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ELASTICITY OF DEMAND FOR BUTTER, A COMPARISON OF
TWO PERIODS: 1924-1941 AND 1947-1959 ²¹

BY

MARILYN J. CHAPMAN

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Department of
Economics, South Dakota State
College of Agriculture
and Mechanic Arts

August, 1961

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**ELASTICITY OF DEMAND FOR BUTTER, A COMPARISON
OF TWO PERIODS: 1924-1941 AND 1947-1959**

This thesis is approved as a creditable, independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree; but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Advisor

Head of the Major Department

2661^c

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M. J. C.

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CHAPTER I

INTRODUCTION

A rather dramatic change has occurred in the consumption of butter in the United States. Butter consumption per person for the years since World War II has been only about half of what it was during the years between World Wars I and II. Shortages of butter on the civilian market contributed to the decrease in consumption during World War II, but since that time consumption has remained at the lower level. The question arises as to whether there has been a basic change in consumer response to butter price.

The purpose of this paper was to compare aggregate consumer response to retail butter price in the domestic civilian sector of the butter market in the United States during the two periods 1924-41 and 1947-59. After an inquiry into the background of the butter market, the demand elasticities for the two periods were calculated to determine whether a change in elasticity of demand occurred. A shift in the level of demand for butter was also revealed by this study.

The investigation was limited to the domestic civilian disappearance of butter in the United States. It excluded butter purchased partly or wholly with government funds and amounts of butter distributed from

supplies of the Commodity Credit Corporation. It included an estimate for the butter churned and consumed on farms that otherwise would have been purchased by farm families.

The procedure followed in this study was (a) to examine information from published sources on the consumption of butter in the United States; (b) to clarify by means of an economic model the primary factors or variables affecting the consumption of butter; (c) to calculate the elasticity of demand for butter with respect to these variables for the periods 1924-41 and 1947-59; and (d) to analyze the results of the statistical inquiry.

CHAPTER II

HISTORICAL REVIEW OF BUTTER CONSUMPTION IN THE UNITED STATES 1924-59

Domestic Civilian Disappearance of Butter

The civilian consumption of butter per capita in the United States declined from 17.8 pounds in 1924 to 8.0 pounds in 1959. The trend in consumption has been steadily downward over this time. Figure 1 graphically portrays this trend. The disappearance through commercial and non-commercial channels is shown.

The domestic civilian consumption of butter per person declined from an average of 17.0 pounds during the period 1935-39 to 8.0 pounds in 1959. About 77 per cent of this decline was in butter available to consumers through commercial sources; about 23 per cent of this decrease was due to a net decline in the consumption of butter from non-commercial sources. The civilian consumption of creamery butter declined 6.3 pounds per person from the 1935-39 period average. The consumption of butter churned and consumed on farms dropped from 3.0 to .5 pounds in the same period.

A summary of the domestic civilian disappearance of butter through commercial and noncommercial sources on a per capita basis for the period 1935-39 and 1959 is shown

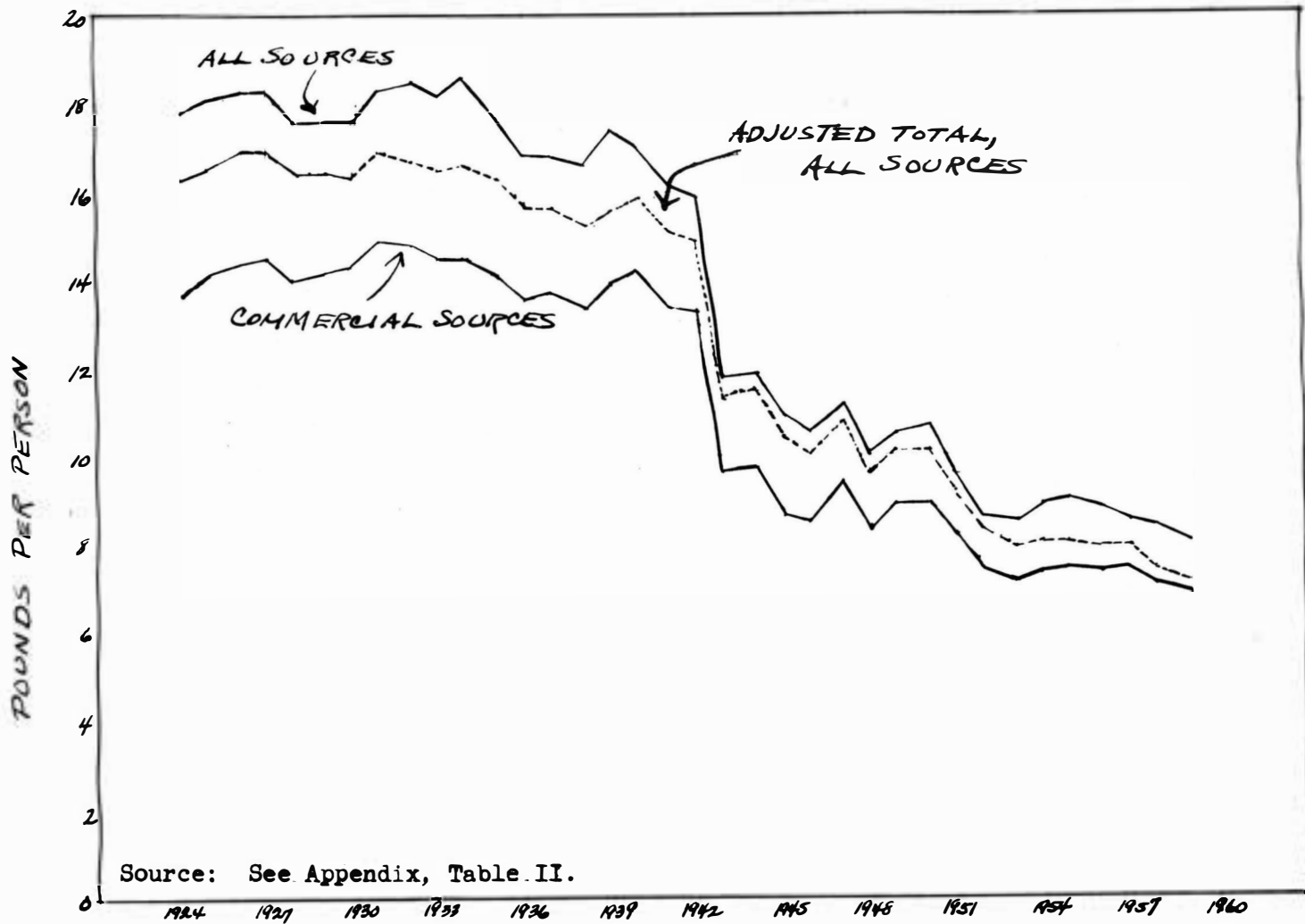


Figure 1. Domestic Civilian Disappearance of Butter Per Person by Source and Estimated Domestic Civilian Consumption of Butter in the United States, Per Capita, 1924-59

in Table I. Total and per capita data on the domestic civilian disappearance of butter through commercial and noncommercial channels for the years 1924 through 1959 are shown in the Appendix, Table I and Table II.

Supply and Distribution of Butter 1924-59

The civilian consumption of butter is derived by subtracting from the total supply of butter amounts for military consumption, commercial exports, ending commercial stocks, U. S. Department of Agriculture programs, and use in margarine (1909-35 only). Table III in the Appendix shows the supply and distribution data for the years 1924-59.

A diagram of the supply and distribution flow of butter in the United States is shown in Figure 2. The diagram shows four major sources which provide the total supply of butter and the various channels into which it is distributed.

Fats and Oils Consumption

In spite of the decline in the consumption of butter, the civilian consumption of fats and oils per person has remained about the same since 1924 except during the World War II period. Total fats and oils include butter, lard, margarine, shortening, and other edible

Table I. Domestic Civilian Consumption of Butter in the United States, Per Capita, 1935-39 and 1959

Item	Civilian Consumption of Butter			
	Average : 1935-39	1959 ¹	Decline : from 1935-39 average to 1959	Relative importance of each item in total decline
	Pounds	Pounds	Pounds	Per cent
Commercial Sources:				
Creamery butter	13.1	6.8	6.3	
Farm-churned butter sold	.7	.1	.6	
Total	13.8	6.9	6.9	77.5
Noncommercial sources:				
From CCC supplies or bought wholly or partly with government funds	.2	.7	.5 ²	
Consumption of farm-churned butter on farms	3.0	.5	2.5	
Total	3.2	1.2	2.0	22.5
Total Commercial and Noncommercial Sources	17.0	8.1 ³	8.9	100.0

