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An Evaluation of Pricing Practices and Their Effect on the Egg Industry in Utah

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AN EVALUATION OF PRICING PRACTICES AND THEIR EFFECT ON THE EGG INDUSTRY IN UTAH

by

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INTRODUCTION AND STATEMENT OF PROBLEM

The decade from 1953 to 1963 was one of drastic change for the egg industry in Utah. A study conducted at Utah State University shows that in 1952, slightly more than 40 percent of local egg production was sold in distant markets while in 1964, import data gathered from egg handlers in the State indicate that 20 to 25 percent of the eggs consumed in Utah were imported.

After a period of slight increase, there has been an almost uninterrupted decline in egg production since 1951. The only exceptions being that 1958 production was slightly higher than 1957, and on two different occasions, the production remained unchanged for two consecutive years,

Figure 1. Egg production in Utah by years, 1945-1964

While a decrease in egg production has occurred over the past few years, the reverse has been true of population. Based on a linear projection of the 1960 census, Utah's 1964 population is estimated at 950,000. This is an increase of about 6 percent from 1960. The egg industry in Utah continues to grow smaller both in absolute terms and in relation to the population.

The problem, then, is one of a shrinking industry, but the answer is not quite so simple. If the goal is simply one of providing good quality eggs to Utah consumers, the answer might well be to let the local industry continue its decline and increase imports as needed.

From printed population statistics and U.S.D.A. (United States Department of Agriculture) production and consumption figures, it can be shown that California produced approximately 1.5 billion more eggs than were consumed in that State in 1963. Since California is the source of nearly all the eggs imported into Utah, it is obvious that this source could be called on for a much larger portion of the supply than is currently the practice. While Utah egg handlers were reluctant to import at all, those interviewed were agreed that Southern Califirnia was a good source of high quality eggs. If the goal with regard to the declining egg industry is to save that industry, as is assumed in this thesis, the problem becomes more complex. It becomes necessary to analyze the industry, compare it to some standard, and finally determine the causes for the decline.

REVIEW OF LITERATURE

The literature reviewed was of two types. First, that which describes the types of market structures, and second was literature which used similar analytical methods to those used in this study.

A series of publications have been written by the U.S.D.A. describing the egg markets in New York (2). Chicago (1), St. Louis (1), and Los Angeles (3). The series adequately describes the two types of central markets as typified by the New York and Los Angeles markets. While both types use a "quotation" price as a base, the difference is in the method of arriving at that price. In New York, the quotation is based primarily on prices established in open bidding in the Mercantile Exchange. Private and government agencies report the prices established in the Exchange which become the base prices for most of the eggs sold in the New York market. While this method has long been a part of egg marketing and has served well in the past, it has recently been criticized on several scores. Critics have claimed the volume of eggs sold on the Exchange is too small (less than 1 percent) to be a fair measure of the total market. Another claim is that the average quality of eggs sold on the Exchange is lower than that of the total market.

The Los Angeles base price for eggs is directly connected to the price quoted in the Dairy and Poultry Market News. A market specialist contacts a representative sample of the egg handlers in the area and gathers data about the previous days trading. Based on his observation, the specialist quotes a range of prices for previous days. These historical prices along with the supply-demand observation published daily in

the Dairy and Poultry Market News are the factors considered when establishing the current prices.

Two other works dealing with deficit markets are of interest because of the suggestions they offer.

Hathaway and Roy list the following as possible ways of improving egg marketing:

1. Study and analyze the number of participants needed and volumes of eggs sold on the "spot call" trading for this to be a valid system of price quotations.

2. Study possibilities and means of broadening the base of "exchange" trading.

3. Study the reliability of retail pricing of eggs based on elasticities of demand in large consumption centers.

   By coordinating the principles of
   a. low price elasticities for eggs;
   b. private labels as "product differentiation" and
   c. guaranteed quality as "service-product" differentiation,
   the food chain store and the dealer grower supplier may each obtain one cent per dozen over and above the price generally prevailing and otherwise set by conventional price reporting systems. (8, p. 27)

A study conducted at Harvard University by Dr. Alden C. Manchester contained the following suggestions:

> Fundamentally, there are two promising lines of attack upon this problem. One would be an attempt to obtain a sufficient volume of open-market sales at some point to make a real base for the pricing system. The other would involve a sharp change in the approach to the problem through an attempt to determine the base price by some other means, getting away from reporting the market and acknowledging that price-making is a function to be openly engaged in. (9, p. 3)

A number of studies have been conducted in Utah dealing directly with egg marketing problems. Anderson, 1956, described the marketing agencies in Utah and explained the function of each. (4, p. 12)

A section of the study dealing with efficiency within the system showed wide variancy among the 30 egg handlers included. Assembly

costs varied from less than 10 cents to more than 60 cents per case. When the handlers were divided into cooperative and independent handlers, the independents proved the more efficient. The mean assembly cost for cooperative handlers was 35 cents per case as compared to 18 cents per case for the independents.

Another section on marketing margins was summarized as follows:

> The margin between the price the consumer paid for eggs and the price received by producers was about 20 cents per dozen and varied only slightly among the various sizes and grades. About 40 percent of the margin went to retailers and 60 percent to handlers and wholesalers. (4, p.12)

W. P. Thomas and Marion Clawson in 1933 published a study that is of particular historical interest.(13).

They attributed the growth of the poultry industry in Utah to high egg prices, low feed cost due to a surplus of wheat in Utah, and an active marketing association which helped and encouraged producers. The local supply of eggs began to sxceed supply in about 1923, and grew continuously until 1931. Up to 90 percent of the surplus eggs during this period were shipped to New York. Farmers were paid on the basis of grade with a premium going to producers of high quality eggs. Seasonality in production varied widely, causing considerable price change within a given year.

Two other studies are of particular interest both for content and for methodology. In 1959, an Agricultural Experiment Station Bulletin of Utah State University briefly showed a similar technique applied to similar data (5). The study covered a two year period, 1956-1957, and revealed a total margin of 17.6 cents with a much better constant dollar fit than constant percent fit between farm and retail prices. The reason this test was duplicated was to see if the same relationships have held throughout the period when Utah was changing from an exporter to an importer of eggs.

The other publication, Marketing Margins for Eggs in Finland, was

written by Martin Waananen and Paavo Kaarlehto of Washington State University (14). This study conducted in Finland covered a period from 1956-1961. The bulletin is divided into three main subheadings: "Part I, describes the margin variations and analyzes the factors in three changes. Part II, attempts to explain why certain variables were associated with marketing margins and interprets the results. Part III, describes the production and consumption of eggs in Finland." Part I, is the most applicable of the three. Linear regression was used to show the nature of the margin while multiple correlation analysis was used to explain price variation. The results similar to those achieved by Anderson, were that there was a high correlation between retail price and producer price and that the margin tended to be a constant dollar rather than a constant percent.

THEORETICAL MODEL

Like other fields of science, economics uses models to simplify and explain real world situations. The purpose of most models is not to paint an exact likeness of the real problem, but to abstract from real life and thus make the problem manageable. The fact that a model is not just a miniature of reality does not make it any the less useful as a tool for explaining and predicting reality.

The model used in this study is the perfect market concept (11). The idea probably had no exact time and place beginning. It seems to have evolved into being. Alfred Marshall had the concept in mind when he said:

> Thus the more nearly perfect a market is, the stronger is the tendency for the same price to be paid for the same things at the same time in all parts of the market; but of course if the market is large, allowance must be made for the expense of delivering the goods to different purchasers; each of whom must be supposed to pay in addition to the market price a special charge on account of delivery. (10, p.319)

As Marshall suggests, the distinguishing characteristics of a perfect market is uniform price. If it is assumed that all the buyers and sellers have perfect knowledge of supply, demand and prices, and that they act rationally on this knowledge, there should exist a single price for a specific commodity at a point in space and an instant of time. If one wishes to change the nature of the commodity, its point in space or its instant in time, he will add the cost of the change to the original purchase price without upsetting the perfect market situation.

The following quotations from Shepherd are another way of explaining the space, time, form elements of the perfect market.

