partly explain the reduction in the ratio of feed utilization to production of livestock and livestock products indicated in the supply-utilization index. In addition, as the

horse and mule population declined, more pasture and rangeland became available for feeding food-producing livestock.

Use of farm food products in alcohol and alcoholic beverages reflects a rise after the repeal of prohibition to a peak in the war years when the demand for industrial alcohol was heavy. Such use of farm food products then tapered off as petroleum products were substituted for grains and molasses as raw materials in production of ethyl alcohol.

Analyses Made with Supply-Utilization Index

Although the full potential of the new index for analytical purposes is not yet known, we can demonstrate its usefulness in the study of several rather complicated problems. We cannot assume that we have definitive answers to these problems, but in using this master index and its mass of subindexes we have made a start.

Here are several problems we have considered: What has been the effect of changes in the national economy on total domestic utilization of farm products? On domestic food use? How have changes in utilization affected the demand for farm resources? Do changes in food utilization measured at the farm level differ from changes in consumption measured at retail? How have changes in major commodities affected the total utilization of farm products during the last 30 years?

Study of the effects of changes in the national economy on the use of farm food products is complicated by technological changes. Because of the substitution of tractors for horses and mules, requiring petroleum products instead of feed, we must adjust the utilization figures to draw a reasonable conclusion about economic effects. This raises the tilt of the utilization curve slightly but domestic utilization still increased only about a third as much as real income between 1924 and 1953. During the 1930's total supply-utilization was slow to adjust to the changes in national income but since 1935 it has followed the movements in income closely.

On a per capita basis, domestic use of farm products for food in 1924-52 was highly related to real income after taxes, but it showed no

relation to prices farmers received for food commodities.⁷ As sidelight, changes in retail food prices are a factor in the changes in food consumption at retail along with disposable income. We plan to explore later the converse of this picture, that is, the effect of food supplies (as measured by our index) on prices received by farmers and on farm income.

Our discussion leads to the question, What has been the relationship of changes in domestic food utilization to the demand for farm resources? Before we discuss this question, we must emphasize that we are still in an exploratory stage. A glance at the index of per capita food utilization shows that food use has risen a little faster than population. So we need to find out whether the pattern of food use has changed and, if so, how those changes have affected the use of farm resources. To demonstrate our new tool, and still to be brief, we shall use only a two-way breakdown—food use of crops, and of livestock products—but will exclude those foods not produced in this country. The farm value of crops used for domestic food in 1953 (in 1947-49 prices) was \$0.2 billion less than was expected on the basis of the increase in population from 1924 to 1953. But the value of livestock products in 1953 was \$1.9 billion higher. This indicates that the greater emphasis by our consumers on livestock products called for \$1.7 billion extra farm resources, 8 percent more.

Or we can put it another way. A shift in consumption involving a 10-pound reduction in per capita consumption of wheat flour and an increase of 10 pounds in per capita consumption of meat means an increase of \$530 million (in 1947-49 prices) in the use of farm resources aside from changes in marketing services. This demonstrates the significance to our farmers of the make-up of the daily poundage of food that we eat.

Comparison of changes in food use, measured at the farm level on the one hand and at the retail level on the other, reveals the effect of some of the changes in marketing patterns on

the index of per capita consumption of food. When we measure utilization at the farm level, we work with raw farm products and the equivalents of processed products and combine them by means of farm prices. But for the index of per capita food consumption we use retail weights of fresh and processed commodities and retail prices which include marketing costs. Because of the great increase in consumption of processed foods, which require substantial amounts of marketing services, we expected that food use measured at the farm would show much less change than when it was measured at retail. Between 1924 and 1953 the index of food utilization went up 9 percent while the index which evaluated food consumption at retail went up 12 percent.

The shift to processed forms of cereals, sugar, fruits, and vegetables gradually separates the subindexes for those food groups of the overall index of food consumption from the comparable subindexes of the farm-level index over the last three decades. Because cereal products, sugar, fruits, and vegetables currently make up less than a third of the total value aggregate of both indexes, the difference between the two indexes is less than we expected. Moreover, looking at detailed data, we found that for some fruits, such as oranges, and vegetables the relatively high cost of distributing the fresh item offsets the cost of processing and distributing the canned and frozen products. In such cases, a shift from fresh to processed food may actually reduce the retail value, though the farm value is not affected.

Turning to the question of how changes in major commodities have affected total utilization in the last 30 years, we note first that total utilization (food and nonfood) has just kept pace with the 40-percent rise in our population. Study of the figures in table 2 shows the broad shifts among commodities which occurred from the beginning to the end of the period covered with the index. We used averages of 1924 and 1925 and of 1952 and 1953 to reduce the effect on our comparison of unusual happenings to individual commodities in single years.

It appears (to us) that the increased use of poultry products has not been at the expense of any particular commodity group, except per-

⁷ X_1 = index of per capita food utilization, X_2 = per capita disposable income (deflated), X_3 = farm prices for food (deflated), fitted 1924-52, $R^2 = 0.86$
 $\log X_1 = 1.49 + 0.31 \log X_2 - 0.06 \log X_3$
 $(\pm .05) \quad (\pm .06)$

TABLE 2.—*Farm value of farm food products used in 1924-1925 and 1952-1953 in terms of 1947-49 average prices, by commodity group, with comparisons*