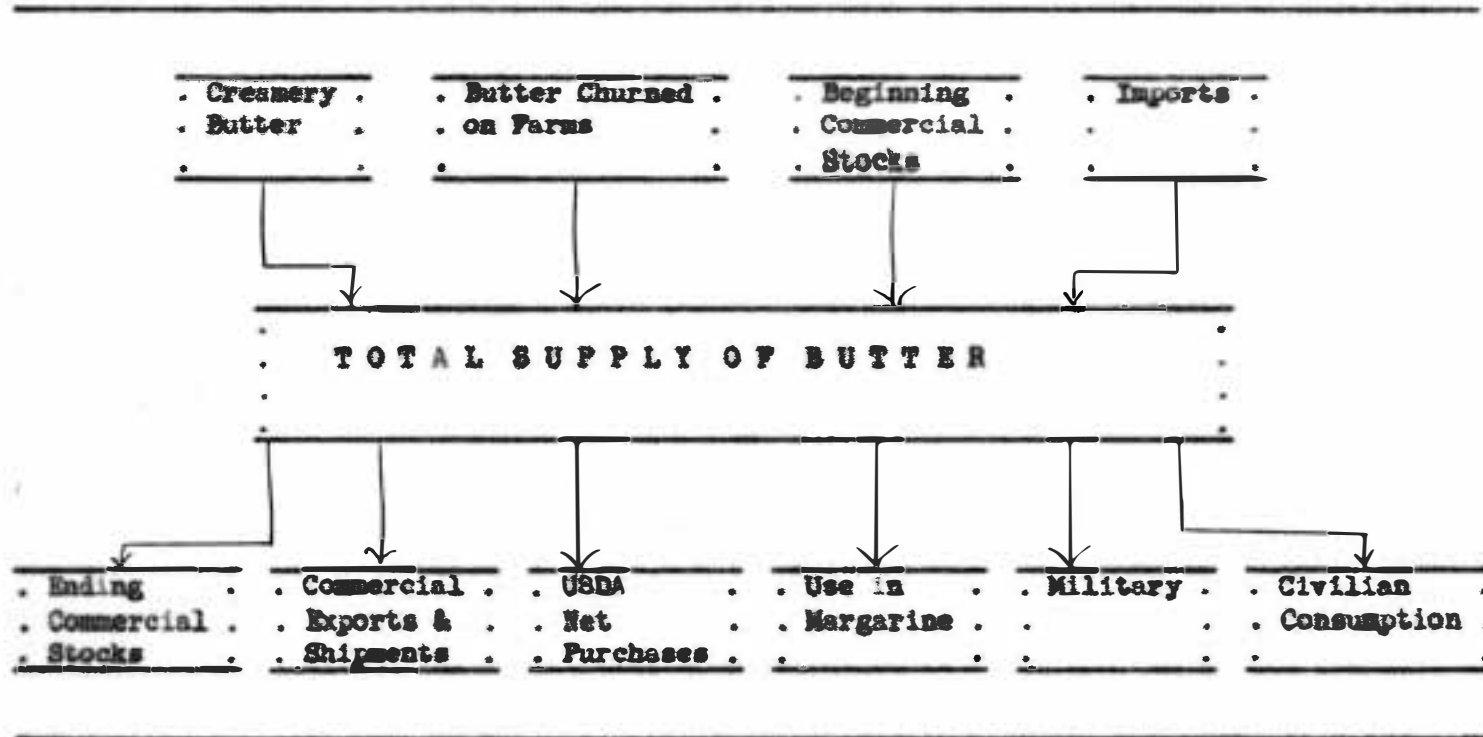
¹ Preliminary

² Increase

³ Due to rounding totals do not agree with data in Appendix Table II.

Source: The Dairy Situation-265, p. 10, Agricultural Marketing Service, U. S. Department of Agriculture, April 17, 1958; and The Dairy Situation-280, p. 31, AMS, USDA, November 1960.

Figure 2. Supply and Distribution of Butter
in the United States, 1924-59.



Source: Dairy Statistics, p. 333, Statistical Bulletin No. 218, Agricultural Marketing Service, U. S. Department of Agriculture, October 1957.

fats and oils. A graphic history of the consumption of fats and oils per person in the United States may be seen in Figure 3. The consumption of shortening has remained about the same. The consumption of total fats and oils per person has varied between 42 and 51 pounds. Total civilian butter consumption per person remained at about the same level until World War II when it declined sharply. After World War II the per capita consumption of butter remained at the lower level continuing its decline. However, the combined total consumption of butter and margarine declined only slightly between 1924 and 1941. The post World War II period reveals no particular trend in the combined consumption of butter and margarine. The data on consumption of fats and oils 1941 to 1959 provided by the Agricultural Marketing Service of the Department of Agriculture are for civilian consumption only. Data on civilian consumption only of fats and oils prior to that time are not available. So the data for the years 1924-40 tend to overstate the consumption of fats and oils. One of the significant factors shown by the chart is that margarine seems to have supplanted part of the butter consumption. (See Appendix, Table V).

Government Price Support Programs

As early as 1933 the Federal Government engaged in the purchase of surplus butter under various programs of

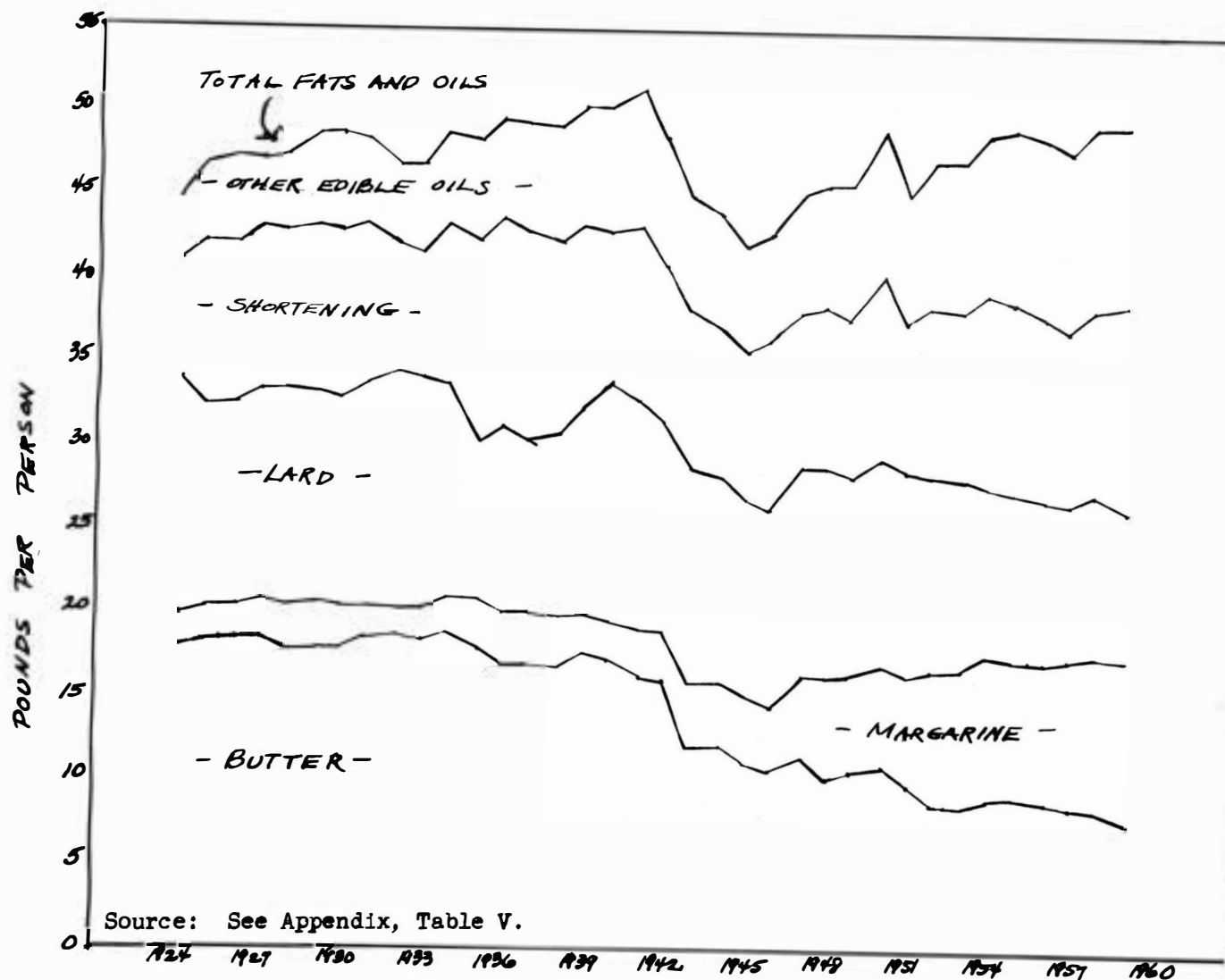


Figure 3. Civilian Consumption of Fats and Oils Per Person in the United States, by type, 1924-59

the United States Department of Agriculture for the purpose of price support. The effect of these programs is to remove butter from commercial channels and put a "floor" under the butter price. Under these programs the attempt is made to distribute butter to those who would normally consume very little butter. It is not distributed to those consumers who would ordinarily purchase butter. As a result of these programs, the supply of butter available to the consumer through commercial channels is reduced. It is as though the supply function of butter had shifted to the left, rather than causing any shift in the demand curve. In response to a higher price of butter, consumers would simply operate at a higher point on the (aggregate) demand curve.

Figure 4 shows the effect of government supported prices of butter. Assuming that DD is the demand for butter and P the retail price of butter in the period prior to price supports, quantity Q would be purchased. Under government programs which support the price of butter at P_1 , consumers will be willing to purchase quantity Q_1 . The effect is the same as if the supply function SS had shifted to the left.

