

Butter Pricing and Marketing At Country Points In the North Central Region

Hugh L. Cook, Paul L. Kelley, E. Fred Koller, and Arthur H. Miller

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FOREWORD

At the April, 1949, meeting of the North Central Regional Committee on Dairy Marketing Research, the pricing of butter at country points in that region was selected as a problem of regional importance needing study. Butter pricing, with particular reference to the adequacy of published quotations as a pricing basis, and the nature and efficiency of customary pricing arrangements, was regarded as basic to the committee's research program, NCM-1, undertaken in 1946, on "Maintaining and Expanding the Market for Dairy Products."

A butter pricing subcommittee was elected by the regional committee and was assigned primary responsibility for the regional survey and for preparation of a preliminary manuscript. The members are Hugh L. Cook, subcommittee chairman, Paul L. Kelley, and E. Fred Koller. The Agricultural Experiment Stations in the region and the Bureau of Agricultural Economics, U. S. Department of Agriculture actively assisted the subcommittee.

The members of the North Central Regional Committee on Dairy Marketing Research (NCM-1) are:

| | |
|--------------|--|
| Illinois | Roland W. Bartlett |
| Indiana | Norris T. Pritchard |
| Iowa | Geoffrey Shepherd, Henry A. Homme |
| Kansas | Paul L. Kelley |
| Kentucky | John B. Roberts (NCM-1 Chairman) |
| Ohio | Charles G. McBride (deceased) Elmer F. Baumer |
| Michigan | Gerald G. Quackenbush |
| Minnesota | E. Fred Koller |
| Missouri | C. C. Erwin |
| Nebraska | C. J. Miller |
| North Dakota | L. A. Fourt |
| South Dakota | Ernest Feder |
| Wisconsin | Hugh L. Cook |

Federal-State Cooperative agents have been:

William E. Black (until October 1950)

Arthur H. Miller (since December 1950)

U. S. Department of Agriculture representatives who share responsibility are:

Bureau of Agricultural Economics, Louis F. Herrmann and
William Bredo (since October 1950)

Dairy Branch, Production and Marketing Administration,
Don S. Anderson and Louis F. Herrmann (since October
1950)

Technical consultants who have assisted on sampling and
other statistical problems at the request of the committee are:

Earl E. Houseman, Bureau of Agricultural Economics

Harlow W. Halvorson, University of Wisconsin

J. I. Northam, Kansas State College

Warren C. Waite, University of Minnesota (deceased)

Administrative adviser is Noble Clark, associate director of
the Wisconsin Agricultural Experiment Station.

Representatives of the Farm Credit Administration and of the
Marketing Research and Facilities Branch, Production and
Marketing Administration have met with the committee oc-
casionally and offered suggestions.

The NCM-1 committee helped in preparing the schedules,
conducted the field survey in their respective states, revised the
preliminary manuscript, and approved the final draft for publi-
cation. Grading of butter samples for the study was carried out
by the Inspection and Grading Division, Dairy Branch, Produc-
tion and Marketing Administration.

The butter pricing subcommittee, together with the coopera-
tive agents, developed the schedules and performed the task of
tabulating the data, preparing a preliminary report and revising
it to incorporate committee suggestions. Parts of this task were
distributed among the subcommittee members. Pretesting the
schedules fell chiefly on E. Fred Koller and his research assist-
ants, John Buck and Stanley Krause, who likewise were respon-
sible for taking fully one-third of the regional schedules and
coding them from the master code prepared by William Black.
Paul Kelley and J. I. Northam were chiefly responsible for the
tabulations from IBM code sheets prepared at Iowa, Kansas,
Minnesota, and Wisconsin. Arthur Miller and Hugh Cook analyzed
the data and prepared the preliminary manuscript.

In its general content this report embodies the ideas of, and
is sponsored by, all members of the NCM-1 Regional Committee,
and also the representatives of the cooperating federal agencies
and the technical consultants.

Butter Pricing and Marketing At Country Points In the North Central Region

Hugh L. Cook, Paul L. Kelley,
E. Fred Koller, and Arthur H. Miller

BUTTER is an important outlet for butterfat produced within the North Central Region. It is the outlet for most of the farm-separated cream of the area. Enough farm-separated cream is sold in the North Central States to produce about three-quarters of a billion pounds of butter annually. Butter also is the major outlet for the butterfat of a large amount of milk sold to creameries specializing in the production of butter and nonfat dry milk solids.

At the same time it is a secondary outlet for surplus butterfat not needed in the regular operations of plants specializing in the processing and sale of such products as fluid milk and cream, evaporated milk, and ice cream. Although much of this surplus butterfat may be associated with seasonal periods of peak milk production, a great deal is nonseasonal in character. An example is the diversion of grade A milk to the manufacture of butter that accompanies a decrease in the per capita consumption of fluid milk and cream in a period of declining business activity.¹

In recent years the North Central Region has produced more than a billion pounds of butter annually, or about 80 per cent of all butter produced in the nation.

The importance of the price of butter goes beyond the determination of the dollar value of that commodity. Mar-

kets for other dairy products are affected by the butter market. The relationship is direct in many fluid milk markets which use the price of butter as a primary base for determining fluid milk prices. It is indirect in other cases, by way of competition between various outlets for butterfat. Government programs designed to support the prices paid to farmers for milk, have operated principally through the purchase of butter, nonfat dry milk solids, and cheese, relying heavily upon the competitive influence of these products.

Price conditions in the butter market have been the subject of criticism since the days of the old Elgin Butter Board, of Elgin, Illinois, which was disbanded during World War I. These criticisms have usually centered about four main points.²

First, it is often said that the central market quotations are not representa-

¹Grade A in this report refers to whole milk approved by some fluid milk market for ultimate use as bottled milk. Grade B refers to whole milk not so approved.

²See: A. G. Mathis and Donald E. Hirsch, *Butter Pricing by Iowa Creameries*, (Farm Credit Administration Circular C-136, [May, 1950]); Gordon W. Sprague, "Butter Price Quotations at Chicago," (unpublished thesis at University of Minnesota, 1940); and Hugh L. Cook, "Central Market Quotations and Country Buying," *Journal of Farm Economics*, (Proceedings Number) XXXII, No. 4, November, 1950.

tive of the whole market. The volume of butter moving through the central markets is said to be too small to reflect adequately the total sales of the industry. This point has been made especially about mercantile exchange transactions.

A second criticism, closely related to the first, is that the published quotations underquote the market. It has been said that gross prices paid to creameries selling butter according to central market quotations are rarely lower than the basic quotation, and that high quality butter usually receives a differential or premium above this quotation. The prevailing size of the premium is better known to the receivers than to the creameries. The creameries are, therefore, at a disadvantage for lack of this information.

Third, many shippers believe the day-to-day price fluctuations are unnecessarily wide and do not reflect trends of production and consumption. They believe these fluctuations to be the result of manipulation by central market dealers and assume that the dealers profit from such fluctuations.

Fourth, many sellers believe they suffer a marked disadvantage in selling butter due to a lack of adequate market information. They have no means of knowing the size and extent of premiums associated with the use of published quotations. Neither do they have as complete information regarding supply and demand conditions as they believe the buyers of butter have.

This study was undertaken to analyze the situation with regard to the second and fourth points listed above, while the first and third are the subject of another phase being undertaken by the Dairy Branch of the Production and Marketing Administration of the United States Department of Agriculture. In general, however, the studies at each of these two levels will furnish information useful to the other, as

well as data on various related questions.

The problem of a difference between the quotations and the actual price at which the bulk of the butter transactions are made is associated very closely with the decentralization of the butter market. Several advantages are recognized in short-circuiting the central markets. By establishing agreements for the regular sale of the butter of certain creameries to a particular buyer, greater uniformity is obtained in the butter distributed to the customers of that dealer. By establishing an arrangement whereby the butter of a creamery may regularly be sold through the same sales channel to the consumer, the creamery operator is relieved of the task of finding a buyer for each lot to be shipped. Both buyer and seller avoid much of the effort encountered in making new negotiations for each lot.

Agreements usually provide for price flexibility in response to changing market conditions by basing the settlement price upon a published quotation of some specified market. The buyer agrees to pay the seller the specified quotation, possibly plus a premium or minus a discount, for butter in a particular type of package f.o.b. some agreed delivery point.

However, ever-increasing quantities of butter are sold direct, leaving progressively smaller amounts to be traded at wholesale on exchanges or in the open market. Thus, a major part of the total production is settled for on the basis of market quotations resulting from a relatively small amount of trading. The butter traded often represents butter least satisfactory for use in the outlets of the handler concerned.

Three quotations are in general use in the North Central States. Two are published privately, as a service to the subscribers of trade publications, while the third consists of the reports of the

Market News Service of the United States Department of Agriculture. The private reports are the Chicago Price Current quotations issued for the Chicago market, and the Urner-Barry quotations covering the New York market.

The two private publications form the basis for the majority of the agreements of the area, while the Market News Service reports are more often used to evaluate and appraise the prices paid according to agreements based on some other quotation. One reason for the popularity of the private reports seems to be that they are usually published as a single concise figure while the government reports usually give a range of prices. Also, they are available earlier in the day than the Market News Service reports. For example, the Chicago Price Current report seems to rely heavily upon the sales, bids, and offers of the Chicago Mercantile Exchange. It is issued at about 10:15 a.m. and is based on the day's trading up to that time. The Market News Service covers the bulk of the trading for the day, but to do so, publication is delayed until mid-afternoon, about 2:15 p.m.

Since both private publications rely heavily upon sales which can be characterized as single transactions and are not a part of a continuous business relationship between buyer and seller, it is probable that quality is not as uni-

form and the butter not as desirable as much of the butter used in regular outlets. If this is true, the bulk of the butter going to regular outlets may merit a price different from that of the sales represented in the published quotations. At any rate, many agreements provide for use of a differential with the basic quotation, either as a premium to be added to, or a discount deducted from, the quotation. In addition to quality, the differential may depend on certain other provisions such as who pays the cost of transportation or cost of packages.

The base price, together with the premium or discount which may have been agreed on, determines the price for butter received by creameries. The net receipts of the creamery are also affected by considerations such as which party bears freight, packaging, and occasionally other selling costs. The published butter quotations also influence indirectly the prices received for milk used in other dairy products.

To obtain data for the purposes outlined, field surveys were made of a sample of creameries of the region. In addition to schedules obtained by interviews with creamery managers, production and sales data were taken from the accounting records of these firms. Copies of the schedule forms are available from the authors on request.

Sampling Plan

THE 12 STATES participating in the study had a total of 2,164 butter manufacturing plants in 1948. They manufactured 78 per cent of the nation's butter in 1949 and 1950.³

Of these plants, 1,070 were cooperatives and 1,094 were of noncooperative ownership. More than three-fourths of the plants produced less than 500,000 pounds of butter in 1948, and about a

fifth produced between 500,000 and 2,500,000 pounds. Less than 5 per cent produced in excess of 2,500,000 pounds. Slightly less than half of the smaller plants were cooperatives, as compared

³ *Milk Production on Farms and Statistics of Dairy Plant Products, 1950* (U.S. Department of Agriculture, Bureau of Agricultural Economics [Feb. 15, 1951]) p. 14.

with 60 per cent of the middle-sized group and a third of the large plants.

Three states—Minnesota, Iowa, and Wisconsin—contained 62 per cent of the butter manufacturing plants of the area and produced 56 per cent of the butter. These three states also had 85 per cent of the cooperative creameries of the area. Two-thirds of all butter plants in these states were cooperatives while in Illinois, Indiana, Ohio, and Kentucky, only 8 per cent were cooperatives. About 40 per cent of the plants in Nebraska and South Dakota and about 20 per cent of those in Kansas, Missouri, and Michigan were cooperatives.

The plants in each state were grouped according to volume of butter produced. Those groups were further subdivided by type of ownership, making six general groups for each state. Each group was then arrayed according to the 1948 production, from the largest to the smallest volume.

With due regard to the number of plants in each group, varying rates of sampling were determined by consulting statisticians in order that the sample might be expanded to represent the area.⁴ Plants were then randomly selected for the sample for one state at a time by applying the appropriate sampling rates (table 1).

If one of the designated plants was out of business or refused to cooperate in the study, substitutions were made when possible by including the nearest plant of approximately the same size in the same ownership category.

The sample included approximately 15 per cent of all butter plants in the 12 states participating in the study. About 40 per cent of all plants making more than 500,000 pounds of butter and about 8 per cent of those manufacturing less than 500,000 pounds in 1948 were included in the sample.

Table 1. Number of Plants Included in the Sample by States, North Central Region, 1949

| States | Number of plants |
|------------------------|------------------|
| Minnesota | 109 |
| Wisconsin | 54 |
| Iowa | 42 |
| Four western States | |
| Kansas | 24 |
| Missouri | 9 |
| Nebraska | 10 |
| South Dakota | 21 |
| | 64 |
| Five eastern states | |
| Illinois | 13 |
| Indiana | 8 |
| Kentucky | 2 |
| Michigan | 13 |
| Ohio | 8 |
| | 44 |
| Total for region | 313 |

A comparison of the enumeration of the 1949 creamery butter production by the Bureau of Agricultural Economics with estimates based on the reported production of the sample plants showed a difference of less than 2 per cent for the area. The region was broken into five areas for purposes of analysis: (1) Minnesota, (2) Wisconsin, (3) Iowa, (4) Kansas, Missouri, Nebraska, and South Dakota, and (5) Illinois, Indiana, Kentucky, Michigan, and Ohio. The estimates for Wisconsin and the four states in group 4 varied 10 and 14 per cent, respectively, but the other groups didn't vary as much as 5 per cent. These variations may be explained partially by the fact that there was a greater change between the years 1948 and 1949 in the production of butter by the plants in the sample from Wisconsin and group 4 than from the other three areas. If the sample plants had been rated on the basis of their actual 1949 butter production, 14 per cent of the plants in these two areas would have fallen into different size classifi-

⁴ The sample was drawn by Earl E. Houseman, in consultation with Harlow W. Halverson and Warren C. Waite. They, however, were not responsible for the survey beyond the original sampling, except as consulted.

cations than those into which they were drawn on the basis of 1948 production. Use of 1949 production data would have changed the size classification of only 7 per cent of the sample plants of the remainder of the region (table 2).

The multi-unit proprietary creameries usually declined to cooperate in the study. Failure to obtain data from this type of firm does not affect the findings for the primary purpose of the study, though it does damage its descriptive value. The chief objective in sampling was to study pricing for shipped butter at country points, usually the first point of sale. Final analyses of price differences at country plants were made only for factories that sell their own butter. Creameries selling through cooperative sales federations were not included in the analyses of price differences, even though price data were obtained from most of them. Those selling through parent firms likewise were set aside because there was no actual sale at country plants. For these plants price determining forces are brought to bear at some level other than the country point, and so the first transfer is merely a book entry. However, data or recommendations about agreements or price behavior included in this bulletin are not affected significantly by the failure to collect data from multi-unit proprietary firms.

A secondary objective of the study, nevertheless, was to obtain a description of current trade practices. Because of omission of the multi-unit proprietary firm, data on procurement and manufacturing practices are not completely descriptive of the creamery industry in the region. Recommendations of this study have taken this discrepancy into account. No numerical correction can be made for this discrepancy because no public agency or trade association has data on butter operations of all these firms. The most desirable

Table 2. Comparison of Estimated Butter Production of Region with Production Enumerated by Bureau of Agricultural Economics, 1949

| Area | Estimated production in pounds based on this survey | Production in pounds enumerated by B.A.E.* |
|---|---|--|
| Minnesota | 263,345,000 | 252,621,000 |
| Wisconsin | 151,356,000 | 168,214,000 |
| Iowa | 184,621,000 | 193,153,000 |
| Kansas, Missouri, Nebraska, and South Dakota | 255,793,000 | 223,828,000 |
| Illinois, Indiana, Ohio, Michigan, and Kentucky | 269,167,000 | 269,430,000 |
| Total for region | 1,124,282,000 | 1,107,246,000 |

* Milk Production on Farms and Statistics of Dairy Plant Products, 1950 (U.S. Department of Agriculture, Bureau of Agricultural Economics [Feb. 15, 1951]) p. 14.

practices for representative creameries of the region are not necessarily preferable for particular multi-unit organizations. Consequently, it should be pointed out that recommendations are not intended to apply to plants of that kind.

Most tabulations of the data are expressed as a percentage of replies rather than in actual numbers of replies, because many schedules were not complete in all respects. The showing of results in percentage is based on the assumption that replies from those who failed to respond to a particular question would have been distributed in about the same way as replies from those who did respond. For most purposes this assumption is reasonable, though the data were biased somewhat in that certain classes of firms were more likely to withhold information than others. Small single-unit proprietary firms and multi-unit proprietary firms were most likely to withhold information. Medium and large single-unit proprietary firms and almost all cooperatives were most likely to supply complete data.

Grading of Butter Samples

SAMPLES OF THE BUTTER of 79 per cent of all plants used in the study were graded by federal butter graders⁵ as an indication of the general type of butter produced by the sample plants. Some check on the reliability of these grades in one state was obtained by comparing them with the historical record of grades of butter compiled by the state graders of that state.⁶

Of all plants in the region from which samples were graded by the federal graders, 58 per cent received an average score of 92 or better and a few received a score lower than 90. The high scores which prevailed may have been partly because the grading was done in winter and spring months when quality is usually higher than in summer. Fifty-four per cent of the Wisconsin sample plants and 31 per cent of the Minnesota sample received an average score of 93. The percentages of sample plants for Minnesota, Wisconsin, and Iowa receiving an average score of 92 or better were 82, 70, and 50, respectively, compared with 17 per cent for the other nine states. However, 85 per cent of all sample plants in the other nine states received a 90 score or better (table 3).

Of those plants reporting cooperative sales agencies as their only receive-

ers of shipped butter, the federal graders found 87 per cent of the sample plants to average 92 score or better. Only 52 per cent of the plants selling

Table 3. Average Scores of Butter on Hand at Sample Plants When Graded, by Area, North Central Region, 1950*

| Area | Score of butter | | | | Total |
|--|--------------------|----|----|-------|-------|
| | 93 | 92 | 90 | 89 | |
| | per cent of plants | | | | |
| Minnesota | 31 | 51 | 18 | ..... | 100 |
| Wisconsin | 54 | 16 | 26 | 4 | 100 |
| Iowa | 5 | 45 | 48 | 2 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 11 | 74 | 15 | | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 10 | 76 | 14 | | 100 |
| Total for region | 24 | 34 | 38 | 4 | 100 |

* These grades were weighted average scores that federal graders applied to lots of butter on hand at the factory when they graded butter for this research project. Occasional high or low scores would tend to be obscured by this averaging process.

⁵Through cooperation of the Production and Marketing Administration, USDA, federal graders visited factories in the sample, without previous announcement, and graded each lot of butter on hand. Most of these grades were obtained during the period March through May 1950. Butter was graded in this study according to the regular commercial scores. The top commercial grade given butter is U.S. "AA," or 93 score. Although one occasionally hears of a score higher than 93, such scores are used only in contests to differentiate among prize-winning lots, and would not normally be given to the same lots in commercial channels. In everyday market use, the second highest grade is U.S. "A," or 92 score. The third highest grade, U.S. "B," includes commercial 90 and 91 scores, both of which would be reported 90 score by federal graders, and 89-score butter is graded U.S. "C." If a lot of butter fails to score as high as 89 it is classified as "Cooking grade," and does not ordinarily move in the usual market channels.

