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Cheese Pricing Systems

By

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Introduction

The pricing systems used in the cheese industry are an intriguing blend of a thinly traded open market (the National Cheese Exchange, at Green Bay, Wisconsin) and a heavy dependence upon "formula pricing contracts" where the ultimate transaction price is directly based upon the level of the Cheese Exchange price. This study attempts to determine the extent of formula pricing arrangements used in the cheese industry, and the advantages and problems of that pricing system. Policy implications are then briefly considered, especially regarding congressional proposals to ban similar pricing systems in the meat industry.

A survey of the six leading cheese processing and marketing corporations focused on the pricing systems in use between them, their suppliers, and their customers.^{1/} Confirmation of the pricing systems in use, and additional perspectives on the strengths and weaknesses of formula pricing systems were obtained from interviews with seven major retail and food service buyers of cheese, two cheese wholesalers and assemblers, a cheese importer, and nine cheese manufacturing plants.

The Cheese Production, Processing and Distribution System*

United States cheese production in 1978 totalled 3.5 billion pounds. Wisconsin has historically been the dominant cheese producing state, producing nearly 40 percent of U.S. cheese production in some recent years.

The principal group or type of cheese produced is American, which includes the specific varieties cheddar, colby, monterey jack, and several

^{1/} Individual responses were to be kept confidential and not to be attributed to the respondent without their permission.

*For a more comprehensive description, see The Cheese Industry, by Harold W. Lough.

others. This group accounted for 59 percent of total U.S. cheese production in 1978, with cheddar comprising three-fourths of American-type production. Italian cheeses comprised 25 percent of the total U.S. cheese production in 1978, with mozzarella making up 70 percent of the Italian cheese production. Swiss cheese comprised 6 percent of the total cheese production, with the remaining ten percent split among a large number of other varieties (blue, brick, limburger, muenster, etc. (see Figure 1)). Cheese production and consumption in the United States have sharply increased in the last 20 years, with the sharpest rate of increase occurring in the 1970's in response to the several periods of high meat prices, the growth in fast food outlets, and the surge in pizza consumption (see Figures 2, 3, and 4). The sharpest consumption increases were in Italian cheeses (some of them imported), natural cheeses, and processed cheese foods.

Approximately two-fifths of natural cheese is further processed into pasteurized processed cheese products. Since cheese and manufactured dairy products claim much of the milk remaining after the higher-valued fluid milk demand is satisfied, natural cheese production is highly seasonal, with highest production during the spring and early summer months when there is flush milk production, and lowest in the late summer and early fall.

While the number of cheese manufacturing plants has been rapidly declining since 1950, and average plant size has been increasing, there remain 300-400 relatively small plants producing natural cheese in the United States. However, the increase in plant size has largely eliminated the need for the local assembler and warehouse operator who used to acquire the cheese from many small plants, consolidate it into carlot quantities, and sell to the large cheese processing or marketing firms.

U.S. Cheese Production, 1978
(3519 mil. pounds)

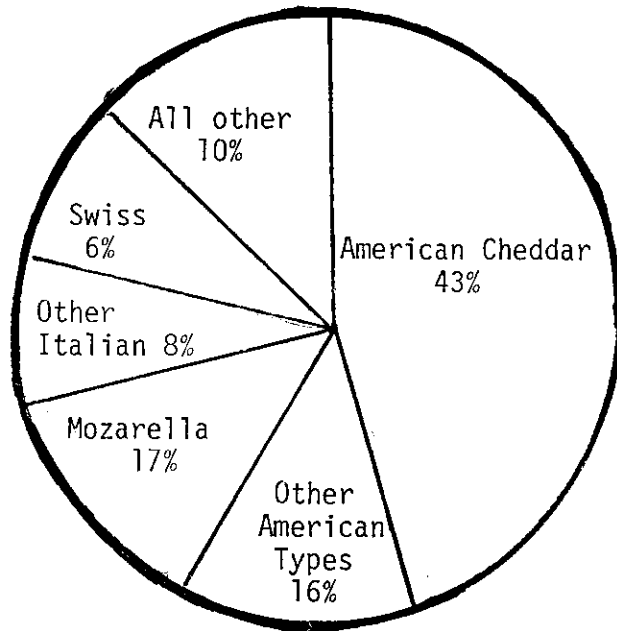


Figure 1.

Source: USDA Dairy Product Annual.

PER CAPITA CHEESE CONSUMPTION AND SALES

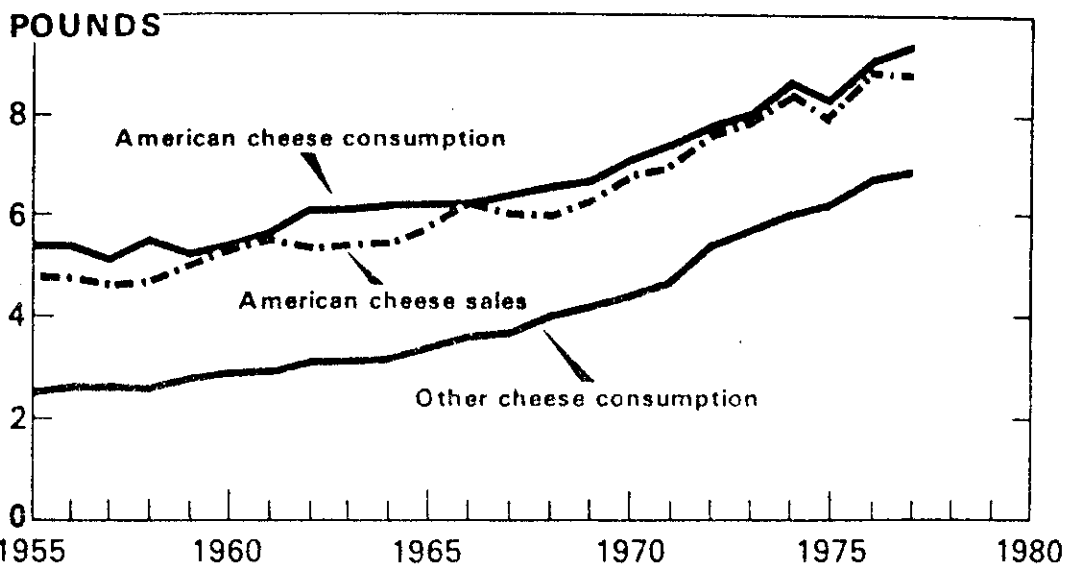


Figure 2

USDA

NEG. ESCS 8371- 78 (10)

