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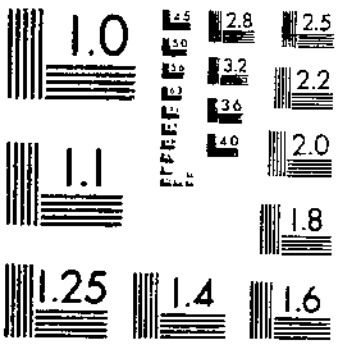

MICROCOPY RESOLUTION TEST CHART
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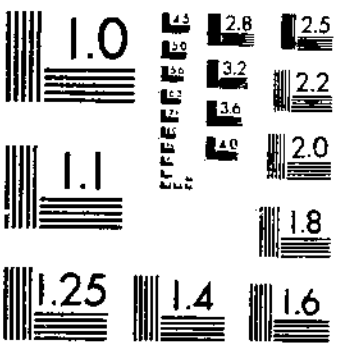

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Classified Pricing of Milk

some theoretical aspects

By Edmond S. Harris

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PREFACE

The pricing of milk in city markets is a subject of continuing interest to consumers, dairy farmers, milk distributors, and governmental agencies. Some of the most controversial aspects of the subject involve the pricing method commonly used in the sale of milk by dairy farmers to milk distributors. This method is known as classified pricing.

This study was made for the purpose of improving our understanding of the functions and economic consequences of the application of classified price plans under varied circumstances and with divergent objectives of pricing policy. It involved both a reappraisal of the existing body of economic theory on the subject, and an extension of that theory to give greater consideration to the consequences of pricing policies over time.

The study is part of a broader program being carried out by the U. S. Department of Agriculture to improve the efficiency of the marketing processes for farm products.

CONTENTS

SUMMARY

Classified pricing of milk, or pricing according to use, is a system of pricing first developed by associations of producers in the sale of milk to handlers in city markets. The operation of classified pricing plans in particular markets is frequently the subject of controversy. Producers, handlers, and consumers may hold divergent views as to the objectives to be sought through this system of pricing. Because most of the larger city markets are today under public regulation by either State or Federal agencies, these agencies have responsibility for resolving differences with respect to price policies. These agencies, however, do not always alter fundamentally the kind of pricing policy which would result from the other institutional influences in the market.

From the producers' viewpoint, two different objectives may be sought: (1) To stabilize returns to producers; and (2) to enhance returns beyond those consistent with long-period demand and supply considerations. In practice, both objectives influence pricing policy in varying degrees. For theoretical purposes, the pricing policies consistent with each of these objectives are isolated and analyzed under conditions of marketwide pooling (defined on p. 25). Modifications are later made for other types of pooling.

The Stability Objective

The stability objective has been an outgrowth of historical conditions. In city markets where producers were not organized, the perishability of milk caused its price to be hypersensitive to seasonal or other excesses of supply over demand. Because neither demand nor supply is very responsive over a short period to moderate price changes, even a very low price to producers would not always bring the two into balance. Thus, some producers might be forced off the market temporarily.

The organization of producers and the application of classified pricing solved this problem. Under this system of pricing, the producers' association sells milk to dealers at one price for the fluid milk market and at one or more lower prices for disposition in manufacturing markets. This represents an application of a practice, found in various forms in our economy, which is known as price discrimination (defined on p. 34). Thus the seasonal surplus, or any abnormal excess of supply, no longer acts as a depressing factor on the price of milk sold for fluid use, and it enables all producers to remain as year-round participants in the fluid market.

Classified pricing to achieve the stabilization objective requires: (1) That the prices of milk disposed of for surplus uses be established at levels which will salvage the highest return for such milk; and (2) that the Class I price be adjusted so that the blend returns to producers from sales in fluid and surplus markets are consistent with long-period supply and demand expectations in the fluid market.

These pricing policies may, in some markets, have some effect upon the competitive relations among handlers. Those handlers who require relatively small proportions of surplus milk would have to pay more for their milk than they did when they purchased milk at a flat price. The competitive position of such handlers, whose scale of operations is likely to be small, would then be less favorable than before.

The Price-Enhancing Objective

Applying classified pricing to enhance producer returns in city milk markets is analogous to discriminative pricing or "dumping" in international trade. The city market is the sheltered "home" market where the producers' association has a measure of control over prices. The markets for manufactured milk products are the "foreign" market where prices are lower and are not significantly affected by milk which may be diverted from the fluid market.

An important difference between classified pricing and the normal case of price discrimination in international trade is that marginal revenue from sales of milk in surplus markets is usually below marginal costs of production for producers supplying the city market. This, in combination with other factors, limits the successful application of classified pricing to enhance producer returns above normal levels over a prolonged period of time. (The marginal concepts are described on p. 36.)

Demand responses to changes in milk prices are likely to be more elastic over a long period than in a short period. Short-period elasticity is likely to be a determining factor in the appraisal, by officers of a producers' association, of the level of the Class I price which will maximize returns. Thus, the officers may try to obtain Class I prices which would bring immediate profits for milk producers at the expense of an ultimate loss of fluid sales which would exceed expectations.

Over a period of time, the supply responses in the market caused by returns to producers higher than economic conditions would warrant, would also tend to reduce the advantages of applying classified pricing for this purpose. As the proportion of surplus rises, the blend return to producers declines. The adoption of protective devices for limiting supplies of milk are, in almost all cases, not completely effective. Supplies of milk for the fluid market do respond to higher prices, even though the response may be delayed.

In the short run, classified pricing can be effectively applied to maximize producer returns. However, attempts to maximize producer returns by raising the Class I price and diverting milk to surplus classes are not likely to be profitable to producers in city markets over an extended time. The benefits of whatever improvements in blend returns may remain after a prolonged period tend to be dissipated by higher costs of production, including those costs associated with higher land values. The ultimate situation is that the high price of Class I milk remains, but the excess profits of operation are gone. Some producers may benefit from an increase in the capitalized values of their farms, but new producers coming on the market would not share in this benefit.

The long-period consequences of classified pricing, applied for the purpose of maximizing producer returns, would be: (1) A decrease in the consumption of fluid milk; (2) an increase in the total supply of milk on the market; and (3) an intensification of efforts to slow down the rate of increase of supplies.

The impact of this type of application of classified pricing upon the competitive relations among handlers is of more consequence than when stabilization objectives determine pricing policy. Handlers (typically small) with relatively high fluid milk sales are less able to compete with handlers whose proportions of fluid sales to total milk handled are substantially lower. In markets where milk for surplus uses is priced at less than its value for such uses, this effect is accentuated.

Classified pricing when applied with the object of maximizing producer returns also affects the markets for manufactured milk products. The additional quantities of milk diverted from fluid markets add to the supplies of milk available for the manufacture of butter, milk powder, evaporated milk, and other products, with depressing effects upon the prices of these products and upon the returns to producers whose primary business it is to supply milk to plants engaged in their manufacture.

Institutional factors may influence the degree to which classified pricing is applied with the objective of maximizing producer returns. The sheltering aspects of local health regulations (slowing the flow of supplies from new sources) is an enticement to a high Class I price policy. Once this policy is applied, it may be bolstered by the creation of quota plans which tend to hold back the output of producers already on the market. Producers' associations themselves are organized to obtain better returns for their members. Their officers are subjected to pressures from members to raise Class I prices to accomplish this. During periods when farm prices are falling because of broad economic factors, this pressure to protect producer returns by exploiting the more sheltered fluid milk market can be very great.

Dealer control over prices of fluid milk at the consumer level also causes a presumption of monopoly profits in which producers seek to share through raising the Class I price. This is encouraged in some instances by a rough balance of bargaining power between the larger handlers and the producers' organizations. In such situations, mutual advantage at times appears to lead to high Class I prices and low prices of milk for surplus uses.

CLASSIFIED PRICING OF MILK

Some Theoretical Aspects

By Edmond S. Harris

Market Organization and Costs Branch, Marketing Research Division, Agricultural Marketing Service

INTRODUCTION

Prevalence of Classified Pricing in City Milk Markets

Classified pricing is the prevalent system by which farmers sell milk to handlers[1] in city markets. Under this system, handlers pay different prices for milk in accordance with the manner in which they use it.

Organized dairy farmers introduced this system of pricing in several markets near the close of the First World War. It came into widespread use, especially in the large eastern markets, during the next decade. The growth of producers' bargaining organizations has been closely associated with the development of classified price plans. Economic necessity impelled dairy farmers to organize, and Federal and State laws encouraged them to do this. The Capper-Volstead Act, passed by Congress in 1922, was important in this respect. It resolved any doubt regarding the right of farmers to unite and act through cooperative associations in handling or marketing their products without violating the antitrust laws (*38*, p. 25).[2] Today, classified pricing is the typical method by which milk producers sell their milk to handlers, not only in all of the very large city markets, but in most city markets whose population exceeds 50,000.

Conflicting Interests Involved in the Application of Classified Pricing

Classified price plans in fluid milk markets have been the subject of sharp controversy. They have been attacked as monopoly devices to raise prices of milk to consumers, as a means of giving unfair advantages to some milk distributors and penalizing others, as a factor in the creation of surpluses, and as a factor in depressing the prices of manufactured milk products. They have been as staunchly defended as an essential device for the protection of producers, for the promotion of orderly marketing of milk, for the protection of city consumers by

[1] Throughout this report, unless the context limits its meaning, "handler" is used as a broadly inclusive term to cover a milk distributor or a milk processor of any kind.

[2] Italic numbers in parenthesis refer to items in Literature Cited, page 104.

assuring adequate supplies of safe milk, and for assuring fair and equitable pricing of milk to distributors.

The controversial aspect of classified price plans is related to conflicts of interest which are involved in their application. Farmers who are members of a particular producers' organization may find their interests adversely affected by pricing policies advocated by other producers who either belong to another producers' organization or to none. Handlers with different kinds of operations also may find themselves at odds over the prices to be charged for milk in the different use categories.

The interests of consumers in a fluid milk market[3] are affected not only by the price which producers may charge handlers for milk which they resell as bottled whole milk, but also by the prices charged for milk sold in the form of cream, flavored milk, buttermilk, and other products. Because families do not consume these items in the same proportionate amounts, their interests may conflict when the relationship of prices of milk for different uses is changed.

Intermarket and interregional conflicts of interest among dairy farmers or among handlers may arise out of the pricing policies carried out in fluid milk markets. Thus, we hear of protests from organizations of Midwestern dairy farmers against alleged diversion of milk from city markets to their manufacturing markets. Similar allegations of diversion are at times made by producers or handlers in one city market with respect to the milk in a neighboring city market.[4]

In addition to these issues arising from conflicts of interests over the effects of classified pricing policies, there are certain problems relating to long-period considerations. Most important of these problems, from the point of view of directors of a producers' association, is this: To what extent are pricing policies which will enhance the returns of members over a period of a few years consistent with pricing policies which will advance their interests over a decade or several decades? Where the two pricing policies are not consistent, to what extent should they follow one policy or the other?

Because governmental agencies, Federal and State, have assumed price-determining functions in most of the larger city markets, the responsibility for resolving conflicts of interests rests largely with them. These agencies must, therefore, bear a considerable share of responsibility for weighing short- and long-period considerations with respect to pricing policies, as they bear on the welfare of producers in a particular market, on the broader welfare of milk producers generally, on consumers and handlers, and even on other segments of the economy.

Scope of Present Study

Two aspects of classified pricing which are a part of our theoretical framework are: First, its function as a stabilizer of producer returns,

[3] In conformity with prevailing usage, the term "fluid milk market" is used in this report as synonymous with "city milk market." Although handlers in a city milk market normally resell most of the milk from local dairy farmers in fluid form, part is sold to city consumers in the form of fluid cream, cottage cheese, or other perishable products, and part may be made into butter, cheese, or other manufactured milk products for resale locally or in other markets.

[4] Diversions of milk between city markets are, in part, related to the type of pooling arrangements used in conjunction with the classified pricing plans (see p. 32).

and second, its function as a device for enhancing producer returns. Earlier economists who studied the origin of classified pricing emphasized the first of these functions (*16*, pp. 29–31). Later economists, viewing classified pricing as a form of price discrimination, have been inclined to minimize or ignore its function as a stabilizer of producer returns and to treat it primarily as a device for enhancing producer returns (*9*).

The present study of the theory of classified pricing is predicated on an acceptance of the fact that both of these functions of classified pricing are operative. Pricing policies in a market, formulated by actual people in industry and government under real conditions, will incorporate these functions in varying degrees at different times. For the purpose of theoretical analysis, it is necessary to isolate the two functions, although, in practice, it is extremely doubtful whether classified pricing policy is ever influenced entirely by either objective to the exclusion of the other.[5]

In examining the application of classified pricing as a device for enhancing producer returns, the present study is concerned with some of the special characteristics of milk marketing which may limit such application. Closely associated with this is emphasis upon the time element. The analysis, in theoretical terms, of long-period consequences of different sets of pricing policies is not a happy task for an economist. It involves the assumption that conditions affecting supply and demand are stationary over such a long period of time that the theoretical reasoning may seem to be carried out under conditions of hothouse artificiality. Our justification for doing this is that economic reasoning about immediate effects only is of limited value as a guide to people faced with practical problems. These practical problems always do have a time dimension which the people concerned have to consider in determining policy. A director of a producers' association is not satisfied to know that returns of members can be increased by following a certain price policy. He wants to know whether the benefits will be lasting or whether the policy may set in motion changes in supply and demand which may have an unstabilizing effect on the market for the association's milk. He is also interested in any tendencies over time which may disturb relationships with handlers or with producers in other markets.

In considering the long-period implications of pricing policies, certain assumptions which are usually appropriate for the short-run situation have had to be reexamined. Most important of these, perhaps, is that relating to the nature of the response of consumer demand to changes in price for milk in fluid form. A high degree of inelasticity of demand with respect to price changes is generally accepted by economists for "normal" ranges of prices. Although care is not always taken to specify the fact, short-period responses are almost always under consideration when this assumption is made. The fact that we have not accepted this assumption of demand inelasticity as a workable assumption for long-period analysis may seem

[5] Marshall observed that "pure elements are seldom isolated from all others by nature either in the physical or moral world," and that it is the task of the economist "to follow the examples of the chemist who seeks for the true properties of each element" while dealing with substances which contain admixtures of several elements (*23*, pp. 421–422).

to mark a point of drastic disagreement with the work of other economists in the field. The disagreement is, however, more apparent than real. It is due to the length of the time period under consideration in the present study.

Plan of This Report

The chapters of this report which follow may be grouped in four parts. The first part, comprising the first three chapters, deals with historical and institutional aspects of milk marketing, to provide a framework for the later analysis of classified pricing. The second part, comprising the next four chapters, is an analysis of classified pricing as a form of price discrimination. Chapters IV, V, and VI deal with its application to enhance producer returns. Chapter VII deals with its effect on the margins of handlers, including producer associations as handlers. Although the time element is brought into the analysis in this part, particularly in relation to the question of demand elasticity, this aspect is left largely to the third part of the report, chapters VIII and IX, where the tendencies and long-period consequences of applying classified pricing with different policy objectives are analyzed. The analysis to this point was carried out with the assumption that market-wide pooling was used in conjunction with classified pricing. In chapter X, some effects of classified pricing with association pools and individual-handler pools are discussed. A few further observations are made in the final chapter with respect to collective bargaining, governmental regulation, and the difficulties of measuring monopoly pricing.

CHAPTER I.—CONDITIONS CAUSING HIGHER MILK PRODUCTION COSTS IN CITY MARKETS THAN IN MANUFACTURING MARKETS

In the course of their development, each of the numerous city milk markets became seperated, to some degree, from the broader markets for manufactured milk products. These developments also created higher production costs for farmers supplying these city markets than are incurred by farmers supplying milk for manufacturing uses. But the conditions of milk marketing are such that fluid milk markets and milk product markets continued to be interrelated in certain important economic respects. This situation has created problems of price instability for suppliers of city markets, as well as opportunities for them to enhance their returns, at least on a short-run basis, through the practice of price discrimination.

Increase in Size of City Markets

Small communities usually obtain milk for their fluid needs from farms located close to the city. This was true during the early history of most of today's large cities.[6] When these cities were small, some producers also participated in the distribution of milk (and sometimes cream and butter) to homes of consumers and to retail outlets. These producer-distributors, in direct contact with consumers and with neighboring farmers, provided a direct link between producers and consumers. Most farms were unspecialized, and any seasonal excess of supplies was made into butter and cream for farm consumption or used as whole or skim milk in feeding livestock.

As cities grew in size, the extent of the supply area also expanded and city consumers had to rely upon farms more distant from the city limits for their supplies of milk. The producer-distributor tended to be replaced by firms specializing in the business of distributing milk.

Zoning of Supply Areas

The relative bulk and greater perishability of whole milk as compared with cream, butter, and other milk products cause supply zones to become differentiated. As the size of cities increases and supply

[6] In some areas, this is not true. Improved means of moving milk long distances, coupled with pasteurization and other sanitary requirements as well as other factors, sometimes make it mutually advantageous today for small cities and towns to be served by a distributor whose primary operation is in a market some distance away and whose source of supply is nearer to that market. Thus, a report on outer-market distribution of milk in paper containers states: "In the North Central Region, outer-market shipments of milk in paper containers have become commonplace. This has increased the amount of overlapping in markets for fluid milk. Separate and distinct markets for packaged milk have practically disappeared." (25, p. 7).

areas for fluid milk expand, this differentiation of zones becomes more definite. Transportation costs become a more important factor in the economics of milk marketing. Fluid cream, though less bulky and perishable than milk, is not as concentrated as and does not have the storage qualities of manufactured milk products. Thus, the city draws its supply of fluid cream from a zone somewhere between its supply zones for milk and for manufactured milk products.

A high degree of regional specialization has developed in the production of butter, cheese, and other manufactured milk products which are easily stored and whose cost of transportation is small in relation to their value. The entire country constitutes a single market for each of these products. Technical changes of a far-reaching nature, in the receiving, storing, and manufacturing of milk products, have encouraged regional specialization in the production of such products as butter and cheese.

The lines of demarcation between competitive zones of supply for a city milk market are blurred by practical problems of equating supplies of milk with consumer requirements.[7] The seasonal swings of supply, common to most markets, are most spectacular. There are also continuous, though less spectacular, fluctuations in both supply and demand. There is a further problem involved in equating the two components of the milk supply, butterfat and fluid skim milk, with the total of each of these purchased by consumers in the form of whole milk or of other items which distributors require from the milk supplied by local producers. Thus, in a market where local producers supply milk of a substantially higher butterfat percentage than distributors sell to consumers in fluid form, there may be a considerable excess of cream which is more or less a byproduct of the local milk supply.

The way in which differences in transportation costs for milk, in the form of whole milk, cream, and butter (taken here as representative of manufactured milk products), tend to create supply zones has been sometimes illustrated by concentric circles with the city market as the center, as in figure 1–A (*5*, p. 154, and *9*, p. 20). Distance is not, however, the only factor affecting the cost of bringing milk to the market. Actual transportation costs depend on the accessibility of farms to highways and railroads. Also, such factors as topography and soil conditions affect the intensity of milk production in different parts of the area and thus influence the boundaries of the zones.[8] For purposes of a very simplified abstraction, however, the concentric circle diagram is valid for a city market which meets two conditions: (1) It is located in a dairy region where the normal production of milk is more than sufficient to supply all the requirements for milk and milk products of its population,[9] and (2) its supply zones are not disturbed by the prices which other city markets might pay in the vicinity.

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[7] Bredo and Rojko, in "Prices and Milksheds of Northeastern Markets," discuss the complexities involved in defining milksheds (*7*, ch. VIII).

[8] Nonprice elements also are involved in buying practices of milk plants (*12*, pp. 29 ff).

[9] Such a region is sometimes referred to as a "surplus dairy region" in contrast to a "deficit dairy region."

Three Illustrative Situations

RELATIONSHIPS OF SUPPLY ZONES FOR MILK, CREAM, AND BUTTER

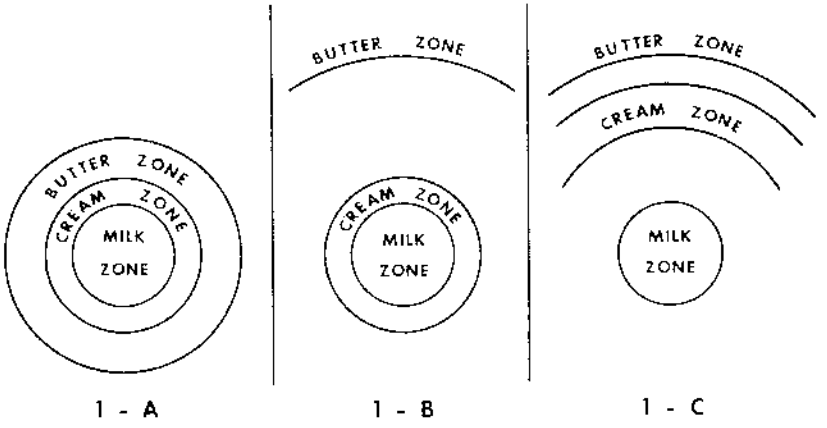


Figure 1.

For other city markets, the effect of differences in transportation costs for whole milk, cream, and milk products may be to create gaps between the cream and butter zones or even between the milk and cream zones, as shown in figures 1–B and 1–C. A gap between the milk and cream zones, for example, indicates that the supply of milk and the effective demand in the market are in balance at a price which will provide a return to producers at the outer edge of the milk zone which is higher than they could receive for milk delivered to the market as cream priced in competition with more distant sources of supply.

Whether the supply zones are contiguous or whether gaps exist between any of the supply zones will affect the structure of values of milk in the city market as related to the distance at which it is produced or assembled. Figures 2–A, 2–B, and 2–C indicate the prices offered to producers, f. o. b. farms, at different distances from the market, in three cases analogous to those of figures 1–A, 1–B, and 1–C. Theoretical price offers for milk for fluid milk, cream, and butter uses are represented by lines PmPm, PcPc, and PbPb, respectively. Only the parts of these lines which are effective in their respective zones are solid.

It can be seen from figure 2–C, for example, that under the given conditions of prices at the market and transportation costs for whole milk, cream, and butter, no producers are found just beyond the fluid milk zone (160 miles) who sell milk for use as cream for the market. Its value for use as whole milk in the market is greater. The line PcPc extended to the edge of the milk zone, is below the line PmPm. The fact that there are no farmers in the zone from 160 to 310 miles

who supply milk for use either as milk or as cream in the market indicates that other markets are more attractive to them. These may be other city milk markets or, if a city market is somewhat isolated in a deficit dairy region, the more attractive markets may be almost entirely for farm products other than milk.

Under competitive conditions, extra costs of producing milk in any part of the fluid milk zone of a city market will tend to offset any

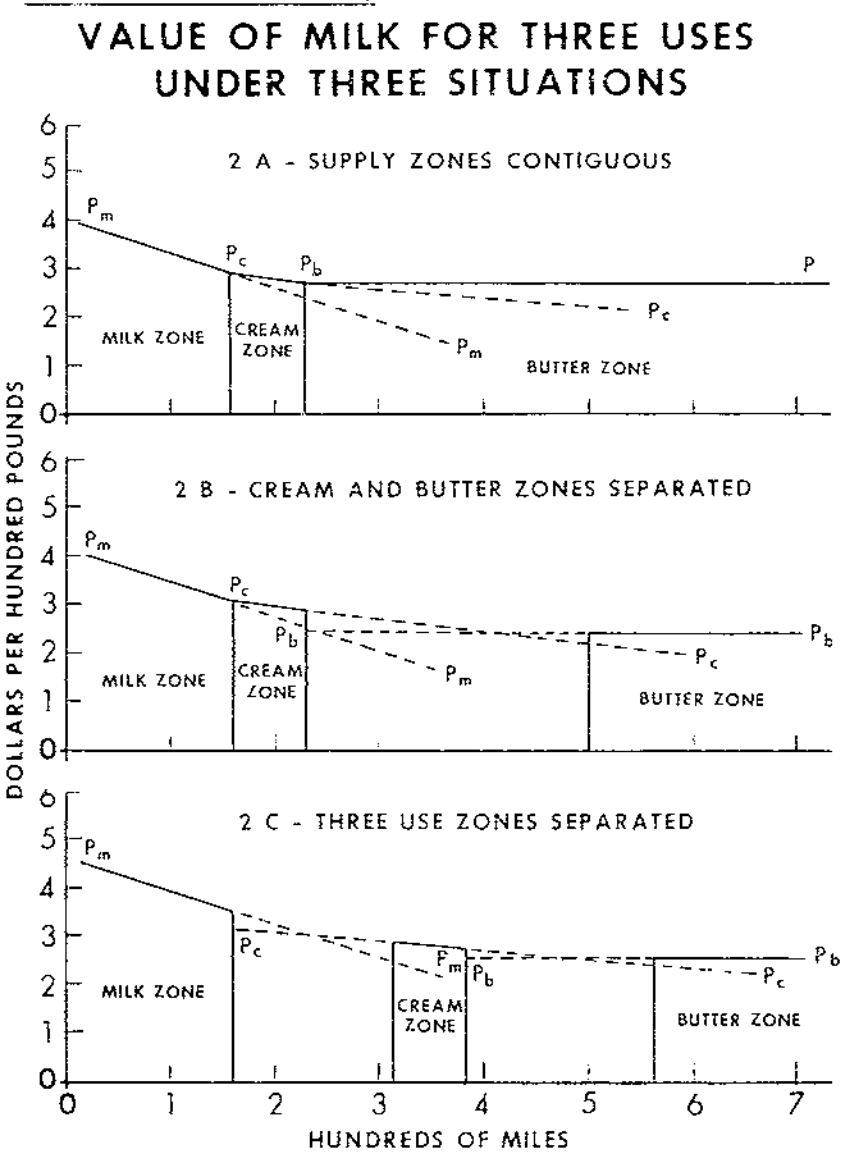


Figure 2.

price differential which producers may receive, f. o. b. their farms, over farm prices received for milk of equal quality produced in more distant parts of the fluid milk zone or in regions producing milk for manufacture. If this were not the case, there would be a continual state of disequilibrium of returns on capital invested in the dairy enterprise in different parts of the fluid milk zone or between the fluid milk zone and the manufacturing zone.[10]

Factors Causing Higher Costs

This tendency under competitive conditions for higher costs to offset the differences in the prices received by producers within a fluid milk zone of a city market and the prices received for milk of equal quality in manufacturing regions is operative regardless of whether or not the zones for fluid milk, cream, and manufactured products are contiguous. The high cost of transporting whole milk operates as an economic incentive to attract dairy enterprises close in to the city. This tendency creates a greater intensity of dairy enterprise in the vicinity of the city than there would be if the market for whole fluid milk were not there.

If the city is located in a region poorly suited to dairying, the extra cost may be considerable. Even in a region such as the Northeast, where conditions are in many respects well suited to dairying, the unusual degree of urbanization tends to encourage a greater intensity of milk production than would otherwise take place. At the same time, the concentration of industry and the competition of various specialty crops, such as vegetables and fruits, which are also attracted to areas close to city markets, tend to create extra competition for factors of production, especially land and labor.

The more important factors which may make for higher costs of producing milk in fluid milk zones, over costs of producing milk of equal quality in regions where milk is produced primarily for manufacturing outlets, may be summarized as follows:

1. *Unsuitability of land.* In the vicinity of some cities, the topography or soil conditions are far from ideal for dairying, but the land is used for this purpose because it is close to the city market.
2. *High cost of land.* Cost of land, in proximity to city markets, may be high because of competition among dairymen and by those who would use it for alternative farm enterprises or manufacturing industries. In some locations of the fluid milk zone, suburban residential users enter into competition for farm land. Higher taxes are apt to accompany higher land values.
3. *Unsuitability of climate.* In some parts of the country, the climate is a factor operating to raise production costs in fluid milk zones of city markets. In parts of the South, for example, the temperature is considerably higher than optimum for milk production during the summer. In other sections of the country, an arid climate presents special problems of raising feeds and watering livestock.

[10] A condition of disequilibrium may, of course, be brought about by factors which restrict the free play of competitive forces, such as restrictions set up by city health departments or others on the entry of new producers to the fluid market or upon the free movement of milk from outside the supply zone, or by the establishment of arbitrary prices within the fluid milk market.

4. *High labor costs.* Labor costs may be high because of alternative employment opportunities near the city.
5. *The intensity of dairy enterprise.* This is encouraged because of proximity to the city market, and is an element which affects all of the factors cited above and is itself a factor tending to raise costs of producing milk close to the city. The price differential received by producers for the city market over prices received in regions producing milk for manufacture tends to bring forth additional supplies of milk, especially from those farms quite close to the market where the prices received for milk are not appreciably reduced by deductions for costs of transportation.

Not all of these factors are operative in all cases. For example, land and climate may be excellent for dairying in the vicinity of some cities but the higher cost of land close to the city and factors involving greater intensity of milk production will tend to raise production costs. The way in which city demand for milk increases the output and cost of milk may be illustrated by the use of conventional supply and demand curves, as in figure 3, where the line ss is the schedule of supplies offered by producers in any part of the fluid milk zone at different prices at their farms, and the line dd is the schedule of demands at these prices for milk for manufacturing uses. The demand curve tends downward from left to right, indicating some response to price at all points, and the supply curve tends upward from left to right, reflecting higher costs associated with more intensive production in the area. City consumers, in order to attract these supplies, must outbid manufacturers of dairy products by offering higher prices as in d′d′. The curve d′d′ cuts the supply curve ss at a higher point and to the right of the point where dd cuts ss. In

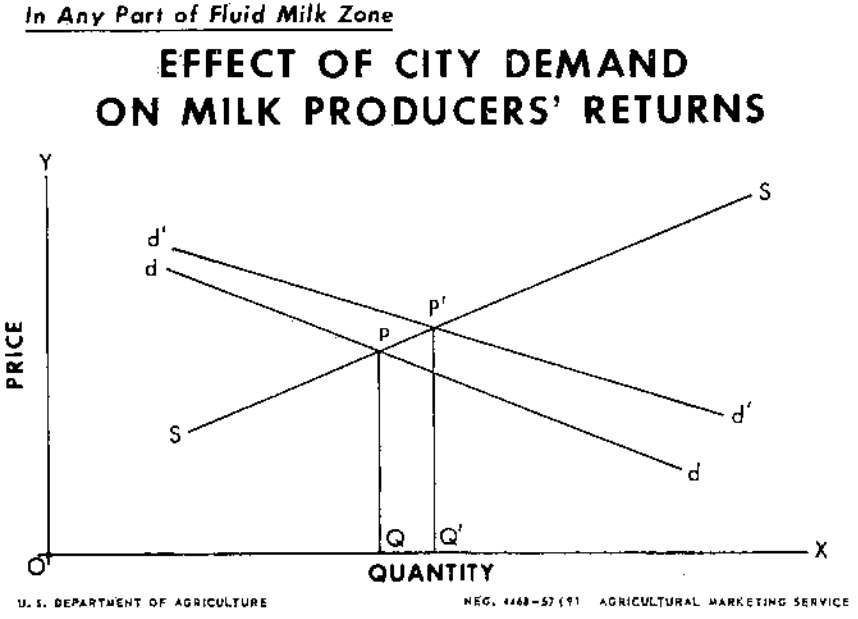


Figure 3.

our illustration, this would mean that the city demand creates a higher price for milk at the market and that this higher price induces a greater output of milk from farms in this part of the supply zone. Under competitive conditions, the marginal cost of this expanded supply would exceed the marginal cost of the smaller supply by the difference in price.

