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R.E. Post

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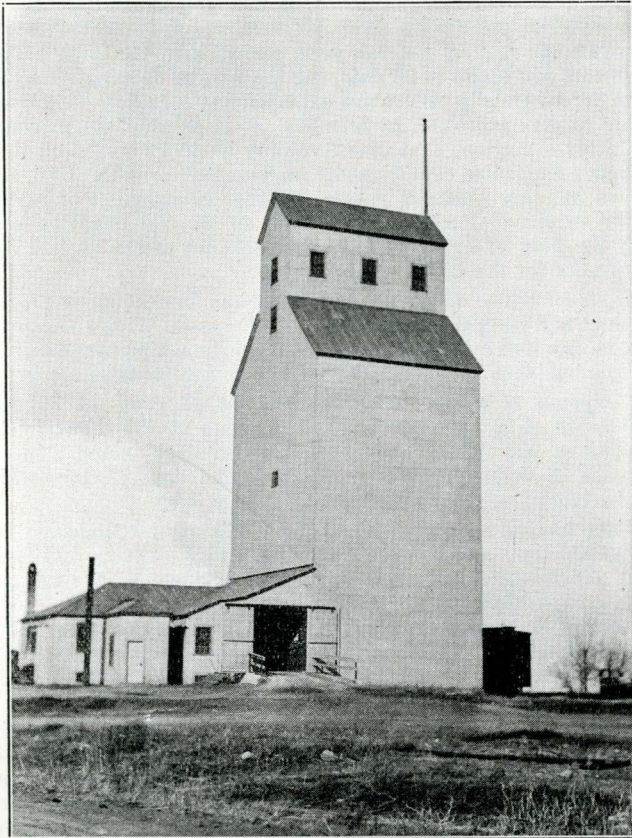
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Farmers' Elevators

*in the Spring Wheat Area
of South Dakota*

1. Business Operations, 1921-22 to 1930-31

By R. E. Post



Agricultural Economics Department—Agricultural Experiment Station
South Dakota State College of Agriculture and Mechanic Arts
Brookings, South Dakota

Brief Summary

The object of the study is to find possibilities of lowering costs and improving operating practices in order that prices paid to farmers for grain might be as high as possible and elevator margins adequate for maintaining the business. Expenses, net income and economic profit, all in terms of per dollar sales or per bushel handled, are used as measures of operating effectiveness by which to analyze variations in elevator business units.

The elevator business is analyzed from the point of view of (1) the business as a whole, including sidelines and services, (2) the grain business—considering estimated income and expense from grain only, (3) general sidelines, consisting of coal, flour, etc., (4) special sidelines, including the handling of gasoline, hardware and lumber, and (5) services and miscellaneous, including livestock and grinding, etc. The grain business is considered of primary importance with sidelines and services supplementary.

Comparing the last of the ten-year period with the first part, many of the elevators are found to be enjoying the results of expansion of wheat and durum acreage while others are experiencing a falling off in such production due to diversification in farming. It is pointed out in connection with the latter situation, that small-volume business may find it advantageous, under favorable conditions of management and location, to maintain or even increase business volume by the enlargement or addition of sidelines or services. Three elevators out of 24 had negative economic profits for the first five-year period, while ten out of the 24 had negative economic profits for the last five-year period.

Expense is shown to decrease and net income and economic profit to increase with minor exceptions as volume is increased. Wide variations from the averages are noted in all cases. These relationships are relatively the same for the business as a whole as for the grain business alone.

Grain expense is shown to average about 12 cents at 50 thousand bushels, 5 cents at 95 thousand bushels, 4 cents at 125 thousand bushels and 3.3 cents at 250 thousand bushels. The greatest decrease in expense with increase in volume occurs in salaries and depreciation, which are shown to be two of the most important expense items.

Grain net income averaged about 1.2 cents at 150 thousand bushels, 1.7 cents at 200 thousand bushels, reaching a high average net income of 2 cents at 270 thousand bushels. Variations in incomes are discussed as affected by competition and buying practices, selling, hedging, storing and handling. Experiences of managers in buying protein with a view of paying on the basis of individual test, while at the same time operating on a safe margin, are presented. Close hedging is indicated to be the desirable policy as compared with no hedging or partial hedging.

Sidelines are discussed from the point of view of supplementing the grain business. Demand for and relative profitableness of the various sidelines are brought out. Of the general sidelines, coal is first in total amount handled, and flour and feed second. Salt is first in gross profit per dollar of sales, with coal second. Of the special sidelines, the gasoline-oil business is most profitable. Grinding is shown to be profitable.

The study indicates that on the average there is a negative economic profit below 125 thousand bushels, a 1 cent per bushel profit at 200 thousand bushels, and 1½ cents at 275 thousand bushels.