Amounts of butter purchased wholly or partly by government funds have been excluded in the calculations of demand elasticity of the consumer reaction to retail

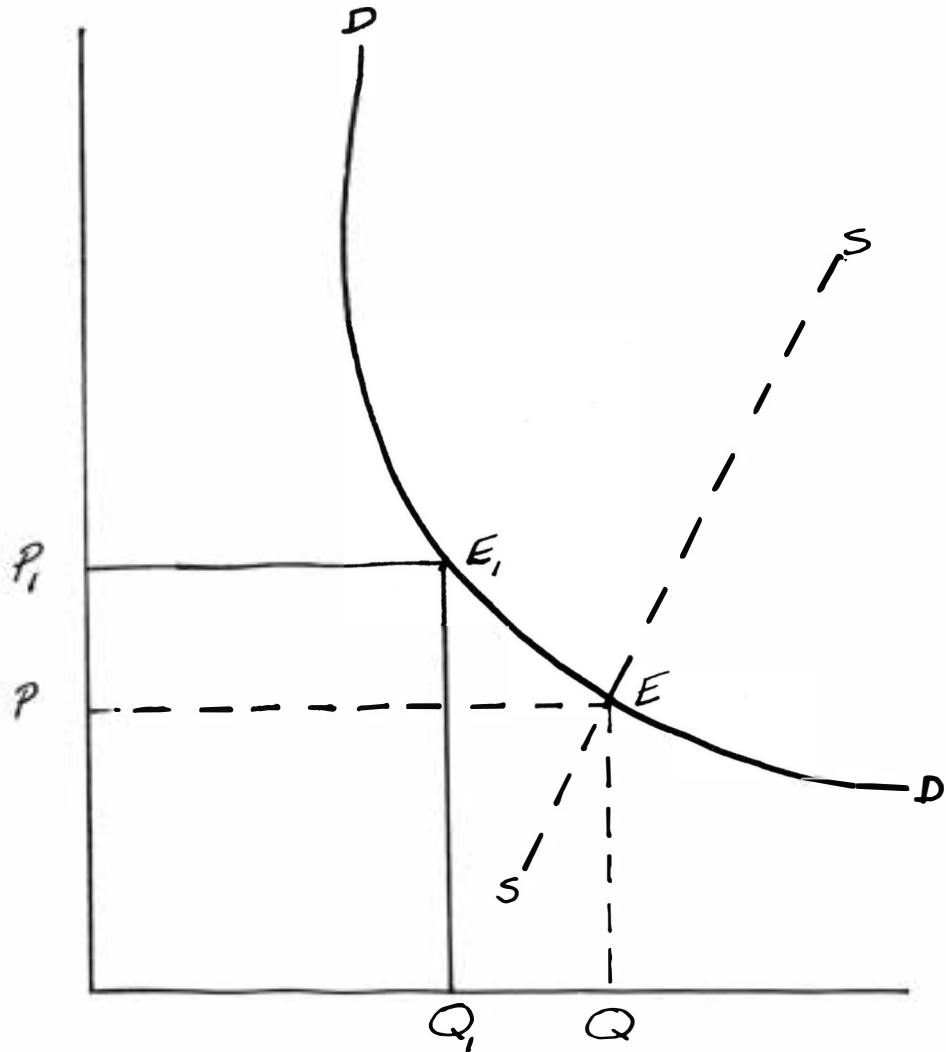


Figure 4. Effect of Federal Government Price Support Purchases of Butter

price of butter.

Substitutes for Butter

The uses of butter include spread for breads, baking, frying, broiling, and roasting, flavoring for vegetables and sauces, in addition to many others. Other fats and oils may take the place of butter for some of the uses mentioned. However, margarine is probably the closest substitute for butter as it can replace butter in nearly all uses. Figure 3 showed that on a per person basis the consumption of butter and margarine combined declined slightly during the 1924-59 period. Shortening may be used in place of butter for baking and frying. Lard may be used in place of butter for baking and frying probably to a lesser extent. It is probably safe to assume that nearly all of the margarine consumed is a butter substitute.

Butter and Margarine

The per capita civilian consumption of margarine increased from 2.0 pounds in 1924 to 9.2 pounds in 1959. During this time the civilian consumption of butter declined from 17.8 pounds to 8.0 pounds. Evidence that margarine use is widespread is reported by the Department of Agriculture. The Agricultural Research Service studied

household purchases during a six-month period April-September 1947, and 1953 through 1957. It was found that in 1947 70.7 per cent of the households used butter; in 1953 58.6 per cent of the households used butter; and in 1957 56.9 per cent of the households used butter. On the other hand, in 1947 57.8 per cent of the households were using margarine, 78.3 per cent by 1953, and in 1957 78.6 per cent of the households were using margarine. Table II summarizes this data.

Table II. Percentage of Households Buying Butter and Margarine in the United States April-September 1947, 1953, and 1957.

Items	Percentage Buying		
	1947	1953	1957
Butter	70.7	58.6	56.9
Margarine	57.8	78.3	78.6

Source: Household Purchases of Fluid Milk, Nonfat Dry Milk, Butter, Margarine, by Family Characteristics, April-September 1957 With Comparisons, p. 21, 25. Agricultural Marketing Service, U. S. Department of Agriculture, HPD-58, July 1958. Data obtained from National Consumer Panel of the Market Research Corporation of America.

The changing pattern in the consumption of butter and margarine for urban households is apparent. Margarine has come to be accepted in a larger percentage of households.

A factor which has contributed to the decline in

consumption of butter and increase in consumption of margarine has been the advantageous price position which margarine holds.¹ Before World War II the price of butter was about twice the price of margarine; in more recent years the ratio has been about 2 1/2 to 1.

Excise taxes and prohibitions against the sale of colored margarine at the state and national levels have limited the consumption of margarine. Until 1950 the Federal Government levied a tax of ten cents a pound on the sale of colored margarine. Since 1943 26 states have abolished the laws prohibiting the sale of colored margarine, 12 of these since 1950.² In 1940 the sale of colored margarine was not permitted in states having about 71 per cent of the populations. In 1945 64 per cent of the population lived in states prohibiting the sale of margarine. In 1950 the figure had been reduced to 34 per cent; and in 1955 only two states containing about four per cent of the population prohibited the sale of colored margarine. Six states taxed the sale of margarine in 1957: Idaho, Wisconsin, Minnesota, North Dakota, Utah, and

¹The Dairy Situation-280, p. 13, Agricultural Marketing Service, U. S. Department of Agriculture, November 1960.

²This information was taken from a tabulation by the National Association of Margarine Manufacturers, September 1955 and subsequent follow-up letters to state tax collectors, June 14, 1957.

South Dakota.³

The recent emphasis on the health hazard due to the consumption of foods containing cholesterol such as butter has doubtless had some influence in decreasing the per capita consumption of butter.⁴

³Ibid., Minnesota and Wisconsin prohibit the sale of colored margarine (1955).

⁴The Dairy Situation-230, p. 12, op. cit.

CHAPTER III

REVIEW OF LITERATURE

Elasticity of Demand Computed from
Household Budget Data

A number of studies have been made of consumer attitudes toward butter. In these studies demand elasticities are computed from data on consumption of butter at the household level.

In a preliminary analysis reported from Michigan State College by Shaffer and Queckenbush⁵ it was indicated that butter showed an inelastic demand. Estimates of elasticity varied from $-.36$ to $-.57$. This estimate was based on a survey of Michigan State College consumer panel members residing in East Lansing, Michigan, area over a two-year period 1951-53. The study reported a significant statistical relationship existed between family income and purchases of butter. It also stated that the habits and attitudes of consumers were important in determining butter consumption.

In a study at Washington State College Baum and Corbridge reported that income and household size were

⁵J. D. Shaffer and G. G. Queckenbush, Consumer Purchases of Butter and Oleomargarine, p. 30, Michigan State College, Technical Bulletin 243, April 1955.

statistically significant in influencing butter purchases.⁶ Household size appeared to be most important.

A University of Minnesota study by Cox⁷ also indicated that there was a definite relationship between family income and butter consumption. A study at the University of Wisconsin in 1948 showed similar results.⁸

Several consumer surveys have shown that perhaps the major reason that consumers do not purchase more butter is because of its high price in relation to available substitutes.⁹

These studies of butter consumption at the household level are cited to provide some justification for the use of the variables butter price, consumer income, and price of margarine in the computations.

⁶E. L. Baum and S. L. Corbridge, An Economic Study of Dairy Products Consumption, Seattle, Washington, p. 11, 14, Technical Bulletin No. 8, Washington Agricultural Experiment Station, January 1953.

⁷Rex Cox, Competition Between Butter and Margarine, Station Bulletin 417, University of Minnesota, June 1953.

⁸What Makes the Market for Dairy Products? p. 22, Bulletin 477, Agricultural Experiment Station, University of Wisconsin, September 1948.

⁹Cox, op. cit., p. 16; Homemakers Use of and Opinions About Fats and Oils Used in Cooking, p. 139, U. S. Department of Agriculture Supplement to Marketing Research Report No. 67, June 1954; Sheffer and Quackenbush, op. cit., p. 11.

Elasticity of Demand Computed from Market Data

In a study by Shepherd,¹⁰ it was reported that for the period 1920-41 the elasticity of demand for butter with respect to price was -1.3, or a 1 per cent change in price would result in a 1.3 per cent change in consumption in the opposite direction.

In an article by Mehren¹¹ elasticities of demand for various agricultural commodities are quoted. The elasticity of demand for butterfat per pound at the 1949 no-support price is estimated at -.75.

Major economic influences which affect the demand for milk and manufactured dairy products in the United States is the subject of a recent publication of the Agricultural Marketing Service of the Department of Agriculture.¹² Contained in the study are statistical analyses of demand during the period between World Wars I

¹⁰ Geoffrey Shepherd, Changes in the Demand for Meat and Dairy Products in the United States since 1910, p. 399, Research Bulletin 363, Agricultural Experiment Station, Ames, Iowa, November 1949.

¹¹ George Mehren, "Comparative Costs of Agricultural Support Plans and Certain Policy Implications," American Economic Review, May 1951, pp. 717-746.

¹² Anthony S. Rojko, The Demand and Price Structure for Dairy Products, Technical Bulletin No. 1168, Agricultural Marketing Service, U. S. Department of Agriculture, May 1957.

and II and the post-World War II period (1947-54). The simultaneous multi-equation and least-squares single-equation methods are used to obtain demand coefficients of elasticity. Table III shows some of the elasticity coefficients derived.

Table III. Price and Income Elasticities and Percentage Coefficient
for "Time" Base on Single and Multiple-Equation Models of
the Consumption of Butter in the United States
1924-41 and 1947-54

1924-41						
Analysis	Effect of Time Per Year	: Demand Elasticity with respect to				
		: Own Price		: Income		
		: Value	Stand. Error	: Value	Stand. Error	
Simultaneous Equations	-1.18	-.39	.15	.15	.14	
Least Squares	- .77	-.16	.09	-.06	.09	

1947-54 ¹							
Analysis	Effect of Time Per Year	: Price Elasticities			: Income Elasticity		
		: Direct	: Cross	:	: Value	Stand.	
		: Value	Stand.	: Value	Stand.	: Value	
		: Error:	Error	:	Error	: Error	
Simultaneous Equations	-3.82	-1.30	1.27	.54	.38	.33	2.26
Least Squares	No Results Given						

¹ 85% of government purchases excluded.