PER CAPITA CONSUMPTION OF OTHER CHEESE

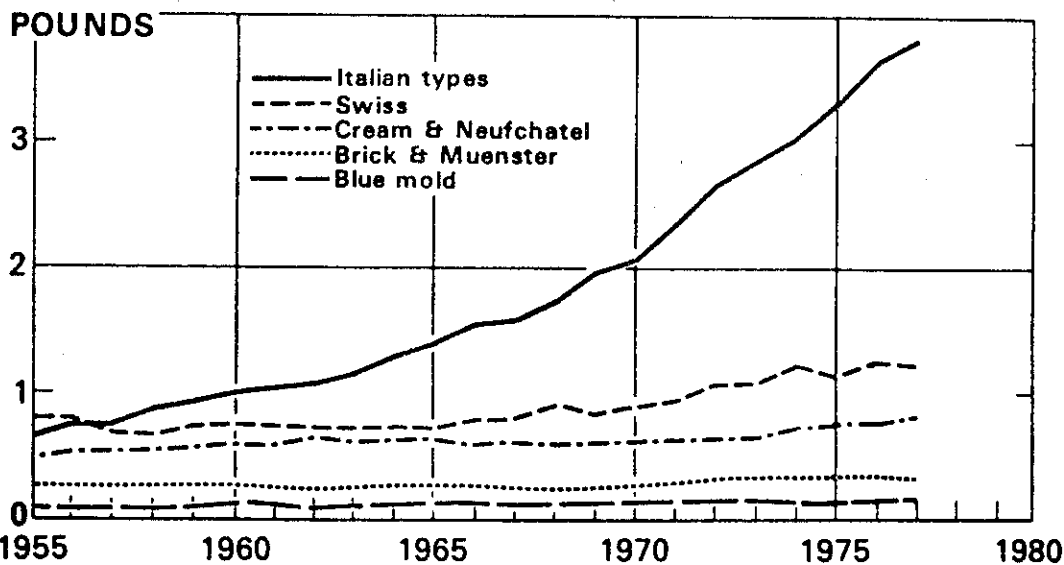


Figure 3

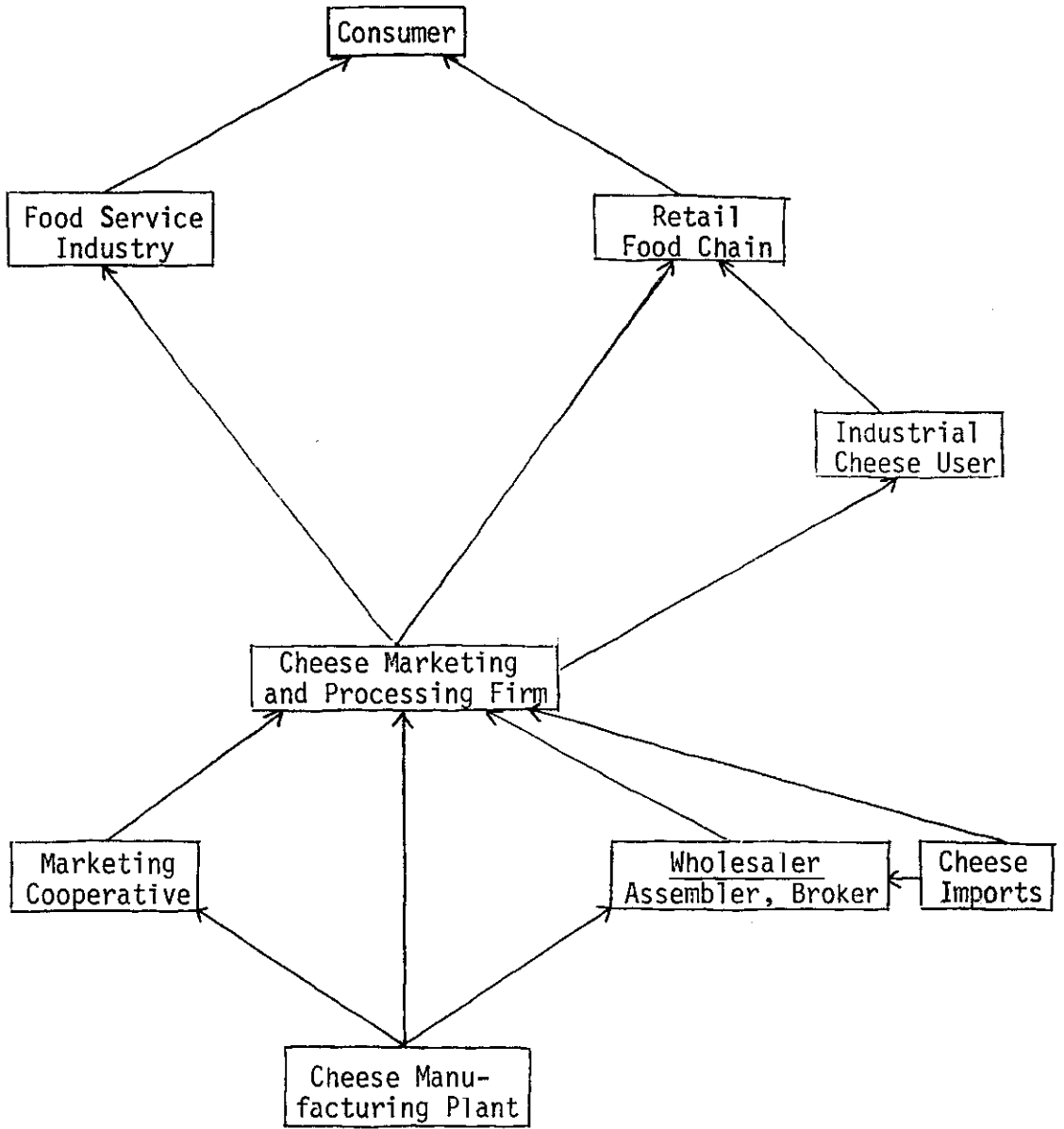
USDA

NEG. ESCS 8370- 78 (10)

According to a 1973 USDA study, over half of the natural cheese producing plants were corporations, manufacturing nearly 60 percent of the total cheese produced. Slightly less than a quarter of the plants were cooperatives, producing approximately one-third of the cheese. Dairy cooperatives became more heavily involved in cheese manufacturing during the last 15 years as a few large regional cooperatives were formed to improve the bargaining position of farmers. As a result, manufactured product facilities were developed to assist in cooperative bargaining, and to take advantage of the market opportunities for manufactured as well as fluid products.

