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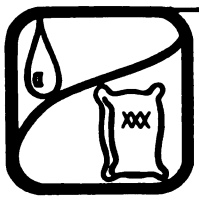

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MARGARINE CONSUMPTION AND PRICES

by
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ABSTRACT: Margarine is the major table spread consumed in the United States and use is still expanding. Technological breakthroughs have improved its quality. This, coupled with prices lower than butter, primarily explains its expanding use. Vegetable oils are major margarine ingredients, with soybean oil the largest. Abundant supplies and favorable prices account for the increasing use of soybean oil in margarine production. To analyze variability in margarine prices, we tested the hypothesis that retail margarine prices are affected by ingredient costs and retail butter prices. A statistical analysis was conducted regressing retail margarine prices against weighted wholesale fat and oil prices and retail butter prices. The equation explained 84 percent of the annual variation in margarine prices.

KEY WORDS: Margarine, butter, vegetable oil, soybean oil, animal fats, price variation.

Margarine Consumption Continues Its Expansion

Traditionally, butter was the preferred table spread used in this country, its roots deeply embedded in our European heritage of highly developed livestock and dairy economies. Even today, many Americans insist upon using nothing but butter on their dinner table.

Over the past 40 years, however, margarine has become widely accepted as a substitute. Margarine was first developed in France in the nineteenth century in response to a prize offered by Napoleon. Due to short butter supplies and high prices, a substitute food fat was needed for his armies and for the French people. Today, margarine is the major table spread in the United States, with use about 2½ times that of butter.

Growth in Production and Use Impressive

In the early 1930's, per capita consumption of margarine averaged around 2 pounds compared with about 18 pounds for butter (actual weight). Their total of around 20 pounds accounted for nearly 50 percent of the total solid fat products used. Lard and shortening, the other two major solid fats, totaled about 22½ pounds.

Since 1950, production of margarine has increased about 2½ times, growing from 0.9 billion pounds (actual weight) to 2.4 billion in 1973. Domestic use has risen correspondingly, as most of the margarine is used at home. Per capita use rose from 6 pounds in 1950 to a little over 11 pounds in 1973. During this same period, butter output declined about 45 percent to 0.9 billion pounds. Domestic butter disappearance declined around 6 pounds to a little over 4½ pounds per person, from about 10½ pounds per person in the earlier period (tables 15 and 16).

Although significant shifts occurred in both the production and use of margarine and butter, the increase in use of margarine tended to offset the decline in the use of butter. As a result, total output of both products rose from 2.6 billion pounds to 3.3 billion, an increase of about a fourth. Domestic use rose at approximately the same rate. Per capita use

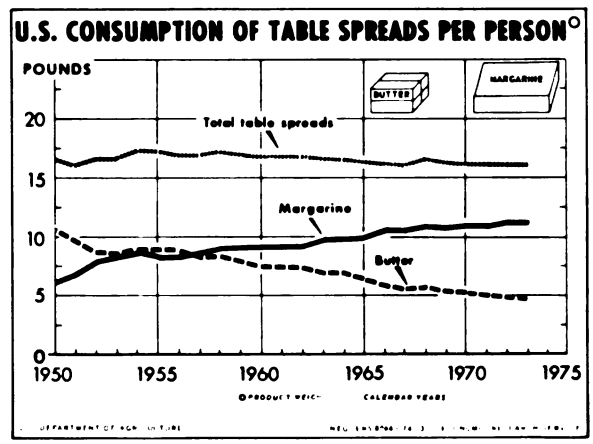


Table 15—Production of solid food fats products

Calendar year	Table spreads (actual weight)			Cooking fats			Total solid food fats
	Margarine	Butter[1]	Total	Lard[2]	Shortening	Total	
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
1950	937	1,648	2,585	2,631	1,710	4,341	6,926
1955	1,334	1,545	2,879	2,660	1,975	4,635	7,514
1960	1,695	1,436	3,131	2,562	2,313	4,875	8,006
1965	1,904	1,346	3,250	2,045	2,972	4,837	8,087
1970	2,230	1,143	3,373	1,913	3,588	5,501	8,874
1971	2,290	1,144	3,434	1,960	3,515	5,475	8,909
1972	2,361	1,102	3,463	1,559	3,532	5,091	8,554
1973	2,357	922	3,279	1,254	3,445	4,699	7,978

[1] Includes production of farm butter. [2] Includes production of farm lard.