Source: The Demand and Price Structure for Dairy Products, p. 90, 105, Technical Bulletin No. 1168, Agricultural Marketing Service, U. S. Department of Agriculture, May 1957.

CHAPTER IV

ECONOMIC RELATIONSHIPS IN THE RETAIL BUTTER MARKET

Market demand for a product may generally be considered dependent on its price, income, and price of substitutes.¹³ Butter consumption is then primarily a function of its price, consumer income, and the price of margarine. Along with these major influences or factors affecting butter consumption time will also be considered in the statistical determination of the elasticity of consumer demand for butter. Limiting the number of independent variables to four was necessary in order that the problem be reduced to manageable size.

There is some doubt whether margarine should be considered a substitute for butter in the 1924-41 period. In a recent study by Anthony S. Rokjo,¹⁴ margarine price was not recognized as an important factor in butter consumption for the period 1924-41, but it was included in the post-World War II analysis.

The possibility of any long term trend in demand for butter over time will be accounted for by including time as one of the variables. In addition to the

¹³Herman Wold and Lars Jureen, Demand Analysis: A Study in Econometrics, p. 11, John Wiley and Sons, Inc.: New York, 1953.

¹⁴Anthony S. Rokjo, op. cit.

variables mentioned previously: price of butter, consumer income, price of margarine, and time, there are other minor influences or residual factors not specifically taken into account in the calculations which affect consumption.

This relationship may be stated symbolically as

$$C_b = (f) P_b + Y_d + P_m + T_n + z$$

where

- C_b = butter consumption
- P_b = retail price of butter
- Y_d = consumer disposable income
- P_m = retail price of margarine
- T_n = time, each year in the series
- z = residual variations

CHAPTER V

STATISTICAL ANALYSIS

Elasticity of Demand

Elasticity is an indication of consumer response to a change in price of a commodity. If a slight decrease in price results in a more than proportionate increase in the quantity demanded by consumers, then demand is said to be elastic. If a decrease in price results in a less than proportionate increase in quantity demanded, then demand is said to be inelastic. In the case of elastic demand, a decrease in price will result in an increase in total revenue; in the case of inelastic demand, a decrease in price will decrease total revenue.

Briefly, the economic meaning of the term elasticity is a measure of consumer response to a change in price. It is a ratio of the percentage change in quantity to the percentage change in price over the same period of time.

$$\text{Elasticity of Demand} = \frac{\text{Percent change in quantity}}{\text{Percent change in price}}$$

If the ratio equals 1, the relation is described as "unit" elasticity. If the ratio is less than 1 it is described

as inelastic; if greater than 1, elastic.¹⁵

Method

Least-squares regression was used to estimate the elasticity of demand for butter at the retail level. The statistical association of the independent variables (retail price of butter, disposable income per capita, price of margarine, and time) with the civilian consumption of butter per capita was measured.

Recently, there has been some differences of opinions among statisticians as to the relative merits of the least squares and simultaneous equations approach to the study of demand. Wold and Jureen in Demand Analysis: A Study in Econometrics, examined the regression method, the assumptions underlying the use of the method, and the limitations in the application of the regression method. They conclude, ". . .that the regression analysis as traditionally applied is essentially sound. In demand analysis, at least, it can still be safely recommended."¹⁶ Richard J. Foote and Frederick V. Waugh made a Monte

¹⁵Paul A. Samuelson, Economics: An Introductory Analysis, Third Edition, p. 371-372, McGraw-Hill Book Company, Inc.: New York, 1955.

¹⁶Wold and Jureen, op. cit., p. 59.

Carlo analysis of some constructed data in an experiment to test the relative merits of least squares and limited information coefficients for forecasting under specified conditions. They concluded, "In comparing some of the alternative methods, either (a) no consistent superiority was in evidence or (b) the results, although slightly superior for one method or the other, were not sufficiently different to be of practical significance."¹⁷

In applying the method of least squares to obtain coefficients of elasticity, "In essence the only assumption required is that the disturbance factors should be uncorrelated with the regressors, and this is a minimal requirement for the validity of the approach, since the regression residuals will automatically be uncorrelated with the regressors."¹⁸

The cause-effect relationship between each independent variable and the dependent variable must be justified by non-statistical considerations. It is necessary that the dependence of price on consumption be unilateral, that is, not reversible. Wold and Jureen state, "When a consumer enters a store he is confronted with a fixed

¹⁷Richard J. Foote, Analytical Tools for Studying Demand and Price Structures, p. 141, Agriculture Handbook No. 146, Agricultural Marketing Service, U. S. Department of Agriculture, August 1958.

¹⁸Wold and Jureen, op. cit., p. 56.

butter price, bargaining being practically absent. When buying the quantity he desires, his transaction is accordingly similar to the reaction in a stimulus-response experiment of the type known from experimental psychology. . . .The conclusion that we are actually concerned with a case of unilateral dependence is seen to be quite general, applying to any ordinary retail market."¹⁹

Use of logarithms will yield demand elasticities directly from the coefficients of the variables. The assumption must be made that the elasticity for the period under analysis is constant. Even though demand elasticities actually vary with time, this coefficient factor is an expression of the average elasticity of demand over the particular period under study.

Graphic Relationships: Dependent and Independent Variables

The relationship between the civilian consumption of butter and each independent variable is shown graphically on the diagrams which follow.

Consumption of Butter and Retail Price of Butter

The relation between the adjusted per capita con-

¹⁹Wold and Jureen, op. cit., p. 10.

consumption of butter and the retail price of butter deflated by the Consumer Price Index of the Bureau of Labor Statistics (1947-49 = 100) is shown in Figure 5. The figure shows that there was a slight tendency for consumption to decrease as the retail price of butter (in constant dollars) increased in the 1924-41 period. During the 1947-59 period, a decrease in the retail price of butter (in constant dollars) was associated with a decrease in butter consumption per capita.

Consumption of Butter and Disposable Income

Figure 6 shows the relationship between the per capita consumption of butter and the per capita disposable income. It appears that an increase in income is associated with a decrease in consumption of butter. However, the decrease in consumption during a period of rising incomes may merely indicate that the trend in butter consumption itself was downward in spite of the rise in income.

Consumption of Butter and Price of Margarine

During the period 1924-41 an increase in the price of margarine was associated with a decrease in the per capita consumption of butter. However, during the post World War II period, an increase in the price of margarine

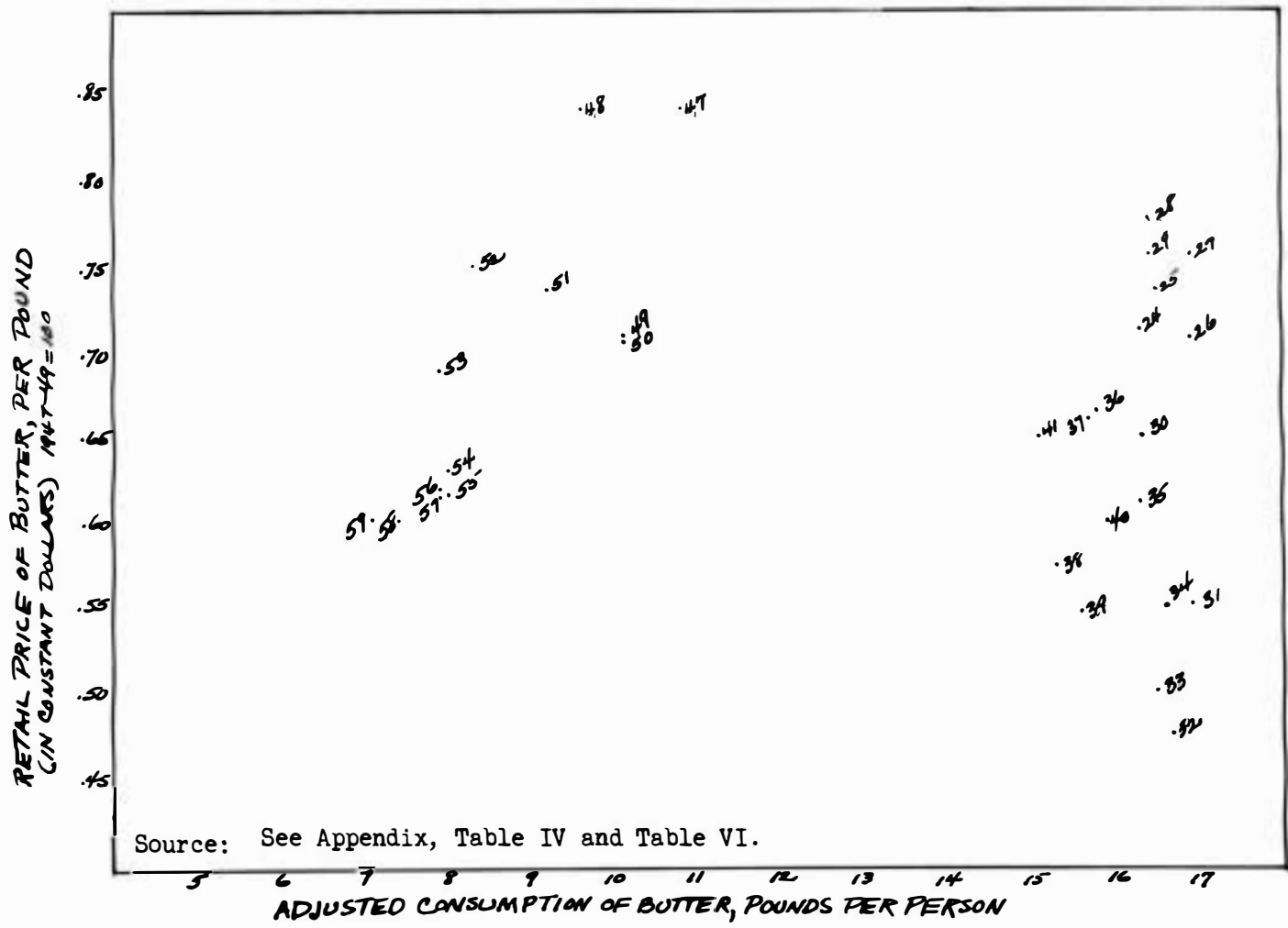


Figure 5. Scatterdiagram of the Retail Price of Butter Per Pound (in constant dollars) and the Per Capita Consumption of Butter in the United States, 1924-41 and 1947-59

