AN ANALYSIS OF DEVELOPMENTS AND ADJUSTMENTS IN THE LOWER MICHIGAN FLUID MILK PROCESSING INDUSTRY

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ABSTRACT

AN ANALYSIS OF DEVELOPMENTS AND ADJUSTMENTS
IN THE
LOWER MICHIGAN FLUID MILK PROCESSING INDUSTRY

by Roger Lee Baur

There have been dramatic changes in the market organization of the Lower Michigan fluid milk processing industry during the last five years. Many of the changes can be attributed to the marketing, institutional, and technological developments that have taken place internally and externally to the industry.

The purpose of this study was to examine a number of these developments and the processors' adjustments to them, especially in the area of marketing, that are believed to have helped change the market organization.

Specifically, the objective of this thesis was to examine the significance of selected developments in changing the market organization of the Lower Michigan fluid milk processing industry and to analyze what adjustments fluid milk processors have made and are planning to make in response to these changes.

A two-way analysis of variance test with unequal cell frequencies was utilized to test the null hypothesis stating that the marketing, institutional, and technological developments had been of equal importance in changing the market organization during the last five years, and to test for relationships between variables.

A contingency chi-square test was utilized to test respective null hypotheses stating that the adjustments have been and will be of equal importance to the fluid milk processors. The criterion of importance was the number of fluid milk processors utilizing and planning the adjustments, respectively.

On the basis of the analysis, it was concluded that the developments have not been of equal importance in changing the organization of markets served by Lower Michigan processors. The growth of supermarket chains was significantly more important than all other adjustments. Other developments of high importance were the widening of distribution areas for packaged milk, the growth of large dairy companies, and the processing of milk by food distributors.

If the number of processors that have used the adjustments is utilized as a criterion of relative importance, then it can be concluded that the adjustments have been of differential importance to Lower Michigan processors.

The chi-square test indicated a relationship between classifications of processors and the adjustments used. In general, a larger percentage of the national and multiunit, the corporate, and the medium and large processors have used the adjustments than have the singleunit, the cooperatives, partnerships, or proprietorships or the small processors.

The analysis also indicated that the adjustments will probably be of differential importance to the fluid milk processors in the next five years, if the number of processors planning their use is used as a criterion of importance. The relationships between the adjustments and the classifications described in the preceeding paragraph are also applicable to the adjustments planned in the future.

The relative importance of the adjustments in the future will not differ greatly from the relative importance that they have had during the past five years with one exception. Twenty percent of the processors interviewed plan to sell their business within five years.

The results of the study were somewhat limited by the level of measurements and the nature of the schedule.

The study shows that a continuing study of the structure, conduct and performance of the Michigan fluid milk industry is needed to keep abreast of the influence that these developments and adjustments will have on the industry. A periodical, static analysis does not fulfill this need.

This in turn implies the need for research to develop more definitive criteria of acceptable structure, conduct, and performance for the Michigan fluid milk processing industry.

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By

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CHAPTER I

INTRODUCTION

There have been dramatic alterations in the market organization of the Lower Michigan fluid milk processing industry during the last five years. Factors that may have precipitated these changes include, but are not confined to, enlargement of distribution areas, greater utilization of plastic and paper containers, increases in the amount of milk sold through stores and the growth of large dairy companies.

Many of the changes can be classified as marketing, institutional, or technological developments, either internal or external to the fluid milk processing industry. The consequence of these developments and accompanying adjustments is a complex market situation with numerous political, economic, and social facets that preclude a cursory analysis. Shifts in this situation resulting from the direct or indirect influence of these developments have affected, not only the processors, but also the producers, cooperatives, merchandisers, and consumers.

It is important to study these developments and the processors' reactions in order to prepare a solid foundation on which to base public policy decisions and recommendations for industry adjustments. Such a study may

help the economist to forecast future developments and their impact on the industry.

The purpose of this study is to examine a number of these developments and the processors' adjustments to them, especially in the area of marketing, that are believed to have helped change the market organization of the Lower Michigan fluid milk processing industry. There is no intent to examine the usual measurements of industry structure, conduct, and performance. Studies by McBride[1], Juers and McMillan[2] have dealt with various aspects of the latter.

Review of Developments

The following paragraphs lay a foundation for the study by indicating the nature of several developments that may have influenced the market organization of the Michigan fluid milk processing industry. In addition, the influence of similar developments which have occurred in other geographic areas as reported in the literature will be examined.[3]

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[1]Glynn McBride, Structural Changes in Michigan's Dairy Industry and Their Implications, Department of Agricultural Economics Preliminary Report (East Lansing: Michigan State University, 1962).

[2]Linley E. Juers and Anita McMillan, Michigan Dairy Plants-Changes in Size, Numbers and Products Produced, 1950 and 1963, Agricultural Economics Report, No. 4, (East Lansing: Michigan State University, 1965).

[3]The format for, and a large part of the content of this review is derived from Chapter II of an unpublished manuscript written by the North Central Regional Research Committee on Dairy Marketing.

Marketing Developments

The market organization of the fluid milk processing industry may have been influenced by a number of important developments that have occurred in the merchandising of fluid milk products by processors and food retailers. A brief discussion of the more important developments follows.

Changes in the structure of the food retailing industry

The major developments in the food retailing sector of the economy have been an increase in the size of individual stores as small stores are displaced by supermarkets, and the growth of large corporate food chains and buying groups. This means that milk processors face a more concentrated wholesale market.[1]

The quantity of products and services demanded and the large geographic area served by these large buying units make it difficult for the small processor to serve them and may be a factor in the attrition of small processors. However, the large volume sold by large retailers has generated intensive price and non-price competition among the processors desiring these accounts, and this competitive atmosphere affects the rest of the in-

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[1] John Moore and Robert Clodius, Market Structure and Competition in the Dairy Industry, Agricultural Experiment Station Research Bulletin 233 (Madison, Wisconsin: University of Wisconsin, 1962). p. 13.

dustry.[1]

The growth of chains and large buying groups may also affect the fluid milk industry by making it feasible for them to vertically integrate into fluid milk processing, thus competing directly with the independent processors.[2]

Changes in merchandising methods

The market organization of the fluid milk processing industry is also affected by changes in the merchandising methods for fluid dairy products.

Private labeling, either through vertical integration or contractual agreements generally reduces product, distribution, and selling costs. The resulting price differential between private labels and processors' brands may be an important factor in reducing processors' profits, in shifting milk sales from home delivery routes to retail food stores, and in the attrition of small processors and home delivery routes.[3] Baumer concludes that the role of home delivery has declined to one of a stepchild in most operations, while the spotlight is on the whole-

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[1]Sheldon Williams, "Summary and Implications", Milk Distribution Packaging Trends in the Dairy Industry, Department of Agricultural Economics Bulletin No. 13 (Urbana, Illinois: Department of Agricultural Economics, University of Illinois, 1967), p. 45.

[2]National Commission on Food Marketing, Organization and Competition in the Dairy Industry, Technical Study No. 3 (Washington, D.C.: United States Government Printing Office, 1966), p. 121.

[3]National Commission on Food Marketing, Organization and Competition in the Dairy Industry, pp. 142-147.

sale operation.[1]

A number of fluid milk processors are utilizing controlled or franchised dairy stores to develop assured outlets for their products with less reliance on wholesale accounts. With convenient locations, long hours, and low overhead, they are contributing to the changes in the market organization of the fluid milk processing industry.[2]

The growth of large national and multiunit dairy companies is another development in the merchandising of fluid milk products. The market power that these enterprises derive from horizontal, vertical, and conglomerate mergers, and from advantages in advertising and merchandising, can be used to alter the market structure. With this power, they can make the competitive situation unbearable for many processors.[3]

Institutional Developments

Modifications in the institutional framework may also influence the market organization of the fluid milk processing industry. Changes in sanitary regulations and product specifications are examples.

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[1]E. F. Baumer, "Home Delivery Revisited", Milk Distribution and Packaging Trends in the Dairy Industry, Department of Agricultural Economics Bulletin No. 13 (Urbana, Illinois: Department of Agricultural Economics, University of Illinois, 1967), p. 5.

[2]North Central Regional Committee on Dairy Marketing, NCM-38 Report (unpublished manuscript, University of Illinois, 1966), pp. 51-53.

[3]North Central Regional Committee on Dairy Marketing, NCM-38 Report, pp. 75-77.

Changes in sanitary regulations

The enforcement of sanitary regulations in Michigan was recently changed from local jurisdiction to state jurisdiction with uniform standards. This change may have affected the market structure by subjecting the local processor to more competition from outside the local market, by facilitating the widening of distribution areas, by enabling the processors to utilize the intermarket movement of milk and raw milk price differentials as competitive weapons, and by facilitating vertical integration into milk processing by food retailers.

Parry, et al., observed that sanitary ordinances have been used more extensively than any other regulation as a method of affecting the competitive situation.[1]

Changes in product, packaging, and labeling specifications

Variations in composition, packaging, and labeling specifications can operate as an effective competitive restraint.[2] Standardization of specifications over a large area can affect the market organization of the fluid milk processing industry in a manner similar to the modification of the sanitary codes. Michigan's statutory change allowing the sale of milk in gallon

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[1]S. P. Parry, et al., Institutional Arrangements Influencing the Movement of Milk in the South, Southern Cooperative Series Bulletin 104 (Knoxville, Tennessee: Tenn. Agr. Ext. Station, University of Tenn., 1965) p. 13.

[2]National Commission on Food Marketing, Organization and Competition, p. 19.

containers is an example of a change in packaging specifications. Changes in the regulations governing the sale of imitation and filled milk products could also have a substantial affect on the market structure.

Changes in the labor market

Rising wage rates, greater union bargaining power, and restrictive clauses on overtime and seasonal employment influence the market structure by inducing adjustments, especially in distribution.[1] These adaptations may include changes in driver pay plans, alterations in the services provided wholesale customers, less frequent home delivery, and greater use of distributors and vendors.

Changes in Federal milk orders

The adoption, expansion, alteration, or termination of a Federal milk marketing order can influence the relationships between firms in a particular market and firms in different markets. The impact of market order changes on the market organization of the Michigan fluid milk processing undustry is unknown.

Although there have been no major adoptions or terminations of Federal milk marketing orders in Michigan during the last five years, the several alterations that have taken place may have had some affect.

Parry, et al., indicates that Federal milk marketing

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[1]North Central Committee on Dairy Marketing, NCM-38 Report, pp. 32-35.

orders can have a substantial influence on the movement of milk.[1]

Changes in trade practice regulations

Michigan does not have a trade practice law for fluid milk products. However, the adoption of a trade practice law in Michigan could have a substantial affect on the market organization of the Michigan fluid milk processing industry. Jackson states that the major impact of adopting trade practice legislation in Wisconsin was to shift competitive methods from a non-price base to an emphasis on price, to encourage new methods of distribution, and to provide economic information.[2]

Stricter enforcement of federal trade regulations could also affect the market structure.

Changes in capital requirements

Technological innovations have increased the capital requirements for an efficient business. The inability of the small enterprise to obtain sufficient capital or to obtain it at a cost comparable to the large firms may be a factor contributing to the attrition of small processors.[3]

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[1]Parry, et al., Arrangements Influencing Movement of Milk, pp. 25-29, 39.

[2]C. L. Jackson, "Regulation of Dairy Pricing and Trade Practices in Wisconsin," Midwest Milk Marketing Conference, Proceedings of the Nineteenth Annual Meeting (St. Paul, Minnesota: University of Minnesota, 1964), p. 92.

[3]North Central Regional Committee on Dairy Marketing, NCM-38 Report, p. 36.

Technological Developments

Technological innovations in packaging, processing, distribution, and products have no doubt played a prominent role in changing the market organization of the Lower Michigan fluid milk processing industry. The major affects of these developments have been to increase the capital requirements, the optimum size of a processing plant, and the area of distribution.[1] Jarrett and French indicate that the high cost of new technology makes it difficult for processors with low volumes or limited capital to take advantage of new technology.[2]

Developments in packaging

Hammond and Cox have indicated that packaging innovations, especially the paper carton, have been major factors in changing the market organization of the fluid milk processing industry.[3] Cook also expressed this opinion.[4] The authors indicate that packaging innovations

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[1] North Central Regional Committee on Dairy Marketing, NCM-38 Report, pp. 38-39.

[2] William Jarrett and Charles French, Changes in Ownership of Indiana Fluid Milk Plants 1946-1955, Agricultural Experiment Station Bulletin 745 (Lafayette, Indiana: Purdue University, 1962), p. 7.

[3] Jerome W. Hammond and Rex W. Cox, Structural Changes in the North Dakota Dairy Industry, Agricultural Experiment Station Bulletin No. 454 (Fargo, North Dakota: North Dakota State University, 1965), p. 10.

[4] Hugh L. Cook, Paper Packaged Milk in Wisconsin - Its Part in Expanding Distribution Areas, University of Wisconsin Research Bulletin 179 (Madison, Wisconsin: University of Wisconsin, 1953), p. 1.

have affected the industry by expanding competition over larger geographic areas and by centralizing the processing facilities of multiplant firms.

Developments in processing equipment and methods

Innovations in processing equipment and methods may have altered the market structure of the Michigan fluid milk processing industry by increasing capital requirements, optimum size, specialization, and economics of scale.

Potential economics of scale were indicated in a Vermont study that showed per unit costs dropped as volume increased to 100,000 quarts per day.[1] A study by Cobia and Babb found that a decline in per unit cost extended to volumes of 50,000 quarts per day.[2]

Developments in refrigeration, storage, and transportation

Technological developments in refrigeration, storage, and transportation have affected the market organization by widening distribution areas, by facilitating the vertical integration of food retailers into fluid milk processing, by adding to the capital requirements, and

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[1] Fred Webster, et al., Economics of Size in Fluid Milk Processing Plants, Agricultural Experiment Station Bulletin 636 (Burlington, Vermont: University of Vermont, 1963), p. 9.

[2] D. W. Cobia and E. M. Babb, Determining Optimum Size Fluid Milk Processing Plants and Sales Areas, Purdue Agricultural Experiment Station Research Bulletin 778 (Lafayette, Indiana: Purdue University, 1964), p. 1.

by increasing the optimum volume of business.[1]

Developments in products

Synthesis of new dairy products and non-dairy substitutes, and the improvement of existing products affect the market organization of the fluid milk processing industry by facilitating vertical integration of food retailers into milk processing, market area expansion, specialization and product differentiation. However, many of the benefits from product development accrue to the large processors that have the resources to develop, test market, and promote new or improved products.[2]

Adjustments

In response to these developments the processors have often made adjustments, particularly in marketing, in order to remain viable in the changing fluid milk processing industry.

The adjustments can take on several forms. They are often new developments in response to the upheaval caused by the original development. Some adjustments may complement other developments and/or adjustments, while others function as a defense mechanism.

Several of these adjustments were mentioned in the

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[1]North Central Regional Committee on Dairy Marketing, NCM-38 Report, p. 49.

[2]National Commission on Food Marketing, Organization and Competition, p. 146.

discussion of changes in the labor market. Other adjustments that the processors might make include adding sideline dairy items, adding or deleting package sizes, types, or whole produce lines or, as a last resort, selling the business.