> The uniform price which distinguishes a perfect market is uniform over the area, plus or minus any necessary transportation and handling charges between buyers and sellers in different parts of the territory.
>
> The price is uniform over a period of time, plus or minus the storage charges involved in carrying some of the commodity over from periods of relative abundance to periods of relative scarcity.
>
> ... . A perfect market would result in a uniform price for "a commodity" (for example wheat) plus or minus appropriate price differentials for different classes and grades within that commodity. (11, p. 19-25)

The following table also serves to illustrate the perfect market concept:

Table 1. Integration of the concept of the perfect market with the analysis of marketing problems. (11, p. 28)

Utilities that create demand	Prices that reflect demand to producers	Costs of getting goods from producers to consumers
Time	Price movements over long, medium and short periods of time	Costs of producing at different times and cost of storage from one time to another
Place	Price differentials between different places	Costs of production in different places and costs of transportation from one place to another
Form	Price differentials between different grades and forms	Costs of production of different grades or forms and costs of processing the products into different grades or forms

OBJECTIVES OF THE STUDY

The problem, as stated earlier, is one of a declining egg industry in Utah. Assuming for the purpose of this Thesis that the goal is to preserve and promote egg production in the State, steps should be taken to find the cause of this decline. If it can be demonstrated that Utah's egg market is a perfect market and the industry continues to shrink, it must be concluded that other areas have the advantage in production thus making it unprofitable to produce eggs in Utah. If this is the case, it would be wise to take the resources out of egg production and import all the eggs needed in the State.

If, on the other hand, market inperfections can be found and associated with the decline in local production, it is possible that the industry can be revived by correcting the imperfections.

Given, that the goal is to "save" the egg production industry, the objectives of this study were:

1. To ascertain if Utah's egg market is functioning as a perfect market.

2. To ascertain if pricing practices such as allowing interdealer exchange of eggs at a price 2 cents under wholesale contributes to the market imperfection and may, therefore, contribute to the decline in production.

3. To ascertain if marketing margins in Utah are high when compared to Los Angeles and that Utah producers are receiving a relatively small share of the consumer's egg dollar.

There are undoubtedly many more avenues that could be explored when looking for market imperfections and their causes. The same would be

true in any market, since the perfect market concept is the ideal and is never achieved in reality. The purpose here is not to indict the Utah egg market, but to point up areas of difficulty and suggest possible solutions.

DATA COLLECTION AND ANALYSIS

The null hypothesis to be tested in this section is that the Utah egg market is a perfect market. The hypothesis can, of course, be rejected without analysis, since there is no such thing as a perfect market. But if the process of rejecting the hypothesis one can show something about the nature and magnitude of the imperfections, some progress will have been made toward solving the problem of a declining egg industry in Utah.

Before moving into the actual process of seeking out market imperfections, two preliminary steps are necessary. First, to establish whether Utah is on an import or an export basis. Second, to reexamine the theoretical model to see just where these imperfections are most likely to occur in the table egg market.

Utah Egg Imports

Declining production and a growing population has made necessary the increased importation of eggs from outside the State. This fact is supported by data compiled for this study from the records of four major egg handlers in Utah.

The data were taken directly from the handler's invoices. One of the dealers had records of imports as early as January, 1962, while the records of the other three began in 1963. The time period studied was January, 1963, through May, 1965. The combined imports of these four large handlers are shown in Figure 2. Again it sould be emphasized that this is not the total imports into the State, but that of Four of the major handlers. The volume indicated in the graph is certainly more than

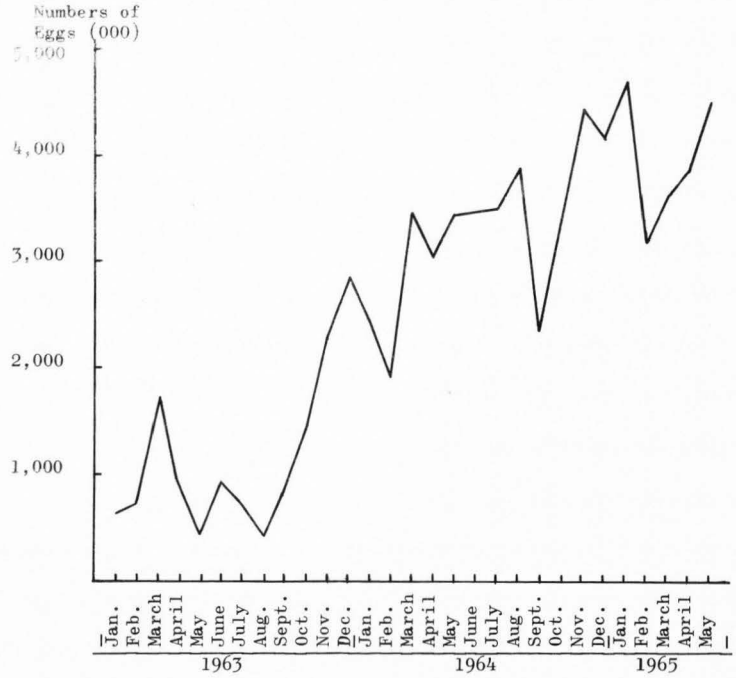

Figure 2. Eggs imported into Utah by four major egg handlers by Months, 1963 - 1965

50 percent and may be as high as 85 percent of total imports. Since the relative size of these four handlers changed very little during the time period covered, the trend indicated should be representative of the total imports into the market.

There were no obvious cycles when the data were plotted on a weekly basis, but some eggs were brought into the State every week for the last 89 weeks of the period. The monthly comparison clearly shows an upward trend with ample volume to place Utah in a continuous import situation.

Possible Market Imperfections

The three major areas of concern in a perfect market are time, form and place. These will be examined individually to see how each applies to the table egg market. Since the term "table eggs" implies shell eggs for human consumption, the time element of the perfect market has very little application. If there is a perfect market in time, there exists a uniform price over the market plus the cost of storage from a period of excess production to a period of short supply. Eggs are rarely stored for more than a few days and the cost for this short period is negligable.

A uniform price throughout the market plus the cost of transporting the product from the surplus to the deficit area is the criterion for a perfect market in place. Place utility is the area of major concern when examining the Utah egg market since eggs are being imported into the State weekly. If a perfect market exists in place, the price of eggs in Utah should be the price in Los Angeles plus the cost of transportation from Los Angeles to Utah

This principle can be shown graphically as follows using Los Angeles and Utah as examples. (11, Chapter 8)

The supply and demand curves are similar for the two markets, the only difference being that the Utah curves are higher than the Los Angeles curves by the amount of the transportation cost between the markets.

The supply curve in the Los Angeles market is a primary curve since it depends only on the cost of production.

In the Utah market, the demand curve is primary since it is determined by the wants and purchasing power of the consumer in that market.

The other two curves are from derived schedules since they depend on conditions in the other market. The demand curve in Los Angeles depends

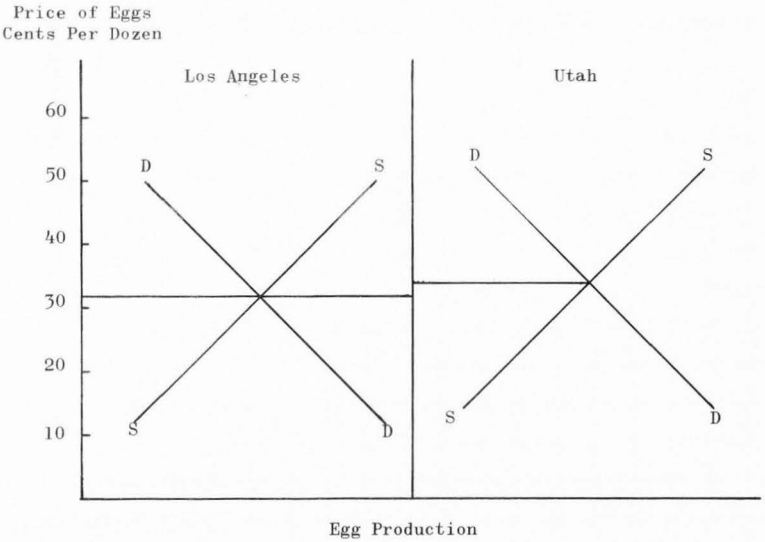

Figure 3. Demand and supply curves for eggs in Los Angeles and Utah

on the demand of all consumers who buy in that market both in and out of the geographic area. If Los Angeles eggs are being sold in Utah, any change in marketing costs in Utah will affect the demand curve faced by Los Angeles producers. Similar reasoning applies to the supply curve in Utah. Since the quality of eggs supplied to the Utah market is a function of the production costs in Los Angeles, and since marketing costs are part of production costs, a change in marketing costs in Los Angeles will affect the supply schedule in Utah.

At the present time, the transportation cost is about 2 cents per dozen. This is shown by placing the Utah schedules at a level 2 cents higher than those for Los Angeles. If for some reason the cost of shipping should increase, the demand faced by Los Angeles producers and the

supply faced by Utah consumers would shift left and reach an equilibrium at a decreased quantity.