Table 16—Civilian domestic disappearance of solid food fat products

Calendar year	Table spreads (actual weight)			Cooking fats			Total solid food fats
	Margarine	Butter	Total	Lard[1]	Shortening	Total	
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
1950	918	1,614	2,532	1,891	1,656	3,547	6,079
1955	1,323	1,460	2,783	1,639	1,863	3,502	6,285
1960	1,676	1,332	3,008	1,358	2,238	3,596	6,604
1965	1,891	1,232	3,123	1,225	2,695	3,920	7,043
1970	2,223	1,061	3,284	939	3,496	4,435	7,719
1971	2,264	1,038	3,302	880	3,429	4,309	7,611
1972	2,335	1,011	3,346	796	3,451	4,247	7,593
1973	2,348	997	3,345	713	3,403	4,116	7,461
	Per capita Pounds	*Per capita Pounds*	*Per capita Pounds*	*Per capita Pounds*	*Per capita Pounds*	*Per capita Pounds*	*Per capita Pounds*
1950	6.1	10.7	16.8	12.6	11.0	23.6	40.4
1955	8.2	9.0	17.2	10.1	11.5	21.6	38.8
1960	9.4	7.5	16.9	7.6	12.6	20.2	37.1
1965	9.9	6.4	16.3	6.4	14.1	20.5	36.8
1970	11.0	5.3	16.3	4.7	17.3	22.0	38.3
1971	11.1	5.1	16.2	4.3	16.8	21.1	37.3
1972	11.3	4.9	16.2	3.8	16.7	20.5	36.7
1973[2]	11.3	4.8	16.1	3.4	16.4	19.8	35.9

[1] Direct use of lard. [2] Preliminary

declined slightly from nearly 17 pounds to about 16 pounds.

Significant changes also occurred in the production and use of solid cooking fats (lard and shortening). Lard output dropped from 2.6 billion pounds in 1950 to 1.3 billion in 1973, a decline of nearly 50 percent. Lard yields per hog have been declining steadily and are one of the major factors behind lower lard production. Direct use of lard fell from nearly 2 billion pounds to around 0.7 billion, with per capita use declining from 12½ to around 3½ pounds. During this same period, shortening production doubled from 1.7 billion to 3.4 billion pounds. Domestic consumption increased at about the same rate, with per capita use increasing from around 11 to nearly 16½ pounds.

Margarine Demand and Oil Supply Expand

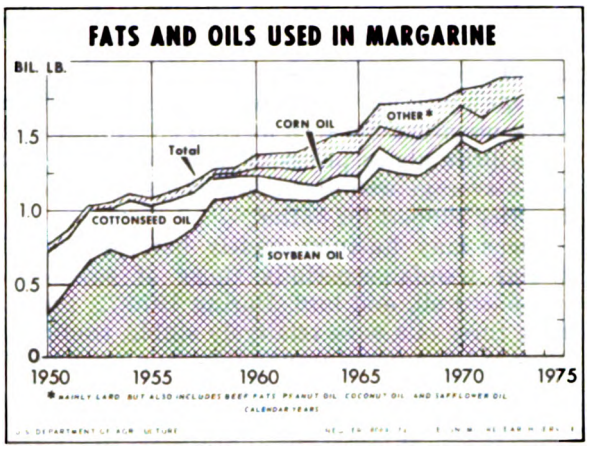
Several factors are responsible for the acceptance and increased use of margarine. Many consumers first became exposed to margarine and found it to their liking when restrictions were placed on butter and other food fats during World War II. Removal of Federal and State taxes and removal of restrictions on the production and use of margarine, especially colored margarine, also were effective in promoting its use. Over time, significant technological improvements have resulted in improved margarine quality, such as those relating to important characteristics like consistency, appearance, and taste. Many consumers may have switched from animal fats to vegetable compounds because of the "cholesterol" scare. Probably one of the most

important reasons is related to the cheaper price. The butter-margarine price ratio in recent years has averaged around 2.7 to 1 in favor of margarine.

Growth of the margarine industry to keep pace with increasing demand was made possible by the sharp expansion in the domestic vegetable oil industry, which began during World War II. The large annual increases in soybean oil production were mainly responsible. This expanded supply of soybean oil maintained relatively low prices for the oils used in margarine production.