Objectives

The general objective of this thesis is to examine the significance of selected developments in changing the market organization of the Lower Michigan fluid milk processing industry and to analyze what adjustments fluid milk processors have made and are planning to make in response to these changes. More specific objectives are:

1. To determine the relative importance of selected developments in changing the market organization of the Lower Michigan fluid milk processing industry.
2. To determine the relative importance of selected adjustments, utilizing the number of Lower Michigan fluid milk processors making these adjustments during the last five years as a criterion.
3. To determine the importance of selected adjustments, utilizing the number of Lower Michigan fluid milk processors who plan to use the adjustments during the next five years as a criterion.
4. To determine whether the relative importance of the selected developments and adjustments are related to certain classifications of fluid milk

processors.

Organization of Thesis

This chapter has set forth the relevance of the study, a review of the developments influencing the direction of market organizational changes in Michigan's fluid milk processing industry, and a statement of objectives. Chapter II will be devoted to a description of the methodology used to collect and analyze the data, and a statement of the hypotheses to be considered. The analysis in Chapter III will indicate the relative importance of selected developments in changing the market organization of Michigan's fluid milk processing industry and the relationship between characteristics of the processors and the significance ascribed to these developments.

Chapter IV will examine the use of various adjustments by fluid milk processors during the last five years in adapting to changes in the market organization and the relationship between the use of these adjustments and characteristics of the processors. Chapter V will make a similar analysis of the adjustments that processors plan to make in the next five years. The summary and conclusions will be set forth in Chapter VI.

CHAPTER II

METHODOLOGY

The Survey

The primary data used in this survey were obtained through personal interviews with managers of fluid milk processing plants located in Lower Michigan. The interviews were conducted in cooperation with the North Central Regional Committee on Dairy Marketing as part of a regional project. Major objectives of the regional project were to ascertain the problems of fluid milk processors, as viewed by the managers, that have resulted from changes in the market organization of fluid milk processing industry, to study the impact of technological and institutional developments on the market organization, and to evaluate the alternative adjustments processors have made.[1]

The Sample

The plants, whose general managers were interviewed, were selected from a current list of licensed fluid milk processing plants in Lower Michigan. The list was com-

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[1]North Central Regional Committee on Dairy Marketing, Dairy Marketing Adjustment Problems in the North Central Region, Proposed Regional Research in Dairy Marketing-North Central Region (Urbana, Illinois: United States Department of Agriculture, Animal Products Branch, 1965), pp. 3-4.

piled from the records of the Dairy Division of the Michigan Department of Agriculture. The method used to select the plants was a stratified random sampling with disproportional sampling fractions. Cochran states that in simple random sampling, the selection of a sample is left to chance, and no use is made of knowledge that we might have about the population. Given such knowledge, we should be able to improve upon the simple random method by utilizing this knowledge to help us select the sample. One method is to stratify the population.[1]

The regional committee suggested that the fluid milk processors be separated into two strata. Stratum I would include plants processing over 15,000 quarts of milk per day and stratum II for plants processing less than this volume. The committee also suggested that from these strata, a disproportional sample of at least fifty percent of stratum I and at least twenty-five percent of stratum II be drawn.[2]

To facilitate the analysis of the data pertaining to this study, the fluid milk processing plants located in Lower Michigan were separated into three strata. Plants

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[1]William G. Cochran, "Design and Analysis of Sampling," in Statistical Methods by George W. Snedecor (Ames, Iowa: The Iowa State College Press, 1956), p. 492.

[2]North Central Regional Committee on Dairy Marketing, Enumerator Instructions, Survey of Milk Processors' Problems and Adjustments (Urbana, Illinois: United States Department of Agriculture, Animal Products Branch, 1967), p. 1.

utilizing less than fifteen million pounds of milk per year were considered small, plants utilizing between fifteen and fifty million pounds were classified as medium, and plants annually utilizing over fifty million pounds of raw milk were classified as large plants. The regional committee's stratum I was less inclusive than the small plant classification.

There were fifty-three fluid milk processing plants classified as small, fourteen processing plants were large, and seventeen processing plants were classified as medium in size. Tables 2-1 and 2-2 indicate some of the characteristics of the plants selected.

Table 2-1. -- Number of fluid milk plants selected by processors, Lower Michigan, 1967.

Size Stratum	Number of Plants	Plants Operated by National Dairies	Plants Operated by Multiunit Firms	Plants Operated by Single-Unit Firms	Plants Interviewed
Small	53	0	4	31	35
Medium	17	0	1	14	15
Large	14	2	3	6	11
TOTAL	84	2	8	51	61

Table 2-2. -- Number of fluid milk plants selected by size and ownership pattern, Lower Michigan, 1967.

Size Stratum	Number of Plants	Plants Owned by a Cooperative	Plants Owned by a Corporation	Plants Owned by a Partnership or Proprietorship	Plants Interviewed
Small	53	1	18	16	35
Medium	17	0	15	0	15
Large	14	3	8	0	11
TOTAL	84	4	41	16	61

The fluid milk processing plants selected were geographically representative of the fluid milk plants located in Lower Michigan and each size was representatively sampled with sixty-eight percent of the small plants, eighty-eight percent of the medium plants, and seventy-nine percent of the large plants being included in the sample.

The Interview

The personal interview was selected as the best method of obtaining the data. Pretesting of the schedule revealed a problem of getting managers to complete the schedule and it was believed that a personal interview would minimize this problem. The length of the schedule made the use of phone interviews or a mailing inadvisable.

The general manager was interviewed in almost all cases because his position provided an overall view of the situation and enabled him to consider all phases of the business. In the four cases where the general manager was unavailable, the sales manager was interviewed since a majority of the questions dealt with marketing.

The following procedures were used in arranging and conducting the interview. The person to be interviewed was called by telephone to explain the purpose of the survey and to make an appointment. The interviewer then called upon the person and conducted the interview, which lasted about three-fourths of an hour and was generally conducted in the manager's office. The interviewer usually read the questions and recorded answers.

The Schedule

The schedule used to collect the data was prepared by the Coordinator and a subcommittee of the North Central Regional Committee on Dairy Marketing for the regional committee's study of milk processors' problems and adjustments. It was designed in such a way that most questions could be answered by a numerical score or a check. Several minor revisions were made after the schedule was pretested in Iowa and Illinois. In a few cases the managers did not answer all of the questions because they did not have the information or they felt that the questions did not apply to them. Other respondents were reluctant to give specific numerical scores.

It is possible that the schedule may have introduced a bias toward answers in multiples of ten inasmuch as over sixty percent of the questions were answered in this manner. If the schedules had been illustrated in multiples of five, a greater differentiation of answers may have resulted.

The Analysis

All the schedules were edited for completeness and coded to protect the confidential nature of the data and to facilitate analysis. The data were then transferred from the schedules to machine tabulation cards. The following paragraphs indicate the hypotheses tested, the statistical methods used, and comments made by other authors regarding these methods.

The Hypotheses

The analysis was carried out by using statistical methods to test the following hypotheses against their respective null hypotheses of equal importance.

1. The marketing, institutional, and technological developments listed in the schedule have been of differential importance in changing the market organization of the Lower Michigan fluid milk processing industry.
2. The adjustments listed in the schedule have been of unequal importance to the fluid milk processors attempting to adapt to changes in the market organization of the Lower Michigan fluid milk

processing industry. The criterion of importance is the number of Lower Michigan fluid milk processors utilizing these developments during the last five years.

3. The adjustments listed in the schedule will be of unequal importance to the fluid milk processors attempting to adapt to changes in the market organization of the Lower Michigan fluid milk processing industry. The criterion of importance is the number of Lower Michigan fluid milk processors planning these adjustments during the next five years.
4. The relative importance of the developments and adjustments listed in the schedule is related to specified classifications of Lower Michigan fluid milk processors.

The Statistical Methods Used

Two-Way Analysis of Variance

The two-way analysis of variance with unequal frequencies was selected as the best method to test the first hypothesis. Garrett indicates that the value of analysis of variance in testing an experimental hypothesis is best demonstrated in those situations in which the significance of the differences among means is important.[1] Popham adds

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[1] Henry E. Garrett, Statistics in Psychology and Education (New York: David McKay Company, Inc., 1966), p. 279.

that in such an analysis, the researcher is trying to discover whether there is a relationship between a dependent variable, usually a score, and independent variables representing several groups.[1]

The capabilities of the two-way analysis of variance with unequal frequencies are ideally suited to the objectives of this study. With the two-way classification, differences in the average importance of the different developments can be tested and, at the same time, test for differences in the average importance between groups. Also, the interaction between developments and the groups can be assessed. The feature of unequal frequencies reduces the problem associated with unanswered questions on the schedule. The actual computations were made on a digital computer using a pre-programed analysis of variance routine that permitted unequal frequencies in the cells.

Assumptions

From a theoretical standpoint, the assumptions underlying the analysis of variance model must be met in order that it yield information which is accurately interpretable. One assumption is that measurements within each category or subgroup must represent random samples. Although it is often difficult to fully satisfy this condition, it is usually possible to approximate random sampling, or at least rule out the possibility that a biased

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[1]W. James Popham, Educational Statistics (New York: Harper and Row, Publishers, 1967), p. 189.

subgroup is being used to represent the population.[1] It is assumed that the random sampling with disproportional sampling fractions method approximated this condition.

Another assumption is that variances within subgroups are homogeneous, i.e., not significantly different among themselves.[2] However, experimental evidence shows that although variances in the samples may differ considerably, a valid F test is possible unless the sample is very small.[3] It was assumed that the variances in 670 observations did not invalidate the F test.

The analysis of variance test also assumes that the subgroup samples are drawn from a population that is normally distributed, or does not depart radically from this state.[4] This condition was assumed to be fulfilled.

There is growing evidence that even if significant deviations from the strict theoretical assumptions exist, the analysis of variance test is sufficiently "robust" so as to yield results that may be meaningfully interpreted.[5] It is assumed that in this study, the

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[1]Popham, Educational Statistics, p. 179.

[2]Popham, Educational Statistics, p. 180.

[3]Garrett, Statistics, p. 289.

[4]Popham, Educational Statistics, p. 180.

[5]Popham, Educational Statistics, p. 179.

deviations from the assumptions did not unduly affect the results of the analysis.

Level of Measurement

Another consideration in selecting the statistical model to be used is the level of measurement. Herrman states that when the interval scale is used as the basis for measurement, it is possible to state not only the relative magnitude between individuals, but also the absolute magnitude. Thus an interval scale is characterized by a common and constant unit of measurement which assigns a real number to all objects in the ordered set.[1]

Seigal indicates that the interval scale is the first quantitative scale in the heirarchy of measurement levels. Achievement of this level of measurement allows us to use all common parametric statistical tests. In fact, if the interval scale of measurement has been achieved and the assumptions of the statistical model have been met, the researcher should utilize parametric statistical tests.[2]

The subcommittee that prepared the schedule assumed that the importance of the developments could be measured cardinally with an interval scale utilizing one as a zero point. The assumption was accepted for this analysis.

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[1]Robert O. Herrman, "Household Socio-Economic and Demographic Characteristics as Determinants of Food Expenditure Behavior." (unpublished Ph.D. dissertation, Michigan State University, 1964), pp. 104-105.

[2]Sidney Siegal, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Company, Inc., 1956), p. 28.

However, the author believes that a method utilizing rankings may have been more appropriate.

Herrman indicates that in order to utilize the analysis of variance model, we need only place the categories under study on the nominal scale but the dependent variable must be expressed at least in the interval scale, as it is assumed to be in our case.[1]

Hartley's Method for Comparing Individual Means

The researcher often wishes to obtain more than just a simple statement, based on a significant F value, to the effect that the trial means are not equal. Ideally, he would like to know if a number of the treatments might be equivalent, or the relative ranking of the treatments.[2]

With Hartley's method for comparing individual means, the researcher can do more than test the hypothesis. Utilizing the significant difference value computed with this method, he can say with a reasonable degree of certainty which, if any, of the treatments are equal.[3] As Tukey put it, the researcher can then separate the treatments into groups without frequently separating the variables

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[1]Herrman, "Determinants of Food Expenditure Behavior," pp. 106-107.

[2]Bernard Ostle, Statistics in Research (Ames, Iowa: Iowa State University Press, 1954), p. 154.

[3]George W. Snedecor, Statistical Methods (Ames, Iowa: Iowa State College Press, 1956), p. 253.

that should stay together.[1] Computational procedures are found in appendix A.

The use of this technique made it possible to place the developments into groups that were significantly different from each other, thus indicating the relative importance of the developments contributing to the changes being studied.

Contingency Chi-square Test

Hypotheses two and three were tested by using the contingency chi-square test to determine if there was a significant difference in the number of Lower Michigan fluid milk processors that had made or were planning the individual adjustments.

The contingency test can indicate significant differences among the number of fluid milk processors in each classification making or planning the individual adjustments. However, the ordinal level of measurement prevents the subsequent use of Hartley's method to segregate the adjustments into statistically significant groups. As an alternative method of indicating the relative importance, the adjustments were ranked in descending order according to the number of Lower Michigan fluid milk processors using the selected adjustments.

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[1] John Tukey, "Comparing Individual Means in Analysis of Variance," Biometric, Vol. 1, (Washington, D.C.: American Statistical Association, 1949), p. 100.

The contingency chi-square test was also used in Chapters IV and V to determine whether there was a relationship between classifications of fluid milk processors and the number of them using and planning the selected adjustments. Edwards points out that when the observations are arranged in a contingency table, we can use the contingency chi-square to determine whether there is any relationship between the two criteria.[1]

The contingency chi-square assumes that the observations are from a random sample and are independent. It is assumed that these conditions are fulfilled.

The contingency chi-square was computed by using the following formula;

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})}{E_{ij}}$$

where O_{ij} = the observed number of cases categorized in the i^{th} row of the j^{th} column.

E_{ij} = the number of expected cases to be categorized in the i^{th} row and the j^{th} column.

$\sum_{i=1}^{r} \sum_{j=1}^{k}$ - directs one to sum over all (r) rows and all (k) columns.

To find the expected frequency for each cell (E_{ij}), multiply the two marginal total common to a particular cell and divide this product by the grand total.[2] The results were

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[1]Allen Edwards, Statistical Methods for the Behavior Sciences (New York: Reinhart and Company, 1954), p. 375.

[2]Siegel, Nonparametric Statistics, pp. 104-105.

interpreted at the 0.05 level of significance with degrees of freedom equal to (rows -1)(columns -1).

The contingency tables used to test the null hypotheses stating that the number of processors in each calssification that have used or plan the adjustments were not significantly different were designed like the one below.

	Adjustments													
	A	B	C	D	E	F	G	H	I	J	K	L	M	Total
Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	xx
Do Not Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	xx
Total	x	x	x	x	x	x	x	x	x	x	x	x	x	xx

To test the hypotheses of relationships between the various classifications and the adjustments made and planned, the contingency tables within the major classifications were combined and rearranged into contingency tables like the partial one shown on the next page. These tables were not presented because the data were contained in other tables.

The Classifications Used

The classifications used in the analysis were derived

from those used on page seventeen of the schedule as is indicated in the following paragraphs.

	Adjustments												Total
	A		B		C		D		...	M			
	+	-	+	-	+	-	+	-		+	-		
Classification I	x	x	x	x	x	x	x	x	...	x	x		xxx
Classification II	x	x	x	x	x	x	x	x	...	x	x		xxx
Total	x	x	x	x	x	x	x	x	...	x	x		xxx

+ denotes that the adjustment was made or planned
- denotes that the adjustment was not made or planned
x denotes number of processors

Type of Processor

The two national and eight multiunit processors were combined into a single group to protect the confidential nature of the data, while the remaining fifty-one processors fell into the single-unit classification.