If perfect market conditions exist between California and Utah, egg handlers in Utah would be forced to sell at a price no higher than the price in California plus the cost of transporting eggs from California to Utah. There would be no reason for them to sell for less. If the shipping cost is about 2 cents per dozen and at least some of Utah's eggs are being imported from California on a continuous basis, there should be a 2 cent spread between the two areas. This means that if AA large eggs are selling for 55 cents per dozen in Los Angeles, they should be selling for 57 cents in Utah.

If local supply is enough to keep the price differential under 2 cents, eggs will not be imported since dealers could only do so at a loss. By the same reasoning, if producers in Utah supplied enough eggs to drive the price to 2 cents below California price, eggs would move in the opposite direction.

A perfect market with regard to form means that a uniform price exists over the market plus the cost of changing a product from one form to another. The eggs considered in this study do not change form from producer to consumer. This means that within a given size and grade there is no added cost for processing or other change in the basic product. The cost of grading and handling does enter in and will be considered in the section on marketing margins.

Perfect Market Comparison

Now that it has been established that Utah is a continuous importer of eggs, and the perfect market criteria has been explained, it is enlightening to compare the Utah market to the ideal. The data for this

comparison comes from two sources. The price of eggs delivered to retailers in cartons for Utah was taken from a price card published by Intermountain Farmers Association, one of the largest egg handlers in the State. These cards, published through 1964, appeared weekly unless a price change occurred during the week. Based on interviews with handlers in the State, these prices appear to have been used widely as a starting point for price negotiations.

Comparable prices for California were taken from the U.S.D.A. publication Dairy and Poultry Market News. This publication lists California egg prices on a daily basis and is the foundation for the establishment of the producer contracts through which most of the eggs in the State are sold.

For ease of comparison, the raw data has been condensed into four graphs, one for each size and grade considered in this study. Each graph contains three broken lines. The top two are simply a comparison of prices between Utah and California. The lower line represents the difference between the top two. For each month the California price is subtracted from the Utah price and the difference plotted. The value will be positive when the Utah price exceeds the California price, and negative when the California price is greater.

The Los Angeles price is used in place of the California price since Los Angeles is the source of nearly all eggs imported into Utah.

Several observations can be made before comparing the Utah egg market to the perfect market criterion previously established.

By inspection of the graphs, it is obvious that prices vary widely both in Utah and Los Angeles. It is not so obvious which is the more variable. To make the comparison, the average deviation from the mean price was calculated in both Los Angeles and in Utah for each size and grade (Table 2).

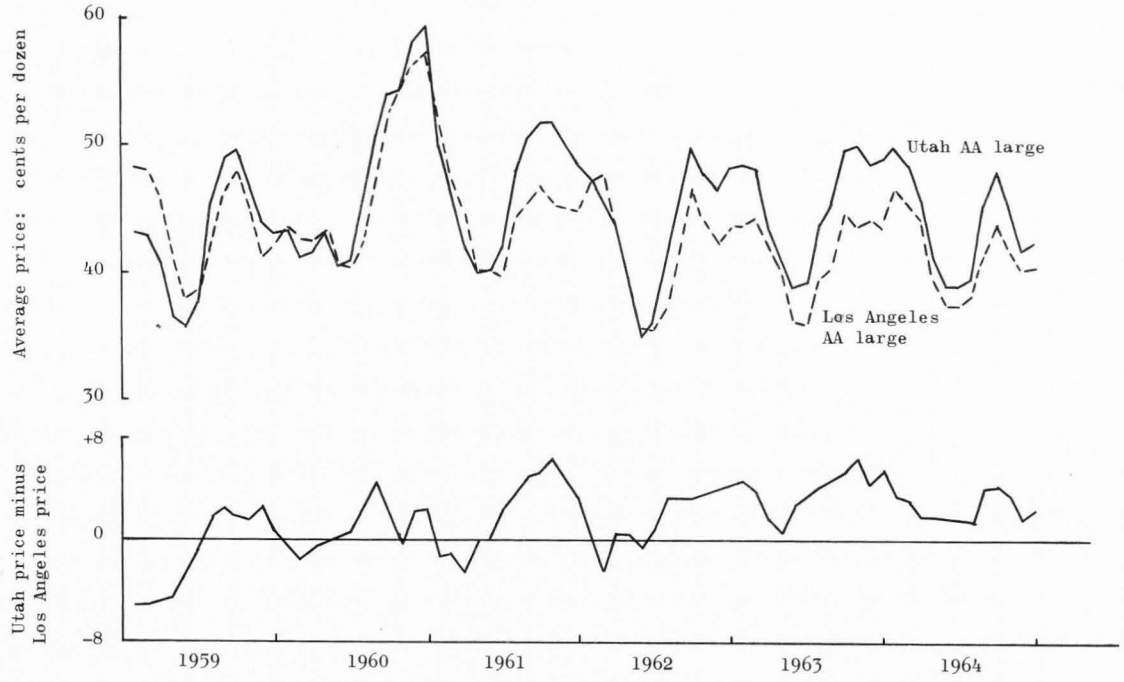

Figure 4. Average prices of eggs delivered to retailers in cartons in Utah and in Los Angeles by months, 1959-1964 (AA large)

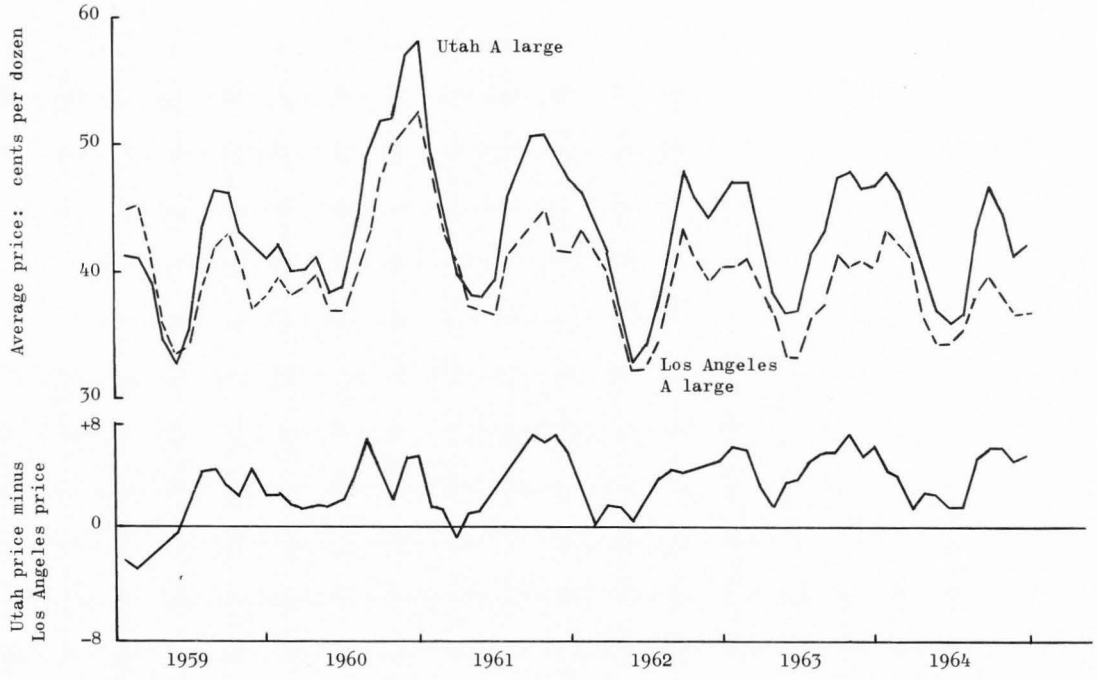

Figure 5. Average prices of eggs delivered to retailers in cartons in Utah and in Los Angeles by months, 1959-1964 (A large)