Commodity group	Total utilization ¹				
	Average for 1924 and 1925		Average for 1952 and 1953		1952-53 as a percentage of 1924-25
	Farm value	Percentage of total	Farm value	Percentage of total	
	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>	<i>Percent</i>
Tree nuts.....	74	0.3	152	0.4	206
Poultry products.....	2,239	9.0	4,432	12.7	198
Oil crops.....	854	3.4	1,631	4.7	191
Coffee, tea, and cocoa.....	579	2.3	1,081	3.1	187
Dry beans and peas.....	105	.4	170	.5	162
Fruits, including bananas.....	810	3.2	1,222	3.5	151
Vegetables.....	1,273	5.1	1,858	5.3	146
Livestock products.....	6,696	26.7	9,298	26.7	139
Milk.....	3,968	15.8	4,958	14.2	125
Grain products.....	7,224	28.8	8,804	25.2	122
Sugars and sirups.....	590	2.4	690	2.0	117
Potatoes and sweetpotatoes.....	646	2.6	580	1.7	90
Total.....	25,058	100.0	34,876	100.0	139

¹ Includes domestic uses and exports and shipments for food and nonfood purposes.

haps some substitution of eggs for oatmeal. The livestock product group, including meats and pulled wool, held its relative position and the decline in consumption of milk was actually in butter, so increased use of poultry products didn't particularly affect that category. Poultry products contributed an extra \$1,300 million (in 1947-49 prices) to the demand for farm resources over and above the 40-percent increase for all commodity groups.

One striking change in utilization was the 9-pound drop in per capita consumption of butter from 1924 to 1953. This is equivalent to a reduction of 28.5 billion pounds of whole milk, valued at \$1.2 billion in terms of 1947-49 prices. About \$500 million of this reduction in the use of farm resources for butter was offset by increased use for other dairy products, leaving a balance of \$700 million. Because of the concurrent 6-pound increase in per capita consumption of margarine, we examined the offsetting effect of the rise in the use of farm resources for producing the ingredients of margarine, mainly cottonseed oil and soybean oil. The farm value equivalent, in 1947-49 prices, of the increased use of these oils in production of margarine was about \$100 million. The remaining \$600

million of farm resources was shifted to the production of other farm products.

Now for a few notes on the commodity groups whose utilization has lagged behind. The grain group held its own much better than we expected from the downtrends in feeding horses and mules, referred to earlier, and in per capita food use of cereal products. The former use required roughly \$1 billion less of farm resources in the last 2 years than in 1924 and 1925. From 1924-25 to 1952-53 total domestic food use of grains went up only \$75 million in terms of farm values; the reduction in per capita use meant more than a third of a billion dollars smaller demand for grains. The significant supporting element in the grain picture is the increased use of grains for feeding poultry and cattle. The total value of grain fed to livestock other than horses and mules rose about \$1.8 billion from 1924-25 average to 1952-53 average, again in terms of 1947-49 farm prices.

Part of the failure of the sugar and sirup group to keep pace with population can be ascribed to maple, sugarcane, and sorgo sirups, but use of refined cane and beet sugar is also less per capita than in the midtwenties.

The downtrend in per capita consumption of

potatoes and sweetpotatoes reduced the farm value of all agricultural products having food use by a quarter of a billion dollars during the 30 years.

In conclusion, we say again that our preliminary study of these commodity shifts, as well as the other questions we posed, has merely skimmed the surface of the problems.

There are other important questions, too, which we haven't tackled yet. One of the most intriguing is to evaluate the relationships between changes in utilization and farm prices, farm income, and the marketing bill for farm products. Furthermore, we have still to put those farm products which have no food uses, such as cotton, shorn wool, and tobacco, into our data, as well as our analyses. As soon as the

index covers all agricultural commodities, we shall be able to construct an index of per capita utilization of farm food and nonfood products for use in matching the production potential of American agriculture with future "requirements" for farm products. Also, we shall be able to tailor special indexes for use in particular problems, such as utilization of only those products grown in this country or utilization excluding exports.

We must end this article with the favorite conclusion of economists and statisticians, "more work needs to be done on the subject." But we continue work on a bulletin which we hope will cover more adequately these areas opened up in this article, as well as other aspects of the supply and use of farm products.

Condensed vs. Detailed Schedule in Expenditure Surveys

By Barbara B. Reagan

High costs of surveys have brought pressure for less expensive ways of getting data on family expenditures, and have raised interest in opportunities to get such data through limited supplementary schedules attached to other surveys. An experiment to test this approach was undertaken by the (former) Bureau of Agricultural Economics and the (former) Bureau of Human Nutrition and Home Economics in simultaneous surveys of farm-operator families in contiguous areas. One included a few summary questions on family spending, the other a more detailed breakdown of the major expenditure categories. This paper summarizes the comparison of data obtained from the two surveys, and discusses the implications regarding the feasibility of this approach for gathering data on family expenditures.¹

A CONDENSED-SCHEDULE APPROACH to family expenditures, obviously, is suited only for studies that seek total family living expenditures alone, or at most the relative importance of broad categories of family spending. It

would not yield data adequate for deriving expenditure weights for consumer price indexes or for analyzing market demand for specific consumer goods.

The type of condensed schedule considered in the study reported here is one in which esti-

¹ The separate surveys have been reported in THE GENERAL ENUMERATIVE SURVEYS, by EMERSON M. BROOKS and CATHERINE SENF, this Journal 1 (2):37-48; 1 (4): 105-128. April and October 1949; and FARM FAMILY SPENDING AND SAVING IN ILLINOIS, by JEAN L. PENNOCK, MARGARET L. BREW, and ROSE C. TILLINGHAST, U. S. Dept. Agr., Agr. Inform. Bull. 101 (in press). The ex-

periment described here is also summarized in USE OF CONDENSED SCHEDULE TO CUT COSTS IN FAMILY EXPENDITURE SURVEYS, Journal of Home Economics, vol. 46, No. 3 (March 1954), by the present author. A complete report, including reproductions of the schedules used, is available on request from the author.