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Farmers' Elevators

in the Spring Wheat Area of South Dakota

1. Business Operations, 1921-22 to 1930-31

By

R. E. Post¹

Acting Head, Department of Agricultural Economics

Introduction and Method of Investigation

The complete grain marketing project relating to farmers' elevators in South Dakota consists of a study of the problems of management, organization, and financing. Its object is to find possibilities of lowering costs, improving services, and bettering organization in order that farmers might receive as high a price as possible for their grain. This involves the problem of having margins adequate to maintain the elevators in business.

This is the first of a series of publications and is limited to an analysis of the operating practices of elevators located in the spring wheat area of the state. In it are discussed the results of operation together with the various practices found. The second bulletin will deal with a study of the organization of farmers' elevators from the standpoint of the economic set-up as it affects costs of operation and the stability of the enterprise. Another publication may deal with sources of capital and problems involved in the different methods of financing.

The project covers a ten-year period, 1921-22 to 1930-31. Figures for three years were obtained in connection with the five-year Regional Spring Wheat Area Study carried on by Minnesota, Montana, North Dakota and South Dakota, in cooperation with the Bureau of Agricultural Economics, U. S. Department of Agriculture. The regional study had already been in progress two years and the South Dakota study one year in the spring of 1927 when South Dakota joined the area study. When the field work of the regional study was completed three years later, the South Dakota study again proceeded independently. The data upon which the hedging and protein analysis in this bulletin are based were secured in connection with the cooperative work.

1. ACKNOWLEDGMENTS: The field study was carried on for three years in cooperation with the Division of Cooperative Marketing, which was at the time a part of the Bureau of Agricultural Economics of the U. S. Department of Agriculture, but was later taken over by the Federal Farm Board. W. J. Kuhrt and later E. J. Bell, Jr., represented the Division of Cooperative Marketing. Lloyd Ulyott, Herbert Seckel and Sedey Lingo of the South Dakota station assisted in the collection of the field data. John Muehlbeier contributed materially by assisting with the tabulation and summarization. Appreciation is expressed for the assistance of the elevator managers and board members who furnished the information upon which the study is based and also for the hearty cooperation extended by the following accountants: John Frøstad, Manager of the Equity Audit Company of Aberdeen, J. C. Heister, President of the Northwest Audit Company of Fargo, North Dakota, Frank L. Pollard, Public Accountant of Watertown, W. L. Dean, Public Accountant of Ellendale, North Dakota and Bert DeMerssman, formerly resident manager at Aberdeen for Austin Coward and Company of Minneapolis, Minnesota. The author also acknowledges helpful suggestions and criticisms from Professor Sherman E. Johnson, South Dakota Experiment Station.

Preliminary work consisted of sending out questionnaires to all farmers' elevators, numbering approximately 299 at the time, analysis of census figures and interviews with auditors and managers of elevators. The information thus obtained made possible the outlining of the area and the general basis of selection. Twenty-six elevators were finally chosen, all of which were located in the spring wheat area of the state. This number constituted about 30 per cent of the farmers' elevators in the counties in which the elevators chosen were located. In the selection of the elevators, an effort was made to include all typical variations in management, financing and operating, also typical variations in grain growing and grain quality factors. A number of small houses were included in order to make the group studied more representative of the elevators in the spring wheat area of the state with regard to volume of bushels or dollars of business.

In the intensive wheat area, one elevator was chosen for each one million bushels of wheat produced based on county production figures, while in the less intensive areas one elevator was selected for about half that production.

A high degree of representativeness as to volume is indicated in the sample when compared with the questionnaire which had been sent out asking for information on the 1925 crop year. The average dollars of sales obtained from the questionnaire data was \$196,000 as compared with \$207,000 for the same item and year in this study. Comparable figures for bushels handled were 181,000 and 194,000 respectively. While a degree of representativeness exists concerning such primary factors as volume, there is little basis for an assumption that derived factors, such as economic profits, are representative of the area as a whole, although such could easily be the case.

Records from the same 26 elevators were used for the entire ten-year period with the exception that in 1926 one record was not available, in 1924 and 1927 two records and in 1921-22 and 1922-23 three records were not available. In these few cases where records were not to be had, there were no substitutions. In a limited number of cases specialized information was not given or was not usable, in which cases such items were omitted from the average.

The method of investigation was in the nature of a detailed survey. Much information was obtained from audit statements covering the ten-year period. In addition, beginning in 1926-27, research workers visited each elevator and obtained information on organization and business set-up, cash and stored grain purchased, grain bought on contract, grain shipped, grain sold locally, hedging transactions, and storage tickets issued and purchased. Most of this information was obtained from all elevators and for some it was obtained on a daily basis in order to enable daily "long" and "short" statements to be made up. The elevators were visited in the spring months at the close of their business for the fiscal year.