⁶This check was made on Wisconsin plants only and was made possible through the cooperation of the Wisconsin State Department of Agriculture in supplying the data on its butter scoring for the years 1947-49. The state graders had following the practice of picking up samples of butter periodically from retail stores and counters. Consequently, the grades were not strictly comparable, because the federal grade of the butter at the factory might be expected to be somewhat higher than the state grade of the butter sold in a retail package by many different local retailers. This is because the butter was older by the time it reached the retail display case and may not have been handled properly. Likewise, a direct relationship might not be expected because of the varied handling conditions to which the retail packages were subjected and the storage period before being collected by the state graders. As would be expected, the federal grades on the whole were slightly higher than the state grades for the same plants. State grades were obtained for the period of 1947 through 1949 for 41 Wisconsin plants from which samples were scored by federal graders. For respective plants, 80 per cent of the federal grades differed from the state grades by not more than one point in score, but twice as many of the federal grades were above as below the state grades.

through other agencies had an average score of 92 or better. The difference between creameries reported as cooperatives and noncooperatives also was noticeable. For the cooperatives, 74 per cent of all sample plants graded an

average score of 92 or better compared with 32 per cent of the sample plants from the noncooperatives. Grades of 93 score were received by 32 per cent of the cooperatives and 10 per cent of the noncooperatives.⁷

Types of Creamery Operation

BUTTER IS MANUFACTURED in many types of dairy plants. Some plants are on a cream basis of operation, either using farm-separated cream or whey cream purchased from cheese factories. Others receive whole milk, usually grade B, and separate it, using the cream in butter while drying the skim milk. Still others receive grade A milk and make large numbers of products or sell milk and cream for fluid use, while using their surplus butterfat in the manufacture of butter. Still others are combinations of the above three types.

Those plants receiving all butterfat in the form of cream manufacture principally butter and therefore furnish supplies of butter regularly to the market. Plants receiving grade B milk usually use their butterfat in the manufacture of butter, but with increased demand for other products, they frequently interrupt this operation to use the milk for other purposes.

The plants which receive a large proportion of their butterfat as grade A whole milk make the largest proportion of the highest score butter. These are, in many cases, the least dependable of all sources of butter supply. In other instances, and particularly in the large butter-surplus states of Minnesota and Iowa, there are plants which produce a steady volume of high grade butter from whole milk. Those plants which are not dependable sources of butter usually aim to put their butterfat into products that bring

a higher return than butter, and only when these outlets fail to utilize their milk will they manufacture large quantities of butter. The existence of a number of these plants which make high quality butter from grade A milk, but in widely variable quantities, largely accounts for the greatly reduced quantities of high quality butter in the market in times of diminishing butter supply.

Nearly half of the butter manufacturers of the region received all of their butterfat in the form of cream, and 6 per cent received only whole milk. According to the findings of this survey, three-fourths of all butter plants in the five states of Iowa, Kansas, Missouri, Nebraska, and South Dakota used only cream and less than 1 per cent received only whole milk. This is in contrast to the other seven states in which a third of the butter plants received only cream and 6 per cent received only whole milk. Of the remaining plants, about a

⁷ Again, this relationship observed at one period of time may not be causal, but may be due to location. The study provides no proof. However, Stanley Krause, of the University of Minnesota, found that a larger proportion of cooperatives than of independent plants produced high scoring butter in that state. Both types of ownership are found side-by-side in Minnesota. Fifty-four per cent of the independent creameries and 91 per cent of the cooperatives produced mostly 92- or 93-score butter. Further, this difference occurred within each major volume-group of plants in Minnesota. Hence, this difference is not associated with volume in that state.

Table 4. Form in Which Butterfat is Received by Creameries, North Central Region, 1949-50

| Area | Form in which butterfat is received | | | | Total |
|---|-------------------------------------|--------------------|----------------|--------------|-------|
| | Whole milk | Cream | Milk and cream | Not reported | |
| | | per cent of plants | | | |
| Minnesota | 1 | 37 | 62 | ..... | 100 |
| Wisconsin | 7 | 21 | 69 | 3 | 100 |
| Iowa ..... | ..... | 84 | 11 | 5 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 1 | 67 | 30 | 2 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 20 | 33 | 42 | 5 | 100 |
| Total for region | 6 | 47 | 44 | 3 | 100 |
| By type of ownership: | | | | | |
| Cooperatives* | 1 | 49 | 50 | ..... | 100 |
| Noncooperatives* | 3 | 43 | 49 | 5 | 100 |

* Includes only Iowa, Minnesota, and Wisconsin plants.

fourth of those in the five states west of the Mississippi River excepting Minnesota and about 60 per cent of those in Minnesota and the six states east of the Mississippi River, received both cream and whole milk. Most of the whole milk plants were located in states east of the Mississippi River. Butter is frequently a sideline in these states and, with the exception of Wisconsin, the percentage of cooperatively owned plants is relatively low (table 4).

The majority of the creameries in the region are specialized in butter production. Two-thirds of the plants used more than 90 per cent of all the butterfat they received in the manufacture of butter (table 5). However, in Wisconsin only slightly more than one-third of the

plants used as much as 90 per cent of their butterfat in the manufacture of butter while more than a third of the plants in this state used more than half of their butterfat in products other than butter. Creameries in the six states west of the Mississippi River, including Iowa and Minnesota, are much more specialized in butter production than those east of the river. Since 1949 was a year when butter prices were relatively favorable, one would expect the percentage of plants in any one class to shift as price relationships changed.

A smaller proportion of cooperative than of noncooperative plants are diversified in the North Central Region.

Table 5. Plant Diversification as Measured by Per Cent of Butterfat Receipts Used for Butter, North Central Region, 1949*

| Area | Per cent of butterfat used for butter | | | | Total |
|---|---------------------------------------|--------------------|--------|--------------|-------|
| | 0-20 | 21-90 | 91-100 | Not reported | |
| | | per cent of plants | | | |
| Minnesota | 4 | 34 | 62 | ..... | 100 |
| Wisconsin | 20 | 43 | 37 | ..... | 100 |
| Iowa ..... | ..... | 8 | 86 | 6 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota ..... | ..... | 11 | 87 | 2 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 20 | 21 | 59 | ..... | 100 |
| Total for region | 8 | 24 | 67 | 1 | 100 |
| By type of ownership: | | | | | |
| Cooperatives | 6 | 23 | 71 | ..... | 100 |
| Noncooperatives | 10 | 24 | 63 | 3 | 100 |

* For purposes of this study, a plant using less than 20 per cent total butterfat receipts in butter production was regarded as highly diversified.

Table 6. Butter Plants Manufacturing Other Major Dairy Products,
North Central Region, 1949*

| Area | Dairy products manufactured | | | | |
|---|-----------------------------|--------|-------------------------------|-----------------------|-----------------------------|
| | Dry milk products | Cheese | Evaporated and condensed milk | Fluid milk and cream† | Ice cream and ice cream mix |
| | | | per cent of plants | | |
| Minnesota | 11 | 3 | 2 | 85 | 7 |
| Wisconsin | 21 | 28 | 5 | 64 | 10 |
| Iowa | 2 | 6 | ..... | 10 | 8 |
| Kansas, Missouri, Nebraska, and South Dakota | 6 | 6 | 9 | 21 | 18 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 10 | 16 | 9 | 28 | 24 |
| Total for region | 10 | 10 | 4 | 46 | 13 |
| By type of ownership: | | | | | |
| Cooperatives | 12 | 8 | 5 | 57 | 3 |
| Noncooperatives | 7 | 12 | 4 | 34 | 24 |

* Percentages may total more than 100 because a butter factory may make more than one additional product, or no additional one, in which case they would total less than 100.

† Includes fluid whole milk and cream sold in bulk quantities to other plants and milk and cream sold in bottled form.

Butter plants in the region typically made one product besides butter (table 6). Only so-called major dairy products actually manufactured at the plant are included in this tabulation, and not the by-products from a farm-separated cream operation. Some of the latter probably would manufacture dry buttermilk. Sales of fluid skim milk for drying by another factory, of course, were not included as another product manufactured.⁸

For the region, 46 per cent of the plants sold fluid milk and cream, 13 per cent made ice cream and mix, nearly 10 per cent made dry milk, and an equal proportion made cheese. A larger proportion of the factories in Minnesota and Wisconsin sold fluid milk and cream and likewise a larger proportion made dry milk than was typical for the average of the region. In Wisconsin the butter-cheese combination is more prevalent than elsewhere. The specialized butter factory with no other products was more prevalent in Iowa and the four states of Kansas, Missouri, Nebraska, and South Dakota.

As would be expected, the specialized butter plant and the plant making additional products occurred in all size groups and among cooperatively owned and noncooperative factories, with little difference between size classes or types of ownership. Plants in the size class above 500,000 pounds were somewhat more likely to make other products.

Although no important differences are revealed between types of ownership by comparing average number of products per plant, there were differences in types of products sold. While dry milk products were made by nearly twice as large a percentage of the cooperative factories as noncooperative, eight times as large a proportion of noncooperative factories made ice cream and ice cream mix. While more than half the cooperative factories reported the sale of fluid milk and cream, many of these plants sold only bulk milk and cream to other dealers. The noncooperative factories, only a third of which sold fluid milk and cream, often carried on a bottling and distribu-

⁸ For comprehensive statistics on product combinations see: J. M. Cowden and H. C. Trelogan, *Flexibility of Operation in Dairy Manufacturing Plants* (U.S. Department of Agriculture Circular No. 799 [1948]).

tion operation. Though these factors may be associated with types of ownership, it is possible that they may often have been locational in nature.

Because of the heterogeneous character of butter manufacturing operations it proved difficult to obtain meaningful relationships between plant volume or size and such factors as quality of butter, net prices received, or procurement practices. Analyses to measure effect of volume on price are discussed more fully in the section, "Differences Associated With Size of Creamery."

When plants were grouped by type of butterfat intake, average butter production for each group was about the same. The plants receiving all butterfat in the form of cream averaged 533,000 pounds each of butter sold in 1949. The whole milk plants averaged 538,000 pounds, and those receiving both milk and cream sold an average of 543,000 pounds. However, the whole milk plants sold an average of only 86,000 pounds locally in contrast to 116,000 pounds

sold locally by the cream plants and 121,000 pounds by those receiving both whole milk and cream. *Local sales* refers to butter usually distributed in printed form to restaurants, merchants, patrons, and others in the creamery neighborhood.

Although their butter production did not differ greatly, it should be pointed out that the plants receiving part or all whole milk were actually larger than the plants entirely on a cream basis of operations. The whole milk plants often sold a large portion of their butterfat as whole milk, fluid cream, or in the form of other manufactured dairy products. Also, the plants receiving whole milk maintained much more processing equipment for the handling and processing of their skim milk than is necessary for buttermilk. However, no significant difference was found to exist for the region as a whole between the amount of butter produced by a plant and the score reported by federal graders.

Creamery Intake Operations, Butter Output, and Quality

SINCE IT WOULD be expected that certain practices followed in receiving butterfat should have a direct effect upon the quality, quantity, and uniformity of butter, an analysis was made of that relationship. Some of the points considered were the form in which butterfat was received, the frequency with which cream was gathered from farms, and whether or not different kinds of cream were churned separately.

Comparison of average federal scores with type of milk or cream received at the intake showed plants receiving only buttermilk making a higher grade of butter than those receiving only cream, or those plants receiving both milk and cream. For those plants receiving only whole milk, 79 per cent of the sample plants received a score of 92 or higher, in contrast to only 45 per cent of those plants receiving only cream and 69 per

cent of those plants that received both milk and cream (table 7). About 41 per cent of all plants whose samples were graded received only cream, including farm-separated cream, factory-separated cream, and whey cream. These plants accounted for 31 per cent of all sample plants grading 92 score or higher, and 56 per cent of all sample plants grading lower than 92 score on an average.

Table 7. Average Score of Butter Graded at Sample Factories, by Type of Intake, North Central Region, 1950

| Score of sample | Type of intake | | | |
|----------------------|--------------------|----------------|--------|------------|
| | Whole milk | Milk and cream | Cream* | All plants |
| | per cent of plants | | | |
| 93 | 43 | 33 | 12 | 25 |
| 92 | 36 | 36 | 33 | 35 |
| 90 | 21 | 30 | 47 | 36 |
| 89 | ..... | 1 | 7 | 3 |
| Cooking grade | ..... | ..... | 1 | † |
| Total for all grades | 100 | 100 | 100 | 100 |

* Includes whey cream.
 † Less than 1 per cent.

It should not be concluded from these percentages that high quality butter is obtainable only from butterfat received in the form of whole milk. Fully 45 per cent of those plants receiving only cream averaged 92-score quality or better. Other factors also play an important part in the determination of quality. A major factor is that producers selling whole milk tend to give it better care than do farmers selling farm-separated cream. However, farm cooling and storage practices and hauling conditions were not observed in this study.

Another important factor in the production of high quality butter is the frequency of collection of the cream. About 40 per cent of those plants from which samples were graded reported that their cream is gathered three times per week in June, with about 30 per cent gathering even more frequently and about 30 per cent collecting cream less than three times per week.

From those plants gathering cream more than three times per week, 87 per cent average 92 score or higher (table 8). This is in contrast to only 64 per cent from those plants gathering cream three times per week, and only 10 per cent from those plants gathering less than three times per week.

Table 8. Relationship Between Frequency of Farm Pick-up of Cream in June 1949 and Average Grade of Butter Made in February to May 1950, by Plants in the North Central Region*

| Number of farm cream pick-ups per week | Average score of butter | | | | |
|--|-------------------------|----|----|----|--------------------------|
| | 93 | 92 | 90 | 89 | Cooking grade All grades |
| | percentage of plants | | | | |
| 0-2 | 1 | 9 | 85 | 4 | 1 100 |
| 3 | 16 | 48 | 32 | 4 | 100 |
| 4-7 | 52 | 35 | 9 | 4 | † 100 |
| All plants | 23 | 32 | 40 | 4 | † 100 |

* Frequency of farm pick-up was obtained for both February and June. The relationship here shown is between frequency for June (rather than February) pick-ups and average score of butter on hand when the plant was graded. This selection was made for two reasons: (1) Most of the grading certificates in the areas where farm-separated cream is extensively used in butter making were dated in April. It was thought that April cream deliveries were probably more nearly representative of June than February. (2) Those plants having a low number of pick-ups per week in June were found usually to have a small number in February.
 † Less than 1 per cent.

There also appears to be some relationship between the grade of butter and whether or not various kinds of cream are churned separately (table 9). For those plants which churn various kinds of cream separately, 64 per cent graded higher than 90 score, in contrast to only 46 per cent of those plants that did not churn different types of cream separately. Whether the mixing of different types of cream results in a lower quality of butter, or whether the churning of the various types separately is simply an indication of greater care in their general manufacturing opera-

Table 9. Relationship Between Average Grade of Butter Manufactured and Practice of Churning Various Kinds of Cream by Creameries in the North Central Region, February to May, 1950

| Average score of butter graded by federal grader | Various kinds of cream churned separately | Various kinds of cream churned together |
|--|---|---|
| | per cent of plants | |
| Above 90 score | 64 | 46 |
| 90 score or below..... | 36 | 54 |
| Total for all grades | 100 | 100 |

tions is not known, but in any case a much higher percentage of the lower grades was from plants that do not church each kind separately.

Packaging Butter for Shipped Sales

FIBER BOXES were used almost universally to package bulk butter for shipped sales. They were used by 97 per cent of the plants in the region, selling to all types of receivers. The other 3 per cent were divided between corrugated boxes, wire baskets, and combinations of the three types. No association was found between the use of wire baskets or corrugated boxes and such factors as size, ownership, or diversification of the seller, or the grade of butter sold.

The wire baskets were all reported by Minnesota plants selling to meat packers. However, they were such a small percentage of the total number of plants selling to meat packers that no significant association may be attached between that type of buyer and the use of wire baskets.

Corrugated boxes were used in selling to a variety of buyers, all of whom also received a much larger amount of butter in fiber boxes. All plants using corrugated boxes were located in Iowa and Wisconsin.

OVERAGE IN BULK PACKAGES

Most plants include a few ounces of butter in excess of the marked weight in each bulk package. This overage is included because most buyers do not pay for fractional poundage in the purchase of bulk butter. The overage serves as a precaution against the possibility of buyers docking in excess of the actual short weight if shrinkage should result in the actual weight falling just short of the number of pounds marked on the package.

The most common overage reported was 4 ounces per package (usually 60 to 64 pounds), or about 0.4 per cent. This amount was used by 46 per cent of the plants reporting. About 10 per

cent of the plants reported an overage of 6 ounces, and 15 per cent reported that they did not include any overage. Most of the latter group were small plants, making only occasional shipments when they had more butter than could be distributed locally.

Although those plants allowing larger overages appeared not to receive prices differing from the plants allowing smaller overages, the amount of butter used for overage does affect the total returns to the plant. This is true because overage is not paid for in most cases, and any overage in excess of that needed to insure the marked weight may well be considered as a gift to the buyer. Occasional slight underweights usually result only in warnings from the buyer. However, if it happens too often, the buyer will likely pay only for the number of full pounds of butter included in the package.

The efficient creamery will determine the amount of overage necessary to offset the probable shrinkage in bulk sales. Once this is determined the plant will profit most by using that amount and neither more nor less. At 60 cents per pound of butter each four ounces of excess overage in the usual 60- to 64-pound package entails a loss to the plant of about 25 cents per hundred-weight of butter shipped.

Destination of Shipped Butter

THE DESTINATION of shipped sales, both in terms of receiving markets and types of first receiver, is a necessary part of the basis for appraising the quotations and official price reports. Previous studies have pointed to the decline in relative importance of the strictly wholesale operator in the central market. This section deals with the relative importance of differentiated channels in which marketing agencies are in direct touch with the creamery on the one hand and with retail distributors on the other. It also shows the relative importance of central markets.

Only half the shipped butter from the region went to buyers in the two large central markets from which the principal quotations are issued. Of this amount 30 per cent was sent to Chicago and 20 per cent was sent to New York City (table 10). The other half was distributed among many lesser markets in the general trade area.

Chicago was a relatively unimportant receiving point for butter from Minnesota and Iowa, and New York was a relatively unimportant receiving center from Minnesota, Wisconsin, and the eastern five states taken as a group. However, it is probable that New York is more important than these percentages would indicate, especially for Minnesota. Many plants from that state reported shipping butter to Jersey City and Newark. It is probable that much of this butter was received for resale in New York City.

MARKETING CHANNELS

Destination of the butter shipped out of the local area, by type of first receiver, showed wholesaler-jobbers as receivers of the largest volume while dairy companies and meat packers received the smallest volume.⁹ Chain store buyers and central cooperative sales agencies ranked in between volume-

wise. Wholesaler-jobbers bought 46 per cent of the volume, central cooperative sales agencies and chain stores bought 23 and 16 per cent, respectively, and other dairy companies and meat packers each bought about 7 per cent. No sales were made on the butter exchanges by the plants in the sample.

The relative importance of these receivers varied by individual states. Wholesalers were less important volumewise in Wisconsin and Minnesota than for the region as a whole.

Table 10. Percentage of All Shipped Butter Sent to First Receivers in Principal Markets in 1949 Based on Reported Shipments, North Central States, 1949

| Area | Destination of shipments | | | |
|---|--------------------------|----------|----------------|-------------|
| | Chicago | New York | Other markets* | All markets |
| | per cent of all butter | | | |
| Minnesota | 9 | 12 | 79 | 100 |
| Wisconsin | 51 | 1 | 48 | 100 |
| Iowa | 22 | 36 | 42 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 35 | 23 | 42 | 100 |
| Illinois, Indiana, Ohio, Kentucky, and Michigan | 48 | 15 | 37 | 100 |
| Total for region | 30 | 20 | 50 | 100 |

* Includes many shipments, made to Jersey City and Newark, that probably were received for resale in New York.

⁹ Wholesaler-jobbers are distinguished from other types of organizations which handle wholesale lots of butter, such as chain stores, meat packers, and dairy companies. The wholesaling and jobbing of butter is the principal activity of the wholesaler-jobber, which is not true of the meat packers and chain stores.