Most cheese plants manufacture primarily one type or variety of cheese, with the dominant styles of American-type cheese made in 40 pound blocks, bulk 500 pound barrels, and 640 pound blocks. The barrel cheeses are commonly used for further processing, while the block cheeses are commonly cut and packaged and sold as natural cheese. Most plants have a long term arrangement to supply their cheese production to one buyer, though there is an increasing tendency for larger plants to split their production among one or more varieties and one or more long term customers.

Cheese purchased from manufacturing plants is ultimately used as packaged natural cheese or a processed cheese product, usually going through the retail grocery store, put into industrial products (convenience foods like cheese crackers, frozen pizzas, etc.), or sold to the hotel, restaurant or institutional trade where pizza and cheeseburgers utilize a large quantity of cheese. Retail sales of cheese comprise 50-55 percent of total cheese sales, according to industry estimates. While limited data are available on other market segments, it is likely that the food service industry utilizes 30-40 percent of the cheese produced or imported, while the food manufacturing or industrial sector uses most of the rest.



Simplified Example - Cheese Marketing and Distribution System

Figure 5

The intermediate distribution system for natural cheese is highly complex. A simplified example is shown in Figure 5. Although there are still a few independent assemblers, wholesalers, and brokers active in the cheese industry, most large cheese processing and marketing firms, like Kraft and Borden, buy most of their cheese directly from factories. Approximately 20 percent of the cheese sold by the major marketing firms (in total) is produced in their own plants, and 80 percent is purchased from domestic and import suppliers.

Cheese that must be aged may be stored and aged by the cheese producing plants (though many don't have large capital investments in storage capacity) or by the cheese processing and marketing firms. Some cutting and packaging of natural cheese is done at all levels in the market channel, including manufacturing plants, intermediate distributors, and the chain store warehouse. A small amount of cutting and packaging for local customers is done by the small manufacturing plants.

National cheese companies and other intermediate handlers cut and package the greatest volume of natural cheese. Kraft and Borden are noted for merchandising their own brands of packaged cheese, whereas, L.D. Schreiber and Clearfield Cheese Company, a subsidiary of H.P. Hood, Ind. are primarily private label packagers as is Swift & Company, a division of Esmark, Inc. Land O'Lakes, a large cooperative, concentrates more heavily on industrial cheese users than most large marketing firms, but it, too, services the food service industry and the retail sector.

Approximately 40 percent of U.S. cheese consumption in 1977 was in the form of processed cheese. There are approximately 80 manufacturers of processed cheese; about one-half of the processors are based in Wisconsin. Approximately half of the processed cheese goes to the retail market, with the remainder of the production going to the food service and industrial markets.

Approximately 6-7 percent of U.S. cheese consumption has been provided by imports in recent years, with the greatest quantities typically cheddar, swiss, and specialty cheeses. Most of these cheeses are used for further processing, though a small amount may be sold at retail. Virtually all imported cheese comes in at a predetermined price. The major importers are small specialized food import firms which, in turn, sell most of their imported cheese to the large marketing firms.

There is a general consensus among industry members that Kraft, Inc., is the dominant firm in the cheese market, with a market share of 45-50 percent of the total cheese market, and a slightly larger share of the retail market (see Table 1). The L.D. Schreiber Cheese Company and Borden, Inc. are generally considered to rank second and third in size, with an overall market share in the 8-10 percent range. Clearfield Cheese Company, Swift, and Land O'Lakes are slightly smaller, with each controlling 6-7 percent of total cheese marketed in the United States. While these estimates may involve some double counting (interfirm transactions do occur), the 6 largest cheese processing and marketing companies in the United States control approximately 85-90 percent of the cheese sold to the retail, food service, and industrial customers. A few large retail chains (e.g., Kroger, Safeway, A&P, Jewel) cut and package cheese under their own label at their own packaging and warehouse operations, and do some cheese processing to provide greater control over the type of product merchandised.

Under the Agricultural Act of 1949, as amended, the Secretary of Agriculture supports the price of manufacturing milk through purchases of dairy products. Thus, the U.S. Department of Agriculture purchases natural cheddar cheese at announced support prices, and processed cheese offered on a competitive bid basis, to support the annual average milk price which milk processing plants pay to farmers. While cheese prices

Table 1
Market Shares -- Cheese Marketing Firms

<u>Firm</u>	<u>Estimated Market Share</u> (percent)	<u>Customer Emphasis</u>
Kraft, Inc.	45-50	retail-branded
L.D. Schreiber	8-10	retail-private label, and HRI
Borden, Inc.	8-10	retail-branded
Swift and Co.	6-7	retail-private label and HRI
Land O'Lakes	6-7	industrial
Clearfield Cheese	6-7	retail-private label

Source: Industry Estimates.

have occasionally surged above the price support level, the USDA price support program has been an important influence on the price of cheese over long periods of time during the last decade or two. In addition, restrictions on cheese imports have had some influence on the prevailing price level.

Pricing Systems

The primary points in the cheese marketing system for establishing prices are: (1) the transaction between the cheese factory and the first handler of cheese -- typically the national cheese marketing firms like Kraft, Borden, Schreiber, Swift, Clearfield, Land O'Lakes; direct factory sales to retailers, industrial users or brokers are relatively infrequent; (2) the transaction between the national cheese processing and marketing firm and the retail, food service, and industrial users of cheese.

While this simplification necessarily ignores some of the complexities of the cheese marketing system, we will consider in the following sections the pricing systems in use at the "first handler" level of the cheese market, the role and operations of the National Cheese Exchange, and the primary pricing systems employed by the national cheese marketing firms in sales to their retail, food service, and industrial customers.

The "First Handler" Market for Cheese

While some cheese is manufactured by national cheese marketing firms for their own use,^{1/} approximately 70 percent of U.S. cheese consumption is made by independent or cooperative cheese manufacturing plants, and 6-7 of U.S. cheese consumption is imported (this will increase as import

^{1/} Estimated at approximately 20% of U.S. cheese consumption.

quotas increase in 1979). Because the pricing systems for domestically produced and imported cheese differ significantly, we will consider them separately.

