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In order to understand some of the hedging operations of a wheat flour miller a brief description of the general practices and customs of the industry will be helpful.

At the beginning of the crop year which is June and July in the southwest winter wheat area, and August and September in the northwest spring wheat area, the miller selects those types and grades of actual cash wheat which are most suitable for his particular trade. He determines to the best of his ability, those types that will be in short supply and those that are plentiful and buys his wheat as intelligently as possible.

Because wheat is a cash crop for the producer, with practically none of it used on the farm, it is the producer's custom to market the majority of his wheat at harvest time to avoid the expense and risk of storing it on his farm. This may be sold in the market place or go into Commodity Credit Corporation loan. Obviously at harvest time there is

a wide selection of wheat so the miller is able to pick and choose. This is a welcomed opportunity for the miller to buy, especially if his mill is located inland close to the source of supply and back of the terminal market where the services of the terminal grain merchant are not available to him. In such cases he may deem it advisable to buy up to 6 months supply or more of wheat and store it in his mill elevator. Because freight rates from producing areas to consuming areas are the same on wheat and flour, and milling transit privileges are widely available, milling centers are located at both producing and consuming areas. Thus all mills, regardless of location, are in a competitive position.

Large supplies of wheat at the mill permit steady operations but they require large elevator storage facilities. The investment in wheat inventory will usually exceed the miller's working capital, requiring him to borrow from bankers to finance his grain inventory. After all he must pay cash at time of delivery on all of his cash wheat purchases.

The manufacture of flour takes place rather uniformly throughout the year because of the uniform consumption of flour and bread. Most mills operate 24 hours per day, 5 days per week which is the most economical method of operation. To manufacture 100 pounds of flour requires about 140 pounds of wheat, or about 2.35 bushels of wheat. 40 pounds of millfeed which includes the bran, middlings and shorts are obtained. Of the 100 pounds of flour obtained all of the streams can be combined to make a straight grade which is analogous to whole milk in the dairy industry. The streams can be split into many different grades, patent flour corresponding to cream, first clear and second clear flours corresponding to skim milk.

Generally speaking, 75% of all flour goes to the bakery and institutional buyer while 25% goes to the grocer for the home consumer. The large bakery flour buyer will generally use a somewhat stronger type of flour to withstand the high speed mixing, will buy a variety of grades from many sources and blend all of them to obtain maximum uniformity. The home flour buyer generally buys weaker or softer types of flour suitable for all purposes in the family kitchen.