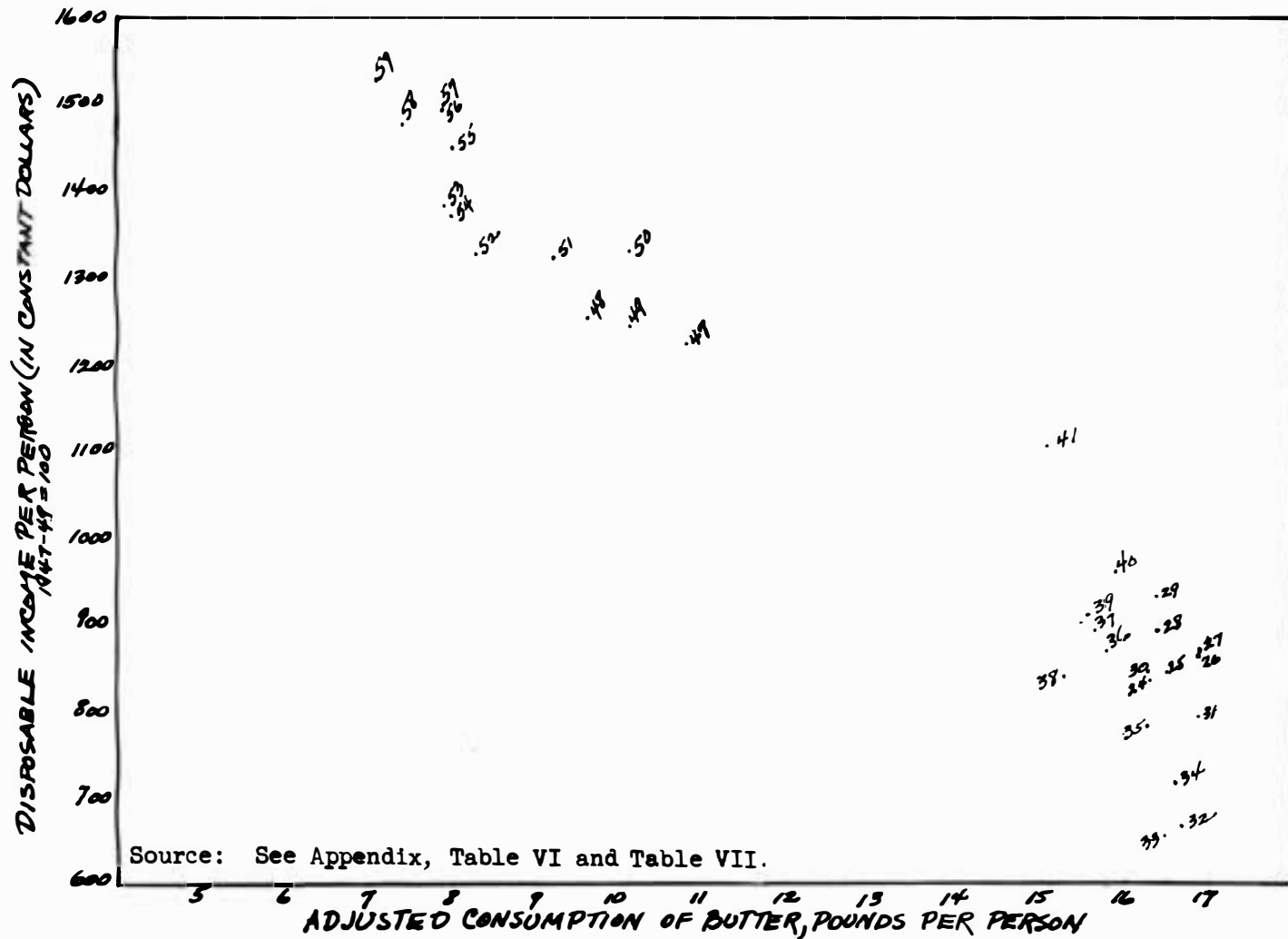


Figure 6. Scatterdiagram of Consumer Disposable Income Per Person (constant dollars) and Per Capita Consumption of Butter in the United States, 1924-41 and 1947-59

was associated with an increase in the consumption of butter. Figure 7 shows this relationship.

Data

Demand in this study was the domestic civilian consumption of butter purchased through commercial channels and the estimated amounts that farmers would have purchased. An estimate is made for amounts that farmers would have purchased by multiplying the per capita consumption of butter churned and consumed on farms by the farm value as a per cent of retail butter price for the particular year.

Data on retail prices of butter and margarine were those published by the Agricultural Marketing Service, U. S. Department of Agriculture of the average retail price in leading cities in the United States.

Disposable personal income data were compiled by the Department of Commerce for the years 1929 through 1959. For the years 1924 through 1928, estimates were made by the Agricultural Marketing Service.

Price and income data were deflated by the Consumer Price Index of the Bureau of Labor Statistics to exclude the general movement in consumer prices from the data.

Results of the Statistical Computations

Using the following relationship coefficients of the elasticities of demand were computed by the least squares method.

$$X_1 = a + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

where,

X_1 = Civilian consumption of butter per capita including an estimate of the amount farm families would have purchased through commercial channels and excludes amounts purchased wholly or partly with government funds

X_2 = Retail price of butter deflated by the Consumer Price Index of the Bureau of Labor Statistics

X_3 = Disposable income per person deflated by the Consumer Price Index

X_4 = Retail price of margarine deflated by the Consumer Price Index. Price data to 1950 are for white margarine only; from 1951 to 1959, for colored.

X_5 = Time, each year; 1924 = 1 and 1947 = 1.

Since logarithms were used in the calculations, the relationship became:

$$\log X_1 = a + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5$$

In addition to the relationship of the four independent variables to the dependent variable, three other computations were made for each period: (1) omitting time

as an independent variable; (2) omitting the retail price of margarine as an independent variable, and; (3) omitting both time and the retail price of margarine. The results of the computations for 1924-41 are shown in Table IV; for the period 1947-59, results are given in Table V.

In the 1924-41 period, with all four independent variables included in the calculations, the price elasticity was about .06; indicating that a one per cent change in the retail price of butter was associated with a .06 per cent change in the same direction in the per capita consumption of butter. A change of one per cent in the per capita disposable income was associated with a change of about .21 per cent in the consumption of butter in the opposite direction. A one per cent change in the retail price of margarine was associated with a .04 per cent change in the consumption of butter in the same direction. Over this period, there appeared to be a .01 per cent decrease in the consumption of butter per person each year. The demand for butter was highly inelastic with respect to its price. Consumption changed very little with changes in the price of butter.

In the 1947-59 period, the consumer was more responsive (in the aggregate) to changes in butter price, though demand remained inelastic. In the 1947-59 period, a one per cent change in the retail price of butter was

Table IV. Price and Income Elasticities and Per Cent for Time, Per Year, for the Domestic Civilian Consumption of Butter in the United States, 1924-41 1/

Independent Variables	Per cent for Time Per Year	Elasticity, with respect to		
		Direct	Price	Income
$P_b; Y_d$	---	.14786	---	-.25980
$P_b; Y_d; P_m$	---	.06516	.06646	-.23090
$P_b; Y_d; T_n$	-.01226	.08358	---	-.20637
$P_b; Y_d; P_m; T_n$	-.00873	.05825	.03522	-.20643
	(.01)	(.08)	(.08)	(.07)

1/ Figures in parentheses are the standard errors of the coefficients in the line immediately above.

Table V. Price and Income Elasticities and Per cent for Time, Per Year, for the Domestic Civilian Consumption of Butter in the United States, 1947-59 ^{1/}

Independent Variables	Per cent for Time Per Year	Elasticity, with respect to		
		Direct	Cross	Income
$P_b^j Y_d^j$	---	.03741	---	-1.55217
$P_b^j Y_d^j P_m^j$	---	-.42745	.40816	-1.30018
$P_b^j Y_d^j T_n^j$	-.14982	-.40518	---	-.77245
$P_b^j Y_d^j P_m^j T_n^j$	-.12495	-.44004	.09511	-.84317
	(.10)	(.08)	(.31)	(.22)

^{1/} Figures in parentheses are the standard errors of the coefficients in the line immediately above.

associated with a .44 per cent change in the per capita consumption of butter in the opposite direction. The elasticity with respect to income was much higher. A .83 per cent change in butter consumption was associated with a one per cent change in disposable income per capita in the opposite direction. There was a slightly "greater" response in butter consumption to the price of margarine in the same direction in 1947-59 than in 1924-41. Butter consumption per person appeared to decline about .12 per cent per year during the 1947-59 period. All coefficients of elasticity showed a more elastic (or less inelastic) demand during the 1947-59 period as compared with the 1924-41 period. The income and cross elasticity coefficients were higher when time was omitted from the calculations.

Table VI shows the standard errors of the estimate for the different combinations of variables used. In the 1924-41 period the standard error of the estimate was about .01; for the 1947-59 period, it was about .02.

The coefficients of multiple correlation are shown in Table VII. The data indicate that for the 1924-41 period the four independent variables explained about 51 per cent of the variation in butter consumption; in 1947-59 the same variables explained about 85 per cent of the variation. The calculations using retail price of butter, disposable income, and time provided the least reliable results in both periods.