Cheese Factory Sales -- Because cheese is a perishable product with highly variable levels of production throughout the year, small cheese plants are highly motivated to assure themselves of an outlet for their cheese production (especially during "surplus" periods). At the same time, large cheese processing, packaging, and marketing firms must be in a position to consistently supply product to their customers if they hope to maintain hard-won relationships with these buyers and their branded product acceptance by consumers. The primary technique developed in the cheese industry to serve these purposes is the long term contract (either written or oral) in which all or a specific portion of a plant's cheese production is allocated to a specific buyer on a long term basis, with the price based upon the reported price from the National Cheese Exchange plus a prenegotiated premium.

This type of "formula price contract" is typically based upon a specification of the type of cheese to be manufactured, the particular process which is to be used (including the enzymes or other ingredients to be used), shape of the cheese (block, longhorn, daisy, mammoth, etc.), the type of wrap, the moisture discount schedule, and a prenegotiated penalty for not meeting the buyer's specifications. In addition, the contracts, whether oral or written, generally specify: whether the container is to be furnished by the supplier or the buyer; whether grading, testing, and assembling is to be done by the buyer or the supplier; the length of storage required; and the assignment of responsibility for freight charges and handling costs. All of these factors are built into the negotiated premium which typically is applied to the quoted price on the National Cheese

Exchange for 40 pound block cheddar cheese, if the cheese is to be cut and packaged, or the quoted price for 500 pound barrels if the cheese is to be used for processing. Typically, the date that the cheese is made by the cheese plant is considered the pricing date, and the National Cheese Exchange price on the prior Friday is then the effective base price.^{1/}

The volumes specified in the formula price contracts are often all the plant can produce, or a specific portion of the plant's production, as long as the suppliers meet the buyer's quality specifications which are especially critical for their branded, cutting type cheeses. Several of the largest cheese marketing firms prefer long term arrangements to insure consistent quality and quantity; consequently, they negotiate premiums that remain stable throughout the year, during both periods of surplus and shortage.

While some contracts allow very little flexibility for a three month period at the prenegotiated premium, they do make the premium renegotiable upon 90 days notice if market conditions change. However, the premium structures under these arrangements tend to remain quite stable relative to many others (described subsequently). Cheese plant managers typically presume that the plants quickest to ask for a higher premium, say when cheese is in short supply, will have buyers respond in kind, negotiating lower premiums or reducing purchases, as allowed in the contract, when cheese surpluses occur in the future. Since finding a home for a perishable product in a period of surplus can be extremely traumatic, many plant managers opt for the stable premium, long term contract.

Long term formula price priced contracts are sometimes used by some of the large companies as vehicles to develop new suppliers to satisfy anticipated marketing requirements. This may involve a contract for as

^{1/}Some firms apply the Friday price to cheese made on the three days prior to and subsequent to Friday to minimize plant managers' changing their production schedule to capitalize on expected price changes.

much as five year's production, where the buyer will provide a guaranteed market outlet on a formula priced arrangement, with relatively high premiums for guaranteed full-supply contracts. These arrangements can facilitate long term financing of the new cheese plant, and benefit both supplier and buyer.

The prenegotiated premiums for several large buyers are stable for shorter time periods; renegotiations occur three to four times a year, on the average, as costs of materials change, labor contracts change, or either the supplier or the buyer get a better offer from someone else. One plant mentioned some "sliding scale" contracts where the premium could be adjusted by 1/2 cents, depending upon the supply and demand situation in the market, as a means to offer premiums to milk producers to get enough milk supply to make cheese when seasonal shortages develop. While premium changes during the season might reach 3 cents per pound if someone is in a desperate situation, most premium changes within a season typically won't be greater than one cent per pound (see Graf's study for some examples). However, some survey respondents noted that premiums varied cyclically by as much as 12 cents at the extreme.

A small proportion of the total cheese supply coming from domestic U.S. cheese plants is not sold on a long term formula price arrangement. For example, one survey respondent mentioned one formula price arrangement that was renegotiated every five weeks. Also, a small amount of processed cheese is occasionally offered to the government on a bid basis in conjunction with the government price support program, donation programs, and the Department of Defense quartermaster purchasing of cheese. Very few cheese plants tend to participate directly in the National Cheese Exchange, and spot sales of cheese on a firm price basis are quite unusual.

On domestically produced specialty cheeses -- often aged cheeses, or special shapes like mammoth or daisies -- a firm negotiated price is typical because these products are often sufficiently differentiated from the products priced on the National Cheese Exchange that their market prices don't closely follow the cheddar block and barrel prices. Asking prices are often based upon the basic cost of the cheese when it went into storage, storage costs, and target profit. However, because the National Cheese Exchange price has a significant influence on the price which many cheese makers pay dairy farmers for their milk, the makers of specialty cheeses that aren't aged must carefully monitor the National Cheese Exchange prices to see that their pay price for milk doesn't get out of line and cause producers to ship milk to other cheese plants. As a consequence, the National Cheese Exchange prices certainly affect the willingness of a specialty cheese maker to produce their cheese at a particular price, and cause most producers of specialty cheeses (like mozzarella) to base their price on the National Cheese Exchange price. Stable premiums are usually employed on long term sales agreements, while a more volatile premium is observed on shorter term agreements.

Imported Cheese Pricing -- Imported cheese provides six to seven percent of U.S. cheese consumption. The primary cheeses imported include some American-type cheeses like cheddar, and a large number of specialty cheeses that originate in Europe. The European cheeses include Italian, Edam, Gouda, Swiss, Roquefort, and many others. New Zealand and Australia are the primary suppliers of imported American-type cheeses. Due to the significant lag between the time of transaction and the time of delivery, and the lack of direct competition of many specialty cheeses with the cheeses traded on the National Cheese Exchange, most suppliers of imported cheese require firm prices to be established at the time of the transaction.

During periods of surplus, suppliers may sometimes offer down-side price protection (a reduction in the price if the market price declines between the time of transaction and the time of delivery) using the National Cheese Exchange as a barometric indicator of the general market level for all cheeses.