## FLOUR MILLER CANNOT BE BOTH MILLER AND WHEAT SPECULATOR

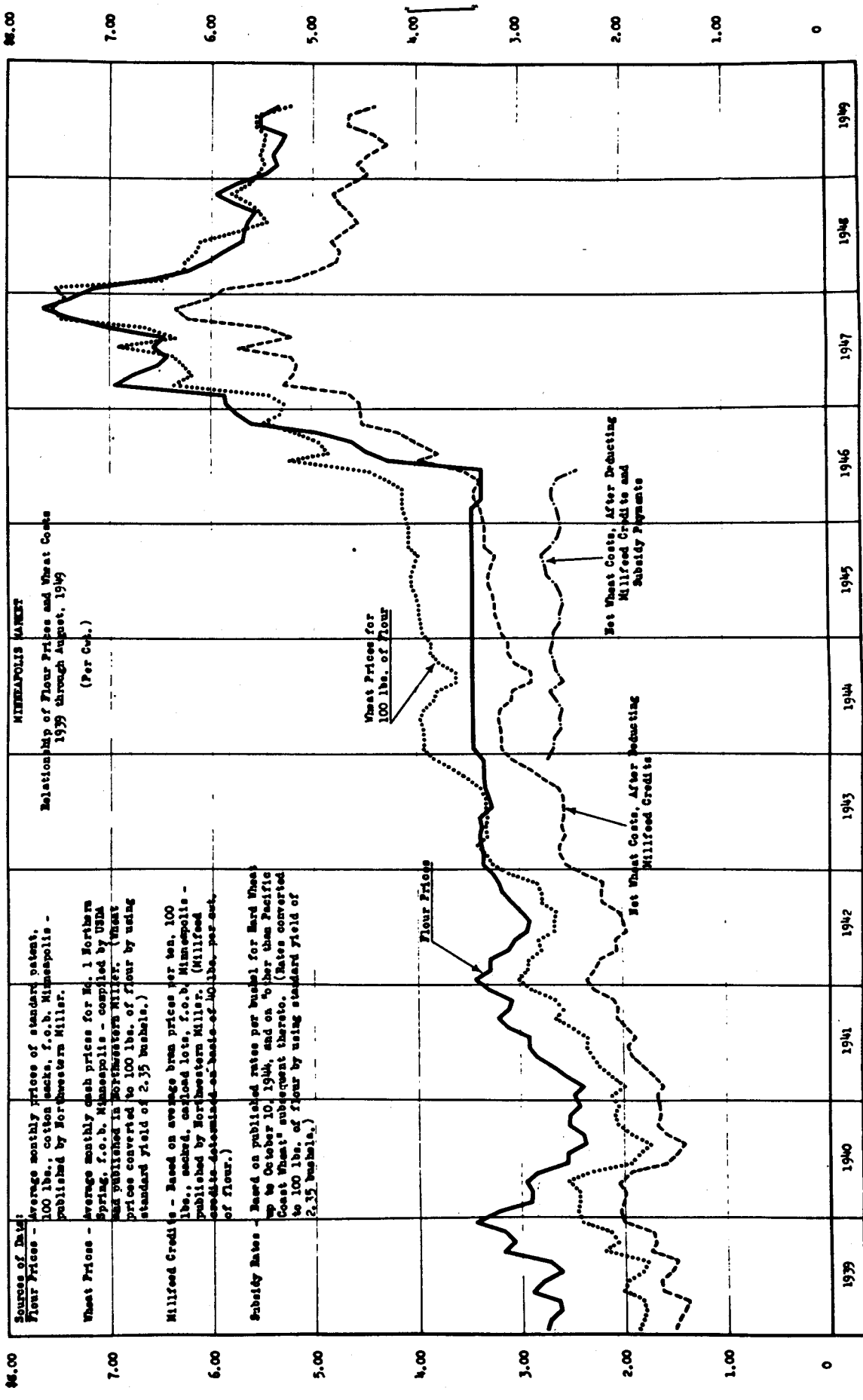
It is the practice of flour buyers to contract for supplies ahead at prices they regard as favorable. This may be, in the baker's case, a price which in the light of labor costs and other costs, permits him to obtain the desired margin of profit on his bread. It is not common for flour buyers to buy when wheat producers are selling because the producer generally is trying to sell when his appraisal of the market is downward, while the flour buyer is generally trying to buy when his appraisal of the market is upward.

Since the miller historically has been primarily interested in his toll for processing wheat, he learned a long time ago that he cannot be both a flour miller and a wheat speculator. Consequently, he tries to avoid the inventory price risk by hedging in the wheat futures market. This seems a logical course to him because he has already undertaken many risks inherent to the milling business which he professes to know something of and which he cannot shift. I refer to the raw material storage risk, the risk in physically operating his mill and obtaining the yield of flour which he calculated he would get at the time of the flour sale and the risk of delivering the product to the customer at a transportation rate no higher than the one he calculated at the time of sale and the risk of recovering the value on by-products which he anticipated. Indeed unfavorable experience in these business risks can more than wipe out any gross margin the miller anticipated without even considering the risk of wheat price fluctuations. The margin of profit after taxes for the average wheat flour miller, omitting of course other business activities in which many engage, is estimated to average around 1% on sales. This is the equivalent of 2¢ or 3¢ per bushel which in terms of wheat prices may be less than one day's fluctuation in price. As a result it is a customary procedure for the miller to shift the price risk of his wheat inventory by selling wheat futures or, if the flour sale is made in advance of wheat purchase, by buying wheat futures from the speculator in the futures market. This is called hedging and is fundamentally a sound economic practice because, as the charts on pages 63 and 64 show,

Dollars Per Cwt.

# GRAPH SHOWING FLOUR & WHEAT PRICE CORRELATION - MPLS.

Dollars Per Cwt.



**Sources of Data:**  
**Flour Prices** - Average monthly prices of standard patent, 100 lbs., cotton sacks, f.o.b. Minneapolis - published by Northwestern Miller.

**Wheat Prices** - Average monthly cash prices for No. 1 Northern Spring, f.o.b. Minneapolis - compiled by USDA and published in Northwestern Miller. (Wheat prices converted to 100 lbs. of flour by using standard yield of 2.35 bushels.)

**Millfeed Credits** - Based on average bran prices per ton, 100 lbs., sacked, carload lots, f.o.b. Minneapolis - published by Northwestern Miller. (Millfeed credits determined on basis of 40 lbs. per cent. of flour.)