Tests of Effectiveness

The tests of effectiveness used in this study are illustrated in the following financial summary, all of which are expressed in per unit terms which implies multiplication by volume in order to obtain elevator totals.

| | |
|---|--------|
| Income Per Unit (Gross trading profit) ----- | \$.08 |
| Expense Per Unit (Trading expense) ----- | .04 |
| Net Income Per Unit (Net trading "profit") ----- | .04 |
| Stock Dividends Per Unit (Computed at 7%) ----- | .01 |
| Net income less computed dividends per unit ----- | .03 |
| Additional net income per unit (Net non-trading "profit")-- | .01 |
| Profit (Economic) Per Unit ----- | .04 |

Ratios, such as income per bushel, expense per bushel, etc., were determined for each elevator business. These were averaged to arrive at typical figures for various volume groups. By using ratios for each elevator business, each business is weighted equally. For example, if one elevator handled grain at 6 cents per bushel and another at 8 cents per bushel, the fact that they handled different volumes would not enter into consideration, provided they were in the same volume group. Seven cents, the average of the two ratios, would be the average expense of handling grain by the different elevators.

In the case of the sideline analysis, the values are not related to each elevator but are considered entirely from the point of view of total sales. For example, income from coal is income per dollar of total coal sales of all elevators.

The term elevator business recognizes more than one house if operated in connection with a single business. In the study the term elevator is frequently used for the sake of simplicity. When so used it should be interpreted as elevator business or organization.

Income per unit means the difference between the price paid per unit and the price received per unit, taking into consideration factors which directly enter into the buying and selling, such as hedging, conditioning, price policy, grading, etc.

Expense per unit includes both cash and non-cash charges, the latter in the form of reserves necessary to protect capital investment. It does not include interest which is shown as a separate item. This is for the purpose of having greater comparability between elevators, and to isolate an expense which serves as a great handicap in some cases. Expense per unit provides a measure by which one elevator may be compared with others in the same volume group, the kinds of grains handled being approximately the same and in approximately the same proportions. Grain expense per unit includes such expense as would conceivably be incurred if only grain were handled. Sideline expense per unit includes extra charges estimated by managers and research workers as being those which were necessary to the handling of sidelines. The grain business is by far the most important phase of the elevators included in the study. By using the method of extra expense, all the elevators are put on the same basis with regard to grain handling. Sideline operations are left to be analyzed from the point of view of relative profitability.

Net income per unit—the difference between the income per unit and the expense per unit—indicates the adequacy of operating margin for meeting expense. It constitutes the measure commonly used by accountants to determine relative trading success.

Additional net income is the income derived from sources other than trading, such as returns from investments, etc. In this study it includes income from grinding less expense, which is not a matter of trading. It also includes commissions obtained from handling livestock less any expense incurred, which is likewise not a matter of buying and selling. The accountant adds net additional income to his net trading profit and obtains business profit. Additional net income per unit serves as a measure to determine the amount of income which reflects itself in economic profit but which must be kept separate from trading income per unit in order properly to allocate sources.

Stock dividends computed at 7 per cent reflect in the form of a fiscal charge the amount of capital invested. Every business was placed on the same basis of a 7 per cent return on capital stock regardless of what each actually paid. This rate was the median rate paid by elevators in the study, and may be considered a reasonable competitive payment for the use of capital. By using the same rate for all elevators, the stock dividends used in the study, reflect directly the amount of capital invested.

Profit, as used in this study, is in the sense of economic profit. This recognizes the economic interpretation of the term instead of the ordinary business usage. Profit as thus used measures the excess of income over expense and computed dividends on capital invested. From the economic point of view, total costs, as applied to the cooperative elevator business include not only actual payments of salaries and wages for management and labor, of rents and depreciation on buildings and equipment, etc., but also the payment for the use of capital funds. Two elevators might show different amounts of business profits simply because the capital used was larger in the one case than in the other. When due allowance is made for differences in the amount of stock dividends at a competitive rate, no discrepancy arises from the fact that one concern owns its own plant and equipment and another does not. While a competitive rate is used in the determination of the computed dividend, it is recognized that it is not necessarily used in connection with a figure representing competitive value of investment. It is impossible to obtain such a value and the amount of paid-in capital stock is used in its place.

Economic profit is assumed to be a fairly dependable criterion of the degree of effectiveness of the sum total of the operations of the business taken as a whole, taking into consideration, as it does, all of the other measurements. It is assumed fairly dependable even though such profit is subject to the outside influences which make for a particularly favorable or unfavorable annual showing. Under competitive conditions, the consistent existence of economic profits year after year indicates a high degree of success. Such profits may be assumed to be due to relatively good management and labor, to an efficient arrangement of adequate buildings and equipment, to a minimum of capital investment, or a particular combination of these factors.

Profit is used only in the sense that it represents an amount in excess of all costs existent at the time of the fiscal accounting before patronage refunds are declared. It is recognized that a true cooperative can not re-

tain in excess of a reasonable surplus any funds as profits to the elevator, but must distribute either directly or indirectly such amounts to members as patronage refunds. It is on this assumption that cooperative elevators are exempted from the payment of income taxes on business done by members.