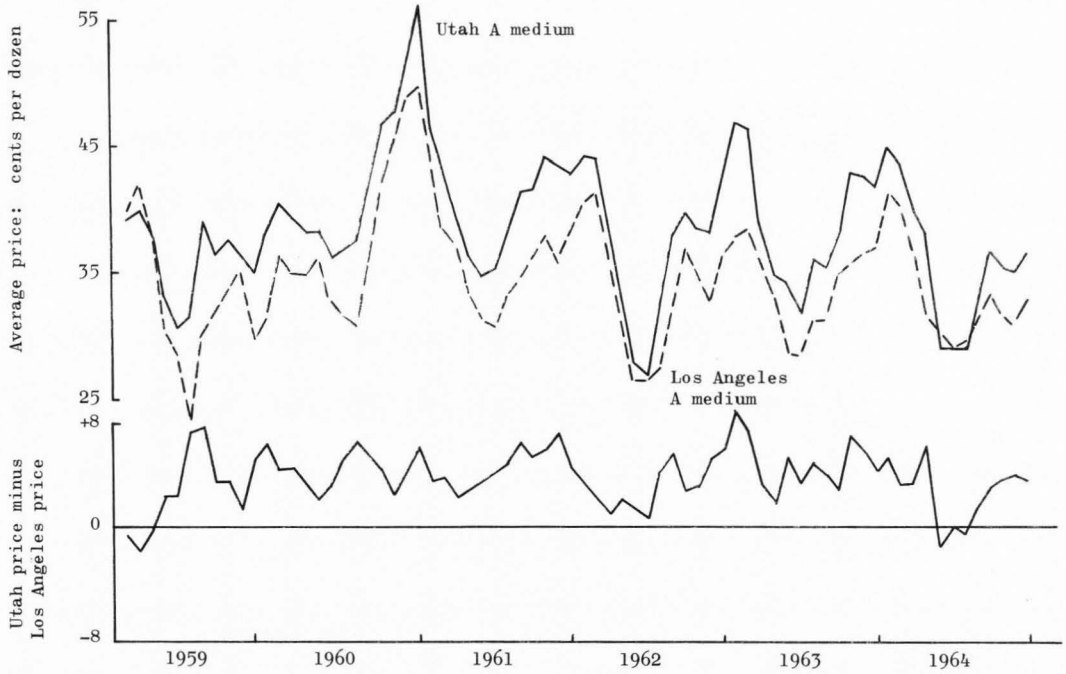

Figure 6. Average prices of eggs delivered to retailers in cartons in Utah and in Los Angeles by months, 1959-1964 (A medium)

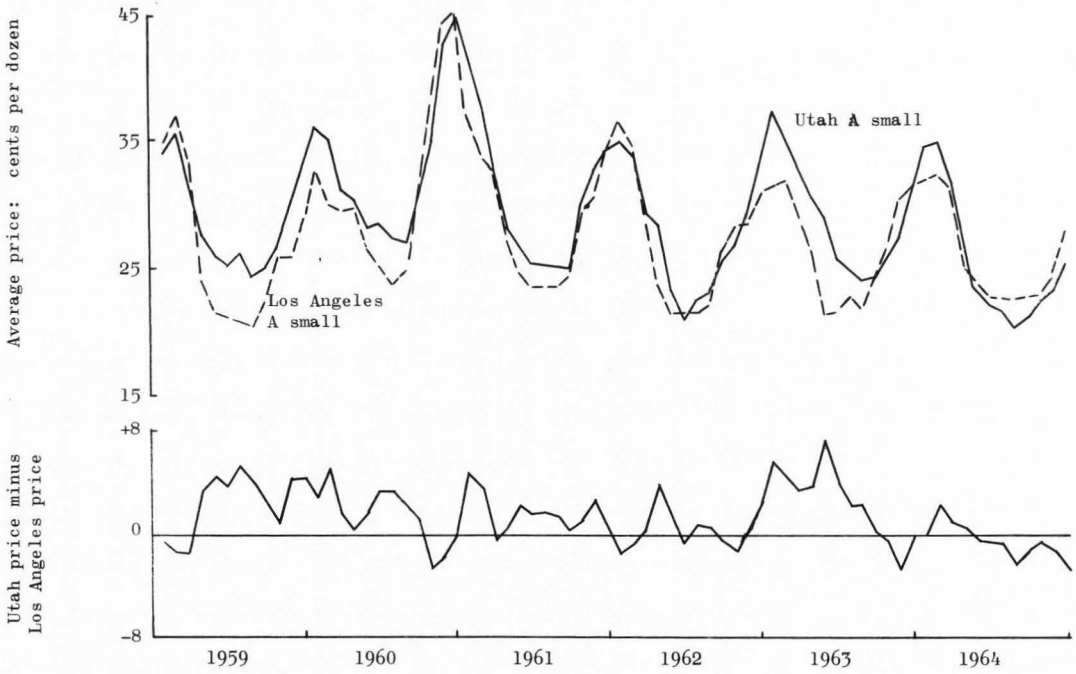

Figure 7. Average prices of eggs delivered to retailers in cartons in Utah and in Los Angeles by months, 1959-1964 (A small)

Table 2. Average deviation of egg prices in Utah and Los Angeles by years, 1959-1964

	AA Large		A Large		A Medium		A Small	
	Utah	L.A.	Utah	L.A.	Utah	L.A..	Utah	L.A.
1959	3.46	3.10	3.40	3.14	2.47	4.09	3.50	4.71
1960	6.35	5.47	6.47	5.08	5.57	5.51	4.66	5.54
1961	3.89	2.40	4.17	2.35	3.10	2.66	4.51	4.16
1962	4.02	3.52	4.16	3.45	4.61	4.32	3.87	4.19
1963	3.48	2.55	3.58	2.47	4.12	3.00	3.86	3.62
1964	3.35	2.51	3.34	2.58	4.05	3.14	4.20	3.62
Averages (6 yrs.)	4.09	3.26	4.19	3.18	3.99	3.79	4.10	4.31

With the exception of three years in the A small class and one year in the A medium class, Utah prices were more variable than Los Angeles prices. This is not unexpected since the Utah market has a much wider range of supply-situations to adjust to than the Los Angeles market. Utah, for example, might range all the way from a sizable deficit in some season to a local equilibrium situation or even a slight surplus of certain sizes and grades, at the prevailing prices, in a single year. Los Angeles, on the other hand, has a continuous surplus, given local prices.

With incomplete knowledge, one can only speculate as to reasons for the higher variability of Los Angeles prices in the small class. One possibility is that Los Angeles producers have a greater variety of markets for these eggs. It is very likely that many of the smaller eggs in Los Angeles are sold to egg breakers and are not placed in direct competition in the table egg market. In times of short supply the egg breakers might bid the prices up to a high level. Utah producers may not have the option of selling to an egg breaker and may feel that the best alternative is to sell these highly seasonal eggs through the regular

table egg channels. If this is done, any price change would be spread over the entire market and not confined to a single size or grade. To illustrate, suppose all the small eggs in the Los Angeles market were sold to egg breakers and small eggs were all they bought, obviously prices of small eggs would be high in seasons of short supply and low in the excess seasons. Now suppose that all of the small eggs in Utah were marketed as table eggs. If the volume of small eggs increased 10 percent, the increases in all sizes and grades would be very small and the price would drop very little.

The price spreads between the two markets tended to be greatest in the fall when prices were highest. When the low turning point of the cycles were averaged for the five years and compared, the difference was found to be .18 cents. At the high turning points, the difference was 3.52 cents. In the AA large group, the Los Angeles price never exceeded the Utah price after May, 1962. There were two occasions in the spring of 1963 and the spring and early summer of 1964 when the differential was less than 2 cents.

The large differential at the high period of the cycle and the small differential at the low period can be at least partially explained by examining the supply, demand, and price situations that exists between the two markets. Price tends to vary directly with supply and inversely with demand. Therefore, it is reasonable to assume that when prices are high, the demand for eggs is high relative to the short run supply on hand. But before local egg handlers can profitably bring eggs into the local market, the difference must be great enough to pay the cost of transportation. Thus, when the shortage in the local supply begins to be felt, the gap between the prices widens to allow outside eggs to be imported.

The converse would also be true if local supply were to exceed

local demand given local prices. The spread between the prices would widen in a negative direction to allow local eggs to move to distant markets and thus relieve the pressure of supply on deman in Utah. By inspection of the four graphs, it can be seen that supply has not exceeded demand in Utah at any large extent since early 1959.

In the early months of 1959, the Los Angeles price was higher than the Utah price in each of the four size and grade groups considered. This same phenomenon can be observed at other periods during the six year span. The negative price differential in 1959 is unique, however, in that it has a larger spread than any of the others and is the only one that occurs for all four sizes and grades. It is felt that had earlier data been available, this could have been shown to be the end of an era of general surplus production in Utah.

A negative differential also occurred at other times over the six year period. February, March, and April were the months when the negative spread was most likely to appear. These three months were times of seasonal decline in prices.

Utah market vs. perfect market

Since Utah is importing eggs from Southern California each week, and since the cost of importing is approximately 2 cents per dozen, the Utah price should remain at a level about 2 cents above the California price. By inspection of Figures 4-7, it can be seen that such is not the case. It comes as no surprise that the Utah egg market is not functioning as a perfect market, but to see such wide variability and such long periods of imbalance does require some explanation.

Only for isolated periods and then for only short time spans does the market approach the plus 2 cents which the perfect market requires.

Early in the period, the differential tended to be less than plus 2 cents; later in the period it was more.