**Subsidy Rates** - Based on published rates per bushel for Hard Wheat up to October 10, 1944, and on "bar then Pacific Coast Wheat" subsequent thereto. (Rates converted to 100 lbs. of flour by using standard yield of 2.35 bushels.)

**MINNEAPOLIS MARKET**  
 Relationship of Flour Prices and Wheat Costs 1939 through August, 1949  
 (Per Cwt.)

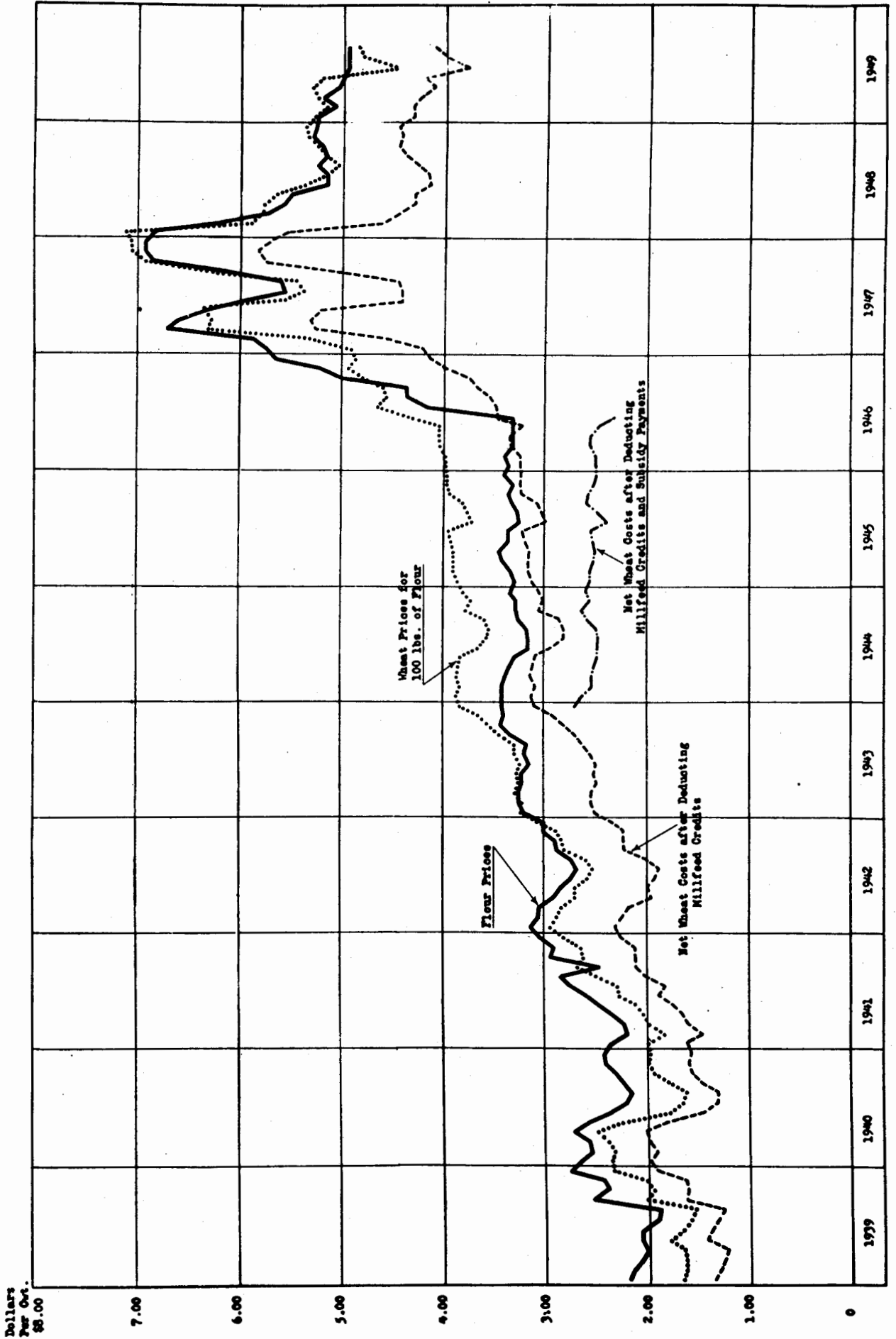
Wheat Prices for 100 lbs. of Flour

Flour Prices

Net Wheat Costs, After Deducting Millfeed Credits

Net Wheat Costs, After Deducting Millfeed Credits and Subsidy Payments

# Graph Showing Flour and Wheat Price Correlation, Basis Kansas City



flour prices do correspond over both short and long periods of time to wheat prices.