A further element closely akin to a greater intensity of dairy enterprise in supply areas for city markets is the effort made to decrease seasonality of production. Even where a city is located in a surplus dairy region, farmers in the fluid milk zone are urged by their distributors, and are encouraged by the manner in which returns are apportioned among them, to bring their production of milk during the fall and winter more closely into line with production during the spring and summer. This usually involves more costly feeding of cows because of the necessity of raising and storing additional feed crops or purchasing feeds to supplement those raised on their own farms (*26*, p. 17).

Development of Sanitary Requirements

The growth of cities and the necessity of bringing milk from longer distances has required improved practices to maintain the quality of milk from farm to consumer. The movement toward improved practices has been hastened by advances in medical science which found a causal relation between the presence of certain micro-organisms in milk and outbreaks of various diseases. This has led to requirements for pasteurization of milk and to a number of other public health measures applied to producers, haulers, and city handlers, some of which have had an influence on the economic structure of fluid milk markets.

City and State milk codes and the activities of public health officials have affected the production of milk in the following ways: (a) By increasing the size of investment required by farmers to produce milk for the fluid market and necessitating specialized types of farming practices for the production of high-quality milk, and (b) by determining which farms would be permitted to supply milk for use as whole milk or cream in the market. The trend toward higher quality standards for milk in city markets has also been promoted by handlers and by producers' associations. The activities of either of these have had the same effects on the production of milk for the market as have similar activities of public health agencies.

Milk codes may influence the size of investment required by farmers supplying city markets, by specific requirements for construction of barns, milkhouses, and certain types of equipment, and by setting standards for bacteria count, cleanliness, and temperature of milk, which, in practice, can be met by most farmers only with a certain minimum investment in additional facilities.

The extent to which local or State authorities make mandatory their requirements for particular types of buildings and equipment varies considerably among city milk markets. For example, the milk codes of some cities give the producer considerable discretion in determining the type of construction of a barn or milkhouse. Wash vats and hot water are not required by some city codes. In cities

with milk ordnances which follow the recommendations of the U. S. Public Health Service, suggested dairy barn and milkhouse plans provide minimum recommendations. Two-compartment wash and rinse vats, water heating facilities, and utensil storage racks are required for the milkhouse. Other requirements relate to such facilities as toilets, water supply, and cleaning and sterilizing equipment. Some cities go considerably beyond the Public Health Service recommendations in setting out detailed requirements. Detailed specifications and blueprints for the dairy and milking barn may have to be followed, including dimensions of barns, stanchions, stalls, and feed and litter alleys. Separate entrances to milkhouses (if attached to the barn) may be required. Steam or hot water sterilization and mechanical cooling equipment may be required (*13*).

Aside from special equipment needs, farmers producing for city markets frequently follow more specialized and more costly practices than those usually required when milk is produced for manufacturing uses. This is brought about either as a direct result of procedures and practices written into the milk codes or other rules enforced by public health authorities, or because farmers find it necessary to do certain things to produce milk meeting the standards for bacteria count, cleanliness, and temperature required by their codes. As in the case of investment in specific types of buildings and equipment, the codes of different cities vary considerably in the degree to which they permit individual farmers to determine the procedures necessary for producing quality milk.

Effect of Sanitary Requirements Upon Size and Specialization of Dairy Farms

The immediate effect of establishing higher quality standards for milk in any market is to raise production costs for many farmers. Some farmers who have already been producing milk of the required quality and whose farms are already equipped according to the new milk code may have no additional cost. On the other hand, other farmers will have to invest in new equipment and change their methods of dairying, which will result in higher costs per unit of output if their scale of operation remains unchanged. Some farmers will be unwilling or unable to meet the new requirements, and milk from new producers or additional output from old producers, or both, will be necessary to meet the requirements of the market. The immediate result of all this is higher marginal costs of production for the city's milk supply, requiring correspondingly higher prices to attract milk to the market. The process by which costs and prices are related to the decisions of individual producers has been described by Black (*5*, p. 163) as follows:

> * * * different producers will have different reactions to the job of meeting the standards, determined by the kind of herd and equipment they have, their available capital for making the improvements called for, the supply of family labor available, the degree of dependence upon dairying as a source of income, and perhaps more important than all else, upon their equipment of aptitudes and psychological traits and attitudes. The amount of this differential will need to be just high enough to meet the resistance of enough producers to supply the city's demand for milk and cream of these standards at the higher prices resulting * * *

Common responses of milk producers to the costs of meeting higher sanitary standards are: (a) To increase the size of their herds, and (b) to become more specialized dairy farmers. By these means, they are able to minimize the additional costs, on a unit of output basis, of producing milk under the new requirements. Dahlberg et al., conductors of a survey of city milk codes made by the National Research Council, noted that an apparently simple requirement for a wash vat and hot-water heater might be serious to small producers. It involves not only the purchase and installation of this equipment but also the problem of maintaining a suitable temperature in the milk house during the winter for washing utensils. A number of such producers must choose between dropping out of the fluid market or increasing the size of their herds sufficiently to justify the additional expense (*13*, p. 36). The authors of the Council's report noted also that the farmers supplying milk for the cities of Washington, Birmingham, and Sacramento had exceptionally large herds. They suggested that this may have been "because of the detailed, rigid regulations which required so much investment in buildings and equipment that a large output of milk was necessary to yield a profit" (*13*, p. 45).

The relationship between sanitary requirements and costs, and the effect of sanitary requirements upon the scale of dairy farms, is illustrated by the history of the St. Louis milk market during the years immediately following the adoption of a new milk ordinance on December 15, 1936.

Before 1935, there was little enforcement of regulations relating to farms supplying milk to St. Louis and new producers could enter the market without farm inspection or registration with the city health department. In response to public criticism of the quality of the milk supply, a somewhat stronger milk ordinance was passed in November 1934 and, in December 1936, a standard milk ordinance, as recommended by the U. S. Public Health Service, was adopted and funds were appropriated for its enforcement (*15*, pp. 55–57).

In 1934, there were a little more than 12,000 producers supplying the St. Louis market. By 1936, after the first efforts to raise standards through a new ordinance, the number of producers had fallen to about 10,000. After the passage of the standard ordinance and a tightening of enforcement, the number of producers declined rapidly, and by 1938 there were less than 5,000 supplying the market. By 1940, only a little more than 1,000 were left (*15*, p. 24).

Smaller producers were hardest hit by the new regulations. Producers who remained on the market or who entered the market tended to maintain larger herds to reduce costs of production per unit of output. In 1934, average receipts per producer were 97 pounds a day. By 1939, receipts per producer had more than doubled, averaging 199 pounds a day. This upward trend continued, and by 1949, daily receipts per producer averaged 300 pounds a day, or more than 3 times the average before the ordinances were adopted (*15*, p. 24).

Effect of Sanitary Requirements Upon Mobility of Producers

A distinct characteristic of the historical development of city milk markets has been the decline in ability of milk producers to change

easily between fluid and manufacturing markets. Two aspects of this decline in mobility have already been discussed: (1) Higher costs of milk production on farms, related to their closeness to the city market; and (2) the existence, in many cases, of territorial gaps between a city's fluid milk (or cream) supply area and the specialized regions where manufactured milk products are made.[11] Sanitary requirements of city milk markets are an additional factor in reducing the mobility of milk producers between fluid and manufactured milk markets.

Figure 4 shows how requirements for special construction, equipment, and procedures for farms supplying city markets, and the consequent increase in cost of production, size of farms, and degree of specialization of the dairy enterprise, restrict the ability of the operators of these farms to divert their output from the fluid milk to the milk products markets without incurring financial losses. This illustration applies to a fluid milk market where supply zones for fluid milk, cream, and butter are contiguous. Except for costs of meeting sanitary requirements, the price structure would be similar to that previously shown in figure 2–A. In figure 4, it is assumed that these costs are 50 cents a hundred pounds. The price of milk at the market will be $4.50. Producers at the outer edge of the fluid milk zone who have equipped their farms and are carrying out the procedures required to produce for the fluid market are receiving 50 cents per 100 pounds more than their neighbors who are producing unapproved milk for the cream market. Most of this price differential would be lost if the milk of such producers was either voluntarily or involun-

[11] Opportunities for relatively easy movement by milk producers between fluid milk markets are open in cases where the hauling and assembly operations of city milk supply areas overlap.

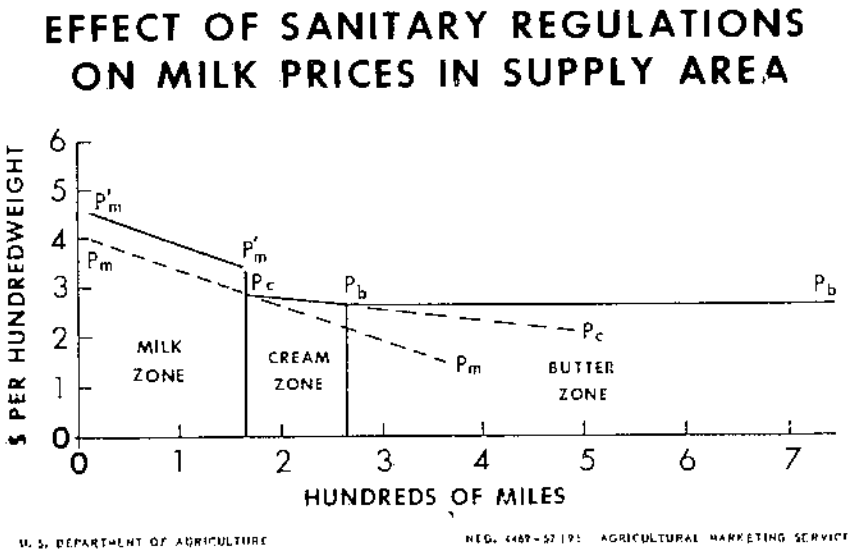


Figure 4.

tarily diverted to the cream market.[12] The same loss of differential would be added to the losses of all producers closer to the market. If the sanitary requirements applied to milk used for fluid cream as well as fluid milk, the line P'eP'c would be raised by 50 cents and the decrease in mobility between producers for the city market and producers for manufacturing uses would extend to the outer edge of the cream zone.

The more costly the requirements of the city market, the greater will be the differential, applied to the price of milk at the market, which will be reflected throughout the fluid milk supply zone. If the requirements apply to milk used in making cream, it will continue to be reflected across the cream zone, whether or not that zone is contiguous with the fluid milk zone.

Relation of Health Authorities to Sources of Supply

Health authorities may either limit the area within which farms can receive permits to supply milk for the market or may restrict the importation from other markets of supplemental supplies of milk of comparable quality. These policies may further affect the pricing structures and the economic relationships in the markets under their jurisdictions.

Limiting the area within which farms may receive permits has taken various forms. In some cities, health authorities set a certain number of miles from the city as the maximum distance they will send farm inspectors. In other cities, the State line may represent the arbitrary boundary of part of the supply area. In the Northeast, the Canadian border is the outer boundary of supply areas for New York and New England cities.

Several consequences follow from this restriction of the supply area.[13] The shape of the more natural competitive supply area may be distorted, as illustrated in figure 5. As part of the natural supply area is cut off, a depletion of supplies leads to somewhat higher prices which induce producers in the remainder of the supply area to intensify their production and which attract new producers at parts of the outer boundary of the supply area where expansion is permissible. Marginal costs of this additional supply f. o. b. the city market are somewhat higher. This has the effect of rendering all supplies for the fluid milk market less mobile in relation to supplies for the markets for manufactured milk products. Beyond the boundary where part of the natural supply area is actually cut off, supplies are completely immobilized because there can be no response of supplies, no matter how attractive market prices may be.

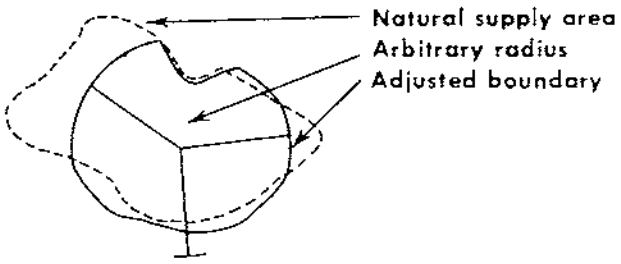
The prohibition against importation of milk or cream from other fluid markets or from other plants handling milk and cream of comparable quality has similar effects. The supply area for the market

[12] Presumably in some cases a small part of the loss of the price differential would be compensated for by cost reductions in operating procedures, as distinct from special construction and equipment requirements.

[13] Various reasons have been advanced as a basis for restrictions of this kind, among them being the high cost of making inspections beyond a certain distance. It is not the purpose of this discussion to appraise the merits of these restrictions but simply to analyze the economic consequences which result from their operation.

Effect on Boundaries

ARBITRARY LIMITATION OF MILK SUPPLY AREAS



U. S. DEPARTMENT OF AGRICULTURE NEG. 2470-57 F AGRICULTURAL MARKETING SERVICE

Figure 5.

which restricts supplemental supplies in this way is necessarily larger or production within its boundaries more intensive than it would be without the restriction; marginal costs and prices are higher; and an additional factor is introduced to make supplies less mobile between markets. Bredo and Rojko, in connection with a study of milk markets in the northeastern part of the country (7, p. 76), reached a conclusion bearing on this aspect of sanitary regulations:

> Lack of uniformity in quality standards and in the mutual acceptance of inspections has especially hindered the movement of cream and to a lesser extent the movement of milk between the Midwest and the Eastern markets. There would appear to be a need for the establishment of recognized quality standards and their acceptance either by common agreement or through national legislation to facilitate interregional and intermilkshed movements of supplies.

Where local health authorities require that milk used for making cream or other milk products supplied to the city market must come from farms covered by local inspectors, the consequences may be to change entirely the location of the supply zone for that product. The situation is illustrated in figure 6. Before the adoption of such a policy, we assume that a market, located in a deficit milk region, was supplied with milk from a zone 0–160 miles from the market and with cream from a zone 310–385 miles distant. After adoption of the regulation, milk for use as cream is supplied by local producers in a zone adjacent to the fluid milk zone. The cost of producing milk in this latter zone is higher and market prices of cream also will be higher. Another competitive link between the city market and the markets for manufactured milk products would be weakened through this type of restriction.

In a Deficit Milk Region

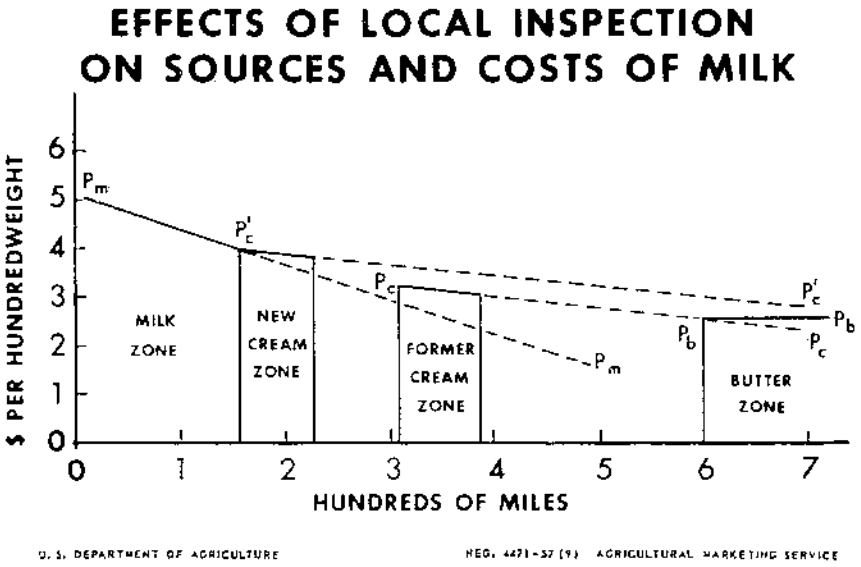


Figure 6.

CHAPTER II.—INSTABILITY OF PRODUCER RETURNS AND THE DEVELOPMENT OF CLASSIFIED PRICE PLANS

The Surplus Problem in Fluid Milk Markets

Although producers supplying city milk markets were forced, by the developments described, to incur higher costs, and were less able to shift from one market to another, they were not always able to obtain a dependable return for their milk to compensate them for these higher costs. Several factors contributed to the instability of producers' returns, including the nature of the product itself, and their impact became manifest in the growth of what has been termed the surplus problem.

Essentially, the surplus problem in fluid milk markets amounts to this: It is characteristic of fluid milk markets, primarily because of the perishable nature of the product and the unsynchronized movements of supply and demand, that not all of the milk produced for sale as fluid milk can be sold for that use. The market value of milk for fluid use, for reasons previously described, is higher than its value for manufactured milk products. Therefore, the use of part of the milk supply for manufactured products, or purposes other than fluid milk, represents a salvage use whose allocation becomes a matter of concern to distributors and producers. If a distributor is paying for his milk at a single price, it is to his best interest to handle as little as possible of such surplus milk because it reduces his rate of profit on his total milk operations. The producer, for his part, is concerned that the efforts of distributors to minimize their surplus milk operations do not result in his being cut off the fluid market for certain periods of time or, perhaps, in depressing temporarily the price of his milk to the level of its alternative value for manufacturing uses at nearby plants.

Under fully competitive conditions and with uniform sanitary requirements for milk for all uses, seasonal fluctuations in the volume and cost of milk supplies would cause seasonal changes in prices and in the location of supply zones. Seasonal fluctuations of milk prices in the fluid market might not be very much greater than the fluctuations of prices of milk for manufacture. Although the demand for fluid uses is not very responsive to price changes over a short time, small changes in the price relationships between the fluid and manufacturing markets would provide the incentive for the required shifts in supplies between them. Thus, in most markets, the radius of the zone from which producers would ship to the fluid market would be at a minimum during the spring and early summer and would expand to a maximum during the fall and early winter. Black estimated that a city requiring about a 50-mile zone for its fluid milk supply, and located in a butter-producing region, might require an area with a radius of 60 miles in November and of 41 miles in June (*5*, p. 185).

All of this presupposes an easy shifting of supplies at the outer edges of the fluid milk zone. It is based on a market where contiguous zones exist for milk for different uses, where alternative facilities are available to producers in the outer portion of the fluid milk (or fluid cream) zone, and where the sanitary requirements are the same for all uses.

We have traced the developments which, in practice, prevent this type of mobility of milk between markets. During the flush period of production, the supply of milk in excess of fluid requirements is not diverted to manufacturing outlets. It backs up, creating temporarily a large excess of supplies in relation to demand. Because demand responses of distributors and consumers to price changes are small over a short time, even a rather large seasonal price differential is not sufficient to clear the market. The result, in the absence of producer organizations and price plans adapted to these special conditions, is likely to be highly unstable pricing of milk at the producer level and insecurity of status as suppliers of the fluid milk market on the part of producers, especially those whose farms are more distant from the city.

How the problem of surplus milk becomes of increasing concern to producers supplying a fluid milk market in the course of a market's growth may be shown by the following considerations. Taking as an example a small city market, in a dairy region, but not within a large city milkshed, it is apparent from the previous analysis of price relationships that, in the absence of special quality requirements, milk would have about the same value for all uses. It would therefore be of little concern to producers whether their supplies went for use as fluid milk, as cream, or in making a manufactured milk product.[14]

As the population of the city market increases and the supply zones for fluid milk, cream, and milk products become differentiated, this equality of values of milk for use as fluid milk or for other uses ceases to exist except at the outer edges of the milk zone where the values of milk for use as milk and cream are the same. All producers in other parts of the fluid milk zone would stand to lose by being cut off the fluid milk market and their loss, as previously described, is inversely related to their distance from the city.

With the application of special quality standards, the potential losses sustained by producers in all parts of the milk supply area through temporary or permanent exclusion from the fluid milk market are increased. The existence in the market of milk which is not sold to consumers as fluid milk becomes more of a threat to producers as their dependence on the fluid market increases. Even if producers are not cut off the fluid market, their individual bargaining position with distributors becomes seriously impaired, especially during seasonal peaks of supplies when the proportion of surplus milk on the market is likely to be highest.

The situation is aggravated by the practice which had developed in some large city markets, for distributors to maintain the prices of milk to consumers during the season of flush production at the

[14] In deficit dairy regions, some differentiation of values between milk for fluid and manufacturing uses occurs even in small city markets if milk products may be shipped to the market at a lower price than could be met by a local plant relying on supplies of milk in the vicinity of the city.

same, or close to the same, level as they charged during the season of short production. Thus, consumers had little price incentive to consume more milk during the flush season although prices which distributors paid producers might drop considerably.

Increase in Scale of Distributor Operations

Simultaneous with the increase in size of fluid milk markets was the growth in size of operations of the leading dealers in each market. Small dealers continued to engage in the business of milk distribution, and in most markets a number of producers whose farms were relatively close to a city also engaged in milk distribution, but a growing proportion of the total business became concentrated in the hands of a few distributors. Under these circumstances, most producers in the market found themselves dependent on one or the other of these distributors as the sole available outlet for their milk. This was particularly true of producers whose farms were some distance from the city and whose milk had to be handled through a country receiving station owned by one of the larger dealers, or who were dependent on a hauler who acted as agent for a single dealer.

This unequal situation of many sellers competing in the sale of their product to one distributor was a cause of insecurity for producers and, under the conditions of milk marketing previously described, provided an opportunity for their economic exploitation. A tendency was already well under way in many markets for the largest dealers to exercise a considerable degree of monopoly [15] control of buying policies and prices, because of their dominant position in the market. Even the presence of more than one distributor in the market for the producers' milk did not necessarily mean that the distributors would bid competitively to get it. According to Gaumnitz and Reed, before the organization of producers into collective bargaining units, most producers felt that they were forced to sell their milk to city distributors under what practically amounted to a buying monopoly (*16*, p. 21).

It may be noted that this situation was developing during the same period when the other changes in fluid milk marketing were making it less possible for producers to shift from the fluid milk market to the manufactured milk market and when the growing importance of surplus milk (as markets grew in size) was providing distributors with a powerful bargaining argument. The situation in the Washington, D. C., market, before the organization of producers, has been described (*35*, p. 10) in the following terms:

> Periodically and without warning or cause distributor "A" would call a conference with several other distributors in the market and agree that they were paying too much for milk. The next day each distributor involved would send a form letter to a number of his producers to the effect that beginning tomorrow he could no longer accept the producer's milk. Each producer who received such a letter would be in Washington the next day to find out why the distributor would not accept his milk. The distributor would explain that he had too much milk to meet his daily needs and that he simply had no use for the producers' milk. The producer would then immediately go to every distributor in town trying to place his milk. Each distributor would tell him the same story.

[15] The term "monopoly" is used throughout this report in a technical sense consistent with modern economic usage. See appendix A.

Finally, in desperation, the producer would go back to his original distributor and offer to sell his milk at any price. The distributor would, reluctantly it seemed, offer the producer about 4 or 5 cents per gallon less than he had been receiving, and the producer, having no alternative, would accept. The net result of these simple operations being, that the distributor had his milk and producers continued to sell their milk, but for considerably less money.

Growth of Producer Organizations

The efforts of producers in fluid milk markets to organize was a logical response to the situation in which they found themselves as a result of the changes in the marketing structure previously discussed. These changes created problems for producers which made their economic well-being and, for many of them, their very survival as milk producers dependent upon their ability to organize. They were caught between two trends. One was the growing differentiation of the milk supply for each city market from the supplies for other city markets and from the supplies of milk used for manufacturing purposes. This required special financial and other commitments by farmers who wanted to qualify to produce milk for a particular city market. Once having qualified, they became dependent upon the stability of prices offered in that market and upon the continued acceptance of their milk by that market. The other trend, the growth in size of dealers, was putting producers in an increasingly precarious position in bargaining with them for prices of a perishable commodity under circumstances where they were required to supply a surplus above distributors' fluid resale requirements. Thus, city markets were becoming less desirable to producers from the standpoint of providing continuous markets for their milk at stable prices, while their dependence on these markets in this respect was becoming greater.

The degree of pressure for organization had to be great to overcome the traditional individualism of producers in most sections of the country and to drive them to make the sacrifices inherent in attempts at organization.[16] In most markets, several unsuccessful attempts at organization were required before producers succeeded in building a strong organization capable of surviving in the face of opposition by dealers and the apathy of many producers.[17]

Efforts of milk producers to improve their economic situation through organization led to the development of several different types of cooperative associations. One is the purely collective bargaining association which acts as the agent for its members in price negotiations with dealers. This type of association does not usually handle any of the milk of its members, and payments are made by dealers

[16] In some sections, farmers who had migrated from Scandinavian countries carried with them a certain amount of experience and psychological acceptance of cooperation. Undoubtedly the pressures toward organization were greatest during periods of market adjustments which created abnormal degrees of price and market instability. Such periods included the immediate years after World War I and the depression years of the early 1930's.

[17] Dealer opposition and the apathy of certain producers were not always unrelated problems facing those producers who were attempting to organize. It was not an unusual tactic for dealers, opposing a producers' organization, to pay unorganized producers a few cents more than the price which organized producers received through collective bargaining. This reduced the incentive for unorganized producers to join the organization and, at the same time, weakened the position of the organization in its price negotiations with dealers.

either directly to association members at the prices and conditions arranged for with the association, or to the association, which redistributes them to its members.

Producers in some markets acted to improve their economic condition still further through the operation, by their cooperative associations, of plants for processing surplus milk into manufactured products. This helps an association to strengthen its position in negotiating with dealers for prices of milk for fluid uses and affords an opportunity to increase the return on that part of the supply which is not sold for fluid uses.

In some markets, producers' associations actually entered the field of distribution of milk to consumers and retail outlets. Such operations were stimulated by a belief on the part of many producers that too large a proportion of the price paid by the consumer was going to the "middleman" and that the competition of producers themselves through their organization would serve as a yardstick to fair margins for dealers. In some cases, these distributor operations by producer organizations were a direct answer to dealers who refused to recognize and bargain with the new producer organizations. This type of producer association may also act as sales representative for that part of its members' milk which it does not itself distribute or process.

Producer associations of all three types usually perform a number of other services for their members. Among the most important of these are checking of the weights and tests of producers' milk as reported by dealers, and arranging for the collection and hauling of milk. Other services frequently performed are the furnishing of market information to members, insuring the payment to them of sums owed by dealers, and acting as agents for members in the purchase of farm supplies and equipment.

The Development of Classified Pricing

The central problem faced by the new organizations of milk producers was that of disposing of all the milk of their members and returning to them the best possible prices. For those bargaining associations which did not possess manufacturing facilities, this meant that they had to find some way of inducing dealers to buy the total supply available at all times without allowing the existence of milk in excess of fluid requirements (surplus milk) to depress the price of the rest of the supply. The problem has been expressed by Gaumnitz and Reed (*16*, p. 29) as follows:

> Perhaps the most fundamental difficulty in pricing milk to distributors on a flat-price basis is found in the fact that distributors tend to vary widely as regards the proportion of milk sold in each use. . . . Cooperatives, in bargaining for flat prices, found that two major difficulties confronted them. These were: (1) If they bargained for a flat price . . . the distributor who utilized a higher proportion of his receipts in fluid form than the average for the market would be placed at an advantage as compared to the distributor who utilized a lower proportion than the average; and (2) under the flat-price system distributors who utilized a significant proportion of their total receipts in product form tended to cut off producers in order to bring their receipts and fluid milk sales into closer adjustment, or refused to bargain with the cooperatives.

As a solution to this problem, representatives of associations proposed that each dealer show producers the exact amounts of producers' milk disposed of for different uses and that he pay different prices

for the different categories of uses. This became known as the classification plan of payment for milk. Under this plan, that part of the milk used in making products which had to be sold in competition with similar products made outside the local fluid market was priced accordingly. This gave the cooperative a freer hand in negotiating for prices on that part of the supply which was sold for fluid purposes. The market for this milk was comparatively noncompetitive with outside supplies.

The acceptance by dealers of classified pricing, in principle, left serious practical problems for cooperatives, the most important of which were: (1) The necessity of assuring the accuracy of reports of utilization by distributors, and (2) the extension of the classified pricing system to sales made by producers who were not members of the association, to prevent a breakdown of the system through price cutting. Progress of producers' associations in solving these subsidiary problems served to strengthen their position as bargaining agents for producers and to increase the effectiveness of the classified price plans in their markets.

Classified pricing has had effects in city milk markets which were more far-reaching than the achievements of the objectives which led to its adoption. In most markets, classified pricing has had an important bearing upon the competitive relations among dealers, upon relations between dealers and producers, upon different groups of producers, and upon consumers. Some of the most important effects of classified pricing have been related to its application as a means of increasing the returns of producers through the diversion of milk from the fluid to surplus milk markets. Analysis of this aspect of classified pricing is a primary concern of this report. However, we should not lose sight of the functions of classified pricing, already described, which were a direct outgrowth of the historical evolution of fluid milk markets. These functions continue as essential elements of classified price plans in fluid milk markets.

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CHAPTER III.—IMPLEMENTATION OF CLASSIFIED PRICE PLANS

Need for Supporting Devices

The need for various supporting devices is inherent in the nature of classified pricing. A classified price plan involves the payment by handlers of at least two different prices for milk supplied by producers. Some arrangements must be made for pooling these payments and computing prices to producers grouped on some prearranged basis. Because it is a plan of selling milk by producers to handlers in accordance with the manner in which the milk is used, some means is required also to assure correct reporting by handlers of how the milk is sold, processed, or otherwise disposed of. Further, a classified pricing plan must usually rely upon some kind of enforcement authority. The enforcement authority may be exercised by one or more producers' associations and some or all of the handlers in the market. Because this type of authority is not effectively exercised under adverse economic conditions and because of legal obstacles to industry administration and enforcement, governmental agencies have been called upon to carry out these functions in most of the larger fluid milk markets during the past 20 years (*17*, p. 87).