The nature of the Utah egg market

In order to understand these deviations, something must be said about the nature of the egg market in Utah.

All the major egg handlers in the State number only about one dozen. One large marketing cooperative has dominated the market with probably 75 percent or more of the volume being handled by the five largest firms. The cooperative, being a farmer owned business, has attempted to keep prices high, but in its attempt to serve the producer, it has found itself to be the recipient of any or all eggs which farmers do not market through other channels. Many producers sell eggs to two or more handlers so they can check on grade-out percentages. As a result of its policy, the cooperative has found itself with a highly variably supply (Figure 8). The standard deviations calculated for the variability in supply were 12.01 percent for the cooperative, 5.77 percent for the State of Utah, and 1.38 percent for California.

Through interviews with egg handlers in the State, it has been determined that the cooperative in question holds the position of oligopolistic price leader in the Utah market.

The operations of the Utah egg market

Two questions deserve consideration: Why should the price differential rise above 2 cents when at this price, eggs can be imported at a profit? Why should the differential drop below 2 cents when eggs are continually being imported? These questions will be considered in turn.

The answer to question one may lie in the nature and workings of

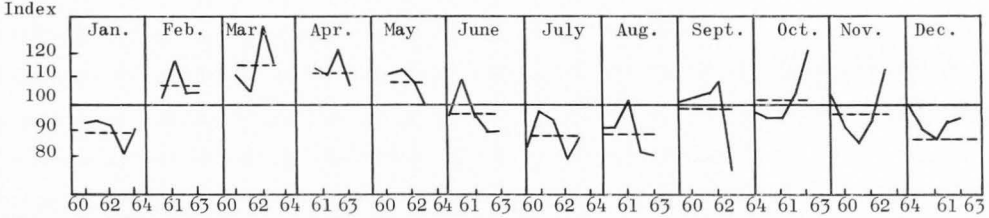

Figure 8. Changes in seasonality of egg supply for the major egg marketing cooperative in Utah, 1959-1964

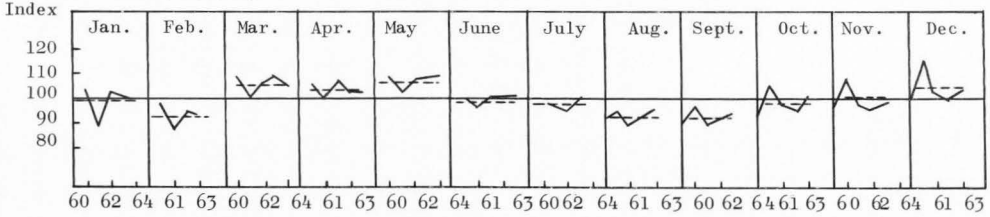

Figure 9. Changes in seasonality of egg supply for the State of Utah, 1959-1964

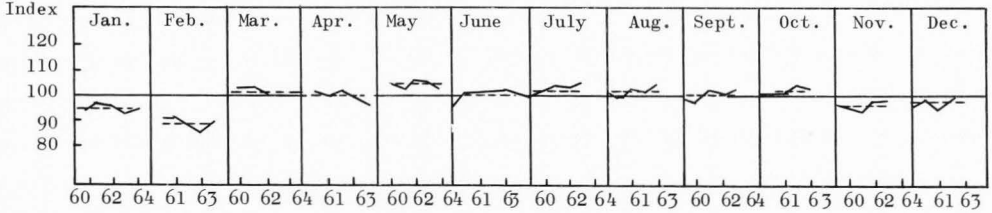

Figure 10. Changes in seasonality of egg supply for the State of California, 1959-1961

the oligopolistic market faced by the egg handlers in the State.

The picture is one of a few firms sharing all the available outlets for a highly homogeneous product. Advertising is ineffective, since product identification and differentiation is so difficult. The only effective method of increasing volume is by cutting price, and the only source of new customers is from other handlers. This complexity gives rise to the kinked demand curve characteristic of an oligopoly market (Figure 11).

Suppose all firms in the market are selling eggs at equilibrium price P_E and firm A wishes to increase its volume. But as soon as firm A lowers price to attract new customers, other firms in the industry will follow A's lead. Now A finds itself with approximately the same volume of business but selling at a lower price.

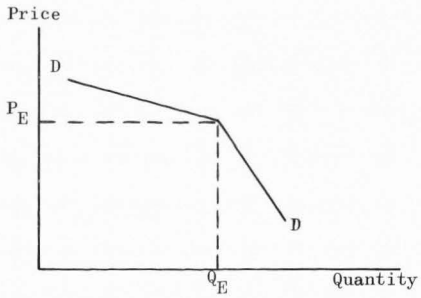

Figure 11. The kinked demand curve of an oligopoly

Once the weak firms have been eliminated from the picture, those remaining usually learn to cooperate on prices or follow some obvious leader.

Since the price leader in the Utah egg market--the farmer owned cooperative--is interested in maintaining a high price level, and since additional imports could only be marketed by attracting customers from other sellers, it may be that handlers are content to enjoy the wide price spread rather than risk a price war with competing firms.

Several other answers can be suggested in explanation of the greater than 2 cent spread.

The expectations of the handler may offer a partial answer. Most of the firms originated and developed in a surplus period of production. This condition probably persisted with only a few exceptions until mid 1959. It is no surprise then, that handlers were slow to alter their operations to include imports. When interviewed, handlers revealed a loyalty to local producers but felt compelled to turn to imports when local supply continued to fall short of demand.

Another possibility is that while local supply is short of demand, it may not be enough of a deficit to make importing profitable. It may be that imports can only be made by car load or truck load lots. Since the Utah market is relatively small, and since local supply may at times almost equal demand, it may take considerable time before a large volume of eggs could be brought in. This condition is most likely to have existed early in the period studied, since import data prove that some eggs have been brought into the State every month since early 1962.

Still another possible explanation is that the quoted prices were not the actual sale prices. It has been mentioned by some of the handlers that the card prices published by the cooperative were only starting points and that certain concessions were given to volume buyers, distance of delivery and other conditions. This means that the spread between prices in the two markets may not have been as great as the graphs

indicate.

In opposition to this idea is a statement by an expert from the Los Angeles area who claims that similar concessions are granted there. Assuming that Utah importers qualify for these concessions, the two would tend to compensate each other and the spread pictured in the graphs may be very close to accurate.

The reasoning behind the less than 2 cent spread is also complex and again seems to be closely tied to pricing practices. Two practices in particular will be considered here; no contract buying by handlers and the interdealer exchange mechanism used in Utah.

The cooperative was the only handler in the State that indicated the existence of a contract with its producers. All other handlers bought eggs on a day to day or other short term verbal agreement. While the cooperative may be a contract, it is obviously ineffective in controlling supply (Figure 8). Most producers in the State are paid on the basis of size and grade of eggs they produce. Since oligopolistic industries dislike direct price competition, the area of dispute becomes the grade-out percentages. The producers feel that the only way to insure a fair grade-out is to split their sales between two or more handlers.

The cooperative's policy with regard to local producers is stated in a letter from the manager of the egg department to "The Directors and Large Producers." The letter is dated October 23, 1963.

> It has always been a policy to use locally produced eggs regardless of price differential. The Association was formed in the first place to look after the interest of Utah producers, and I believe the record will show that we have.

Producers, being aware of this policy and feeling the need for splitting their production will likely choose the cooperative as one branch of their split. If egg production should exceed demand as it

does in the spring, producers know the cooperative will take the surplus.

One possible answer, then, to the problem of a less than 2 cents price differential is an imbalance of local supply. One or more of the handlers in the market will begin to accumulate a quantity of eggs greater than his outlets require. Eggs being quite perishable, the handler will find it necessary to cut price in an attempt to move the eggs and because of the kinked demand curve faced by the handlers, the entire market quickly follows his lead.

If seasonal surpluses are responsible for the sharp decline in prices, there should be some negative correlation between price and supply (Figures 12 and 13). Inspection of the graphs reveals a general trend for the price differential to be high when supply was low. A regression coefficient calculated for the AA large and the A large groups had a value of about -0.25. While this is not high, it is negative, and it is felt that a much higher value could have been obtained if only the periods of high price differential had been used. The value was obviously lessened by the positive movements in times when the price spread was low.

Left unanswered is the paradox between surpluses and imports. How can there be surpluses in a market of sufficient size to cause a general price decline while in the same market eggs are being imported continuously? The answer may be in the mechanism whereby interdealer exchanges are made in Utah.