Ownership Pattern

The processors were also classified according to the type of ownership. There were four cooperatives, sixteen partnerships or proprietorships and forty-one corporations. In Chapters IV and V, the cooperatives, partnerships, and proprietorships were combined into one group (CPPs) to protect the confidential nature of the data.

Size

The size classifications used in the analysis were different than those used to select the processors. In the selection of the processors, processors processing less than fifteen, between fifteen and fifty, and over fifty million pounds of milk per year were considered small, medium, and large processors, respectively. In the analysis, processors processing less than twelve, between twelve and forty-eight, and over forty-eight million pounds per year were classified as small, medium, and large processors, respectively.

If the processors selected had been classified according to the former criteria, there would have been thirty-five small, fifteen medium, and eleven large processors. When the processors are classified according to the method used in the analysis, there are thirty-four small processors, twelve medium, and fifteen large processors.

CHAPTER III

DEVELOPMENTS AFFECTING THE FLUID MILK PROCESSING INDUSTRY

Introduction

The objective of this chapter is to examine the relative importance of selected developments in changing the market organization of the Fluid Milk Industry in Lower Michigan and to relate the relative importance to the various classifications of processors.

The scope of this objective is limited to the consideration of the market, institutional, and technological developments in the schedule. Briefly stated, these developments are:

A. Growth of supermarket chains
B. Changes in sanitary regulations
C. Initiation, expansion or termination of a federal milk marketing order
D. Growth of large dairy companies
E. Widening of distribution areas
F. Passage of a trade-practice law
G. Processing of milk by food distributors
H. Changes in milk containers
I. Shortages in local supplies of milk

J. Milk price-wars

K. Increased sales of milk through distributors

The two-way analysis of variance with unequal frequency was used to test the null hypothesis that the marketing, institutional, and technological developments listed above have been of equal importance in changing the market organization of the Lower Michigan fluid milk processing industry against an alternative hypothesis stating that they have been of differential importance.

Each of first analysis of variance tests (AOV-I) considered the relationship between a classification of processors and the developments, excluding any influence that other classifications might have on the relationship being studied. The second analysis of variance test (AOV-II) was designed to take account of possible interdependence between the classifications and the developments. Both AOV tests, in addition to testing for significant differences among the means, also provided information regarding the significance of differences between groups within a classification and the significance of interactions.

The results of the two AOV tests are shown in Table 3-1. The discrepancy between the total degrees of freedom is accounted for by the fact that the nine blank cards representing non-responses were removed for the AOV-II test.

Hartley's method for comparing individual means was

Table 3-1. -- Analysis of variance of importance scores given to selected developments by Lower Michigan fluid milk processors, Lower Michigan, 1967.

	d.f AOV-I	d.f AOV-II	Sum of Squares AOV-I	Sum of Squares AOV-II	Mean Square AOV-I	Mean Square AOV-II	F AOV-I	F AOV-II	S AOV-I	S AOV-II
Developments		10		84,083.6		8,408.4		11.8		0.0005
AOV-I test with Firm Type	10		156,807.5		15,680.7		20.3		0.0005	
AOV-I test with Ownership Pattern	10		107,451.6		10,745.2		13.7		0.0005	
AOV-I test with Size	10		202,353.1		20,235.3		26.3		0.0005	
Type of Firm	1	1	10,906.6	11,387.6	10,906.6	11,387.6	14.1	16.0	0.0005	0.0005
Ownership Pattern	2	2	4,699.1	1,019.6	2,349.6	509.8	3.0	0.7	0.051	0.5
Size of Firm	2	2	7,814.3	1,398.0	3,907.2	699.0	5.1	1.0	0.006	0.4
Interaction										
Type of Firm and Dev.	10	10	9,266.6	7,573.6	926.7		1.2	1.1	0.3	0.4
Ownership Pattern and Dev.	20	20	14,162.5	18,912.2	708.1		0.9	1.3	0.6	0.2
Size and Dev.	20	20	22,085.4	24,074.1	1,104.3		1.4	1.7	1.0	0.03
Error		596		423,119.3		709.9				
AOV-I test with Firm Type	649		500,301.1		770.9					
AOV-I test with Ownership Pattern	638		501,924.9		786.7					
AOV-I test with Size	638		490,894.1		769.4					
Total	670[a]	661[a]	775,694.3	739,870.9						

[a]Discrepancy due to nine blank cards representing non-responses being removed for the AOV-II test.

used to locate the significant differences detected by the analysis of variances in the development means.

The Analysis

Importance of the Developments

Examination of the analysis of variance table (Table 3-1) reveals that the second analysis of variance test (AOV-II) indicated a significant difference among the average importance of the developments at less than the 0.0005 level of significance with ten degrees of freedom. The average importance that each of the eleven developments have had in changing the market organization as assessed by all of the processors is shown in Table 3-2.

Table 3-2. -- Grouping of selected developments on the basis of significant differences in importance that they have had in changing the Lower Michigan fluid milk market, by all fluid milk processors, Lower Michigan, 1967.

	All Processors	
Development	Mean	Group
A	72.4	1
G	59.4	2
E	58.4	
D	53.9	
J	48.7	
H	45.6	
B	42.3	
K	31.6	3
C	24.0	
I	10.6	4
F	6.2	
Average Mean	41.3	

The separate AOV-I tests also indicate a significant difference among the average importance of the developments in changing the market organization of the Lower Michigan fluid milk processing industry. This would indicate that the processors in each classification hold the opinion that the eleven developments have been of unequal importance in changing the market organization.

The AOV-I test using the firm type as the A affect and the developments as the B affect yielded an F value for the developments of 20.3, indicating significant differences among the means at less than the 0.0005 level with ten degrees of freedom. The average importance assigned each development by both classifications is found in Table 3-3.

Likewise, the AOV-I test using ownership pattern and the developments as main effects found a significant difference among the means at less than the 0.0005 level. The F value of 13.7 was interpreted with ten degrees of freedom. The individual means from this test are presented in Table 3-4.

The F value of 26.3, with ten degrees of freedom, indicates a significant difference among the development means at less than the 0.0005 level of significance. This F value results from an AOV-I test using size and the developments as A and B effects, respectively. The average importance assigned each development by each of the three size groups is indicated in Table 3-5.

Table 3-3. -- Grouping of selected developments on the basis of significant differences in the importance that they have had in changing Lower Michigan fluid milk markets, by type of processor, Lower Michigan, 1967.

Type of Firm					
National and Multiunit Processors			Single-Unit Processors		
Development	Mean	Group	Development	Mean	Group
G	79.4	1	A	75.1	1
E	74.4				
A	74.0		G	55.4	2
D	68.9		E	55.3	
			D	51.0	
H	54.0	2	J	49.3	
B	52.5		H	44.0	
K	50.0		B	40.3	
J	46.0				
			K	28.0	3
C	30.2	3	C	22.9	
I	19.6	4	I	8.7	4
F	17.3		F	4.2	
Average Mean	51.5			39.5	

Table 3-4. -- Grouping of selected developments on the basis of significant differences in the importance that they have had in changing Lower Michigan fluid milk markets, by ownership pattern, Lower Michigan, 1967.

Ownership Pattern								
Cooperatives			Corporations			Partnerships or Proprietorships		
Development	Mean	Group	Development	Mean	Group	Development	Mean	Group
J	79.8	1	A	70.9	1	A	77.0	1
E	77.3		G	61.8				
A	70.0		E	60.5		G	55.0	2
			D	56.0		D	49.1	
G	54.0	2	J	47.4		E	48.4	
H	53.8		H	45.9		J	44.4	
D	51.5		B	43.7		H	43.1	
						B	40.4	
K	35.3	3	K	29.4	2	K	36.3	
B	35.0		C	26.1				
C	25.2					C	18.8	3
I	24.0		I	9.8	3	I	8.9	
			F	7.4		F	4.6	
F	1.0	4						
Average Mean	46.1			41.7			38.7	

Table 3-5. -- Grouping of selected developments on the basis of significant differences in the importance that they have had in changing Lower Michigan fluid milk markets, by size of processor, Lower Michigan, 1967.

Small Firms			Medium Firms			Large Firms		
Development	Mean	Group	Development	Mean	Group	Development	Mean	Group
A	73.4	1	E	71.2	1	A	78.2	1
			A	61.7		G	76.6	
D	53.8	2	G	60.7		E	67.0	
J	51.8		D	53.5				
G	51.2		H	51.5		B	55.7	2
E	50.2		B	43.4		D	54.7	
H	40.3		J	43.2		H	53.0	
B	36.0					J	46.3	
K	32.2		C	23.8	2	K	39.5	
C	35.0		K	20.2				
			F	9.9		C	22.0	3
I	9.2	3	I	8.7		I	14.7	
F	2.7					F	11.8	
Average Mean	39.6			40.7			47.2	

All tests thus indicate a significant difference between the values representing the average importance of the developments in changing the market organization. The significant differences located in each classification by Hartley's method are indicated in the following paragraphs, in the preceding tables by the groupings, and by the tables in Appendix A.

Importance To All Processors

The use of Hartley's methods indicates that the growth

of supermarket chains (A) has been significantly more important than all other developments in changing the market organization of the Lower Michigan fluid milk processing industry during the past five years. The reader is referred to Table 3-2.

The developments in group two; G,E,D,J, H, and B, have been less important in changing the market organization than has development A. Development B (change in sanitary regulations) has been significantly less important than the processing of milk by food distributors (G) and the widening of distribution areas (E), but just as important as developments D, J, and H.

Adjustments C and K have been significantly less important than the developments listed previously, but significantly more important than F (passage of a trade-practice law) and I (local milk shortages).

Importance To National and Multiunit Processors

The national and multiunit processors do not view processing of milk by food distributors (G), widening of distribution areas (E), growth of supermarket chains (A) and the growth of large dairy companies (D) as having been significantly more important than each other in changing the market organization of the Lower Michigan fluid milk processing industry. They do believe that all of them have been very important.

Although the developments in group two (see Table 3-3) H, B, K, and J, have been significantly less important

than those in group one, there is no significant difference in importance among them.

Development C is less important than the previous developments, but is significantly more important than the last group of developments. I (local milk shortages) and F (passage of trade-practice laws).

Importance To Single-Unit Processors

The growth of supermarket chains (A) has been the most important development affecting the markets of single-unit processors. They gave it an average importance of 75.1 on a ninety-nine point scale.

Table 3-3 shows that developments G, E, D, J, H, and B (group two) have been significantly less important than A. With the exception of changes in sanitary regulations (B) being significantly less important than G or E, the developments in this group are, in the opinion of the single-unit processors, relatively equal in their effect on the Lower Michigan fluid milk processing industry.

Developments C and K, I and F, belong in separate groups with the former being less important than all preceeding developments, but significantly more important than the latter group.

Importance To Cooperative Processors

The importance the cooperative processors ascribe to the developments breaks them into four groups (see Table 3-4) with significant differences between groups but not within groups. Milk price-wars (J), widening

of distribution areas (E), and the growth of supermarket chains (A) comprise the first group in order of importance.

Developments of moderate importance in changing the markets of the cooperatives were G (processing of milk by food distributors), H (changes in milk containers), and the growth of large dairy companies (D).

The third group contain the developments of lesser importance K, B, C, and I, while development F was least important.

Importance To Corporate Processors

The corporate processors believe that all the developments in group one (see Table 3-4) have been significantly more important than the other groups, and that all in this group have not been equally important. Changes in sanitary regulations (B), changes in milk containers (H), and milk price wars (J), have been of equal importance in changing the conpetitive situation in the markets they serve, but significantly less important than adjustments E, G, and A. The growth of large dairy companies (D) has been as important as B, J, H, E, and G, but less important than A.

The widening of distribution areas (E), and the processing of milk by food distributors (G) have been as important as D (growth of large dairy companies), but D is significantly less important than A.

Development C (changes in federal milk marketing

orders) and K (increased milk sales through distributors) have been equally important, but significantly more important than F and I in the last group.

Importance To Partnerships and Proprietary Processors

The processors in the partnership and proprietorship classification also believe that the growth of supermarket chains (A) is the development that has been most important in changing the relationships in the markets they serve.

Table 3-4 indicates that the developments in group two, G, D, E, J, H, B, and K have been less important than A. However, Hartley's method for comparing individual means indicates that developments G, D, E, J, and H have been of approximately equal importance in changing the market organization. Although developments K (increased sales of milk through distributors) and B (changes in sanitary regulations) have been as important as D, E, J, and H, they are significantly less important than G (processing of milk by food distributors).

Changes in federal milk marketing orders (C) have been as important as development I (shortages in local supplies of milk), which in turn has been as important as the passage of a trade practice law (F), but Hartley's method reveals a significant difference between the F and I.

Importance To Small Processors

The growth of supermarket chains (A), according to

the small processors, has been the most important development in changing the competitive situation in the markets they serve.

Table 3-5 indicates group two is comprised of developments D, J, G, E, H, B, K, and C. Hartley's method reveals that developments D, J, G, E, and H have been about equal in their impact on the market organization. The relationship between the next three most important developments is not so clear cut.

Increased sales of milk through distributors (K) and changes in sanitary regulations (B) have been as important as the changes in milk containers (H), and although changes in federal milk marketing orders (C) has been as important as K and H, it (C) has been significantly less important than H.

Local milk shortage (I) and the passage of a state trade-practice law (F) have been equally unimportant to the small processors located in Lower Michigan.

Importance To Medium Sized Processors

The medium size processors believe that developments E, A, G, D, H, B, and J (group one) have been significantly more important than developments C, K, F, and I. (See Table 3-5) However, the relationships within group one are not so clearly defined. Developments E, A, and G have had approximately the same impact on markets served by medium-sized processors, and developments H and D have been as important as the growth of supermarket chains (A)

and the processing of fluid milk by food distributors (G), but H and D have been significantly less important than E (widening of distribution areas).

Development C has been as important as K, as have I (local shortages of milk) and F (passage of a trade-practice laws), but the results of Hartley's test indicates that I and F have not had the same influence as C.

Importance To Large Processors

The large processors indicated no significant difference in the importance between developments A, G, and E in changing the market organization during the last five years, but suggested that these developments (group one) have been significantly more important than all others (see Table 3-5).

They also indicate that developments B, D, H, and J have influenced the market organization to the same degree, and although the importance of K (increased milk sales through distributors) is comparable to J (milk price wars), it (K) is significantly less important than B, D, and H.

Developments C, I, and F, have been significantly less important than previous adjustments but are not, in the opinion of the large processors, distinguishable from each other.

Average importance of the developments for processor type classifications

Both the AOV-I and the AOV-II tests detected a signif-

icant difference between the average importance of the developments in changing the market organization for the two firm type classifications; national and multiunit processors, and the single-unit processors. The respective AOV-I and AOV-II F values of 14.1 and 16.0, each with a single degree of freedom, were both significant at less than the 0.0005 level (Table 3-1). The overall average importance of the developments in changing the market organization for the national and multiunit processors and for the single-unit processors of Lower Michigan is given in Table 3-3.

Average importance of the developments for ownership classifications

The AOV-II F value of 0.7 shown in Table 3-1 for the ownership classifications indicates a significant difference between each ownership group's assessment of the overall average importance of these developments in changing the market organization, at the 0.5 level of significance and two degrees of freedom. This level is above the selected significance level of 0.05 and the level of significance computed with the AOV-I test. It can be concluded that there is not a significant difference between the average importance of the developments to each ownership at the 0.05 level, if an analysis of variance model allowing interdependence among the variables is used. These average importance values can be found in Table 3-4.