Kinds of Producer Price Pools

The marketing device most closely associated historically with the selling of milk under a classified price plan is the pooling of proceeds of such sales by producers. Producer price pools in city milk markets came into use with the formation of producers' cooperative marketing associations and their introduction of classified price plans as the basis of selling milk to handlers (*32*, p. 3). Pooling is the arrangement for combining the payments made for milk at different class prices, and averaging them so that each producer in the group covered by the pool receives payment on the same basis. The average or blend price under a pooling arrangement is sometimes referred to as the uniform producer price. It is, strictly speaking, a uniform basis for payment to producers participating in the pool rather than a uniform price actually received by producers. The price received by a producer is the blend price computed from the pool, plus or minus differentials based upon the butterfat content of his milk, the location in the milkshed where his milk is delivered, and perhaps other factors. If a base-rating or other type of program for influencing the volume of marketings, seasonally or otherwise, is in operation, further differences are introduced in the returns received by individual producers participating in a pricing pool.

There are numerous ways in which producers supplying a fluid milk market may be grouped for pricing purposes. A marketwide pool is the broadest type of pooling arrangement within the confines of the

fluid market. In a marketwide pool, all producers participate who are supplying distributors of fluid milk in the market. The average or blend price computed from this type of pool provides the basis upon which all producers in the market are paid. This is the most common type of pool used in the markets under Federal milk marketing orders. Of the 56 markets under such orders on April 1, 1955, 42 had marketwide pools and these accounted for 87 percent of producer deliveries in all the markets (*41*, pp. 4 and 57).

Pricing pools may conceivably encompass a broader group of producers than those who supply a single fluid market. The producers supplying fluid milk markets within an entire region, or even all producers supplying both fluid and manufacturing markets within a region, could conceivably be covered. In the latter case, a differential for higher sanitary standards of the milk produced for the fluid markets might be added to the various other differentials applied to the blend price computed from the total pool payments by handlers.

Within a fluid milk market, pooling plans may group producers for pricing purposes on a narrower basis than the entire market. The pool basis for California markets, adopted by the State department of agriculture, is the individual plant to which the producer's milk is actually delivered. Thus, if a handler operates more than one plant, his producers would be grouped for pooling purposes on the basis of the plant where the producer's milk was received, and the blend price would be computed for each of these groups in accordance with the class utilization of each plant's milk (*11*, p. 85). Outside California, the two most common forms of milk price pooling, in addition to the marketwide pool, are the association pool and the individual handler pool.

Association pools usually include the members of a producers' association who supply a fluid milk market. In some cases, such pools may include members who regularly supply different fluid markets or even some members whose milk may be produced for manufacturing rather than for fluid outlets. The basis upon which participating producers are paid is a weighted average of the class prices paid by handlers who purchase milk from the association. When a producers' association comprises almost all the producers for a fluid milk market, the association pool approaches a marketwide pool in scope. The existence of even a small minority of producers who are not included may, however, have considerable bearing on the operation of a classified price plan.

An individual-handler pool includes all of the producers who ship milk to a particular handler operating in the fluid milk market. In a single fluid milk market, there might be a number of such pricing pools. In each pool, the basis upon which participating producers are paid would be a weighted average of the class prices paid by the handler to whom the producers shipped their milk. There might then be as many different average or blend prices in the market, as bases for producer payments, as there were handlers.

In markets where individual-handler pools are operating, one or more association pools may operate simultaneously. A producer who did not belong to an association would be paid on the basis of the blend price computed from the class utilization of the handler to whom he sold his milk, while a member of an association would be paid on a

blend price computed from the class utilization of all the handlers to whom the association sold milk produced by its members. This is the arrangement in some markets under Federal milk marketing orders where individual-handler pools are used.

Private Arrangements for Administration of Pricing and Pooling Plans

Classified pricing is sponsored primarily by organized producers, but, in the absence of governmental controls, the plans can be adopted and carried out only through the same collective bargaining procedures as are followed in the negotiation for single or flat prices. In any given market, this is likely to mean that the classified price plan must be mutually acceptable to organized producers and to those dealers who are in the strongest competitive and bargaining positions.

The application of a classified pricing plan to any handlers who do not want it must, in the absence of governmental control, rely on the economic power and influence of organized producers and those handlers who do want it. Economic power may be exercised directly, for example, through the ability of a producers' organization to withhold or divert supplies of milk from handlers, or through the ability of larger handlers to concentrate on reducing the share of business of a recalcitrant handler by offering discounts or other incentives to his customers. Indirect power has at times been exercised through the media of local health authorities or labor union. In some cases, important services required by handlers, such as the use of bottle exchange facilities or facilities for processing milk, may be withheld as a means of bringing them into line (*3*, p. 64).

The first classified price plans in some fluid milk markets were made a part of agreements developed in the mediation of price disputes between producers' organizations and dealers. Dr. Clyde L. King, a university professor, gained a nationwide reputation as an arbitrator of price disputes in city milk markets during the period after the first World War. Dr. King's work extended well beyond the limits of simple arbitration. His ability to bring together the disputing parties in a spirit of mediation led to the development of so-called "arbitration awards" which actually were industry agreements of a more formalized nature than producers' organizations and dealers had been able to arrive at before the price disputes. Other persons followed in the path of Dr. King as arbitrators in city milk markets, using much the same approach.

These agreements included some of the early classification and pooling plans. They usually attempted to set up some form of administrative apparatus through a committee of dealer and producer representatives. These committees sometimes gave their attention to other matters, such as the promulgation of fair trade practices and the setting up of rules for admission of new producers (*17*, p. 7).

Breakdown of Private Controls

Producers did not succeed in holding the gains toward price stability and security of market status which they had achieved through organization and the establishment of classified price plans. This was in part due to problems of administration, especially those con-

nected with the need for accurate reports from handlers on utilization, supported by proper audits of their books and records. A more serious defect in producers' efforts to equalize their bargaining position without outside assistance was, however, their inability to extend classified pricing to entire markets. The classified pricing plans developed by some of the producers' associations before 1930 were able to operate with a fair degree of effectiveness with association-type pools or with individual-handler pools restricted to handlers who were buying from association members. With the advent of the depression of the 1930's, however, this program was unable to survive the severe economic stresses upon the market structures.

In the first stages of the depression, when falling demand for fluid milk led to abnormal surpluses in fluid milk markets, producers' associations which had developed classified price plans attempted to use them as a prop to support the sagging returns of their members. They did this by maintaining the levels of Class I prices at a time when the prices of milk products, as well as the general level of prices for commodities, were falling. In some markets, during this period, classified pricing was first adopted as an outcome of arbitration, and it was a means of providing returns to producers which were more in line with their demands while making it possible for dealers to pass on part or all of the extra costs to consumers.

As the depression became deeper and the demand for milk continued to fall, these pricing policies accentuated the surplus problem by further curtailing the fluid milk market. During the early thirties, milk prices in fluid milk markets did not decline to the same extent as prices of manufactured dairy products or prices of foods in general. Black, noting that the lag in the decline of retail milk prices was more pronounced than in the 1920–21 period of falling prices, attributed this "to the more complete organization, especially on the production side of the fluid milk industry, now than then" (*5*, p. 80).

By 1931 and 1932, price cutting at both resale and producer levels began to undermine the pricing structures developed by the producers' associations and the handlers who bought milk of association members. In spite of efforts to patch them up, these price structures eventually collapsed. It is probably true that the classified pricing and pooling plans developed by organized producers and handlers would have broken down in any case. They were not broad enough in their coverage to deal with the abnormal surplus situations which developed in fluid milk markets, nor were their means of control sufficiently effective to deal with extreme abnormalities of excess supplies in relation to effective consumer demand. Nevertheless, the pricing policies applied through the classified price plans in the beginning of the depression, which were designed to protect producers, undoubtedly contributed to chaotic conditions in fluid milk markets when these policies could no longer be carried out.

Government Regulation of Marketing

Under the weight of the economic depression, all efforts by producers and dealers in city milk markets to shore up their collapsing price structures were unsuccessful (*17*, p. 11). Requests were made to State and Federal governments for assistance in reestablishing more orderly

marketing conditions as a basis for more stable milk prices. The requests from representatives of dairy farmers and dealers in city markets for governmental aid were quite similar to requests being made at that time by almost every segment of agriculture and industry. National Recovery Administration (NRA) codes in industry and crop or acreage controls in some branches of farming were part of the Federal Government's response to these requests.

By 1933, the Federal Government and some States began preparations for regulating prices and marketing practices in city milk markets. Between 1933 and 1935, 17 State laws were passed providing for control of the prices of milk as sold by farmers and as resold by dealers. Some additional States tried controls of milk prices at some time or other during succeeding years. By 1954, 16 States retained price controls in fluid milk markets, 4 of which confined their efforts to producer prices (*34*, p. 81).

Federal efforts in relation to regulation of fluid milk markets were first authorized by the Agricultural Adjustment Act of 1933. This act authorized the Secretary of Agriculture to enter into marketing agreements with producers' associations and handlers and to issue licenses to regulate the conditions under which handlers might operate in particular markets. The Secretary used this authorization to enter into agreements and to issue licenses in a number of fluid milk markets. These had the effect of regulating milk prices at producer and resale levels. Regulation of resale prices was abandoned as a matter of policy early in 1934. In 1935, the Agricultural Adjustment Act was amended to provide for a Federal order system of regulation which has continued to the present time. The part of the act providing for Federal orders was amended and reissued as the Agricultural Marketing Agreement Act of 1937.

In 1956, more than 180,000 farmers sold 30 billion pounds of milk to purchasers who were required to pay the minimum prices established under these orders. One-third of the milk sold wholesale by farmers was marketed under the terms of 67 orders in May 1957. The population of these market sales areas represented about half the urban population of the country. A substantial additional population outside the defined sales areas also is served to some extent from the supply of milk sold under the orders (*47*, p. 6).

Extension of Association Pools to Marketwide Pools

The Federal programs for regulating the marketing of fluid milk have applied classified price plans to entire markets. In some of these markets where classified pricing was already in operation, under agreements between the producers' associations and the handlers to whom they sold their milk, the Federal orders (or their predecessors, Federal licenses and agreements) extended this method of pricing to the remaining handlers in the markets. In other markets, where all milk had previously been sold to handlers on a single-price basis, the Federal orders introduced classified pricing as a required method of paying for milk.

More significant economically than the extension of classified pricing brought about by Federal regulation was its sponsorship of marketwide pooling. This provided a basis for carrying out pricing arrangements between producers and handlers during the period of

emergency brought on by the depression. Classified pricing with association pooling had collapsed in those markets where it had operated. There was no prospect of restoring these arrangements as long as heavy surpluses of milk were pressing for outlets on the fluid market. These surpluses made it possible for nonparticipating handlers to buy their supplies at prices comparable to average prices of the association pool and to undersell handlers buying from the association by a considerable margin (see ch. X). This was the condition which led handlers to break off bargaining relations with producers' associations, and it was unrealistic to believe that this type of marketing structure could be relied upon, even under governmental sponsorship, to restore orderly marketing conditions and improve prices for producers during the emergency.

The solution to the problem was the extension of the association pools to the entire markets in which they were operating. This required all handlers to pay the same price for milk for fluid distribution and equalized payments to producers supplying the market. The adoption of classified pricing with marketwide pooling, under the circumstances, brought about a decisive change in the competitive relationships among handlers, especially between the specialized fluid milk operators and those handlers who were processing the market's surplus milk. It did this under slogans of "sharing the burden of surplus," "creating equity among handlers," and restoration of "price stability."

Economists have referred to marketwide pooling as a device which has grown out of the bargaining arrangements (including classified pricing) developed by producers' associations and handlers. This is, of course, quite true insofar as marketwide pooling is simply an extension of association pooling. This extension, however, marked a change which was qualitative as well as quantitative. Equalization of producer returns achieved an objective which organized producers had long sought, and it raised no serious objections from unorganized producers. However, marketwide pooling caused an important change in the competitive positions of many handlers. Those with a relatively high proportion of fluid milk sales had to make payments to an "equalization fund" to be drawn out by handlers with relatively low proportions of fluid sales, so that all producers could be paid a uniform price.

There was, therefore, vigorous opposition to the introduction of marketwide pooling by some handlers with high proportions of fluid milk sales. Most of these were operating on a small scale and believed that they owed their survival in competition with large handlers to lower overhead costs and their ability to avoid carrying a large percentage of surplus milk. Many of them felt that they were being penalized because they were price cutters (*17*, p. 35).

The identification of small dealers as price cutters was of some significance. In the period of the depression, when Federal regulation of milk marketing came into being, a virtual crusade against price cutting was taking place in almost all phases of the economy. In industry, this was given legal sanction through the NRA codes where "competitors" were encouraged to agree on minimum prices for their products and to establish so-called fair trade practices. Widespread public support developed for the restoration of a certain measure of retail price stability as essential to economic recovery.

This general support extended to the application of classified pricing and marketwide pooling in fluid milk markets, and created an unsympathetic attitude toward firms which might be hurt, especially when these firms were traditionally most competitive in their markets.

Retention of Marketwide Pooling

Because classified pricing with marketwide pooling carried out basic objectives of organized producers and provided a method of payment for milk which was advantageous to some of the larger handlers, there was strong support in the industry for retaining, beyond the period of the economic emergency, the regulatory programs which provided these features.

Opposition to marketwide pooling came, in most markets, from those handlers who had to make payments into the equalization pool. Court actions initiated by the Federal Government were necessary to obtain compliance by violators of the orders. The U. S. Supreme Court, in June 1939, decided the constitutionality of marketwide pooling in fluid milk markets, in a 5-to-4 decision, rendered in the Rock Royal Case (*42*).

The Court stated with reference to the defendant's objection to marketwide pooling:

> The defendant's objection to the equalization pool, here considered, is to the alleged deprivation of liberty and property accomplished . . . by the pooling requirement in taking away from the defendants their right to acquire milk from their patrons at the minimum class price, according to its use, and forcing the handlers to pay their surplus, over the uniform price, to the equalization pool instead of to their patrons. This argument assumes the validity of price regulation as such, but denies the constitutionality of the pooling arrangement because handlers are not at liberty to pay the producer in accordance with the use of the producer's milk but must distribute the surplus to others whose milk was resold less advantageously.

It is probably in part attributable to the complexities of the milk marketing process, especially that of the New York milk market where this litigation occurred, that some of the more subtle economic questions associated with marketwide pooling were not dealt with in either the Court's opinion or in the opinions of the dissenting justices. No reference was made to the essential differences in the operations of handlers which might require different proportions of surplus milk nor to the possible effects of equalization upon the total competitive structures of fluid markets.

The Court, in its opinion upholding the constitutionality of marketwide pooling, stated: "The pool is only a device reasonably adapted to allow regulation of interstate markets upon terms which minimize the results of the restrictions. It is ancillary to the price regulation, designed, as is the price provision, to foster, protect and encourage interstate commerce by smoothing out the difficulties of the surplus and cutthroat competition which burdened this marketing . . ." The Court went on to relate its decision to other decisions dealing with limitations of marketing of commodities and upholding other pooling devices for equalizing risks.

Administration and Enforcement

In addition to extending classified pricing and pooling plans to entire fluid milk markets, the Federal orders provided a means of

effectively administering and enforcing these and related provisions. The terms of each marketing order are carried out by a market administrator appointed by the Secretary of Agriculture. The expenses of his office are met by an assessment on handlers. Each order provides for periodic reports by handlers of their utilization of milk, and these are verified by a periodic examination of handlers' books and records. The market administrator is responsible also for investigation of complaints and of violations.

Violators who cannot otherwise be brought into compliance with the terms of the orders are prosecuted through the courts. The somewhat shaky position of the earlier legislation, under which the first licenses and agreements were issued, made successful prosecutions of violators difficult and encouraged widespread violations in many markets. Since the revision of the earliest legislation, the essential features of the Marketing Agreement Act of 1937 have been tested and upheld in the courts, and enforcement of the orders has become effective.

Devices to Support the Market Concept

The application of Federal milk marketing orders to city milk markets and the establishment of classified pricing and, in many cases, marketwide pooling involve a commitment to the concept of distinct and separate fluid milk markets, the development of which was traced in chapter I. On the basis of this concept, handlers participating in the defined market are required to pay class prices for milk and to observe regulations with respect to price differentials, reporting, accounting, and other matters, including payment of the costs of administration of the order. Also, on the basis of the concept of a distinct market under regulation, producers supplying these handlers receive payments computed in accordance with the provisions of the orders.

The world of economic reality is never as neat and precise as the concepts of economic theory. Movements of milk into and out of the defined market areas show that the concept of separate and distinct fluid markets is a relative one only. Less direct, but important, relations between fluid markets and between fluid and manufacturing markets are also maintained through the pricing and movement of manufactured milk products.[18]

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[18] Federal regulation of fluid milk markets is based in part upon some of these more subtle interrelationships of markets which give the commerce in milk its interstate character. In a decision relating to the Columbus, Ohio, market, where petitioning handlers urged that their milk market was intrastate in character and therefore not a proper market to be regulated by a Federal order, the judicial officer of the U. S. Department of Agriculture pointed out: (1) That substantial amounts of milk handled by them are disposed of outside of the Columbus market as milk or milk products in competition with milk and milk products outside of Ohio; (2) that the milk supply for the Columbus market is obtained from a production area devoted primarily to the production of milk for manufacturing products that are sold throughout the Nation; and (3) that conditions in the fluid market have a dominant influence upon the prices paid for all milk in the area. The judicial officer concluded from these observations: "The economic reality is that any considerable decline in prices or shrinkage in consumption on the Columbus fluid market would have quick and drastic effects upon the marketing of manufactured milk in the production area and the prices to the producers of this milk" (14).

To supplement classified pricing and marketwide pooling in a particular fluid milk market, it is necessary therefore to deal with movements of milk which violate the concept of a separate and distinct market. Handlers who are primarily engaged in the manufacture of milk products may find it advantageous to participate in the marketwide pool of the regulated fluid market by selling a small amount of milk in that market. Aside from this somewhat artificial inducement, some plants are strategically situated in the supply area so as to be in a position to sell milk in either the regulated market or in one or more other markets. In addition, some handlers in the regulated market may have, or wish to develop, sales in other markets.

These movements of milk, both actual and potential, between markets vary in both volume and direction with changes in conditions. They are related particularly to: The seasonal requirements for supplies on the part of each of the markets involved; periodic shortages or excesses of a nonseasonal nature, such as those associated with changes in general economic conditions; technological changes in the collection, shipment, and distribution of milk; and changes in sanitary requirements or in reciprocal arrangements with respect to such requirements.

Among the devices used in Federal orders for dealing with these movements are: (1) Performance requirements for plants as a condition of participation in the marketwide pool, (2) allocation rules to determine the classification of "pool" milk when it is intermingled with "nonpool" milk, and (3) compensatory payments required to be made into the pool by regulated handlers who receive "nonpool" milk.

Performance requirements for plants relate to such matters as the proportion of milk sold in the marketing area or the availability of the plants' milk when required by handlers in the market. Unless the plants meet the requirements, they are not considered "pool" plants, and producers supplying them cannot participate in the equalization of payments under the marketwide pool. Allocation requirements typically call for the classification by a handler of his entire receipts of pool milk in the higher priced use classes in preference to any milk which he may receive from sources outside the market which is unpriced and not pooled. Compensatory payments are amounts of money which regulated handlers are required to pay into the pool for that portion of unregulated milk used in specified classes, usually involving uses which are required to have health department approval.

The object of all these devices is to shore up or protect the classified pricing and marketwide pooling arrangements in the regulated market. Through these devices, efforts are made to distinguish between the regular, dependable supply of milk for the market and irregular, unpredictable movements which might disrupt the pricing and pooling arrangements and cause returns to "regular" producers to be diminished. They may also be a means of supporting the concept of the market area by giving priority, when supplies are short, to handlers' requirements for serving the regulated market over handlers' requirements for serving other markets. Finally, and sometimes in conjunction with carrying out the above objectives, these devices may prevent capricious efforts of handlers to participate in the marketwide pool for their own advantage without fully performing their functions as handlers in the market.

Considerable controversy has centered around these devices as possible barriers to movement of milk to the markets where it would be most effectively utilized. That these devices do affect the movement of milk is beyond question --indeed, by their very nature they cannot help doing so in most cases. But this can be said of other features of regulation, including the pricing and pooling processes themselves, to which they are merely supplementary. A report of the U. S. Department of Agriculture, "Regulations Affecting the Movement and Merchandising of Milk," says of performance requirements for pool plants: "Assuming that classified pricing and pooling of milk are necessary and desirable, performance requirements also are justified on the basis that they are necessary regulations to maintain market pools." The report indicates, however, the possibility of abuse of this feature: "Granting their necessity, there are, nevertheless, circumstances under which performance requirements may go beyond offsetting the tendency of the equalization feature of marketwide pools to attract pool-riding plants" (*40*, p. 52).

Similar comments might apply to the other devices h re discussed. All of them must be evaluated as part of the system of classified pricing which they are used to support. The strains a d stresses of their application, as reflected in volumes of milk held o the market, penalties on legitimate dealer operations, or other factors, may become severe under certain conditions. If so, amelioration must be sought in examination of the manner in which classified pricing and pooling are applied to the particular fluid market where these symptoms appear.

CHAPTER IV.—CLASSIFIED PRICING AS A FORM OF PRICE DISCRIMINATION

Price discrimination is the term applied to any practice whereby a seller sells a homogeneous commodity at the same time to different categories of purchasers at different prices.[19] By this means, the seller exerts some influence over the apportionment of his output among categories of buyers, for the purpose of increasing his returns.

Classified pricing is thus a form of price discrimination. It may be applied with the limited objective of apportioning output among buyers on the basis of use so as to stabilize returns of producers. In this case, seasonal excesses of supply are diverted from the fluid market to avoid depressing producer prices on that market (see p. 22). On the other hand, classified pricing may be applied with the object of controlling the allocation of milk supplies between the markets for fluid milk and for milk products so as to enhance the total returns of producers on a year-round basis.

Our analysis deals with the application of classified pricing for each of these purposes and the economic tendencies and consequences which result. As a preliminary, we shall discuss the prevalence of price discrimination in modern economic life, the prerequisite conditions for its practice, and some of the special features of classified pricing which limit its application for the purpose of enhancing producers' returns.

Examples of Price Discrimination

The practice of price discrimination is more common than may be generally supposed. A few familiar examples may be cited: (1) It is the accepted custom among doctors to charge different prices for their services to patients in different income classes; (2) manufacturers sometimes sell the same or similar products to consumers under different brand names at different prices; (3) public utilities usually sell water, gas, or electricity at different rate schedules to home and commercial users; (4) growers' associations sometimes dispose of parts of the crops of fruits or nuts under marketing programs in which market and price discrimination plays a part; and (5) railroads set up freight rate schedules for different categories of goods to "charge what the traffic will bear," a phrase which has come into usage to apply to monopoly pricing.

Many other instances of discriminatory pricing could be cited as it appears in various forms in our modern marketing structures. It

[19] The definition of price discrimination is usually extended to cover practices whereby a seller systematically and simultaneously: (1) Sells similar but not identical commodities, such as differently packaged or branded articles, at price differences which do not correspond to cost differences; or (2) sells under terms in which the costs of differences in services (transportation, credit, etc.), to different groups of customers, are not accurately reflected in prices charged.

comes into play wherever advertised and unadvertised brands of the same product appear on the market together, wherever a seller finds some way of segregating his products or his customers to his advantage, and wherever a group of consumers is found by a seller to be in a special situation because of tariff barriers or other conditions which prevent the free play of competition among sellers.

Some degree of control by the seller over his markets is required for the practice of price discrimination, but some further factors which are cited as encouraging the practice are: (1) Heavy fixed costs in the production of the commodity, (2) a variety of potential uses for the commodity, and (3) existence of joint costs in the production of several commodities. Today it is recognized by economists that these and other factors constitute powerful economic forces working toward discriminatory price policies. "Businessmen are continuously experimenting to discover new divisions of their respective markets as a basis for formulating discriminatory price policies in the interests of maximum utilization of capacity, maximum spreading out of fixed costs, and maximum profits" (*44*, pp. 350–355).

Prerequisites for Price Discrimination

The elements essential to the successful application of a discriminatory pricing policy are: (1) A considerable degree of control by the seller of the supply of the commodity in the area or among the groups of buyers where he applies discriminatory prices, (2) different elasticities of demand for the commodity in the price categories established, and (3) assurance that buyers will not be able to divert the commodity from one price category to another (*8*, pp. 273–274, and *27*, pp. 179–181).

The prevalence of monopolistic competititon, in its various forms, provides sellers with opportunities to make some decisions with respect to the allocation of their products or services among buyers. For successful price discrimination, however, the buyer groups must be clearly distinguishable to the seller and he must be able to apply his multiple-price policy so that each price is applicable to each group only. Where a number of independent sellers engage in the practice of price discrimination in markets which they share in common, uniform selling practices are required to prevent some of them from concentrating sales in the high-price market (*31*, p. 223).

The ability of sellers to hold the gains from price discrimination over an extended time depends largely upon whether they can limit their output and restrict the entry of new competitors. Unless they are able to prevent added investment and increased output which the extra returns from price discrimination encourage, profits will eventually be reduced to a normal competitive level even though higher prices remain in effect.

Differences in elasticities of demand among groups of buyers are required in order to make it possible for the seller to profit from discriminating in the prices which he charges to each group. Elasticity of demand at any price is the proportionate change in amount purchased (in response to a small change in price) divided by the proportionate change in price. As the demand curve normally slopes downward, quantity increasing as price decreases, elasticity would have

a negative sign. A convenient convention has sometimes been adopted of referring to the elasticity of a falling curve as positive and of a rising curve as negative (*27*, p. 18).[20]

If we consider a seller who is charging the same price to two different buyers, each with a different elasticity of demand, he will obtain a greater aggregate return by charging two prices; a higher price to the buyer whose demand is less elastic (less affected by a rise in price), and a lower price to the buyer whose demand is more elastic.[21] This reasoning may be extended to many buyers or groups of buyers with differences in demand elasticities.

To the extent that conditions allow a seller to discriminate, he will gain by charging different prices to each buyer or group of buyers. The highest price will be charged where the demand is least elastic. The seller will achieve his most profitable position if his sales in each price category are such as to make equal the revenues derived from the last units sold (marginal revenues) and the cost incurred in producing his last units of output (marginal cost). At this point, elasticity of demand will be smaller in any higher priced market as compared with any lower priced market (*31*, p. 225). This last proposition is of special significance in the application of class prices in fluid milk markets, and will be demonstrated and more thoroughly discussed in chapter VI.

The third prerequisite for the practice of price discrimination is that the seller must have some assurance that buyers will not be able to divert the commodity from one price category to another. A manufacturer may discriminate by geographic area, absorbing part or all of the cost of transporting his product to areas where he is meeting competition from other firms and charging higher prices to customers in areas where he has less competition. The distances separating his customers in the different areas and the nature of his competition give the seller the assurance that he can maintain his price categories. Industrywide agreements are sometimes entered into where competing firms establish prices by zones or according to a basing point system.[22] In cases of this kind, the agreement among competitors provides the assurance that the price categories will hold.

Where personal services are involved, selling practices involving price discrimination may be maintained because such services are not

[20] The range of elasticities of demand for almost all goods at all prices would thus be from zero to infinity, the former representing complete inelasticity and the latter complete elasticity. Those very exceptional cases where quantity bought might increase due to an increase in price would be said to have a negative elasticity of demand.

[21] Robinson explains the impossibility of profitable price discrimination where the demand curves in the separate markets are similar (*27*, p. 185): "If the demand curves of the separate markets were iso-elastic, so that at any price the elasticity of demand was the same in each market, then the same price would be charged in all of them; for when the marginal revenues were equal in each market, the prices would then also be equal and the result would be the same as though the market were not divisible. . . . It might be possible for a village barber to charge a differential price for shaving red-haired clients, but if the red-haired members of the village had the same wealth and the same desire to be shaved as the rest of the inhabitants, the barber would find it profitable to charge them the same price as the rest."

[22] "A basing point system of selling exists whenever goods are sold at delivered prices calculated by adding together the price at a basing point and the cost of transportation from that point to the point of delivery" (*8*, p. 290).

transferable. Doctors customarily charge fees related to the ability of the patient to pay and lawyers frequently base their charges on the ability of the client to pay or on how much money is involved in the case.

Where a manufacturer is able to associate prestige or other satisfaction with his product when sold under one brand name, he may sell it at a higher price to one class of people, while selling the same product at a lower price for quantity distribution under another brand name. Some perfumes and cosmetics are examples of products which have been sold on this basis. The fact that the same product appears in different guises to the different groups of buyers gives the seller the assurance that the price categories will be held.[23]

In some cases, the seller must be in a position to measure, supervise, or check the manner in which his product or service is used to assure against diversion from one price category to another. Thus, gas or electric power companies charging different rates for industrial and home users, or for different kinds of home use, are able to install meters to measure the amounts used for each purpose. Railroads are able to check the classes of merchandise actually carried in their cars. When milk is sold by a producers' association in accordance with a classified price plan, the association must have some means of assuring itself of the accuracy of dealers' reports on how the milk is used. Otherwise, the association cannot be sure that milk purchased in a lower priced use category is not diverted by dealers to a higher priced use category. This assurance of accurate reports of utilization is accomplished either by an arrangement whereby the association's own auditors have access to dealers' records or whereby impartial auditors are made by an outside agency.

Special Features of Classified Pricing of Milk as a Form of Price Discrimination

In the application of classified pricing of milk as a form of discriminative pricing, certain features differentiate it from the more usual application of price discrimination by sellers. Several of these are of special significance in limiting the use of classified pricing to increase the net returns of milk producers.

First, and most important, the separation of the fluid and surplus milk markets is not brought about by the application by the sellers of discriminatory prices. The fluid market is separate and distinct from, though interrelated with, the markets for manufactured milk products. It is the market where costs of production, and consequently the value of milk, even in the absence of classified pricing, are normally higher (see ch. I).

The application of classified pricing in fluid milk markets is analogous, in certain respects, to price discrimination by sellers in international trade. In foreign trade, the domestic sellers, with some degree of monopoly control in the home market, may sell in the

[23] Cf. Robinson (27, p. 180): "Various brands of a certain article which in fact are almost exactly alike may be sold as different qualities under names and labels which induce rich and snobbish buyers to divide themselves from poorer buyers; and in this way the market is split up, and the monopolist can sell what is substantially the same thing at several prices."

competitive foreign markets at prices lower than those charged domestic consumers, a procedure which has become known as "dumping" (*43*; and *6*, p. 558).