Utah was, for a long while, an exporter of eggs. Most of the producers in the States were too small to market their eggs independently, so cooperatives were formed whose primary function was to accumulate enough eggs to make a shipment and to market them to the best advantage of the producers. Since it cost the local cooperative approximately 2 cents per dozen to ship eggs to distant markets, they were indifferent

as to whether they exported the eggs or sold them to local handlers at 2 cents less than market price. This practice seems to have been retained even under the present deficit conditions. Each of the dealers involved in interdealer exchanges indicated that the transactions took place at 2 cents below the price of retailers. If a local handler has a need for more eggs and has a choice of buying from another local dealer at a 2 cent gross margin or importing at a greater than 2 cent margin, he will obviously import. Even if the gross margin on imported eggs is less than 2 cents, a handler may prefer them if he feels he can get better quality, or if he finds it distasteful to deal with a direct competitor.

One obvious step toward improving the degree of perfection would be to balance local supply before importing eggs. This would involve more cooperation among the handlers in the State. First, they would have to work out an agreement on price either through periodic meetings, following a local price leader, or tying directly to the Los Angeles price quoted in the Dairy and Poultry Market News. The latter seems the best alternative and is the least likely to violate anti-trust regulations.

Second, some impartial, uniform grading system needs to be developed so both producers sales to handlers and interdealer sales can be made in confidence of quality.

Third, interdealer exchange should be made at a price sufficiently low that handlers would have a real advantage in using all local eggs before turning to imports.

At the current production rate in Utah, there would still be considerable importing even if local supply were spread more evenly over the market. This gives Utah handlers the 2 cent price advantage which the perfect market allows. If the egg industry in Utah would use the Los Angeles price quotation as its starting point and balance local supply

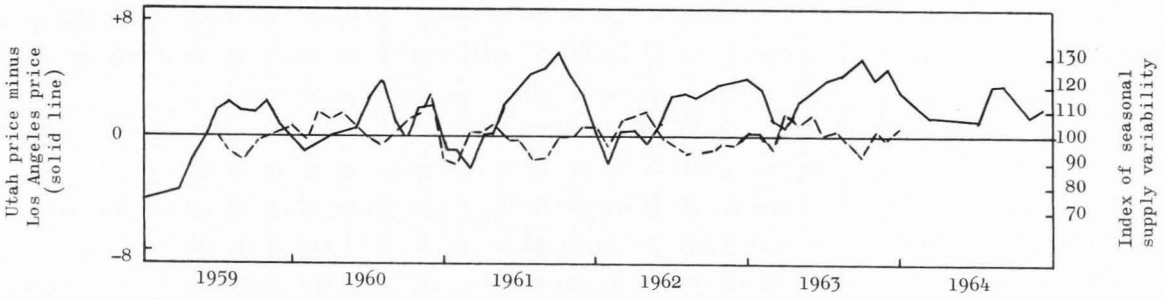

Figure 12. A comparison of seasonal supply changes with changes in the price differential between Los Angeles and Utah by months, 1959-1964, AA large

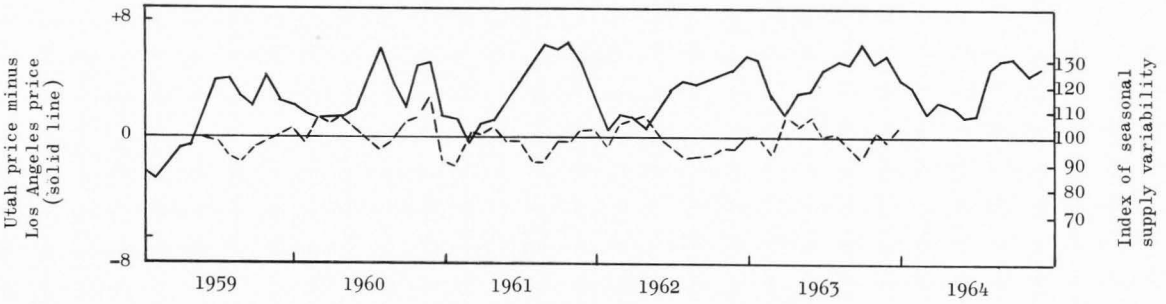

Figure 13. A comparison of seasonal supply changes with changes in the price differential between Los Angeles and Utah by months, 1959-1964, A large

before importing, it could reduce the price differential fluctuation and enjoy an almost constant 2 cent advantage that should belong to a deficit area.

Marketing Margins in Utah

The emphasis of the previous section was on price at various levels in the marketing process. This section concerns itself with costs incurred in moving eggs from producer to consumer. Are marketing costs in Utah comparable to other areas? What portion of the consumer's eggs dollar is getting back to the producer? Might not high marketing costs and therefore, a relatively small portion to producers be one reason for the decline in production in the State?

The perfect market model can again be used as a standard of comparison. A perfect market with regard to form means that a uniform price should exist plus the cost of changing the product from one form to another. But if the eggs in both areas are subject to approximately the same form changes, and if it can be assumed that the costs associated with these form changes are approximately the same for both areas, the price should be uniform. The form changes associated with eggs are such things as collection, cleaning, grading, etc. These processes are performed in both Utah and Los Angeles, and there is no apparent reason for assuming a cost difference between the two areas. The marketing margin, then, should be equal for each area.

The purpose of this section is to ascertain the margins, compare Utah to the United States and to California, and to estimate the portion received by producers.

Calculation of the margins

The term margin here refers to the difference between the price received by farmers and the price of eggs at the retail level. Both

prices were readily available for Utah. Since the early 1950's, the Intermountain Farmers Cooperative has published a price for each size and grade of eggs on a weekly basis. The Agricultural Economics Department at Utah State University has collected prices in several large retail markets in Salt Lake City and Ogden. The modal price for each size and grade was selected as representative.

The prices for each size and grade over the four year period from 1961 through 1964 were transcribed into tables and the difference taken to arrive at the margin. No significant difference in the margins of the three largest groups could be found when a "Student's" test was applied to the data. The A small group was found to have had a significantly smaller margin than the other three groups in three of the five years considered.

To make the margin comparable to national figures taken from Egg and Poultry Market Statistics (12), the Utah margin had to be combined into a single margin for all eggs. This was accomplished by using the estimated composition of total sales by size and grade in Utah over a 12 month period as reported by Anderson (4, p. 21) (Figure 14).

From the graph a weighting factor was taken for each size and grade for each month. For example, in May there was about 40 percent AA large, 46 percent A large, 12 percent A medium, and 2 percent small and others. These percents are used as the weights in calculating the overall margin. For example, in 1960, the following margins were observed: AA large, 19.25 cents; A large, 19.50 cents; A medium, 17.50 cents; and A small, 17.25 cents. The weighted margin is: (.40)(19.25 cents) + (.46)(19.50 cents) + (.12)(17.50 cents) + (.02)(17.25 cents) or 19.12 cents per dozen for all sizes and grades of eggs for the month of May. Sixty weighted margins

were calculated for the five year period and then a yearly average for each of the years.

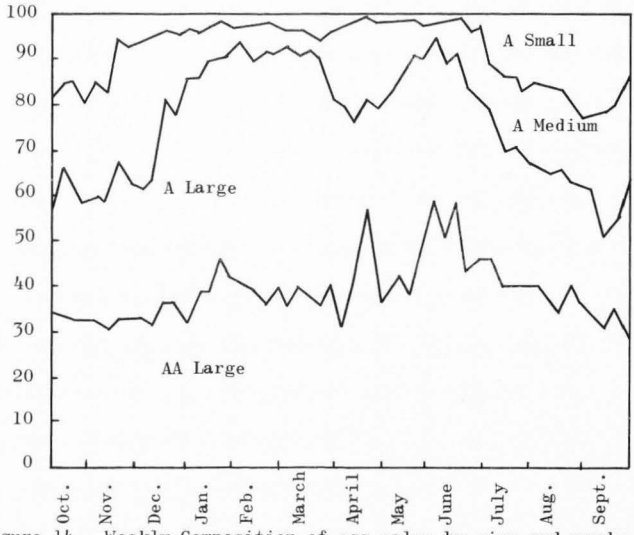

Figure 14. Weekly Composition of egg sales by size and grade, six Salt Lake City supermarkets, 1956-1957

The United States margins are taken directly from the Egg and Poultry Market Statistics for years through 1964.

In California, while prices both at the retail and the farm level were available, it was impossible to calculate a weighting factor for aggregating. Comparisons were made between the two largest selling sizes and grades, AA large and A large.