Other tests of effectiveness could be mentioned as price paid and services rendered. Price paid would have to include the determination of the various qualities of grain handled, which perhaps would not be adequately reflected by differences in grades. The accuracy of docking would also have to be considered. This test has not been used in the study because of difficulties involved in arriving at differences in quality of grain and in dockage practices. Price paid is approximated in this study by the algebraic sum of the scale price per bushel and the economic profit per bushel. Service rendered, however important as a test of effectiveness, can not be measured quantitatively. This is dealt with qualitatively in connection with cost analysis. Farmers demand varying degrees of service which include feed grinding, handling of livestock, furnishing better and fewer varieties of seed, etc.

The primary purpose of this study is to point out the extent of variations in elevator business units, measured by these various tests, and the reasons for the same. Such analysis should be indicative of ways of reducing costs, services considered, and ways of making profits adequate and possibly more stabilized.

Method of Analysis

Statistical method is used in instances where two or more years can be combined. In the combining of two or more years the same elevator enters into the sample more than once, causing the different observations in the sample not to be entirely unrelated. Statistical method is used in dealing with small samples only with qualifications. In this instance, the analysis approaches the case method.

Analysis proceeds largely along the comparative method but in certain phases it closely approaches the synthetic method. Separate elevators are first compared on the basis of the various tests by years and then by five-year averages. Following this, the elevators are grouped by dollar volumes and bushel volumes for the purpose of analyzing on the basis, first, of the business as a whole, and second, of the grain business only. The analysis of the business as a whole shows the results of the combined effects of grain, sidelines and services. In the analysis of the grain business many of the fundamental problems and practices of farmers' elevators are discussed. Volume of business appearing as the independent variable, various factors, such as total expense per bushel, managers' salaries, etc., and economic profit, are related thereto.

In the section in which the grain business is analyzed, operating practices which have to do with the buying and selling of grain, including hedging, cleaning and screenings, storing and handling are discussed. Grinding is not included with the grain business. It has been separated out as one of the sources of additional income, not due directly to buying and selling. Were it possible to separate out storage and handling of grain for others, with a reasonable degree of accuracy, they also would have been included as sources of additional income.

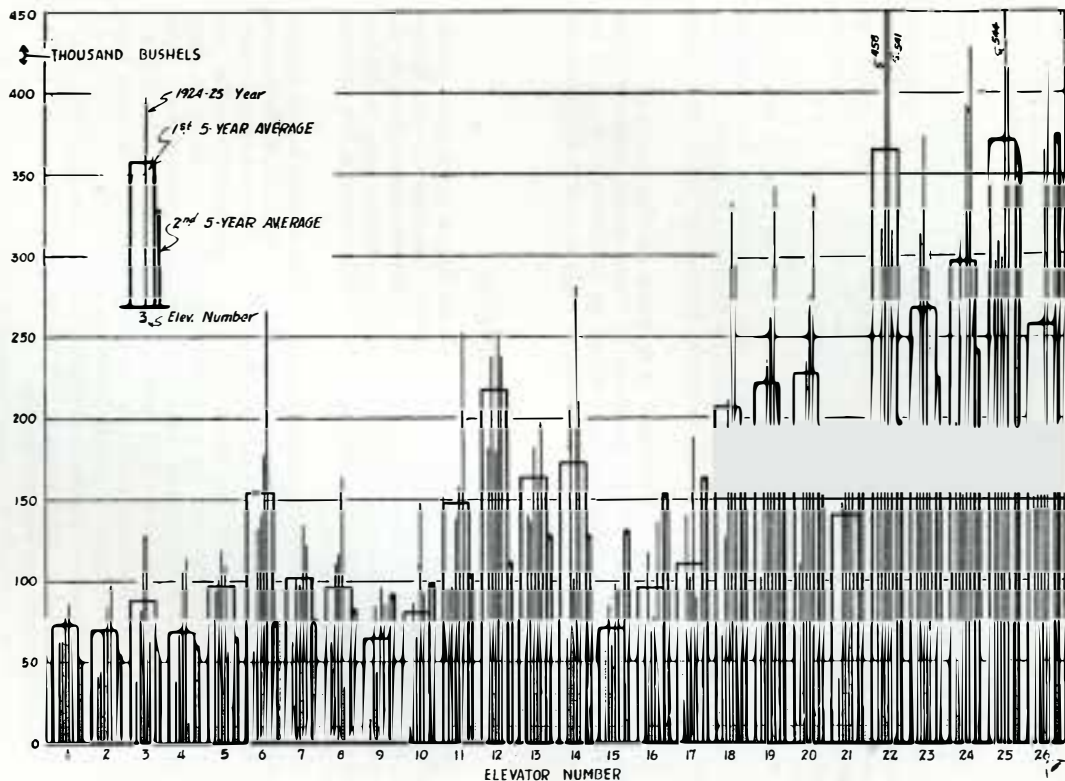


Chart 1a.—Bushel volumes by elevators, 1921-22 to 1925-26. Based on Table 1.