The analogy between price discrimination as practiced by milk producers supplying fluid milk markets and the practice followed by domestic firms in international trade is a good one in certain respects. The city market, from the standpoint of the organized milk producers who supply it, is a sheltered market, in much the same sense as the home market often is to a domestic firm which sells some of its output abroad at lower prices. It is sheltered not only by the association's control over its own supplies, but also by the geographic isolation of its buyers from most alternative sources of supply, by health regulations, and by other institutional factors. Again, the markets for milk for manufacturing uses stand, with respect to any city milk market, in much the same relation as does a foreign market to the home market. The fluid milk association, like the domestic firm selling in a foreign market, must sell milk at a lower price to meet the competition of other producers who sell milk in a market for manufacturing use. Also, because the amount of milk sold for a manufacturing use by any fluid milk association is normally small in relation to the total supply, it has little effect upon the prevailing price of milk sold for that use.[24]

There is, however, one respect in which the application of classified pricing in a fluid milk market is quite different from the usual situation of price discrimination, including that between home and foreign markets. It is a difference which limits (but does not entirely prevent) its effectiveness for increasing the returns of producers.

It frequently happens that a domestic firm will find it advantageous to sell in a foreign market even though the price in this market is "below cost," that is, below its average cost of production. This is not surprising, in view of the nature of price discrimination and the price relationships required for maximum returns to the seller (see p. 36). What a domestic seller will not normally do, unless subsidies are involved, is to sell his product abroad at a price below his marginal cost (*6*, p. 558, and *27*, p. 185).[25]

In price discrimination as applied by organized producers in a fluid milk market, the situation is different. Marginal revenue from sales of milk in surplus markets may be expected to fall below marginal costs of production. Nonfluid outlets for milk in fluid milk markets represent unprofitable outlets for most of the producers who meet the quality standards set up for supplying the city market. If it were not for the perishable nature of the product and the conditions of seasonality associated with its production, no part of the fluid milk

[24] This does not mean that the price of milk which a fluid milk association can receive for a manufacturing use is always independent of the quantity which it sells for such use. Limitations of available facilities play a part (see p. 45).

[25] An unusual glut of inventory held by a domestic monopolist might lead to a temporary expedient of selling part of his product abroad at prices below marginal costs. This might occur because of a sudden fall in domestic demand for the product, especially if high storage costs or losses through deterioration are involved. Government sales abroad, at prices below marginal costs of domestic producers (as in the case of butter) fall in a different category, because the Government Treasury, not the producers, bears the losses.

supply would normally be used in these outlets.[20] Gaumnitz and Reed comment (*16*, p. 24): " . . . ordinarily no milk would be produced for use as manufacturing milk in the area supplying fluid milk to the market (leaving aside the question of the seasonal and daily excess, which can hardly be considered as being produced for use in manufacturing dairy products, even though so utilized)."

A second special feature of classified pricing as a form of price discrimination is that the seller, in this case the producers' association, is not able to set prices unilaterally. Considerable concentration of economic control in the market is represented by buyers as well as sellers. The price schedules are established either through collective bargaining with dealers or through a governmental agency (see appendix B).

Another important feature of classified pricing is that, even after the class prices are established, it is the buyers who are usually in the position to make the allocation of milk to the various uses. This allocation will be made on the basis of maximizing the buyers' profits, not those of producers. This is an important limitation on the application of classified pricing for the benefit of producers. In markets where the producers' association also operates as a handler, it shares the control of allocation and thereby increases its ability to practice price discrimination for the advantage of its members.

A further aspect of fluid milk markets bearing upon the application of classified pricing as a means of price discrimination is the degree to which supplies of milk for the market may be limited. Restrictions upon expansion or importation of supplies are not uncommon in fluid milk markets, but typically these tend to delay rather than to prevent expansion. This tends to place a time limitation upon the financial advantages which producers may derive from the practice of price discrimination.

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[20] In those fluid markets where local health authorities require that milk for use as fluid cream, or any other specified milk product, must come from the same farms which supply milk for fluid milk use, such products are not true surplus outlets for local milk. They are profitable outlets for local producers who may, however, put milk used in these products in a lower price class, either: (1) To take advantage of greater elasticities of demand relative to that of fluid milk, or (2) in the case of cream for certain large city markets, to reflect lower costs of transporting cream, separated at country plants, as compared with costs of transporting whole milk.

CHAPTER V.—ELASTICITY OF DEMAND FOR MILK FOR FLUID AND SURPLUS USES

The nature of the demand responses to price changes in each of the differentiated markets is, as we have seen from the discussion in the previous chapter, a matter of central importance in the application of a system of discriminative prices to a commodity. We have noted the principle (pp. 35 ff.) that differences in demand elasticities are a necessary condition for profitable price discrimination among different markets. In our later discussion (ch. VI), we shall show, however, that this is not a sufficient condition for sellers to increase their aggregate returns [27] when their "home" market is a higher price and higher cost market than are the other "unprotected" markets to which they may divert part of their output. Thus, when we come to consider the application of classified pricing for enhancing producer returns from the sale of a given supply of milk, we must consider the price level for producers' milk in the surplus market (or markets) relative to that of the fluid market, in addition to the elasticities of demand for producers' milk in the fluid and surplus markets.

Our analysis of demand elasticities for milk for fluid and surplus uses has two main aspects. We shall differentiate between the nature of the more general demands for milk for either fluid or surplus uses and the nature of the specific demands for the milk which a producers' association is selling for fluid or surplus uses. We shall also require a differentiation of the elasticity of demand for milk for fluid use in accordance with the time period under consideration. Thus, there is not a single elasticity of demand for milk for fluid use, but a whole range of elasticities related to different durations of time. This matter of relating demand elasticity to the time factor also comes into play in connection with demands for surplus milk in city markets where there are limited local outlets for such milk.

Elasticity of Consumer Demand for Milk for Fluid Use

The amount of the aggregate demand response of consumers in a market to changes in price for milk in fluid form varies with: (1) The composition of the particular market; [28] (2) conditions prevailing at the time of the price change, including levels of employment and income and the prices and availability of other commodities, especially potentially substitutable foods; (3) the level at which the price of milk is when the change in price occurs; and (4) the time period al-

[27] This is not to be confused with the question of stabilizing returns, relating primarily to seasonality of milk production.

[28] Especially the income distribution of consumers in the market. Purchases per family of fresh whole milk by low-income families are considerably below those of middle- and upper-income families (*39* and *45*) and elasticity of demand among families for milk in this form is generally considered to vary inversely with size of income.

lowed for the response to take place. The first two points are probably self-explanatory, so our discussion will be confined to points 3 and 4.

The elasticity concept involves a relationship of two proportions. It is measured at any price by the proportionate change of amount of the commodity purchased in response to a small change in price, divided by the proportionate change in price. To translate this into concrete terms, consider that in a given milk market, the retail price of fluid milk is 10 cents a quart and at that price 100,000 quarts a day are being sold. Now, if the price of milk is raised 1 cent, this would mean a proportionate change of price amounting to $\frac{1}{10}$. If the proportionate change in the demand for milk caused by this change in price is less than $\frac{1}{10}$ (representing a decline of 10,000 quarts a day), the elasticity will be less than 1 and we say that the demand is inelastic at this point.[29] If the proportionate change in the demand is greater than $\frac{1}{10}$, the elasticity will be greater than 1 and we would say that the demand for milk is elastic at this point.

Now, let us suppose that in the same market the price of milk has been raised by gradual degrees to 20 cents a quart and that the quantity of milk purchased at this price is 50,000 quarts. A change in price of 1 cent a quart would mean a proportionate change in price of only $\frac{1}{20}$. This would now have to cause a proportionate change in demand for milk of less than $\frac{1}{20}$ (representing a change of only 2,500 quarts a day) for the elasticity to be less than 1; that is, for the demand for milk to be called inelastic at this point.

It is unrealistic to speak of milk, or any commodity, as having a demand with certain fixed characteristics of elasticity. The degree of elasticity of any commodity varies at different prices and is likely, under any given conditions of the general price level, to increase rather rapidly beyond a certain price range. Robinson points out that any seller faced with an inelastic demand would always find it profitable to raise his price. "If the demand curve were inelastic throughout its length, it would pay him best to produce an infinitesimal amount and sell it for an infinite price . . . obviously an absurdity" (27, p. 53).

Allen refers to the difficulties usually presented in diagrammatic illustrations:

> If demand curves are drawn on natural scales, as is usual in economic works, it becomes more difficult to estimate and compare the elasticities at various points on the same or on different demand curves. It is tempting to estimate the elasticity from the gradient of the demand curve, to say that a demand curve steeply inclined to the price axis has a large elasticity. This is incorrect. . . . For example, the linear demand curve has a constant gradient but its elasticity is not constant. The elasticity, as is easily seen, decreases as the price decreases and the demand increases (*1*, p. 255).

Studies of aggregate consumer responses in fluid milk markets to small changes in the retail price per quart indicate that over short periods of time proportionate changes in amounts of milk purchased are less than the proportionate changes in price; that is, the elasticity

[29] By convention, if the elasticity of demand at a certain price is less than unity, we say that demand is inelastic at that price and, if greater than unity, we say that demand is elastic at that price. When demand is inelastic, an increase in price will bring a greater total return from a smaller volume of sales, and, conversely, a decrease in price will bring a smaller total return from a larger volume of sales.

of demand is less than unity. Several reservations must be borne in mind with respect to this conclusion. First, it relates to changes within "customary" or "reasonable" price limits in a city milk market. Second, it should not be accepted as an indication that demand responses are similar in all city markets at all times and under all conditions. Finally, and most important, these studies apply to short-period responses only. For long periods, there is no proof that changes in price relationships between fluid milk and other partially substitutable food products (including milk products) would not result in changes in consumer buying habits of a magnitude which would result in a proportionate change of demand exceeding the proportionate change in price. As we look at the place of fluid milk in different national diets, some with higher and others with lower per capita consumption, or as we consider the changes in consumption of milk and other staples by decades in our own country, we get some inkling of the powerful long-period responses to changing price relations and other conditions.[20]

Today fluid milk in city markets is in direct competition with evaporated milk and nonfat milk powder, with the latter slowly but persistently gaining a place in an ever-growing number of city households as a partial or complete substitute for fresh fluid milk. New products, like concentrated milk, also have economic potentials for underpricing whole milk in some markets. Sellers of fluid milk, on the other hand, seek to replace other products, such as soft drinks, where price relationships as well as new methods of selling play a part.

Economists have long recognized that protected market conditions for a product provide a strong inducement to technological changes designed to overcome such protection. Thus, according to Roland Bartlett (*4*):

> The attainment of a high-quality storable, sterile concentrated milk and a high-quality dry whole milk appears to be probable within the next few years. . . . They will sound the death knell of excessive milk distribution costs and will tend to lower Class I prices in all high-cost areas.

Not all economists would be in complete agreement with Bartlett's forecast, but no agency engaged in the selling of fluid milk can afford to ignore the possible long-run effect of price changes by accepting uncritically the idea that the consumer demand for its product is inelastic.

It may be noted that Alfred Marshall, who first developed the concept of elasticity of demand, gave considerable attention to the time element, elaborating on several historical examples, among which was that of the demand response to a rise in prices of wood and charcoal (*23*, p. 111):

> For instance, when wood and charcoal became dear in England, familiarity with coal as a fuel grew slowly, fireplaces were but slowly adapted to its use, and an organized traffic in it did not spring up quickly even to places to which it could be easily carried by water: The invention of processes by which it could be used as a substitute for charcoal in manufacture went even more slowly, and is indeed hardly yet complete.

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[20] "Little is known about the response which consumers make after a given price has been in effect for months or even years. There is reason to believe that through custom and lack of knowledge of the qualities of competing products, consumers are slow to change their food habits. But, given a price relationship that is maintained over a period of time, the response, though gradual, may have far-reaching effects" (*45*, p. 19).

Marshall summed up the general application of the time factor in most cases of demand (*23*, p. 110):

> . . . there is great difficulty in allowing for time that elapses between the economic cause and its effect. For time is required to enable a rise in the price of a commodity to exert its full influence on consumption. Time is required for consumers to become familiar with substitutes that can be used instead of it, and perhaps for producers to get into the habit of producing them in sufficient quantities. Time may be also wanted for the growth of habits of familiarity with the new commodities and the discovery of methods of economizing them.

For the purposes of our own theoretical applications, we shall apply to fluid milk the generally accepted principle that "the individual and market demand curves of a commodity increase in elasticity when the time period is lengthened" (*31*, p. 93). Specifically, we shall go on the asumption that, under usual conditions, the elasticity of consumer demand for milk is less than unity (inelastic) for, say, a few weeks or so following a price change, but that the impact of the change in price on demand will become greater as time goes on and will come to exceed unity (i. e., become elastic). No further precision of assumptions is required for our purposes.

This concept of increasing elasticity through time is not based on changes in consumers' tastes. Like all concepts with respect to economic phenomena over time, it must abstract from the reality of changing conditions to consider only the relationships of the factors under observation—in this case, the impact of a price change on consumer demand.

Elasticity of Demand for Association's Share of Supply for Fluid Use

Even for short-period calculations, it is not enough for an association to consider the general response of consumers to a retail price change. The association sells milk to handlers, and its calculations must be based not on the general response of consumers in the market but upon the response of the particular handlers to whom the association sells its milk. Cassels (*9*, p. 48) shows us that "that part of the dealers' demand which is derived from the demand of the ultimate consumers for fluid milk must always be more inelastic than the consumers' demand itself," even in markets where dealers' margins customarily are increased as prices paid to producers increase. We must, however, take into consideration two factors which tend to increase the elasticity of demand for the association part of the fluid milk supply.

If buyers to whom the association sells milk are in competition with handlers who buy outside the association at a single price, the latter may be in a better position to undersell the former after the association increases the price of its milk for fluid use. New handlers may be encouraged to enter the market with greater opportunities for building up a fluid milk business. Thus handlers buying from the association might suffer greater losses of fluid sales than the average for the market as a whole, and, consequently, the association would find more of its milk diverted to surplus uses.

A change in the price of milk for fluid use would also affect the inclination of handlers either to buy from the association or to seek supplies outside the association. Thus an increase in the Class I price might encourage some handlers who buy from the association

to seek supplies elsewhere. A decrease in the Class I price might help to induce handlers who have been buying outside supplies to buy from the association. Gaumnitz and Reed recognize the relationship of price policies of a producers' association and the degree of control of total producer sales (*16*, p. 126):

> . . . the greater the degree to which the cooperative controls the total supply of milk available in the market, the closer the demand curve for the milk sold by the cooperative will approach that of the market as a whole. Similarly, the demand curve for the milk sold through the cooperative will become more and more elastic as the proportion of the total supply controlled by the cooperative declines. Hence, under complete control the extent to which commodity price discrimination is practiced will probably be found to be greater than when a smaller degree of control is exercised. With a small degree of control the cooperative would merely deprive member producers of their market if it insisted upon arbitrary prices for that portion of their milk sold as fluid milk.

In some instances, associations may respond to the pressure of outside supplies by taking the initiative to bring producers, not previously supplying the fluid market, into the association (*18*, p. 49). This may make it more difficult for handlers to buy supplies from nonmember producers. If, by this device, the association is able to maintain its share of the somewhat diminished fluid sales after a Class I price increase, the proportion of the association's surplus usage will nevertheless increase by the amount of milk from new producers unless the association can acquire new customers from among those handlers of fluid milk who were not previously buying from the association.

Elasticity of Demand for Association's Milk for Surplus Uses

The nature of the demand in a fluid milk market for milk for a manufactured use has been subject to some misunderstanding in the theoretical treatment of milk prices. Some writers have concluded that the demand in any fluid milk market for milk for any particular manufacturing use must necessarily be very elastic under all conditions. They have been led to this conclusion by the following considerations: (1) The prices of the major manufactured milk products, such as evaporated milk, butter, nonfat powder, and cheddar cheese, are determined primarily on a national market; and (2) the surplus milk of any single fluid milk market would not amount to a large proportion of the total supply of milk used in making any of these products.[31]

The nature of the demand for milk for a surplus use in any fluid milk market can be determined only from a knowledge of the actual

[31] Cassels, for example, deals with the elasticity of demand for all manufactured milk products (Class II milk) in a fluid market (*9*, p. 53): "Turning to the Class II demand, we perceive at once that its elasticity must be great. The diversion of 10 percent of all the fluid milk consumed in the urban markets would mean an addition of between 3 percent and 4 percent to the total national supply of manufactured dairy products. If the total demand for manufactured dairy products has an elasticity of unity, as the Washington authorities have concluded from their investigations, the effect of increasing the supply by this amount would be to depress the price by approximately 3 percent or 4 percent. As a result of this lowering of the price, production in areas outside the milksheds would be decreased to some extent and the price would be restored part way to its former level. From this it is evident that for any one fluid milk market taken by itself the Class II demand must have an elasticity so great that the effects of changes in the quantity of Class II milk would have practically no effect on the price obtainable for it."

conditions in the particular fluid market under observation. If, for example, there are at all times ample facilities in the vicinity of the fluid market for the manufacture of evaporated milk, such plants might be ready to buy, at the prevailing competitive price, all the milk which a fluid milk association might offer to sell them. In this case, the demand for this use would be completely elastic. On the other hand, if there is only one evaporated-milk plant in the vicinity of the supply area and it has unused capacity only during the months when the fluid market itself is in short supply, the demand for the association's milk for this use might at times become completely inelastic.

At this point it might be well to mention how the time factor might be expected to affect the demand for surplus milk in a fluid market. If a fluid market makes available a given supply of surplus milk, with a fairly regular seasonal pattern, and this supply is maintained relatively unchanged over a sufficiently long time, manufacturing facilities for its effective utilization will be created. Under certain circumstances, these facilities might create a continuous demand for this surplus milk and this demand might be very elastic. But this result might not necessarily follow in all cases. The seasonal pattern of the surplus supply (or perhaps other factors) might still make it advantageous for more than one type of facility to be used in the handling of the surplus. For example, ice cream facilities might take care of part of the surplus at a relatively high surplus-use price, and some butter-making facilities might take care of seasonal peaks of the surplus supply which exceeded the capacity of the ice cream facilities. Thus, even when long-run adjustments are considered, the surplus outlet which is most remunerative to producers in the fluid market may not offer them a completely elastic demand at all seasons of the year.

We can proceed from the analysis of the demand characteristics of an individual plant to trace the nature of the total demand schedule among handlers in the fluid market for that portion of the association's milk which it sells for a particular manufacturing use. At any time, each plant will have its own offering price based upon its own operating cost structure, its current supplies in relation to capacity, and its competitive relation to other buyers. An illustration, under rather restricted conditions, is worked out in appendix C. These price offers, less the cost to the handler of moving milk to these plants, provide the basis for the demand schedule for the association's milk for the particular surplus use. This would be true whether or not the manufacturing facilities were owned by the handler, operating in the fluid milk market, who buys from the association.

For any quantity of milk which the association sells to handlers in the fluid market for this use, the applicable class price must be low enough to attract the facilities required for its manufacture. This amount would be the lowest price paid by that plant (minus the cost of moving the milk to it) which had to be patronized to get all the milk sold.

A hypothetical example may illustrate the way in which the demand by handlers in a fluid milk market for milk for a particular surplus use is related to the character and location of facilities available. Suppose that four plants in the vicinity of the supply

area have facilities for the particular operation under consideration, which we shall assume to be the manufacture of evaporated milk. These plants are designated as A, B, C, and D. Milk in excess of quantities which can be disposed of to any of these plants would have to be shipped to evaporated milk plants in a more specialized manufacturing region. The cost, to the purchasing handler, of moving milk to each plant is:

Plant:	*Cost per cwt. (dollars)*
A	None
B	0.20
C	.20
D	.40
Other	.90

Demand schedules for the association's surplus milk for manufacture into evaporated milk are to be constructed for May and November, when the current paying prices to regular producers supplying this type of plant are $3.00 and $4.00 per cwt., respectively.[32] The prices which would be offered by each plant, the amounts of milk which it would accept at these prices, the transportation cost to the handler buying from the association, and the net return to the association for each of these months are shown in table 1.

TABLE 1.—*Prices offered by evaporated milk plants for quantities of surplus milk and net prices which might be received by an association after deducting transportation costs*

Plant	Quantity	Price f. o. b. plant per cwt.	Transportation cost	Net price
	Hundredweight	*Dollars*	*Dollars*	*Dollars*
		May		
A	100	3.00	0	3.00
A	50	2.70	0	2.70
B	100	2.70	.20	2.50
C	None		.20	
D	30	3.00	.40	2.60
Other	Not limited.	3.00	.90	2.10
		November		
A	50	4.30	0	4.30
A	150	4.00	0	4.00
B	100	4.00	.20	3.80
C	50	4.00	.20	3.80
D	100	4.00	.40	3.60
Other	Not limited	4.00	.90	3.10

[32] There may be plants in the vicinity of a supply area for a fluid market whose operating costs are too high for profitable operation under normal competitive conditions because of obsolescence or because they are "standby" facilities without sufficient year-round supplies to make for efficient operations. These plants will be brought into operation if milk is available at prices below those paid by other commercial plants. This type of plant is not included in the model, as the principle involved is similar to that of discounts associated with extra costs due to "overcapacity" operations.

The May and November demand schedules for the association's milk for use in the manufacture of evaporated milk, based on these prices, are shown in figure 7. The limitations of available facilities and the increasing costs of using more distant facilities as greater quantities of milk are channelled to their use, cause returns to the association to drop off in a series of steps. Within intervals, returns are not affected by volume (infinite elasticity). At the end of each interval, a drop-off occurs (zero elasticity) as it becomes necessary to draw on facilities less remunerative to the association. The total range of intervals representing returns from plants in the vicinity of the supply area is smaller in May than in November. Smaller proportions of the capacities of these plants are available for handling association milk because supplies from regular patrons are high. This is apt to coincide with the time when the association has larger quantities of surplus milk to sell.

Demand schedules for association milk could be constructed for other manufacturing uses (ice cream, butter and powder, cheese, etc.). Some of these might show higher returns for at least part of the association's surplus milk than could be obtained from evaporated milk plants. The more facilities available in the vicinity of the supply area, the more gradual is apt to be the descent of the aggregate demand schedule of handlers in the market.

In May and November

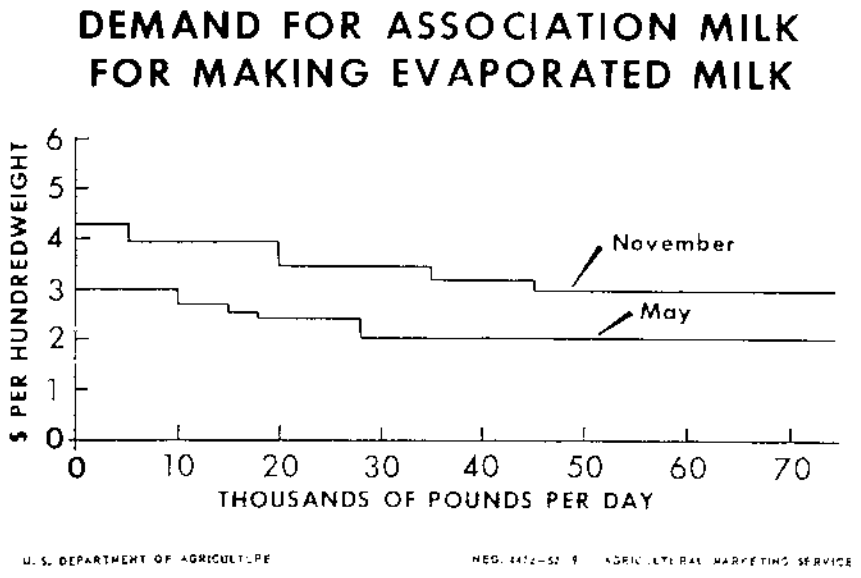

Figure 7.

CHAPTER VI.—PROFITABLE PRICE DISCRIMINATION WITH SUPPLIES CONSTANT

Raising Returns of Producers at a Given Time

Our analysis of how classified pricing may be applied as a form of price discrimination to raise returns of milk producers has three parts: (1) A simple illustration to show how an association selling a given amount of milk may apply classified pricing to raise the return of its members under certain broad assumptions of prices and demand elasticities in the fluid and surplus markets, (2) an analysis to show more precisely the relationships of these conditions which determine whether this can be done, and (3) an illustration to bring out the pricing policies of an association which, for varying quantities of milk to be marketed, would be associated with maximum returns to its members.

For our first illustration, we shall assume the following conditions: (1) An association is acting as sales agent for its members and must dispose of the total output of these members—that is, the supply of milk to be sold by the association is fixed by the "given time" condition; (2) the association may sell this supply of milk at a single price or in accordance with a two-price plan, viz.: Class I price for fluid use and Class II price for nonfluid use; (3) if the association sells its milk on a single-price plan, the entire supply is bought by distributors for fluid use;[33] (4) if it sells in accordance with a two-price plan, it is in a position to establish a price for Class I milk higher than the single price;[34] (5) the demand of distributors for milk for nonfluid use is, to a considerable degree, elastic; and (6) the demand of distributors for the association's milk for fluid use is, for the very short time period under consideration and in the vicinity of the price range of the analysis, either inelastic, or has an elasticity not greatly in excess of unity.

These conditions are applied in figure 8. The distance OQ represents the quantity of milk which the association must sell for its members. The line DD, taken with reference to the price axis Oy and the quantity axis Ox, represents the demand responses of dealers for milk for fluid use in relation to prices at the market. Now, if the association is selling the milk of its members at a single price and if dealers take the entire supply for fluid use, they will pay a price QP, determined by the intersection of the perpendicular from Q with DD. The total payment for producer milk (f. o. b. the market) will be rep-

[33] This assumption is made for simplicity of illustration of the effects of classified pricing in figure 9. It does not affect the validity of the illustration.

[34] The sale of milk by a producers' association in accordance with a classified price plan merely provides a means of raising producers' returns. Unless the association is in a position to apply higher prices in the higher price market, through its bargaining strength or by other means, it cannot exploit this market to the advantage of its members.

resented by multiplying the unit price of milk QP by the number of units, represented by the quantity OQ. In the diagram, this total payment is represented by the area of a rectangle OQPA.

Now, consider what will happen if the association decides to sell the milk of its members on a two-price plan and is able to raise the price of milk for fluid use to an amount represented by Q'P'. Only the quantity OQ' can be sold at this price and the remainder of the supply Q'Q must be sold for surplus uses. The demand for milk for surplus uses is represented by dd taken with reference to the price axis Q'y' and the quantity axis Q'x. The price of this milk would be QP'', determined by the intersection of the perpendicular at Q with dd. Under the single-price method of marketing, the association would have sold the entire quantity OQ at the price QP with the total payment represented by the rectangle whose area is OQ times QP. Selling on a two-price plan, dealer payments for producer milk are divided into two parts; one part of the supply OQ' is sold at a somewhat higher price, Q'P', and the remainder, Q'Q, is sold at a lower price, QP''. The total payment will therefore be the sum of the payments made for each class of milk: OQ' times Q'P' plus Q'Q times QP''. In the diagram, this total payment is represented by the areas of two rectangles, OQ'P'B and Q'QP''C.

The amount of the increase in total payments received through adoption of the two-price plan will depend upon the extent to which the gains from selling a reduced part of the supply at the higher (fluid) price exceed the losses from selling the remainder of the supply at the lower (surplus) price. In our diagram, this gain is represented by the excess of the area of rectangle I over the area of rectangle II.

From a Given Supply of Milk

APPLICATION OF CLASSIFIED PRICING TO RAISE PRODUCERS' RETURNS

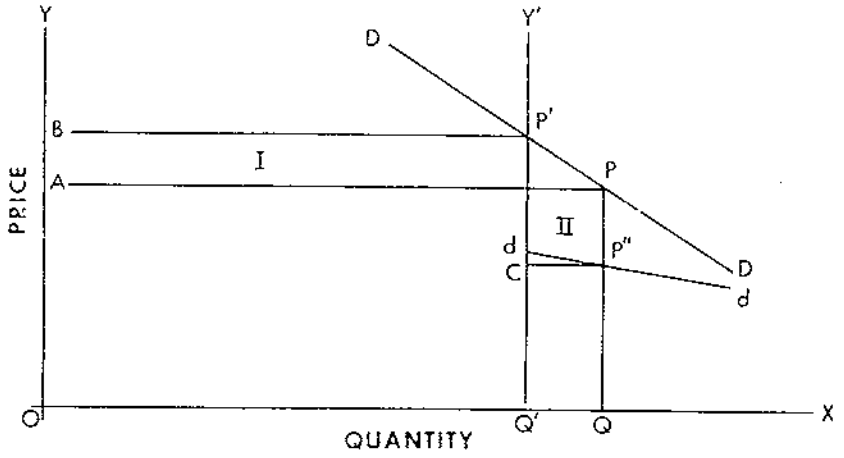

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Figure 8.

Limiting Conditions

This type of illustration, although it indicates the way in which total returns of milk producers may be increased through classified pricing, does not tell us just what conditions are required for the application of classified pricing to achieve such results. Nor, if the conditions are given, does it give us any idea of the limits of its application for this purpose. Looking at figure 8, we want answers to questions like the following: (1) What must be the demand elasticities in the fluid and surplus markets to make area I larger than area II? (2) if we know the demand elasticities in the two markets, do the relative price levels in these markets have anything to do with the profitable application of class prices? and (3) under given demand elasticities in the fluid and surplus markets, what ratio of prices for milk sold in the two markets will produce a maximum total return (i. e., maximize the difference between area I and area II)?

Classified pricing is price discrimination in the protected "home" market and unprotected "outside" market type of case, with cost conditions higher in the "home" market. Prices would normally be higher in the fluid market even if price discrimination were not applied (see ch. I and p. 37). This fact is quite independent of elasticities of demand in the fluid and surplus markets.[35]

The adoption of classified pricing does not, in itself, enhance total returns of producers, although it may stabilize them on a seasonal basis. Enhancing of total returns involves increasing the differential between fluid and surplus prices beyond the amount which is necessary to reflect normal cost differentials between the markets. This inevitably means diverting more milk from fluid to surplus uses than would normally go into such uses on the basis of reserve needs of distributors and seasonality of supply. Here relative elasticities (not simply absolute differences) and relative price levels in the fluid and surplus markets will both come into play in determining whether raising the Class I price will actually result in an increase or decrease of returns.

Our approach to the problem of determining the relationships of elasticities of demand and prices in the two markets as they bear upon the profitability of price discrimination in selling milk is through the measurement of increments of total revenue. For this purpose, we shall set up the following hypothetical situation. An association acting as sales agent for its members sells Q units of milk for fluid use at a price P, and Q′ units for surplus use at a price P′. At these

[35] In the literature of milk marketing, there has been some tendency to apply the general theory of price discrimination without modification to fit the particular conditions of milk marketing. Thus, for example, Cassels states (9, p. 53): "If the price differential is accurately determined, total returns can always be increased through the practice of charging a higher price in the Class I market whenever the demand in the Class II market is more elastic (or less inelastic) than the demand in the Class I market . . ."