This fact is verified by statements made by leading flour millers at congressional hearings a few months ago. Philip Pillsbury, President of Pillsbury Mills, Inc., stated "Flour prices have always fluctuated directly with the price of wheat." Leslie Perrin, President of General Mills, Inc., stated "The price of flour is in constant relationship with the price of wheat, subject only to the variations in what the miller receives for his by-products, the ebb and flow of competition and the long range trend of increasing costs such as labor, freight, sacks, etc."

To be more precise - they correspond with the net wheat costs because flour prices include a freight factor, a sack price, as well as a manufacturing cost, all of which vary somewhat. These three factors are all included in published flour price quotations but are comparatively sticky. They are standard business risks which the miller absorbs. Of the miller's gross sales the cost of wheat which is his raw material will average about 85% to 90% of gross sales at present prices. The banker, who generally assists in financing the wheat inventory, is willing to consider the miller as a prime risk when the miller's raw material is hedged.

#### HEDGING NOT AN EXACT SCIENCE

It should be understood at the outset that hedging is no exact science nor does it completely compensate for all the price risks in his business as we have just indicated. The classic example of how the miller hedges, shown in most textbooks, usually reads as follows:

"A flour miller makes a contract in July to deliver 5,000 sacks of a specific grade of flour in September at a specific price. He will need a certain quantity of wheat for milling into flour in August. At the time of the sale he simultaneously buys September wheat at Chicago. If the price of wheat advances 10¢ per bushel from July to August, he will have a gain in his futures contract but will be forced to pay an equal amount more for the cash wheat to produce the flour. The cash wheat needed to produce the flour, having also advanced 10¢ per bushel in the intervening time, makes the flour

contract show a loss which is balanced by the 10¢ gain in the long futures contract; thus, the miller is permitted to make his normal anticipated profit by being hedged."

As a general statement, - this explanation of hedging by a flour miller is quite correct but it leaves an impression that the hedging operation enables him to make a profit which is not correct. The statement also over-simplifies the miller's problem.

Wheats vary in quality and specific milling grades do not fluctuate precisely with the futures market. Depending upon supply and demand for those cash types of wheat, they will sell higher (or lower) than the basic futures contract which is used as the hedging medium. Thus, the miller says he pays so much over (or under) the basic futures for his cash wheat. This milling grade thus brings a premium over the basic futures. Wheat premiums become a major risk for the miller to undertake which he cannot shift onto speculators in the futures market.

*quality, timing, location, liquidity, etc*

This basic future may be July wheat at harvest time which expires about July 20th. Unless a flour sales opportunity presents itself, the miller may be forced to transfer his hedge from July to September or December futures. To do this without loss requires great skill. Frequently the later months sell at substantial discounts which adds to the premium risk the miller has already in his milling wheat stock. Thus, his risk may increase before he is able to negotiate a favorable sale. Because of the lack of liquidity of the normal basic future he should use, he may be forced to transfer his hedges into another market which involves a further risk. For example - he may be grinding Kansas wheat in Chicago and want to carry his hedge in Kansas City futures but because of the narrow trade be forced to transfer it to Chicago at a difference which may be considerably less than the transportation rate from Kansas City to Chicago.

Indeed millers may transfer hedges many times both between months and between markets before they are finally closed out.

#### TAXPAYERS NOW BEAR SPECULATIVE RISK

I should like to explain the lack of liquidity of futures contracts because it is closely related to Commodity Credit Corporation programs. Formerly cash wheat could be

bought at harvest time when the supply was extraordinarily large at a favorable relationship with the basic futures and this relationship would improve at a rate generally sufficient to compensate for storage, interest and handling charges until it was converted into flour. That relationship has been modified to a great extent by the Commodity Credit Corporation wheat loan program which has upset the previous pattern. This has forced most millers to resort to storing wheat for Commodity Credit Corporation and wheat producers to help pay for the cost of operating mill storage facilities. This has resulted in less wheat ownership by the mill and consequently less mill hedging of wheat inventories in the futures market. The reduced futures trade brought about by the Commodity Credit Corporation storage and loan program complicates the procurement operation of the miller. It has impaired the liquidity of the futures market which has increased the premium risk. Mr. Carl C. Farrington, Vice President of Archer-Daniels-Midland, at the annual meeting of the American Farm Economics Association held last month at Montreat, North Carolina, said on this subject of government operations in the grain market:

*add to Row's wheat study*  
"It is obvious that with government guarantees to the producer as a floor, the government sales at a minimum level above support prices as a ceiling, a large part of the speculative risk inherent in carrying the grain is borne by the taxpayers.