Table VI. Standard Error of Estimate Related to Computations for the Elasticity of Demand for Butter in the United States, using various combinations of Independent Variables, 1924-41 and 1947-59

Independent Variables	Standard Error of Estimate			
	1924-41	\bar{S}	\bar{S}^2	1947-59
$P_b Y_d$	.00010	.010	.00072	.027
$P_b Y_d P_m$	.00010	.010	.00052	.023
$P_b Y_d T_n$	.00015	.012	.00485	.070
$P_b Y_d P_m T_n$	.00011	.010	.00050	.022

Table VII. Coefficient of Multiple Determination (\bar{R}^2) and Coefficient of Multiple Correlation, (\bar{R}) Related to Computations for the Elasticity of Demand for Butter in the United States, using various combinations of Independent Variables for the Periods 1924-41 and 1947-59

Independent Variables	1924-41		1947-59	
	\bar{R}^2	\bar{R}	\bar{R}^2	\bar{R}
$P_b; Y_d$	.539301	.734	.781209	.884
$P_b; Y_d; P_m$	.536008	.732	.842899	.918
$P_b; Y_d; T_n$	.318808	.564	0	0
$P_b; Y_d; P_m; T_n$	.514494	.717	.848781	.921

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of the study was to determine if a change in the consumer response to butter had taken place between the two periods 1924-41 and 1947-59. The scatterdiagrams (Figures 5, 6, and 7) show that there was a definite change in the level of consumer demand for butter from the 1924-41 period to the 1947-59 period. Consumer response to butter price was at a lower level in 1947-59 even after changes in the general price level were taken into account. There also was a definite change in elasticity of demand between the two periods. Chances are very slight that the data for the two periods could have come from the same population, statistically speaking.

In the 1924-41 period the elasticity of butter consumption with respect to price (.06) was associated with a standard error of .08. This means that chances are 2 out of 3 that the true elasticity lies within the range of $-.02$ to $+.14$. Chances are 19 out of 20 that the true value lies within the range of $-.10$ to $+.22$. Consequently, the true coefficient of the elasticity of demand for butter could be a low negative coefficient as well as a low positive coefficient. Whether the direction of change was positive or negative, the results show that

consumption of butter tended to change very little with changes in the retail price of butter. The coefficient of elasticity with respect to income (-.21) was associated with a .07 standard error. Thus, chances are 2 out of 3 that the true coefficient lies within the range $-.21 \pm .07$. Thus, as real income tended to rise, butter consumption declined per capita.

Other factors remaining constant, a one per cent increase in retail price of butter in the 1947-59 period was accompanied by a .44 per cent decrease in consumption of butter per capita (standard error .08). During the same period a one per cent increase in income was associated with a decrease of .34 per cent in the per capita consumption of butter (standard error .22).

It appears that other unidentified factors may have had an influence on the consumption of butter. Research did not reveal with certainty what these factors were. It is likely that some of these unidentified factors influencing butter consumption cannot be quantified. Results showed a large negative income elasticity during the 1947-59 period. This period was characterized by rising real incomes per capita. Perhaps this phenomenon can be partially explained by the correlation between income and educational level. A rise in the level of education is generally accompanied by a rise in income.

There also appears to be a relationship between educational level and the use of nonfat dairy products and an avoidance of foods containing animal fat for health reasons.²⁰ Thus, as income per capita increases and the general educational level rises, people tend to consume less butter. Thus, in spite of an increase in income, they consume less butter.

The direct price positive elasticities during the 1924-41 period may be partially explained by the period itself. It appears from the scatterdiagram (Figure 5) that there may have been a different set of factors influencing the consumer response to price of butter in the pre-1929 period than in the post-1929 period. If the two groups of data were considered separately, it appears from the scatterdiagram that there might be a negative elasticity for each of the two periods. However, considered together they yield a positive .06 coefficient of elasticity with respect to price. Data were not sufficient in the pre-1929 period for a separate statistical analysis. Literature available does not suggest what different factors might have influenced the two periods except a change in the consumptive habits from the boom era of the pre-depression days to the post-1929 period. Identifica-

²⁰The Dairy Situation, DS-280, p. 12, op. cit.

tion of any other factors influencing demand and the extent of their influence would be an area of further investigation. The effect on demand of the unidentified factor or factors associated with time appears to be much larger in the 1947-59 period than in the 1924-41 period.

In the 1924-41 period about 51 per cent of the variation was explained by the four independent variables: price of butter, income, price of margarine, and time. About 85 per cent of the variation in butter consumption was accounted for by the four independent variables in the 1947-59 period.

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APPENDIX

Table I. Butter, creamery and farm: Domestic Civilian Disappearance, Commercial and Noncommercial Sources, 1924-59 (millions of pounds)

Year	Civilian Total					Total :Comm'l. :and non- :comm'l. :sources
	Commercial sources		Noncommercial sources		Total	
	Creamery :Butter	Farm- :churned :Butter :Sold	Total :Commer- :cial	From CCC :supplies :or bought :wholly or :partly with :Government :funds <u>1/</u>	Consump- :tion on :farms of :farm- :churned :butter	
1924	1,392	176	1,568	---	467	2,035
1925	1,473	166	1,639	---	453	2,092
1926	1,528	162	1,690	---	458	2,148
1927	1,568	155	1,723	---	452	2,175
1928	1,538	145	1,683	---	432	2,115
1929	1,596	135	1,731	---	407	2,138
1930	1,639	121	1,760	---	402	2,162
1931	1,726	122	1,848	---	422	2,270
1932	1,725	128	1,853	---	453	2,306
1933	1,698	122	1,820	3	458	2,281
1934	1,722	109	1,831	64	450	2,345
1935	1,688	104	1,792	7	435	2,234
1936	1,646	94	1,740	3	408	2,151
1937	1,683	86	1,769	3	386	2,158
1938	1,660	83	1,743	46	371	2,160
1939	1,739	77	1,816	108	352	2,276
1940	1,804	71	1,875	37	332	2,244

Table I. (continued)

Year	Civilian Total					
	Commercial sources			Noncommercial sources		Total
	Creamery Butter	Farm- churned Butter Sold	Total Commer- cial	From CCC supplies or bought wholly or partly with Government funds <u>1/</u>	Consump- tion on farms of farm- churned butter	Comm'l. and non- comm'l. sources
1941	1,693	68	1,761	28	327	2,116
1942	1,689	61	1,750	37	305	2,092
1943	1,183	54	1,237	---	288	1,525
1944	1,202	51	1,253	---	279	1,532
1945	1,077	53	1,130	---	283	1,413
1946	1,125	54	1,179	---	277	1,456
1947	1,289	48	1,337	---	263	1,600
1948	1,157	44	1,201	---	249	1,450
1949	1,268	40	1,308	5	236	1,549
1950	1,301	36	1,337	51	226	1,614
1951	1,206	31	1,236	---	209	1,445
1952	1,102	28	1,130	---	186	1,316
1953	1,079	25	1,104	55	170	1,329
1954	1,139	23	1,164	93	156	1,413
1955	1,187	21	1,205	112	145	1,462
1956	1,183	19	1,197	115	131	1,443
1957	1,220	17	1,236	65	120	1,421
1958	1,190	15	1,204	130	106	1,440
1959 <u>2/</u>	1,179	13	1,192	115	93	1,400

1/ Includes purchases of butter with blue stamps 1939-42. 2/ Preliminary

Source: The Dairy Situation, DS-280, p. 31, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., November 1960.

Table II. Butter, creamery and farm: Domestic Civilian Disappearance, Commercial and Noncommercial Sources, Per Capita, 1924-59

Year	Civilian Per Capita					
	Commercial Sources			Noncommercial sources		Total
	Creamery Butter	Farm-churned butter sold	Total commercial 2/	From CCC supplies or bought wholly or partly with Government funds 1/	Consumption on farms of farm-churned butter	Comm'l. and non-comm'l. sources 2/
1924	12.2	1.5	13.7	---	4.1	17.8
1925	12.7	1.4	14.1	---	3.9	18.1
1926	13.0	1.4	14.4	---	3.9	18.3
1927	13.2	1.3	14.5	---	3.8	18.3
1928	12.8	1.2	14.0	---	3.6	17.6
1929	13.1	1.1	14.2	---	3.3	17.6
1930	13.3	1.0	14.3	---	3.3	17.6
1931	13.9	1.0	14.9	---	3.4	18.3
1932	13.8	1.0	14.8	---	3.6	18.5
1933	13.5	1.0	14.5	3/	3.6	18.2
1934	13.6	.9	14.5	0.5	3.6	18.6
1935	13.3	.8	14.1	.1	3.4	17.6
1936	12.8	.7	13.6	3/	3.2	16.8
1937	13.1	.7	13.7	3/	3.0	16.8
1938	12.8	.6	13.4	.3	2.9	16.6
1939	13.3	.6	13.9	.8	2.7	17.4
1940	13.7	.5	14.2	.3	2.5	17.0
1941	12.9	.5	13.4	.2	2.5	16.1
1942	12.8	.5	13.3	.3	2.3	15.9
1943	9.2	.4	9.6	---	2.2	11.8
1944	9.3	.4	9.7	---	2.2	11.9
1945	8.3	.4	8.6	---	2.2	10.9

Table II. (continued)

Year	Civilian Per Capita					
	Commercial sources			Noncommercial sources		Total
	Creamery	Farm	Total	From CCC	Consump-	Total
	Butter	churned	commer-	supplies	tion on	Comm'l.
		butter	cial ^{2/}	or bought	farms of	and non-
		sold		wholly or	farm-	comm'l.
				partly with	churned	sources
				Government	butter	^{2/}
				funds ^{1/}		
1946	8.1	.4	8.5	---	2.0	10.5
1947	9.0	.3	9.4	---	1.8	11.2
1948	8.0	.3	8.3	---	1.7	10.0
1949	8.6	.3	8.9	^{3/}	1.6	10.5
1950	8.7	.2	8.9	.3	1.5	10.7
1951	8.0	.2	8.2	---	1.4	9.6
1952	7.2	.2	7.4	---	1.2	8.6
1953	6.9	.2	7.1	.4	1.1	8.5
1954	7.2	.1	7.3	.6	1.0	8.9
1955	7.3	.1	7.4	.7	.9	9.0
1956	7.2	.1	7.3	.7	.8	8.8
1957	7.2	.1	7.4	.4	.7	8.5
1958	6.9	.1	7.0	.8	.6	8.4
1959 ^{4/}	6.8	.1	6.8	.7	.5	8.0

^{1/}Includes purchases of butter with blue stamps, 1939-42.