The AOV-I test using ownership patterns as the A variables and developments as the B effect, indicates that the difference between the average importance of the developments given by each of the three ownership patterns (partnerships and proprietorships, cooperatives, and corporations) is significant at the 0.051 level. If the selected significance level of 0.050 is adhered to we must conclude, based upon the results of the AOV-I test, that the average importance of the developments to the partnerships and proprietorships, to the cooperatives, and to the corporations do not differ significantly. This is the same conclusion reached with the AOV-II test. The computed F value was 3.0 associated with two degrees of freedom.

A possible explanation of the discrepancy in the F values of the two tests is the lack of independence between ownership size, indicating that they are related. The simple correlations calculated with the AOV-II model does indicate a lack of independence between these two variables. In the AOV-I test most of the affect of both variables was incorporated in the ownership variable and thus indicating a significant difference between the groups. The AOV-II attempted to separate effects of ownership and size, but was not entirely successful because of the lack of independence between the two variables.

Average importance of the developments for size classifications

There is not a significant difference between the

average importance of the developments that have changed the market organization for the small, medium, and large processors located in Lower Michigan. This statement is based upon an AOV-II F value of 1.0 associated with two degrees of freedom, indicating that the differences are significant at the 0.4 level, but not at the selected significance level of 0.05.

In contrast, the AOV-I test using the various size of the processors as variables and the developments as the other variables found a significant difference between the average importance of the developments for the processors in each size group. The F value of 5.1 evaluated with two degrees of freedom, indicates that the difference is significant at the 0.006 level. The average importance of the developments to each size group is given in Table 3-5.

The reason for the discrepancy in the F values of the two tests is the relationship between the two variables discussed in the previous section. If there is a lack of independence between ownership and size, it is reasonable to believe that the reverse is also true. Thus when the AOV-I test was used, most of the effect of the two variables were combined into the size variable. The AOV-II test attempted to separate the affects of size and ownership, but was not entirely successful because of the lack of independence between the two variables.

Interaction

Between Type of Processor and the Developments

Examination of the analysis of variance Table 3-1 shows that there is no significant interaction between the type of firm and the developments when an analysis of variance model that considers interdependence, such as the AOV-II test, is utilized. The computed F value of 1.1 evaluated with one degree of freedom, indicates significance at the 0.4 level which is above the selected significance level of 0.05.

A similar statement can be made from the results of the AOV-I test that used the firm types and the developments as variables. The F value of 1.2 signifies that the interaction is not significant at the 0.05 level.

Between Ownership Pattern and the Developments

It can be concluded, on the basis of both AOV-II and AOV-I tests containing the ownership and development variables, that there is no significant interaction between the ownership variables and the development variables. The F values of 0.9 (AOV-I) and 1.3 (AOV-II), both interpreted with twenty degrees of freedom, indicates no significant difference at the 0.05 level.

Between Size of Processor and the Developments

There is a significant interaction between the size of the processor and the developments according to the AOV-II test. The F value of 1.7 with twenty degrees of freedom, indicates that the interaction is significant

at the 0.05 level.

In contrast, the AOV-I test using the size groups and the developments as variables detected no significant interaction at the 0.05 level of significance. It did however, detect a significant interaction at the 1.0 level of significance.

Summary

On the basis of this analysis, it can be concluded that the processor believe that the developments have not been equally important in changing the competitive situation in markets served by Lower Michigan fluid milk processors. The differences in the average importance of all the developments for each group of classifications were not significant except for the type of firms when a model allowing interdependence among the classifications was used. The only significant interaction detected was between the size of the processors and the developments.

CHAPTER IV

ADJUSTMENTS MADE BY FLUID MILK PROCESSORS

The objective of this chapter is to determine the relative importance of certain adjustments used by Lower Michigan fluid milk processors during the last five years. The relationship between the adjustments and classifications of processors will be considered.

The analysis presented in this chapter is limited to a discussion of the adjustments listed in the schedule which include:

A. Sale of business
B. Home delivery on a reduced service basis
C. Fewer types and sizes of packages
D. Plant consolidations and mergers
E. Establishment of franchised dairy stores
F. Addition of sideline dairy items
G. Becoming a distributor
H. Intensifying promotion
I. Establishing gas station outlets or outdoor dispensers
J. Negotiating labor contracts better suited to wholesale distribution
K. Increasing the use of distributors
L. Diversifying into non-dairy operations

M. Increasing the number of package sizes and types

To accomplish this objective, the contingency chi-square was used to test null hypotheses against alternative hypotheses stating that some of the selected adjustments have been used by more fluid milk processors during the last five years than have other adjustments. Acceptance of the alternative hypotheses would indicate that some of the adjustments may have been more important than others, with the number of processors using the adjustments being accepted as a criterion. The contingency chi-square was also used to test for relationships between the adjustments used and the classifications of processors.

Aggregate Analysis

Table 4-1. -- Number of processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	1	35	18	22	11	31	6	34	6	14	17	21	34
Have Not Used	60	26	43	39	50	30	55	27	55	47	44	40	27
Percent Used	2	58	30	36	18	51	10	56	10	23	28	34	56
Ranking	13	1	7	5	10	4	11	2	12	9	8	6	3

Chi-square, with twelve degrees of freedom = 122.9

The chi-square value of 122.9 with twelve degrees of freedom can be interpreted to mean that there is a significant difference among the number of fluid milk processors that have used each adjustment during the last five years. This signifies that the adjustments have been of unequal importance to the processors in their attempts to adapt to changes in the market organization of the Lower Michigan fluid milk processing industry.

A possible explanation of the differential is that minor adjustments involving shorter run decisions such as B, C, F, G, H, I, J, K, L, and M may have been used by more Lower Michigan processors than have the major adjustments involving long run decisions such as A, D, E, and G.

Information contained in Table 4-1 indicates that this supposition is tenable. The four most important adjustments; home delivery on a reduced service basis (B), intensification of promotion (H), wider line of package sizes and types (M), and the addition of sideline dairy items (F), all minor adjustments, have been used by over fifty percent of the fluid milk processors during the past five years.

The fifth most important adjustment, plant consolidation (D), was considered a major adjustment. The other three major adjustments, E (establishment of franchised dairy stores), G (becoming a distributor), and

A (sale of the business) were made by eighteen, ten, and two percent of the processors, giving them relative rankings of ten, eleven, and thirteen, respectively.

The other minor adjustments L, C, K, J, and I have been of moderate importance to the processors. The number of processors using these adjustments gives them a relative ranking of six through nine, and twelve.

On the average, each processor has used four of the thirteen adjustments during the last five years. Some adjustments have been used more often by certain classification of processors as is shown in the following section.

Analysis by Processor Type Classification

Table 4-2. -- Number of national and multiunit processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	0	8	5	7	3	9	0	7	3	6	5	5	7
Have Not Used	10	2	5	3	7	1	10	3	7	7	5	5	3
Percent Used	0	80	50	70	30	90	0	70	30	60	50	50	70
Ranking	12	2	7	3	10	1	13	4	11	6	8	9	5

Chi-square, with twelve degrees of freedom = 38.4

The adjustments listed in the schedule have been

of unequal importance to the national and multiunit processors that were adapting to changes in the market organization of the Lower Michigan fluid milk processing industry. This conclusion is predicated upon a chi-square value of 38.4, with twelve degrees of freedom. This value rejects the null hypothesis stating that an equal number of the national and multiunit processors have used each of the adjustments during the last five years.

If the number of processors using the adjustments is an indication of their relative importance, then the adjustments should be listed in descending order as follows; F, B, D, H, M, J, C, K, L, E, I, A, and G.[1]

Table 4-3. -- Number of single-unit processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	1	27	13	15	8	22	6	27	3	8	12	16	27
Have Not Used	50	24	38	36	43	29	45	24	48	43	39	35	24
Percent Used	2	53	26	29	16	43	27	53	6	16	24	31	53
Ranking	13	1	7	6	9	4	11	2	12	10	8	5	3

Chi-square, with twelve degrees of freedom = 98.1

[1] In all rankings contained in this chapter, adjustments made by an equal number of processors were ranked alphabetically.

It can be said, based upon a chi-square value of 98.1, with twelve degrees of freedom, that there is a significant difference among the number of single-unit processors that have used adjustments and that some of the adjustments may have been more important to them in the last five years than other adjustments.

The number of single-unit processors using the adjustments indicates that home delivery on a reduced service basis (B), intensification of promotion (H), and the addition of package size and types (M) have been the most important for them. The other adjustments in descending order of importance are F, L, D, C, K, E, J, G, I, and A.

The contingency chi-square value of 41.8, interpreted with twenty-five degrees of freedom, indicates that there is a relationship between the type of processor and the adjustments. A contingency coefficient of 0.2 indicates the strength of the relationship on an index of 0.0 to approximately 1.0 with the former representing no relationship. The number of processors using the adjustments was converted to percentages to facilitate interclassificational comparisons.

It is reasonable to expect that a greater percentage of the national and multiunit processors have diversified into non-dairy operations (L), increased the use of distributors (K), and negotiated contracts better suited to wholesale distribution (J). Examination of

Tables 4-2 and 4-3 reveal that a greater percentage of the national and multiunit processors as compared to the single-unit processors have, in fact, used these adjustments.

A greater percentage of the single-unit processors probably have used adjustments A, E, G, and I, during the last five years as compared to the national and multiunit processors. Tables 4-2 and 4-3 shows that this is not entirely true. Although a greater percentage of the single-unit processors have used adjustment A (selling the business) and G (becoming a distributor), the percentage of single-unit processors that have utilized adjustments E (establishment of gas station outlets or outdoor dispensers) is smaller than the percentage of national and multiunit processors using them.

The remaining adjustments B, C, D, F, H, and M have all been used by higher percentage of the national and multiunit processors.

Analysis by Ownership Classifications

The chi-square value of 81.9 with twelve degrees of freedom makes it necessary to reject the null hypothesis stating that an equal number of corporate processors have made use of each adjustment. Thus, some of the adjustments have been used by more corporate processors than have others, and if this is accepted as a criterion, the importance of the adjustments is as follows; F, H, B, M, L, D, K, C, J, E, I, G, and A.

Table 4-4. -- Number of corporate processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	1	22	13	17	9	23	2	23	5	11	14	19	22
Have Not Used	40	19	28	24	32	18	39	18	36	30	27	22	19
Percent Used	2	54	31	42	22	56	5	56	12	27	34	46	54
Ranking	13	3	8	6	10	1	12	2	11	9	7	5	4

Chi-square, with twelve degrees of freedom = 81.9

Table 4-5. -- Number of cooperatives, partnerships, and proprietorships combined that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	0	13	5	5	2	8	9	11	1	3	3	2	12
Have Not Used	20	7	15	15	18	12	16	9	19	17	17	18	8
Percent Used	0	65	25	25	10	40	20	55	5	15	15	10	60
Ranking	13	1	5	6	10	4	7	3	12	8	9	11	2

Chi-square, with twelve degrees of freedom = 57.6

A similar statement can be made for the classifications containing the cooperatives, partnerships, and proprietorships. Since the chi-square value of 57.6 indicates that there is a significant difference among

the number of processors in this classification making the individual adjustments, it can be assumed that the cooperatives, the partnerships, and the proprietorships (CPPs) do not regard the adjustments as having been of equal importance. The relative importance that they appear to have had is indicated by the following ranking; B, M, H, F, C, D, G, J, K, E, L, I, and A.

There is a relationship between the ownership pattern and the adjustments. This statement is based upon a contingency chi-square value of 53.4 with twenty-five degrees of freedom. The number of processors making the adjustments were converted to percentages to facilitate interclassificational comparisons.

It is possible that a greater percentage of the CPPs have sold their business (A), have established franchised dairy stores (E), have become distributors (G), and have established gas station outlets (I), compared to the corporate processors. Examination of Tables 4-4 and 4-5 show that this relationship is true in the case of adjustments A. The other adjustments; G, E, and I, were made by a larger percentage of the corporate processors.

It is probable that a greater percentage of the corporate processors have used adjustment D (plant consolidation and mergers), J (labor contracts better suited to wholesale distribution), K (increased use of distributors), and L (diversification into non-dairy operations)

in comparison to the percentage of CPPs using the same adjustments. The percentages presented in Tables 4-4 and 4-5 confirms our expectations.

Adjustment B (home delivery on a reduced service basis) and M (increasing the number of package sizes and types) have been made by a larger percentage of the CPPs while a larger percentage of the corporate processors have used adjustment C (fewer types and sizes of packages) and F (addition of sideline dairy items). There is only one percentage point difference between the classifications in regard to adjustment H (intensification of promotion).

Analysis by Size Classifications

Table 4-6. -- Number of small processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	1	18	7	7	7	14	6	18	2	3	5	10	17
Have Not Used	33	16	27	27	27	20	28	16	32	31	29	24	17
Percent Used	3	53	21	21	21	41	18	53	6	9	15	29	50
Ranking	13	1	6	7	8	4	9	2	12	11	10	5	3

Chi-square, with twelve degrees of freedom = 66.9

The null hypothesis stating that an equal number of small processors have used each of the adjustments

during the last five years was rejected on the basis of a chi-square value of 66.9 with twelve degrees of freedom.

It can be concluded that processors in the small classification think that some of the adjustments have been more important than others in the last five years. The relative importance of the adjustments, based upon the number of processors that have made them, is indicated by the following ranking; B, H, M, F, L, C, D, E, G, K, J, I, and A.

The chi-square value of 35.2, with twelve degrees of freedom indicates that the null hypothesis stating that the adjustments listed in the schedule have been made by an equal number of medium sized processors during the

Table 4-7. -- Number of medium sized processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	0	5	3	6	1	8	0	7	2	4	6	5	8
Have Not Used	12	7	9	6	11	4	12	5	10	8	6	7	4
Percent Used	0	42	25	50	8	67	0	58	17	33	50	42	67
Ranking	12	6	9	4	11	1	13	3	10	8	8	7	2

Chi-square, with twelve degrees of freedom = 35.2

last five years should be rejected. This would indicate that some of the adjustments may have been more

important than others, if the number of medium sized processors that have used the adjustments is utilized as a criterion. Using this criterion, the relative importance of the adjustments to the medium size processors is indicated by the following list; F, M, H, D, K, B, L, J, C, I, E, A, and G.

The number of large processors that have used each adjustment during the last five years is also significantly different. A chi-square value of 47.9 makes it necessary to reject the null hypothesis indicating that the alternative hypothesis is tenable and that the adjustments have not been of equal value to the large processors. The following list of adjustments; B, D, F, H, M, C, J, K, L, E, I, A, and G, indicates their relative importance if the number of large processors that have used them is utilized as an index.

Table 4-8. -- Number of large processors that have and have not used selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Have Used	0	12	8	9	3	9	0	9	2	7	6	6	9
Have Not Used	15	3	7	6	12	6	15	6	13	8	9	9	6
Percent Used	0	80	53	60	20	60	0	60	13	47	40	40	60
Ranking	0	1	6	2	10	3	13	4	11	7	8	9	5

Chi-square, with twelve degrees of freedom 47.9

There is a relationship between the size of the processors and the adjustments used. This statement is based upon a contingency chi-square value of 48.1 with twenty-five degrees of freedom.

A larger percent of the small processors have used adjustments A (sale of business), E (establishment of franchised dairy stores), G (becoming a distributor), and I (establishment of gas station outlets or outdoor dispensers) than have the medium or large processors. Examination of the size classifications in Tables 4-6, 4-7 and 4-8 show that this statement is true for adjustments A, E, and G, but not for adjustment I.