Table 11. Per Cent of all Butter Shipped Classified by Type of First Receiver by States, North Central Region, 1949

| Area | Wholesaler-jobbers | Chain store buyers | Central co-op. sales agencies | Other dairy companies | Meat packers | Total shipped sales |
|---|--------------------|--------------------|---------------------------------|-----------------------|--------------|---------------------|
| | | | per cent of total shipped sales | | | |
| Minnesota | 37 | 16 | 30 | 2 | 15 | 100 |
| Wisconsin | 8 | 5 | 64 | 21 | 2 | 100 |
| Iowa | 54 | 23 | 21 | 2 | 0 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 63 | 14 | 0 | 15 | 8 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 62 | 20 | 9 | 1 | 8 | 100 |
| Total for region | 46 | 16 | 23 | 7 | 8 | 100 |

Chain stores bought less in Wisconsin and the four western states than the regional average. Greater importance of cooperative sales agencies in Minnesota and Wisconsin was observed. Other dairy companies are also important first receivers in Wisconsin, and meat packers are important in Minnesota (table 11).

When the data are expressed as percentages of total butter produced in the region, the relative proportions going to various first receivers remain

essentially the same, but relationships among states change slightly because Wisconsin and the five-state eastern group ship a smaller percentage of total butter than the region as a whole.

In classifying shipped butter sales according to type of first receiver, only those plants were used that reported a single type of outlet. Some creameries reported selling butter to several types of outlet. The classification used assumes that these miscellaneous combinations were distributed in the same

Table 12. Percentage of Plants Shipping Butter by Type of First Receiver, North Central Region, 1949

| Area | Type of first receiver for shipped butter | | | | | | | | Total |
|---|---|-------------|--------------|-----------------------|-----------------------|--------------|-----------------------------|--------------|-------|
| | All butter sold locally | Wholesalers | Chain stores | Co-op. sales agencies | Other dairy companies | Meat packers | Miscellaneous combinations* | Not reported | |
| | | | | | | | | | |
| | | | | per cent of plants | | | | | |
| Minnesota | 4 | 35 | 12 | 26 | 1 | 15 | 6 | 1 | 100 |
| Wisconsin | 20 | 17 | † | 26 | 16 | 7 | 14 | ..... | 100 |
| Iowa | † | 50 | 6 | 27 | 1 | ..... | 10 | 6 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 4 | 40 | 1 | ..... | 11 | 3 | 24 | 17 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 20 | 29 | 15 | † | 9 | 17 | 9 | 1 | 100 |
| Total for region | 9 | 35 | 8 | 17 | 6 | 10 | 11 | 4 | 100 |
| By type of ownership: | | | | | | | | | |
| Cooperatives | † | 32 | 9 | 29 | 4 | 8 | 17 | † | 100 |
| Noncooperatives | 19 | 38 | 8 | 3 | 8 | 11 | 5 | 8 | 100 |

* Butter was shipped to more than one type of first receiver.

† Less than 1 per cent.

manner as the sales of the plants selling to only one type of outlet. However, the percentages of plants using miscellaneous combinations of outlets for shipped sales, along with those plants selling all butter locally, are given for the various states in table 12.

Wholesalers were found to be the most important single class of first receivers for the region as a whole, having been the sole outlet for shipped butter for 35 per cent of the plants. They were reported as the most important type of first receiver for all of the region except Wisconsin, in which only 17 per cent of the plants shipped solely to wholesalers while 26 per cent shipped only to cooperative agencies. Cooperative sales agencies were the second most important class of receivers. They handled the shipped but-

ter of 17 per cent of the plants in the region, but this percentage consisted of more than a quarter of all plants in Iowa, Minnesota, and Wisconsin, and practically none in the other nine states. Meat packers, chain stores, and other dairy companies followed with 10, 8, and 6 per cent, respectively, for the region as a whole.

A comparison of the types of outlets used by cooperative and noncooperative plants shows one major difference. Nearly a third of the cooperatively owned plants sold through cooperative sales agencies in contrast to only 3 per cent of the noncooperatives. Consequently, the percentages of cooperatives selling to the other types of buyers were generally smaller than those of noncooperatives selling to the same type of outlet.

Sales Agreements Used in Shipping Butter

MOST BUTTER manufactured in the region is sold on the basis of some sort of advance sales agreement. Some of these agreements are written contracts, some are letters setting forth the details of the sale, and others are merely verbal agreements made sometimes in person and sometimes by telephone. However, some creameries are reported to ship to certain wholesale buyers without a formal agreement, depending only upon the reliability of the buyer to assure a fair price.

The details of these agreements usually include provisions that a part of the butter of the factory will be purchased by the buyer at a price based on some specific quotation, often plus a premium or minus a discount. They usually designate the receiving point and who is to bear freight and cartage costs. The agreements usually stipulate the score of the quotation to be used as a base price, the score of butter to be delivered, and frequently the conditions under which, and by whom, the butter shall be graded.

Some details were reported on 394 agreements. Some of the plants in the

survey had agreements with more than one buyer, with the result that data were obtained on more agreements than plants. Of those reported, 80 per cent were verbal understandings, 12 per cent were written contracts and 8 per cent were in the form of letters. The duration of these agreements varied greatly, from a few days to more than a quarter of a century.

Less than a fourth of all agreements had been renegotiated within the two years previous to the study, and 43 per cent had never been renegotiated. About 5 per cent were renegotiated with each change in market price and

only 1 per cent required a new agreement for each shipment. About 9 per cent were renegotiated annually and a few made new agreements semi-annually, quarterly, or monthly.

Information obtained from a supplementary mail questionnaire in Wisconsin during a rising market situation (not seasonal) showed that most premiums remained unchanged. A slightly larger number were increased than were decreased. This suggests a tendency for premium levels to increase or decrease somewhat with shifts in price levels other than seasonal.

A sixth of all agreements provided for size of shipment and only an eighth specified the amount to be shipped weekly. However, 35 per cent specified the day of the week on which the shipment is to be made.

Approximately 40 per cent of the agreements specified the grade that would be accepted, but two-thirds of all plants reporting said they do not receive lower prices for undergrade shipments. Of those stating the grade that would be accepted, 55 per cent specified a minimum grade, 14 per cent the average grade, and 31 per cent stated the only grade that was to be accepted. In 54 per cent of the agreements provisions were made for variations in price based on grade differentials.

About three-fourths of the agreements provided for the grading of butter. Of these 46 per cent were to be graded by a federal grader, 45 per cent by the buyer, and 9 per cent by the seller. Grading was to be done at the plant of the seller in only 20 per cent of the cases, while 80 per cent provided for grading at the warehouse of the buyer. Although most of the agreements provided for grading, many of the factories were never notified of the actual score of their butter, unless their butter fell below the standards specified in the agreement, except for occasional certificates from state food inspection agencies. Only 24 per cent used federal

grade certificates as a basis for settlement.

AGREEMENTS BASED ON COMMERCIAL PUBLICATIONS

The Urner-Barry quotations were reported as the basis for the largest number of agreements. However, their use was concentrated in a few major areas, particularly Iowa and Minnesota. The Chicago Price Current quotations were more widely used, with every state in the region reporting their use. Urner-Barry quotations were the basis of 145 agreements, but all of these were reported by plants located in only seven states, and 82 were reported by Minnesota plants (table 13). Chicago Price Current quotations were the most frequently used bases in Illinois, Kansas, and Wisconsin.

Price reports of the United States Market News Service were the basis for 49 agreements, 21 of which were reported by Michigan plants. The other 28 were reported from nine other states.

Only 101 agreements provided for a price to be paid f.o.b. the manufacturing plant, in contrast to 274 providing for

Table 13. Number of Sales Agreements by Type of Market Quotation Used as a Base Price for the Agreement by States, North Central Region, 1949

| Area | Urner-Barry | Chicago | Current | United States | Other | None |
|---|----------------------|---------|---------|---------------------|-------|------|
| | Price | Price | Price | Market News Service | | |
| | number of agreements | | | | | |
| Minnesota | 82 | 24 | 10 | 1 | 2 | |
| Wisconsin | 5 | 34 | 4 | 3 | 18 | |
| Iowa | 36 | 4 | 1 | ..... | 8 | |
| Kansas, Missouri, Nebraska, and South Dakota | 20 | 61 | 10 | 16 | 6 | |
| Illinois, Indiana, Ken- tucky, Michigan, and Ohio | 2 | 19 | 24 | 1 | 3 | |
| Total | 145 | 142 | 49 | 21 | 37 | |

Table 16. Provisions Specified in Use of Urner-Barry Quotations, by Plants in the North Central Region, 1949

| Date of quotations used | Place of delivery | | | | Total |
|-------------------------------|-------------------|----------------|-----------------|--|-------|
| | F.o.b. plant | F.o.b. Chicago | F.o.b. New York | F.o.b. receiver other than Chicago or New York | |
| | | | | number of agreements | |
| Arrival date | 4 | 3 | 39 | 16 | 62 |
| Arrival week | 2 | ..... | 4 | 2 | 8 |
| One week after arrival ..... | ..... | ..... | 2 | 11 | 13 |
| Shipment date | 2 | ..... | 8 | 2 | 12 |
| Shipment week | 4 | ..... | 10 | 1 | 15 |
| One week after shipment ..... | ..... | ..... | 11 | 1 | 12 |
| Other | 1 | 1 | 14 | 2 | 18 |
| Not reported | 1 | ..... | 1 | 3 | 5 |
| Total | 14 | 4 | 89 | 38 | 145 |

In 24 of the agreements butter was to be sold on the basis of its actual grade, and the butter of each grade was to be paid for according to the corresponding Urner-Barry quotations. In using the quotations, the actual price was usually determined by either the addition of a premium or the subtraction of a discount from the quotation for each of the respective grades (table 17).

Of the agreements specifying payment according to some particular Urner-Barry quotation, 75 were made

Table 17. Premiums or Discounts Used in 24 Agreements Specifying that Butter Be Graded and Paid for According to Urner-Barry Quotations for Respective Grades, North Central Region, 1949*

| Premium or discount differential in cents per pound | Place of delivery | |
|---|-------------------------|-------------------------|
| | F.o.b. New York | F.o.b. some other point |
| | number of differentials | |
| Plus 1 ..... | ..... | 12 |
| Plus 3/4 | 5 | ..... |
| Plus 1/2 | 12 | 4† |
| Plus 1/4 | 3 | ..... |
| 0 | 6 | 24 |
| Minus 1/2 ..... | ..... | 12 |
| Total | 26 | 52 |

* The number of premiums and discounts reported exceeds the total number of agreements reported because most agreements specified the premium or discount for each of three or four grades.

† Includes two f.o.b. plants.

by plants from which samples of butter had been graded by federal graders as a part of this study. Ten agreements were reported by plants whose samples had graded 93 score, and three of these were based on the 93-score quotation, while seven used the 92-score price. Of 46 agreements reported by plants whose samples were graded 92 score, 45 were based on the 92-score price and one used the 90-score quotation. Of 19 agreements reported by plants whose samples had received a 90 score, 12 were based on the 92-score quotation and seven used the 90-score price (table 18).

Those 46 agreements unaccounted for were reported by plants which either had no sample graded in this study or which had failed to report sufficient detail to classify the agreements.

In no case did a plant whose sample had graded lower than 93 score report an agreement basing the price on the 93-score quotation, and only one agreement based on the 90-score price was reported by a plant from which a sample had been graded higher than 90 score in connection with this study.

Chicago Price Current Reports

Chicago Price Current quotations were reported used as a basis for 142

Table 18. Premiums or Discounts Used in 75 Agreements Specifying a Particular Urner-Barry Quotation as Basis for Payment, Classified by Relationship of Grade Used as Pricing Basis to Grade Given Butter Sample by Federal Graders, North Central Region, 1949

| Premium or discount differential in cents per pound | Price basis grade above sample grade | Price basis grade same as sample grade | Price basis grade below sample grade |
|---|--------------------------------------|--|--------------------------------------|
| | number of agreements | | |
| Plus 1 or more | 2 | 2 | 1 |
| Plus ¾ | ..... | 7 | 2 |
| Plus ½ | ..... | 12 | 1 |
| Plus ¼ | ..... | 8 | 2 |
| 0 | ..... | 17* | ..... |
| Minus ¼ | ..... | 2 | ..... |
| Minus ½ | ..... | 1 | ..... |
| Minus more than ½ | ..... | 1† | ..... |
| Amount not given | 2‡ | 5 | 2 |
| Total | 12 | 55 | 8 |

* Includes three f.o.b. plants.

† Includes one f.o.b. plant.

‡ All others are f.o.b. some other receiving point.

sales agreements. Kansas and Wisconsin reported the most frequent use of this base, although it was the basis for at least one agreement from every state in the region (table 13).

The price was reported as f.o.b. Chicago in 52 of these agreements, and 38 were priced f.o.b. some other receiving point, while 52 provided for a price f.o.b. the manufacturing plant (table 19). This is in sharp contrast to the Urner-Barry agreements in which less than a tenth were priced f.o.b. plant. Of the various provisions of these agreements no one appeared related to size of factory.

Seven of the agreements called for grading of the butter, with prices to be paid according to the respective grades. Three of these were priced f.o.b. plant. Of the three, one provided for a discount of one-half cent from the respective Chicago Price Current quotation, one provided for a discount greater than one-half cent, and the third did not

report the differential. All of the other four provided for the price f.o.b. Chicago, with three receiving the reported quotations for the respective grades and the fourth getting a premium of a quarter cent on all grades.

Of the agreements reporting use of a particular Chicago Price Current quotation, only 28 included complete information on both the quotation used and the amount of premium or discount, and were reported by plants from which samples had been graded for this study (table 20). Of these, 11 provided for a premium, 13 used the quotation as published, and four provided for a discount. None of the premiums, and only one of the discounts, were greater than half a cent.

The remainder of the agreements reported based on Chicago Price Current quotations included 49 from plants whose butter had not been graded by federal graders, and 58 from plants which failed to give adequate information about provisions of the agreement.

Of those plants providing complete information, more than half used the quotation for the same grade as was given their butter by the federal graders. In no plants were the quotations more than one grade different

Table 19. Provisions Specified in Use of Chicago Price Current Quotations, North Central Region, 1949

| Date of quotation used | Place of delivery | | | | Total |
|------------------------|----------------------|----------------|-----------------|---|------------|
| | F.o.b. plant | F.o.b. Chicago | F.o.b. New York | F.o.b. receiving point other than Chicago or New York | |
| | number of agreements | | | | |
| Arrival date | 13 | 41 | 1 | 16 | 71 |
| Arrival week | ..... | 1 | ..... | ..... | 1 |
| Shipment date | 31 | ..... | ..... | 4 | 35 |
| Shipment week | 4 | 1 | ..... | ..... | 5 |
| Other | 4 | 9 | ..... | 17 | 30 |
| Total | 52 | 52 | 1 | 37 | 142 |

Table 20. Premiums or Discounts Used in 28 Agreements Specifying a Particular Chicago Price Current Quotation as Basis for Payment Sorted by Relationship of Grade Used as Pricing Basis to Grade Given Butter Samples by Federal Graders, North Central Region, 1949

| Premium or discount in cents per pound | Pricing basis grade above federal grade | Pricing basis grade same as federal grade | Pricing basis grade below federal grade |
|--|---|---|---|
| | number of agreements | | |
| Plus 1/2 | 2 | 5* | ..... |
| Plus 1/4 | 2* | ..... | 2 |
| 0 | 6† | 7* | ..... |
| Minus 1/4 ..... | ..... | 2 | ..... |
| Minus 1/2 | 1 | ..... | ..... |
| Minus more than 1/2 ..... | ..... | 1 | ..... |
| Total | 11 | 15 | 2 |

* Include one f.o.b. plant.

† Include three f.o.b. plants.

All others f.o.b. some other delivery point.

from the federal grade given their butter.

AGREEMENTS BASED ON U. S. MARKET NEWS SERVICE PRICE REPORTS

Of 49 agreements using the Market News Service price reports as a basis for settlement, 32 plants did not report which grade was used as the basis for payment, and one reported only that the 93-score price was the basis of the agreement but did not say how their price was related to that base (table 21).

Seven plants located in Minnesota and five in South Dakota reported receiving prices based on the 92-score quotation. None of the South Dakota agreements was from plants from which butter samples had been graded, and all provided for payment of the 92-score quotation without any differential. One was to get the mid-point of the price range, but the other four did not speci-

fy what point in the 92-score price range was to be used.

Of the Minnesota agreements, one from a plant where a sample had graded 92 score, was to get the high point of the 92-score price range. Three plants from which samples had graded 92 score and three which had graded 93 score were to receive the high 92-score price plus a half cent. All of these prices were f.o.b. the receiving point.

One plant whose sample had graded 93 score was to receive payment for its butter according to actual grade, the butter of each grade bringing a half cent over the high reported price for their particular grade. Another plant whose sample had graded 92 score was to be paid according to the actual grade, with 93-score butter to receive a half cent more than the high reported 93-score price, and the lower grades were to receive the high reported respective prices without any differential. These prices, also, were f.o.b. the receiving point.

One Minnesota plant whose sample had graded 90 score was to receive the high reported 92-score price f.o.b. the plant, and an Iowa plant whose sample had graded 89 score was to receive the low 90-score price plus 1 cent f.o.b. the receiving point.

Market News Service reports were the basis for pricing of 21 Michigan agreements, 10 Minnesota agreements, 6 South Dakota agreements, 4 Wisconsin agreements, and 1 or 2 from each of six other states.

OTHER AGREEMENTS

Numerous other bases were used for 21 agreements reported from seven states. Most of these were probably based on commercial reports since a number of them specified such bases as certain daily papers or radio reports. Of these, eight provided for a price f.o.b. plant, two were f.o.b. Chicago,

Table 21. Provisions Specified in Use of United States Market News Service Reports, North Central Region, 1949

| Price specified | Date of quotation used | Place of delivery | | | | Total |
|---------------------------|-------------------------|-------------------|----------------|-----------------|---|-------|
| | | F.o.b. plant | F.o.b. Chicago | F.o.b. New York | F.o.b. receiving point other than Chicago or New York | |
| High point of price range | Arrival date | ..... | 1 | 6 | 2 | 9 |
| | One week after arrival | ..... | ..... | 1 | ..... | 1 |
| | Shipment date | 1 | 1 | ..... | 2 | 4 |
| | Shipment week | ..... | ..... | 1 | ..... | 1 |
| | Other | 2 | ..... | 4 | ..... | 6 |
| | Total | 3 | 2 | 12 | 4 | 21 |
| Average high daily price | Arrival date | ..... | 1 | ..... | ..... | 1 |
| | One week after arrival | ..... | ..... | 1 | ..... | 1 |
| | Shipment week | ..... | 1 | ..... | ..... | 1 |
| | One week after shipment | ..... | ..... | ..... | 1 | 1 |
| | Total | ..... | 2 | 1 | 1 | 4 |
| Midpoint of price range | Arrival date | ..... | 1 | ..... | 1 | 2 |
| | Shipment date | 2 | ..... | ..... | 1 | 3 |
| | Other | ..... | ..... | ..... | 1 | 1 |
| | Total | 2 | 1 | ..... | 3 | 6 |
| Low point of price range | Arrival date | ..... | 2 | 1 | ..... | 3 |
| | Shipment date | 6 | 1 | ..... | 1 | 8 |
| | Total | 6 | 3 | 1 | 1 | 11 |
| Other | Arrival date | ..... | 1 | 1 | ..... | 2 |
| | Other | 1 | ..... | ..... | 4 | 5 |
| | Total | 1 | 1 | 1 | 4 | 7 |
| Total | | 12 | 9 | 15 | 13 | 49 |

seven were f.o.b. New York, and four were f.o.b. some other receiving point. Six provided for payment of the quotation on date of arrival and one specified payment on the basis of date of shipment. Details of the other 12 were not reported.

Another 37 agreements were made for the sale of butter without any published quotation to provide for a flexible price base. Most of these appear to have been for specific amounts of butter to be delivered at some specific price within a relatively short time period.

Deciding Where to Sell Shipped Butter

AS THE PREVIOUS section reported, most creameries in the region shipped butter to one or two receivers, usually under some form of an agreement specifying a wholesale quotation as a basis for settlement.