"This, of course, has a tremendous impact on the futures markets and those agencies using them.

"I hardly need labor the point that to the extent the government carries the risk, the mechanism of the futures market is put on the shelf. A striking example of this is afforded by the volume of trading in wheat on the Chicago Board of Trade. In the five years from 1933 to 1937 inclusive, the annual volume of trades in wheat on the Chicago Board of Trade ranged from about 7 to 11 billion bushels, and averaged 8.6 billion.

"With the inauguration of the wheat loan program in 1938, the volume of trading fell to about the 5 billion bushel level during the 3 years from 1938 to 1940 inclusive, and declined further to about the 2 billion level during the next five years. In 1947 and 1948, with controls removed and prices generally above the loan level, the volume

of trading increased to about  $4\frac{1}{2}$  billion bushels, but during the last two years, with prices near the loan level and large quantities being put under the loan program, the volume of futures trading in wheat has again declined.

"From the standpoint of removing uncertainty, the government's speculative operation is not as helpful to a merchandising agency as is an open and liquid futures market, for the reason that there are unpredictable government decisions which are hard to hedge against. Such decisions are unavoidable, and one often leads to another, because the price structure maintained by the government is artificial and sometimes bears little relationship to the total supply and demand situation.

"The problem of the processor, on account of the seasonality of crops, is to get the qualities he needs at harvest time if he expects to get them at all. Thus he must acquire large stocks early in the year, and in a normally operating futures market he has an opportunity to hedge such purchases.

"In the present situation, such hedges often do not afford him the full protection he normally expects. Instead of the futures prices reflecting carrying charges, the situation is often reversed. The markets have been inverted much of the time --that is, the nearby futures have been worth more than the distant ones, and the cash grain has been higher still. In the case of a commodity such as wheat, where farmers participate extensively in the loan program and most of the carry-over stocks are owned by the government, even though total supplies are very large, sufficient of the supply is tied up under government programs to produce a price and supply situation similar to that experienced in short crop years.

"These conditions have resulted, I believe, from the lack of confidence in the future on the part of everyone in the marketing system, because of the unpredictability of government action. Everyone has tended to operate on a "hand to mouth" basis, not wishing to get too far out on any limb. This "hand to mouth" basis of operating tends to bring about wide fluctuations in the cash premiums for various qualities of grain.

"Normally the market carried the risk of the crop. Today the consumer carries part of it in the prices he pays, and the taxpayer carries the rest on that portion of

the crop which is in the program. The farmer, who used to carry some of it, no longer does so provided he is a cooperator in the government program."

#### CHICAGO NOW MAJOR HEDGING MARKET

Trade in Kansas City and Minneapolis futures formerly was sufficiently broad to permit absorption of normal mill hedging. The miller could use Kansas City futures as the hedging medium on southwest hard wheats which were the basic types deliverable there and Minneapolis futures on spring wheat which were the basic types deliverable in that market. However, since the Commodity Credit Corporation loan program tended to be more effective in drying up the supply in Kansas City and Minneapolis, trades in those markets diminished enough to render them too narrow to become effective hedging mediums to the extent they were formerly. This forced proportionably more hedging trade into Chicago. Even though both winter and spring types, as well as soft, are deliverable in Chicago it has increased risk to the miller both because it reduced the proximity of the market to the miller, thus reducing his chances of making or taking delivery and forced him to hedge premium hard winter and spring milling types in the Chicago contract which is now fundamentally a soft wheat contract. In effect, this is more of a spread than a hedge. The futures market price movements thus did not as closely correspond with the cash wheat price movements which increased the premium risk of the miller on his cash wheat or flour hedge.