Or Nicholls (24, p. 184): "Under what circumstances does it pay to discriminate by 'surplus' diversion? Whenever the demand for milk in the Class II market is more elastic (or less inelastic) than the demand in the Class I market."

prices, the elasticities of demand for the association's milk in each of the two markets are E and E′, respectively. The problem with which the cooperative representatives are faced is whether it will be profitable to raise the price of milk for fluid use.

The situation may be conceived of as one where an association is already selling milk in accordance with a class price plan or as one where an association is selling milk at a single price, and is changing to a class price plan. In the latter case, the single price would be taken as representing a composite price paid by handlers based on their utilizations, Q and Q′, and the values of these quantities for the two uses, P and P′, would be assumed to provide the underlying basis for payment (*9* p. 59). If, then, the association changes its selling plan from a single-price to a class-price basis, it may continue to sell Q units of milk for fluid use at a Class I price P or may raise the Class I price above P with some diversion of milk from fluid to surplus use.

We shall make use of the following symbols:

Q—Number of units of milk sold for fluid use.
Q′—Number of units of milk sold for surplus use.
P—Price per unit of milk for fluid use.
P′—Price per unit of milk for surplus use.
E—Elasticity of demand for milk for fluid use at price P.
E′—Elasticity of demand for milk for surplus use at price P′.
x—Increase in P when (Q−1) units are sold.
y—Decrease in P′ when (Q′+1) units are sold.
R—Total revenue when milk is sold at prices P and P′.
R′—Total revenue when milk is sold at prices (P+x) and (P′−y).
D—Gain or loss from raising the price of milk for fluid use, equal to (R′−R).

We can compute R and R′ and D, equal to (R′−R), as follows:

$$R=QP+Q'P'$$
$$R'=(Q-1)(P+x)+(Q'+1)(P'-y)$$
$$D=(Q-1)(P+x)+(Q'+1)(P'-y)-(QP+Q'P')$$
$$D=QP+Qx-P-x+Q'P'-Q'y+P'-y-QP-Q'P'$$
$$D=P'-P+x(Q-1)-y(Q'+1)$$

E and E′ in terms of quantities and prices are:

$$E=1/Q\div x/P=P/Qx \qquad E'=1/Q'\div y/P'=P'/Q'y$$

From the above, we can find x and y:

$$E=P/Qx \qquad E'=P'/Q'y$$
$$x=P/EQ \qquad y=P'/E'Q'$$

We can substitute the above values for x and y in our equation for D:

$$D=P'-P+x(Q-1)-y(Q'+1)$$
$$D=P'-P+P(Q-1)/EQ-P'(Q'+1)/E'Q'$$

For large values of Q and Q′, the approximate value of D is:[36]

$$D=P'-P+P/E-P'/E'$$
$$D=P'(1-1/E')-P(1-1/E)$$

[36] The marginal unit must be conceived of as sufficiently small to make Q and Q′ large (except for the special case where Q′ is zero).

From this formula for D, we are able to compute the data for table 2 showing, for different pairs of demand elasticities in the fluid and surplus markets, the ratios of prices in the surplus market to prices in the fluid market which would equate marginal revenues for the two markets. These are the ratios of prices in the two markets which will bring maximum returns from the sale of a given supply of milk. Looked at in another way, we may say that, for each elasticity relationship in the two markets, there is a percentage of the Class I price which the Class II price must exceed in order for it to be profitable for producers to raise the Class I price any further. In other words, these ratios must be exceeded before profitable diversion of milk from the fluid to the surplus market would be possible.

The equilibrium position of maximization of revenue of the association as seller is not different, in this respect, from that of any seller who is practicing price discrimination. Elasticity of demand must always be less in the higher priced market than in the lower priced market (or markets) when total revenue for all sales of the product is at a maximum (*31*, p. 225). The only real difference in this type of case from the more common case is that the seller is faced with separate markets even before he starts to discriminate. Thus, if prices in the manufactured milk outlets are too low, there may be no opportunity for profitable price discrimination even though elasticities of demand are greater in these outlets than in the fluid market.

TABLE 2.—*Ratios of prices of milk for surplus use (P') to prices of milk for fluid use (P) which will equate marginal revenues from milk for fluid and surplus uses for different elasticity relationships in the two markets*

Elasticity of demand for surplus use (E')	Elasticity of demand for fluid use (E)										
	1	2	3	4	5	6	7	8	9	10	∞
1	X	X	X	X	X	X	X	X	X	X	X
2	0	X	X	X	X	X	X	X	X	X	X
3	0	.750	X	X	X	X	X	X	X	X	X
4	0	.667	.889	X	X	X	X	X	X	X	X
5	0	.625	.833	.938	X	X	X	X	X	X	X
6	0	.600	.800	.900	.960	X	X	X	X	X	X
7	0	.583	.778	.875	.933	.972	X	X	X	X	X
8	0	.571	.762	.857	.914	.952	.980	X	X	X	X
9	0	.562	.750	.844	.900	.938	.964	.984	X	X	X
10	0	.556	.741	.833	.889	.926	.952	.972	.988	X	X
∞	0	.500	.667	.750	.800	.833	.857	.875	.889	.900	X

NOTE: X indicates that profitable diversion is not possible for the indicated values of E and E' as long as price for surplus use is less than price for fluid use.

The data in table 2 disprove the generally accepted theory that it is always possible for an association to exploit differences in demand elasticities between the fluid market and a milk product market. Of course, if the elasticity of the demand for the association's milk for fluid use is less than unity (for the period of time under consideration)

and less than the elasticity of demand for surplus use, it will always pay to raise the price of milk in the fluid market to the point where elasticity equals unity. This would be the case even if there were no alternative market for the milk. Under conditions where the elasticity of demand for the association's milk for fluid use exceeds unity,[37] however, the price of surplus milk in relation to the fluid-use price is a factor for consideration as well as the elasticity of demand in the surplus market.

For purposes of illustration, we will take as our example an association selling milk at $5.00 a hundred pounds for fluid use and $2.50 a hundred pounds for the surplus use to which diversion will take place, and considering a 30-cent increase in the Class I price, amounting to 6 percent. The officers of the association estimate that handlers buying from the association will raise resale prices by 1 cent a quart after such an increase, with an estimated decrease of demand for fluid milk of about 2 percent. It is further anticipated that handlers buying from the association will be able to obtain some supplementary supplies from other sources, resulting in a further loss of fluid utilization for the association's milk of about 10 percent, a total decline of about 12 percent. A 12-percent decline in fluid sales, associated with an increase in price of 6 percent, would mean an elasticity of demand of the association's milk for fluid use of approximately 2 at the $5.00 price. If we assume the most favorable conditions for price discrimination in the surplus market, an infinitely elastic demand, we find from table 2 that the price in the surplus market would have to exceed one-half of the fluid-use price to make for a profitable diversion of milk from the fluid to the surplus market. As the price of surplus milk in the market to which milk would be diverted is only one-half the price in the fluid market, $5.00, the association would be unwise to make effective the proposed Class I price increase, in spite of the fact that elasticity of demand is less in the fluid than in the surplus market.

Of course, it must be borne in mind that the elasticity relations themselves are applicable to whatever time perspective the association officers are applying in their price-making decision.[38] Figure 9 illustrates the concept of elasticity of demand for an association's supply of milk for fluid use as a function of time. Starting at a point of time, zero, the demand response will vary with the Class I price at which we start. The limiting elasticity (that is, the full response of demand over time) in each case is presumed to be higher for higher prices, all other conditions being the same, for the range of prices under consideration.

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[37] Even under conditions where the demand of handlers for milk for fluid use may be inelastic, the demand for a particular supply, viz., the association's milk, may not be. We should also bear in mind that, while we are for the moment restricting our consideration to a "given time," even the most "short-sighted" decisions on price policies look somewhat beyond the next pay period.

[38] If, as is usual, an association is not in a position to make decisions on prices unilaterally, the same reasoning would apply with respect to its position on prices at the bargaining table or at a public hearing held by a State or Federal regulatory agency.

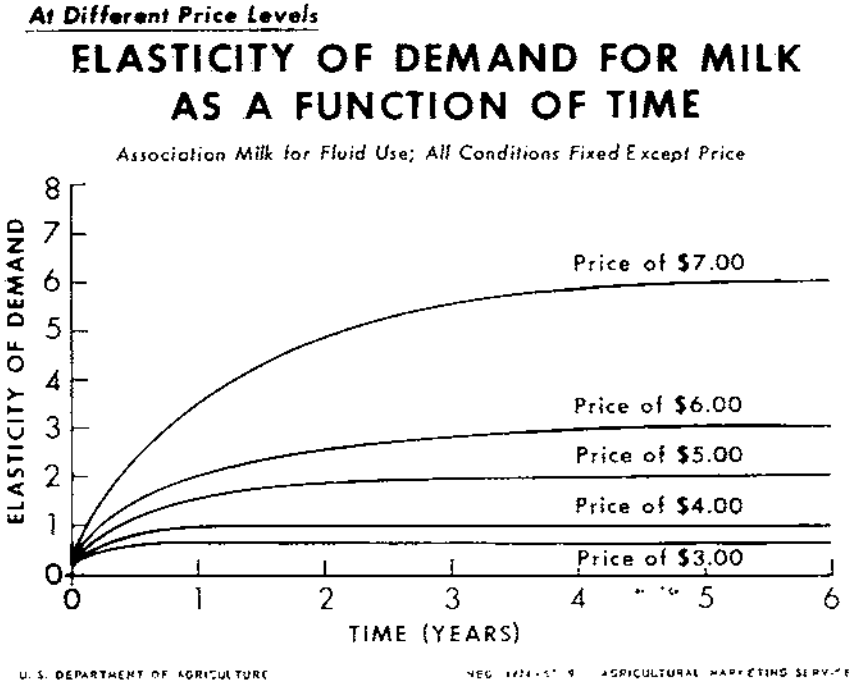

Figure 9.

The Class I Price and Maximum Returns

The pricing policies of a producers' association selling milk under a classified price plan and assumed to be trying to maximize the returns of its members may be considered diagrammatically as in figure 10. Here the determining factor is the point of intersection of the marginal revenue curve for milk sold for Class I use, plus a minimum quantity of Class II (surplus) required by handlers as reserve, and the marginal revenue curve for sales in the Class II market. Line D_I represents a schedule of buying prices for Class I milk associated with different quantities of milk offered for sale by the association. The minimum surplus requirements of handlers are assumed to be one-ninth, so that, in the absence of diversion from fluid to surplus use through a policy of discriminative marketing, 10 percent of milk is paid for at the Class II price. The Class II demand is perfectly elastic in our illustration and is represented by the line D_{II} parallel to the axis Ox. Line AR represents the average revenue and MR the marginal revenue for different quantities of milk sold in the two classes in the ratio 9 to 1.[39]

[39] The lower price received by producers from handlers for that part of their supply required as a minimum reserve to meet the variable needs of the fluid market is rightfully chargeable to returns from the fluid market. The situation is comparable to that of any purchaser of goods at wholesale who knows that not all of the product can be resold (fruits, vegetables) or can find its way into salable products (leather, yard goods), because of spoilage or other unavoidable shrinkage in marketing or fabricating. The schedule of Class I price offers, line D_I in figure 10, is predicated on the fact that handlers are buying on a classified price plan. Their actual demand schedule, buying milk at a single price with 10 percent going for Class II uses, would be represented by AR.

PRICING OF CLASS I MILK TO MAXIMIZE RETURNS TO PRODUCERS

Under Given Conditions of Demand for Fluid and Surplus Milk

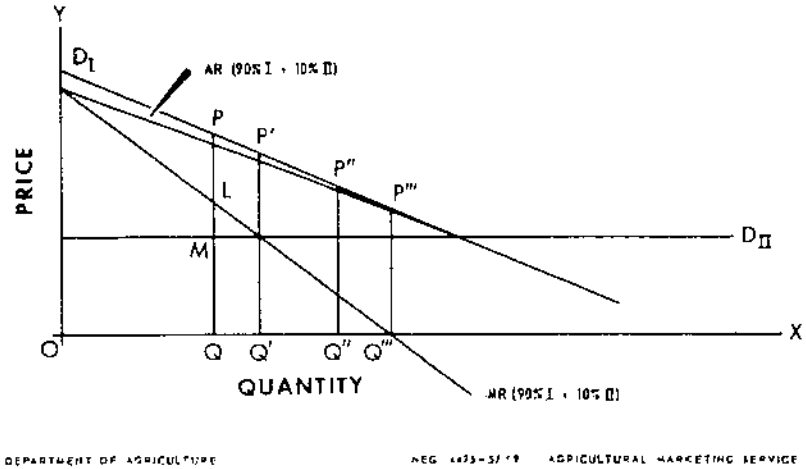

Figure 10.

The line MR is constructed in relation to the line AR to conform to the following principle which is subject to geometric proof:[40] If the average revenue curve is a straight line, the marginal revenue will also be a straight line and a perpendicular from any point on the average curve to the y axis will be bisected by the marginal curve.

If the association has a quantity of milk to sell which does not exceed OQ′, it will maximize the returns to its members by charging a Class I price which is no higher than the level consistent with minimum Class II usage. If, for example, the quantity of milk to be sold was OQ, the association would charge a Class I price of QP. At this price, the marginal revenue, QL, received from Class I sales with minimum Class II usage exceeds the marginal revenue, QM, from Class II sales. It would not pay to charge a higher Class I price which would divert milk from fluid to surplus uses.

If the association has a quantity of milk to sell which exceeds OQ′, it will maximize the returns for its members by establishing a Class I price of Q′P′. The marginal revenue on additional Class I sales (plus minimum surplus) associated with a lower Class I price would be less than QM, the marginal revenue on Class II sales. Thus, if the association has to sell a quantity of milk OQ″, it would sell an amount equal to 90 percent of OQ′ at the Class I price Q′P′ and an amount equal to 10 percent of OQ′ plus Q′Q″ at the Class II price of QM. The quantity of milk diverted from fluid use to surplus use by maintaining a Class I price of Q′P′ instead of Q″P‴ would be represented by 90 percent of Q′Q″.

[40] See, for example, Robinson (27, p. 30).

The foregoing analysis is consistent with our previous analysis of elasticity and price ratios between the two markets as determining factors in profitable discrimination. The straight-line, downward-sloping demand curve for Class I milk, D_I, represents decreasing elasticity of demand with decreasing price. Demand becomes less than unity (inelastic) when the price is lower than Q'''P'''.

The effect of the level of the surplus price upon the level of the Class I price associated with maximum exploitation of the fluid market can then be ascertained from figure 10. If the line D_{II} were higher, it would cut the line MR at a point to the left of Q'P' so that it would pay to sell a smaller amount of Class I milk at a higher price. If the line D_{II} were lower, it would cut the line MR at a point to the right of Q'P', indicating that it would be more profitable to sell a larger amount of Class I milk at a lower price. The Class I price would not go below Q''' P''', however, because below this price, elasticity of demand for fluid milk is less than unity. This is also what table 2 tells us, in a negative way. Taking the bottom row of ratios of P' to P for $E'=\infty$, the less elastic the demand (E) in the fluid market, the lower will be the price in the surplus market which is consistent with profitable diversion of supplies from the fluid market by raising the price in that market.

Pricing Milk for Surplus Uses

Our analysis continues on the previously stated condition that all surplus markets are, in themselves, unprofitable outlets for producers supplying a fluid milk market. The primary mechanism for profitable price discrimination is through diversion from the fluid to one or more surplus markets. As has been brought out in the previous section, the higher the price which producers receive for this diverted milk (under given elasticity conditions), the greater the opportunity offered for increasing total returns by raising the Class I price. When more than one market is used for surplus milk (e. g., evaporated milk, ice cream, butter), the prices and demand elasticities which must be compared, to determine whether diversion will be profitable, are those applicable to the fluid milk market and the particular surplus market to which milk from the fluid market will be diverted. This will not always be the lowest priced surplus market. Under some conditions, the newly diverted milk might go to more than one surplus market, in which case prices and demand elasticities in all the markets affected must be compared.

The demand for milk by manufacturing plants in the vicinity of the supply area is, as we have seen (p. 47), apt to be characterized by intervals of infinite elasticity separated by points of absolute (zero) inelasticity. These points may present opportunities to an association for advantageous price discrimination among different surplus uses.

The possibilities may be illustrated by the demand schedules for association milk for two manufactured uses: (1) Evaporated milk, and (2) butter plus skim milk powder. Figure 11 shows May and November demand schedules for association milk for these two types of manufacturing uses.

For illustration, we shall assume that the association must sell 40,000 pounds of milk per day for surplus uses in May and 20,000 pounds in November. It would be to the advantage of its members

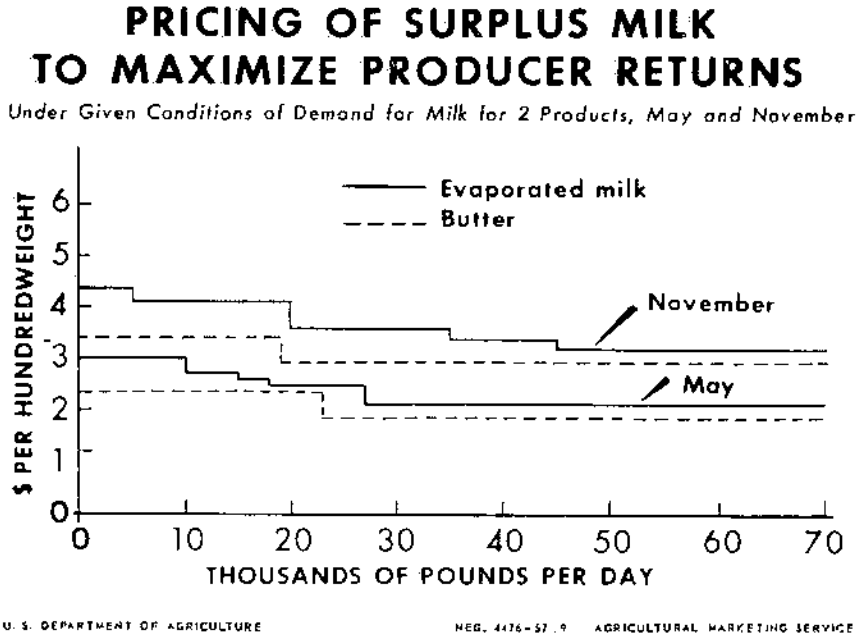

Figure 11.

if the association sold its entire surplus for evaporated milk use (returning $4.00 per cwt.) in November. The highest return it could obtain for milk sold for use in making butter and powder would be $3.40 per cwt.

In May, the situation is different. In order to sell to handlers in the market 40,000 pounds of milk daily for evaporated milk use, the association would net a return of $2.10. There is, however, a market for milk (up to 23,000 pounds per day) for making butter and powder, which would yield a return of $2.40. It would be to the advantage of the association members if about 12,000 pounds of milk were diverted from the evaporated milk to the butter-powder market and the remaining 28,000 pounds of milk for evaporated use were sold at a price of $2.50. A comparison of returns for the two sets of utilizations would be:

	One surplus class	*Two surplus classes*
Evaporated milk use	400×$2.10=$840	280×$2.50=$700
Butter-powder use	none	120×$2.40=$288
Total return	$840	$988

Under these circumstances, the association might get the best return by setting up one surplus class in November and two in May. The use of two surplus classes would extend to other months where diversion to the butter-powder markets was advantageous. Similar analyses would apply to the theoretical possibilities of price discrimination between other outlets for surplus milk.

It should be noted that the return on milk diverted to the butter-powder market does not necessarily have to exceed the return ($2.10

in our illustration) on the entire supply of surplus milk if used for evaporated milk. Even if the butter-powder market yielded a return to the association of less than $2.10, it might still pay to divert milk to that market so that the remaining milk sold for evaporated milk use could bring the $2.50 return.

The use of classified pricing as a means of enhancing producer returns suffers from a serious limitation in practice. This is that, while an association may set up separate classes and different prices for two or more manufactured uses, the decision as to how much shall go into each use is made not by the association but by each handler who purchases milk from the association.[41] Under an association or marketwide pool, these decisions will be made in accordance with the principle of maximizing the return of the handler. Under an individual handler pool, a handler would also have to take account of how diversion to a lower price use might effect returns to his own producers and hence his ability to retain them as his source of supply.

Thus, in our previous illustration, the aggregate of these individual decisions of handlers might be to allocate more than 12,000 pounds to butter-powder use and less than 28,000 pounds to evaporated milk use. This is quite likely to happen where, under association or marketwide pooling, the decision of each handler is made solely by a comparison of his own margins from handling the two types of milk.

Efforts are sometimes made to overcome this defect, at least in part, by setting up use classes on a conditional basis. Thus the association may permit a handler to pay for milk in a butter-powder use class only up to a certain percentage of his total utilization, or during certain periods when total surplus on the market exceeds a certain proportion of total fluid sales.

It is also possible for an association to attain a greater degree of control over the allocation of milk to surplus classes through: (1) Disposing of part of its surplus milk on its own account to manufacturing plants, or (2) maintaining its own facilities for manufacturing milk products. Thus, in the previous example (fig. 11), instead of setting up a separate price class for milk used in the manufacture of butter and powder, an association may retain one surplus class with a price of $2.50 predicated on evaporated milk use. It may then take responsibility for the disposal of all the association's surplus milk which handlers in the market fail to take at this price, either diverting it to manufacturing plants owned by handlers outside the market or processing it with its own facilities.

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[41] This may interfere also with the efforts of the association to achieve the best return as between the fluid and surplus markets. The association must rely on the competitive incentive for distributors in the market to maximize their fluid milk business as their steadier and more permanent source of revenue (*21*, p. 36).

CHAPTER VII.—CLASSIFIED PRICING AND MARGINS

Two aspects of classified pricing as a form of price discrimination have previously been described: (1) It is a means by which a producers' association may dispose of its entire supply of milk at prices which provide a composite return to producers which is not unduly depressed because part of the supply must go into surplus uses in competition with milk produced under conditions of lower costs; and (2) it is a device by which a producers' association may increase total returns, at least temporarily, by raising prices of milk for fluid use and diverting a larger portion of the supply from the fluid to the surplus markets than would normally go to those markets because of seasonality of supply and reserve requirements of handlers. A third aspect of classified pricing is discussed in this chapter: Its influence on handlers' margins.

The use of classified pricing under any conditions is, of course, bound to affect the margins of handlers. The general effects upon procurement costs of specialized and less specialized fluid milk distributors have previously been noted (p. 29) and these will be discussed further in the analysis of the tendencies and consequences of price discrimination over time. The discussion in this part is concerned with other possibilities for applying class prices to affect margins of particular handlers [42] or the margins of a particular product. Special attention is given to cases of producer associations operating as handlers.

The extent to which class prices are deliberately applied to affect particular margins is beyond the scope of this study. That it is natural for handlers to have a keen interest in their own and in their competitors' margins is undeniable. It is therefore reasonable to suppose that the implications upon margins will not be overlooked in the consideration of a set of use classes or of prices applicable to each class. It may also be expected that the distribution of economic power, including any reflections of such power upon governmental authority in areas where such authority is exercised, will determine the ability of producer or handler groups in a particular milk market to apply classified pricing advantageously to influence margins.

Effect of Prices of Milk for Surplus Uses Upon Margins

The relationship between prices of milk for surplus uses and the margins of handlers of milk for these uses is a direct one. Where the price of the surplus product is determined on a broader market and is not appreciably affected by the price of milk in the local fluid market, the higher the price established for milk used in making the product, the narrower will be the handlers' margins. And conversely, lower prices of milk for that particular use category will mean wider

[42] Methods of accounting for milk in each class and rules for classifying nonpool milk or for compensating the marketwide pool for receipts of nonpool milk (p. 32) may also affect margins of handlers.

margins for handlers making the product or for handlers buying milk which must be resold to other handlers who make the product.

Should the price of milk for a surplus use be too high, some or all of the handlers who have been putting the milk to this use may cease to do so. A low price will encourage handlers to put more milk to the particular use, even diverting milk from higher priced use categories which are more advantageous to producers but which are less profitable to handlers. Abnormally wide or narrow margins on particular categories of surplus milk will favor some handlers and disadvantage others, depending on the proportions of the products handled (*22*, p. 11).

Because the margin on any phase of a handler's operations is part of his margin on his total operation, he may use a competitive advantage on surplus operations to his advantage in competing on the fluid market. Thus, a less efficient milk distributor might be able to undersell a more efficient distributor because the former has large surplus operations upon which margins are wide and profits high. In the case of unprofitable surplus operations, a reverse situation would occur, where the distributor who did not handle that particular category of surplus milk would have an advantage in competing on the fluid market.

Producer Associations as Handlers

Many producer associations operate as handlers of milk in fluid markets where classified price plans have been established. The relationship of an association as a handler to other handlers and nonmember producers is, in part, determined by such factors as: (1) The types of operations performed (distributing of fluid milk, processing of one or more milk products); (2) the extent of its operations; (3) the relation of these operations to total operations of the same types in the market; (4) the number of other producer associations in the market; and (5) the type of pooling plan in the market.

For illustration, two models are used for analysis: Case A, a producers' association processing all of the surplus milk of its members; and Case B, a producers' association processing half the surplus milk of its members and distributing as fluid milk one-fifth of the milk of its members. In each case, we wish to find out: (1) The possible effects of price manipulations upon returns of association members, in relation to those of producers outside the association; (2) the possible impacts upon the competitive positions of handlers buying from nonmember producers; and (3) the effects of differences in utilization among the different handlers buying from the association upon their competitive situations. It will not, of course, be possible to derive any general conclusions from these two models. They are analysed merely to illustrate that classified pricing may be applied under some circumstances so as to exert a powerful influence upon competitive relations both among producer groups and among handlers.

A condition first assumed for both models is that all milk for surplus use is of one market value, and accordingly only two classes are used, Class I (fluid) and Class II (surplus). This condition is then modified to consider further effects on margins of handlers when prices applied to different uses of surplus milk do not have the same relationship to their respective market values. Returns to producers

are made through a marketwide pool with association members sharing such returns, plus or minus profits or losses which the association may experience in its own operations as a handler.

For each of these models, it is assumed that an average of 600,000 pounds of milk is sold daily, 500,000 pounds by members of the association and 100,000 pounds by nonmembers. The fluid sales of association milk are 350,000 pounds, surplus utilization is 150,000 pounds. One-half the milk produced by nonmembers is purchased by several small specialized distributors with 100 percent fluid utilization and the other half by a single handler who distributes 35,000 pounds daily as fluid milk and processes 15,000 pounds as surplus.

Case A.—Association Processing All Surplus for Its Members

The marketwide pool, on a daily basis, would be made up of the following utilizations:

Handlers	Hundred pounds of milk			Percent		
	Class I	Class II	Total	Class I	Class II	Total
Milk of association members:						
Purchased by handlers	3,500	0	3,500	100.0	0.0	100.0
Association as handler	0	1,500	1,500	0.0	100.0	100.0
Total	3,500	1,500	5,000	70.0	30.0	100.0
Milk of nonmembers:						
Specialized fluid handlers	500	0	500	100.0	0.0	100.0
Nonspecialized handlers	350	150	500	70.0	30.0	100.0
Total	850	150	1,000	85.0	15.0	100.0
Total in market pool	4,350	1,650	6,000	72.5	27.5	100.0

For concreteness, we will use a Class I price of $5.00 per 100 pounds and shall first apply a Class II price of $3.00 per 100 pounds—a price which covers the costs and a competitive rate of profit for processing the surplus.[43] The blend price computed from the marketwide pool would be:

$$\frac{(4350\times\$5.00)+(1650\times\$3.00)}{6000}=\$4.45$$

In analysing the effects of a change in the Class II price, we can assume its reduction by 50 cents. The new Class II price will then be $2.50 and the blend price will be:

$$\frac{(4350\times\$5.00)+(1650\times\$2.50)}{6000}=\$4.3125$$

[43] The "competitive rate of profit" would be difficult to define precisely and it need not be, as our interest here is in the effects of lowering or raising the Class II price. It may be considered as a rate equivalent to the rate of profit earned by enterprises of comparable efficiency in fields involving comparable risks of capital invested.

The effect upon returns of producers outside the association will be a reduction of 13.75 cents per 100 pounds of milk. Producers within the association will also receive 13.75 cents less for their milk, but the 50 cents per 100 pounds extra profit earned by the association on its surplus operations will eventually be returned to them.[44] This amounts to 1500×.50 or $750. Applying this to members' total deliveries, it amounts to $\frac{750.00}{5000}$=15 cents per 100 pounds. A reduction of 50 cents in the Class II price will bring a gain of 1.25 cents per 100 pounds to members of the association and a loss of 13.75 cents per hundred pounds to nonmember producers.

The reduction of the Class II price is of benefit to association members as individuals, and also furthers their interest in building their association, as it adds to the advantage of association membership. Although all producers supplying the market are paid on the basis of the same blend price, the association is in a position to return an extra 15 cents as profit from its handling operations.

Those handlers buying outside the association whose operations are confined to the distribution of fluid milk will have more difficulty in retaining an independent source of supply. A type of economic pressure is developed, additional to that ordinarily associated with marketwide pooling, toward either eliminating handlers of this type or compelling them to channel their purchases of supplies through the association. The latter may not always be a solution for the specialized fluid milk distributor if his business is based on the preferences he has developed among his customers for his special source of supply.

The less specialized handler, buying outside the association, will be in about the same competitive position as he was before. His operation is such that he requires a reserve supply of 30 percent, the average of handlers buying from the association. As he is paying 50 cents less for this part of his supply, his margin is enhanced accordingly and he can, from his expanded margin, pay premiums to his producers to keep their returns in the same relation to those received by association members (in prices and dividends) as they were before.

If we consider a situation where a second producers' association is organized in the market, selling milk to the handlers who do not buy milk from the first association, the following observations may be made. The proportion of milk produced by members of the second association which goes into surplus uses is less than 30 percent. Therefore, even if it processes its own surplus, it will not derive enough extra profits from these operations to maintain a parity of its members' returns with those of the first association.

The extra profit realized by this association on 15,000 pounds of Class II milk would amount to 150×.50 or $75. Applying this to

[44] Assuming average efficiency in the handling of surplus milk. If efficiency is less than average, part or all of the extra margin may be used to offset this situation and will not be returned to members in dividends.

the total supply of its members, 100,000 pounds, the dividend due to this extra profit would be 7.5 cents per 100 pounds compared with 15 cents which the first association was able to return to its members. Assuming equal internal efficiencies on the part of both associations, the lower Class II price will tend to draw members from the second association to the first association, if membership in the latter is open to them.