There is no basis for distinguishing between medium and large sized processors in regard to which group has made greater use of a given adjustment. However, it is reasonable to expect that a greater percentage of both classifications have negotiated labor contracts better suited to wholesale distribution (adjustment J), increased the use of distributors, (adjustment K), and have diversified into non-dairy operations (adjustment L) during the last five years, when compared to the percentage of small processors making the same adjustments. Tables 4-6, 4-7 and 4-8 indicate that our expectation is fulfilled.

Adjustments C, D, and H (fewer types and sizes of packages, plant consolidations and mergers, and intensification of promotion, respectively) were used by a

larger percentage of the medium sized processors when compared to the percentage of small processors using them, but they were used by a still larger percentage of the large processors.

Adjustments F and M were used by a larger percentage of the medium sized processors when compared to the other two classifications, but when a comparison is made between the large and small processors, a greater percentage of the large processors had used them during the last five years.

Adjustment B (home delivery on a reduced service basis) was used by eighty percent of the large processors, and fifty-three percent of the small processors but used by only forty-two percent of the medium sized processors.

Summary

In every classification, there was a significant difference between the number of processors that have used the individual adjustments. If the number of processors that have used the adjustments is accepted as a criterion of relative importance, then it can be concluded that the adjustments have been of differential importance to Lower Michigan fluid milk processors in each classification. The relative importance was indicated by ranking the adjustments, but any further breakdown into groups is left to the discretion of the reader.

The contingency chi-square tests indicated that there was a relationship between the three types of classifications and the adjustments used. In general, a larger percentage of the national and multiunit processors, of the corporate processors, and of the medium and large sized processors have used each of the adjustments than have the single-unit processors, the cooperatives, partnerships and proprietorship processors combined, or the small processors, respectively.

CHAPTER V

ADJUSTMENTS PLANNED BY FLUID MILK PROCESSORS

This chapter will examine the expected importance of adjustments which the fluid milk processors of Lower Michigan plan during the next five years. It will also examine the possible relationship between classifications of fluid milk processors and the expected use of these adjustments.

The adjustments considered in this chapter are identical to those in the preceeding chapter. For a review of them, the reader is referred to page 49. The same statistical procedures were used to test alternative hypotheses stating that in the next five years, the different adjustments will be planned by an unequal number of Lower Michigan fluid milk processors in each classification against null hypotheses of use by an equal number of processors. Acceptance of these alternative hypotheses would indicate that some adjustments will be considered relatively more important than others, if the number of processors planning them is utilized as a criterion. Hypotheses indicating a relationship between the classifications and the planned use were also tested.

Aggregate Analysis

The chi-square value of 75.0 with twelve degrees of freedom shows a significant difference among the number of fluid milk processors planning the different adjustments, thus rejecting the null hypothesis and signifying that the adjustments may be of differential importance in the next five years.[1]

A possible explanation of the differential is that the adjustments, such as A (sale of the business), D (plant consolidation and mergers), G (becoming a distributor), and E (establishment of franchised dairy stores), will be planned by fewer processors than will be adjustments such as B, C, F, H, I, J, K, L, and M. Table 5-1 supports this supposition, but does not provide conclusive evidence.

Table 5-1. -- Number of processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	11	23	17	13	17	35	4	30	8	15	16	28	23
Do Not Plan	50	38	44	48	44	26	57	31	53	46	45	33	38
Percent Plan	18	38	28	21	28	57	7	49	13	25	26	46	38
Ranking	11	4	6	10	7	1	13	2	12	9	8	3	5

Chi-square, with twelve degrees of freedom = 75.0

[1] All chi-square values in this chapter were interpreted at the 0.05 level of significance.

The reader will note that the three adjustments which the largest number of processors intend to utilize in the next five years; F, H, and L in descending order, (addition of sideline dairy items, intensification of promotion, and diversification into non-dairy operations, respectively) are relatively minor adjustments. Adjustments ranked four through six, eight and nine (B, M, C, K, and J, also minor adjustments) are planned by thirty-eight, thirty-eight, twenty-eight, twenty-six, and twenty-five percent of the processors, respectively.[1]

Analysis by Processor Type Classifications

Table 5-2. -- Number of national and multiunit processors that plan and do not plan to make selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	0	5	6	7	6	9	0	8	5	7	7	8	6
Do Not Plan	10	5	4	3	4	1	10	2	5	3	3	2	4
Percent Plan	0	50	60	70	60	90	0	80	50	70	70	80	80
Ranking	12	10	7	4	8	1	13	2	11	5	6	3	9

Chi-square, with twelve degrees of freedom = 37.8

The chi-square value of 37.8 with twelve degrees of freedom for the national and multiunit classification indicates a significant difference among the number of national and multiunit processors located in Lower Michigan planning the separate adjustments, and that some

[1] In all ranking contained in this chapter, adjustments planned by an equal number of processors were ranked in alphabetical order.

of these adjustments may be more important to them in the coming five years than other adjustments.

The following list indicates the national and multi-unit processors' assessment of the relative importance that the adjustments might have in the process or adapting to changes in the market organization. Adjustment F is planned by the largest number, with the other adustments in descending order being H, L, D, J, K, C, E, M, B, I, A, and G.

Table 5-3. -- Number of single-unit processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	11	18	11	6	11	26	4	22	3	8	9	20	17
Do Not Plan	40	33	40	45	40	25	47	29	48	43	42	31	34
Percent Plan	22	35	22	12	22	51	8	43	6	16	18	39	33
Ranking	6	4	7	11	8	1	12	2	13	10	9	3	5

Chi-square, with twelve degrees of freedom = 65.0

The differences in the number of single-unit processors planning the individual adjustments is also significant, signifying that some of the adjustments are expected to be more important to the single-unit processors than other adjustments in the next five years. This conclusion is based upon a chi-square value of 65.0 with twelve degrees of freedom, which makes it necessary to

reject the null hypothesis of use by an equal number of single-unit processors.

The expected importance that the single-unit processors attached to these adjustments is indicated by the following list of adjustments in descending order by the number of single-unit processors planning them; F, H, L, B, M, A, C, E, K, J, D, G, and I.

The chi-square value of 92.7 with twenty-five degrees of freedom indicates that there is a relationship between the adjustments and the type of processor. The number of processors planning each adjustment was converted to a percentage to facilitate inter-group comparisons. The contingency coefficient of 0.3, relative a minimum value of 0.0 and a maximum value approaching 1.0, indicates the strength of the relationship.

Previous information gives us reason to believe that a larger percentage of the single-unit processors would plan to sell their business, establish franchised stores, establish gas station outlets, or become distributors (adjustments A, E, I, and C) than would the national and multiunit processors. However, a greater percentage of the latter might be expected to make adjustments D, J, K, and L (plant consolidations and mergers, increased use of distributors, negotiating labor contracts better suited to wholesale distribution, increase use of distributors, and diversification into non-dairy operations, respectively). There is no in-

dication whether a greater percentage of the national and multiunit processors or the single-unit processors plan to use adjustments B, C, F, and M.

Examination of Tables 5-2 and 5-3 reveals that the first proposition is supported in only two cases. A larger percentage of the single-unit processors plan to sell their business (A) and become distributors (G), but contrary to our expectations a greater percentage of the national and multiunit processors plan adjustments E and I.

Compared to the single-unit processors, a larger percentage of the national and multiunit processors, do in fact, plan adjustments D, J, K, and L. This substantiates the second supposition.

Ninety percent of the national and multiunit processors plan to add sideline dairy items (F) within five years. This adjustment will also be important to the single-unit processors because over fifty percent of them plan to use it. Addition of package sizes and types (M) is planned by thirty-three percent of the single-unit processors, compared to sixty percent of the national and multiunit processors. Compared to the single-unit processors, a greater percentage of the national and multiunit processors intend to use adjustments B, C, and H during the next five years.

On the average, each national and multiunit processor plans to use twice as many adjustments during

the next five years as do the single-unit processors. Thus it appears that the national and multiunit processors will be more active in adjusting to changes in the market organization of the Lower Michigan fluid milk processing industry.

Analysis by Ownership Classifications

The adjustments listed in the schedule might be of unequal importance to the corporate processors planning ways of adapting to market organization changes in the Lower Michigan fluid milk processing industry. This judgment is based upon a chi-square value of 54.7, with twelve degrees of freedom, which allows us to reject the null hypothesis stating that an equal number of corporate processors intend to use each of the adjustments.

Table 5-4. -- Number of corporate processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	6	17	14	9	13	26	3	19	7	13	11	21	15
Do Not Plan	35	24	27	32	28	15	38	22	39	28	30	20	26
Percent Plan	15	42	34	22	32	63	7	46	17	32	27	51	37
Ranking	12	4	6	10	7	1	13	3	11	8	9	2	5

Chi-square, with twelve degrees of freedom = 54.7

The relative ranking of the adjustments which fol-

lows is based upon the number of corporate processors expecting to make the respective adjustments. The adjustments in descending order are F, L, H, B, M, C, E, J, K, D, I, A, and G.

The null hypothesis stating that during the next five years an equal number of cooperatives, partnerships, and proprietorships, collectively plan to use each of the adjustments is rejected on the basis of a chi-square value of 29.8, with twelve degrees of freedom.

A possible conclusion is that some adjustments might be more important to the cooperatives, partnerships, and proprietorships (CPPs) during the next five years than other adjustments.

Table 5-5. -- Number of cooperatives, partnerships, and proprietary processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	5	6	3	4	4	9	1	11	1	2	5	7	8
Do Not Plan	15	14	17	16	16	11	19	9	19	18	15	13	12
Percent Plan	25	30	15	20	20	45	5	55	5	10	25	35	40
Ranking	6	5	10	8	9	2	12	1	13	11	7	4	3

Chi-square, with twelve degrees of freedom = 29.8

If the number of CPPs planning the adjustments is accepted as a criterion of usefulness, then adjustment

H will be the most important. The other adjustments in descending order of importance are H, F, M, L, B, A, K, D, E, C, J, G, and I.

A computed chi-square value of 14.2 with twenty-five degrees of freedom can be interpreted to mean that there is not a significant relationship between the ownership pattern and the respective adjustments. However, a comparison between the two classifications of ownership based upon the percentage of Lower Michigan fluid milk processors will be made.

Data in Tables 5-4 and 5-5 indicates that when adjustments A (sale of the business), F (addition of sideline dairy items), and G (becoming a distributor) are considered, only adjustment A was planned by a larger percentage of the cooperatives, partnerships, and proprietorships as compared to the corporate processors. A greater percentage of the corporate processors plan adjustments D, J, and K (plant consolidations and merger, negotiating labor contracts better suited to wholesale distribution, and increasing the use of distributors) than do the CPPs.

Adjustments L, B, C, and I are planned by fifty-one, forty-two, thirty-four, and seventeen percent of the corporations as compared to thirty-five, thirty, fifteen, and five percent of the cooperatives, partnerships, and proprietorships, collectively.

Analysis by Size Classifications

It can be said, based upon a chi-square value of 46.2, with twelve degrees of freedom, that there is a significant difference among the number of small processors planning the various adjustments, and that some adjustments may be of greater importance than others to the small processor located in Lower Michigan in the next five years.

Based upon the number of small processors planning the adjustments, the following list indicates the relative importance that these adjustments are expected to have; F, H, B, L, A, M, E, C, K, G, J, D, and I. See Table 5-6.

A similar statement can be made about the number of medium sized processors planning the adjustments. The chi-square value of 27.8 with twelve degrees of freedome makes it necessary to reject the null hypothesis stating that an equal number of medium sized processors

Table 5-6. -- Number of small processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	10	12	6	2	8	16	3	15	2	3	5	11	10
Do Not Plan	24	22	28	32	26	18	31	19	32	31	29	23	24
Percent Plan	29	35	18	6	29	47	9	44	6	9	15	32	29
Ranking	5	3	8	12	7	1	10	2	13	11	9	4	6

Chi-square, with twelve degrees of freedom = 46.2

intend to use the respective adjustments during the next five years. Rejection of the null hypothesis leads us to believe that some of the adjustments will be more important than others. See Table 5-7.

The ranking of the adjustments F, L, M, B, H, K, J, C, D, E, I, A, and G indicates the relative importance that these adjustments might have to medium sized processors during the next five years. The ranking in descending order of importance, is based upon the number of medium sized processors planning the adjustments.

Table 5-7. -- Number of medium sized processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	1	5	3	3	3	9	1	5	2	4	5	8	7
Do Not Plan	11	7	9	9	9	3	11	7	10	8	7	4	5
Percent Plan	8	42	25	25	25	75	8	42	17	33	42	67	58
Ranking	2	4	8	9	10	1	13	5	11	7	6	2	3

Chi-square, with twelve degrees of freedom = 27.8

The large processors also believe that some of the adjustments may be more important to them than others. Using the number of large processors planning these adjustments as an index, the relative importance of the adjustments is indicated by the following ranking; F, H, L, C, D, J, B, E, K, M, I, A, and G. This statement is based upon a chi-square value of 35.2 with twelve degrees of freedom, for the large processor classification.

Table 5-8. -- Number of large processors that plan and do not plan selected adjustments, Lower Michigan, 1967.

	Adjustments												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Plan	0	6	8	8	6	10	0	10	4	8	6	9	6
Do Not Plan	15	9	7	7	9	5	15	5	11	7	9	6	9
Percent Plan	0	40	53	53	40	67	0	67	27	53	40	60	40
Ranking	12	7	4	5	8	1	13	2	11	6	9	3	10

Chi-square, with twelve degrees of freedom = 35.2

A chi-square value of 66.8 with twenty-five degrees of freedom indicate a relationship between the size classification and the adjustments. The following paragraphs explore this relationship, using the percentage of processors planning the individual adjustments as a basis of comparison.

It is reasonable to expect that a larger percentage of the small processors plan to use adjustment A (selling the business), E (establishment of franchised dairy stores), G (becoming a distributor), and I (establishment of gas station outlets and outdoor dispensers) as compared to the other classifications. There is no basis for differentiating between medium sized and large processors in regard to the percentage of the two classifications planning an adjustment, but it is expected that a larger percentage of the processors in these two groups plan adjustments J, K, and L as compared to the small processors.

It is uncertain whether the other adjustments will be made by a larger percentage of the small processors or by processors in other classifications.

A considerably larger percentage of the small processors plan to sell their business (A) as compared to other groups, and although a larger percentage of small processors also plan adjustment C, the differences between the percentage of each group of firms are smaller. Contrary to our expectations, a greater percentage of both the medium sized and large processors plan to use adjustments E and I.

As indicated in Tables 5-6, 5-7 and 5-8, a substantially greater percentage of the medium and large processors plan to negotiate labor contracts better suited to wholesale distribution (J), to increase the use of distributors (K), and to diversify into non-dairy operations (L).

The percentage of small processors planning adjustments B, F, and M (home delivery on a reduced service basis, addition of sideline dairy items and increasing the number of package sizes and types, respectively) is less than the percentage of either the medium or large processors planning these adjustmenets, but the percentage of medium processors is greater than the percentage of large processors planning them.

The opposite is true for adjustment C (fewer types and sizes of packages) and D (plant consolidations and mergers). The percentages of large processors planning

the adjustments is greater than the percentages of medium sized processors, which are in turn, both greater than the percentages of small processors planning the adjustments.