#### MILLER RISKS VARY

I want to mention again the flour yield of wheat which is a risk the miller must take in order to obtain the proper amount of flour and by-products from a given parcel of wheat. If the wheat or his mill won't mill out this quantity and quality - hedging his wheat and flour sales won't help him. I emphasize flour and by-products because I mentioned above that it takes 140 pounds or 2.35 bushels of wheat to make 100 pounds of straight grade flour. This would necessitate buying 11,750 bushels of wheat for 5,000 sacks of flour in the classic example cited. He will have 40 pounds of by-product millfeed to dispose of for each 100 pounds of flour or a total of 200,000

pounds or tent tons of millfeed. However, in many cases he will sell a higher grade of flour, a patent or a short patent, which may take from 2.5 to 2.7 bushels of wheat or from 150 to 160 pounds of wheat to make 100 pounds of flour. In this case he will have 45 to 50 pounds of millfeed and some first clear and second clear to sell per cwt. sale of flour. Thus, he will have his 5,000 sack sale covered but be long 12½ tons of millfeed and as much as 75,000 pounds or 750 sacks of clear flour. It is not always easy to sell such by-products simultaneously with the sale of top grade flour. Similarly it may be difficult to sell the millfeed to balance the market position. Indeed, most of the time the miller's position on raw material is not balanced with that of his products. He is either long millfeed and long clears, and short on top grade flours or some combination of the three against his wheat position.

Attempts to establish millfeed futures markets of a breadth sufficient to absorb millers' millfeed risks have not been wholly successful so far. I hope they will ultimately be successful. In an attempt to find a hedge many millers have made correlation studies on millfeed and feed grains such as corn and oats, and futures markets in these grains have been used intermittently by millers as millfeed hedges.

Formerly cotton bags were widely used in packing sacks of flour for the bakery and family trade. Miller bag inventories were of substantial proportion and it was the practice by some to hedge this risk in cotton futures. However, this type of bag has given way in the majority of cases to various multiwall paper bags and other containers such as chipboard cartons so that this type of hedging is no longer necessary on the part of the miller.

#### FUTURES MARKET PERFORMS ECONOMIC SERVICE

The conclusion I wish to draw on hedging is that it is no device to enable the miller to make a profit but rather a means of minimizing his risk. To the extent that an offsetting futures trade did not minimize the risk of a cash transaction, it was not a hedge but an additional speculation. When futures markets behave in any manner, for example, to decline to large discounts under the loan, where the miller appraised a

hedging sale in such futures as not minimizing his risk in a long cash wheat position, he has been forced to forego his traditional hedging practice. Where the cash wheat prices in an area like the Pacific Northwest bear little or no relationship to Chicago futures prices, the miller has been forced to undertake the cash wheat risk as best he could like other risks in his business. In every case he adds an additional safety factor in the form of a few cents per bushel to compensate for a risk he cannot shift or hedge against. In such cases the extra margin of safety widens the spread between producer and consumer. When the miller can hedge in the futures market he is able to reduce or eliminate this margin of safety which narrows the spread between producer and consumer, thus enabling the producer to obtain a higher price or the consumer to buy at a lower price or some of both. Thus the futures market performs an economic service for producers and consumers. Moreover, it is a service sought by the processor for I know of no miller who would not prefer to hedge in the futures market when he feels that such a hedge tends to minimize his cash wheat risk.

The subject of flour millers' hedging policy is rather clearly stated in the annual statements of Pillsbury Mills and General Mills, copies of which I have here.

Pillsbury's says: "The company enters into commitments for the purchase and sale of these and other related commodities as an essential part of its established policy of hedging these inventories to the extent practicable, to minimize the market risk due to price fluctuations. The financial statements reflect the hedged position by taking into account all elements in the hedge (inventories on hand and long and short commitments) at market, so that the market gains and losses substantially compensate or offset one another, subject to the completeness of the hedge and certain other relatively minor elements. This procedure has been applied in a manner which does not result in taking unrealized profit into account.

"Inventories other than those specified above, on which there were no satisfactory hedging facilities, have been stated on the basis of cost (first-in, first-out and average bases) or market, whichever lower. In accordance with previously established policy, the excess of inventories of unhedged commodities so stated over their

valuation at prices of May 31, 1946 is reflected in a reserve for inventory valuation."

General Mills says: "The company continues to hedge its flour and soybean product unfilled orders and inventories of raw materials and finished goods whenever adequate hedging facilities exist, as a means of minimizing the risk of adverse price fluctuations. All factors relating to items customarily hedged are reflected in the financial position at fair market value, including market adjustments for open transactions.

"Items for which no hedging facilities exist, such as formula feeds, ingredients, package foods, home appliances, etc., are valued at the lower of cost or market. In addition, for certain of these items, valuation allowances determined by specific formula are established in order to minimize the effect of fluctuating prices on earnings."

Hence you can readily see how fundamental and important it is for a miller to hedge as this is the only means by which he can obtain insurance against price fluctuations.