All of the tendencies noted in relation to lowering the Class II price below the level covering costs and normal profits would be reversed if the Class II price were raised above this level. For example, the members of the producers' association (again assuming only one in the market) would be disadvantaged financially as individuals compared with nonmembers, and the association would have less than normal profits or would show losses on its surplus operations. The nonspecialized handler buying milk from nonmembers might reject part of his supply so as to reduce his proportion of surplus utilization under these conditions. If a second association of producers is operating and a smaller proportion of its members' milk is used as surplus, the disadvantage to its members of the higher Class II price is not as great as it is for members of the first association.

Because, under the conditions assumed in case A, the distributors who buy from the association do not handle surplus milk, their margins will not be affected by changes in the Class II price. They may require different proportions of reserve milk because of differences in their types of operation, so that benefits from classified pricing and marketwide pooling may be unequally distributed. As long as the association handles all its surplus, the competitive relations among distributors to whom it sells supplies will not be affected by changes in the Class II price. The effect of such changes on competition with handlers buying outside the association has previously been indicated.

If more than one surplus product is processed in the market and if milk has more than one value when used in making these products, it would be possible to reduce (or in some circumstances to raise) the price of one surplus use category without affecting other use categories. Thus margins might be raised (or reduced) for one association or one handler without affecting other handlers of surplus milk. This may be done by applying different class prices to different use categories or by applying the same class price to different use categories where values to handlers are distinctly different.

In all instances of underpricing a surplus use category, milk is encouraged to move into that category because of the wider margins offered to handlers.

Case B.—Association Handling Half Surplus and One-fifth Fluid Milk of Its Members

The marketwide pool, on a daily basis, would be made up of the following utilizations:

Handlers	Hundred pounds of milk			Percent		
	Class I	Class II	Total	Class I	Class II	Total
Milk of association members:						
Purchased by handlers	2,800	750	3,550	78.9	21.1	100.0
Association as handler	700	750	1,450	48.3	51.7	100.0
Total	3,500	1,500	5,000	70.0	30.0	100.0
Milk of nonmembers:						
Specialized fluid handlers	500	0	500	100.0	0.0	100.0
Nonspecialized handler	350	150	500	70.0	30.0	100.0
Total	850	150	1,000	85.0	15.0	100.0
Total in market pool	4,350	1,650	6,000	72.5	27.5	100.0

The main feature of this situation which distinguishes it from the previous one is that the association may use part of any wider margin on surplus operations to strengthen its position as a competitor for fluid sales. As long as all surplus milk has one value and is priced in one class, however, other handlers who process surplus milk will possess similar advantages from the underpricing of surplus milk. These will vary with the proportion of surplus to total sales in each case.

If the association specializes in the processing of one of several surplus products, it may have opportunities to derive a type of competitive advantage from which other handlers of surplus are excluded. This can be done by underpricing milk used for the particular surplus product handled by the association while leaving the price of milk used for other surplus products at its full market value.

This in effect gives the association an extra margin on its own surplus handling operations which is not shared by other handlers. It can at its discretion use this either to subsidize its operations as a distributor of fluid milk, or to add to its dividends to members, or to cover other operating expenses. Should the association have, or wish to expand, capacity for additional surplus operations, it may draw to itself a larger share of surplus if it can raise the price of milk applicable to other surplus uses.

CHAPTER VIII.—ECONOMIC EFFECTS AND TENDENCIES ASSOCIATED WITH CLASSIFIED PRICING

We now resume our analysis, taking up the immediate effects and the economic tendencies which may be expected to be set in motion by the operation of classified pricing under different price policies. In the next chapter, we will appraise the long-run consequences or the limits approached by these different sets of tendencies from the standpoint of such matters as producer returns, marketing efficiency, and consumption of milk.

Three different sets of pricing policies with respect to the operation of a classified price plan are hypothesized. The first set represents an application of classified pricing to achieve price stabilization and market security objectives. The second set is an application of classified pricing to increase returns of producers (ch. VI). The third set is an application which combines either of the foregoing objectives with the underpricing of surplus milk as discussed in chapter VII. It is assumed that in each case the plan is adopted for an entire market and that producers are paid under a marketwide pooling arrangement.

Pricing Milk With Price Stabilization and Market Security Objectives

Our analysis in this case is made on the following assumptions: (1) The Class II price is set and adjusted to obtain for producers the highest return consistent with the continuous disposal of milk which cannot be sold for fluid uses: [45] (2) the Class I price is established and adjusted with a view to returning blend prices to producers sufficient to maintain, but not exceed, the milk requirements for the market; and (3) no effective limitations are attempted with respect to production within the supply area or upon milk entering the market from other areas. Under these policies, no effort is made to realize, except seasonally, higher returns for producers through fuller exploitation of the Class I demand and consequent diversion of milk from the fluid to the surplus market.

The benefits to producers of this application of classified pricing are primarily those of security of status as suppliers of the fluid market and a greater stability of income throughout the year. The blend prices which producers receive when their milk is sold under a classified price plan are less vulnerable to the effects of seasonal surpluses than their returns would be if their milk were sold to handlers at a single price. Inequality of returns among different groups of producers, because of opportunistic bargaining by some handlers who might play off one group of producers against another, are also eliminated (p. 20).

[45] We continue as in chapter VI to adopt the assumption of a single surplus class.

This application of classified pricing is consistent with the achievement of a more orderly and more stable means of marketing milk as described in chapter II. It represents a deliberately limited application of the discriminative possibilities of classified pricing with a view to long-run marketing stability. Discriminative pricing is applied only to facilitate the orderly marketing of seasonal surpluses or any other temporary abnormalities of supplies.

Although the price paid by handlers for milk which is resold for fluid use is somewhat higher than they would pay under a flat price system, this is offset by a lower price for that part of the milk which is disposed of in surplus categories. Some handlers would pay more per hundredweight of milk than they would if they were paying a single price and other handlers would pay less, depending upon their proportions of fluid to surplus utilization.

What effect, if any, this might have on resale prices and on consumption of fluid milk would depend upon the actual market situation. A few of the more relevant considerations which come into play can be mentioned.

First, the elimination of wasteful practices of procurement, which are associated with instability of producer prices and with the cutting off from the market of some producers and the bringing on of others for temporary periods, is a contribution to greater marketing efficiency. The direct beneficiaries are, of course, the producers concerned. It is quite possible that over a period of time this might also cause savings in procurement costs for some handlers, at least. This conclusion is not inconsistent with a recognition of the immediate advantage to handlers of using temporary abnormalities of surplus milk to cut off producers from the market or to drive the best possible price bargain with producers. It is a conclusion based on the expectation that the production response of producers to the average prices which are paid them for milk over a period of time will be greater when fluctuations of prices are confined within a moderate range and when a reasonable degree of security on the market is assured (*2*, p. 31).

Second, the class prices which handlers are required to pay are, under the assumed conditions, established at levels which are only sufficient to bring about a blend return to producers necessary to maintain adequate supplies of milk on the fluid market. This means that, except for the consideration of savings due to elimination of wasteful practices already referred to, the total procurement costs of handlers as a whole are not directly affected by the change from single pricing to classified pricing.

Third, the typical situation in most of the larger city markets is for the greater part of sales to be concentrated among a few of the largest handlers who exercise the greatest degree of economic authority in setting resale prices. These larger handlers usually have higher proportions of surplus usage than the smaller handlers. Thus, the adoption of classified pricing, even under these pricing policies, tends to reduce margins of those handlers who may act with a greater degree of independence in setting their resale prices.

A further observation may be made with respect to small and large dealers in relation to the handling of surplus milk in the market. The position taken by some economists has been that the handling of surplus milk represents a service to the entire fluid market and that, inasmuch as the proportions of surplus handled by different dealers

vary, the classified price plan with marketwide pooling represents a more accurate method of paying for this service. This position is a sound one, as applied to dealers each of whose needs for surplus reserves are in approximately the same proportion to their fluid sales, and where the surplus milk handled by each dealer is available to every other dealer when needed for fluid use. It fails, however, to take into account the fact that there are dealers whose procurement and operational practices are so organized that their need for surplus reserves in proportion to fluid sales is substantially less than for the market as a whole. This type of dealer usually operates on a small scale, sometimes producing part of his own supply and buying the remainder from a few neighboring producers whose output is relatively even throughout the year. Classified pricing and marketwide pooling require such a handler to pay more for his milk than is actually received by his own producers. The rest of his payments go to make up the deficiencies in payments made by dealers whose operations are such as to require larger proportions of reserve milk. Thus, producers supplying both types of dealers are paid on the basis of the same blend price, but procurement costs for those dealers who require smaller proportions of surplus milk are higher than when they bought milk at a flat price (p. 29). Part of the opposition to classified pricing with marketwide pooling has come, as we have previously noted, from this type of handler.

Thus, even when classified pricing is applied with the limited objective of stabilizing prices, it may in some market situations cause higher consumer prices and lower consumption of milk. There would, however, be no tendency toward expansion of supplies beyond the effective demand requirements of the market. Consequently, the long-run stability of the market is not jeopardized by a tendency for surpluses to accumulate in excess of the requirements of the fluid market.

Pricing Milk to Enhance Producer Returns

The pricing policies which are assumed in this case are: (1) The Class II price is set and adjusted with the same objective as in the previous case (to obtain for producers the highest return consistent with the continuous disposal of surplus milk); and (2) the Class I price is established with a view to exploiting, to an appreciable extent, the short term inelasticity of demand for milk for fluid consumption. Under this policy, an effort would be made to obtain blend prices for producers which are higher than would be consistent with the incentive price required by producers to induce them to produce an adequate supply for the fluid market. The question of "what the traffic will bear" in Class I prices would be brought more prominently into price considerations, although this does not preclude some consideration of broader supply and demand factors as in the previous example.

The initial effect of these policies upon producers as a whole is to raise their returns above the level received under the flat price plan of payment. This is the situation illustrated in figure 8. Because of these higher returns, supplies of milk will tend to be greater due to the response of producers already on the market and the attraction of new producers or of milk from other markets. The higher Class I prices will add to the costs of milk to handlers and, to the extent that they are able to pass on these added costs to consumers, this will mean higher resale prices to consumers of fluid milk. These higher prices

then tend to reduce the demand for fluid milk. The result of greater total supplies and reduced sales of fluid milk will mean a tendency for a larger proportion of milk to be disposed of as surplus. A decline in blend prices will set in unless countered by other actions.

The logical counter actions which producers may take to halt or slow down the decline in their blend prices are: (1) A more intensive exploitation of the demand for fluid milk, if the situation permits, by raising the Class I price still higher; or (2) the introduction of or intensification of measures for more effective control of the supply.[46] The first of these measures by itself is not a final solution to the problems, as it merely postpones the day of reckoning when supplies are still greater, the proportion of surplus still higher, and the limits of exploitation of the fluid demand have been reached (p. 52). Control of supplies, if it could be achieved, would enable producers supplying a fluid milk market to prolong the period during which they could receive higher returns through classified pricing. The longer run consequences of attempts at control of supply will be described in the next chapter. At this point, it is sufficient to say that efforts to exploit fluid demand through classified pricing give impetus to efforts to control supplies.

It is possible that an association whose officers have a short-range pricing perspective might try to obtain a Class I price higher than is consistent with the longer run interests of its members. The Class I price may, if the association's bargaining position is sufficiently strong, be adjusted upward from time to time to obtain benefits offered by low short-run elasticity of demand, only to have the benefits gradually dissipated when demand responses to the price changes have run their full course. The result of pricing Class I milk with a short-range perspective is chronic overexploitation of the fluid market—that is, a tendency for the Class I price to exceed the optimum price from the standpoint of producers.

With respect to the impact of these price policies upon the competitive relations among handlers, it may be noted that the raising of the Class I price increases the differential of procurement costs (average price) for milk paid by handlers with small proportions of surplus over the procurement costs of handlers with higher proportions of surplus. As previously noted, the former group usually includes the smaller handlers in the market.

The Effects of Underpricing Surplus Milk

If the Class II price is set and adjusted at a lower level than in the two previous cases, the handling of surplus milk is more profitable to handlers. The losses to producers on the surplus part of the supply are correspondingly greater unless the association is itself a handler of surplus milk. The policy objective of producers as far as blend prices are concerned might be the same as in the first case; that is, to make them sufficient to maintain, but not exceed, the milk requirements for the market. Or it might be the same as in the second case, to obtain higher blend prices than are consistent with long-period price stability.

[46] Efforts to limit supplies of milk on city markets preceded the adoption of classified pricing. The vulnerability of producer prices to the impact of surplus milk, whether seasonal or associated with yearly fluctuations of supply and demand, had turned their attention to supply limitation for the amelioration of their problems.

Regardless of which of these policies of pricing Class I milk is pursued, the underpricing of milk for surplus uses may be expected to create an unstable and probably less efficient competitive situation among handlers. There would be an incentive for handlers to put milk to surplus uses beyond the requirements for reserve supplies and an encouragement to the employment of surplus equipment in a way which would otherwise be uneconomical.[47] Handlers of relatively high proportions of surplus milk would receive further advantages in competition with handlers whose operations are almost entirely confined to fluid milk. They could, for example, use the extra profits of surplus operations to offset smaller profits on fluid sales. Such a policy might enable them to acquire and retain a larger share of these sales than would otherwise be possible.

It might be expected, under the conditions of imperfect competition, that some handlers would develop larger surplus operations than were required to provide a reserve supply for their fluid operations. It might also be expected that the movement of extra supplies among handlers in the market would be impeded because of the extra attractiveness to handlers of manufacturing surplus products. These factors would cause a less efficient use of surplus milk for the market as a whole and consequently a greater proportion of surplus milk would be needed on the market under these conditions.

We may now consider what would happen under the first of the alternative pricing policies as applied to Class I milk—exploiting the inelastic demand for fluid milk only to the point of compensating producers for their losses due to the underpricing of Class II milk. As we noted above, a larger proportion of surplus milk would probably be used and required in the market. On the other hand, higher Class I prices, to the extent that they would be reflected in higher resale prices, would reduce the demand for fluid milk. While, under the general conditions assumed in this problem, we have no way of knowing whether total supplies purchased by handlers in the market would tend to be greater or less than under the pricing policies of our first case, we can expect reduced Class I sales and a higher proportion of surplus utilization.

Now, let us turn to the situation where the second pricing policy is applied to Class I milk: An attempt to exploit the fluid demand to obtain a higher blend price for producers than that indicated by the supply and demand conditions in the market. This objective is impeded by the underpricing of Class II milk which involves losses to producers on Class II milk beyond those normally associated with surplus handling. Whatever gains are to be passed back to producers will require a higher Class I price than if Class II milk were paid for at its full market value. This higher Class I price will have an adverse affect on consumption of fluid milk. The tendencies for blend prices to decline and for counter-efforts to be made to control supplies would be expected as in the preceding case. The effects on competition between handlers with high and those with low surplus utilization would be greater than under any of the other sets of conditions analyzed.

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[47] Thus what would otherwise be obsolescent plants for the manufacture of milk products might be kept in operation to take care of surplus in excess of reserve needs of the market.

CHAPTER IX.—LONG-PERIOD CONSEQUENCES OF CLASSIFIED PRICING

Purpose of Analysis

We can now indicate the limits which the tendencies associated with classified pricing, in accordance with each of the three sets of pricing policies discussed in chapter VI, may be expected to approach over an extended period of time. The abstract nature of this kind of analysis becomes somewhat more pronounced for long-period than for short-period considerations. In actual market conditions under the pressures of real economic and social forces, distinct lines of pricing policy are not apt to be carried out consistently over a long period of time. Vacillations are more likely to occur, especially under the impact of sharp changes in general economic conditions which may at times encourage or at other time discourage producers' efforts to apply classified pricing to exploit the demand for fluid milk in their own markets.

Our incentive for making this theoretical analysis of long-period consequences of these different pricing policies rests on the belief that it does help us to understand the kind of market situation to which each of these sets of policies is headed whenever it is put into practice. Such an analysis helps to provide the theoretical framework for evaluating real marketing conditions and actual institutional arrangements which would lead to the adoption or continuation of one or the other of these policies.

Consequences of Pricing for Price Stabilization and Market Security

The assumed policies in this case include the highest Class II price consistent with continuous disposal of surplus milk, a Class I price adjusted to a level to maintain blend prices in line with supply and demand conditions, and no serious efforts to restrict supplies. Of the three cases under discussion, this one would be most consistent with the maintenance of long-period stability in marketing and prices.[48] The consequences of the application of classified pricing in accordance with these policies are not such as would interfere with their continued application.

The chief attribute previously noted with respect to this application of classified pricing is that, while it may have rather marked effects upon competitive relations among handlers as compared with the single pricing of producers' milk, once it is established it does not itself generate any new tendencies toward contraction of fluid demand or expansion of supplies, with a consequent growth in the proportion of milk going into surplus uses. Blend prices are responsive to changing economic conditions. Neither the Class I price

[48] Although not consistent, even over a long period, with highest blend prices for producers (see p. 73).

nor the price for milk going into surplus uses encourages diversion from fluid to surplus uses. No pressures are built up by the operation of the price plan for overexpansion of production within the supply area for the fluid market, or for diversion of milk from outside the supply area which is attracted to the fluid market because its price is out of line with prices obtainable from other market outlets.

In practice, of course, marked fluctuations in economic conditions within and outside the fluid market may bring about instability of relationships of supplies within and outside the supply area, or may create shortages or abnormal surpluses within the fluid market. These conditions would not be tendencies attributable to the operation of the classified pricing plan. Under the policy objectives of this case, the prices of milk established under the plan would be such as to counter rather than encourage imbalance.

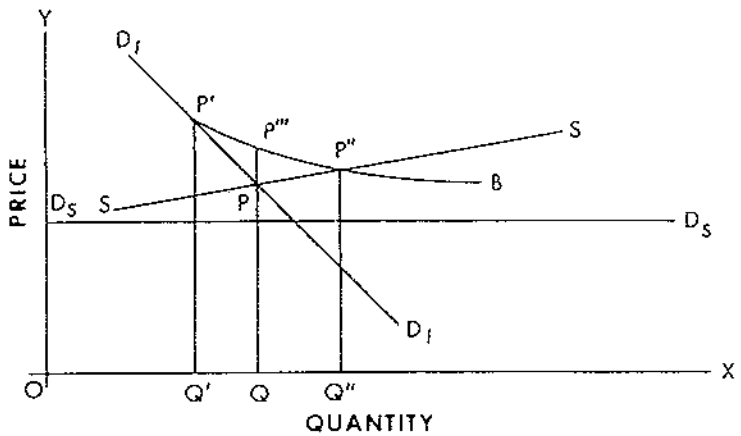
Consequences of Pricing to Enhance Producer Returns

The assumed policies previously noted for this case are to maintain the highest Class II price consistent with continuous disposal of surplus milk and a Class I price designed to exploit the demand for fluid milk so as to raise the returns (blend prices) to producers to a level substantially higher than would be warranted by supply and demand conditions in the market if milk were sold at a single price. The tendencies, already analyzed, which would be associated with this set of policies would be for: (1) Fluid consumption to decline, (2) total supplies and the proportion of surplus to increase, (3) blend prices to fall, and (4) counter efforts to be made by producers either to raise Class I prices still further or to restrict supplies, or both.

Figure 12 provides an illustration of the possible limits which these tendencies might be expected to approach on the assumption that

The Long-Run Consequences

APPLYING CLASSIFIED PRICING TO RAISE PRODUCER RETURNS



U. S. DEPARTMENT OF AGRICULTURE NEG. 4477-57 (1) AGRICULTURAL MARKETING SERVICE

Figure 12.

no effective limitation of supplies is adopted.[49] The line D_fD_f represents the demand of handlers for milk for fluid use. The demand responses represented by this line are long-period responses to changing prices of milk for fluid use. All other factors influencing demand, except those which are caused by changed prices of milk for fluid use, are considered static. Thus the size and composition (by age, sex, race, etc.) of the consumer population in the market is unchanged and the handlers (number, sizes, and operating structures) in the market would be modified only through changed competitive relations caused by changes in prices charged by the association.

The line D_sD_s represents the demand of handlers for milk for surplus uses. This is horizontal, based on an assumption that any quantity of milk for surplus use can be sold at the same price after sufficient time has elapsed to permit facilities in the supply area to adjust to the quantity offered. Considerations of the proportions of surplus milk required to maintain minimum reserve supplies to support fluid sales or of seasonal surpluses need not concern us for the purpose of this analysis. We can think of our long-period curves of supply and demand in our figure as applying to a particular time of the year over a period of many years, and assume that the demand for milk for fluid use at that time includes minimum reserves.

The line SS represents the quantities of milk which would be offered for sale in the market at different prices after a sufficient time had elapsed to elicit a complete response to any new price situation. Like the conception of long-period demand, the idea of a long-period supply curve is a highly abstract one. Although it presumes to indicate responses over an extended period of time, we must assume no change in economic conditions and no new technological developments. This is essential if we are to analyze effects caused solely by pricing policies. It does not assume a static situation, however, in the application of existing technological knowledge, such as might result, for example, from increased size of farming operations in response to a higher price.[50]

Turning again to figure 12, QP will be the price at which producers sell milk to handlers when it is sold at a single price. The quantity of milk sold is OQ. Both the price and quantity sold are determined by the point of intersection of the supply curve SS and the demand curve D_fD_f. Our concept of long-period supply and demand curves, as previously described, indicates that their point of intersection must coincide with the point at which short-period supply and demand curves would intersect. Both the short- and long-period curves

[49] This assumption does not preclude efforts to restrict or slow down supply responses to higher blend prices. It does imply that these efforts are not sufficiently effective to allow an equilibrium adjustment to be reached in the market until these responses are fully realized.

[50] Cf. Robinson's description of long-period supply curves (27, p. 22): "The cost curves which we employ are not historical curves showing at what costs actual outputs are produced; they show the effect upon costs of an alteration in output, all other conditions remaining unchanged. Changes in the techniques of production entailed by a change in the scale of output are admitted, but changes in techniques which arise from invention or the application of new methods which might equally well have been applied to a different scale of production are not an element in the cost curve, but alter the position of the whole curve."

abstract only those changes in demand and supply related to changes in price. Starting at an equilibrium position, an unchanged price would not affect either demand or supply as represented by either of these sets of curves. Demand and supply will continue to equate at the same point.

With the introduction of classified pricing, the Class I price is set at a higher level. Eventually it is established at Q′P′ which we shall assume represents the maximum degree of exploitation of the fluid demand. The quantities of fluid milk sold at this price would tend toward an equilibrium position at OQ′.[51] Surplus milk is sold at the price OD_s. From P′ we may construct a curve, P′B, which will represent the blended prices, under a marketwide pooling system, which would be received by producers for various quantities of milk when the quantity OQ′ is sold at the fluid-use price Q′P′ and the remainder is sold at the surplus-use price.

In our analysis of short-period tendencies associated with this pricing situation, we noted that the addition to producer returns will encourage additional supplies, which in turn cause the blend price to decline. This encourages efforts among producers to try to slow down the rate of increase in supplies and to exploit the fluid market more fully. An equilibrium position will be reached where the curve P′B crosses the long-period supply curve SS. Then Q″P″ will represent the stabilized position of the blend price. The increase in production which will take place before this new equilibrium is reached will be represented by QQ″, the difference between OQ and OQ″. This higher level of production will be achieved at a higher marginal cost, represented by the difference between QP and Q″P″.

The difference between Q″P″ and QP represents also the net increment in prices which producers in the market will be able to retain. Benefits to individual producers will vary and will be related to their own cost curves and to the time when they had been induced to enter the fluid market. Some producers who may have been encouraged by earlier and higher blend prices to enter the market, or, if already on the market, to expand their production facilities, may find that the lower equilibrium price of Q″P″ does not provide a return on investment equal to alternative opportunities.

There is a further factor which affects the incidence of price benefits among farmers. This is the tendency for higher prices eventually to become capitalized in higher farm values, especially that part of farm values represented by the cost of land. To a certain extent, this will be reflected in higher taxes. Farm operators who do not own their own farms may expect higher rents to siphon off a further share of the gains from higher prices. It may be expected, therefore, that once this process of capitalization is completed, new purchasers of farms in the milkshed may expect no advantage from the higher

[51] It has been noted in chapter VIII that one of the economic tendencies associated with this kind of pricing situation, in the absence of effective limitation of supplies, is for producers to seek maximum exploitation of the fluid market to offset declining income due to increasing surpluses. If the officers of the association have a short-range perspective on price policy and consequently underestimate the elasticity of demand for the association's milk for fluid use (p. 68), the Class I price would approach a higher limiting position than Q′P′ and the quantities of fluid milk sold would tend toward an equilibrium position which would be lower than OQ′.

prices. This tendency for higher costs to be an outgrowth of higher prices has been noted in a study by the U. S. Department of Agriculture (*40*, p. 69) even under conditions where entry of new producers is restricted:

> From a cost viewpoint, the continuance of high prices, while entry is restricted, may encourage the capitalization of the value of the permit to sell milk into the value of a farm. Another cost effect is to cause considerable capital expenditure for expansion. As a result, these costs become a permanent part of the cost structure in the market area and are used in cost of production data as evidence favoring continuance of unnecessarily high prices for milk.

The new adjustment will be a less efficient one in certain respects, from an economic standpoint, than the one which we have hypothesized before the introduction of classified pricing.[52] The supply of milk is larger in relation to the amount of fluid consumption. The extra supply goes into surplus uses. Production and marketing resources are less effectively allocated. The boundaries of the milkshed will be overextended, and within the milkshed the dairy enterprise will tend to become overintensified in relation to the amount of fluid milk consumed in the market. There would also be a tendency for more land and other agricultural resources to be allocated to dairying, as compared with other farm enterprises, than was the case before the adoption of classified pricing. The situation is that described by Burns (*8*, p. 77), where monopoly prices remain but monopoly profits are gone. The crux of the inefficiency of the new adjustment, from the standpoint of consumers, is the contraction of fluid milk sales and the expansion of sales of milk for surplus uses.

It is even possible that the incentive for short-run gains may lead producers' representatives to raise the Class I price higher than the nature of the long-period demand responses would warrant. That is, if the long-period demand for milk is more elastic than the short-period demand, the pressures associated with the economic bargaining process may lead to the setting of Class I prices above the limit of profitable exploitation for producers (see p. 68). This would accentuate the tendencies described and would lead to a situation where producers might be worse off in terms of cost-price relationships than they were before.

Under given conditions of long-period demand for fluid and surplus milk in the market, the flatness or steepness of the long-period supply curve will determine the degree to which the effects, already discussed, will be apt to take place. If, for example, the curved SS in figure 12 were more nearly horizontal, the equilibrium blend price $Q''P''$ would be lower, the total supply of milk OQ'' would be greater, and the proportion of surplus to fluid sales would be increased. A steeper slope of the curve SS would, on the other hand, mean that more of the increase in the blend price would be retained in the new equilibrium situation, total production would not expand as much, and the proportion of surplus sales would be less than in the figure, although it would still be greater than it was before adoption of classified pricing.

The shape and direction of the long-period supply curve would depend on such factors as the conditions affecting milk production in

[52] This statement has meaning only within the limits of this abstract analysis, which takes no account of possible nonprice benefits of classified pricing under actual marketing conditions such as we have discussed in ch. II.

the vicinity of the market, the competing uses for agricultural resources, the competition of other milk outlets, including other markets for fluid milk, and various influences within the market which may impede supply response to higher prices. The long-period supply curve for a fluid market in a surplus dairy region whose milkshed does not overlap milksheds of other cities (particularly cities of larger size), with no limitations imposed on supplies, would be expected to approach a horizontal position. On the other hand, the long-period supply curve might be expected to be somewhat steeper for a city market in a deficit dairy region where other cities entered into direct competition for supplies, and where some hindrances associated with higher costs were imposed on increased output of producers or on the entry of new producers.

The analysis of the effects of applying classified pricing to raise the level of returns to producers has dealt thus far with a situation where supplies of milk for the market could not be effectively limited at any given amount. It remains now to consider the situation where it is possible to hold the level of supplies.

First, we will consider the situation where milk supplies are held to the amount OQ (fig. 12), the quantity of milk on the market at the time classified pricing was adopted. Then the blend price might reach and could be held at QP''' and producers supplying the market would retain the advantage of the difference between QP''' and QP. The amount of milk diverted from fluid to surplus uses would remain stationary at Q'Q.

Although producers would retain a greater advantage from the higher blend price than without supply limitation, part of this might be lost if the devices which restricted supplies caused added costs of production. For example, inspection policies of health authorities which arbitrarily limit the boundaries of a milkshed to a certain number of miles from the city, or which cut off part of the potential milkshed at the State border, may have this effect (p. 15). Also, there would be some tendency toward capitalization of higher returns in the form of higher land and farm values. This would not take away benefits to producers already on the market, except as higher taxes might result. It would, however, mean that new producers or new investors in dairy farms might lose some or all of the advantages of this situation of restricted supply and higher prices.

Consumers in the fluid market would be in substantially the same position whether or not total supplies were restricted. The price of fluid milk (to distributors) would remain at Q'P', at which level consumption of fluid milk would be curtailed to OQ'.

We may go further and assume a situation where producers not only are in a position to prevent an expansion of supplies in response to higher prices but also are able to limit effectively supplies sold on the market to any amount which is most advantageous to them. Again referring to figure 12, the supply curve SS lies above the line D_sD_s for all quantities of milk sold on the market beyond OQ', which represents sales of milk for fluid use at the price QP'. Marginal revenue received from sales of surplus milk are in this illustration always below marginal costs of producers. With the Class I price fixed at Q'P', producers will maximize returns by reducing output to a point OQ' which covers no more than the essential minimum of surplus milk required by distributors as a reserve for fluid sales.

The assumption that surplus sales are always unprofitable in themselves is probably in line with economic realities in most fluid milk markets, especially those in deficit regions. If, however, we wish to assume a fluid market where conditions of production are such as to permit the sale of some milk for manufacturing uses which is profitable to producers for the fluid market, the curve SS would cut D_fD_f at some point beyond OQ′. D_sD_s, being horizontal, represents the marginal as well as the average revenue curve for surplus milk. The amount of milk which producers would supply the market would then correspond with the point at which SS cuts D_fD_f.

Consequences of Underpricing Surplus Milk

The pricing policies for this case, as previously described, are to underprice surplus milk and to price fluid milk at a level which will result in a blend price, either: (a) To maintain, but not exceed, a supply of milk to meet handlers' needs for fluid sales plus minimum reserve requirements for the fluid market; or (b) to raise the blend price received by producers to a level substantially higher than was received when producers were paid a single price for their milk.

The first of these alternative pricing policies is the same as that for attaining price stabilization and market security objectives, except for the underpricing of milk for surplus use. The Class I price would, as previously noted, tend to be higher than the Class I price would be if it were not necessary to compensate for the lower prices at which Class II milk is sold and for the larger amounts of surplus milk which may be required as a reserve for fluid sales, under conditions where the circulation of such milk among handlers might be impeded (p. 69).