Adjustment H is somewhat unique in that the percent of large processors intensifying promotion is greater than either of the other classifications, but the percentage of small processors planning the adjustment is, by a very small margin, larger than the percentage of the medium sized processors planning the same adjustment.

Summary

In all classifications, there was a significant difference among the number of Lower Michigan fluid milk processors planning each adjustment. This would indicate that the adjustments will probably be of differential importance to fluid milk processors in each classification during the next five years. The relative importance of these developments was indicated by ranking them according to the number of processors planning them in the next five years. It is left to the reader's discretion to separate the adjustments into groups that are alike within, but different from other groups.

Analysis by chi-square revealed that there was a significant relationship between the type of processors and the size of the processors and the adjustments, but not between the ownership pattern of the processors and the adjustments. In general, a greater percentage of

the national and multiunit processors, of the medium sized processors, and of the large processors plan to use these adjustments during the next five years than do the single-unit processors and the small processors, respectively.

CHAPTER VI

SUMMARY AND IMPLICATIONS

Concerning the Developments

It can be concluded that Lower Michigan fluid milk processors believe that the developments considered in this study have played a part in changing the market organization of the Lower Michigan fluid milk processing industry. It may also be concluded that the developments have not been of equal importance in bringing about the changes.

They believe that the growth of supermarket chains (A) was significantly more important that G (the processing of milk by food distributors), E(widening of distribution areas), D (growth of large dairy companies), J (Milk price wars), H (changes in milk containers) and B (changes in sanitary regulations). Increased sales of milk through distributors (K) and the initiation, expansion, or termination of a Federal milk order (C) have been significantly less important than the previous adjustments, but significantly more important than I (shortages in local supplies of milk) and F (passage of a state trade practice law).

It is the processors' opinion that the growth of

supermarket chains has had a significantly larger impact on the organizational structure of fluid milk markets than have the other developments. Much of the impact can be attributed to more intensive competition for fewer accounts, greater market power on the buying side, and demands for more products and services over larger geographic areas.

This development was among the top three in all classifications and therefore it can not be said that it has affected any one type of processors substantially more than any other type. It is interesting to note that the development of the greatest importance is external to the fluid milk processing industry and as a consequence, processors have had very little control over its impact.

Since large processors are in a better position to serve the large retailers and supermarkets, the small processors are at a competitive disadvantage in the wholesale market. Even if the small processor is not engaged in wholesale competition, the market conditions that result from the processors vying for the accounts of large retailers is not isolated to the wholesale market, but permeates the whole industry. This places the processors that have been relegated to the role of a price taker by the developments at a disadvantage compared to the processors that have the market power to be price setters.

Noticeable concern was shown by fluid milk processors for those developments which are usually associated with large operating units. In addition to the growth of supermarket chains (A), the processing of fluid milk by food distributors (G), the widening of distribution areas for packaged milk products (E), and the growth of large dairy companies (D) have been important enough to be ranked high in the aggregate analysis and in most classifications.

The importance given development G by processors reflects the impact of vertical integration into fluid milk processing by food distributors, which deprives the processors of large volumes of business. Even if food distributors do not process milk, their capability and the possibility of their doing so, gives them strong bargaining leverage. This development has been primarily the concern of national and multiunit processors, and the large processors.

The relative importance of development E (widening of distribution areas for packaged milk products) can be attributed to the effect of several complementary developments. These include technological developments allowing packaged milk to move greater distances, changes in milk containers (development H) and changes in sanitary regulations (development B). The combined effect of these developments has been to expose processors to competition from sources not faced before. Frequently, the source of this competition is a processor trying to expand his volume in an effort to take advantage of economies

of scale. Those processors unable to withstand the competition have found it advantageous to leave the industry.

The importance that the growth of large dairy companies (D) has had during the past five years may reflect the exploitation of their competitive advantages. These include lower per unit costs attributable to economies of scale, countervailing market power against large food retailers, specialized personnel, and the ability to carry on extensive research and development.

Another advantage that the large processors have is the ability to use price discrimination. They are in a better position to subsidize loses from a market with revenues from other markets. The processors that do not have a broad market base are placed under severe competitive pressure, and it is likely that this pressure has been a factor in the exit of a large number of processors. These movements have led to a more concentrated Lower Michigan fluid milk processing industry.

The developments of moderate importance such as J (milk price wars), H (changes in milk containers) and B (changes in sanitary regulations) have been less important than G, D, and E, although not significantly so in the aggregate analysis. Although the cooperative processors considered J (milk price wars) to be the most significant development, the processors in the other classifications generally agreed that it had been a moderate importance.

The importance of milk price-wars (J) is somewhat related to price discrimination. The larger dairies with their multimarket base can use price discrimination to a greater advantage than can smaller processors. There is no readily explainable reason why the cooperative processors should attach such great importance to this development.

The importance of changes in sanitary regulations (B) and changes in containers (H) can be ascribed to the influence that these developments have had on the widening of distribution areas (development E).

All classifications of processors generally agree that increased sales of milk through distributors (K), changes in Federal milk orders (C), shortages in local supplies of milk (I), and the passage of a trade-practice law (F) have been the least important in changing the market organization.

The analysis in Chapter IV indicates that twenty-eight percent of the processors have increased the use of distributors (adjustment K) and ten percent have become distributors (adjustment G). However, as shown in Chapter III, the increased sales of milk through distributors (development K) has not had a large impact on the market organization.

The relatively low importance which the processors attach to development C (initiation, expansion, or termination of a Federal milk order) may be explained by the fact that except for a few processors, most of them have

not been affected by this development. It is conceivable that this development has been a stabilizing factor rather than a factor of change.

Local shortages of milk (I) apparently have not been a problem to the processors or a major factor in changing the competitive situation. However, the schedule was not designed to recognize the impact of in-shipments of milk which may be a factor in preventing shortages of milk in certain markets.

The passage of a state trade practice law has been unimportant to Lower Michigan processors because Michigan has not enacted such a statute, and the only processors who might be affected are those who sell in other states.

The impact that the growth of supermarket chains and large retailers will have in the future may diminish because it is unlikely that supermarkets will be built at the rapid pace that has prevailed during the past decade.

However, the large retailers probably will not allow the market power they have amassed lay unused. As a result, the influence of supermarket chains on fluid milk markets in the future is not likely to emanate from the continued growth of supermarket chains, but rather from the continued utilization of their market power.

The importance of vertical integration by food distributors into fluid milk processing (development G) will have on the market organization may depend to a large degree upon the processors.

If the processors will not or cannot meet the demands

of the large buying units or if there are apparent excess profits, it is reasonable to believe that the buying units with the capability to do so, will vertically integrate into fluid milk processing. The processor(s) that lose the accounts may go out of business or may force other processors out of business by preying upon their business to maintain economies of scale for themselves. Either course of action would increase concentration.

The future importance of development E (widening of distribution areas) will probably not depend on advances in transportation technology, but rather on changes in the institutional framework and new product development.

The future development of concentrated milk products, filled milk, imitation milk and sterlized packaging techniques, have the potential to widen distribution areas even further. The degree to which this potential is realized will probably depend on changes in sanitary regulations and product composition standards.

Changes in these two areas allowing the widespread sale of these products would affect the market organization not only by widening the distribution areas but also by the potential of these products to be priced below whole milk. These products combined with the institutional changes may also determine to a great extent the future importance of development I (shortages in local supplies of milk).

The growth of large dairy companies (development D) is likely to continue. The national processors are

likely to grow mainly through diversification and internal growth since they are prohibited from engaging in horizontal integration by court decree. The medium sized processors will probably grow by absorbing the smaller processors that find it advantageous to leave the industry. Vertical integration into fluid milk processing will also increase the average size of processors in Lower Michigan.

If development J (milk price-wars) and the use of trade practices such as loss-leaders and below cost selling become more prevalent in the future, it is expected that development F (passage of a trade practice law) will correspondingly increase in importance.

The importance of development K (increased sales of milk through distributors) in the future may depend on the labor unions. Depending upon the circumstances, a greater number of fluid milk processors might use this distribution method.

There is little doubt that these developments have been important factors in changing the market organization of the Lower Michigan fluid milk processing industry during the last five years. An apparent manifestation of these changes is the decline in the number of processors and the consequential increase in concentration.

The pertinent question is whether the viable processors are going to continue engulfing competitors unable to withstand the competitive pressure generated by the

developments internal and external to the fluid milk processing industry. The analysis in Chapter V indicates that these developments have created conditions that have induced eighteen percent of the processors interviewed to sell their business within five years.

The implication is that unless the trends that were shaped by the action and interaction of these developments during the past five years change radically, the Lower Michigan fluid milk processing industry will continue its movement toward an oligopolistic, highly concentrated industry.

This further implies that a public policy decision on the performance goals that we are seeking and on the alternative means of achieving these ends looms before us. It is not within the scope of this paper to propose, discuss, or evaluate the desirability of various performance goals nor to speculate on the affect that the various means of reaching these goals would have on the industry or the public.

However, the author wonders whether the consuming public will be interested or aware of the long run effects that these developments and public policy decisions will have on the Lower Michigan fluid milk processing industry as long as consumers are adequately supplied with milk at a reasonable price.

Concerning the Adjustments

It can be concluded from the aggregate analysis in

Chapter IV that some of the adjustments have been more important than others during the last five years to fluid milk processors located in Lower Michigan, if the number of processors that have used an adjustment is utilized as a criterion of importance.

The analysis of adjustments made within the last five years assumes that the adjustments listed in the schedule have been equally available to all processors. The degree to which the actual conditions deviate from the assumed may explain some of the variation between classifications and between the adjustments. The analysis also assumes that the use of an adjustment was independent from the use of other adjustments. Besides the relationship between adjustments C and M, it is possible that there were others.

The adjustments that have been used during the last five years in order of importance are; B (home delivery on a reduced service basis), H (intensification of promotion), M (wider line of package sizes and types), F (addition of sideline dairy items), D (plan consolidations and mergers), L (diversification into non-dairy operations), C (fewer types and sizes of packages), K (increased use of distributors), J (labor contracts better suited to wholesale distribution), E (establishment of franchised stores), G (become a distributor), I (establish gas station outlets), and A (sale of the business). The processors are in general accord on this ranking.

A similar conclusion can be drawn from the aggregate analysis in Chapter V. The analysis indicates that some of the adjustments may be more important to fluid milk processors in Lower Michigan during the next five years than other adjustments, if the number of processors planning to make the adjustments is accepted as a criterion of importance.

The analysis assumes that these adjustments will be equally feasible for all processors. Although a number of processors in a classification plan the adjustment at the present time and under present industry conditions, when the processors try to implement the adjustments at a future date, some may find the adjustments are no available to them under the same conditions as at present.

We must also consider an undetermined probability function in assessing the analysis in Chapter V. Given the fact that a certain number of processors plan to make a given adjustment within five years, what is the probability that the processors will actually make the adjustment.

The relative importance that the adjustments are expected to have is indicated by the following list; F (addition of sideline dairy items), H (intensification of promotion), L (diversification into non-dairy operations), B (home delivery on a reduced service basis), M (wider line of package sizes and types), C (fewer types and sizes of packages), E (establishment of franchised

dairy stores), K (increased use of distributors), J (labor contracts better suited to wholesale distribution), D (plant consolidations and mergers), A (sale of the business), I (establishment of gas station outlets) and G (becoming a distributor). The processors in a few of the classifications have a different assessment of the expected importance of certain adjustments as compared to the aggregate analysis.

Although the percentage of processors planning the four most important adjustments (B, H, M, and F) will decrease when compared to the percentage of processors using them in the last five years, they will have approximately the same importance relative to the other adjustments.

In the future, adjustment F will replace B as the adjustment used by the largest number of processors, while B will drop to a position of fourth. H (intensification of promotion) will continue to be the second most important adjustment, but will probably be used by forty-nine percent of the processors as compared to the ffity-six percent during the last five years.

The adjustment that has been third in importance during the past five years, M (addition of package sizes and types), will probably drop to fifth, to be replaced in the future by adjustment L (diversification into non-dairy operations) which currently ranks sixth.

The developments that have been of moderate importance to Lower Michigan fluid milk processors during the last five years, those ranked fifth through ninth, were adjustments D (plant consolidations and mergers), L (diversification into non-dairy operation), C (fewer types and sizes of packages), K (increased use of distributors), and J (labor contracts better suited to wholesale distribution). They have been used by thirty-six, thirty-four, thirty, twenty-eight, and twenty-three percent of the processors, respectively.

In the next five years, these same adjustments (D, L, C, K, and J) are expected to be used by twenty-one, forty-six, twenty-eight, twenty-six, and twenty-five percent of the processors which would give them respective ranking of importance of tenth, third, sixth, eighth, and ninth.

The adjustments made by the smallest number of milk processors E (establishment of franchised dairy stores), G (becoming a distributor), I (establishment of gas station outlets or outdoor dispensers), and A (selling the business) have been made by eighteen, ten, ten, and two percent of the processors, respectively, and will probably continue to be made by a small percentage of the processors in the future.

The analysis in Chapter IV and V indicates that there was a relationship between the adjustments used, the adjustments planned, and the various classifications of

Lower Michigan fluid milk processors. In general, a greater percentage of national and multiunit processors, the medium and large sized processors, and corporate processors have used and plan to use these adjustments than single-unit, cooperative, and small processors.

The analysis implies that the relative importance of the various adjustments in the future will not differ greatly from the relative importance that these same adjustments have had during the past five years.

Concerning Future Research

The study indicates that the structure of the food retailing industry has the potential to influence the structure of the fluid milk processing industry in the future. In depth research dealing with the relationship between the two industries would be helpful in making public policy decisions in both industries.

The author believes that a continuing study of structure, conduct, and performance of the Michigan fluid milk industry is needed to keep abreast of the influence that these developments and adjustments will have on the industry. A periodical, static analysis does not fulfill this need.

This, in turn, emphasizes the need for research to develop more definitive criteria of acceptable structure, conduct, and performance for the Michigan fluid milk processing industry.

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APPENDIX A

COMPARISON OF THE AVERAGE IMPORTANCE OF THE DEVELOPMENTS BY CLASSIFICATIONS OF LOWER MICHIGAN FLUID MILK PROCESSORS

Hartley's Method for Comparing Individual Means

Computational Procedures

Degrees of freedom = ∞

Significance level = 0.05

Values of Q[1]

$Q_1 = 2.8$ $Q_2 = 3.3$

$Q_3 = 3.6$ $Q_4 = 3.8$

$Q_5 = 4.0$ $Q_6 = 4.2$

$Q_7 = 4.3$ $Q_8 = 4.4$

$Q_9 = 4.5$ $Q_{10} = 4.6$

$N = 11$, where N equals the number of means

$$M = \frac{N(N-1)}{2} = \frac{11(10)}{2} = \frac{110}{2} = 55.0$$

where M is the number of potential differences

$s^2 = 709.93$

$$S_{\bar{x}} = \frac{s^2}{M} = \frac{709.9}{55.0} = 12.9 = 3.6$$

Value of D

$D = S_{\bar{x}} \cdot Q$

$D_1 = 10.0$ $D_2 = 11.9$

$D_3 = 13.0$ $D_4 = 13.7$

$D_5 = 14.4$ $D_6 = 15.1$

$D_7 = 15.5$ $D_8 = 15.8$

$D_9 = 16.2$ $D_{10} = 16.6$

In reference to the following tables, if the lower number in each pair was greater than the number above it, then the differences between the means of the developments being compared were not significant.