The National Cheese Exchange^{1/}

The National Cheese Exchange located in Green Bay, Wisconsin is the only open public market for cheese in the United States. The Exchange meets each Friday morning for one-half hour (or longer if deemed necessary) at which time the 44 members, who handle an estimated 80-90 percent of all the cheese in the United States, are represented at these trading sessions. The exchange is a vehicle for the national cheese processing and marketing companies to offer surplus inventories or pick up additional supplies to meet their customers' requirements. Thus, the exchange serves as a mechanism to transfer inventory deficits or surpluses.

Because the volume of cheese traded on the National Cheese Exchange comprises only a very small proportion of the total cheese production in the country (less than 1 percent in the last two years), it clearly is a very "thinly traded market". In 1978, the weekly average volume was 6.3 cars (36,000 pounds each), with the number of transactions ranging from zero to twenty-one (no transactions took place in 18 weeks). While most of the trading on the National Cheese Exchange is normally done by four or five large cheese marketing firms, the presence of most major cheese firms undoubtedly provides a fairly significant "policing" of the price changes that could be effected by the major traders. Because most major cheese buyers and sellers are concentrated in one location when trading occurs, distortions are quickly evident to all industry participants and responses

^{1/}For more detail about the National Cheese Exchange see the papers by Graf and Gould noted in the references.

from competitors or firms on the "opposite side of the market" can be immediate if price changes are inconsistent with their inventory situation. This may be in contrast to the meat industry where everything is quite widely geographically dispersed, and communication of market distortions is not instantaneous. In a dispersed market situation, reactions of other market participants can be very slow, and distortions may exist for relatively long periods of time, even though the relative or absolute market volume is substantially greater.

Most firms interviewed in this study, as well as firms involved in an earlier study by Graf, use the National Cheese Exchange prices as a base for formula price arrangements which determine the prices on a very high proportion of the cheese marketed in the United States. While some firms interviewed felt that one large cheese company might be able to unduly influence the market price for a week, or perhaps two, they indicated that flexibility within some plants to shift quickly to the block or barrel cheese traded on the Exchange, if the prices were artificially kept high, would quickly lead to a flood of offers of cheese at those inflated prices.^{2/} This potential for quick response should insure that any attempted price manipulation would be short-lived at best.

One concern mentioned by several firms interviewed in this study, and in a study by Graf [Jacobson, et. al., p. 37-39], was the failure of the price at the National Cheese Exchange to reflect the seasonal and cyclical variations of the premiums paid under formula arrangements. The premium structure on long term contracts is the primary competitive mechanism used by the large cheese marketing firms to capture cheese suppliers from their competitors. While the prices on the Cheese Exchange are quite

^{2/}This is a cash market where transfer and payment must be completed within one week. The styles tracked are those into which residual milk flows in times of surplus, and from which milk is drawn during shortages.

well-known, the formula premium structures are quite variable and less well-known, perhaps putting some of the smaller, less well-informed plants at a competitive disadvantage.

However, it may be quite appropriate for the premium structure not to be fully reflected in the spot market transactions that are the basis for the National Cheese Exchange trading. The premium structures negotiated on the long term formula pricing arrangements are in essence a reflection of the prevailing market opinion about the value of a long term supply contract-market outlet arrangement where a continuous market outlet is assured to the seller and tight quality specifications (different from those on the Exchange, typically) and a regular supply are assured for the buyer. Thus, the variability in the difference between the National Cheese Exchange spot market price and the longer term formula contract paying prices may be analogous to the difference in interest rates on short term borrowings of money and long term indebtedness (bonds, etc.). They are two closely related markets, but yet have distinct characteristics that are unique, and the market prices reflect the perceived value of the differences.

The Retail, Food Service, and Industrial Cheese Markets

The primary markets for cheese that are serviced by the national cheese processing and marketing firms are the retail, food service, and industrial cheese markets. The pricing systems utilized between the national cheese marketing firms (or a few cheese plants who have direct sales arrangements) with their retail, food service, or industrial customers do exhibit some interesting differences from those utilized at the first handler level.

Pricing Systems -- Retail Customers

Large cheese processing and marketing firms sell 50-55 percent of their cheese to retail chains, according to industry estimates. Approximately 40 percent of all retail sales have been under retail private labels, while the rest has been under a manufacturer brand.^{1/} Most cheese sold under a manufacturers' brand is sold to the retailer on the basis of a weekly price list. There is a strong tendency for the price list on all cheeses not considered specialty cheeses to closely follow changes in the National Cheese Exchange price. While firms with strong brand franchises tend to consider the Cheese Exchange a useful input in their pricing process, because it is a key determinant of their input costs, they stress that it is not the final determinant of their selling price (they also consider changes in other costs, changes in target profit margins, etc.). One branded product cost is advertising and promotion, which probably is the primary method used to capture an increased market share. One industry member estimated the average industry advertising and promotion cost at 4-5 percent of the sales dollar.

In periods when the National Cheese Exchange price is quite stable, weekly price lists may not change for several weeks. Most major cheese marketing firms follow the practice of offering price protection clauses to their retail customers when retail prices increase. This typically involves giving the customer an option to purchase one normal order at the old price when a price increase is announced. Since most customers order once a week, this typically is one week's normal requirements, though some firms allow those customers that order every two or four weeks to purchase a corresponding quantity at the old price.

^{1/}In a 1972 study, Lough indicates that 30% of retail sales were private label. However, some industry sources indicate the private label market share has increased in recent years.

In addition, some firms offer a price ceiling to the retailer during extended trade deals and sales promotions, guaranteeing that the price would not increase from the level at the beginning of the trade deal. However, if the price declines, the retailer gets the benefit of that price decline. Retail buyers typically are offered price protection on cheese already purchased while it is in transit; the purchase price may be the price at the date of departure or at the date of delivery, whichever is lower.

Private label sales of cheese to large retail customers sometimes are on a price list basis, where the net price to the private label customer is essentially the price charged for equivalent branded cheese less advertising and promotion costs which are not incurred on the private label sales. Thus, the marginal profit from the branded and private label products would be equivalent. However, most private label sales are on a formula basis, with the formula based upon the National Cheese Exchange price plus a prenegotiated premium for the services, costs incurred, and profit for the manufacturer. Even if a price list is used for such private label products, the price list typically varies directly with the block or the barrel market for "cutting" or processed cheeses, respectively. While the price lists loosely follow the Cheese Exchange prices, formula prices follow the Cheese Exchange prices very closely in the short run, and slightly less closely in the long run as premium renegotiations alter the parallel price behavior.