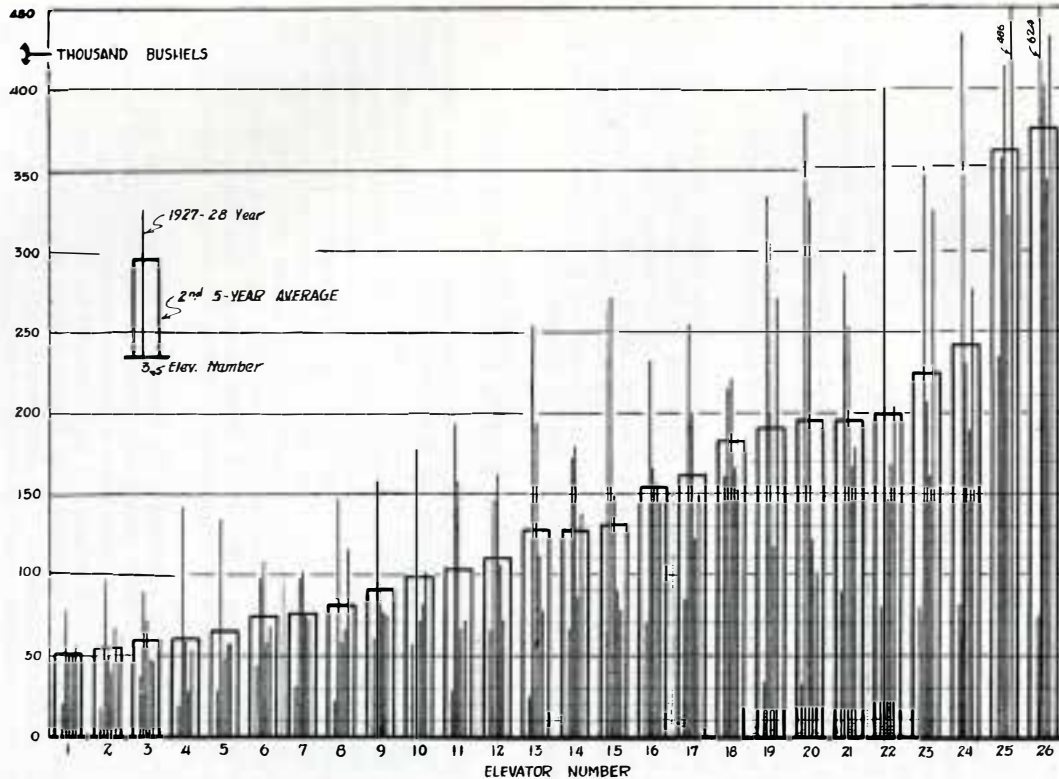


Chart 1b.—Bushel volumes by elevators, 1926-27 to 1930-31. Based on Table 1.

General sideline and special sideline operation are discussed as additions to the grain business and are considered from the point of view of supplemental returns per dollar of sales. General sidelines were taken as those usually handled by elevators and include coal, flour, twine, salt, fence and tankage. In special sidelines have been included the oil business, implements and hardware, and lumber. Additional income is the net revenue derived from handling livestock and grinding feed, from interest, dividends, the rent of property, etc.

The study, covering as it does the ten-year period from 1921-22 to 1930-31, is divided into two five-year periods. These are frequently spoken of in the text of this bulletin as the first and second five-year periods, and are properly designated in all tables and charts. The author believes that variations are fully as important as averages and has included much detail in tables and charts which indicates the amount and extent of variability.

It was necessary for the auditors, from whose reports much of the data were taken, to make arbitrary allocations of certain items. The author had to do the same thing in his assignments of various items. In view of the fact that some inaccuracies enter into the analysis, the figures in this bulletin must be taken as indicating approximate values and general relationships. The figures presented, moreover, are to be interpreted as the results obtained by the methods used in this analysis.

Changes in Ten Years, 1921-22 to 1930-31

This section of the bulletin serves to introduce the elevator organizations as the units which form the basis upon which the study rests. Charts 1a and 1b (Table 1)² show the bushel-volumes by elevators and Charts 2a and 2b (Tables 2a and 2b) picture the dollar-volumes by elevators. While a bushel-volume analysis is desirable for grain, the dollar-volume analysis is necessary in order to combine sidelines with grains. Various methods of figuring bushels handled were compared and it was finally decided to use the method adopted in the regional spring wheat area study. Bushels handled were figured as sales, minus one-half the opening inventory, plus one-half the closing inventory, it being assumed that the cost of taking grain into the elevator approximately equals the cost of shipping grain out of the elevator.

Bushels-handled constitutes the best basis of comparison because ordinarily dollars of sales varies with prices as well as volume of business. The variations due to annual price differences were eliminated in this study by multiplying bushel volumes of each grain by the average ten-year South Dakota price for that grain. The figure of total sales thus obtained for grain was easily combined with sideline sales, and provided a denominator by which one elevator could be compared with another and one year compared with another year. Another reason for using average state prices was to estimate dollars of grain sales in the first five years, during which period many of the records did not show dollars of sales as a separate item.