^{2/}Estimates computed from total disappearance.

^{3/}Less than 0.05 pound.

^{4/}Preliminary

Source: The Dairy Situation, DS-280, p. 31, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., November 1960.

Table III. Part 1, Butter, actual weight:
United States Supply, 1924 - 1959

Year	Production :1/ : Million : pounds	Beginning : commercial : stocks 2/ : Million : pounds	Imports :3/ : Million : pounds	Total : supply : Million : pounds
1924	2,066	30	19	2,115
1925	2,082	66	7	2,155
1926	2,132	53	7	2,192
1927	2,188	34	8	2,230
1928	2,120	46	4	2,170
1929	2,184	44	3	2,231
1930	2,149	82	3	2,234
1931	2,239	63	2	2,304
1932	2,307	27	1	2,335
1933	2,375	22	1	2,398
1934	2,286	111	1	2,398
1935	2,211	47	23	2,281
1936	2,168	40	10	2,218
1937	2,135	61	11	2,207
1938	2,252	43	2	2,297
1939	2,210	129	1	2,340
1940	2,240	55	1	2,296
1941	2,268	41	4	2,313
1942	2,130	114	20	2,264
1943	2,015	8/ 24	3	2,042
1944	1,818	9/ 35	2	1,855
1945	1,699	10/ 21	4	1,724
1946	1,502	11/ 28	7	1,537
1947	1,640	23	4	1,667
1948	1,504	22	7/ 7	1,526
1949	1,688	32	7/ 7	1,720
1950	1,648	26	7/ 7	1,674
1951	1,443	39	7/ 7	1,482
1952	1,402	24	7/ 7	1,426
1953	1,607	64	7/ 7	1,671
1954	1,628	30	1	1,659

Table III. Part 1, (continued)

Year	: Production	: Beginning	: Imports	: Total
	: <u>1/</u>	: commercial	: <u>3/</u>	: supply
	: stocks <u>2/</u>	:	:	:
	: Million	: Million	: Million	: Million
	: <u>pounds</u>	: <u>pounds</u>	: <u>pounds</u>	: <u>pounds</u>
1955	: 1,549	35	1	1,585
1956	: 1,562	28	1	1,591
1957	1,551	23	1	1,575
1958 <u>15/</u>	1,510	32	1	1,543
1959 <u>15/</u>	1,435	28	1	1,464

Table III. Part 2, Butter, actual weight, United States distribution, 1924 - 1959

Year	Ending stocks	Commercial exports and shipments	Department of Agriculture Beginning stocks	Ending stocks	Deliveries	Net purchases	Use in margarine	Domestic disappearance		
	2/	3/4/	4/	5/	6/	7/	Military	Total	Civilian Per capita	
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	
1924	66	12	---	---	---	---	2	---	1,999	17.8
1925	53	8	---	---	---	---	2	---	2,092	18.1
1926	34	8	---	---	---	---	2	---	2,148	18.3
1927	46	7	---	---	---	---	2	---	2,175	18.3
1928	44	8	---	---	---	---	3	---	2,115	17.6
1929	82	8	---	---	---	---	3	---	2,138	17.6
1930	63	7	---	---	---	---	2	---	2,162	17.6
1931	27	7	---	---	---	---	7/	---	2,270	18.3
1932	22	7	---	---	---	---	7/	---	2,306	18.5
1933	111	6	---	---	---	---	7/	---	2,281	18.2
1934	47	6	---	---	---	---	7/	---	2,345	18.6
1935	40	7	---	---	---	---	7/	---	2,234	17.6
1936	61	6	---	---	---	---	---	---	2,151	16.8
1937	43	6	---	---	---	---	---	---	2,158	16.8
1938	129	8	---	---	---	---	---	---	2,160	16.6
1939	55	9	---	---	---	---	---	---	2,276	17.4

Table III. Part 2, (continued)

Year	: Ending : Commer-		: Department of Agriculture :					: Domestic disappearance		
	:commer-:cial		: Use in					: Military :		: Civilian
	: stocks	: exports	: Begin-: ning	: Ending : stocks	: Deliv- : eries	: Net : pur- : chases	: marga- : rine	: Total	: Per	
: 2/	: ship- : ments	: 3/	: 4/	: 5/	: 6/				: capita	
	: Mil.	: Mil.	: Mil.	: Mil.	: Mil.	: Mil.	: Mil.	: Mil.	: Mil.	: Lb.
	: lb.	: lb.	: lb.	: lb.	: lb.	: lb.	: lb.	: lb.	: lb.	
1940	: 41	11	---	---	---	---	---	---	2,244	17.0
1941	: 114	13	---	---	---	---	---	70	2,116	16.1
1942	<u>8/</u> 24	9	---	1	14	15	---	124	2,092	15.9
1943	<u>9/</u> 35	6	1	123	88	210	---	321	1,525	11.8
1944	<u>10/</u> 21	6	123	7	91	-25	---	266	1,532	11.9
1945	<u>11/</u> 28	<u>12/</u> 8	7	<u>13/</u> 13	<u>12/</u> 47	53	---	222	1,413	10.9
1946	23	<u>12/</u> 6	<u>13/</u> 13	---	<u>12/</u> 11	-2	---	54	1,456	10.5
1947	22	<u>12/</u> 17	---	---	---	---	---	28	1,600	11.2
1948	32	8	---	---	---	---	---	36	1,450	10.0
1949	26	6	---	<u>14/</u> 107	---	107	---	32	1,549	10.5
1950	39	5	<u>14/</u> 107	66	23	-18	---	34	1,614	10.7
1951	24	4	66	3	20	-43	---	52	1,445	9.6
1952	64	2	3	9	---	6	---	38	1,316	8.6
1953	30	2	9	252	24	267	---	43	1,329	8.5
1954	35	3	252	344	53	145	---	63	1,413	8.9
1955	28	8	344	135	216	7	---	77	1,465	9.0
1956	23	<u>16/</u> 24	135	2	160	27	---	70	1,447	8.8
1957	32	<u>16/</u> 6	2	55	7	60	---	55	1,422	8.4
1958	<u>15/</u> 28	<u>16/</u> 7	55	41	31	17	---	50	1,441	8.4
1959	<u>15/</u> 20	<u>16/</u> 9	41	11	20	-10	---	51	1,394	8.0

Table III. Parts 1 and 2, (continued)

1/1909-16, estimates of total butter production were based on data of Census of Manufactures, Census of Agriculture and market receipts. 1917-38, annual estimates of factory production based on data from Census of Manufactures, State Departments of Agriculture, and from data received directly from creameries by the former Bureau of Agricultural Economics; 1939-date, data are as published by the Agricultural Marketing Service in Production of Manufactured Dairy Products. Farm butter production, 1917-23, estimated primarily from Census of Agriculture and from 1924-date from reports by farmers, in addition to Census data, and published by AMS. Data prior to 1909 available in U. S. Department of Agriculture Technical Bulletin No. 722, Production and Consumption of Manufactured Dairy Products. 2/Stock data cover quantities in commercial storage warehouses, reported beginning 1916 in Cold Storage Report, AMS. 3/Imports, exports, and shipments are those published by the Department of Commerce, except for the period during World War II when this information was supplemented and partially replaced by data from Department of Agriculture records. Import data prior to 1918 are "general imports" while for 1918 and following years they are "imports for consumption". Shipments to Alaska and Hawaii excluded starting with April 1948. 4/Government stocks as reported in Cold Storage Report beginning December 31, 1950. 5/Includes donations beginning 1950; in 1954-56, also includes donations and deliveries of butter oil (in terms of butter). 6/Use of butter in margarine prior to 1914 estimated; 1914-16 and beginning 1920 from Bureau of Internal Revenue; 1917-19 (fiscal year data), from Institute of Margarine Manufacturers. 7/ Less than 500,000 pounds. 8/Cold-storage total 25 million pounds include about 1 million pounds owned by Department of Agriculture and the Armed Forces. 9/Total of 35 million pounds includes approximately 30 million pounds in cold storage and 5 million pounds outside cold storage. Cold-storage stocks of 155 million pounds includes about 125 million pounds of Department of Agriculture and military stocks. 10/Cold-storage total of 61.5 million pounds includes approximately 39.6 million pounds of Department of Agriculture and military stocks. 11/Includes 3 million pounds in process of transfer as of January 1 from military holdings to civilian channels via Production and Marketing Administration. 12/Includes butter equivalent of butter spread and butter oil. 13/ In process of transfer from the military as of January 1. 14/Includes 10 million pounds for distribution to School Lunch Program in 1950. 15/Preliminary. 16/Includes butter equivalent of butter oil.