Pricing Systems - Food Service Customers

The primary food service customers for cheese are the full line and specialty distribution firms which service many small and intermediate sized fast food chains, hotels, restaurants, and other institutional customers. In addition, very large food service customers with special

volume or formula requirements are dealt with directly by the large cheese marketing firms; these include major pizza chains (Shakey's, etc.) and hamburger chains (like McDonald's, Burger King, Wendy's, etc.). The cheese sold through the full line or specialty distributors to many other food service customers are typically priced according to a weekly or monthly price list, unless special formula cheeses are required by the customer. In situations where the cheese required by several customers is a standard formula, the f.o.b. plant prices are the same to all buyers. These list prices are virtually the same as formula prices, since they are typically related to the Cheese Exchange price plus a prenegotiated premium which may last unchanged as long as a year if little change occurs in packaging and labor costs, etc. In situations where the quantities required vary significantly during the year, the premium may vary significantly, especially when there is a shortage. Sometimes the premium increases when the marketing firm has to reach beyond its normal suppliers to acquire the cheese, and a higher premium is required to get the additional cheese for their food service customers.

Formula price arrangements are fairly typically used with large food service customers who require special formula cheeses. In order to maintain consistent quality where special formulas are used, food service firms cannot go to just any cheese processor to make these cheeses. Thus, such arrangements don't lend themselves to month to month negotiations, and formula price arrangements are considered essential. In fact, some fast food service firms indicated that, if they had to change, they would have to go to a different "cost plus" arrangement in order to establish workable long-standing arrangements with their suppliers.

The standard pricing arrangement with some large fast food chains is to use the average Exchange price in the preceding month as the base price for the following month, to which the prenegotiated premium is then added. This provides the large fast food customer with advance knowledge of the raw material costs and "menu margin" for the following month. For the supplier, the variations in the monthly cheese prices should average out in a long term supply arrangement, and his inventory of cheese should provide a partial hedge against the risk that cheese market prices might increase during the month when they are locked into the lower selling prices to these food service customers.

Occasionally, some food service customers may want a fixed price for cheese when they anticipate higher prices in the future. However, suppliers are seldom interested in exposing themselves to a significant price risk by establishing a firm price on cheese to be delivered three or four months in the future (unless they immediately purchase the cheese and put it into storage for future delivery). Suppliers typically do provide price protection to the food service customer for a week on price increases, but do not give any price protection on the buyer's small cheese inventories.

Pricing Systems - Industrial Users

While some suppliers use a price list on cheese sales to industrial users, most cheese suppliers emphasize formula pricing arrangements for the special formula cheeses, cheese spreads, and cheese powders that are ingredients in manufactured food products. The typical formula arrangement uses the base price from the National Cheese Exchange on the date of cheese production plus a prenegotiated premium. The premium may vary depending upon the extent of storage and aging cost, delivery timing and procedure, insurance, freight, and the risk that the cheese produced may not meet the

buyer's specifications at the time of delivery. Thus, the buyer bears the risk of any price change from the time that the cheese is produced, and the premium reflects the risk (which varies with different kinds of cheeses) of not meeting the specifications at the time of delivery.

Advantages and Disadvantages of Formula Pricing

Formula Pricing Advantages

Cheese Factory Views -- The market price for cheese typically has been based on the prices established at the National Cheese Exchange for at least the last 30 years. As a consequence, the managers of many cheese plants and several large processing and marketing firms surveyed found it quite difficult to envision how price of cheese could be established in a different fashion. Many cheese factory managers indicated that establishing market prices on the basis of the National Cheese Exchange was the "standard of the trade". Since most cheese plants base their milk price on their selling price for cheese, competitors have little option but to price their cheese and milk accordingly to remain competitive in their input and output markets.

Many cheese factories felt formula pricing arrangements were usually a good, fair way of trading which eliminated a lot of their price risk. These respondents felt that long term formula arrangements eliminated the need to scramble for additional buyers during the periods of cheese surpluses, while assuring customers of the type of cheese that they required.^{1/} Most suppliers felt that the Green Bay Exchange generally was representative of the "market tone", and were quite comfortable with the base price that

^{1/}Since many special formula cheeses are not wanted by any other buyers, the buyer has to be responsible for the risk in order to achieve desired quality and quantity on a long term standing arrangement.

resulted from the Cheese Exchange trading. In fact, several cheese plant managers felt that there would be more problems if formula pricing and the Green Bay Exchange did not exist, particularly for small cheese factories that would be at a significant market information and bargaining disadvantage. Several felt that the big buyers would know their needs and the overall market situation, while the small cheese factory would be "in the dark".

Marketing Firm Views -- A few large national cheese processing and marketing firms also indicated that they didn't know how to price their cheese in any other way; they predominantly used formula pricing on both their cheese purchases and cheese sales. Some other firms used a price list to price most of their finished products sales, especially their sales to retailers. Nearly all of the large marketing firms felt that formula pricing their raw material and some or all of their end product helped assure a stable profit margin.

All marketing firms surveyed felt that the National Cheese Exchange prices reasonably reflected the cheese supply and demand situation. With the National Cheese Exchange as a "legitimizing" of the basic market price, buyer and seller disagreement is sharply reduced; this in turn facilitates efficient, low cost long term contracts that avoid the higher cost of negotiating individual shipments.

Several large firms indicated that elimination of the National Cheese Exchange and formula pricing arrangements would force them to "set a price" that would undoubtedly be higher than would otherwise prevail because of the additional cost per transaction, and the risk of adverse raw material price changes (and margin squeezes) after a selling price is established. One respondent felt that the combination of the well recognized price base in the industry (the National Cheese Exchange) in combination with formula

pricing probably eliminated the incentive which might otherwise be present for managers to collude in order to maintain margins at a satisfactory level; otherwise the risk of collusive price activity might be very high in an industry where a relatively small number of firms control a very high proportion of the overall product being traded.

One marketing firm noted that a formula price arrangement was an excellent device to facilitate long term facility planning in the industry. A large buyer can assure a sales outlet to the supplier without significant price risk, and this commitment can help the potential supplier obtain adequate financing for plant and equipment. In this way, an adequate long term cheese supply can be assured without significant price risk for the buyer, and less marketing risk for the supplier.