Today soybean oil is the major oil used in margarine production, accounting for about four-fifths of all the oils used (table 17).

Use of soybean oil increased from 0.3 billion pounds in 1950 to 1.5 billion in 1973. In 1950, cottonseed oil was the oil most used, but recently has fallen behind both corn oil and the animal fats, both of which have expanded significantly. "Corn oil" margarines are widely advertised as desirable in controlling cholestrol buildup in the blood because of their high ratio of polyunsaturated oils. Total use of all fats and oils rose from around 0.8 billion pounds to nearly 2 billion in 1973.



Except where specific qualities are an overriding consideration, vegetable oils are highly substitutable, with price playing a very important role in the kind used. In most cases, a combination of several oils is used. Because oil is the chief ingredient used in margarine production, manufacturers closely watch its price. As a result, the amount of a given oil

Table 17—Fats and oils used in the manufacture of margarine

Calendar year	Soybean oil	Cottonseed oil	Corn oil	Safflower oil	Animal fats[1]	All other fats and oils[2]	Total fats and oils
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
1950	312	418	1	---	9	24	764
1955	746	278	[3]	---	22	29	1,075
1960	1,105	136	55	---	62	9	1,367
1965	1,112	114	161	10	114	24	1,535
1970	1,410	68	185	22	99	10	1,794
1971	1,385	63	186	19	168	10	1,831
1972	1,459	65	194	20	138	7	1,883
1973	1,490	63	213	32	79	13	1,890

[1] Includes lard and beef fats. [2] Mainly peanut and coconut oils. [3] Less than 500,000 pounds.

Table 18—Wholesale prices of selected food fats

Calendar year	Soybean oil (crude Decatur)	Cottonseed oil (crude, Valley)	Corn oil (crude, midwestern mills)	Lard (tanks, loose, Chicago)	Butter (grade A, 92° bulk, Chicago)
	Cents per pound	*Cents per pound*	*Cents per pound*	*Cents per pound*	*Cents per pound*
1950	14.0	15.7	16.0	11.8	61.7
1955	11.6	12.4	13.0	10.6	57.4
1960	8.8	9.9	13.1	8.8	59.0
1965	11.2	11.6	14.0	11.7	60.2
1970	12.0	13.4	16.5	11.6	69.4
1971	12.6	15.2	19.8	10.8	68.4
1972	10.6	11.5	16.4	10.4	68.6
1973	19.8	19.5	22.6	19.8	69.8

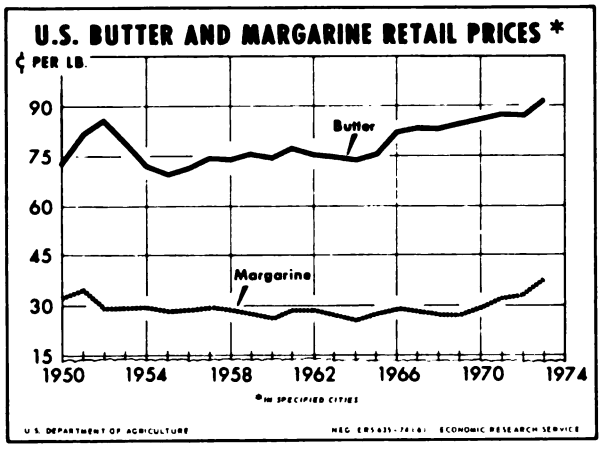
used in margarine is determined in large degree by its cost to the manufacturer relative to prices of other fats. Generally, wholesale prices of soybean oil average a little under cottonseed oil and significantly below premium oils such as corn oil. However, they run a little above prices of lard. Wholesale butter prices average well above the others, due mainly to the price support for butter.

Prices may fluctuate widely but usually follow similar trends, especially those of soybean oil, cottonseed oil, and lard. During 1970-72, prices for these three oils were relatively stable, trading in a range of 10½ cents to around 15 cents per pound. Corn oil prices averaged somewhat higher (table 18).

Retail prices of margarine average considerably below prices of butter. In recent years, the prices of both products increased sharply. In calendar year 1973, they averaged the highest of any year during the 1950-73 period (table 19).