Nearly two-thirds of all butter plants in the region were found to ship butter regularly to only one receiver. However, half of those selling more than 2,500,000 pounds in the year reported more than one regular buyer of shipped butter in contrast to only an eighth of those selling less than 2,500,000 pounds. More than 20 per cent of the plants reported no regular buyer of shipped butter, but most of those plants manufactured only a small amount of butter, and that frequently only as an accommodation to their local customers and patrons or as an outlet for occasional surpluses of butterfat not required by their regular operations. About 90 per cent of the plants with no regular buyer of shipped butter were noncooperative plants, many of which carried on a fluid milk distribution business as their principal operation (table 22).

The fact that most creameries use only one receiver suggests that they make little attempt to obtain new market outlets, an observation which agrees with that of previous researchers on butter pricing. In this connection two

questions are appropriate: (1) How much shopping for price can the creameries do without changes essentially of a long run character? (2) How much shopping should they do? These questions will be explored in the above order.

HOW MUCH PRICE SHOPPING CAN CREAMERIES DO?

A creamery can shop for both the best time and the best place for selling butter. The first is commonly termed speculation. The second consists of choice of the buyer offering the best price and other terms, and of bargaining over price and other terms. Price shopping often involves some delay in the selling of butter.

Price shopping also will depend on who has authority over sales, on whether quick decisions can be made on the information available within the time, and on other resources at the disposal of management.

Choice of the product which will provide the most desirable outlet for available butterfat and milk solids can be regarded as another form of shopping. This type of shopping requires that the plant may readily shift to production of a more profitable product until butter prices improve. Shifts can be made to other dairy products pending improvement of butter prices only when the plant receives whole milk. Information presented elsewhere has shown that only about half of the plants received whole milk. Many of the butter plants receiving whole milk are not equipped to make other manufactured products, nor are they inspected and approved by a fluid milk market for whole milk or cream sales, as an alternative to butter.

Shopping often involves a delay in the receipt of payment for butter sold. Capital will be tied up in inventories.

Table 22. Classification of Plants by Number of Regular Receivers of Shipped Butter, North Central Region, 1949

| Area | Number of regular receivers | | | | Total |
|--|-----------------------------|----|----|-----------|-------|
| | 0 | 1 | 2 | 3 or more | |
| | per cent of plants | | | | |
| Minnesota | 4 | 85 | 10 | * | 100 |
| Wisconsin | 37 | 56 | 5 | 2 | 100 |
| Iowa | * | 74 | 20 | ..... | 100 |
| Kansas, Mis- souri, Neb- raska, and South Dakota | 19 | 51 | 16 | 7 | 7 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 60 | 29 | 8 | 3 | ..... |
| Total for region | 22 | 62 | 12 | 2 | 2 |

* Less than 1 per cent.

Table 23. Distribution of Butter Plants According to Current Ratios, North Central Region, 1949

| Current ratio* | Per cent of plants |
|--------------------|--------------------|
| Less than 1 | 27 |
| 1 - 2 | 41 |
| 2 - 3 | 6 |
| 3 or more | 12 |
| Not reported | 14 |
| All plants | 100 |

* Current ratio is calculated by dividing the current assets by the current liabilities. Only the first figure of the ratio is given, thus 2 means a ratio of two dollars of current assets for each one dollar of current liabilities, etc.

Most of the creameries in the region do not have enough capital to permit tying it up in large butter inventories.¹⁰ In 1949, 68 per cent of the creameries in the region reported a current capital ratio of less than two dollars in current assets to one in current liabilities (table 23). In their lending many bankers tend to regard a two to one current ratio as a minimum requirement.

There was no observed relationship between the level of the financial ratio and the net prices which a creamery received. The important point is whether creameries were in a position to choose market alternatives requiring larger amounts of working capital.

Shopping also often involves storage of butter for a few days or a longer period. Shopping of this type depends on the availability of sufficient refrigerated space for storage until more favorable prices can be obtained. In addition to their low supplies of working capital, creameries generally have insufficient refrigerated space to hold butter. More than half of the butter manufacturing plants in the region have storage space for less than one carload of butter, and about 90 per cent of the plants have storage space for less than

three carloads. Two-thirds of those plants making less than 500,000 pounds of butter in 1949 reported storage space for less than one carload, and one-fourth had room for from one to three carloads. One-fourth of the plants producing between 500,000 and 2,500,000 pounds reported space for storage of less than one carload and 56 per cent had room for from one to three cars (table 24).

The highly diversified,¹¹ or highly flexible, plants usually had more storage space than those specializing in the production of butter. Of the highly flexible plants, 27 per cent reported storage space for more than three carloads of butter in contrast to only 9 per cent of the less flexible ones (table 25). Of the plants surveyed, larger per-

Table 24. Storage Space by Size of Plants, North Central Region, 1949

| Butter production of plants in 1949 | Amount of storage space | | |
|-------------------------------------|-------------------------|-----------------------|--------------------------|
| | Less than one carload* | One to three carloads | More than three carloads |
| pounds | per cent of plants | | |
| 0 - 499,999 | 67 | 25 | 8 |
| 500,000 - 2,499,999 ... | 26 | 56 | 18 |
| 2,500,000 or more..... | 4 | 31 | 65 |
| All plants | 57 | 32 | 11 |

* As used here a carload is 30,000 pounds.

Table 25. Comparison of Storage Space of Diversified Creameries with More Specialized Ones, North Central Region, 1949

| Per cent of butterfat used in manufacture of butter | Amount of storage space owned | | | Total |
|---|-------------------------------|--------------|--------------------------|-------|
| | 0-1 carloads | 1-3 carloads | More than three carloads | |
| | per cent of plants | | | |
| 0 - 20 | 49 | 24 | 27 | 100 |
| 20 - 100 | 64 | 27 | 9 | 100 |
| All plants | 62 | 27 | 11 | 100 |

¹⁰ In Wisconsin at the time of this survey some creamery managers indicated that they were in a poor position to borrow. Others reported that their directors were reluctant to borrow, at least for building storage space or to finance butter inventories.

¹¹ For purposes of this study highly diversified or flexible plants were considered as those using less than 20 per cent of their butterfat receipts in the manufacture of butter.

centages of those making 93-score butter, and those making butter of cooking grade, reported less than one carload of storage space than did the plants making butter grading between those two extremes.

Ordinarily refrigerated space relative to butter output is more important than absolute amounts of space, but the minimum needed depends on the problem. Relevant problems include whether creameries have enough space to enable them to sell to commercial buyers in large lots for economy in handling, to sell to the government, or to hold butter for more favorable prices.

Most creameries have refrigerated space only for the printing of small quantities of butter. Many find it difficult to accumulate lots of butter for truck shipment or for rail carlots. Comparison of space with output of individual factories suggests that about one to two weeks' production during the flush production period is about all that can be accumulated on the premises of even the best equipped creameries. On the whole more space would be required for the other purposes named. Furthermore, such space as these creameries have is not suited to holding butter longer than 30 days, since it is usually "cooler" space.¹² "Freezer" space is required to hold butter for longer periods.

Of course, factories may store butter in public warehouses, but the trade regards this as practical only where it is expected that the product will be stored more than 30 days.¹³

Consequently, most creameries have made little use of public warehouse space. The use they have made of public warehouses for butter is shown in table

Table 26. Plants Storing Butter in Public Warehouses in Selected Periods, North Central Region

| Butter production of plants in 1949 | Time period | |
|-------------------------------------|--------------------|---------------|
| | June 1949 | February 1950 |
| pounds | per cent of plants | |
| 0 - 499,999 | 4 | 0 |
| 500,000 - 2,499,999 | 15 | 2 |
| 2,500,000 or more | 36 | 0 |
| All plants | 7 | 0.5 |

26. Cooperatives reported considerably less use of public warehouses than did noncooperatives. Flexible plants (using less than 20 per cent of butterfat receipts in butter) report more space of their own and greater use of public warehouses during the season of peak production than do specialized butter plants. In June 1949, four times as large a proportion of the flexible plants were using public space as the more specialized plants, but only 7 per cent of all plants were using any then, and less than 1 per cent in February 1950.

How much of this storage is butter held from the season of peak production, for the needs of patrons and local trade during the part of the year when the plant is not making enough butter to meet those needs, is not known. However, some plants manufacture butter only during that period in which butterfat receipts are greater than can be disposed of in more profitable outlets, such as fluid milk and cream, and hold some of this butter in storage for their patrons and local trade during that part of the year in which they are not making butter.

Aside from holding butter to assure a steady supply for patrons and other

¹² Most of the refrigerated space reported in this survey was constructed and equipped for storage at 30°-50°F. Commercial warehouses usually hold butter at -10°F. or less.

¹³ In and out charges are applied to the warehouse rate for the first month, which may run the cost up to prohibitive levels unless spread over a period of time. Working capital can be released by discounting public warehouse receipts but here again the cost, usually 2 per cent, exceeds the benefits for short periods.

regular customers, most plants expressed little interest in storing butter. For the region, 89 per cent of the plants reported that, as a matter of policy, they do not hold butter for higher prices. It is particularly true that the cooperatives consider it to be their principal responsibility to process milk and cream into manufactured dairy products but not to store dairy products for seasonal price rises or for speculation on future price rises.

While 17 per cent of the noncooperative plants reported that they occasionally hold some butter for higher prices, only 7 per cent of the cooperatives engage in such a practice. Cooperative managers have indicated a feeling that there is little to be gained by holding products made during the season of peak production to take advantage of higher prices during seasons of shortage. Some managers offered the information that if the creamery should profit from such operations it is seldom reflected in their salaries. On the other hand if they should lose money it may endanger holding their job, since the patrons consider the manager responsible. Consequently, many cooperative managers sell their products as they are produced regardless of the price level. In June 1949, only 2 per cent of the cooperatives reported that they were storing some butter in public warehouses, in contrast to 13 per cent of the noncooperatives.

One would expect that lack of clear-cut delegation of authority and responsibility for selling, particularly in some cooperatives, might hamper shopping for prices. However, the findings of this survey seemed to indicate enough centralization of sales authority to permit most creameries to shop for prices within limits set by other factors.

In about four-fifths of the plants, responsibility for sales was in the

Table 27. Responsibility for Sale of Butter by Type of Plant, North Central Region, 1949

| Person responsible for butter sale | Type of plant | | |
|------------------------------------|--------------------|-----------------|------------|
| | Cooperative | Non-cooperative | All plants |
| | per cent of plants | | |
| Manager | 66 | 48 | 58 |
| Directors | 21 | * | 11 |
| Manager and directors | 12 | 1 | 7 |
| Manager and sales manager | * | * | * |
| Sales manager | --- | 5 | 2 |
| Owner | --- | 45 | 21 |

* Less than 1 per cent.

hands of two persons or less (table 27). This authority is less centralized in cooperative than noncooperative plants. Two-thirds of the cooperatively owned plants of the region reported that the manager is responsible for the sale of butter. Nearly all of the other one-third reported that responsibility for the sale of their butter rests either with the board of directors or jointly with the manager and the board. The noncooperatives reported the manager responsible for selling butter in 48 per cent and the owner (who may have been the manager) in 45 per cent of the plants.

The problem of adequacy of information is a complex one. Some economists hold the view that the problem of management is largely one of obtaining enough information about alternative courses of action to serve as a basis for decisions. Certainly, market price reports and other public sources of price information are an important part of the process of obtaining this information, though these would not include all the manager needs. The survey could not go into all aspects of the information problem, but it did furnish insights on the kinds of market reports, free or available from commercial

sources for a small charge, that are received by managers.

Nearly all creameries except those selling through federated sales associations reported receiving the Market News Service price report, and most of them received at least one additional type of information (tables 30-31). Further description of market information received is given later in this report.

It should be pointed out that the information and the time available to management for selling, vary depending on the size and organization of the firm. A large firm, generally speaking, can afford a specialized sales manager, or at least can free the general manager from other duties to give more time to sales. It can sell its butter independently of published quotations if it so desires, because it can spread the cost of obtaining adequate information on supply and demand conditions that affect butter prices over a larger output. It can also shift its product among buyers and markets, and thereby can better free itself from undesirable situations that may be associated with regular agreements. If desirable, it can arrange its operations to sell directly to the government or undertake a storage program to profit by seasonal price changes. Where its volume of butter trading is large enough and it has reason to employ the mercantile exchanges for spot sales or futures trading either through a membership, or a brokerage, this alternative is available. On the other hand, the wisdom of a particular large creamery doing any one of these things is not within the scope of a general pricing study at country points.¹⁴

Small plants producing less than a million pounds of butter annually must sacrifice somewhat on efficiency in pro-

curement or manufacturing if they give primary attention to the pricing of their butter. They cannot afford a special sales manager, nor the cost of obtaining adequate information for pricing independent of quotations. Also, the resources available for carefully watching prices paid by various buyers and the price relationships among seasons and among markets are limited. Storage operations and exchange trading are not logical alternatives to them as individual firms. In spite of these important differences in their alternatives, the pricing policies and selling arrangements of some large creameries are little different from those of smaller ones. However, it is clear that leadership for the solution of many of the problems which now surround the country point pricing of butter must come from the larger firms.

HOW MUCH PRICE SHOPPING SHOULD CREAMERIES DO?

The data above suggest that most creameries cannot hold butter for seasonal price changes; nor can many accumulate carlots, or afford to tie up operating capital to sell directly to the government unless the spread between support prices and net f.o.b. plant wholesale prices becomes greater than usual. But all these things can be changed over time, and the explanation for failure to shop for more favorable prices must lie more fundamentally in expectations as to future business conditions and the need to specialize on manufacturing problems, than with the above short run factors.

In spite of these limited choices to management, there are many immediate improvements that can be made in the selling program which sometimes may

¹⁴The appropriate pricing policies for large firms are more difficult to generalize upon than for small ones, because they are less homogeneous and also because the pricing policy of individual large firms has more effect on the industry. Adequate analysis of price policies for such firms as Land O' Lakes Creameries, Inc. would call for case studies.

be profitable. This leads to the question—*How much shopping for prices should creameries do?*

First, do creameries gain or lose by staying with agreements with regular buyers? Analyses showed no important differences between prices received by factories, with, and those without, agreements. The effect of agreements themselves on prices received cannot be determined in a survey such as this, because so many price determining factors are present that may not be associated with the presence or absence of an agreement. An example may show how a manager may get higher prices with an agreement than he would without. A manager entering into an agreement may insist that all details that can affect net prices are firmly agreed on, making careful evaluation of the effect of each provision. He may continue to be aggressive in his price behavior, by keeping informed on prevailing price offers, yet stand by his agreement because he knows he is getting the market price for his grade of output and location, plus an extra price which his buyer attaches to the value of the extra service of regular shipments, consistent quality and others. This manager also is saving the time he would use to rearrange sales outlets frequently, and employing it to increase procurement and manufacturing efficiency.

On the other hand, if the manager permits his agreement completely to substitute for attention to price offers and otherwise becomes nonaggressive, one would expect that his prices would net somewhat less. However, a manager may be nonaggressive without entering into an agreement.

The above suggests that sales aggressiveness is a more important explanation of price differences than agreements. The survey included fac-

tors thought to be associated with aggressiveness. These were:

- (1) How well the manager knows his agreement.
- (2) How he decides where to sell.
- (3) The number of price offers he gets.
- (4) The kinds of market information obtained and used in evaluating prices.
- (5) Sales promotion carried out.

Apparently many managers do not understand their agreements, partly because they do not understand the quotations. Spot checks of schedules from Wisconsin butter-pricing data were made to compare prices under terms of the agreement reported from memory by the creamery manager with the price he received according to his sales records.¹⁵ Seldom were these two figures the same, even for the largest plants in the state where one would expect the management to be well informed. The figure the manager received tended to be somewhat lower than the quotation he thought he was getting, even in cases where he was getting more than the Chicago Price Current quotation less freight to Chicago.

This confusion arises from the understatement of the Chicago Price Current quotation, the range in the Market News Service price, the differences between these quotations, the lack of uniformity among the various media of price information, and from the many direct and indirect ways of introducing a premium into the sale. The buyer tends to understand these things, but the seller does not. Also the buyer has many sources of information which the seller does not have on supply and demand factors which are additional to those reflected in the quotation.

¹⁵ This was not done for all the data of the region because the comparison had to be made by hand; in coding the regional data, analysis of this point was not anticipated. Observations by Ernest Feder (South Dakota) support this conclusion. There is no reason to expect that the findings would differ in other states.

Table 28. Basis of Deciding Where to Sell Butter, North Central Region, 1949*

| Area | Highest offer | Old customers | Combination of highest offer and old customers | Other basis | Not reported | Total |
|---|---------------|---------------|--|-------------|--------------|-------|
| | | | per cent of plants | | | |
| Minnesota | 15 | 47 | 22 | 13 | 3 | 100 |
| Wisconsin | 10 | 18 | 16 | 40 | 16 | 100 |
| Iowa | 36 | 21 | 23 | 20 | ..... | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 26 | 28 | 11 | 26 | 9 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 6 | 63 | 11 | 13 | 7 | 100 |
| Total for region | 18 | 39 | 17 | 20 | 6 | 100 |

* This table includes creameries which sold through cooperative sales federations. It does not include plants that sold through parent firms.

Even if the manager understood the quotations commonly used, he would have difficulty in distinguishing between them in the various media through which they come to his attention. Neither newspapers, radio stations, nor telegraph companies carry reference to which quotations they furnish. Actual copies of the Market News Service or Chicago Price Current arrive one to three days after the day's market they report. Most plants receive the Market News Service report and only a few receive the Chicago Price Current, even though the latter is used more often in pricing agreement sales.

In deciding on buyers for his shipped butter, an aggressive manager would be expected to report that he sold to old customers so long as their offers over a period of time netted the highest prices. Nearly one-fifth of the managers did give this as an answer (table 28). Old customers were reported to be the most important single consideration in the selection of market outlets for shipped butter by 39 per cent of the plants in the region. This suggests that these managers were not giving current attention to prices.¹⁰ Only 18 per cent reported selling to the buyer who made the best offer for their butter. Factors

other than price and previous dealings were used by 20 per cent of the plants in deciding to whom they should sell their butter.

Several sources of price offers may imply that the manager has been unusually aggressive in shopping for prices among various outlets. However, it may mean that a creamery has butter of unusually desirable quality, causing buyers to seek it out. It also could mean that supplies of all butter were unusually short, though this was not the case in 1949.

A low number of price offers may suggest, but does not necessarily mean, that sellers have not been aggressive in seeking price offers, nor buyers in seeking purchases. Plentiful supplies of butter during 1949 probably meant that initiative for price offers had to come from sellers. The fact that market prices that year were relatively stable suggests less need for seeking offers than during a rising or falling market. Also, there are other ways in which plant managers may behave aggressively.

While the manager may send samples of his butter to new buyers and ask for prices, he may keep informed on market prices for his quality of butter in other ways. He may send samples to

¹⁰ The value of these replies is further limited by the fact that the manager may have meant that he based the decision on where to send any one shipment on factors besides current price offers, though over a period of time his choice of an old customer had strongly reflected prices received.

the dairy industry department of his agricultural college. He may get a laboratory analysis from his regular buyer. He may have his butter graded by a federal grader. Also, he may receive market news and other price reports, and carefully evaluate his own prices against these. Although he remains with his regular buyer, he may demand that the terms of his agreement—especially the premium—be renegotiated in a rising market. As long as the manager stays informed as to market conditions and prices available from other outlets, continued bargaining with the regular buyer may be the desirable policy. For small creameries particularly this may be preferable to frequent shifts from buyer to buyer.

These and other price-determining factors are not necessarily associated with the number of price offers, and their effect could not be removed from the data which follow:¹⁷

About 35 per cent of the plants in the region reported that they received no regular offers, while another 20 per cent had only one source of regular price offers for their butter (table 29). Only 45 per cent of the plants received regular price offers from more than one buyer.