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[1] George W. Snedecor, Statistical Methods, (Ames, Iowa: The Iowa State College Press, 1956), Tables 10.6.1, p. 252.

Table 1 - Comparison of the average importance of selected developments to all fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ A
Development A	72.4	66.2	61.9	48.4	40.8	30.2	26.8	23.7	18.5	14.0	13.0	----
		16.6	16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0	
Development G	59.4	53.2	48.9	35.4	27.8	17.2	13.7	10.7	5.5	1.0	----	
		16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0		
Development E	58.4	52.2	47.9	34.4	26.8	16.1	12.8	9.7	4.5	----		
		15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0			
Development D	53.9	47.7	43.4	29.9	22.3	11.6	8.3	5.2	----			
		15.5	15.1	14.4	13.7	13.0	11.9	10.0				
Development J	48.7	42.5	38.2	24.7	17.1	6.5	3.0	----				
		15.1	14.4	13.7	13.0	11.9	10.0					
Development H	45.6	39.4	35.1	21.6	14.0	3.4	----					
		14.4	13.7	13.0	11.9	10.0						
Development B	42.3	36.1	31.8	18.2	10.7	----						
		13.7	13.0	11.9	10.0							
Development K	31.6	25.4	21.1	7.6	----							
		13.0	11.9	10.0								
Development C	24.0	17.9	13.5	----								
		11.9	10.0									
Development I	10.5	4.3	----									
		10.0										
Development F	6.2	----										

Table 2 - Comparison of the average importance of selected developments, to national and multiunit fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ A	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ G
Development G	79.4	62.1	59.8	49.2	33.4	29.4	26.9	25.4	10.5	5.4	5.0	----
		16.6	16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0	
Development E	74.4	57.1	54.8	44.2	28.4	24.4	21.9	20.4	5.5	0.4	----	
		16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0		
Development A	74.0	56.7	54.4	43.8	28.0	24.0	21.5	20.0	5.1	----		
		15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0			
Development D	68.9	51.6	49.3	38.7	22.9	18.9	16.4	14.9	----			
		15.5	15.1	14.4	13.7	13.0	11.9	10.0				
Development H	54.0	36.7	34.4	23.8	8.0	4.0	1.5	----				
		15.1	14.4	13.7	13.0	11.9	10.0					
Development B	52.5	35.1	32.9	22.3	6.5	2.5	----					
		14.4	13.7	13.0	11.9	10.0						
Development K	50.0	32.7	30.4	19.8	4.0	----						
		13.7	13.0	11.9	10.0							
Development J	46.0	28.7	26.4	15.8	----							
		13.0	11.9	10.0								
Development C	30.2	12.9	10.6	----								
		11.9	10.0									
Development I	19.6	2.3	----									
		10.0										
Development F	17.3	----										

Table 3 - Comparison of the average importance of selected developments, to single-unit fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-X F	$\bar{X}$-X I	$\bar{X}$-X C	$\bar{X}$-X K	$\bar{X}$-X B	$\bar{X}$-X H	$\bar{X}$-X J	$\bar{X}$-X D	$\bar{X}$-X E	$\bar{X}$-X G	$\bar{X}$-X A
Development A	72.1	67.9	63.4	49.2	44.2	31.9	28.1	22.9	21.1	16.8	16.7	----
		16.6	16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0	
Development G	55.4	51.2	46.7	32.5	27.5	15.2	11.4	6.2	4.5	0.2	----	
		16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0		
Development E	55.3	51.1	46.6	32.4	27.3	15.0	11.8	6.0	4.3	----		
		15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0			
Development D	51.0	46.8	42.3	28.0	23.0	10.7	7.0	1.7	----			
		15.5	15.1	14.4	13.7	13.0	11.9	10.0				
Development J	49.3	45.1	40.6	26.3	21.3	9.0	5.3	----				
		15.1	14.4	13.7	13.0	11.9	10.0					
Development H	44.0	39.8	35.3	21.1	16.0	3.7	----					
		14.4	13.7	13.0	11.9	10.0						
Development B	40.3	36.1	31.6	17.3	12.3	----						
		13.7	13.0	11.9	10.0							
Development K	28.0	23.8	19.3	5.0	----							
		13.0	11.9	10.0								
Development C	22.9	18.7	14.2	----								
		11.9	10.0									
Development I	8.7	4.3	----									
		10.0										
Development F	4.2	----										

Table 4 - Comparison of the average importance of selected developments, to cooperative fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ A	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ J
Development J	79.8	78.8 16.6	55.8 16.2	54.3 15.8	47.8 15.5	44.5 15.1	28.3 14.4	26.0 13.7	25.8 13.0	9.8 11.9	2.5 10.0	----
Development E	77.3	76.3 16.2	53.3 15.8	51.8 15.5	42.3 15.1	42.0 14.4	25.8 13.7	23.5 13.0	23.3 11.9	7.3 10.0	----	
Development A	70.0	69.0 15.8	46.0 15.5	44.5 15.1	35.0 14.4	34.8 13.7	18.5 13.0	16.3 11.9	16.0 10.0	----		
Development G	54.0	53.0 15.5	30.0 15.1	28.5 14.4	19.0 13.7	18.8 13.0	2.5 11.9	0.3 10.0	----			
Development H	53.8	52.8 15.1	29.8 14.4	28.3 13.7	18.8 13.0	18.5 11.9	2.3 10.0	----				
Development D	51.5	50.5 14.4	27.5 13.7	26.0 13.0	16.5 11.9	16.3 10.0	----					
Development K	35.3	34.3 13.7	11.3 13.0	9.8 11.9	0.3 10.0	----						
Development B	35.0	34.0 13.0	11.0 11.9	9.5 10.0	----							
Development C	25.5	24.5 11.9	1.5 10.0	----								
Development I	24.0	23.0 10.0	----									
Development F	1.0	----										

Table 5 - Comparison of the average importance of selected adjustment to corporate fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ A
Development A	70.9	63.5	61.1	44.8	41.5	27.1	25.0	23.5	14.8	10.4	9.1	----
		16.6	16.2	15.8	15.4	15.1	14.4	13.7	13.0	11.9	10.0	
Development G	61.8	54.4	52.0	35.7	32.4	18.0	15.9	14.4	5.7	1.3	----	
		16.2	15.8	15.4	15.1	14.4	13.7	13.0	11.9	10.0		
Development E	60.5	53.1	50.7	34.4	31.1	16.8	14.6	13.1	4.4	----		
		15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0			
Development D	56.1	48.7	42.7	30.0	26.7	12.3	10.2	8.7	----			
		15.5	15.1	14.4	13.7	13.0	11.9	10.0				
Development J	47.4	40.0	37.6	21.3	18.0	3.7	1.5	----				
		15.1	14.4	13.7	13.0	11.9	10.0					
Development H	45.9	38.5	36.1	19.8	16.5	2.1	----					
		14.4	13.7	13.0	11.9	10.0						
Development B	43.7	36.4	33.9	17.7	14.3	----						
		13.7	13.0	11.9	10.0							
Development K	29.4	22.0	19.6	3.4	----							
		13.0	11.9	10.0								
Development C	26.1	18.7	16.3	----								
		11.9	10.0									
Development I	9.8	2.4	----									
		10.0										
Development F	7.4	----										

Table 6 - Comparison of the average importance of selected developments, to partnership and proprietary fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ A
Development A	77.0	72.4 16.6	68.1 16.2	58.2 15.8	40.7 15.5	36.6 15.1	33.9 14.4	32.6 13.7	28.6 13.0	27.9 11.9	22.0 10.0	----
Development G	55.0	50.4 16.2	46.1 15.8	36.2 15.5	18.7 15.1	14.6 14.4	11.9 13.7	10.6 13.0	6.6 11.9	5.9 10.0	----	
Development D	49.1	44.4 15.8	40.1 15.5	30.3 15.1	12.8 14.4	8.9 13.7	6.0 13.0	4.6 11.9	0.6 10.0	----		
Development E	48.4	43.8 15.5	39.5 15.1	29.6 14.4	12.1 13.7	8.7 13.0	5.4 11.9	4.0 10.0	----			
Development J	44.4	39.8 15.1	35.5 14.4	25.6 13.7	8.1 13.0	4.1 11.9	1.4 10.0	----				
Development H	43.1	38.4 14.4	33.1 13.7	24.3 13.0	6.8 11.9	2.7 10.0	----					
Development B	40.4	35.8 13.7	31.4 13.0	21.6 11.9	4.1 10.0	----						
Development K	36.3	31.7 13.0	27.4 11.9	17.5 10.0	----							
Development C	18.8	14.2 11.9	9.9 10.0	----								
Development I	8.9	4.3 10.0	----									
Development F	4.6	----										

Table 7 - Comparison of the average importance of selected developments, to small fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ A
Development A	73.4	70.7 16.6	64.1 16.2	48.3 15.8	41.1 15.5	37.4 15.1	33.0 14.4	23.2 13.7	22.1 13.0	21.6 11.9	19.6 10.0	----
Development D	53.7	51.0 16.2	44.5 15.8	28.8 15.5	21.5 15.1	17.8 14.4	13.4 13.7	3.6 13.0	2.6 11.9	2.0 10.0	----	
Development J	51.8	49.1 15.8	42.5 15.5	26.8 15.1	19.6 14.4	15.8 13.7	11.4 13.0	1.6 11.9	0.6 10.0	----		
Development G	51.2	48.5 15.5	41.9 15.1	26.2 14.4	19.0 13.7	15.2 13.0	10.8 11.9	1.0 10.0	----			
Development E	50.2	47.5 15.1	40.9 14.4	25.2 13.7	17.9 13.0	14.2 11.9	9.0 10.0	----				
Development H	40.3	37.6 14.4	31.1 13.7	15.4 13.0	8.1 11.9	4.4 10.0	----					
Development B	36.0	33.3 13.7	26.7 13.0	11.0 11.9	3.8 10.0	----						
Development K	32.2	29.5 13.0	23.0 11.9	7.2 10.0	----							
Development C	25.0	22.3 11.9	15.7 10.0	----								
Development I	9.2	6.5 10.0	----									
Development F	2.7	----										

Table 8 - Comparison of the average importance of selected developments, to medium sized fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-X I	$\bar{X}$-X F	$\bar{X}$-X K	$\bar{X}$-X C	$\bar{X}$-X J	$\bar{X}$-X B	$\bar{X}$-X H	$\bar{X}$-X D	$\bar{X}$-X G	$\bar{X}$-X A	$\bar{X}$-X E
Development E	71.2	62.4 16.6	61.3 16.2	51.0 15.8	42.9 15.5	28.0 15.1	27.8 14.4	19.7 13.7	17.7 13.0	10.5 11.9	9.4 10.0	----
Development A	61.7	53.0 16.2	51.8 15.8	41.7 15.5	37.9 15.1	18.6 14.4	18.3 13.7	10.2 13.0	8.2 11.9	1.1 10.0	----	
Development G	60.7	51.9 15.8	50.8 15.5	40.5 15.1	36.9 14.4	17.5 13.7	17.3 13.0	9.2 11.9	7.2 10.0	----		
Development D	53.5	44.8 15.5	43.6 15.1	33.3 14.4	29.6 13.7	10.3 13.0	10.1 11.9	2.0 10.0	----			
Development H	51.5	42.8 15.1	41.6 14.4	31.3 13.7	27.6 13.0	8.3 11.9	8.1 10.0	----				
Development B	43.4	34.7 14.4	33.5 13.7	23.3 13.0	19.6 11.9	2.3 10.0	----					
Development J	43.2	34.4 13.7	33.3 13.0	23.0 11.9	19.4 10.0	----						
Development C	23.8	15.1 13.0	13.9 11.9	3.7 10.0	----							
Development K	20.2	11.4 11.9	10.3 10.0	----								
Development F	9.9	1.2 10.0	----									
Development I	8.7	----										

Table 9 - Comparison of the average importance of selected developments, to large fluid milk processors, Lower Michigan, 1967.

	$\bar{X}$	$\bar{X}$-$\bar{X}$ F	$\bar{X}$-$\bar{X}$ I	$\bar{X}$-$\bar{X}$ C	$\bar{X}$-$\bar{X}$ K	$\bar{X}$-$\bar{X}$ J	$\bar{X}$-$\bar{X}$ H	$\bar{X}$-$\bar{X}$ D	$\bar{X}$-$\bar{X}$ B	$\bar{X}$-$\bar{X}$ E	$\bar{X}$-$\bar{X}$ G	$\bar{X}$-$\bar{X}$ A
Development A	78.2	66.4	63.5	56.2	38.7	31.9	25.2	23.5	22.5	11.2	1.6	----
		16.6	16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0	
Development G	76.6	64.8	61.9	54.6	37.1	30.3	23.6	21.9	20.9	9.6	----	
		16.2	15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0		
Development E	67.0	55.2	52.3	45.0	24.5	20.7	14.0	12.3	11.3	----		
		15.8	15.5	15.1	14.4	13.7	13.0	11.9	10.0			
Development B	55.7	43.9	40.9	33.7	16.1	9.3	2.7	1.0	----			
		15.5	15.1	14.4	13.7	13.0	11.9	10.0				
Development D	54.7	42.9	39.9	32.7	15.1	8.3	1.7	----				
		15.1	14.4	13.7	13.0	11.9	10.0					
Development H	53.0	41.2	38.3	31.0	13.5	6.7	----					
		14.4	13.7	13.0	11.9	10.0						
Development J	46.3	34.5	31.6	24.3	6.8	----						
		13.7	13.0	11.9	10.0							
Development K	39.5	27.7	24.8	17.5	----							
		13.0	11.9	10.0								
Development C	22.0	10.2	7.3	----								
		11.9	10.0									
Development I	14.7	2.9	----									
		10.0										
Development F	11.8	----										

APPENDIX B

SCHEDULE PREPARED BY THE NORTH CENTRAL REGIONAL COMMITTEE ON DAIRY MARKETING FOR A SURVEY OF FLUID MILK PROCESSORS

North Central Regional CONFIDENTIAL

Dairy Marketing Research Code no.____

General Instructions

This questionnaire is concerned with the changes affecting milk processors, adjustments processors are making in response to the changed conditions, and the like. Nearly all questions are to be answered by inserting numerical scores in blanks.

The numerical scores you are to insert are to be in the range from 1 through 99. The numbers "1" and "99" represent extremes--in importance, in degrees of frequency, in the extent of your agreement with a statement, or the like. If the attribute being indicated is importance, a "1" means that attribute is of no importance, while a "99" means it is highly important.

In many instances you may want to indicate intermediate degrees by using scores between 1 and 99. On the "importance" scale, with a score of 1 indicating no importance and 99 indicating much importance, scores between 10 and 30 might be conceived of as indicating slight importance, scores between 40 and 60 as indicating moderate importance, and scores between 70 and 90 as indicating considerable but not maximum importance.

The distinctions you make should be as fine as you feel you can make them. Use the number along the range that you believe best expresses your judgment. If you feel you can distinguish between "50" and "51," do so. If you do not feel you can distinguish that finely, you may use only scores that are multiples of 5 or 10.

The items in this questionnaire refer to the operations of your plant. If your plant is a unit of multiunit operations, where the term "your firm" is used, please interpret it as meaning your unit of your firm.

Developments That Have Changed the Competitive Situation

How important has each of the developments listed below been in changing the competitive situation in your market? Place a numerical score on each line to show how important the item on that line has been in changing the competitive situation in your market during the last 5 years.

For example, on line 1, place a number (from 1 to 99) to show how important the growth of supermarket chains has been in changing the competitive situation in your market during the last 5 years.