Table IV. Average Annual Retail Price Per Pound of
Butter and Margarine in Leading Cities of the
United States, 1924-59 (current and
constant dollars) 1947-49=100

Year	Price of Butter (current dollars) (cents)	Price of Butter (constant dollars) (cents)	Price of Margarine (current dollars) (cents)	Price of Margarine (constant dollars) (cents)	Consumer Price Index 1947-49=100
1924	52.2	71.4	29.3	40.1	73.1
1925	55.2	73.6	30.2	40.3	75.0
1926	53.6	70.9	30.1	39.8	75.6
1927	56.3	75.9	28.3	38.1	74.2
1928	56.9	77.6	27.3	37.2	73.3
1929	55.5	75.7	27.0	36.8	73.3
1930	46.4	65.0	25.4	35.6	71.4
1931	35.8	55.1	19.9	30.6	65.0
1932	27.8	47.6	15.4	26.4	58.4
1933	27.8	50.3	13.2	23.9	55.3
1934	31.5	55.1	13.5	23.6	57.2
1935	36.0	61.3	18.8	32.0	58.7
1936	39.5	66.6	18.5	31.2	59.3
1937	40.7	66.3	19.2	31.3	61.4
1938	34.7	57.5	17.5	29.0	60.3
1939	32.5	54.7	16.7	28.1	59.4
1940	36.0	60.1	15.9	26.5	59.9
1941	41.1	65.3	17.1	27.2	62.9
1942	47.3	67.9	22.1	31.7	69.7
1943	52.7	71.2	23.6	31.9	74.0
1944	50.0	66.5	24.1	32.0	75.2
1945	50.7	65.9	24.1	31.3	76.9
1946	71.0	85.1	28.3	33.9	83.4

Table IV. (continued)

Year	Price of Butter (current dollars) (cents)	Price of Butter (constant dollars) (cents)	Price of Margarine (current dollars) (cents)	Price of Margarine (constant dollars) (cents)	Consumer Price Index 1947-49=100
1947	80.5	84.3	40.8	42.7	95.5
1948	86.7	84.3	41.4	40.3	102.8
1949	72.5	71.2	30.8	30.3	101.8
1950	72.9	70.9	30.7	29.9	102.8
1951	81.9	73.8	34.7	31.3	111.0
1952	85.5	75.3	29.4	25.9	113.5
1953	79.0	69.1	29.4	25.7	114.4
1954	72.4	63.1	29.9	26.0	114.8
1955	70.9	61.9	28.9	25.2	114.5
1956	72.1	62.0	28.9	24.9	116.2
1957	74.3	61.8	29.9	24.9	120.2
1958	74.2	60.1	29.4	23.8	123.5
1959	75.3	60.5	28.0	22.5	124.6

Source: Retail Price Data on Butter and Margarine in current dollars is from Dairy Statistics, p. 291-292, Statistical Bulletin 218, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., Oct. 1957, and Supplement for 1959 to Dairy Statistics, Statistical Bulletin 218, p. 76. Retail margarine price data (1924-1949) is based on uncolored margarine; for 1950 the retail price is the average of uncolored margarine January-July and on colored margarine August-December; for 1951-1959 the retail price is based on colored margarine. Consumer Price Index data is from the Bureau of Labor Statistics, U. S. Department of Labor, Washington, D. C.

TABLE V. CONSUMPTION OF FATS AND OILS IN THE
UNITED STATES PER CAPITA, 1924-59
(IN POUNDS)

Year	Butter	Margarine	Lard	Shorten- ing	Other Edible Oils <u>1/</u>	Total
1924	17.8	2.0	14.2	7.0	3.8	44.8
1925	18.1	2.0	12.3	9.7	4.8	46.9
1926	18.3	2.0	12.2	9.5	5.2	47.2
1927	18.3	2.3	12.7	9.7	4.0	47.0
1928	17.6	2.6	13.2	9.3	4.7	47.4
1929	17.6	2.9	12.7	9.9	5.4	48.5
1930	17.6	2.6	12.7	9.8	5.9	48.6
1931	18.3	1.9	13.6	9.4	5.1	48.3
1932	18.5	1.6	14.4	7.5	4.8	46.8
1933	18.2	1.9	14.0	7.5	5.3	46.0
1934	18.6	2.1	13.0	9.5	5.4	48.6
1935	17.6	3.0	9.6	12.1	5.9	48.2
1936	16.8	3.1	11.3	12.3	6.0	49.5
1937	16.8	3.1	10.5	12.3	6.6	49.3
1938	16.6	3.0	11.1	11.5	6.9	49.1
1939	17.4	2.3	12.7	10.7	7.2	50.3
1940	17.0	2.4	14.4	9.0	7.4	50.2
1941	16.1	2.8	13.8	10.4	8.2	51.3
1942	15.9	2.8	12.8	9.4	7.6	48.5
1943	11.8	3.9	13.0	9.6	6.7	45.0
1944	11.9	3.9	12.3	8.9	6.9	43.9
1945	10.9	4.1	11.7	9.1	6.2	42.0
1946	10.5	3.9	11.8	10.2	6.4	42.8
1947	11.2	5.0	12.6	9.4	6.9	45.1
1948	10.0	6.1	12.7	9.7	7.1	45.6
1949	10.5	5.8	11.8	9.7	7.9	45.7
1950	10.7	6.1	12.6	11.0	8.6	49.0
1951	9.6	6.6	12.3	9.0	7.7	45.2
1952	8.6	7.9	11.8	10.2	8.7	47.2
1953	8.5	8.1	11.4	10.2	9.1	47.3
1954	8.9	8.5	10.2	11.8	9.5	48.9
1955	9.0	8.2	10.1	11.5	10.5	49.3
1956	8.8	8.2	9.8	10.9	10.9	48.6
1957	8.5	8.6	9.5	10.4	10.8	47.8
1958	8.4	9.0	9.7	11.3	11.0	49.4
1959	8.0	9.2	9.0	12.6	10.6	49.4

Table V. (continued)

1/Data for 1924-30 is an approximation as given in Table 32, p. 37, of the Consumption of Food in the United States, 1909-52, Supplement for 1956.

Source: Consumption of Food in the United States 1909-52 Supplement for 1956, p. 15, and Supplement for 1959, p. 3, Agriculture Handbook No. 62, Agricultural Marketing Service, September 1957 and August 1960.

Table VI. Adjusted Domestic Civilian Consumption
of Butter Per Capita in the United States,
1924-59

Year	Commercial Sources	Farm Churned Butter Consumed on Farms	Farm Value as Per Cent of Retail Price of Butter	Col. 3 times Col. 4	Total (Col. 2 plus Col. 5)
(1)	(2)	(3)	(4)	(5)	(6)
	(Pounds)	(Pounds)	(Pounds)	(Pounds)	(Pounds)
1924	13.7	4.1	63	2.6	16.3
1925	14.1	3.9	62	2.4	16.5
1926	14.4	3.9	64	2.5	16.9
1927	14.5	3.8	64	2.4	16.9
1928	14.0	3.6	66	2.4	16.4
1929	14.2	3.3	66	2.2	16.4
1930	14.3	3.3	61	2.0	16.3
1931	14.9	3.4	58	2.0	16.9
1932	14.8	3.6	53	1.9	16.7
1933	14.5	3.6	56	2.0	16.5
1934	14.5	3.6	59	2.1	16.6
1935	14.1	3.4	65	2.2	16.3
1936	13.6	3.2	68	2.2	15.8
1937	13.7	3.0	68	2.0	15.7
1938	13.4	2.9	64	1.9	15.3
1939	13.9	2.7	62	1.7	15.6
1940	14.2	2.5	66	1.7	15.9
1941	13.4	2.5	69	1.7	15.1
1942	13.3	2.3	71	1.6	14.9
1943	9.6	2.2	79	1.7	11.3
1944	9.7	2.2	84	1.8	11.5
1945	8.6	2.2	83	1.8	10.4
1946	8.5	2.0	76	1.5	10.0
1947	9.4	1.8	76	1.4	10.8
1948	8.3	1.7	75	1.3	9.6
1949	8.9	1.6	72	1.2	10.1

Table VI. (continued)

Year	Commercial Sources	Farm Churned Butter Consumed on Farms	Farm Value as Per Cent of Retail Price of Butter	Col. 3 times Col. 4	Total (Col. 2 plus Col. 5)
(1)	(2)	(3)	(4)	(5)	(6)
	(Pounds)	(Pounds)	(Pounds)	(Pounds)	(Pounds)
1950	8.9	1.5	72	1.1	10.1
1951	8.2	1.4	74	1.0	9.2
1952	7.4	1.2	74	.9	8.3
1953	7.1	1.1	72	.8	7.9
1954	7.3	1.0	70	.7	8.0
1955	7.4	.9	69	.6	8.0
1956	7.3	.8	71	.6	7.9
1957	7.4	.7	70	.5	7.9
1958	7.0	.6	69	.4	7.4
1959 Prelim.	6.8	.5	69	.3	7.1

Source: The Dairy Situation-280, p. 31, Agricultural Marketing Service, U. S. Department of Agriculture, November 1960; and Dairy Statistics, p. 294, Statistical Bulletin No. 218, Agricultural Marketing Service, U. S. Department of Agriculture: Washington, D. C., October 1957; and Supplement for 1959 to Dairy Statistics, p. 77, Agricultural Marketing Service, U. S. Department of Agriculture: Washington, D. C., June 1960.

Table VII. Disposable Personal Income in the
United States Per Capita, 1924-59

Year	Amount (in current dollars)	Amount (in constant dollars) 1947-49=100
1924	\$610	\$834
1925	636	848
1926	651	861
1927	645	869
1928	653	891
1929	682	930
1930	604	846
1931	515	792
1932	390	668
1933	364	658
1934	411	719
1935	459	782
1936	517	872
1937	551	897
1938	506	839
1939	538	906
1940	576	962
1941	697	1108
1942	871	1250
1943	977	1320
1944	1060	1410
1945	1075	1398
1946	1136	1362
1947	1181	1237
1948	1291	1256
1949	1271	1249
1950	1369	1332
1951	1473	1327
1952	1520	1339
1953	1582	1383
1954	1582	1378
1955	1660	1450
1956	1742	1499
1957	1804	1501
1958	1826	1479
1959 Prelim.	1905	1529

Table VII. (continued)

Source: Consumption of Food in the United States, 1909-52, Supplement for 1959, p. 38, Agriculture Handbook No. 62, Agricultural Marketing Service, U. S. Department of Agriculture: Washington, D. C., August 1960.