Buyer's Views -- Formula pricing is used by retailers when they purchase cheese for their private label cutting and packaging operations. Most retail buyers felt that the primary benefit from formula pricing arrangements was the assurance that they were paying the "going market price", without negotiating individual transactions or trading on the Exchange themselves. Formula pricing arrangements facilitate good quality on a continuing basis from suppliers, so retailers avoid consumer resistance to their own brand of cheese because of quality variations. Also, most retail buyers indicated that the formula pricing arrangement involved very little hassle, and was very efficient. In addition, a continuing arrangement with an efficient supplier can sometimes offer even more advantages to the retailer, particularly when a back haul can be arranged to minimize freight cost. None of the retail buyers contacted felt that there were any major problems with formula pricing.

The few large fast food chains that were included in the survey listed the stable source of supply of adequate quality as the primary benefit of formula pricing arrangements. Some food service buyers say they are most concerned with quality, with price only as a secondary concern. Another indicated that special formula cheeses required by the food service operations did not lend themselves to month to month negotiations since they cannot readily shift to other cheese processors for specialty cheeses.

Formula Price Disadvantages

As one might expect in an industry where formula pricing is so dominant, there were some disadvantages cited for formula pricing, but very few of the respondents considered the disadvantages to be significant. One respondent felt that formula pricing allowed frequent price changes to be fed through to the retail customer when the cheese market was volatile, causing distress for some retailers when new prices were required too often. Two respondents were concerned about possible price manipulation, and referred to the dominant influence of three or four major companies on the market price at Green Bay.^{1/} One person felt that firms sometimes do buying and selling solely to establish a market. Another marketing firm complained that their formula price arrangements for packaged and processed cheese essentially are options to buy, and buyers load up on cheese prior to government support price increases, creating problems for the supplier in those situations. A few managers relayed their concerns about basing their buying or selling price on a price established through a very low volume of product being traded, and wondered whether it truly was representative when premiums fluctuated throughout the year. One respondent was concerned that the actions of one firm of the Cheese Exchange sometimes seemed unrelated to the current cheese supply and demand situation, and more related to an

^{1/} See Graf, p. 70-71, for sales and purchase concentration figures; two firms made 85% of the purchases, and three firms made 91% of the sales on the Exchange in 1977. It's interesting to note that the largest firm in the industry typically plays only a small peripheral role in the trading on the National Cheese Exchange.

imbalance of manufactured milk prices which could be paid by their cheese plants and their other dairy product manufacturing plants. In addition, the relative shortage of information about the premiums in force on long term contracts, and the prevailing market level for premiums being renegotiated on various long term contracts is one area where market information was considered insufficient, and inequities may be present, particularly among small cheese producing plants.^{1/}

Summary and Conclusions

The six largest cheese processing and marketing companies (which handle approximately 85-90% of the cheese sold to the retail, food service, and industrial sector in the U.S.) were surveyed to determine the extent of formula pricing in the cheese industry, the corresponding role of the National Cheese Exchange in influencing market prices, and the advantages and problems of formula pricing in the cheese industry. Supplemental interviews with seven retail and food service buyers of cheese, two cheese wholesalers, and nine cheese manufacturing plant managers provided confirming evidence, along with their own perceptions of the strengths and weaknesses of the formula pricing systems. On the basis of this survey, one can conclude that approximately 20 percent of cheese sold by large cheese processing and marketing firms is manufactured in their own plants (see summary in Table 2). 90-95 percent or more of the cheese purchased from other plants in the United States is formula-priced. A few cheese manufacturing plants sell a very small proportion of their output directly to local or regional retail customers, often on a price list basis. Some cheese may be sold to government purchasing agencies on a bid basis,

^{1/}See Jacobsen, et. al., p. 37-40, for more detail on premium structures.

Table 2

Cheese Pricing Systems

	<u>First Handler Transactions</u> (percent)	<u>Packaged and Processed Cheese</u> (percent)
Vertical Integration (intrafirm transfer)	20	
Formula Priced	65-70	25-35
Negotiated Pricing	10-15	1-2*
Price List		60-70

*Primarily involves transfer of surplus cheese inventories among large marketing firms, often through the National Cheese Exchange. While this is a "second handler" sale, the cheese is usually block or barreil cheese, not packaged or further processed.

and a few specialty cheese sales may be on a negotiated firm price basis. But even the prices of most specialty cheeses sold by manufacturing plants often are based upon the National Cheese Exchange price plus a prenegotiated premium, to help insure that the plant's paying price to milk producers remains in line with competitors who sell cheese on a formula basis.

Imported cheese, which now comprises approximately 6-7 percent of U.S. consumption, is typically imported by specialized import firms on the basis of a predetermined negotiated price. However, in periods of surplus, some suppliers of imported cheese offer downward price protection to the buyer during the period of shipment, basing the price adjustment on the change in the National Cheese Exchange price between the price of the transaction and the time of delivery.

Combining the cheese imports and the domestic cheese production estimates, one can conclude that 85-90 percent of the cheese purchased by the national cheese marketing firms is purchased on a formula price basis, seven percent are firm priced imports, and 1-2 percent are negotiated trades among large marketing firms (often through the Cheese Exchange) trying to balance inventory surplus and shortages. In addition, approximately 20 percent of the cheese sold by large marketing firms is produced in their own plants, and sold on the same basis as the cheese purchased from other suppliers (though no purchase price is established, except for the raw materials).

Pricing systems used on cheese sold by the national cheese processing and marketing firms to their retail, food service, and industrial customers exhibit some interesting differences. Approximately 50-55 percent of the cheese consumed in the U.S. is sold through retail channels; approximately 60 percent of that cheese is sold under a manufacturer's brand (as contrasted to a retailer's private label), with a slightly higher proportion of

processed cheeses and cheese products sold under a manufacturer's brand. The standard pricing arrangement for most manufacturer branded cheeses, whether natural or processed, is the retail price list. While the National Cheese Exchange is not the only factor influencing the retail price lists, it is probably the most important factor influencing short run changes in retail price lists.