Minnesota plants reported substantially more sources of regular price offers than did the plants in other states. Whether this was due to greater activity by buyers in an area of concentrated regular butter production or a difference in interpretation by enumerators is not known. However, it was noted that those plants selling through cooperative sales agencies in Minnesota reported only two-thirds as many sources as the plants using other types of outlets. No such difference was found in the other states, where the plants selling to cooperative sales agencies received equally as many price offers

Table 29. Number of Sources of Regular Price Offers for Butter, North Central Region, 1949

| Number of sources of regular price offers | Minnesota | Other 11 states | Entire region |
|---|-----------|-----------------|---------------|
| | | | |
| 0 | 10 | 47 | 35 |
| 1 | 9 | 25 | 20 |
| 2 or 3 | 32 | 15 | 21 |
| 4 to 6 | 43 | 8 | 19 |
| More than 6 | 6 | 5 | 5 |
| Total plants reporting | 100 | 100 | 100 |

as did those plants selling to other types of buyers.

A sharp difference in the number of sources of regular price offers was found to exist among plants making different grades of butter. Those plants making the better quality of butter received significantly more price offers than did the plants making the lower grades.

The fact that the typical creamery apparently received at least two published types of price information, for use in evaluating prices received, suggests price shopping. These publications may be called a prerequisite for "shopping," but the extent and nature of this evaluation, the critical points, were not determined. Nevertheless, the following data on kinds and numbers of published information received in various segments of the industry may be useful to those who strive to improve these reports and their distribution.

The most important single type of market information used by butter plants of the region in evaluating prices was found to be the reports of the Market News Service of the United States Department of Agriculture. These reports were the chief source of price information for 40 per cent of the plants. Daily papers were the principal

¹⁷ The schedules were not sufficiently detailed in this respect. Also, analysis of the effect of most of these aspects of price behavior would call for studies over a period of time, rather than at one segment of time.

Table 30. Principal Type of Market Information Used in Evaluating Butter Prices, North Central States, 1949

| Type of information | Butter production of plants in 1949 in pounds | | | All plants |
|-------------------------------|---|----------------------|--------------------|------------|
| | Less than 1/2 million | 1/2 to 2 1/2 million | Over 2 1/2 million | |
| per cent of plants | | | | |
| USDA Market | | | | |
| News Service | 42 | 37 | 42 | 40 |
| Daily papers | 23 | 10 | ..... | 19 |
| Radio | 14 | 21 | 10 | 15 |
| Commercial news service | 8 | 25 | 44 | 14 |
| Personal contacts | 10 | 4 | 2 | 8 |
| Trade papers | 3 | 3 | 2 | 3 |
| Buyers' news letter ..... | * | * | ..... | * |
| None ..... | * | * | ..... | * |
| Total | 100 | 100 | 100 | 100 |

* Less than 1 per cent.

type of information reported for 19 per cent of the plants, and radio for 15 per cent (table 30).

Commercial news service reports, used by 14 per cent of the plants, ranked fourth. However, these reports were used mostly by the large plants. In contrast daily papers were the principal source of information for the small plants. A few small cooperatives reported the use of no regular market information in evaluating prices; but these plants were affiliated with cooperative sales agencies, selling their product on a pool basis and leaving price evaluation to that agency.

However, the average plant received information of at least one other type in addition to the one designated as its *principal* type of information. The percentage of plants receiving each of the major types of information used in evaluating price is given in table 31.

It will be noted that the percentage of plants receiving several of these types differs greatly from the percentage indicating those reports to be their *principal* source of information. For example, only 3 per cent considered

trade papers a principal type of information, although fully a third of the plants received them. It is of interest to observe that more plants both receive the reports of the Markets News Service and consider them to be their principal source of information than any other type of report.

To furnish insight into the sales promotion carried on, the managers were asked, "Do you carry on any sales promotion? What kind? Do you have your own brand?" Sales promotion may include a variety of things, such as good merchandising practices and product promotion with first receivers. However, managers interpreted the question to refer to measures to create consumer demand. Most replied that they subscribed to the American Dairy Association; a few had arrangements with local merchants to include their brand in advertising specials; one or two mentioned plans to establish local retail route trucks. Since the survey was at the local creamery level, any promotion carried out by a parent organization or a sales affiliate was not reported. Ninety per cent of the creameries have their own brand for print butter, chiefly for local sales. In gen-

Table 31. Plants Receiving Various Types of Market Information, North Central Region, 1949*

| Type of information | Butter production of plants in pounds | | | All plants |
|-------------------------------|---------------------------------------|----------------------|--------------------|------------|
| | Less than 1/2 million | 1/2 to 2 1/2 million | Over 2 1/2 million | |
| per cent of plants | | | | |
| USDA Market | | | | |
| News Service | 63 | 76 | 84 | 66 |
| Daily papers | 50 | 47 | 24 | 49 |
| Radio | 43 | 43 | 20 | 42 |
| Trade papers | 52 | 35 | 22 | 34 |
| Commercial news service | 20 | 35 | 52 | 24 |
| Personal contacts | 12 | 8 | 9 | 11 |
| Buyers' news letter | 2 | 13 | 7 | 4 |

* These percentages add to more than 100 per cent, since most plants receive more than one type of information.

eral, little effort was made to create local demand for butter.¹⁸

Only slightly more than half of the plants of the region, 53 per cent, reported that they engage in some kind of sales promotion with no difference found between cooperatives and non-cooperatives. There was a difference in the percentage having their own brands, with the noncooperatives reporting that 96 per cent had their own brands, against 86 per cent of the cooperatives. However, a number of cooperatives handle butter under the brand of a cooperative sales association of which they are a member and through which they sell their shipped butter.

There was, of course, a difference in the amount of sales promotion work done by size of plant. Only 49 per cent of the plants making less than 500,000 pounds of butter in 1949 reported any sales promotion work, in contrast to 68 per cent of the larger plants. Approximately 88 per cent of the plants making less than 500,000 pounds had their own brand, as did 96 per cent of the larger plants. All plants making more than 2,500,000 pounds of butter in 1949 reported that they had their own brand.

In summary, it may be said that attempts to measure sales aggressiveness, through a survey of factors thought to be associated with aggressiveness, were fruitless. The replies failed to provide any significant explanation for price differences. Other price-determining factors, not necessarily associated with the ones surveyed, were present and their effect could not be removed from the data.

In spite of this, a fund of general descriptive material about selling practices was obtained. This, added to the findings of the other studies and the general observations of things not suitable for

tabulation gained from interviews, suggests that nearly all creameries would profit from being more aggressive in their price behavior.

This would call for the managers, (1) to give careful attention to each detail in their agreement that can affect their net prices, (2) to assure carefully that these details are spelled out in their agreements, preferably in written contracts, but at least confirmed by letter, (3) to at least recognize that there are important differences among basic quotations, knowing the general differences among them and insisting upon an understanding with the buyer on the details of whichever one is used, (4) to request renegotiation of premiums in times of a rising trend in the butter market, (5) to select the particular type of channel or the specialized demands for which his butter is best suited. This may change from time to time as the average quality of his butter changes.

SALES UNDER FEDERAL PRICE SUPPORT PROGRAM

During the time covered by this survey, the United States Department of Agriculture stood ready to buy butter in compliance with the provisions of price support legislation. Purchases were limited to solid packed bulk butter in carlots. Prices were the same f.o.b. delivery at any location in the United States. Prices were quoted for only two grades. The top grade, U. S. grade A, 92 score or better, was supported by an offer of 59 cents per pound in June 1949 and 60 cents during February 1950. The other, U. S. grade B, 90 score, was quoted at 57 cents and 58 cents, respectively, for the two periods. All offerings to the government were required to include federal inspection and grading certificates.

¹⁸ However, a question may be raised as to the value of promotion to create local demand. Most of these creameries now supply nearly all the butter used in the small communities where they are located. At least in Minnesota and Wisconsin the population of these local communities is already highly butter conscious. Perhaps, for the region as a whole, more could be done along this line.

In deciding where to sell butter, creamery managers could either accept the price offers of commercial buyers, or offer their butter to the government if it met the necessary requirements. If a creamery made butter grading below 90 score it would not be accepted by the government. On the other hand, plants making 93-score butter could obtain no more than for the sale of 92-score butter to the government. At the same time, the creamery managers reported that making direct sales to the government might jeopardize their status with a regular buyer with the result that long run losses might more than offset the immediate gains.

After evaluating these considerations most plants elected to continue shipping to their regular buyer. According to records of the Dairy Branch of the Production and Marketing Administration, only 2 per cent of the plants in the region sold directly to the government. These plants were the larger creameries of the region, but they sold only a small part of their output to the government. On the basis of government purchases from plants in the sample, only about 1 per cent of the butter in the region was sold under the price support program.

Although very little butter was sold directly to the government by the manufacturers, it is probable that the gen-

eral effect of the price support program was not too different from what it might have been if all sales had been made directly from the manufacturer to the government. However, it does appear from examination of prices received f.o.b. creameries, that the plants whose butter was sold to the government through an intermediary actually received slightly lower net prices than would have been realized if they had sold directly to the government.

These prices were likely acceptable to the plants because, in addition to holding their regular outlets, they avoided investment in storage facilities that might be needed only temporarily. Also, some were short of operating capital, a factor that is important when one considers that payment was usually received more promptly from the regular buyers.

A summary of the usual reported costs indicates that the average cost to the plant selling to the government was about 16 cents per hundredweight above costs incurred in regular market outlets.¹⁹ This does not allow for costs of extra handling of butter that might be avoided by shipping to commercial buyers immediately after manufacture. Neither does it allow for loss of regular outlets or cost of constructing added storage facilities.

Conditions of Sale

THE FINDINGS from this survey lead to the general conclusion that, with few exceptions, no particular condition of sale can be proved to have an effect on price.

¹⁹ Basis for estimates on cost of selling to government: (a) Of 392 domestic nongovernment sales only 57, or 15 per cent, involved grading cost to the seller. (b) For 253 grade certificates, the average charge was \$6.20, with a range from \$.70 to \$21.00, depending chiefly on distance traveled to the creamery by the inspector. (c) The average time lapse between shipment and final payment in 286 domestic nongovernment sales with neither draft nor advance was eight days. (d) Time lapse between accumulation of butter and receipt of payment from government is assumed to be one month. (e) Interest is calculated as 4 per cent for 22 days with butter at \$.60 per pound.

| | | |
|--|---|---------|
| Calculations: 85 per cent of \$6.20 grading cost..... | = | \$ 5.27 |
| 4 per cent interest for 22 days on 30,000 pounds of butter | = | 43.40 |
| Total added cost on 30,000-pound car..... | = | \$48.67 |

This being the general case, rather than focusing on improvement of some special condition of sale, it appears more important to obtain a clear understanding of all the conditions of sale, what their effect on net price will be, and to set up in the plant office a routine verification of receipts against the terms of the agreement.²⁰

IMPORTANCE OF SPECIFIC AGREEMENTS

The conditions of sale that should be firmly agreed on, preferably by written contract, are:

(1) The central market from which some quotation will be taken for use in determining the basic price. If custom is followed, the choice in the North Central Region lies between New York and Chicago.

(2) The publication source of the quotation. If custom is followed, the source for Chicago will be Market News Service or Chicago Price Current. For New York the source will be Market News Service or Urner-Barry. Daily paper, radio, and commercial dispatches appear to originate from these sources.

(3) The amount of premium, if any.

(4) The f.o.b. point at which price applies, which determines the amount of shipping costs and who will bear them.

(5) The delivery point, if other than the f.o.b. pricing point. This condition may call for understanding on where title changes hands, who bears shipping cost, and so forth.

(6) Who will grade the butter, how often, and where. If an "average" grade is agreed upon, how the average will be determined. Are grade reports, laboratory tests, and arrival weights to be furnished to the factory regularly?

(7) What weights will be accepted. Are tolerances for underweights to be set up, or will underweights be docked? How much?

(8) Provision for notice to other party when a change of contract is desired.

(9) Time and amount of shipments that will be accepted.

(10) Time and method of payment. Whether sight drafts are permitted.

(11) The method for selecting the day or days for quotations to be used in settling for each shipment.

(12) If the publication source agreed upon issues prices in a range, what point of the range will provide the basis of payment.

This statement of terms agrees in most respects with those suggested by Mathis and Hirsch.²¹ Those authors have explained the prevailing practice in use of each of these terms for Iowa, and have described the choices that face the creamery manager in deciding on each of these terms. Their analysis of the effect of the alternative choices appears applicable to the region in general, and in the interest of brevity is not repeated here. Statistics on prevailing practices in the use of these terms for the region differ somewhat from Iowa, and where those differences appear to be important, the regional data are set forth at various points in this report. However, the choices involved, and their effect, would differ little from the findings of Mathis and Hirsch.

Added comment will be made on two points with which apparently the Iowa study did not deal. They are: (1) The important differences in average prices from various publication sources and (2) important seasonal differences between New York and Chicago price quotations.

²⁰ One large Chicago wholesaler attaches to his remittance a copy of the price report or quotation on which payment is based, checks the one used, and furnishes laboratory analysis reports. This would appear to be a desirable practice.

²¹ Mathis and Hirsch, *op. cit.*, pp. 14-22.

Table 32. Comparison of Midpoints of Chicago Prices Reported for 92-Score Butter by the U. S. Market News Service with Chicago Price Current Quotations, May 1949 to April 1950

| Month | Market News Service | Chicago Price Current | Difference |
|-------------------|---------------------|-----------------------|------------|
| | cents per pound | | |
| May 1949 | 58.90 | 58.75 | 0.15 |
| June | 58.84 | 58.53 | 0.31 |
| July | 59.87 | 59.66 | 0.21 |
| August | 61.86 | 61.50 | 0.36 |
| September | 61.93 | 61.57 | 0.36 |
| October | 62.07 | 61.69 | 0.38 |
| November | 62.00 | 61.69 | 0.31 |
| December | 62.15 | 62.02 | 0.13 |
| January 1950..... | 61.32 | 61.07 | 0.25 |
| February | 62.08 | 61.79 | 0.29 |
| March | 60.08 | 59.82 | 0.26 |
| April | 59.79 | 59.34 | 0.45 |

DIFFERENCES IN PUBLICATION SOURCES

The prices reported by the U. S. Market News Service and those of the commercial services at Chicago and New York frequently differ. In June 1949, for example, the midpoints of the range as reported by the Market News Service averaged .3 cent higher than the Chicago Price Current for 92-score butter (table 32). Monthly averages of the midpoints of the Market News Reports exceeded the averages of the Chicago Price Current quotations by .13 to .45 cent per pound for the months May 1949 to April 1950.

Small differences among quotations can mean substantial differences in the returns received by creameries. The importance of these differences may be seen more readily when they are expressed in carlots. Based on the average difference for June 1949, a plant whose selling arrangements specified the Market News Service price realized \$60 more per car if based on the lower point

of the range, and \$134 more per car if based on the higher figure, than if his arrangement were based on the Chicago Price Current.²² For the month of June 1949, a plant whose sales were based on the upper Market News Service figure would have realized about \$74 per car more than if based on the lower figure, calculating from the average difference.

For a small plant producing 500,000 pounds of butter annually, these differences mean from \$1,000 to \$2,000 more income, assuming of course, that other terms are equal. This difference, of course, would be expected from knowledge of the type of sales covered by each of the two publication sources. The Chicago Price Current reflects chiefly prices on the Exchange spot call, where grade of the butter and amount of services priced are standardized. The Market News Service price includes all types of wholesale trading by first receivers in Chicago, as well as open market transactions (excluding only those sales involving long-term credit or unusual services and sales for delivery outside the city). It therefore reflects a wider range of qualities and services, many of which add to the price reflected by the exchange. In spite of these differences in the publication source of the quotations, the one selected appears less important than firmly specifying one, understanding its basic characteristics, and giving careful attention to checking it against the other. For example, so long as the manager knows that the midpoint of the Market News Service price usually averages somewhat above the Chicago Price Current, he is as well off with the latter plus a premium for the difference as he would be with the former without the added premiums.

²² The reports of the Market News Service were almost consistently higher during June 1949. Only once was the midpoint of the Market News Service report the same as the Chicago Price Current quotation, and the difference occasionally was as high as .5 cent. For the same month, the upper figure in the range reported by Market News Service averaged .4 cent higher than Chicago Price Current, varying from .25 to .75 cent per pound. Even the lower Market News Service figure for the month was higher than the Chicago Price Current 17 out of 22 times, the same 4 times and lower only once, for an average of about .2 cent above Chicago Price Current.

Table 33. Comparison of Premiums and Discounts Used in Agreements That Specify a New York Quotation with Those That Specify a Chicago Quotation, North Central Region, 1949*

| Premium or discount | New York quotation | Chicago quotation |
|-----------------------|----------------------|-------------------|
| cents per pound | number of agreements | |
| Plus 1 or more | 2 | ..... |
| Plus ¾ | 7 | ..... |
| Plus ½ | 12 | 5 |
| Plus ¼ | 8 | ..... |
| 0† | 17 | 7 |
| Minus ¼ | 2 | 2 |
| Minus ½ or more | 2 | 1 |
| Total‡ | 50‡ | 15 |

* Column 2 from tables 18 and 20.

† Note that nearly three-fifths of the New York based agreements specify premiums, whereas only one-third of the Chicago based agreements specify premiums.

‡ Agreements in which amount of premium was not reported are left out of totals.

SEASONAL DIFFERENCES IN NEW YORK AND CHICAGO PRICE QUOTATIONS

On a year around basis for creameries west of Chicago, that market would appear to be preferable to New York so long as the creamery can get the same other terms for both markets. During the two months specified in this study, premiums most frequently paid to factories selling on the New York quotations appeared only slightly

higher than to those selling on Chicago quotations (table 33). It is noteworthy that plants selling on the Chicago basis netted more on an average for each score in June 1949 (table 34). The premium for shipping on the New York quotation (f.o.b. New York) would have had to exceed the premium for shipping on the Chicago quotation (f.o.b. Chicago) by almost 1 cent to make returns to the plant the same, and the added premium was not that large.

The price advantage in selling on the Chicago basis in June 1949 was apparent for each grade, with all types of buyers averaged together. Net prices for 92-score butter were only slightly higher when sold on the Chicago quotation, but for 93 score were about .5 cent per pound higher and for 90 score were 1.5 cents higher. Individual types of buyers also paid higher net prices for butter bought on the Chicago quotation with one exception. Chain stores paid more for 92- and 93-score butter bought on the New York quotation.

A comparison of quotations for alternative markets should suggest how much the New York based premium should exceed the Chicago premium to equalize the prices. It also should suggest seasonal differences which may be expected.

Table 34. Net Prices Received by Creameries for Sales Based on New York Quotations Compared with Sales on Chicago Basis, Expressed as Deviations from the Adjusted 92-Score Chicago Price Current Quotations, North Central Region, June 1949*

| Type of buyer | 93-score deviation from 92-score adjusted Chicago price | | 92-score deviation from 92-score adjusted Chicago price | | 90-score deviation from 92-score adjusted Chicago price | |
|---|---|---------------|---|---------------|---|---------------|
| | New York basis | Chicago basis | New York basis | Chicago basis | New York basis | Chicago basis |
| | cents per pound | | | | | |
| Meat packers | -.10 | +.08 | -.34 | -.17 | -3.46 | -1.58 |
| Wholesalers | -.28 | +.34 | -.70 | -.05 | -3.45 | -2.59 |
| Chain stores | +1.33 | +.69 | +.51 | +.004 | -2.22 | -.78 |
| All types of buyers | -.08 | +.41 | -.21 | -.06 | -3.37 | -1.84 |
| Amount by which Chicago basis sales exceeded New York basis | | .49 | | .15 | | 1.53 |

* Net f.o.b. creamery prices (packaged bulk shipments) received by creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight from creamery location.