The magnitude and nature of margins in Utah

The magnitude of Utah's egg pricing margins can best be illustrated

graphically. The margin, as pictured in Figure 15, has fluctuated between 16 cents and 22 cents per dozen for the five year period. Not unexpectedly, the two set of prices are very nearly parallel with no obvious leads or lags. Since farmers are often paid based on the price to retailers, the fluctuations can be tied very closely together. The graphs have little meaning alone but will take on significance when compared with similar data from the United States and Southern California.

The next set of figures show whether egg marketing margins in Utah are constant percent of constant dollar margins (Figure 15, 16).

A scattergram and a least squares regression line were plotted to illustrate the relationship between prices to farmers and retail prices. The equation was $y = 18.6 + 1.013X$. Calculation of the correlation coefficient yielded $R = 0.933$ with a coefficient of determination $r^2 = 0.070$. A b coefficient of 1.013 indicates that as price to producer changes by one unit, price at retail changes by 1.013 units. The constant dollar line based on a margin of 18.93 cents gives a very close fit to the scatter points. The constant percentage margin line based on a mark-up of 63.22 percent does not fit the scatter nearly as well. Since handlers are able to extract a constant amount for each dozen eggs sold, they care little about the level of prices in the market. This fact proved to be an important one in the previous section on pricing practices.

Comparison of marketing margins

Two separate comparisons will be made in this section. First, Utah will be compared to the United States average (Tables 3 and 4) and later Utah will be compared to California.

The level of the margin alone says nothing about the profitability of egg production. This is a function of the prices received by farmers

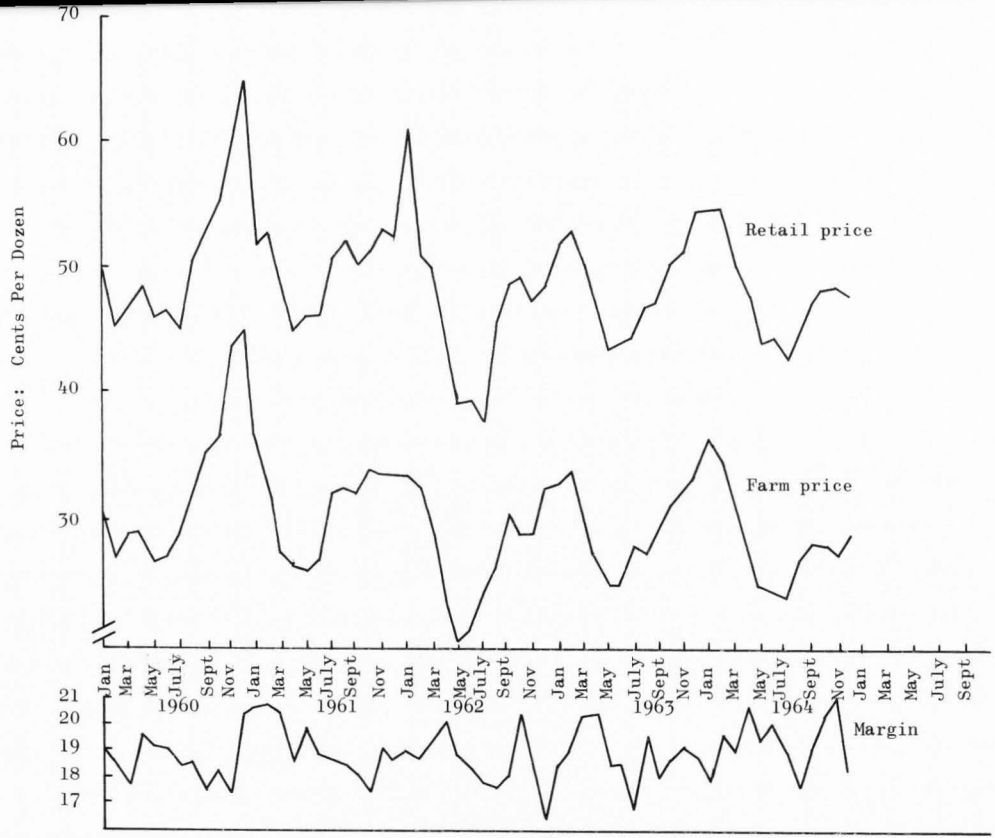

Figure 15. Egg marketing margin in Utah, 1960-1964

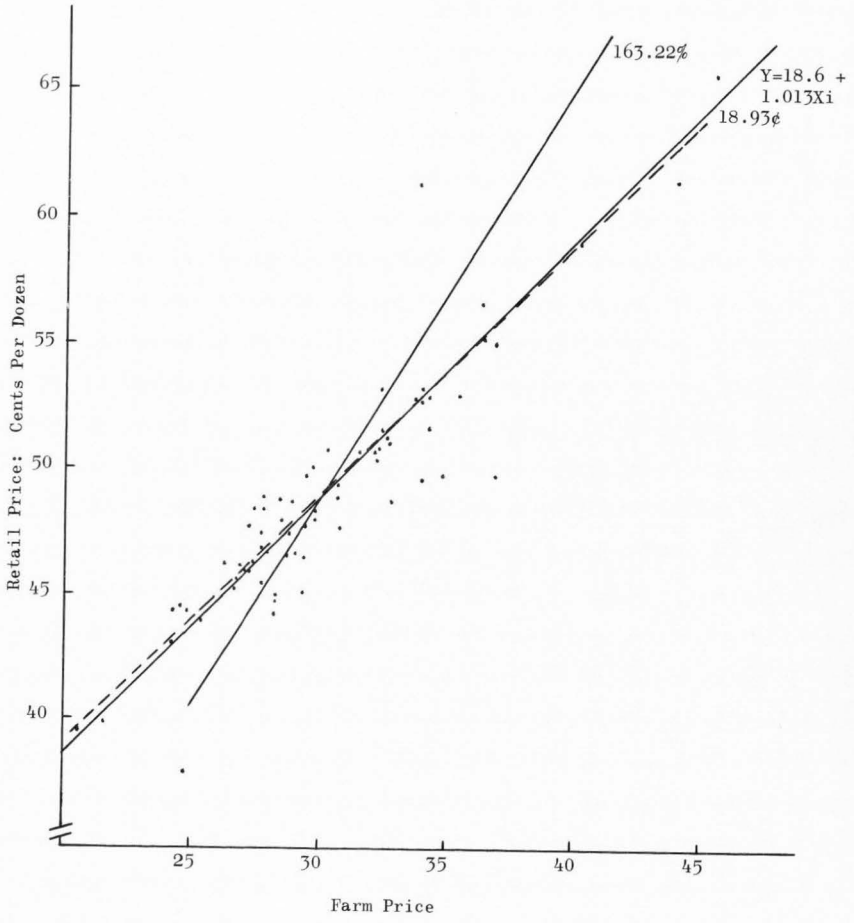

Figure 16. The relationship between farm price and retail price of eggs in Utah, 1960-1964

Table 3. Spread Between Farm Price and Retail Price of Eggs in Utah 1960-1964

Year	Farm price ¢/doz.	Retail price ¢/doz.	Margin ¢/doz.	% to Farmers
1960	32.69	51.32	18.63	64
1961	31.24	50.42	19.18	62
1962	27.91	46.59	18.68	60
1963	29.92	48.91	18.99	61
1964	28.79	47.23	18.44	61

Table 4. Spread Between Farm Price and Retail Price of Eggs in the United States 1960-1964

Year	Farm price ¢/doz.	Retail price ¢/doz.	Margin ¢/doz.	% to Farmers
1960	36.8	54.9	18.1	67
1961	36.2	55.0	18.8	66
1962	34.4	51.8	17.4	66
1963	35.0	52.8	17.8	66
1964	34.1	52.3	18.2	65

and the cost of producing eggs. Assuming that costs are not greatly different in Utah than those faced by the average of producers in the United States, profitability would be determined by prices received by farmers. Prices received by farmers are usually based on the retail price, being some fraction of or some fixed amount under retail. Of importance to the egg producer, then, is the size of the retail price and the portion of the retail price he receives.

On inspection, the margins do not appear to be significantly different. A "Student's" t test verifies this observation, showing no significance at the 1 percent level. The same test applied to the retail prices and the percent to farmers, however, did show significant difference. This means that Utah egg producers are receiving a smaller portion of a smaller price than the average of United States' producers.

This Utah-United States comparison is probably not as meaningful, however, as a Utah-Southern California comparison, since these two areas are in direct competition with each other.

Because of incomplete data, this comparison had to be made between individual sizes and grades rather than for all eggs. The two groups, AA large and A large, were used because they represent nearly 90 percent of total egg sales.

The Utah data are the same as those used in the Utah-United States comparison. The California retail price was taken from the Dairy and Poultry Market News. The price to farmers in California for eggs was calculated using the formula which is the basis for most egg sales in the Los Angeles area (3, page 12). Finally, the percent of large eggs sold in California was assumed to be the same as in Utah.