Whether total supplies on the market would be larger or smaller after these pricing policies were followed over a long period appears to be undeterminable. Fluid consumption would be curtailed and the proportion of surplus to the curtailed fluid usage would be greater. It is also to be expected that, whatever the equilibrium position which might be approached, it would be a less stable one than would be the case if surplus milk were not underpriced. As long as surplus milk is priced below its market value, we may expect internal pressures in the market for acquiring supplies for manufacturing use or for diverting supplies from fluid to surplus use.

We may continue our analysis to determine the consequences of classified pricing if the second alternative policy is followed: that is, to exploit the demand for fluid milk so as to increase returns to producers while, at the same time, underpricing milk for surplus use. The consequences, over a long period of time, of trying to increase blend prices while underpricing Class II milk will be similar to, although not the same as, those which we have already found when the same objective is sought while pricing Class II milk at its full value in the market. We may refer to figure 13, which is based on figure 12 previously used for analyzing the discriminative marketing situation. Broken lines are superimposed to enable us to describe some of the differences in the sitution due to the underpricing of surplus milk.

The Class I price $Q_I'P_I'$ associated with maximum exploitation of the fluid market will be lower than Q′P′, the Class I price associated with maximum exploitation when Class II milk is not underpriced.

The Long-Run Consequences

HIGH PRICES FOR CLASS I AND UNDERPRICING OF SURPLUS MILK

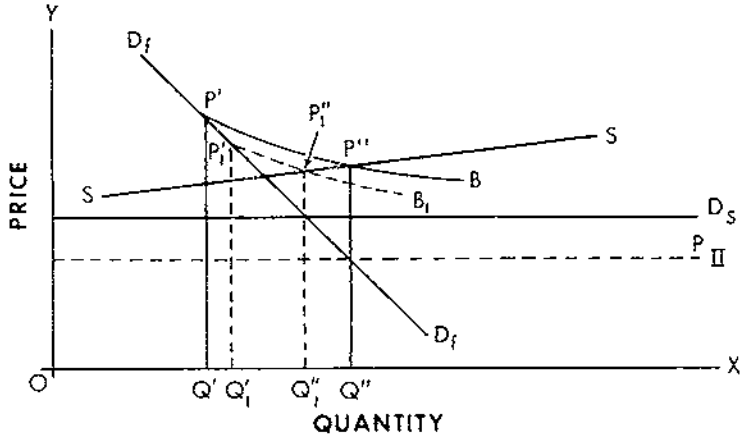


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Figure 13. Long-period consequences of classified pricing applied to enhance producers' returns and to underprice surplus milk.

This was brought out in our previous analysis of the effect of the price level for surplus milk upon the level of the Class I price which would maximize total revenue received by producers (p. 52). The consumption of fluid milk at this point of maximum exploitation will not be curtailed to the same degree, OQ_1' being greater than OQ'.

Unless the long-period supply curve SS is horizontal, the limiting situation of the blend price $Q_1''P_1''$ will be lower than $Q''P''$. These prices are determined by the point of intersection of the respective curves of blend prices ($P_1'B$ and $P'B_1$) and the line SS. It can be demonstrated that $P_1'B_1$ must meet the rising supply curve SS to the left of and therefore at a lower point than P''.[53]

In this limiting situation, total supplies on the market would not be expanded to the same extent as under conditions where Class II milk is sold at its full market value, OQ_1'' being less than OQ''. There would also be less surplus, although the proportion of surplus would be well above minimum requirements. A degree of equilibrium with respect to the utilization of surplus milk under the assumed pricing policies could be conceived of only under conditions where the association had control of the allocation of milk between fluid and surplus

[53] The demonstration is as follows: (1) From P_1' construct a curve of blend prices $P_1'B_1'$ based on a Class I price of $Q_1'P_1'$ and a Class II price of OD_S; (2) this curve would lie below P'B at all points because Q'P' represents the Class I price associated with maximum returns (blend prices) to producers; (3) but $P_1'B_1$ must lie below $P_1'B_1'$ at all points beyond P_1' because it represents an average return based on the same Class I price (and quantity of Class I milk) plus the same quantity of Class II sold at a lower price, OP_{II} instead of OD_S; (4) therefore, $P_1'B_1$ must also lie below P_1B at all points.

uses. If allocation were under the control of handlers other than the association, the incentives to divert larger proportions of milk to surplus uses would come into play and our conception of a limiting situation built up in figure 13 would break down.

The comments made in our previous analysis of the discriminative marketing situation, with respect to the variability of benefits retained by individual producers, the tendencies for higher cost resources to be utilized, and the capitalization of land and other farm values, would apply to the present analysis. New producers entering the market after these equilibrium adjustments have been made may derive no advantage from the higher price situation. As in the previously analyzed situation, land and other farm resources will be less effectively utilized and the efficiency of marketing milk for the fluid market will be reduced.

Intermarket Consequences

The application of classified pricing as a means of maximizing producer returns in the marketing of milk requires, in the absence of effective limitation of supplies, increasing quanties of milk to be diverted to surplus uses. This fact has been noted throughout our analysis. Diversion of milk from the fluid to surplus markets either on a seasonal or year-round basis is in fact the very essence of the practice of price discrimination in fluid milk markets (p. 38).

The quantity of milk diverted from fluid to surplus uses by a moderate increase in the Class I price relative to surplus-use prices in a single fluid market is likely to be small in relation to the total quantity of milk used in making manufactured milk products for the nationwide market. The impact of such diversion upon prices of manufactured milk products might not be very significant. If, however, many fluid milk markets, including some of the largest, are applying price policies, over an extended period of time, which create diversion from the fluid to surplus markets, the impact upon supplies and prices of milk products may be considerable.

A determination of the extent to which classified pricing in fluid milk markets causes a diversion of milk from fluid to surplus markets is beyond the scope of this study. It is perhaps pertinent to our theoretical treatment of the subject to note that, for some time, there has existed among representatives of producers in manufacturing regions an awareness of the possibility that these producers might suffer disadvantages because of the pricing policies in some fluid milk markets. Two related fears are involved: (1) That the bolstering of high Class I prices may lead to practices which prevent milk from manufacturing regions from sharing in fluid milk markets (p. 68); and (2) that pricing policies in fluid milk markets may cause the dumping of milk on markets for manufacturing milk in quantities sufficient to depress the prices of such products.

Criticism of classified pricing practices by producers and handlers in manufacturing regions has become greater since World War II. This is probably related to a general decline in farm prices relative to the general price level and the problem of accumulated surpluses of farm products. It has been a period of greater pressures within fluid milk markets for widening differentials between Class I and surplus prices. Such pressures have been effective in some markets. Sur-

pluses in many fluid markets have increased In 1956, the percentage of milk received from producers in 54 markets under Federal milk marketing orders which was used in fluid form ranged from a low of 55 in June to a high of 75 in October.[54]

The present period is also characterized by greater pressures, exerted by producers in milk manufacturing areas, to obtain higher priced fluid outlets for their milk and to protect manufacturing markets from any depressing effects which might be caused by diversion of milk in fluid markets to manufacturing uses. Representatives of Midwestern milk producers have stated their opposition to the adoption of Federal milk marketing orders with "artificial or unrealistic" class prices, unless they incorporate adequate producer quota provisions to eliminate surplus milk resulting from such prices.[55]

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[54] The quantity of milk used in fluid form for each market taken as a basis for this compilation, was that portion of milk received from producers which was needed for fluid uses, required to be supplied from approved sources. For most markets, fluid use includes whole milk, buttermilk, plain and flavored skim milk, and sweet and sour cream sold within and outside the marketing area. For some markets, including the five in New England as well as Philadelphia, Wilmington, Cleveland, and Detroit, fluid cream is excluded. In the New York market, fluid use includes cream shipped into the marketing area and all whole milk sold.

[55] Dairy Record, March 14, 1956, p. 18.

CHAPTER X.—CLASSIFIED PRICING WITH ASSOCIATION OR INDIVIDUAL HANDLER POOLING

The analysis of classified pricing up to this point has dealt with its operation in conjunction with marketwide pooling—that is, in situations where the payments made by all handlers in the market are pooled for redistribution to producers. In this part, some effects of classified pricing with association pools or individual-handler pools are discussed.[56]

The Association Pool

In our discussion of the effects of operating a classified-price plan with an association pool, we shall assume the following conditions: (1) There is only one association of producers in the market; (2) this association represents its members in bargaining on prices with handlers but does not itself engage in the processing or distribution of milk[57]; (3) handlers who buy milk from association members are under full-supply contracts with the association; (4) handlers who buy milk from producers who are not members of the association have a substantially higher proportion of fluid milk sales in relation to total utilization of milk than does the association pool; and (5) these handlers pay flat prices for milk purchased from nonmembers.

One of the differences between classified pricing under an association pool as compared with a marketwide pool is its effect upon handlers who do not participate in the association pool. We have noted that the adoption of classified pricing with marketwide pooling removed a competitive advantage which handlers with high proportions of fluid sales had previously enjoyed over handlers with lower proportions of fluid sales. It was also noted that the smaller scale handlers, in many fluid markets, are to be found mainly in the former category. In a market where classified pricing is applied only to milk purchased from producers who are members of an association, it is possible for handlers with more specialized fluid operations to retain their advantage as long as they buy from producers outside the association.

The association pool may be considered, in certain respects, as an incomplete marketwide pool. This is especially the case from the standpoint of organized producers. An objective of the association, as a collective bargaining agency, is to represent all of the producers in the market so as to achieve a position of maximum strength in its bargaining negotiations with handlers. The association's efforts to bring the remaining nonmembers into its organization as participants in an association pooling arrangement run counter to the interests of handlers with specialized fluid milk operations. Such efforts, if suc-

[56] The different types of producer price pools are defined in ch. III.

[57] The implications of an association's own operations as a handler upon the operation of classified price plans are discussed in ch. VII.

cessful, would require these handlers to buy on the classified price plan, which, because of their high Class I utilization, would cause them to incur higher costs of procuring their supplies of milk.

In fluid milk markets where association pools are operating in conjunction with classified pricing, those handlers who buy milk from producers who are outside the association usually pay these producers a little higher price than the blend pool price received by members of the association. They can do this and still obtain their supplies at a cost which is less than the cost of obtaining their supplies under the classified price plan.

The situation may be illustrated as follows: Assume a handler "A" who buys from producers outside the association. He sells 90 percent of his supplies for fluid (Class I) use. The average utilization of handlers who buy milk from association members is 75 percent Class I and 25 percent Class II. The Class I price per hundred pounds is $4.00 and the Class II price is $2.00. The association pool price will be the weighted average of these two class prices, which is expressed as:

$$\frac{75\times\$4.00+25\times\$2.00}{100} \text{ or } \$3.50.$$

This is the price received by association members. If handler "A" were to buy milk from association members under the classified price plan, he would have to pay on the basis of the two class prices weighted on the basis of his own utilization, which is 90 percent Class I and 10 percent Class II. His total payment for milk, which would go into the association pool, would be:

$$\frac{90\times\$4.00+10\times\$2.00}{100} \text{ or } \$3.80.$$

Handler "A" could therefore pay his producers a premium of, say, 5 cents over the association pool price of $3.50 and still obtain his supplies of milk at a cost which is 25 cents per 100 pounds less than he would have to pay under the classified price plan.

If the situation is considered from the point of view of his position as a distributor of fluid milk in competition with handlers buying through the association, we may try to compute the cost of that part of his supply which he sells for fluid purposes, for comparison with the Class I price of $4.00. We can do this by applying the Class II price of $2.00 to the 10 percent of his supply which goes into surplus uses and considering that he pays a price of $3.55 (the association pool blend price of $3.50 plus a premium of 5 cents) for his entire supply. The cost per 100 pounds, C, which may be considered applicable to milk sold in fluid form, may be computed from the equation:

$$\frac{90C+10\times\$2.00}{100}=\$3.55.$$

Solving this equation for C, we find that a handler buying outside the association would obtain milk for fluid (Class I) use at a cost of $3.72 per 100 pounds. This would appear to give him a competitive advantage of 28 cents over handlers buying milk from the association for fluid use.

The reliability of this cost figure rests largely on the correctness of our allocation of the Class II price to the part of the supply which goes into surplus uses. It is, in effect, an assumption that milk for surplus uses is worth as much to a handler buying outside the association as it is to handlers buying from members of the association. In view of the fact that the former are the more specialized fluid handlers, presumably operating on a smaller scale than those buying from the association, this assumption is of doubtful validity for most market situations. Where the fluid utilization of the handlers buying outside the association approaches 100 percent, however, errors introduced by applying the Class II price to the part of his supply going into surplus uses become less and less significant, and the cost of the supply for fluid distribution approaches the price paid his producers. The competitive advantage over handlers buying from members of the association approaches the difference between the Class I price and this price. Using the prices in the illustrative example above, this would be $4.00 less $3.55, or 45 cents, as the competitive advantage of a handler with 100 percent fluid utilization over pool handlers, in the cost of procuring supplies for fluid distribution.

Under these conditions the association pool would tend to operate as a mechanism which defeats the association's efforts to organize all of the producers supplying the fluid market. Nonmembers find it to their immediate advantage to stay out of the association because joining it would require them to give up the advantage of premium payments which they receive from their handlers. At the same time, these nonmember producers benefit from the efforts of organized producers to stabilize the marketing of milk and to increase their returns. The blend pool price which association members receive is usually the basis on which nonmembers are paid. The premium over this price which they receive is the inducement required to keep enough of them out of the association to maintain sources of supply for handlers buying outside the association.

It is quite typical under these conditions for producer associations to make strong appeals to producers based on the broader realities of their economic interdependence and on mutual loyalties as producers. For many producers, such appeals are sufficiently persuasive to induce them to join (or remain in) the association even where it means giving up premium payments. It is, however, a common experience of associations to find that the task of organizing producers becomes progressively more difficult as they seek to make inroads among producers supplying handlers with specialized fluid milk operations.

It is less feasible to apply classified pricing for the purpose of raising producer returns above competitive levels with an association pool than it is with a marketwide pool. An increase in the Class I price to exploit the less elastic demand for fluid milk widens the spread between the prices of milk for fluid and surplus uses. This tends to increase the competitive advantage of the specialized fluid milk distributor who buys his supplies from producers who do not belong to the association.

This may be illustrated by taking the previous example of a handler buying outside the association, whose utilization is 100 percent fluid and whose supply of milk is purchased at $3.55 per 100 pounds. This gives him a competitive advantage of 45 cents over handlers buying

from the association on a class price basis, because they have to pay $4.00 per 100 pounds for milk which they sell in fluid form. Now if we assume that the Class I price, instead of being $4.00, is raised to $5.00 with the relative utilization by pool handlers remaining at 75 percent fluid and 25 percent surplus, the blend price computed from the pool which is paid to association members is:

$$\frac{75\times\$5.00+25\times\$2.00}{100} \text{ or } \$4.25.$$

If the handler buying outside the association pays the same premium of 5 cents over the pool price, he will have to pay $4.30 for his supply. At the higher Class I price of $5.00, his competitive advantage in the cost of obtaining milk for fluid use is now 70 cents per 100 pounds, whereas, when the Class I price was $4.00, it was only 45 cents.

These wider margins for the specialized fluid milk handler may be used in part to cut prices to consumers as a means of taking an additional share of the fluid market. If necessary, the handler can use part of the wider margin to pay a higher premium to producers in order to obtain additional supplies. This tends to remove the basis on which higher Class I prices can be paid by handlers buying milk from association members. This basis is their ability to pass on the higher prices to consumers of fluid milk without too great a loss of fluid milk sales. The fact that the total consumer demand for milk in fluid form may be relatively inelastic does not alter the fact that, under an association pool, price cutting by handlers buying outside the association may cause a loss of fluid sales by handlers buying from the association to those buying outside the association. This, in effect, increases the elasticity of demand for fluid milk sold by handlers buying from the association. Thus the association is likely to face increasing resistance from the handlers who buy milk of its members in any efforts to raise the Class I price (see p. 43).

Now we may go one step further in our analysis of the limitations of classified pricing with an associaton pool as a means of exploiting the demand for fluid milk. Let us assume that the Class I price is maintained at a high enough level to accomplish this objective for a time because handlers buying from the association are in a position so strong that they are not at first seriously affected by the competition of the more specialized fluid handlers buying outside the association. We may reasonably expect, however, if we refer back to our analysis in chapter IX dealing with long-period consequences of this type of pricing policy, that this competition will become more serious as time goes on. This will be the consequence of the increasing proportions of the total supply which must be disposed of for surplus uses.

We may illustrate how increasing proportions of surplus milk in the association pool will be a factor, independent of price, in increasing the competitive advantage of handlers buying outside the association. If, in our previous example, we assume that the proportion of surplus milk used by handlers buying from the association has increased from 25 percent to 40 percent, with no change in class prices, the association pool price would be:

$$\frac{60\times\$4.00+40\times\$2.00}{100} \text{ or } \$3.20.$$

The specialized fluid milk handler with 90 percent fluid sales would set his premium to his producers on this $3.20 price instead of the $3.50 price which prevailed when the association pool carried only 25 percent surplus. If his premium payment amounted to 5 cents per 100 pounds, his payment of $3.25 would be 55 cents less than the $3.80 he would be required to pay if he bought milk from the association under the class price plan. A specialized fluid milk handler with 100 percent fluid utilization would pay 75 cents per 100 pounds less than he would have to pay at the Class I price. This figure would also be his competitive advantage in obtaining supplies for fluid utilization over handlers buying from the association. The increase in the proportion of surplus among pool handlers from 25 to 40 percent would result in a 30-cent increase in this advantage.

The increase in the proportion of surplus milk on the market not only offers a greater competitive advantage to the specialized fluid milk handler who buys outside the association, but also presents a more favorable opportunity for new capital to be invested in the business of distributing milk in the market. On a small scale, this might take the form of additional specialized distributors. Some of these might be producers themselves who are located close enough to the market to enter the field of distribution. Prices received by producers participating in the association pool would be lower because of the increase in the proportion of surplus. A corresponding decline would be expected in prices received by producers outside the association—the prices received by the latter being directly related to the association prices. The general decline in producers' returns and the maintenance of high Class I prices would create a situation where it might become advantageous for some producers to distribute their own milk rather than to continue selling milk to established distributors.

Higher proportions of surplus milk in the association pool and the maintenance of a high Class I price create opportunities for new handlers to enter the market on a scale to compete with the larger established distributors who cover the entire market. If the new investors could obtain sources of supply outside the association, they would start with an immediate advantage over their competitors buying from the association, because they would not carry more than a normal surplus as a reserve supply for their fluid operations.

We will, for purposes of illustration, assume that a distributor operating on a large scale in the market (as distinguished from the typically small-scale operator who is able to keep a more specialized fluid milk operation) is required to divert approximately 25 percent of his supply for surplus uses. As long as the proportion of surplus usage in the association pool is about 25 percent, there will be no incentive for a new handler to enter the market and build up his own supply from producers outside the association. As long as he has to pay these producers a price in line with the blend price received by producers paid from the association pool, he will have no advantage as far as the cost of procuring his supplies is concerned. In fact, if he has to pay a premium over the blend price of the association pool, the cost of obtaining supplies will be greater than the cost incurred by handlers buying from the association.

Now let us assume that after the classified price plan has been operating for some time under a policy of exploiting the demand for fluid milk, the surplus utilization by handlers buying from the association increases to 40 percent. Using the same class prices ($4.00 and $2.00) which we have assumed in previous examples, the blend price of association producers will be $3.20 per 100 pounds. The cost of obtaining supplies for fluid distribution by a new handler, who pays a premium of 5 cents over the pool blend price, may be computed from the following equation: $\frac{75 \times C + 25 \times \$2.00}{100} = \$3.20 + .05.$

Solving this equation, we find C equals $3.67. This gives the new handler an advantage of 33 cents ($4.00 less $3.67) over his competitors buying milk for fluid use from the association at the Class I price.

We may summarize our analysis of the operation of classified pricing with an association pool by making the following comparison with our findings with respect to classified pricing with a marketwide pool:

1. The specialized (typically small-scale) fluid milk handler has a better chance of survival;
2. The internal pricing situation created in the market, which leads to the payment of premiums over pool blend prices to producers who are not members of the association, prevents the development of the association pool into a marketwide pool;
3. The application of classified pricing to exploit the demand for milk for fluid use is limited by the fact that the demand for such milk by handlers participating in the association pool is less elastic than it would be if all handlers participated;
4. If an attempt is made to apply classified pricing so as to exploit the demand for milk for fluid use, competitive advantages of nonparticipating handlers (both actual and potential) are increased, and conditions of competitive instability are encouraged among both producers and handlers, which may eventually lead to the abandonment of this practice or to a request for governmental controls which might establish a marketwide pool.

The Individual-Handler Pool

In our discussion of the effects of operating a classified price plan with an individual-handler pool, we shall assume the following conditions: (1) Each handler in the market is required to pay the same minimum class prices for milk disposed of for fluid (Class I) and for surplus (Class II) uses; (2) a producer, whether or not he is a member of an association, is paid on the basis of the blend of the class prices paid by the particular handler to whom he sells his milk; and (3) any producers' association in the market confines itself to bargaining with handlers on class prices and to performing service activities for its members.

For the purpose of comparing individual-handler pooling with association and marketwide pooling, previously discussed, we will first direct our attention to its effects upon competitive relations between handlers with specialized fluid operations and handlers with substantial surplus operations. The former type of handler was found to incur higher costs due to the introduction of classified pricing with

marketwide pooling. Under an association pool, this type of handler could maintain his advantage in cost of processing supplies as long as he stayed out of the pool—that is, as long as he bought milk from producers who were not members of the association, thus not subjecting himself to the classified price plan.

Under the individual-handler pool plan where all handlers must pay class prices, the average cost of milk for each handler, as required by the class prices, will vary with the proportions of milk going into fluid and surplus uses. This average of the class prices also is the basis on which the producers supplying each handler are paid. This is the essential distinction between the individual-handler pool and the marketwide pool, and it permits the specialized fluid handler to retain certain advantages under individual-handler pooling which he does not have under marketwide pooling.

The specialized fluid milk handler is able to use the higher price which he is required to pay under the classified price plan to attract a more valuable source of supply. He can select shippers conveniently located for his own operations, whose output is closely geared seasonally to his distributive operations and whose milk is of better than average quality. Farm operators may be selected for their general experience and reliability or because their herds produce milk of the butterfat content required by the handler. These aspects of producer selection may be of particluar advantage to the small-scale handler who does not employ field representatives and who does not have facilities for efficient processing of surplus milk.

The fact that a specialized fluid milk handler may, under individual-handler pooling, use the higher payments he is required to make under the classified price plan to gain certain advantages in procurement does not imply that the value of these advantages to the handler offsets any disadvantage of having to pay the higher prices. In some cases, this could be so, but the only generalization that can be made is that, under individual-handler pooling, there are possible advantages of procurement to this type of handler which are not possible under a marketwide pool or when he is a participant in an association pool.

The advantage of producer selection employed by the more specialized fluid milk handlers, regardless of scale, under producer-handler pooling may impel handlers with higher surplus operations to resort to the payment of premiums in order to retain producers. This helps to lessen the disadvantage of classified pricing, as compared with single pricing, for the specialized fluid handlers in competing with handlers with larger surplus operations. Freemyer (*15*, p. 108) notes this aspect of the competition for producers in the St. Louis market under individual-handler pooling, although he perhaps overestimates its effect in evening out prices paid among all handlers: "Under the marketwide pool, there will be no price competition among handlers for supplies at any point in the supply area unless premiums are paid. Under the individual-handler pool, there may be substantial price competition; it is assumed, in fact, that competitive forces will be strong enough to require all handlers to pay approximately the same average price, over a period of time, either through adjustments in

their class utilization of milk or through the payment of premiums in addition to the minimum class prices."

In an individual-handler pool, there is a deterrent among handlers to the processing of disproportionate quantities of surplus milk. Even though the class price applicable to such milk may be favorable to the handler, he is normally reluctant to accept milk for surplus uses beyond his reserve requirements because of the depressing effect upon the blend price to his own producers. This competition in the procurement of supplies will compel him, if the proportion of his surplus utilization is too high, to pay premiums to his producers which in effect may be considered as an increase in the cost of his milk for surplus uses. Under a marketwide pool, the handler is not faced with this problem because his producers will share equally in the total payments made by all handlers in the market.

Under conditions of relatively short supply, due to seasonal or other factors, the individual-handler pool tends to perhaps a greater efficiency in the distribution of supplies among handlers in the market than under marketwide pools. The experience in markets operating under Federal milk marketing orders bears this out:

> The individual-handler type pool operates satisfactorily in markets which are relatively short of milk or where the surplus is distributed evenly among producer groups. Where supplies are short, this type of pooling serves as a means of distributing the available supply among handlers in relation to their fluid sales. The handler with a higher fluid use would pay a higher uniform or blended price to his producers and would attract producers from the handler who had more surplus-priced milk. (*41*, p. 58).

During periods of abnormal surpluses, however, there is insufficient incentive for handlers to accept all the milk offered by producers. Problems associated with temporary producer cut-offs, similar to those experienced under single pricing, are apt to arise under such conditions. This may tend to negate the historical function of classified pricing as a means of promoting security of producers on the market and improving their bargaining position on prices.

Over a period of time, the handling of surplus milk may be expected to become less specialized under individual-handler pooling than under marketwide pooling. As under single pricing, the competition among handlers in the procurement of supplies will lead the larger handlers to refrain from handling more surplus than is required as a reserve supply for their fluid distribution. This may result in a less efficient handling of surplus milk, especially in larger markets:

> In many markets, particularly the larger ones, the reserve supply of milk can be more efficiently handled by consolidating the reserve supply in plants most distant from the market. . . . This specialization of function would result in prices at such a plant under an individual-handler pool being lower than those paid handlers who specialized in fluid sales. With a market pool all approved producers who supply the market regularly, even if only in the short-supply period, are paid uniformly according to the total market utilization. (*41*, p. 58).

The individual-handler pool is less adapted than the marketwide pool for supporting policies of classified pricing which would exploit the relative inelasticity of the demand for fluid milk. As discussed in chapters VIII and IX, this policy encourages a diversion of larger proportions of the total supply to surplus uses, and the individual-

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handler pool is not an effective instrument in markets with abnormal surpluses. Also, the fact that the specialized fluid milk distributor retains a stronger competitive position in the market with individual-handler pooling is a factor limiting its usefulness as an instrument for discriminative marketing. Although surplus milk may be apportioned fairly evenly among the handlers with surplus facilities, the more surplus they are required to take, the stronger will become the competitive position of the specialized fluid distributor.

CHAPTER XI.—COLLECTIVE BARGAINING, GOVERNMENT REGULATION, AND MONOPOLY PRICING

In this final chapter, several aspects of fluid milk marketing are taken up which relate to the theoretical treatment of classified pricing. Collective bargaining and governmental regulation of marketing are discussed from the standpoint of their bearing upon pricing policies. The difficulties of determining the extent of monopoly pricing in fluid milk markets are set forth, with an appraisal of two approaches which have been made to this problem.

Some Aspects of Collective Bargaining

In fluid milk markets where prices are arrived at through the collective bargaining process, the producers' association negotiates with those dealers to whom the members sell their milk. Among the customers of the association, in a fairly sizable market, are usually a few large dealers and a greater number of smaller ones. Should the association control a very large share of the milk in the market, say more than 85 or 90 percent, the fact that there are a number of dealers on the other side of the bargaining table might appear to give the association a strong advantage. In practice, this is usually offset by several factors, ably summarized by Nicholls (*24*, p. 192):

> . . . in milk-pricing, the oligopsonists (few large buyers) do not act independently in bargaining with the cooperative, but instead bargain collectively through a "dealers" association. In such an association one of the dominant firms usually assumes the role of leadership in the negotiations with the cooperative. Furthermore, the dominant firms show a certain esprit de corps in the bargaining process, strengthened by their superior research facilities, large financial resources, and their common opposition against "cutthroat competition." On the other hand, the cooperative, as we have seen, is certainly not in the position of a complete monopolist, since its control over its membership and total production is rather imperfect and its financial resources are usually inferior.

There are, of course, considerable differences with respect to the relative bargaining positions of producers and handlers in different markets. On the producer side, bargaining strength may be affected by such factors as: (1) The proportion of producers organized in a single association; (2) the possession by the association of its own facilities for handling surplus milk or for carrying on its own distribution operations; and (3) the ability of its leaders. On the handler side, there are corresponding factors which influence the degree of concentrated control and the ability of handlers to act together effectively in bargaining with organized producers. Thus, there are some markets where a producers' association may announce prices after little or no consultation with handlers, and others where handlers may almost ignore a small association in deciding on the prices which they will pay producers for milk.

But typically, especially in the larger markets, the two sides may be expected to represent fairly balanced aggregates of bargaining

power. At least, both sides are sufficiently strong to develop a wholesome respect for each other at the bargaining table and to create a mutual feeling that a breakdown of price negotiations would be costly to all concerned. Milk strikes by producers or boycotts of association milk by dealers involve diversions of milk by the association to less remunerative outlets and development of new sources of supply by dealers which, because of their emergency and usually temporary character, are more costly, and in some instances may not be possible at all for a considerable period.

Under these circumstances there may exist a powerful incentive for representatives of organized producers and spokesmen for the dominant distributors in the market to find a common ground for understanding, to find a basis for promoting the interests of both sides.[58] Our analysis of the operation of classified pricing plans indicates how they may facilitate this objective.

Classified pricing makes it possible for the large distributors to reach agreement with the producers' association whereby returns of its members may be increased without jeopardizing the earning positions of these distributors in the market or, in some situations, with actual improvement of their positions in this respect. This is accomplished by reaching agreement for a higher Class I price in return for prices on surplus classes which are acceptable to the distributors. The large distributors are able to retain or even expand their margins in the fluid milk market in which they are in a dominant competitive position. In the markets for surplus milk products, resale prices are beyond the control of the distributors in the fluid market, so that whatever price is agreed to by the association determines their operating margins. When this is the general trend of agreements growing out of price negotiations between the association and the large distributors, the policy of discriminative marketing is carried out. Returns to members of the association are increased, aggregate margins of the larger distributors are either maintained or increased, and consumers in the fluid milk market pay the extra cost.

Under marketwide pooling, our analysis has indicated that the competitive position of the larger distributors may be improved in relation to smaller, more specialized distributors. This fact alone is undoubtedly a powerful motivation, in some circumstances, for the larger distributors to make concessions to the association in terms of a higher price for Class I milk. In some instances, an association is in a position to agree to a price structure which enables certain of these distributors to benefit at the expense of others in the handling of surplus milk, as described in chapter VII. This could not be accomplished in the absence of classified pricing, and it may provide the necessary reciprocity to induce these distributors to agree to higher Class I prices.