The following prices were used as the ten-year average: Wheat \$1.08, durum \$.94, barley \$.47, oats \$.32, flax \$2.03, corn \$.62, and rye \$.70. These were obtained by averaging the weighted annual prices of grains based

2. All numbered tables are to be found at end of bulletin.

on the monthly prices as published by the Division of Crops and Livestock Estimates, Bureau of Agricultural Economics of the U. S. Department of Agriculture.

In Charts 1a, 1b, 2a and 2b, the wide bars represent the average volumes handled for each elevator business for the five-year period specified. On Charts 2a and 2b, it was necessary to estimate an average for the five years in three cases because complete information for all years was not available. The estimated average bars are differentiated from the others by broken lines. The line bars represent the annual volumes for each elevator.

The number of elevator organizations included in Charts 1a and 1b by bushel-volume groups are as follows:

| Average 5-year volumes by elevators (Thous. bus.) | Number of elevator organizations | |
|---|----------------------------------|-------------------------------|
| | 1st 5-year period (Number) | 2nd 5-year period (Number) |
| All volumes ----- | 26 | 26 |
| Below 100 ----- | 10 | 10 |
| 100-200 ----- | 7 | 12 |
| Over 200 ----- | 9 | 4 |

Elevator volumes for separate years vary largely because of the amount of grain marketed by farmers, which in turn is dependent largely upon the size of the crop, or in the case of the 1930 crop, upon price being so low that wheat was withheld to use as feed. Production figures³ for the state for wheat and durum multiplied by percentages³ "shipped out of county in which grown" are as follows for the crop-years listed: Sixteen million bushels for 1921, 28 for 1922, 19 for 1923, 25 for 1924, 24 for 1925, 6 for 1926, 39 for 1927, 31 for 1928, 26 for 1929, and 26 also for 1930. Local variations in production account for some of the differences. The operation of a wheat pool in the state also caused some reduction in amount handled, especially in 1924-25 and 1925-26. In the latter case, reduced amounts purchased may have been in part, entirely, or more than offset by amounts paid by the pool for handling, depending upon the amount so handled and how the rate paid for handling compared with elevator margins on grain bought and sold.

The narrow bar, at the right of the wide bar in Charts 1a and 2a permits a comparison of the two five-year periods, the narrow bar being the height of the second five-year average bar. For ready comparison Charts 1a and 1b are arranged in the same sequence based on the volumes in the last five years; Charts 2a and 2b are likewise so arranged but on the basis of dollar-volumes. The volumes handled in the first five years averaged 163 thousand bushels, with a range from 65 to 372 thousand, while the second five years averaged 146 thousand, with a range of 51 to 375 thousand. Volumes for the ten years averaged 154 thousand bushels, ranging from 61 to 367 thousand.

On the basis of these data, elevators must expect wide variations in amounts of grain to be handled. When large crops are in prospect, illustrated by 1927-28, every effort must be made to do the job efficiently.

3. Production figures for wheat and durum, together with percentages "shipped out of county in which grown" from Division of Crop and Livestock Estimates, U. S. Department of Agriculture.