Table 35. Comparison of New York and Chicago Wholesale Prices for 92-Score Butter, between Flush Production and Out-of-Storage Periods, Prewar and Postwar Years*

| Month | 1939-40 | | | 1940-41 | | | 1941-42 | | | 1946-47 | | |
|------------------------|-----------------|----------------|-------------|-----------------|----------------|-------------|-----------------|----------------|-------------|-----------------|----------------|-------------|
| | New York prices | Chicago prices | Diff-erence | New York prices | Chicago prices | Diff-erence | New York prices | Chicago prices | Diff-erence | New York prices | Chicago prices | Diff-erence |
| | cents per pound | | | | | | | | | | | |
| May | 23.64 | 22.77 | .87 | 27.60 | 26.42 | 1.18 | 35.52 | 34.72 | .80 | 46.75 | 46.00 | .75 |
| June | 24.06 | 23.65 | .41 | 26.90 | 26.27 | .63 | 35.60 | 35.40 | .20 | 51.75 | 51.00 | .75 |
| July | 23.78 | 23.23 | .55 | 27.05 | 26.48 | .57 | 34.85 | 34.34 | .51 | 69.44 | 69.74 | -.30 |
| August | 24.25 | 23.54 | .71 | 27.61 | 27.00 | .61 | 35.52 | 34.96 | .56 | 70.46 | 69.82 | .64 |
| 4-month average | | | .64 | | | .75 | | | .52 | | | .46 |
| September | 27.66 | 27.44 | .22 | 28.51 | 27.59 | .92 | 36.94 | 36.59 | .35 | 76.82 | 76.18 | .64 |
| October | 29.00 | 28.38 | .62 | 30.25 | 29.55 | .70 | 35.65 | 35.16 | .49 | 84.04 | 83.18 | .86 |
| November | 30.07 | 29.51 | .56 | 33.12 | 32.43 | .69 | 36.18 | 35.75 | .43 | 81.63 | 80.01 | 1.62 |
| December | 30.16 | 29.54 | .62 | 34.85 | 34.20 | .65 | 34.97 | 34.56 | .41 | 82.21 | 79.71 | 2.50 |
| January | 31.84 | 30.76 | 1.08 | 31.06 | 30.11 | .95 | 35.45 | 35.16 | .29 | 66.55 | 66.21 | .34 |
| February | 29.57 | 29.03 | .54 | 30.80 | 30.07 | .73 | 34.82 | 34.48 | .34 | 70.91 | 69.04 | 1.87 |
| March | 28.61 | 28.03 | .58 | 31.58 | 30.79 | .79 | 34.94 | 34.45 | .49 | 69.55 | 68.96 | .59 |
| April | 27.90 | 27.10 | .80 | 33.23 | 32.54 | .69 | 37.91 | 37.24 | .67 | 63.06 | 61.14 | 1.92 |
| 8-month average | | | .63 | | | .76 | | | .43 | | | 1.29 |
| 12-month average | | | .63 | | | .76 | | | .46 | | | 1.02 |
| | 1947-48 | | | 1948-49 | | | 1949-50 | | | 1950-51 | | |
| May | 61.26 | 60.39 | .87 | 80.12 | 79.58 | .54 | 59.73 | 58.90 | .83 | 59.98 | 59.83 | .15 |
| June | 63.32 | 62.95 | .37 | 80.26 | 80.93 | -.67 | 58.98 | 58.84 | .14 | 59.98 | 59.88 | .10 |
| July | 67.39 | 67.99 | -.60 | 78.55 | 78.83 | -.28 | 59.91 | 59.87 | .04 | 60.32 | 59.99 | .33 |
| August | 74.45 | 74.79 | -.34 | 75.55 | 75.34 | .21 | 61.80 | 61.86 | -.06 | 61.38 | 60.73 | .65 |
| 4-month average | | | .71 | | | -.05 | | | .24 | | | .31 |
| September | 80.23 | 79.19 | 1.04 | 71.89 | 71.77 | .12 | 62.21 | 61.93 | .28 | 63.32 | 62.71 | .61 |
| October | 71.79 | 70.11 | 1.68 | 64.43 | 63.28 | 1.15 | 62.48 | 62.07 | .41 | 64.15 | 63.24 | .91 |
| November | 79.39 | 79.94 | -.55 | 62.87 | 62.68 | .19 | 62.52 | 62.00 | .52 | 64.69 | 63.99 | .70 |
| December | 88.07 | 86.30 | 1.77 | 64.52 | 64.79 | -.27 | 63.14 | 62.15 | .99 | 66.41 | 66.61 | -.20 |
| January | 85.05 | 84.08 | .97 | 62.95 | 62.23 | .72 | 62.40 | 61.32 | 1.08 | 69.78 | 69.82 | -.04 |
| February | 83.60 | 81.74 | 1.86 | 63.30 | 62.80 | .50 | 63.47 | 62.08 | 1.39 | 69.44 | 68.88 | .56 |
| March | 80.16 | 79.03 | 1.13 | 61.55 | 60.29 | 1.26 | 60.70 | 60.08 | .62 | 67.10 | 66.69 | .41 |
| April | 82.78 | 80.49 | 2.29 | 59.89 | 58.95 | .94 | 59.89 | 59.79 | .10 | 66.99 | 66.49 | .50 |
| 8-month average | | | 1.27 | | | .58 | | | .67 | | | .43 |
| 12-month average | | | .87 | | | .37 | | | .53 | | | .39 |

* Source: Compiled by Dairy Branch, Production and Marketing Administration from midpoints of U. S. Market News Service Reports.

In recent years the average New York quotations have exceeded the Chicago quotations by less than the added shipping cost,²³ judging from 92-score averages. For the 1948-49 season through the 1950-51 season the New York price has exceeded Chicago by less than half the added shipping cost. Any price advantage to be gained by basing sales arrangements on New York would appear greater during the out-of-storage season of September-April than during the production season of May-August (table 35). During some years the difference between New York and Chicago quotations may exceed substantially the added cost of shipping to New York during September to April. This was true during the two seasons immediately following World War II; yet, during the flush production season and for the yearly average, this relationship did not hold.

The above seasonal relationship did not hold immediately before the war as may be seen from price data during the period May 1939-April 1942, by seasons. At that time the average for the flush season was quite close to the average during the out-of-storage period, with neither average differing greatly from shipping costs which then prevailed.

The data on the chart bear out the above conclusions relative to seasonal price relationships between the two markets, New York and Chicago (figure 1). Average differences for June, by years, appear unseasonally low for the flush months, and for February they appear low for the storage months. The New York-Chicago difference in June averages .39 cent, whereas it averages .89 cent in February. The latter is about .2 cent less than the added shipping cost based on the current freight

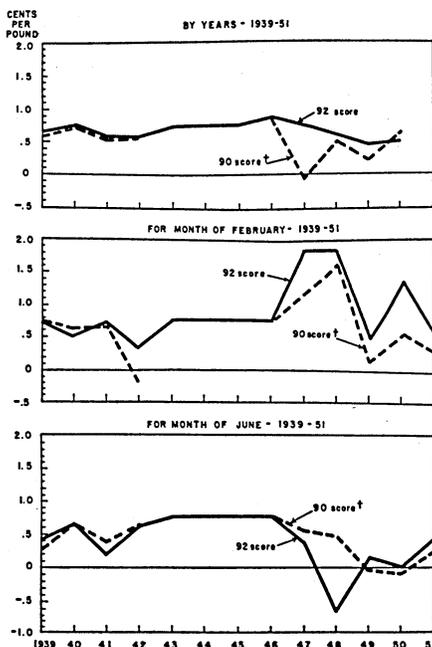


FIG. 1. Amount by which New York wholesale price for creamery butter differs from Chicago wholesale price—annual, February, and June Averages, 1939-51.*

* Prices are midpoints of the Market News reports.

† No quotations available for 90-score butter from 1943 to 1945.

rate, but not far from the average for the 1939-1951 period.

It may be noted that the New York-Chicago difference is greater for 92 score than for 90 score. This suggests that on an average it may be more profitable to sell 90-score butter in Chicago than New York.

To sum up from the above comparisons: If other provisions of the agreement are equal, creameries would gain more by selling on New York quotations regularly during the out-of-storage

²³ In this study, the butter freight cost per pound has been calculated by the following formula: $\frac{28¢ + (12¢) X}{100}$ where X equals the distance in hundreds of miles. To calculate the

added cost for a creamery to ship from Chicago to New York, the 28 cents, an "in and out" charge, would be omitted. (Formula derived from actual shipping rates reported by creameries in this study.) In 1951 this difference to plants west of Chicago averaged about 1.1 cents per pound.

period, September through April, and on Chicago quotations during the flush production period May through August than by selling regularly to New York. It appears that during the periods studied the largest proportion of creameries west of Chicago would have gained by selling on Chicago quotations throughout the year.

It also appears that lower scoring butter would tend to return higher net prices to creameries when sold on Chicago quotations. Provisions of the agreement other than quotations are not equal between New York and Chicago, but the added premium on New York based sales was not enough to make up for the additional freight.

Pricing Butter to Patrons and Local Trade

THE SAME BASES used in agreements for the sale of shipped butter also are used to establish prices of local sales by many creameries in the region. While nearly 90 per cent of the agreements for shipped sales were based on Chicago or New York prices published either commercially or by the Market News Service, these same prices were used by 57 per cent of the plants of the region in establishing prices to patrons and by 93 per cent in pricing other local butter sales.

Local sales accounted for 24 per cent of all butter manufactured in the region in 1949 (table 36). Included in this total were sales to patrons, local retail sales, and local wholesale distribution, but it was impossible to obtain a percentage breakdown of the three classifications because many companies did not set up their records in this way.

It was found that butter sold to patrons is often priced differently from butter sold to other local trade. The

Table 36. Proportion that Local and Shipped Sales Were of Total Butter Sales by Areas, North Central Region, 1949

| Area | Per cent of butter | | |
|---|--------------------|--------------|-------------|
| | Shipped | Sold locally | Total sales |
| Minnesota | 81 | 19 | 100 |
| Wisconsin | 75 | 25 | 100 |
| Iowa | 83 | 17 | 100 |
| Kansas, Missouri, Nebraska, and South Dakota | 86 | 14 | 100 |
| Illinois, Indiana, Kentucky, Michigan, and Ohio | 57 | 43 | 100 |
| Total for region..... | 76 | 24 | 100 |

Table 37. Bases Used in Pricing Butter for Local Sales, North Central Region, 1949

| Base used | Sales to patrons | Other local trade | per cent of plants | |
|---|------------------|-------------------|----------------------|-----------------------|
| | | | Chicago market price | New York market price |
| Chicago market price | 35 | 50 | | |
| New York market price | 22 | 43 | | |
| Average price paid patrons for butterfat | 30 | | | |
| Average net returns from shipped butter | 9 | | | |
| Other bases or to meet competition | 4 | 7 | | |
| Total | 100 | 100 | | |

bases used in pricing local sales were also found to differ sharply in various parts of the region.

The most popular base for pricing local sales at the time of the study was the Chicago market price, used by 35 per cent of the plants in pricing butter to patrons, and by 50 per cent in pricing other local sales (table 37).

The second most popular basis for pricing butter to patrons was the average price paid for butterfat. This basis

Table 38. Comparison of Grades of Butter Sold Locally with the Grades of Butter Usually Manufactured, North Central Region, 1949

| Grade of butter | Butter used in local sales | Samples scored by federal grader | |
|-----------------|----------------------------|----------------------------------|--|
| | | per cent of plants | |
| 93 score | 18 | 18 | |
| 92 score | 40 | 36 | |
| 90 score | 36 | 41 | |
| 89 score | 1 | 5 | |
| Cooking grade | ..... | * |  |
| Plant run | 5 | ..... |  |
| Total | 100 | 100 | |

* Less than 1 per cent.

was used by 30 per cent of the plants, although not a single plant in the sample reported using this for pricing local sales other than to patrons. The New York market price was used by 22 per cent of the plants in pricing to patrons and by 43 per cent in other local sales. The average net returns to the plant for shipped butter serve as the basis for pricing butter to patrons by 9 per cent of the plants. Most plants of the region reported that they price all butter sold to local trade, except that sold to patrons, on the same base.

The grades of butter sold to local trade were of about the same distribution as the samples that were graded by federal graders as a part of this project. Although only 5 per cent of the plants reported the sale of "plant run"

butter to local trade, many reported the same score as that given their butter by federal graders. While 18 per cent of all plants providing samples were given a 93 score, 18 per cent also reported the use of 93-score butter in filling the needs of local trade. The percentage of the samples falling into various other grades and the percentage distribution of grades used to supply local trade were also similar (table 38);

PRICING BUTTER TO PATRONS

Most plants in the region used one of four bases for pricing butter to patrons. In order of importance they were (1) Chicago market quotations, (2) the average price paid patrons for butterfat, (3) New York market quotations, and (4) the net returns to the plant per pound of shipped butter (table 39).

Chicago market quotations were most important in those states east of the Mississippi River, while New York prices were used chiefly in Minnesota and Iowa. The Chicago price was used by 80 per cent of the Wisconsin plants and by 66 per cent of the plants in the other five states east of the Mississippi River, while Iowa and Minnesota plants reported the New York price used by 44 and 45 per cent, respectively. The average price paid patrons for butterfat was the base reported used by 78 per cent of the plants

Table 39. Bases Used in Pricing Butter to Patrons, North Central Region, 1949

| Base used | Area | | | | | Region |
|--|--------------------|-----------|-------|--|---|--------|
| | Minnesota | Wisconsin | Iowa | Kansas, Nebraska, Missouri, and South Dakota | Illinois, Indiana, Ohio, Michigan, and Kentucky | |
| | per cent of plants | | | | | |
| Chicago market price | 10 | 80 | 11 | 20 | 66 | 35 |
| Average price paid patrons for butterfat | 16 | 1 | 41 | 78 | 32 | 30 |
| New York market price | 45 | 9 | 44 | 1 | ..... | 22 |
| Net return per pound of butter | 19 | 1 | 4 | 1 | 2 | 9 |
| Other | 10 | 9 | ..... | ..... | ..... | 4 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Table 40. Description of Differentials in Cents Per Pound Associated with Use of 92-Score Market Prices in Pricing Butter to Patrons, North Central Region, 1949

| Description of differential* | Market used as base | |
|------------------------------|---------------------|----------|
| | Chicago | New York |
| | cents per pound | |
| High of range | +9.00 | +6.00 |
| Low of range | 0.00 | -8.00 |
| Mean† | +3.80 | +1.57 |
| Median‡ | +3.00 | +2.00 |
| Mode§ | +2.00 | +2.00 |

* Differential premium or discount used with the appropriate base to determine the selling price.

† Mean—Simple arithmetic average weighted by number of plants.

‡ Median—Midpoint of array of all price differentials from highest to lowest.

§ Mode—The differential most often used.

of the other states west of the Mississippi River.

For the region as a whole, 35 per cent of the plants reported use of the Chicago market quotations. Of those using this base, 14 per cent used the 93-score price, 62 per cent used the 92-score quotations and 24 per cent used the 90-score price.

The average differential was between 3 and 4 cents per pound (table 40). Less than 1 per cent of all plants using the Chicago price as a base for pricing butter to patrons used a discount to lower the price from the quotation, and only 4 per cent used the quotation without a differential. All other plants used the published quotation plus a differential of from 1 to 9 cents per pound.

New York prices were used to price butter to patrons by 22 per cent of the plants of the region, all using either the 92- or 93-score price. Of these, 11 per cent charged patrons a lower price than the published base, 11 per cent used the published quotations without a differential, and 78 per cent used the base price plus a differential of from 1 to 6 cents per pound.

The average price paid patrons per pound of butterfat was used by 30 per

cent of the plants of the region. Of these, 1 per cent used the base plus 1 cent, 68 per cent used the base without a differential, and the remaining 31 per cent used the base minus differentials of from 1 to 7 cents (table 41).

The net return to the plant per pound of shipped butter was the base for 9 per cent of the plants of the region. Three-tenths of these used the price without a differential and seven-tenths charge from 1 to 6 cents above that price.

It was impossible to weight the above averages by volume of butter sold to patrons to determine the profit or loss from handling butter to patrons as against shipped sales because of inadequate data on the breakdown of local sales between sales to patrons, to other local retail trade, and other local wholesale outlets.

PRICING BUTTER TO LOCAL TRADE

The Chicago market price was used as a basis for the price of butter sold locally to customers other than patrons by 50 per cent of the plants in the region, while 43 per cent of the plants reported use of New York prices. However, Iowa and Minnesota reported that

Table 41. Description of Differentials in Cents Per Pound Associated with Use of Other Bases in Pricing Butter to Patrons, North Central Region, 1949

| Description of differential | Base used | |
|-----------------------------|---------------------------------|---|
| | Net return from shipped butter | Average price paid patrons per pound of butterfat |
| | differential in cents per pound | |
| High of range | +6.00 | +1.00 |
| Low of range | 0.00 | -7.00 |
| Mean | +2.48 | 0.00 |
| Median | +3.00 | -0.79 |
| Mode | +3.00 | 0.00 |

76 per cent of their plants used the New York quotations and only 16 per cent used the Chicago prices. In the other 10 states, 91 per cent used the Chicago quotations and only 3 per cent used the New York prices as the basis for pricing butter to local trade other than patrons.

Of the plants using Chicago quotations, more than half used the 92-score price. One-third used the 90-score price, and the remainder used the 93-score quotation. Only 2 per cent reported the sale of butter locally at less than the published Chicago price while 7 per cent reported use of the quotation without a differential and 91 per cent sold butter locally at from 1 to 9 cents over the Chicago market price (table 42).

Most of the 43 per cent of all plants reporting the New York quotations as their base for pricing butter locally used the 92-score price. Less than 1 per cent used the 90-score quotation, all using the published price plus 1 cent. Of the others, 4 per cent sold for less than the published base, 27 per cent

Table 42. Description of Differentials Associated with 92-Score Market Price in Selling Butter Locally to Others than Patrons, North Central Region, 1949

| Description of differential | Market used as base | |
|-----------------------------|---------------------|----------|
| | Chicago | New York |
| | cents per pound | |
| High of range | +9.00 | +6.00 |
| Low of range | -2.00 | -2.00 |
| Mean | +2.34 | +1.85 |
| Median | +2.00 | +1.00 |
| Mode | +2.00 | 0.00 |

used the base without a differential, and the remainder used the published price plus from 1 to 6 cents.

About 5 per cent of the plants reported the use of some base other than the Chicago or New York market quotation, but the details of these bases were not available.

It was impossible to relate the prices to the amount of butter sold to local trade to determine the profitability of local sales because many plants did not keep records of other local sales separate from those of sales to patrons.

Analysis of Price Differences for Shipped Butter²⁴

DATA ON WHOLESALE PRICES received by creameries for butter shipped out of the local vicinity were analyzed to cast light on five questions: (1) To what extent were differences in prices received by creameries explained by distance from the market where the quotation was made? (2) To what extent are differences in net prices explained by scale of butter output? (3) To what extent were prices received by factories explained by butter grades? (4) Were there important differences in prices paid by particular types of buyers, such as wholesalers, chain stores, and others? (5) Were there important differences in prices paid by a particular buyer to different plants?

All prices were converted to average net prices, packaged f.o.b. factory, paid for particular shipments, during June 1949 and February 1950. This was done

²⁴ The authors appreciate the suggestions of Sydney D. Staniforth, University of Wisconsin, in developing this part of the report.

to translate into uniform actual prices the effect of differences in pricing arrangements, such as variations in delivery points, who furnishes the package, and other factors.

Grade data used as a basis for sorting were those taken from the sales records of the creameries, namely the score of butter the buyer designated in making payment for a specific lot or shipment of butter.²⁵ Actually it made little difference whether the buyer grades or the federal grades obtained for this study were used. Comparison of these two showed that of the sales from factories federally scored, two-thirds were paid for on the same grade as the average federal score. Of the other third, slightly more were paid on a grade below than on a grade above the federal average for the factory (table 43). This may be viewed as surprisingly close considering all the variables that could not be controlled.