Importance in bringing about changes										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Of no importance									Highly important	

1. Growth of supermarket chains _____

2. Changes in sanitary regulations affecting the movement of packaged milk products _____

3. Inclusion of your market in a new or expanded federal order in which it was not previously included--or termination of a federal order _____

4. Growth of large dairy companies _____

5. Widening of distribution areas for packaged milk products _____

6. Passage of a state trade-practice law _____

7. Processing of milk by some supermarket chains or other food distributors _____

8. Changes in milk containers, such as the introduction of gallon jugs, gallon cartons, or plastic containers _____

9. Shortage in local supplies of milk _____

10. Milk price-war _____

11. Increased sales of milk through distributors, subdealers, vendors, or bobtailers _____

Factors That Have Determined Areas and Markets You Serve

How important has each of the factors listed below been in determining the areas and markets in which your firm now sells milk? Place a numerical score on each line to show how important the item on that line has been in determining the area and markets in which your firm sells milk.

For example, on line 12, place a number (from 1 to 99) to show how important transportation factors--distance, road conditions, and the like--have been in determining the area over which your firm distributes milk and which markets it serves.

Importance in determining areas and markets served									
The following scale may help in keeping the directions in mind									
1	10	20	30	40	50	60	70	80	90 99
Of no importance									Highly important

12. Transportation factors--distance, road conditions, and the like _____

13. Whether serving an area would increase your costs of operation by subjecting you to regulation under a (additional) federal order. _____

14. Presence or absence of large chain dairy companies _____

15. History of competition in the market (roughness, tactics, etc.) _____

16. Sanitary regulations applicable in the market _____

17. Presence or absence of one or more supermarket chains with which you might do business _____

18. Prices or margins in the various markets _____

19. Whether it would increase your costs of operation by regulating you under a (different) state trade practice law _____

20. Product specifications applicable in the market _____

Extent of area served by this plant, 1967, and change in area over past 5 years:

21. Greatest length of haul _____ miles

22. Average length of haul _____ miles

23. Approximate percentage change in size of distribution area during past 5 years:

_____ percent increase in size

_____ little change in size (check if applicable)

_____ percent decrease in size

Problems That Have Arisen for Your Firm Due to the Growth of Supermarket Chains

The growth of supermarket chains has directly and indirectly affected milk processors in both wholesale and retail distribution. Indicate on each line below by a numerical score (from 1 through 99) the degree to which the conditions indicated in the statements have been a problem for your firm.

Importance of problem										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Of no importance									Highly important	

24. Greater risk because business is in large lumps _____

25. Reduced effectiveness of your own brand(s) _____

26. Growing dependence on, and control by, supermarket chain(s) _____

27. Higher costs due to greater variety of brands, container types, etc. _____

28. Smaller profits in processing and distribution _____

29. Competitive pressure to provide services for which you are not remunerated (e.g. full service at limited-service price) _____

30. Need to give discounts that are out of proportion to savings _____

31. Need to deliver milk over large areas _____

32. Sales below cost by some supermarkets _____

Factors Affecting Discounts to Large Wholesale Customers

How much effect does each of the factors listed below have on the size of the discounts allowed chain stores and other large wholesale customers for milk, by milk distributors in your major market? Place a numerical score (from 1 through 99) on each line to show the relative size of the discount allowed because of that factor.

Size of discount									
The following scale may help in keeping the directions in mind									
1	10	20	30	40	50	60	70	80	90	99
No discount									Large discount

33. Volume of products taken by individual stores _____

34. Variety of products purchased _____

35. The brand of milk _____

36. Central billing _____

37. Services received, including frequency of delivery _____

38. Overall size of the chain _____

39. Top-level arrangements _____

40. Whether all milk is bought from one supplier (exclusive stop) _____

Inducements Used by Your Competitors in Competing for the Accounts of Large National and Regional Supermarket Chains

How frequently do your competitors in your major market use each of the following inducements in competing for the milk accounts of large national and regional supermarket chains? Place a numerical score (from 1 through 99) on each line to show the frequency of use of the inducement described on that line.

Frequency of use									
The following scale may help in keeping the directions in mind									
1	10	20	30	40	50	60	70	80	90	99
Not used									Used frequently

41. Financing of buyers _____

42. Free milk to new stores _____

43. Discounts that are out of proportion to savings _____

44. Furnishing display equipment free or below cost _____

45. Gifts, paid vacation trips, etc. to store personnel _____

46. Store signs, clocks, etc. _____

47. Advertising allowances without supervision in spending _____

48. Servicing display equipment free or below cost _____

49. Free labor to new stores _____

50. Free by-products to new stores _____

Bargaining Arguments Used by Large Wholesale Customers

In your experience with supermarket chains and other large wholesale customers, what bargaining arguments have they used in negotiations with your firm? Place a numerical score (from 1 through 99) on each line to indicate the degree of frequency with which they have used the argument listed on that line in their negotiations with you.

Frequency of use										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Not used									Used frequently	

61. Contention that competitor offered lower price _____

62. Threat to set up their own processing plant if demands are not met _____

63. Promise of larger volume if you met demands _____

64. Threat to transfer business to competitor if demands are not met _____

65. Contention that chain needs services you cannot feasibly offer _____

66. Argument that your product is not up to the quality it should be _____

67. Argument that your brand is not advertised widely enough _____

Bargaining Arguments You Use With Large Wholesale Customers

In its dealings with supermarket chains and other large wholesale customers, what bargaining arguments has your firm used to support its position? Place a numerical score (from 1 through 99) on each line to indicate the degree of frequency with which your firm has used the argument listed on that line in negotiations with such customers.

Frequency of use										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Not used									Used frequently	

68. Pointing out that your product is of high quality _____

69. Argument that your costs do not permit your firm to grant further concessions _____

70. Reminder that you provide good service _____

71. Mentioning the possibility of your firm operating dairy stores or similar outlets _____

72. Reminder that the law prohibits your firm from providing the concessions the food distributor wants _____

73. Pointing out that consumers have a strong preference for your brand _____

Factors Determining Which Supermarket Chains Your Firm Supplies With Milk

How important has each of the factors listed below been in determining which supermarkets your firm supplies with milk? Place a numerical score (from 1 through 99) on each line to indicate the importance of that item in determining which supermarket chains your firm supplies with milk.

If your firm has not supplied a supermarket chain with milk during the past 5 years, write "none supplied" at the bottom of the sheet and do not answer the questions.

Importance in determining chains supplied with milk										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Of no importance									Highly important	

74. Earlier business relationships _____

75. Overall size of supermarket chain _____

76. Price concessions made by this firm in obtaining the account _____

77. Strong consumer preference for this firm's milk _____

78. Size of chain's administrative district and its degree of conformity with this firm's area of operations _____

79. Personal or business relationships between owners of this firm and of supermarket chains _____

80. Preference by supermarket chain for a brand of milk not stocked by the supermarket's competitors _____

81. Type of service you were able to provide _____

Changes Made in Sales Procedures and in Service to Food Stores

How have your firm's selling procedures and service to food stores changed during the past 5 years? Place a numerical score (in the range from 1 through 99) on each line to show the direction and extent of the change in the importance of the selling procedure or service listed on that line. In this case, a score of 50 indicates no change; scores from 51 through 99 indicate that the item has increased in importance, with "99" indicating a very substantial increase; scores from 1 through 49 indicate the item has become less important, with "1" indicating a very substantial decline in importance.

Importance now as compared with previously										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Less important					No change			More important		

Changes in selling procedures:

82. Part played by top management in negotiating sales _____
83. Time spent by top management in maintaining good relations with buyers _____
84. Knowing with whom to deal in retail organizations _____
85. Adjusting services and the like to meet needs of supermarket chains _____
86. Emphasis, in sales negotiations, upon volume that can be supplied _____
87. Emphasis, in sales negotiations, upon price _____
88. Emphasis, in sales negotiations, upon product and service specifications _____

Changes in services and the like:

89. Delivery at a specific time
90. Delivery of preordered lots (instead of driver determining what and how much to leave) _____
91. Special sales management personnel to service stores (for complaints, problems, etc.) _____
92. Providing private label brands _____
93. Granting price concessions instead of providing certain services _____

Adjustments You Plan to Make During the Next 5 Years

Indicate by check marks in the left-hand column which of the adjustments listed below your firm plans to make during the next 5 years. For each adjustment your firm plans to make, indicate by a numerical score (in the range from 1 through 99) the extent of the benefit you expect to receive from it. A score of 1 would indicate no benefit; a score of 99 much benefit.

Benefits expected from adjustments to be made										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
No benefit										Much benefit

		Check if adjustment is planned	For planned adjustment, score expected benefit
107.	Sale of the business	_____	_____
108.	Home delivery on reduced service, large-volume-per-stop basis	_____	_____
109.	Fewer types and sizes of packages	_____	_____
110.	Plant consolidation, or merger	_____	_____
111.	Establishing own dairy stores, convenience markets, or similar outlets	_____	_____
112.	Adding sideline dairy items	_____	_____
113.	Becoming a distributor (vendor, subdealer)	_____	_____
114.	Intensified promotion of own brand	_____	_____
115.	Gas station outlets, outdoor dispensers, etc.	_____	_____
116.	Labor contracts better suited to mass distribution of milk to stores	_____	_____
117.	Increased use of distributors (vendors, subdealers)	_____	_____
118.	Diversifying into non-dairy operations	_____	_____
118.			
119.	Wider line of package sizes or types	_____	_____

Reactions About Supermarket Chains

Please read each of the following statements carefully. Place a numerical score (from 1 through 99) on each line to indicate the extent of your agreement or disagreement with the statement on that line.

Extent of agreement with statement									
The following scale may help in keeping the directions in mind									
1	10	20	30	40	50	60	70	80	90	99
Strongly disagree				Uncertain or no opinion				Strongly agree		

120. Supermarket chains' demands for changes in milk delivery services have been reasonable _____

121. Supermarket chains' margins on milk in your market are now too wide _____

122. Supermarket chains have increased the value of processors' brands _____

123. Supermarket-chain accounts are too urgently sought after by milk distributors _____

124. Supermarket chains need more competition in retailing milk _____

125. Supermarket chains are likely to control the business of processors who sell mainly to them _____

126. Supermarket chains encourage small processors to supply them with milk _____

127. Supermarket chains should process their own milk _____

128. Supermarket chains pressure milk processors to provide private-label milk _____

129. Supermarket chains are satisfied with limited service-delivery arrangements _____

130. Most supermarket chains have no interest in the welfare of milk processors _____

131. Supermarket chains have little to gain by setting up their own processing plants _____

132. Supermarket chains have done a highly effective job of merchandising milk _____

133. Supermarket chains demand excessive discounts on private-label brands of milk _____

Reactions About Wholesale Milk Drivers' Unions

Please read each of the following statements carefully. Put a numerical score (from 1 through 99) on each line to indicate the extent of your agreement or disagreement with the statement on that line.

Extent of agreement with statement										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Strongly disagree				Uncertain or no opinion					Strongly agree	

134. Milk drivers' unions serve a useful purpose _____

135. Wholesale milk drivers' earnings in your market are too high _____

136. Wholesale milk drivers should be paid on a commission basis _____

137. Wholesale milk drivers ought to service food store milk cases _____

138. Wholesale drivers' union contracts are a handicap to milk processors _____

139. Milk drivers' unions have no concern about the welfare of milk processors _____

140. Wholesale milk drivers need to be salesmen _____

141. Wholesale drivers' unions readily adapt driver pay plans to changing market situations _____

142. Full-service delivery of milk by wholesale drivers is needed by supermarket chains _____

143. Wholesale drivers should be replaced by distributors (vendors, subdealers) _____

Reactions About Fluid Milk Bargaining Cooperatives

In the statements that follow, the term cooperative refers to the fluid milk bargaining cooperative from which you buy the largest quantity of milk. What cooperative is it?

144. Name _____

Please read each statement carefully and indicate the extent of your agreement or disagreement with it by a numerical score (from 1 through 99).

Extent of agreement with statement										
The following scale may help in keeping the directions in mind										
1	10	20	30	40	50	60	70	80	90	99
Strongly disagree				Uncertain or no opinion					Strongly agree	

145. The cooperative benefits processors as well as producers _____

146. A sizable minority of producers (say 20 to 30 percent) should not belong to the cooperative _____

147. The cooperative is a successful organization _____

148. The cooperative often makes unreasonable demands of processors _____

149. The cooperative is a dependable organization _____

150. The cooperative can exist only because it is exempt from paying income taxes _____

151. The cooperative lives up to its agreements with processors _____

152. Members of the cooperative are not unified in their support of the organization _____

153. The cooperative improves returns to producers _____

154. The cooperative has no real concern about the welfare of processors _____

155. The cooperative provides needed procurement services for processors _____

156. The cooperative is poorly organized and does not know where it is going _____

157. The cooperative and milk processors in your market agree on most important issues _____

158. The cooperative serves a useful purpose _____

159. The cooperative has more influence than it should have upon federal order provisions and decisions _____

160. The cooperative provides needed surplus-disposal services _____

General Information About Your Operations

161. Type of firm (check one)

National dairy company	_____
Other multiunit firm	_____
Single-unit firm	_____

162. Type of ownership (check one)

Cooperative	_____
Corporation (excluding cooperative)	_____
Partnership or proprietorship	_____

163. Monthly volume of your plant:
164. Please check appropriate volume groups for both sales and intake

Pounds per month	163. Sales of packaged fluid milk products (Class I sales)	164. Milk intake
Less than 200,000	_____	_____
200,000-499,000	_____	_____
500,000-999,000	_____	_____
1,000,000-1,999,000	_____	_____
2,000,000-3,999,000	_____	_____
4,000,000-5,999,000	_____	_____
6,000,000 or more	_____	_____

165. Percent of milk purchased from a cooperative (or from members of a cooperative) _____(%)

	Types of outlets	Percent of total packaged milk sales
166.	Home delivery	_____(%)
167.	Supermarket chains (including voluntary buying groups)	_____(%)
168.	Special dairy stores or other controlled outlets	_____(%)
169.	Distributors (vendors, subdealers)	_____(%)
170.	Small stores, schools, restaurants, hospitals, etc.	_____(%)
171.	Other	_____(%)
		100 (%)

	Brand categories	Percent of total packaged milk sales
172.	Processor's regular brand(s)	_____(%)
173.	Processor's competing brand(s)	_____(%)
174.	Private-label brand(s)	_____(%)
175.	Custom packaged (for other dairies)	_____(%)
176.	Other_____	_____(%)
		100 (%)

North Central Regional

Dairy Marketing Research

CONFIDENTIAL

Code no.____

177. Your name_____

178. Name of firm_____

179. Address (Street)_____

(City and state)_____

Zip code_____

Operating Goals

How important is each of the goals listed below in your firm's operations? Place a numerical score (from 1 through 99) on each line to indicate the relative importance of that item as a goal of your firm.

Importance of various goals									
The following scale may help in keeping the directions in mind									
1	10	20	30	40	50	60	70	80	90	99
Of no importance									Highly important	

180. To make largest possible net profit _____

181. To maintain this firm's share of the market _____

182. To have an up-to-date bottling operation _____

183. To protect the value of capital invested in the business _____

184. To develop as much customer goodwill as possible _____

185. To be a leading firm in the market _____

186. To develop assured outlets for milk _____

187. To obtain the largest possible gross dollar receipts _____

188. To keep the dollar volume of business growing from year to year _____