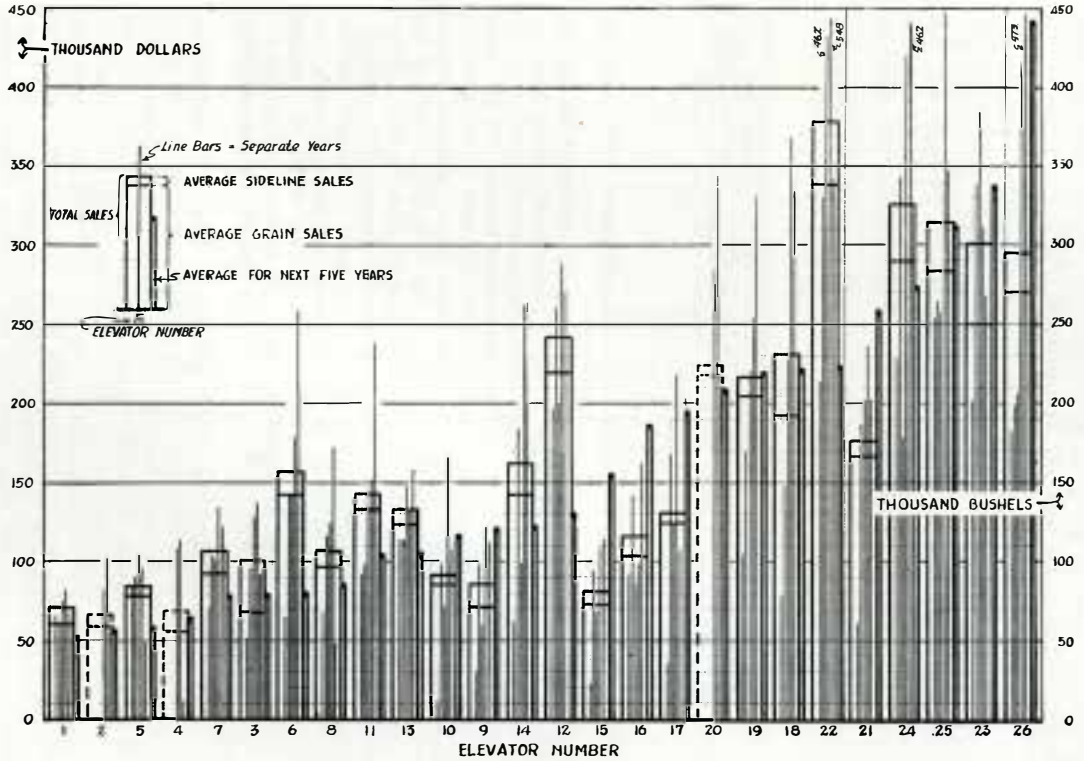


Chart 2a.—Dollars of total sales and grain sales by elevators, 1921-22 to 1926-27. Based on Table 2a.

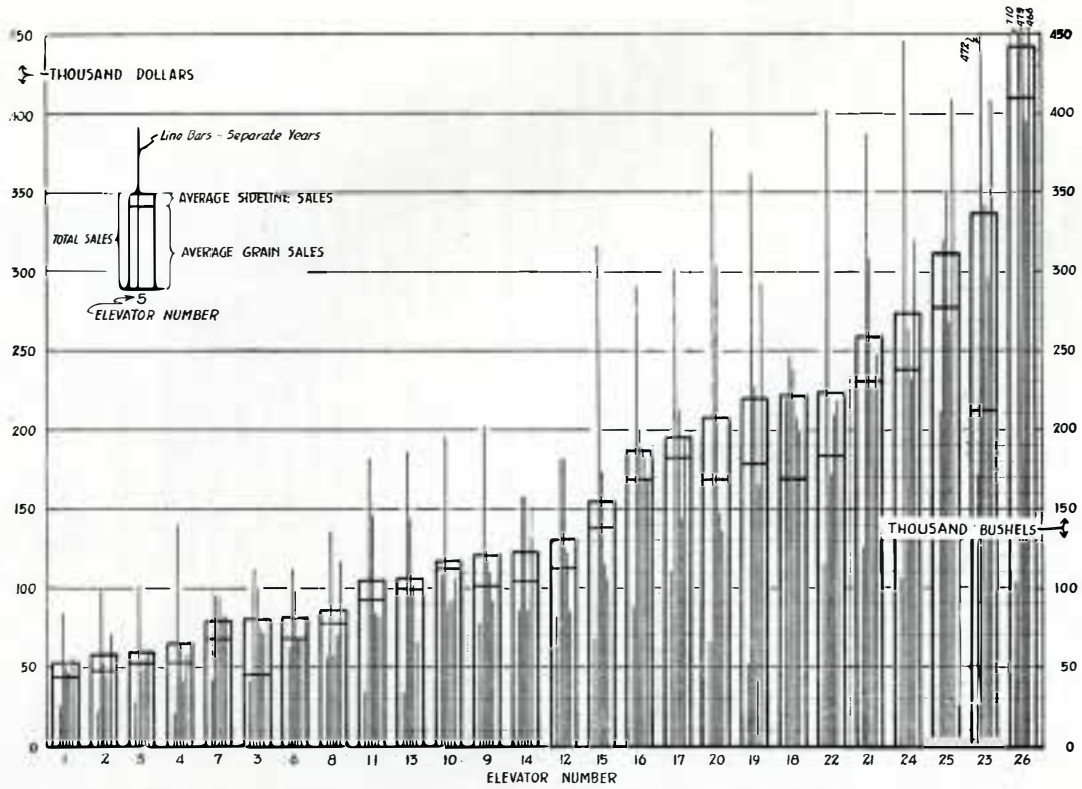


Chart 2b.—Dollars of total sales and grain sales by elevators, 1926-27 to 1930-31. Based on Table 2b.

When small crops are in prospect, illustrated by the extreme case of 1926-27, the problem is primarily to curtail expenses and at the same time to render necessary services.

The differences between the two five-year periods are in brief as follows: Elevator No. 4 dropped low because of a poor crop in 1925. Elevators 4 and 6 suffered reduced production from hail and other causes. In the cases of elevators 9, 10, 15, 16, 17, 21 and 26, increased volume in the last five years was due primarily to increased wheat acreage. Elevator 22 is lower in the last five years because of increased competition. Elevator 26 was higher in the last 5 years because it built another house and actively sought more business. Several of the elevators at the lower end of the last five-year period have witnessed a marked reduction in wheat acreage and an increased amount of feeding in their respective territories.

The foregoing points out many causes for variations, one five-year period compared with the other. Many of the elevators are enjoying expansion of wheat acreage, in which case further expansion of the grain business may be expected. On the other hand, some elevators, which were built to take care of large grain volumes, are suffering a considerable falling off due to their membership gradually diversifying their farms, in which case the grain business may be reduced in volume even further than at present.