Some private label sales to retailers are on a price list basis as well, but with appropriate discounts primarily reflecting advertising and promotion costs which are not borne by the manufacturer on private label sales of cheese to retailers. However, most private label sales to retailers are formula prices, based upon the National Cheese Exchange, but with a large premium reflecting the services, packaging costs, etc., provided. Thus, 70-80 percent of the cheese sales into retail channels are on a price list basis, where the price at the National Cheese Exchange is a very important influence on the retail price list. Formula prices are used on approximately 20-30 percent of the retail purchases, with the National Cheese Exchange price directly influencing the transaction price.

While several large marketing firms use a price list on sales to all food service customers (30-40 percent of the market, and rapidly growing), most national marketing firms tend to use a price list for only those cheese or cheese-based products which are fairly standard and used by several customers. This is particularly true for food service customers serviced through full line or specialty distributors, which may comprise 70-80 percent of the food service volume. Some firms indicated that their food service price list is directly related to the Cheese Exchange block or barrel prices (essentially a formula price), while other firms attempt to maintain a looser tie between the Cheese Exchange price and

their food service price list.

For many large food service customers (perhaps 20-30 percent of food service volume) who require specialty cheeses or cheese products to satisfy their requirements, direct formula pricing arrangements are negotiated, even though the product may be handled by independent distribution for some large food service firms. Two different types of formulas were noted: one where the market price is related to the National Cheese Exchange price prevailing on the date of manufacture plus a prenegotiated premium. The pricing arrangement for a high proportion of industrial cheese sales, which probably comprise approximately 10 percent of the cheese consumed in the United States, is very similar to the standard formula price arrangements used for most large food service customers, with the price established at the date of manufacture.

Though the available data are sketchy on food service and industrial segments of the cheese market, we can conclude that formula pricing is used on 25-35 percent of all cheese sales by the large cheese marketing firms. Another 5-10 percent of sales on a price list basis are so closely tied to the National Cheese Exchange price that they are essentially formula priced sales. The remainder of the cheese sales are on a price list basis, with the exception of a small volume of cheese traded among the large marketing firms to balance inventory surpluses and shortages (often through the National Cheese Exchange), or sold to the government on a bid basis. In total, the proportion of the cheese sold by the large marketing firms on a negotiated or bid basis probably constitutes less than 2 percent of their sales volume.

Despite the fact that the bulk of the cheese traded in the U.S. is based upon the market prices established at the National Cheese Exchange,

involving less than 1 percent of the cheese traded, there were few, if any, significant complaints about the representativeness of the prices generated by the Exchange. While a few market participants were concerned about potential manipulation and the dominance of trading by four or five major Exchange participants, the one case of manipulation cited in the literature (Gould, page 80) occurred in 1971 when "a large cooperative claimed credit for raising the price of cheese at the Exchange". This triggered the Exchange to change its rules, eliminating its restrictions on the origin of the cheese that could be traded on the Exchange, and hopefully forestalling any future attempts. While most traders concede that a large, well financed firm who wished to force a market price change could probably do so near the end of a market session, the presence at the trading session of nearly all of the firms who have a significant interest in the cheese industry probably would not allow any major price change to be maintained for more than one session if the price level was not justified by the industry inventory situation. The presence of all major market participants at the Exchange makes the communication of any market price distortions instantaneous, and the reactions of competitors or firms on the opposite side of the market could make any attempted market manipulation quite costly for the firm attempting it. Even if the financial resources of any attempted manipulator allowed it to absorb 5-10 cars of cheese (at a price tag of \$200-400 thousand dollars) to maintain an artificial price level during one trading session, industry participants indicate that there are enough plants which have the flexibility to shift to producing 40 pound blocks or 500 pound barrels within a few days that the trading session in the following week could have a sharply increased supply of cheese meeting the Exchange's specifications -- enough that even a large, well financed company would find

it extremely difficult to sustain an artificially enhanced market price level. In a similar fashion, firms artificially trying to lower the price have to deliver the product within seven days, so downward manipulation of the price would also appear quite difficult. Further, at least one major trader on the Exchange has most cheese purchases and sales formula-priced; thus, that firm would have no incentive to rig the price at the Cheese Exchange, and others who are partially formula-priced on both sales and purchases would appear to have little incentive to manipulate the price. As a consequence, it appears that the National Cheese Exchange, though thinly traded, has an ample supply of potential buyers or seller "waiting in the wings" that manipulation of the market for more than one session is probably not possible. Nearly all major Exchange participants and independent observers who closely monitor the cheese market felt that the small volume of surpluses and shortages generated in the cheese industry were generally reflected effectively in the changes in the National Cheese Exchange price.

Based upon analysis of the cheese industry, would a policy of banning formula pricing (like that proposed for the meat industry) enhance overall market performance? Certainly the National Cheese Exchange is more thinly traded than the negotiated portion of the carcass beef market, which is probably the most thinly traded in the meat industry. Yet, significant complaints about the nature of the formula priced contract arrangements and the market price used as a base in those contracts are almost non-existent, even among those sometimes considered "mavericks" in the industry. While market participants were unable to estimate the cost impact of a ban on formula pricing in their operations (many could not even conceive what other system could be used), it seems clear that increased risk and cost for market participants could be substantial, especially for the managers

for the small cheese plants who might be most disadvantaged in negotiating individual transactions with their large, better informed customers.

While there was a low level of dissatisfaction with the current pricing systems in the cheese industry, one note of dissatisfaction was the lack of information regarding the prevailing premiums on long term contracts. One potential improvement to the current system would be a price reporting system for recently negotiated premiums. A premium report could enhance the bargaining ability of the small cheese manufacturing plants,¹ and provide better market intelligence on this key element of the competition for cheese supplies to participants at all levels of the cheese marketing system.

In conclusion, somewhat to the author's surprise, the combination of a very high rate of formula pricing with a very thinly traded, yet highly influential central market was generally viewed as performing satisfactorily by buyers and sellers at all levels of the market system. Some firms felt that the alternative to formula pricing would be the large, dominant marketing firms becoming price leaders on cheese purchased from cheese manufacturing plants. This was viewed as much less desirable for the industry as a whole than the current pricing systems. As long as the major firms in the industry continue to act independently and actively respond to any perceived price distortions beginning to occur, the formula price arrangements used in conjunction with National Cheese Exchange prices appear to be performing efficiently and equitably in "clearing the market" of the small cheese surpluses or shortages that develop.

¹While a few phone calls to the large marketing firms may indicate what buyers will offer, they won't necessarily insure that the offers are in line with prevailing market levels.

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