The comparison was made by months for the year of 1963 (Table 5).

Table 5. Comparison of egg marketing margins in Utah and California by months, 1963

Monthly average	Utah margin ¢/doz.	California margin ¢/doz.	Difference
January	18.40	17.25	+1.15
February	19.54	15.25	+4.29
March	20.75	17.00	+3.75
April	20.58	17.25	+3.33
May	18.50	19.00	- .50
June	18.67	18.00	+ .67
July	15.94	17.50	-1.56
August	19.50	17.87	+1.63
September	17.80	17.90	- .10
October	19.00	18.37	+ .63
November	19.67	16.62	+3.05
December	19.00	18.00	+1.00
Average	18.94	17.50	+1.44

When a "Student's" t test was applied to the data, the Utah margin proved to be significantly higher than that of Southern California for the year of 1963. In that same year, Southern California producers received 64 percent of the retail value, while Utah producers received only 61 percent.

When compared to Southern California, Utah had higher marketing margins as well as a smaller portion to producers. The marketing margins were no greater in Utah than in the nation as a whole, but were greater

than Southern California which is a direct competitor.

Still another illustration of the fact that Utah producers are getting a relatively small share of the consumer's egg dollar is a comparison of the prices received by farmers in California and Utah for the six year from 1959 through 1964 (Figure 17).

It should be remembered that if perfect market conditions exist, Utah handlers should be receiving 2 cents per dozen more for eggs sold than his California counterpart. Since the handler has customiarily taken a fixed margin regardless of price level, most if not all of this 2 cents should be passed on to the producer. This means that the price to Utah farmers should approach a level 2 cents higher than the price to California farmers.

By inspection of Figure 17, it is obvious that the 2 cents has not reached the producer consistantly. For one year, 1963, the Utah price was approximately 2 cents greater than the California price, but for all the other years considered, it was less. In 1960 and 1961, there was very little difference between the two; while in 1964 it was only 1.3 cents.

The fact that marketing margins in Utah are high relative to Southern California, and producers are receiving a relatively small portion of the consumers' dollar leads to the conclusion that marketing efficiency must be improved in order to stop the decline of the egg industry in the State. One recommendation is within the scope of this thesis. In a study conducted at Utah State University in 1963, it was demonstrated that the cost per dozen of assembling eggs decreased considerably as the volume per pick-up increased (6). Granting concessions to these large producers in proportion to the money saved would have two effects on the market. First, it would encourage large efficient producers and may

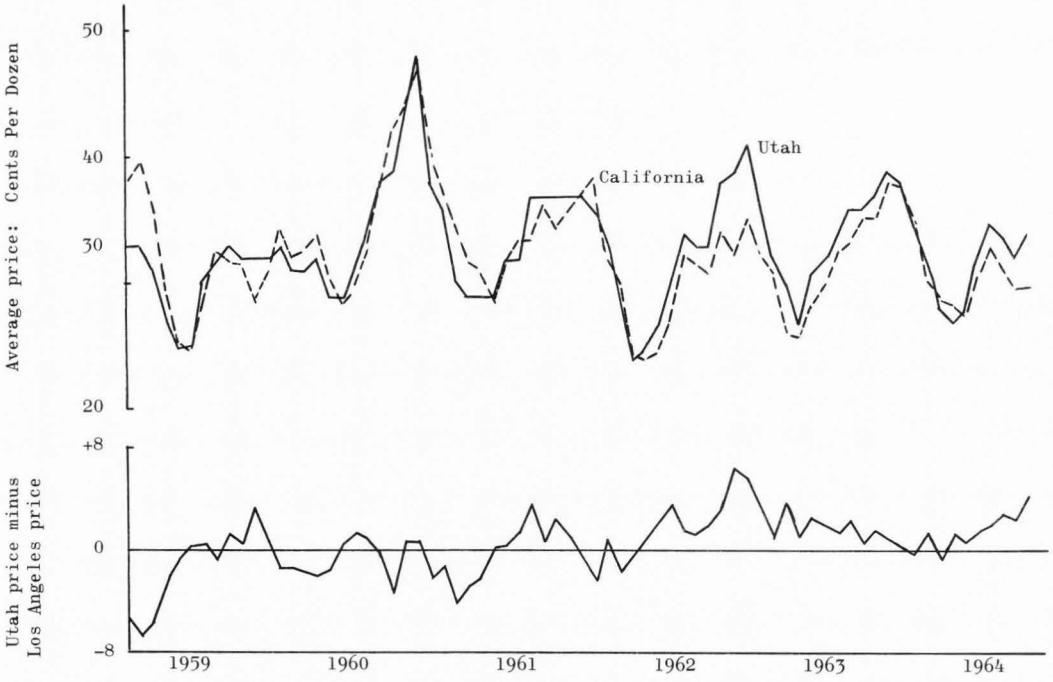

Figure 17. Average prices paid to farmers for eggs in Utah and Los Angeles by months, 1959-1964

cause some small producers to expand. A quote from the study will serve to explain (6, p. 3).

> By passing savings in marketing costs on to the larger producers who make them possible, the patronage of larger producers would be encouraged and smaller producers would have an incentive to increase size.

Second, a relative increase of large volume producers would tend to cut grading and packing costs. The study conducted by Christensen and McArthur included both hand operated and semiautomatic plants. In both cases, there was found to exist ". . . A definite relation between size of lot and average grading and packing time per case," (6, p. 14).

SUMMARY AND CONCLUSIONS

The egg producing industry in Utah has experienced a long period of decline. Over this same period, the population served by the market has grown considerably. The combination of these two forces has caused the transition from an exporting to an importing situation.

This decline in local production and increase in imports may or may not be a cause for alarm, depending on the goals of the industry. If the goal is simply one of providing the consumers with a high quality product at a relatively low cost, it may be wise to let the decline continue and increase imports as needed. There is little doubt that California producers could supply the entire needs of the Utah market.

If the goal of the industry is to curb the decline and save itself, steps should be taken to determine the cause or causes of the decreased production.

The purpose of this thesis was to examine certain pricing practices in the light of the perfect market model in an attempt to point up areas of difficulty and suggest possible solutions.

Imperfections in the market were obvious when a price comparison was made between Utah and California. Using perfect market criteria, the price of eggs in Utah should be the price in Los Angeles plus a 2 cent per dozen transportation cost. The price differential between the two areas was quite variable and ranged from a plus 8 cents to a minus 5 cents.

An oligopolist market with a price leader who is trying to keep prices high is a possible explanation for the price differential exceeding plus 2 cents. The cooperative, a farmer owned organization, is

concerned about price level in the market and may have enough influence to maintain the wide positive differential.

Another practice of the cooperative, that of ". . . looking after the interest of Utah producers", may have had a causitive effect on the decline of the price differential to a level below the 2 cents expected. There is reason to believe that the cooperative, because of the above mentioned practice, is the dumping ground for any seasonal excesses that might develop. When these surpluses are placed on the market at a reduced price, the entire market is forced to follow.

The problem of seasonal surpluses existing in one corner of the market and imports being brought in in another corner is explained by the interdealer exchange practice in the State. A practice started when Utah was exporting, provided for interdealer exchange to take place at 2 cents per dozen under the wholesale price. This practice is still commonly used even though eggs are being imported into the State.

The 2 cents gross margin allowed by the practice may be smaller than the margin on imported eggs, thus causing one handler to import while another handler has surpluses.

Marketing margins were also examined and compared with those of the United States and of California. The margins in Utah, though comparable to the United States average, were higher than those of California. The portion of the consumer's egg dollar reaching the hands of the producer was lower for Utah than either the United States average or Southern California. Assuming costs of production are comparable, Utah producers are receiving less than California producers. Low income to producers would certainly contribute to the decline of the industry.

It was concluded that several steps could be taken to improve the degree of perfection existing in the egg market.

First, handlers in the State could agree on a base price for Utah. Since eggs are continually being imported from Los Angeles, the Southern California price would probably be best.

Second, ways should be devised to use up local supply before imports are brought in. Under this heading at least three suggestions can be made.

1. The market should develop a standardized and impartial system of grading so producers can rely on grade-out percentages and interdealer exchanges could be made in confidence of quality.
2. Interdealer exchanges should be allowed at cost to increase the economic advantage of using local eggs first.
3. If there is a surplus over the State in any size and grade (this will usually be in the small and medium sizes) the excess should be sold as something other than table eggs to keep them out of direct competition with other sizes and grades.

Third, progress could be made toward decreasing marketing margins by granting price concessions to large producers.

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