Net f.o.b. prices paid creameries west of Chicago that sold their own wholesale bulk package butter were expressed as deviations from the Chicago Price Current quotation of the day the shipment arrived at destination, adjusted for freight to Chicago.²⁶ This eliminated four plants with usable data east of Chicago. Selection of factories that sold their own butter eliminated those selling through cooperative sales agencies, for reasons discussed elsewhere. Use of deviations from the quotation used as a basis for payment, instead of actual prices, removed the effect of differences in net prices that might result from daily changes in central market quotations. To simplify tabulations, the day of arrival, used by 75 per cent of the creameries, was as-

Table 43. Comparison of Grades Used as Bases for Settlement in Sale of 1,912 Lots of Butter with Federal Grades Given Butter Samples from Plants of the Respective Sellers, North Central Region, 1949-50*

| Federal grade given butter sample | Grade used as basis for settlement | | | Total |
|--------------------------------------|--|-------|-----|-------|
| | 93 | 92 | 90 | |
| | number of lots | | | |
| 93 | 563 | 207 | 85 | 855 |
| 92 | 139 | 452 | 141 | 732 |
| 90 | 15 | 94 | 209 | 318 |
| 89 | ..... | ..... | 7 | 7 |
| Total | 717 | 753 | 442 | 1,912 |

* A summary of the grades of the lots in this table shows that the number of sales from creameries graded by federal graders and paid for on the basis of a score were as follows:
Higher than the average federal grade, 255 lots or 13 per cent.
The same as the average federal grade, 1,224 lots or 64 per cent.
Lower than the average federal grade, 433 lots or 23 per cent.

sumed to provide the basic quotation for settlement of all sales. The manner of adjustment for freight to Chicago and the reason for so doing is discussed in the following section.

Shipments paid for on basis of New York quotations were separated from those paid for on the Chicago quotation for most analyses. This was done to hold constant the effect of net price differences which came about from differences in these two quotations, less New York-Chicago freight costs.

DIFFERENCES ASSOCIATED WITH TRANSPORTATION COSTS TO CHICAGO WHOLESALE MARKET

As stated elsewhere, this study is oriented to the adequacy of central market quotations as a reflector of sup-

²⁵ The grade used as a basis for payment may not be exactly the grade of that lot of butter. Sometimes a buyer may accept all butter from a factory at a particular grade, expecting that the butter will average that grade. Also some 93-score plants seem to prefer to sell on a price basis of 92-score plus a premium than to sell for a straight 93-score price. Therefore, some 93-score butter may be sold as 92-score grade rather than the actual grade. Also, the pricing arrangement may be tied to 92 score because that quotation is more continuous than others. The effects of such deviations are part of the price variations not explained by the grade at which butter moves in wholesale trade.

²⁶ Since wholesale prices are not available for markets other than Chicago, New York, Philadelphia, and two far western markets, it was not possible to express net prices as deviations from prices in the nearest secondary market.

ply and demand conditions in the general trade area and, therefore, to their adequacy for use as a basis for butter trading at country points. The problem here is to hold constant the effect of transportation costs to Chicago, where the quotation is made.

It would be expected that net f.o.b. creamery prices in the general trade area of a dominant central market would tend to average the wholesale price quoted in the central market less freight to market, other things being equal. One would expect this particularly for prices of butter which is bought and sold throughout the general trade area on basis of quotations for that central market. Although local creamery prices, within limits, would reflect the presence of strong secondary markets in the region, these limits would be determined by the prevailing prices in the central market (which always furnishes an alternative for both buyers and sellers) and regional freight rates.

From the Chicago quotation was deducted the estimated freight from the country plant to Chicago (see footnote 23, p. 41). This procedure in effect gave the price which theoretically would be expected at a plant in the Chicago trade area that used Chicago quotations as a sales basis, under certain sets of assumptions (the competitive model). For simplicity of terms, this will be referred to as the *expected price*.

Since the data used in all further analyses were adjusted in this manner,

the average effect of freight on differences in plant prices was assumed to be held constant.²⁷

DIFFERENCES ASSOCIATED WITH SIZE OF CREAMERY

The data were analyzed to measure the effect of creamery size on net prices, or at least to find a way to hold the effect constant. One would expect that net prices would tend to increase with size of the creamery for three reasons: (1) greater uniformity of quality, (2) regularity of sales, and (3) increased efficiency in the selling and shipping operation. Larger creameries would be expected to employ more uniform manufacturing techniques and to be able to ship in larger lots and hence save on freight costs. In selling, one would expect larger creameries to realize somewhat higher prices from a particular shipment even with quality and size of lot held constant, for reasons discussed in the section entitled "Deciding Where to Sell Shipped Butter."

A primary problem was to find some measurement of scale of butter operations. Preliminary analyses showed no relationship between the peak butter output and net prices. The volume of butter manufactured at the peak month failed to measure the scale of plant as a butter manufacturing operation because many of the largest plants were flexible and tended to move from one butter volume class to another one as they shifted butterfat to other uses.

²⁷ Only in a general way does this hold transportation costs constant. Average transportation costs were taken out of the gross data by converting all prices to net f.o.b. factory. If these costs were unusual, for example, because of regional differences in the rate structure or between rail and truck, their effect would be part of the difference in plant prices unexplained by the analysis of other variables. Since a substantial part of the region's butter output is not shipped to Chicago, it was expected that the actual distance to destination might furnish part of the explanation for differences in net creamery prices. To measure this effect, differences between actual and expected prices calculated in the manner explained above, were plotted around a zero line against actual distance from destination. A random scatter was obtained, indicating that distance from destination supplied no explanation for price differences that was not supplied by distance from Chicago. There is some reason to expect that if net prices were plotted on a map of the region, these would tend to average higher in some geographic areas than others, thereby suggesting the presence of important secondary markets or unusual supply areas. Mathis and Hirsch (*op.cit.*) found three different price areas in Iowa. This was not done for the region, however, because of the time required to do it manually.

Hence, at any one time they may be in the smallest class.

Further analyses showed no relation between volume of butterfat receipts and net prices. The volume of butterfat at the intake has the advantage of measuring scale of plant more accurately, but here again results were affected by flexible plants that were not primarily butter operations. These flexible plants may not achieve the economies of scale nor provide the constant butter supply expected of a large specialized butter factory.

When both measures of scale of plant failed to explain net price differences, owing to the heterogeneous character of butter operations, a search was made for a factor closely associated with flexibility that could be held constant. Data on several such factors were at hand from the survey. The most reasonable ones were: (1) number of kinds of manufacturing equipment, classified to show finished products that could be produced, such as churns, bottling equipment, canning equipment, cheese vats, driers, etc., (2) per cent of 1949 butterfat receipts used in products other than butter, and (3) number of products other than butter sold during 1949 that used butterfat.

Preliminary analyses showed these three to be closely related for the year 1949. The analysis is presented in terms of the third one. Butter prices during that year were relatively favorable, and most flexible plants had a high output of butter even though they also sold some market cream, cheese, or other products during part of the year. It is believed that the results would not be materially different if the relationship were sought with either pieces of equipment or per cent of 1949 receipts used in products other than butter.

Within groups of plants arranged according to degree of flexibility, no general relationship appeared between

volume of butter manufactured and the average deviation from the 92-score adjusted Chicago Price Current quotation for either June or February (table 44). For some cases the relationship tended to be positive, in others negative, and in others the observations fell at random around the zero line.

This finding suggests that, in general, larger factories received no greater average net prices for butter of a particular grade than smaller ones. This may be because larger factories are no more efficient in selling than smaller ones. But it is just as likely that the economies of scale that one expects to be reflected in net prices could not be measured from this type of data.

The hypothesis that net prices realized by creameries will increase with scale is based on several assumptions, one of which is that the firms are reasonably homogeneous. However, creameries are not homogeneous as to cream or milk supply areas, procurement facilities, type of manufacturing facilities, or sales organizations. Sales may be made through federated cooperative sales agencies or through parent firms, and the quality of sales management varies widely. Manufacturing facilities may be specialized for butter, or may be flexible so that the output may be shifted among several products depending on price relationships. Procurement practices may be at a uniformly high level for an entire supply area (perhaps owing to the effect of a state law such as the minimum standards act in Wisconsin) or may vary among creameries within a supply area. All variations in sales organization and in manufacturing and procurement facilities may be present in a given dairy area. Although the data were sorted to use only plants that sold their own butter, and were specialized butter plants, most of these things could not be observed. Partly because of this lack of homogeneity, it was impossible to

Table 44. Test of Whether Size of Butter Output, Within Flexibility Groups, Provides a Significant Explanation for Differences in Net f.o.b. Prices Factories Received for 92-Score Butter, North Central Region, June 1949 and February 1950*

Part I

| Index of flexibility† | Scale of creamery, by size of butter output | | | | | | | | |
|-------------------------|---|-------------------|-------|-----------------------|-------------------|-------|-----------------------|-------------------|-------|
| | 0 - ¼ million pounds | | | ¼ to ½ million pounds | | | ½ to ¾ million pounds | | |
| | Average deviation | Range Low High | | Average deviation | Range Low High | | Average deviation | Range Low High | |
| | cents per pound For June 1949 | | | | | | | | |
| 0 | -.25 | -.79 | +.69 | ..... | ..... | ..... | -.63 | -1.13 | +1.00 |
| 1 | -.42 | -1.43 | +2.87 | ..... | ..... | ..... | -1.30 | -2.84 | +.96 |
| 2 | -.11 | -.84 | +.57 | -.24 | -2.98 | +1.32 | -.35 | -.93 | +1.37 |
| 3 | -.72 | -.82 | -.49 | ..... | ..... | ..... | ..... | ..... | ..... |
| All flexibility groups‡ | -.34 | -1.43 | +2.87 | -.24 | -2.98 | +1.32 | -.65 | -2.84 | +1.37 |
| | For February 1950 | | | | | | | | |
| 0 | -.38 | -1.34 | +.93 | +.16 | -.97 | +.64 | -.01 | -.92 | +.82 |
| 1 | 0 | -1.25 | +1.19 | -.10 | -1.44 | +.79 | ..... | ..... | ..... |
| 2 | +.49 | -.75 | +1.43 | +.33 | +.11 | +1.19 | -.17 | -1.68 | +.85 |
| 3 | -.20 | -1.63 | +.89 | ..... | ..... | ..... | -.36 | -.36 | -.36 |
| All flexibility groups‡ | +.02 | -1.63 | +1.43 | +.11 | -1.44 | +1.19 | -.14 | -1.68 | +.85 |

* Net f.o.b. creamery prices (packaged bulk shipments) paid to creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight to creamery location.

† Number of products other than butter using butterfat.

‡ Weighted average of all sales. This average was obtained by averaging individual observations, rather than averaging the group averages.

Part II

| Index of flexibility | Scale of creamery, by size of butter output | | | | | |
|------------------------|---|-------------------|-------|-------------------------|-------------------|-------|
| | ¾ to 1¼ million pounds | | | 1¼ to 1½ million pounds | | |
| | Average deviation | Range Low High | | Average deviation | Range Low High | |
| | cents per pound For June 1949 | | | | | |
| 0 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1 | -.18 | -1.73 | +1.06 | ..... | ..... | ..... |
| 2 | -.61 | -1.19 | +1.09 | ..... | ..... | ..... |
| 3 | +.31 | -.13 | +1.20 | +.74 | -.26 | +1.38 |
| All flexibility groups | -.24 | -1.73 | +1.20 | +.74 | -.26 | +1.38 |
| | For February 1950 | | | | | |
| 0 | ..... | ..... | ..... | ..... | ..... | ..... |
| 1 | -.11 | -2.18 | +1.03 | +.23 | -.96 | +1.07 |
| 2 | +.23 | -.39 | +.73 | ..... | ..... | ..... |
| 3 | +1.01 | +.87 | +1.38 | -1.35 | -1.88 | -.86 |
| All flexibility groups | +.10 | -2.18 | +1.38 | -.34 | -1.88 | +1.07 |

measure the effect of volume on net prices. To do so, either all other price-determining factors must be closely associated with butter volume as such, or the sample must be designed for the particular purpose of measuring the effect of volume on net prices, with more intensive sampling of creameries

known to be homogeneous in all these respects.

DIFFERENCES ASSOCIATED WITH GRADE

The data were analysed to determine whether grades furnish an important

explanation for differences in butter prices received by factories. Net prices for sales packaged f.o.b. factory, for creameries west of Chicago that sold their own butter on the New York quotation, were expressed as adjusted deviations (as previously explained) for each of the months June 1949 and February 1950. They were grouped by types of buyers within grades. The same was done for sales on the basis of the Chicago quotation. Grades were those used as a basis for payment with 93-score prices and 90-score prices, expressed separately as deviations from the adjusted 92-score Chicago price.

For this test the primary sort was by buyers who bought some of each grade of butter and who dealt with more than one factory in the survey. This sort was made so that the same data could be used for all subsequent analyses.

The following shows the plan on which statistical tests were applied for significant difference among prices paid for each score of butter. This was done both by types of buyers and for averages for all types. Prices received for individual shipments were sorted according to quotation used as a basis for settlement for each month.

In general, those tests which did not show significance are not presented as tables. The result follows:

| | Chicago Price Current basis (scores) | New York Urner-Barry basis (scores) |
|--|--|--|
| June 1949 | | |
| Meat packers | 93-92-90 | 93-92-90* |
| Wholesalers | 93-92-90 | 93-92-90* |
| Chain stores | 93-92-90 | 93-92-90* |
| Averages for all types buyers | 93-92-90* | 93-92-90* |
| February 1950 | | |
| Meat packers | 93-92-90 | 93-92‡ |
| Wholesalers | 93-92-90† | 93-92 |
| Chain stores | 93-92-90* | 93-92 |
| Averages for all types buyers | 93-92-90 | 93-92 |
| * Significance at 1 per cent level. † Significance at 5 per cent. ‡ Significance at less than 2½ per cent. | | |

New York Sales Basis—June 1949

As would be expected, there was a tendency for the higher scoring butter to average a higher price than the lowest score (table 45). Differences between 93- and 92-score averages were small, but large differences appeared between these and the average 90-score price deviations. Differences between these three scores were significant at the 1 per cent level (the F test is used throughout). This indicates that the variations in average prices between grades were significantly greater than the variation among the individual prices for shipments within each grade group, to the extent that only once in a hundred times would a difference this great occur by chance.

Table 45. Test of Whether Grades Provide a Significant Explanation for Differences in Net f.o.b. Plant Prices Factories Received for Butter Sold on the New York Quotations, Expressed as Deviations From the Adjusted Chicago Price Current Quotation for 92 Score by Types of Buyers, North Central Region, June 1949*†

| Type of buyer | cents per pound | | |
|---------------------------|---|---|--|
| | 93-score deviations from adjusted 92- score Chicago price | 92-score deviations from adjusted 92- score Chicago price | 90-score deviations from adjusted 92-score Chicago price |
| Meat packers | -.10 | -.34 | -3.46 |
| Wholesalers | -.28 | -.70 | -3.45 |
| Chain stores | +1.33 | +.51 | -2.22 |
| Dairy companies | | +.14 | |
| All types buyers | -.08 | -.21 | -3.37 |

* Net f.o.b. creamery prices (packaged bulk shipments) paid to creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight to creamery location.

† The test of variation within groups compared with between groups showed significance at the 1 per cent level for both grades and buyers. Obviously most of the difference between grades is between 90 score and each of the others. Most of the difference between buyer types is between meat packers and wholesalers as compared with chain stores and dairy companies.

Table 46. Ranges and Standard Deviations of Grade-Price Data in Net Prices Received by Factories for Individual Butter Sales, a Summary of Which is Shown in Table 45, North Central Region, 1949

| Type of buyer | 93-score deviations from adjusted 92- score price | | | 92-score deviations from adjusted 90- score price | | | 90-score deviations from adjusted 92- score price | | |
|--------------------------------|---|-------|-----------------------|---|-------|-----------------------|---|-------|-----------------------|
| | Range | | Standard deviation | Range | | Standard deviation | Range | | Standard deviation |
| | Low | High | | Low | High | | Low | High | |
| | cents per pound | | | | | | | | |
| Meat packers | -2.08 | +1.47 | ±.74 | -2.84 | +1.38 | ±.90 | -5.31 | -2.78 | ±.83 |
| Wholesalers | -1.67 | +2.05 | ±.86 | -1.34 | + .36 | ±.41 | -4.08 | +2.83 | ±.62 |
| Chain stores | + .75 | +2.01 | ±.59 | -.91 | +1.32 | ±.59 | -2.68 | -1.75 | ±.29 |
| Other dairy companies | | | | + .08 | + .57 | ±.16 | | | |
| All types buyers | -2.08 | +2.05 | ±.88 | -2.84 | +1.36 | ±.87 | -5.31 | +2.83 | ±.90 |

A quick summary of this result may be expressed as the differential these types of buyers paid above their 90-score prices. They are:

| | 93 score (cents) | 92 score (cents) |
|---------------------------|---------------------|---------------------|
| Meat packers | 3.36 | 3.12 |
| Wholesalers | 3.17 | 2.75 |
| Chain stores | 3.55 | 2.73 |
| All types of buyers | 3.29 | 3.16 |

For those who wish to examine these data more closely, the ranges and standard deviations are shown in table 46. Standard deviations tend to run high when ranges are wide, but this is not always the case. A relatively small standard deviation means that a relatively small number of the net prices paid were extremely high or low. For example, wholesalers tended to pay extreme prices more often for 93-score butter, whereas meat packers tended to pay extreme prices more often for low-score butter.

The range in central market prices reported for each grade by the Market News Service was much narrower than the range in prices for each grade as shown by this survey. This may be observed by comparing ranges where set forth in this report with Market News reports for the appropriate period.

Chicago Sales Basis—June 1949

Those plants selling butter on the basis of Chicago quotations likewise

received higher prices for the higher scoring butter. The differences in prices received for 93-, 92-, and 90-score butter expressed as average deviations from the 92 score adjusted Chicago quotation follow:

| | Cents per pound |
|----------------|-----------------|
| 93 score | + .41 |
| 92 score | -.06 |
| 90 score | -1.84 |

The difference among these average deviations is significant at the 1 per cent level, but this results largely from the difference between the top scores and the 90 score.

Differences in prices paid by particular types of buyers were more important for 93-score butter than for other scores. This will be summed up in the section dealing with differences by type of buyer.

Chicago Sales Basis—February 1950

Little important difference would be expected in prices as among the grades of butter sold on the Chicago quotation during February 1950. The Chicago Price Current quotations for 93 differed from 92 only once, on February 28, when 93 was .25 cent higher. The 90-score prices were less than 92 score regularly by only .5 cent. Analysis of the survey data for net prices at creameries showed 90 score averaging .07 cent above the adjusted 92-score quotation,

and 92 and 93, .13 cent below and .3 cent above, respectively. These differences were not significant even at the 10 per cent level, and are therefore not shown in tabular form.

Two types of buyer paid prices that showed more important differences among scores, though one of them paid more for 90 than for 92 score. Prices paid by chain stores follow for February. Price differences among grades are significant at the 1 per cent level. They were:

| | Deviation from adjusted 92-score Chicago Price Current | | |
|--------------------|---|----------|----------|
| | 93 score | 92 score | 90 score |
| | cents | cents | cents |
| High | + .36 | + .49 | +1.39 |
| Low | + .04 | -1.06 | + .88 |
| Average | + .27 | - .11 | +1.01 |
| Standard deviation | ± .09 | ± .66 | ± .22 |

Prices paid by wholesalers for that month were significantly different among scores at the 5 per cent level. They were:

| | Deviation from adjusted 92-score Chicago Price Current | | |
|--------------------|---|----------|----------|
| | 93 score | 92 score | 90 score |
| | cents | cents | cents |
| High | +2.07 | +1.07 | +1.15 |
| Low | -1.19 | -1.63 | -2.60 |
| Average | + .39 | - .15 | - .38 |
| Standard deviation | ± .91 | ± .72 | ± .95 |

Chain stores paid nearly .75 cent more for 90 than for 93 score, and over a cent more for 90 than for 92 score. Wholesalers on the other hand paid about .25 cent more for 92 than 90 score and about .75 cent more for 93 than 90 score. Prices for lower scores may temporarily exceed higher scores because supply of, or demand for, one score of butter may change relative to another, although these prices cannot stay long out of line since one quality can be substituted for another.