The ability of each side to confer certain advantages upon the other in the bargaining process is a definite feature of bargaining under classified pricing, and is probably an incentive for using it as

[58] Cf. Nicholls (24, p. 196): "Thus, once producers as well as dominant distributors are well organized, their opposition of interests may tend to resolve itself into a fairly stable identity of interests. Their main antagonism may then be directed toward noncooperating producers and 'cutthroat' distributors, with the power of the law frequently backing them up."

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CLASSIFIED PRICING OF MILK SOME THEORETICAL ASPECTS 2 OF 2
HARRIS, E S

a device for raising producers' returns while allowing favorable margins to handlers of surplus milk in some instances. A. C. Hoffman writes of collective bargaining in fluid milk markets (*19*, p. 84): "In the ordinary course of bargaining, each concentrates its interest primarily on its own price or margin. Not infrequently each group is willing to grant the other certain concessions, provided there is reciprocity in the matter." [59]

Regulation of Milk Marketing: Theory and Practice

Government agencies, both State and Federal, have for more than two decades undertaken responsibilities in the regulation of milk marketing in numerous city areas. All of these regulations include price-setting at the producer level, and most of the 16 States which were involved in regulatory activities in 1954 authorized their regulatory agencies to set resale prices also. The extent of these regulatory activities, their origins as related to the breakdown of private controls, and the current predominance of Federal controls has been described in chapter III.

In this report, considerable attention has been given to the economic characteristics and the institutions of fluid milk markets. This has helped in our understanding of why classified pricing came into being, how the incidence of its advantages and disadvantages may be distributed among producers, distributors, and consumers, and some of the factors which may influence pricing policies in different markets or at different times. At this point, it is appropriate to raise the question of the relationship of governmental regulation to these prior elements in fluid milk markets.

In general, the answer to this question is that governmental regulation does not do away with or supersede the basic characteristics of fluid milk markets, although it may alter their form in certain aspects. Thus, the essential interests of organized producers or the immediate pressures exerted by individual members, not always coinciding with their long-period interests, are not fundamentally altered by the fact of governmental regulation. Nor are the interests of consumers in the market or of distributors with different types of operations changed. Collective bargaining on milk prices between organized producers and the dominant distributors is replaced by other procedures established by the regulatory agencies. Under Federal orders, these take the form of public hearings. Most of the States engaged in the regulation of milk marketing also provide for public hearings before establishing milk prices.[60]

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[59] Hoffman believed this incentive on the part of the association and the dominant dealer elements to reciprocate benefits might be so strong as to be self-defeating (*19*, p. 195), a conclusion not inconsistent with our analysis, especially that part of it dealing with long-period consequences: "It is obvious that this sort of bargaining is not calculated to lower the price to consumers and may actually be carried to the point where the farmers and distributors themselves lose by it. This could almost certainly be true if the demand for fluid milk were elastic. In this case the efforts of each monopolistic group to improve its own position might force prices so high that the combined profits of both groups would be reduced, a situation which would never occur under conditions of horizontal monopoly or oligopoly."

[60] Thus, of the 10 States in the Northeast which engaged in milk regulation, the laws of all but 2 required that public hearings be held before the issuance of price-fixing orders, or amendments to such orders (*29*, p. 13).

Governmental regulation of milk marketing is based on laws setting up policy objectives which are broader than those generally attributed to either organized producers or the distributors with whom they bargain on prices. It should not be assumed, however, that interested groups in the market, among producers, distributors, or consumers, become less conscious of their own special interests because of governmental regulation. Nor is there any reason to assume that each group will not seek to promote its own interests under governmental as under private control. Legislators, in deciding that government is to participate in a phase of the economy, cannot set neat bounds as to just what results will come from governmental intervention. The most able and conscientious administrative officials delegated to carry out these legislative objectives do not operate in an economic vacuum. They become a part of the economic processes in the market, their actions leading to responses and counter-responses on the part of all the participants. The end results are not determinable by any single element in the process, including the regulatory agency itself.

As described in chapter III, governmental controls were primarily a response to requests of organized producers and distributors following the breakdown of private controls. In important ways, particularly the extension of classified pricing to entire markets and the replacement of association pools with marketwide pools (p. 28), the introduction of governmental regulation extended the type of control devised by the dominant elements in fluid markets.[61] Our interest in this matter, as related to classified pricing, is primarily confined to this question: Does the introduction of governmental regulation preclude the application of classified pricing as a device for enhancing producer returns by diverting milk from fluid to surplus uses? Several considerations would indicate that it does not. These considerations are, in general, related to: (1) The economic and political forces which brought governmental regulations into being and which support their continuance, and (2) the interplay of these forces with the regulatory actions themselves. A more specific discussion of these matters, relating to Federal regulation of fluid milk markets, appears in the remainder of this section.[62]

Raising of returns to milk producers was indicated as part of the broad objective, for all farmers, of the Agricultural Adjustment Act of 1933, which sought relief of "the existing national emergency by increasing agricultural purchasing power." This was the first legislation which authorized Federal regulation of milk marketing. The objective of increasing returns was later incorporated in the Agricultural Marketing Agreement Act of 1937, under which regulation has continued. Under the act of 1937, the process of raising returns was

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[61] Cf. Nicholls (24, p. 195): "With the longer-run results of their monopoly practices showing up in the form of increasing pressures from 'outsiders,' and aggravated by the great depression, the large distributors and the cooperatives alike have frequently sought government control by State and Federal agencies in more recent years, in order to force the will of the dominant groups on recalcitrant interlopers."

[62] In the cases of State milk marketing control, separate analyses would make more specific the general thesis—that governmental regulation of fluid milk markets does not preclude the exploitational application of classified pricing. In those States where control of resale as well as producer prices is exercised, the implementation of a policy of this kind is further simplified.

related to a concept of establishing and maintaining orderly marketing conditions.

A concept of parity prices is set forth as the goal of any price raising which might be brought about as a consequence of regulation. At the same time, if parity prices are not found to reflect supply and demand conditions in the market, prices which do reflect such conditions are to be substituted. The interests of consumers are to be protected by a gradual approach to parity prices and by "authorizing no action . . . which has for its purpose the maintenance of prices to farmers above the (parity) level . . ."

Those responsible for the administration of the orders have considered their effectiveness for carrying out the objectives of Congress in raising returns of producers. Thus, in 1939, the Associate Administrator of the Agricultural Adjustment Administration reported to the Secretary of Agriculture:

> Over a longer period of time, because of freedom in most markets of entry into the milk-producing business, and because of the lack of differentiation of the product of individual producers, probably no income advantage can be secured to milk producers other than that attributable to the development of stabilized conditions in the market, to decreases in the risks involved in milk production, or to other similar factors.

The early emphasis on price-raising objectives of the Federal orders and the effort to evolve a policy more appropriate to long-run stability was described by H. L. Forest, of the U. S. Department of Agriculture:[63]

> From 1934 to 1937, the underlying philosophy in the issuance of these marketing agreements and orders was to get the price of milk up. . . . Regulatory provisions were instituted for the purpose of raising prices to farmers during periods of surplus even though it was evident that increased prices might at the same time further intensify the surplus problem. Consideration could not be given to this matter, however, because of the insistent need for helping to reestablish the farmers' standard of living. We were dealing with an emergency and using emergency means for doing it. At that point, the principles employed were not devoted to aligning the forces of supply and demand.
>
> By 1940, it had become evident that a program of increasing milk prices in any market already oversupplied with milk could not continue indefinitely. Measures more consistent with long-run conditions were becoming increasingly necessary. . . .

Collective bargaining appears for the most part to be superseded by public hearing procedures in fluid milk markets where Federal orders are operating.[64] These hearings are open to all interested parties, but among the principals are the same interests as those which previously sat at the bargaining table. In addition, minority producer elements, small dealers, and consumer groups have a chance to present evidence. The economic power relations of organized producers and the larger dealers are not fundamentally altered by the orders, and they may continue to influence the price structure. All parties learn to express themselves in terms of the economic rationale required under the law. Representatives of organized producers and the larger

[63] Talk before a convention of the Association of Agricultural Workers at Biloxi, Miss., February 11, 1950.

[64] As the orders establish only the minimum prices to be paid for milk by handlers (class prices), the way is open for organized producers and handlers to bargain for premiums over the minimum prices set forth in the orders. This has been done on numerous occasions. There is also nothing to prevent bargaining discussions from taking place prior to a public hearing.

dealers may arrive at substantially the same evaluation of the returns required by producers and the relation of class prices which would be most appropriate for insuring these returns. The economic facts and arguments will reflect the differences in the way each side looks at the situation, but the effect may be the same—the "weight of evidence" leading to a price policy promoting the interests of the two sides. There may even be serious price problems disputed at the hearing, such as the class price to be applied to a particular use of milk, without disturbing a harmony of approach on a general price policy which would seek to exploit the relatively less elastic demand for milk for fluid use.

There are factors which may, from an administrative standpoint, make a pricing policy of this kind appear consistent with other criteria, established by the act of 1937, such as pricing in accordance with supply and demand conditions in the market or pricing to promote orderly marketing of milk. Thus, when amounts of surplus milk are not abnormally high in fluid markets, a sequence of Class I price increases may be set in motion in a region where there are many interrelated fluid milk markets, once one or two markets start the ball rolling.[65] The short-run effects of increased prices upon production might be small, but, in terms of attracting milk, they might be relatively great. Thus each market pulls milk from the other, creating threats of shortage which are relieved by counter-price increases, which in turn bring additional markets into the series of those affected.

When milk prices are declining and surpluses are abnormally high in fluid milk markets, orderly marketing procedures may appear to be in jeopardy because of threats of strikes or diversions of excess supplies. Thus, raising or holding the Class I price may appear reasonable as a means of maintaining orderly marketing conditions in fluid milk markets. Support for such policies is enhanced by the social desirability of protecting the living standards and purchasing power of farm families.

Elusiveness of Monopoly Pricing

A widespread belief exists among economists and others that some degree of monopoly pricing (see Appendix A) is characteristic of fluid milk markets at wholesale (producer) and retail levels. The belief is arrived at empirically, based on such general observations as: (a) The sheltered aspects of fluid markets, (b) the apparent control of prices exerted by large-scale dealers and organized producers, (c) restrictions of supplies, and (d) the chronic condition in some markets whereby larger proportions of milk are diverted to surplus uses than would appear warranted by the requirements of dealers for reserve supplies.

As is usual in matters of this kind, the degrees to which milk prices in fluid milk markets are arbitrarily maintained above what might be considered uncontrolled competitive levels are not easily ascertained. To illustrate the difficulties involved relating to prices at the producer level, with which we are concerned in this study, two approaches to the problem are discussed.

[65] This may take place through collective bargaining in regulated or unregulated markets or it may even occur through administrative adjustments in the Class I prices under the orders.

One approach is to compare Class I milk prices in fluid milk markets with prices of Grade A milk and transportation costs in an area where milk prices are lowest. Underlying this approach is a theory that this area of lowest milk prices is the potential alternative source of supply for fluid milk markets, and as long as, in any given fluid market, the Class I price does not exceed this price plus the cost of transportation of milk in bulk form from this area, it is not arbitrarily high. Thus, in one application of this method, the price of milk at Shawano, Wis., is taken as a base pricing point and Class I prices in fluid milk markets are compared with this price plus costs of transporting milk from Shawano to each market. In only a few markets was the Class I price found to exceed the cost of procuring milk from Shawano (*41*, p. 43).

This type of measurement of arbitrary pricing in fluid milk markets oversimplifies the relationship of prices in fluid and manufacturing markets under competitive conditions. The Class I price in a fluid milk market might be well above the level indicated by supply and demand conditions in that market and still be below the level of the Shawano price plus transportation cost. The pricing relations are indicated in figures 2–b and 2–c in chapter I. Actually, it is precisely the high cost of transporting milk in bulk form which is the primary factor in making it possible to raise arbitrarily the Class I price in fluid markets. The only relevance in a comparison with Shawano prices plus transportation costs is that the latter amount probably represents a practical ceiling beyond which Class I prices in most fluid markets become more difficult to maintain over a prolonged period.

Another approach to the problem of estimating arbitrary pricing in fluid milk markets has been made by Cassels in his "Study of Fluid Milk Prices" (*9*, p. 166). Cassels compared blend prices f. o. b. the market, received by producers in 10 city markets, for the years 1925 through 1929, with "constructed" prices of milk for use in making butter and powder plus costs of transporting it as cream across the cream zone and as milk across the milk supply zone. The excess of blend prices, ranging from 36 cents to $1.31 in the markets covered, was attributed in part to costs of meeting higher sanitary standards, and in part to arbitrary pricing due to the effectiveness of collective bargaining and to policies of local protection adopted by State and municipal authorities. A premium of 20 to 30 cents per 100 pounds was allowed as sufficient to cover the cost of meeting quality standards for the period covered (1925–29) and the remainder is "attributed to the monopolistic position of the producers in the nearby area."

The theory of prices underlying this type of comparison is that "The price received for milk . . . at the outside edge of the milk zone under freely competitive conditions should be on a par with the price of cream, and the price of cream at the outside of the cream zone should be on a par with the price of butter" (*9*, p. 169). This theory is applicable, when allowance is made for differences in quality standards, when the zones of supply for the three products are contiguous (figs. 2–A and 4). Where the supply zones are not contiguous, however, the theory does not apply. The reason for a gap between the milk and cream zones under freely competitive conditions, as in figure 2–C, is that the price received for milk at the outside edge of the milk

zone is in excess of the price which producers could receive for milk used for cream. The line PcPc, if extended, would be below PmPm at the outer edge of the milk zone (160 miles from the market). A gap between the zones of supply for milk used for cream and butter has an analogous implication with respect to prices of milk for the two uses at the outside edge of the cream zone.

The excess of actual prices above competitive prices, computed by this method, for markets in deficit dairy regions cannot therefore be attributed entirely to costs of meeting sanitary requirements and monopoly gains. An unknown part is due to higher costs associated with the development of more intensive dairy enterprise to meet the needs of city markets in the region. In the actual application of this principle, Cassels made a number of modifications for markets whose milk and cream zones are not contiguous. This makes his comparisons more realistic. Some of the assumptions required to make these modifications appear, of necessity, to be somewhat strained.

It may be noted also that this type of comparison is an attempt to measure the increase in the blend prices received by milk producers supplying fluid milk markets. It is not an attempt to measure the extent to which monopolistic Class I prices may cause the higher blend prices. Classified pricing with arbitrarily high Class I prices cause higher blend prices, but, as we have noted, the latter tend to decline with the passage of time as surpluses increase. We have seen also that a short-run perspective on pricing policy might even cause an association to raise the Class I price to a higher level than is consistent with maximum blend prices. In any case, a true evaluation of the monopoly element in milk pricing at the producer level in fluid milk markets requires that the Class I price should be the focus of attention.

APPENDIX A.—MARKET CONTROL AND THE CONCEPT OF MONOPOLY

The practice of price discrimination by a seller presupposes a certain degree of control of that part of his market where he applies discriminatory prices. The term "monopoly" has traditionally been applied to such controls as the opposite of competition. The development of economic theory, to about 1930, rested on the assumption that perfect competition corresponded quite closely to the realities of most phases of economic activity except in a relatively few instances where a firm might stifle competition through achieving a monopoly of the sale of a particular commodity. The situation was described by Robinson in 1932 (*27*, p. 3):

> In the older textbooks it was customary to set out upon the analysis of value from the point of view of perfect competition. The whole scheme appeared almost homogeneous and it had some aesthetic charm. But somewhere, in an isolated chapter, the analysis of monopoly had to be introduced. This presented a hard, indigestible lump which the competitive analysis could never swallow. . . . As a picture of the real world the theory was unconvincing, and as a pure analytical construction it had a somewhat uncomfortable air.

A similar point against this dichotomy between monopoly and competition in the treatment of the behavior of firms was expressed, at about the same time, by Chamberlin (*10*, p. 3):

> Economic literature affords a curious mixture, confusion and separation, of the ideas of competition and monopoly. On the one hand, analysis has revealed the differences between them and has led to the perfection and refinement of a separate body of theory for each. Although the two forces are complexly interwoven, with a variety of design, throughout the price system, the fabric has been undone and refashioned into two, each more simple than the original and bearing to it only a partial resemblance.

For some years, however, it has been recognized by economists that most sellers exert some control over the markets for their products, even where the market is in many respects quite competitive, and that the degree of this control is often considerable. On the other hand, complete control by a seller, or perfect monopoly in the old sense, is about as difficult to find in the real world as is perfect competition. Even where monopolies of particular goods or services are publicly owned (e. g., postal service), or are granted to private firms by franchise (e. g., gas, electricity), a certain degree of competition prevails with goods and services which buyers may use as substitutes. As a result of this recognition, the terms competition and monopoly are no longer used in economic analysis as mutually exclusive. They have been reconciled by the adoption of such terms as imperfect competition or monopolistic competition.

The observational focus of this competition is no longer confined to a group of firms selling closely similar commodities. A firm with exclusive control over sales of an effectively differentiated commodity may be driven to bankruptcy by the competition of firms selling quite

dissimilar but highly substitutable commodities from the standpoint of buyers (*37*, pp. 88 ff).[66]

Hoffman, in his report on large-scale organization in the food industries, states (*19*, p. 79): "Between the extremes of single-firm monopoly and perfect competition are varying degrees of monopolistic or imperfect competition. Imperfect competition may be defined as a situation in which the price obtainable by an individual firm is not altogether independent of its own output, but in which no one firm has complete control of supply as under simple monopoly." Black's observations of competitive relations in the milk industry (*5*, p. 239) are in accord with this: "Many businessmen are still more or less startled at having a charge of monopoly practice leveled at them. They need not be. Most supposed competition is merely a form of monopolistic competition."

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[66] Cf. Stigler (*31*, p. 239): "If there are numerous poor substitutes for a commodity, we have monopoly; if there are numerous good substitutes, we have monopolistic competition."

APPENDIX B.—MARKET CONTROL EXERCISED BY MILK DISTRIBUTORS

In some cases where organized milk producers have applied classified pricing as a means of maximizing returns, they have probably been influenced by the fact that monopoly pricing[67] and limitation of sales in the fluid market had already been practiced by milk distributors. The control which distributors exercised over the prices paid producers has previously been described as a factor which impelled producers to organize. The strategic position of the larger distributors also gave them an opportunity to exercise a degree of control over resale prices to consumers and to retail outlets in the larger markets before introduction of classified pricing. They were thus in a position to employ monopoly practices in both the buying and selling of milk (*33*, pp. 2755, 2805).[68]

Once producers were organized and in possession of a marketing mechanism, such as a classified price plan, they were in a position to share with distributors in the gains from monopoly pricing in the fluid market. Thus, according to Cassels (*9*, p. 51):

> . . . Sooner or later, however, the producers would naturally perceive their own direct interest in the price policies of the dealers, and would, through their marketing organizations, seek to influence the resale policies and to share in the proceeds obtained. . . . And when once these effective arrangements had been made for dealing with the seasonal surpluses, they could hardly fail to be used in periods of depression to maintain the fluid milk prices in the face of declining demand, or even in normal times to secure somewhat higher returns than could otherwise be obtained. . . .

From time to time, antitrust actions have been taken by the U. S. Department of Justice in the milk industry on the basis of alleged collusion in the setting of prices. Producer associations have sometimes been codefendants in these actions. It has been extremely difficult to prove that prices have been discussed or that such discussions actually provided the basis for prices charged by the individual firms. Where certain firms possess in actual fact a high degree of economic power, it is not always necessary for them to discuss their price policies

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[67] The term "monopoly pricing" is here used in a relative rather than in an absolute sense, consistent with the discussion in the text of this report and in appendix A. It refers to any type of price making by a firm or group of firms with a significant degree of market control for the purpose of increasing profits. Monopoly pricing is distinguished from competitive pricing in that the prices established at any given time are not the automatic result of competition in the market, although these prices are influenced, and over a long period may be largely determined, by competitive forces.

[68] Cf. Till: "Combination to the end of controlling prices, though it was not their invention, began with the distributors. In the eighties and nineties it was a reflection of the business spirit of the day. Industries like oil, steel, and the railroads had pointed the way. . . . It was not long before the gentlemen in the milk trade came to unwritten . . . understandings respecting prices" (*36*, p. 476).

in advance with their competitors. The mere announcement of a change in price by a dominant firm may be sufficient. On the other hand, where control is shared by several firms, some discussion of prices or the conditions affecting prices may be essential. It is not always necessary for these discussions to arrive at formal agreements as to prices. An open, lawful discussion of market conditions may be sufficient to arrive at common understandings with respect to price policies.

Frederic Howe, former Consumers Counsel of the Agricultural Adjustment Administration, testifying at hearings held by the Temporary National Economic Committee in 1939, attributed the failure of antitrust actions in the milk industry to the following circumstances: (1) These actions must proceed through the courts and are time-consuming; (2) many monopolistic practices are within the law; (3) penalties for convictions of illegal practices are light relative to financial gains; and (4) capable lawyers can usually find new methods of accomplishing monopolistic purposes if old methods are enjoined as a result of antitrust actions (*33*, pp. 2754, 2770 ff).[69]

The larger milk distributors maintain a dominant position among their competitors in fluid milk markets not only through a control of the bulk of fluid milk sales—typically from 50 to 80 percent—but also through their financial strength and their strategic positions in their markets (*33*, p. 2763). Many of the larger distributors are part of nationwide dairy organizations and are well financed. They are thus in an advantageous position to survive temporarily adverse market conditions or a "price war." [70] The security of the larger distributors is enhanced through advertising of their brands, through close contact of salesmen with homes of consumers, and through contractual arrangements built up with stores, restaurants, and institutions. The position of the larger distributors is in some instances strengthened through their influence on State laws and municipal ordinances, the conduct of health inspectors, or by power exercised through such institutions as dealer associations, bottle exchanges, or even labor unions and producer organizations (*33*, pp. 2754, 2826–2848).

The dominant position of the large distributors is usually most evident with respect to sales directly to homes. Once established, their position is almost unassailable by the small distributors because of the large amount of capital required to enter into this phase of the business on a marketwide scale. Small distributors do, in some cases, enter into the home distribution business on a restricted basis, often on outlying routes, but the possibilities for expansion of this type of

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[69] " . . . I was a member of corporations that were in monopolistic conditions, and whenever monopolistic proceedings were threatened against them or were started, a lawyer was called in, and I think in every case the lawyer knew what he was going to do after the decree was rendered, and was building all his plans so that the next day he would start in some other way * * * you can move fast as a lawyer, much faster than the Government can move." (Frederic Howe, p. 2771 of TNEC hearings.)

[70] Monopoly pricing policies do not under all circumstances result in higher prices than would result from free competition. Drastic price-cutting to drive competitors out of business or to discipline those who have strayed too far from the prices and practices preferred by the large companies is at times resorted to as a deliberate policy (*33*, pp. 2832, 2838, 2861; *17*, pp. 18, 20).

business through independent price policies are not normally a threat to the larger distributors.[71]

The extent to which milk distributors have caused retail prices of milk to be higher than they would have been under more competitive conditions is not known. Both before and after the organization of milk producers and the adoption of classified pricing, two aspect of their price policies observable in the larger markets were: (1) A tendency to maintain resale prices during the flush season at the same, or close to the same, level as in the short-production season; and (2) a tendency to resist price declines during a period of generally falling prices, at least to the extent of maintaining their own margins intact.

The absence of seasonal differentials in retail prices probably accentuated the surplus problem for producers, because consumer sales of fluid milk were not stimulated during the period of flush production. Spencer and Luke look upon seasonal price adjustments as contributing to the reduction of surplus (*30*, p. 22): "Higher retail prices in the fall and lower retail prices in the spring contribute toward the balancing of supply and demand. Although the consumption of milk is relatively stable, many consumers do buy more milk when it is cheap and less when it is high priced. It is desirable to encourage the consumption of fluid milk as much as possible during the season of flush production when production costs are low, and to check the demand with higher prices when the supply is short." The magnitude of the effect of seasonal price changes upon consumption is a point upon which milk marketing specialists would have different opinions. It is probably related to the degree to which consumers are conscious of seasonal "bargains" in milk. This may be enhanced when seasonal pricing has established itself as a regular and customary practice. It is also likely to be enhanced through sales promotional techniques.

The policy of maintaining margins during a period of falling prices also accentuated the surplus problem for producers and, where the decline was part of a major depression as in the early 1930's, this policy fostered price wars and general disorganization of the milk market, with more serious effects on producers, consumers, and distributors (*33*, pp. 2788 ff).

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[71] Cf. Till: "The price cutters, whose volume is small, operate in the crevices of the industry and under a singular disadvantage. In most markets their activities are largely confined to the competitive wholesale trade. Neither the size of their business nor their financial resources permit an excursion into retail delivery; and they have found store managers unwilling to stock their products" (*36*, p. 483).

APPENDIX C.—VALUE OF EXTRA MILK SUPPLIES TO A MANUFACTURING PLANT

The price which a milk manufacturing plant will pay its patrons is related to national market conditions for the product or products which it manufactures. This price, however, is not always the same as the price which the plant will pay for quantities of milk which are surplus to the fluid market. Under some conditions, a manufacturing plant may be ready to pay a premium for milk in addition to that supplied by its regular patrons. At other times, the plant may accept additional supplies only at a discount from its current paying price or may refuse to accept extra supplies.

The reason for this may be understood from a consideration of the general character of a plant's marginal costs in relation to its marginal revenue for different quantities of milk, as shown in figure 14. A plant has a certain amount of fixed costs associated with the use of its building and equipment, and variable costs associated with the cost of milk, labor, power, refrigeration, etc. Some plants are equipped with a sufficient capacity of holding tanks and are otherwise organized to carry on a two-shift operation. The cost curves shown in figure 14 are for a plant with a two-shift maximum capacity. If the amount of milk coming through the plant is low in relation to its capacity (on a one-shift basis), costs per unit tend to be high because the burden of fixed costs is distributed over a small number of units. The plant's average cost of operation, AC, will decline for larger quantities of milk handled until an amount is reached, OA, where average costs, AA′, are a minimum. For quantities of milk in excess of OA, the plant, to handle its total supply, must meet higher average costs. Extra variable costs due to payments for overtime labor, strains or bottlenecks in the operations, or other factors come into play to cause this. There will be an optimum volume in terms of lowest average cost for the plant on a two-shift operation (DD in fig. 14), just as there is for one-shift operation.

To analyze the receptivity of the plant management to additional supplies of milk from an outside source at the current paying price to its own patrons, we shall have to look at the plant's marginal cost curve in relation to its marginal revenue curve. The price of the finished product (evaporated milk, cheese, etc.) is determined by the national market and will not be appreciably affected by the output of the individual plant under consideration. Therefore, this price will be the marginal as well as average revenue for all quantities. The marginal cost curve, MC, will be below the average cost curve as the latter is falling and will intercept it at its lowest point. Thereafter, marginal cost will be higher than average cost.

As long as marginal costs are below marginal revenue, it will be to the advantage of the plant's management to accept additional sup-

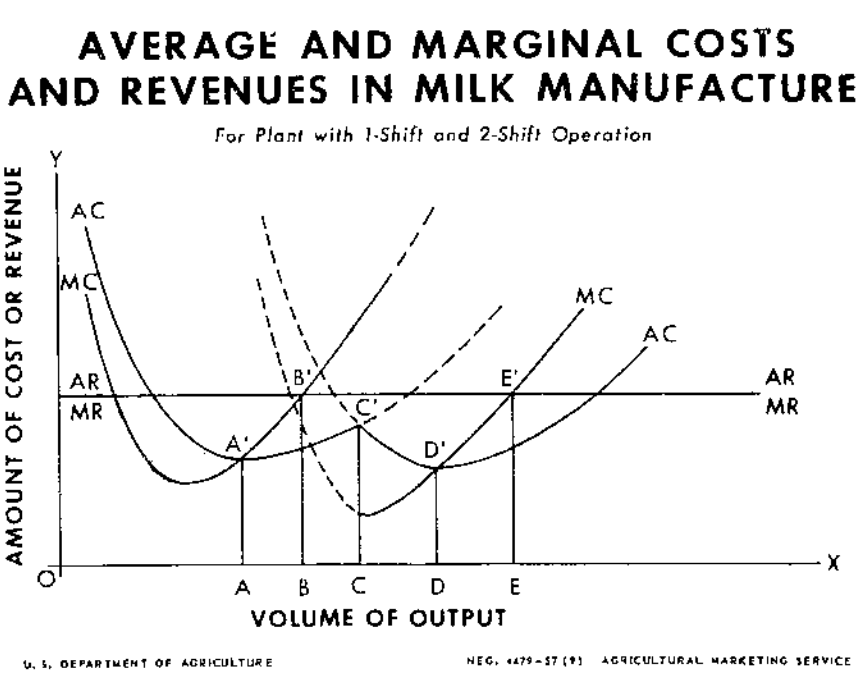

Figure 14.

plies of milk, because it will increase the plant's total profits. This will be true even when MC is above AC. The plant's management might even be ready to pay an extra amount to attract additional supplies if receipts of milk from the plant's regular patrons are well below OB and other plants in the vicinity are also in the market for the association's surplus milk.

If the plant, while on a one-shift basis, had a supply from its regular patrons in excess of OB, it would not be to the advantage of the plant's management to accept the association's surplus milk except at a discount from the price paid by the plant to its regular patrons. The cost of manufacturing additional units of milk at the current paying price would be greater than the plant's marginal revenue and would thus tend to reduce total profits. This situation would prevail until volume of supplies reached a point where, under a two-shift operation, marginal costs again fell below marginal revenue. The marginal cost curve is discontinuous. It is advantageous for the plant to remain on a one-shift operation as long as average costs for such an operation are below average costs for a two-shift operation. The average cost curves intersect when volume reaches OC, at C'. If the plant goes on a two-shift basis, it again becomes advantageous to take on additional supplies beyond OC. This will continue until a volume OE is reached, when marginal costs again exceed marginal revenue. Again, the plant may accept some additional supplies at a discounted price until a point is reached where costs of handling additional supplies become prohibitively high.

If, as in figure 14, the marginal cost curve for a one-shift operation is above the marginal revenue curve where the average cost curve for a two-shift operation is above that for a one-shift operation, there is a range within which it would be unprofitable for the plant to go on a two-shift operation. If, however, the situation were such that marginal cost did not exceed marginal revenue within the entire range of operation OC, there is an uninterrupted advantage for the plant to take on additional supplies at the price paid to its patrons until a quantity is reached (OE in fig. 14) where marginal costs of a two-shift operation exceed marginal revenue.

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