Table 19—Average retail prices of margarine and butter (leading cities of the United States)

Calendar year	Margarine	Butter
	Cents per pound	
1950	32.8	72.9
1955	28.9	70.9
1960	26.9	74.9
1965	27.9	75.4
1970	29.8	86.6
1971	32.7	87.6
1972	33.1	87.1
1973	37.4	91.6



Are Price Relationships Competitive?

Sharp increases in both wholesale fats and oils prices and in retail prices of butter and margarine in 1973 raised some basic questions about the relationships among competing finished products and between a finished product and the cost of its ingredients. Retail margarine prices in 1973 averaged 37.4 cents per pound, a record high. Two factors appeared to be major determinants of this higher price.

First, the prices of vegetable oils, the major ingredients in margarine, rose substantially in 1973 in response to an imbalance in the supply and demand for oils. For example prices of soybean oil, which accounted for about four-fifths of the oil used in the manufacture of margarine in 1973, averaged 19.8 cents per pound compared with 10.6 cents per pound in 1972. This increase in the ingredient cost put upward pressure on the retail price of margarine.

Second, the price of butter also increased substantially in 1973 due to a short supply. Retail butter prices averaged 91.6 cents per pound in 1973 compared with 87.1 cents in 1972. This increase in the price of butter increased the demand for margarine and strengthened the price of margarine.

To measure the impact of major ingredient prices (costs) and butter prices on the price of margarine, the following relationship was estimated:

RMP = f(WOP, RBP)

where;

RMP = retail margarine prices in cents per pound

WOP = weighted quantities and prices of the major oils (soybean, cottonseed, corn oils and lard and edible tallow) used in margarine in cents per pound

RBP = retail butter prices in cents per pound.

Statistical Results

Annual data for 1960-73 were used to estimate the coefficients in the following equation:

$$RMP = 5.03 + \underset{(.158)}{.6474}\ WOP + \underset{(.077)}{.2088}\ RBP'$$

$R^2 = .84$

S.E. = 1.31

The numbers in parentheses are the standard error of the regression coefficients.

Both the weighted oil price and the retail price of butter were significant in explaining variations in the retail price of margarine and the sign of the coefficient was consistent with theory in each case. The positive sign on the coefficient for the weighted oil price indicates that as the cost (price) of the

[1]Coefficients for this equation were estimated using annual data, and therefore should not be used to estimate temporal price adjustments within a given year. If this information is desired, the equation could be reestimated based on monthly data and the use of lagged variables to capture the temporal price adjustments within a year.

ingredients increases, the price of margarine increases. The positive sign on the butter price coefficient indicates that as the price of butter increases, the price of margarine increases; this is consistent with price changes associated with a substitute product. Together, these two variables explained 84 percent of the variations in the retail price of margarine during the 1960-73 base period.

Table 20 compares the actual annual average price of margarine for the period 1960-73 with the estimated price as calculated by the regression equation.

The high prices for butter, margarine, and vegetable oils which prevailed in 1973 are continuing into 1974. It would appear that the competitive price relationships among these commodities would continue to follow patterns of the past. However, other market factors, which recently have become major influences, could affect these relationships over the next year or so.

For example, the recent high prices for soybean oil may tend to influence margarine prices more than they have in past years. Also, the ending of price controls April 30, 1974, probably will have a pronounced effect upon many food prices in the months ahead. And the great supply/demand imbalances which occurred for many food items during the past year or so and which may require some time before they are fully corrected, could tend to distort the historical relationship between prices of butter, margarine, and food fats and oils in the immediate future.

Table 20—U.S. retail prices for margarine, actual and estimated

Calendar year	Actual	Estimated[1]	Difference
	Cents per pound		
1960	26.9	26.6	0.3
1961	28.6	28.7	-0.1
1962	28.4	27.0	1.4
1963	27.5	26.7	0.8
1964	26.0	26.7	-0.7
1965	27.9	28.3	-0.4
1966	28.7	30.1	-1.4
1967	28.6	28.9	-0.3
1968	27.9	28.3	-0.4
1969	27.8	29.0	-1.2
1970	29.8	31.5	-1.7
1971	32.7	31.9	0.8
1972	33.1	30.5	2.6
1973	37.4	37.1	0.3

[1] Based on the equation described in the text.