New York Sales Basis— February 1950

Following uniformly the same method of subsorting, the data yielded price

observations on butter sold on a New York sales basis during February 1950 for 93 and 92 scores. Average prices f.o.b. factory for 93-score butter sold on New York basis would be expected to exceed 92 score by .38 cent, judging from the average Urner-Barry difference for February. The difference for all buyers combined was actually near this amount, but was not statistically significant even at the 10 per cent level. These data, therefore, are not shown in tabular form. Yet a difference which may be important did appear between prices meat packers paid for 93 and 92 score. These follow for February:

| | Deviation from adjusted 92-score Chicago Price Current quotation | |
|--------------------|---|----------|
| | 93 score | 92 score |
| | cents per pound | |
| High | +1.63 | + .89 |
| Low | -1.40 | -2.15 |
| Average | + .66 | - .04 |
| Standard deviation | ± .93 | ± .92 |

Meat packers paid .7 cent more for 93 score, a difference which is significant at slightly below the 2½ per cent level.

DIFFERENCES IN NET PRICES PAID BY TYPES OF BUYERS

Data on net prices paid factories were analysed by particular types of buyers, classified into four groups. They were wholesalers, chain store buyers, meat packers, and other dairy companies. Prices paid by federated cooperative sales agencies are not shown because this analysis deals only with creameries that sold their own butter. When the data were sorted for buyers with two or more creameries that at the same time had bought some of each grade of butter, further subsorted by quotation used as a sales basis, and by the months, June and February, it was usually impossible to compare prices paid by all these types. But in several instances important differences were found.

The following shows the plan on which tests were applied for signifi-

Table 47. Test of Whether Net Prices Paid Creameries for 93-Score Butter by Different Types of Buyers Differ Significantly, Expressed as Deviations from the Adjusted 92-score Chicago Price Current Quotation, North Central Region, June 1949*

| Time period | Quotation used as sales basis | Meat packers | Wholesalers | Chain stores | Average three types buyers |
|-----------------|-------------------------------|--------------|-------------|--------------|----------------------------|
| cents per pound | | | | | |
| June 1949 | New York | | | | |
| | Urner-Barry | — .10 | — .28 | +1.33† | — .08 |
| June 1949 | Chicago | | | | |
| | Price Current | + .08 | + .34 | + .69† | + .41 |

* Net f.o.b. creamery prices (packaged bulk shipments) paid to creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight to creamery location.

† The test of variations within groups compared with between groups showed significance at the 1 per cent level. Further statistical tests between pairs showed that most of the difference is between chain stores and each of the others.

cance of difference among prices paid by types of buyers, by scores. Prices received for individual shipments were sorted according to quotation used as a basis for settlement for each month. The ones showing significance at the 1 per cent level are italicized.

| | Chicago Price Current basis scores | New York Urner-Barry basis scores |
|---------------------|------------------------------------|-----------------------------------|
| June 1949..... | 93-92-90 | 93-92-90 |
| February 1950 | 93-92-90 | 93-92 |

None of the others was significant even at the 10 per cent level, except Chicago 92 score.

On the 93 and 92 score, highest prices were paid by chain stores (tables 47 and 48). Wholesalers and meat packers paid within about .33 cent of each other, with occasionally one and then

the other paying the higher. One would tend to expect this with the chain store channel being more completely integrated.

The same relationship appears from the June 1949 data on prices paid for 92-score butter sold on basis of the New York quotation. These follow, with a column showing how prices paid by each type buyer compared to the average.

| | 92-score deviation from adjusted 92-score quotation cents | Buyers' price compared to average cents |
|-----------------------------|---|---|
| Meat packers | — .34 | — .13 |
| Wholesalers | — .70 | — .49 |
| Chain stores | + .51 | + .72 |
| Other dairy companies | + .14 | + .35 |
| All types buyers ... | — .21 | — .21 |

Table 48. Test of Whether Net Prices Paid Creameries for 90-score Butter by Different Types of Buyers Differ Significantly, Expressed as Deviations from the Adjusted 92-score Chicago Price Current Quotation, North Central Region, June 1949 and February 1950*

| Time period | Quotation used as sales basis | Meat packers | Wholesalers | Chain stores | Average three types buyers |
|-----------------|-------------------------------|--------------|-------------|--------------|----------------------------|
| cents per pound | | | | | |
| June 1949 | New York | | | | |
| | Urner-Barry | — 3.46 | — 3.45 | — 2.22 | — 3.37† |
| February 1950 | Chicago | | | | |
| | Price Current | + .02 | — .38 | + 1.01 | + .07† |

* Net f.o.b. creamery price (packaged bulk shipments) paid to creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight to creamery location.

† The test of variation within groups compared with between groups showed significance at the 1 per cent level. Further statistical tests between pairs showed that most of the difference is between chain stores and each of the others.

Chain stores paid nearly .75 cent above the average, followed by other dairy companies with .33 cent above. Meat packers paid less than the average but more than wholesalers during that month. Other dairy companies are also highly integrated, since many operate routes for home delivery of purchased butter along with bottled milk from a branch of the parent firm.

These data permit no generalization as to relative profitability of selling through particular types of buyer. The only conclusion that can be drawn is that during this specific period, there was, or was not, a significant difference in prices, paid by types of first receiver (with the further limitation that the study did not sample primarily for receivers as such). More research is required to show why chain stores and other dairy companies paid more for butter. Perhaps some savings in costs result from a high degree of integration, and perhaps part of these savings tend to be passed back to the creameries in form of higher prices. Perhaps chain stores and dairy companies may deal in a "different butter" with a different line of quality characteristics and of services expected from suppliers. Perhaps chain stores, for example, follow a different pricing policy for dairy departments than meat packers follow, with different policies for allocating overhead costs. In any case, information is not available to show whether the butter from a particular creamery now selling to meat packers or wholesalers would get a higher price from the more integrated types of buyer. The more efficient creamery, however, will seek out the most profitable type of buyer for its particular butter.

DIFFERENCES IN NET PRICES PAID SEVERAL FACTORIES BY A PARTICULAR BUYER

The data were analysed to show whether there were important differences in the prices paid several factories by a particular buyer. Price data for only 92-score butter were used for this test.

Among the ten buyers for whom the test was made, six paid significantly different prices among the creameries with which they dealt (table 49). The level of significance varied from 1 per cent to 5 per cent. Results are shown only for the tests that showed some statistical significance. Differences in average prices paid sellers by a buyer ranged from as little as .25 cent for one buyer to as much as 2.3 cents for another.

A difference in prices paid plants, such as the above, may indicate that the buyer attaches importance to factors not included in grades, which likewise are not explained by location of the butter factories with reference to Chicago. Data from this survey do not provide an adequate basis for isolating these extra-grade factors nor for measuring the importance of each in price determination.²³

One special case is noteworthy. One buyer (Code No. 70) paid different prices among factories for June sales on basis of the Chicago quotation, but not for February sales based on Chicago. Nor did he pay different prices among factories for June sales based on the New York quotation. Another buyer (Code No. 5) paid different prices among factories for June sales on the New York quotation, but did not for June sales on Chicago quotations.

²³ Partly as an outgrowth of this regional project, research has been undertaken by Robert Pelley, University of Wisconsin, to quantify and test the effect of so-called "extra-grade quality factors" on prices paid by wholesale butter buyers. Data to be obtained from wholesalers will provide a more adequate basis for such analysis than data from country plants, where the volume and number of shipments from sample plants to any one buyer is so small as to forbid subsorts beyond grade and location. One would expect that these extra-grade factors in prices include such characteristics as storability, regularity and size of shipments, uniformity, and differentiated flavors.

Table 49. Test of Whether a Particular Buyer Pays All Sellers the Same Net Prices for 92-Score Butter, Expressed as Deviations from the Adjusted Chicago Quotations,* North Central Region, June 1949 and February 1950

| Period | Basic quotation | Buyer (Code No.) | Plant (Code No.) | Average net prices | Range | | Standard deviation |
|-----------------|-------------------------|---------------------|---------------------|--------------------|-------|-------|--------------------|
| | | | | | Low | High | |
| cents per pound | | | | | | | |
| June 1949 | Chicago | 24† | 240 | -.01 | -1.47 | +1.16 | 1.09 |
| | Price Current | | 61 | -.11 | -.14 | -.08 | .02 |
| | | | 89 | +.35 | -.44 | +.88 | .23 |
| June 1949 | Chicago | 41‡ | 180 | +.23 | -.01 | +.28 | .03 |
| | Price Current | | 184 | -.55 | -.71 | -.40 | .17 |
| June 1949 | Chicago | 70§ | 24 | -.92 | -1.29 | -.79 | .21 |
| | Price Current | | 60 | -.50 | -.16 | -.68 | .23 |
| | | | 83 | +.03 | -.77 | +.73 | .55 |
| | | | 30 | -.66 | -.91 | -.08 | .34 |
| | | 67 | -.83 | -.80 | -.85 | .66 | |
| June 1949 | New York Urner-Barry | 5‡ | 70 | -1.64 | -2.84 | +.96 | 1.52 |
| | | | 105 | -.66 | -.82 | -.51 | .15 |
| | | | 71 | -.38 | -1.31 | +1.38 | .68 |
| | | | 106 | +.71 | -.26 | +1.38 | .43 |
| | | | 46 | -.81 | -.84 | -.79 | .02 |
| | | | 88 | -.42 | -.11 | +1.06 | .66 |
| | | | 54 | -.72 | -.82 | -.49 | .13 |
| June 1949 | New York Urner-Barry | 4§ | 79 | +.71 | +.38 | +.89 | .17 |
| | | | 57 | +.97 | +.57 | +1.32 | .27 |
| February 1950 | Chicago | 24‡ | 61 | -.12 | -.11 | -.12 | .001 |
| | Price Current | | 237 | +.64 | +.64 | +.64 | |

* Net f.o.b. creamery prices (packaged bulk shipments) paid to creameries west of Chicago that sold their own butter, expressed as deviations from the daily Chicago Price Current (Chicago wholesale price) less estimated freight to creamery location.

† Significant at the 2½ - 5 per cent level.

‡ Significant at the 1 per cent level.

§ Significant at the 5 - 10 per cent level.

INADEQUACY OF CREAMERY RECORDS

Many of the price differences examined could not be explained by the approach used in this study. An important reason is that most creameries do not have sufficiently detailed records to provide the needed information. Illustrative of this is the fact that data taken from the actual sales ledger of one seller showed variations as great as 3.75 cents in the deviations from the basic quotation of sales to one buyer under the same agreement within the same month (table 49).

Some of this variation is due to such imperfections of the research method used as the assumption that all prices

are based on date of arrival. However, this variation is greater than the difference between the highest and lowest quotations for the month.

A more important reason for the apparent irrationality of the pricing system at country points is that creamery sales records do not reflect what creameries get for particular lots of butter. Part of this inconsistency may result from the practice in which some buyers assign deductions for certain charges for several shipments to one of those shipments when payment is made. In any case, such practices, even though used by buyers of unquestionable integrity, make it impossible for the manager to determine whether or not he is receiving the proper price for a particular shipment of butter.

Summary and Conclusions

THE RESEARCH ON butter pricing and marketing at country points with which this report deals undertook to test the hypotheses (1) that central market quotations underquote the butter market and (2) that many creameries suffer a disadvantage in selling butter due to a lack of adequate market information as a basis for bargaining.

Analysis of prices received for nearly 3,300 sales of butter during selected high and low production months of the 1949-50 season showed that the commercial quotations in common use underquoted the market, in the sense that premiums were added to central market wholesale quotations in gross prices paid at country points. On the other hand, these prices netted the creamery considerably less than the quotation. Furthermore, net prices received varied in such an irrational way as to make it impossible for the average creamery manager to tell what his grade of butter should bring at his plant location.

Market News Service price ranges issued by the U. S. Department of Agriculture provide the manager with a better notion of what current central market prices actually are. However, they do not tell him what net prices he can expect, and what premiums and other conditions of sale will be necessary to achieve them. This is true because a wide range of services (and occasional extra-grade quality factors) are included in these official reports.

In addition to the tests made of the hypotheses stated above, much information was obtained which is basic to the improvement of not only quotations and price reports, but also of marketing decisions made at the creamery level. This included information on the present organization of the creamery industry, relationships between procurement practices and grades of butter manufactured, marketing practices,

sales agreements, and the bargaining position of creameries.

Much information was obtained on the variations in sales agreements that affect prices, in addition to the basic quotation. However, exploratory analyses suggest that explanations for price differences do not lie with any single provision or condition of sale, but rather with the entire combination of provisions, and especially with how the manager watches the effect of his agreement.

Little difference in volume of butter produced was found between plants receiving whole milk and those receiving all butterfat in the form of cream. However, those plants that received whole milk produced numerous other products that were not produced in the plants on a cream basis.

Higher grades of butter were made more frequently in those plants that received whole milk than in the plant that received only cream. Nevertheless, those plants that gathered cream more than three times per week made butter of as high a score as those that received only whole milk. In general, the butter produced by cooperatives tended to be of higher grade than that made by noncooperatives, although there were noticeable exceptions. This may have been true because most of the cooperatives were located in areas of specialized dairy farming. The same tendency was observed within the dairy section of Minnesota and Wisconsin where the

two types of ownership are located in homogeneous supply areas.

In the North Central dairy region only half the shipped butter was sent to the two large central markets, from which the principal quotations are issued. This half included 30 per cent which was shipped to Chicago and 20 per cent to New York City. The other half was distributed among the many lesser markets in the general trade area.

The findings suggested the relative importance of various market channels for creamery butter. Wholesaler-jobbers were first receivers for the most butter followed by central cooperative sales agencies, chain stores, meat packers, and other dairy companies.

Most butter from the region is sold under some type of sales agreement, usually verbal. Most agreements specify bases for pricing, and which parties to bear the shipping costs. Some specify the grades of butter which are to be shipped, and some provide for price differentials according to grade.

The price reports of the Market News Service of the U. S. Department of Agriculture were found to be the most important single source of information, both by percentage of plants receiving them, and by number making major use of them in evaluating prices. However, most of the agreements used commercial price reports as the basis for price determination.

Chicago Price Current quotations were used in every state in the region, and more butter was sold on the basis of these prices than any other. Urner-Barry (New York) prices were used extensively in a few areas, and actually were the basis for a slightly larger number of agreements. A few agreements were based on reports of the Market News Service.

More than two-thirds of all agreements provided for the shipper to pay the cost of shipment to the receiving point. New York was the receiving

point specified in nearly a third of all agreements, and about a fifth specified Chicago. However, in volume more butter moved to Chicago than New York.

More agreements provided for payment according to the quotation of the day of arrival than any other time. Most agreements provided for either premiums or discounts to be used with the quotation to establish the settlement price. There was a tendency for these premiums to fluctuate with the basic quotations, increasing in periods of high prices and decreasing with price declines.

On the whole, the available data did not indicate any noticeable degree of either up or down grading of butter by first receivers.

Most plants shipped butter regularly to only one receiver, although one-half of the larger plants reported more than one regular buyer. This fact led to an analysis of (1) how much shopping for price the creameries can do without making such major changes as supplying additional capital or providing additional storage space and (2) how much price shopping they should do.

The available data suggested that most creameries cannot hold butter for more favorable prices without additional capital and storage space. Nor can many accumulate carlots or sell directly to the government. However, the explanation for failure of some to shop for more favorable prices depends more on expectations of future business conditions and the need to specialize on manufacturing problems, than on short run factors.

Large creameries and sales organizations are in a more favorable position in selling butter than small ones. In spite of important differences in their choices, some large creameries appeared to follow pricing policies and selling arrangements that were little different from those of smaller ones. Leadership

for the solution of many of the problems which now are associated with country point pricing of butter must come from the larger firms.

Do creameries gain by arranging agreements with regular buyers? The analyses showed no important differences between prices received by factories using agreements and those not using them. The effect of agreements on prices received cannot be determined in a survey such as this, because many price-determining factors are present that may not be associated with the presence or absence of an agreement. The analysis suggested that sales aggressiveness was more important to price differences than were agreements. Examination of those factors thought to be associated with aggressiveness included: (a) how well the manager knows his agreement, (b) how he decides where to sell, (c) the number of price offers he gets, (d) the kinds of market information obtained and used in evaluating prices, and (e) sales promotion carried out.

Statistical attempts to measure sales aggressiveness through a survey and analysis of factors thought to be associated with aggressiveness showed little significant explanation for price differences.

In spite of this, much general descriptive material about selling practices was obtained. Analysis of these findings as well as those in other studies leads to the conclusion that nearly all creameries would profit from being more aggressive in their price behavior. It also suggests the form aggressiveness should take.

Little butter was sold direct to the government by the creameries during 1949 and early 1950. Most butter which was sold to the government was first shipped to the regular receivers of the creameries, then was sold by them to the Commodity Credit Corporation. Examination of net prices received by the

creameries on sales through intermediaries showed that they were slightly lower than would have been realized on direct sales. The cost of selling direct to the government appeared to be less than the discount creameries generally took on these transactions.

No particular condition of sale could be proved statistically to have an effect on net prices. Therefore, it appears more important to work toward a firm understanding on all the conditions of sale and their combined effect on net prices. It would also be advisable to set up in the plant office an adequate record procedure to permit verification of sales returns against the terms of the agreement, and to compare marketing expense with income from individual lots.

Two of these conditions of sale appear to be more important than others. They are the publication source and the market from which the quotation is taken. In recent years the latter has been unusually noteworthy. If other provisions of the agreement are equal, creameries would gain more by selling on New York quotations regularly during the out-of-storage period, and on Chicago during the flush production period than by selling regularly to New York. But it appears that the largest proportion of creameries west of Chicago would have gained by selling on Chicago quotations throughout the year. Provisions of the agreement other than quotations are not equal between New York and Chicago, but the added premium on New York-based sales did not make up for the additional freight. Also lower scoring butter tended to return higher net prices to creameries that sold on Chicago quotations.

More than half of the butter sold to patrons and nearly all that sold to other local buyers was priced according to the same bases as were used in the sales agreements of the respective creameries.

No relationship was found between volume of butterfat receipts, or of butter manufactured at the creamery, and the net price received for butter. Plants receiving a large amount of butterfat were often flexible in their operations, and frequently used considerable butterfat in the manufacture of products other than butter. Such plants were not considered as regular sources of butter supplies by the buyers.

Better grades of butter tended to receive higher prices than the lower grades. However, prices were not as closely related to grades at country points as in the central markets.

Some differences that were not explained by grade or distance from central market were found to exist between prices paid to creameries by a given buyer. This suggests that buyers also considered other service and quality factors. Some of these may be storability, regularity of shipments, size of shipments, uniformity among lots, and distinctive flavors. Grades probably cannot be revised to include these. Also, if these factors are found to be more important than grade, any specific price that can be issued as a quotation would necessitate continuance of the system of premiums and discounts. In any case, premiums might be used occasionally by a buyer to solicit the business of a new creamery in a rising market.

It was found that particular types of first receivers often paid significantly different prices to plants in the same

locality. This suggests that channels and services may be differentiated so that we no longer can expect the price at one stage of marketing, or for one group of marketing agents, to furnish a single effective guide for pricing at country points. More should be known about the nature and efficiency of pricing arrangements in various channels through which butter moves from first receivers to retailers and consumers.

Although selling to a regular buyer may be a good policy, the seller should inform himself as completely as possible about the channels and buyer to which his particular butter is best suited. The buyer who can best use that kind and quality of butter may be in a position to offer the highest price.

In summary, it was found that the system of butter pricing at country points, based on agreements with regular buyers on the basis of a central market quotation, results in an irrational system of net f.o.b. plant prices. Although the manager of a representative midwestern creamery can do much to market his product more advantageously, he can do little as an individual about the basic faults of the quotation. Improvements in the quotation must await research at the central market, and will call for group action through trade associations, farm organizations, and government agencies. Group action can also bring about better understanding of these quotations and their use in the marketing of butter.