Charts 2a and 2b deal with dollar-volumes of grain business and in addition show total dollar volumes including sidelines. While they indicate dollars of business, the result of buying or selling, they do not take into consideration dollars of business of services rendered, which is considered separately. The causes of variations pointed out in bushel volumes handled apply equally well to dollars of grain handled. The line graph, on Charts 2a and 2b, which represent bushel-volume averages, corresponds very closely with total dollars because average ten-year prices were used, and differs only because of variations in the sideline business, or a changed combination of grains, or both.

Charts 2a and 2b (Tables 2a and 2b) show the important part played by grain in the various elevator businesses, and also the differences in amounts of sidelines handled. Considering five-year averages for each organization and identical elevators in both periods, the following tabulation shows an increase in dollars of sideline sales of only two per cent for the organizations which handled less than 100 thousand bushels in the second five-year period, a 40 per cent increase for the organizations which handled between 100 thousand and 200 thousand bushels in the second five-year period, and a 59 per cent increase for those which handled over 200 thousand bushels. This would seem to indicate that the smaller elevators are not increasing sidelines to offset a loss in grain business or to make up for small volumes in grain. On the other hand, this indication should be modified by data presented later in the publication.

| Elevator-volumes in last 5 years | Identical elevators | Average sideline sales | | Per cent change |
|-------------------------------------|------------------------|------------------------|---------------------|------------------------|
| | | 1st 5-yr. period | 2nd 5-yr. period | 2nd period over 1st |
| (Thous. bus.) | (Number) | (\$) | (\$) | (%) |
| Less than 100 ----- | 8 | 13,117 | 13,321 | + 2 |
| 100 to 200 ----- | 11 | 17,281 | 24,112 | +40 |
| Over 200 ----- | 4 | 35,595 | 56,495 | +59 |

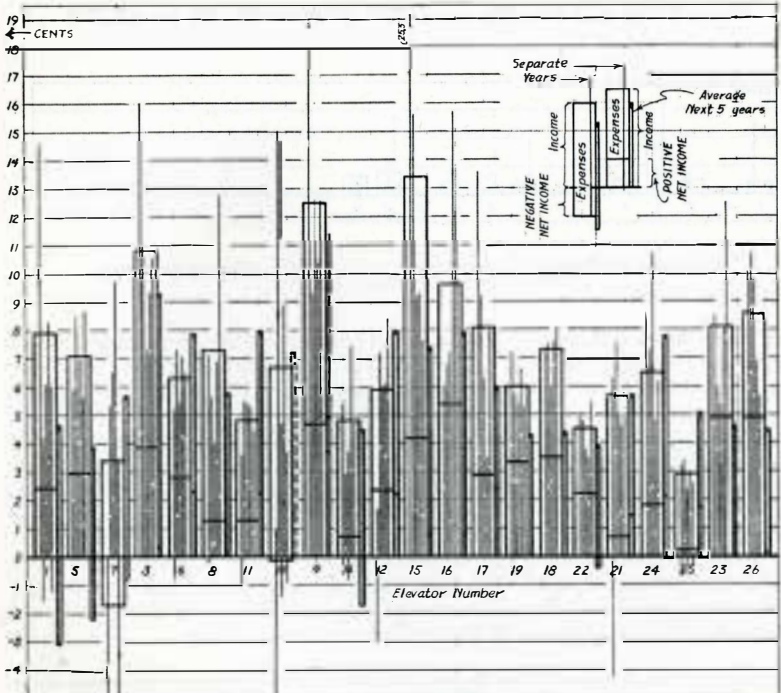


Chart 3a.—Income and net income per dollar of total sales by elevators, 1921-22 to 1925-26. Based on Table 3a.

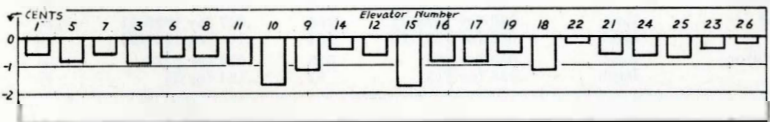


Chart 4a.—Computed stock dividends per dollar of five-year average total sales, by elevators, 1921-22 to 1925-26. Based on Table 4.

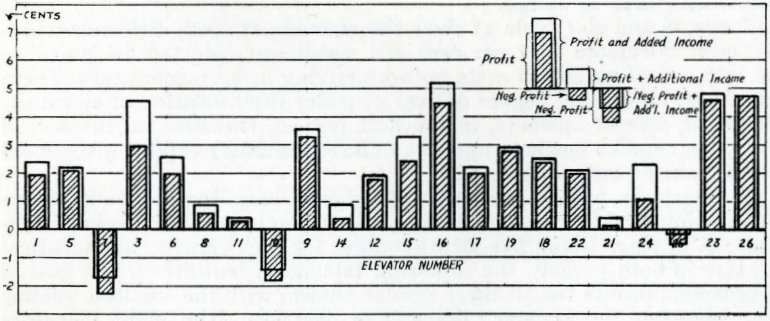


Chart 5a.—Profit per dollar of total sales, with and without additional income, by elevators, 1921-22 to 1925-26. Based on Table 5.

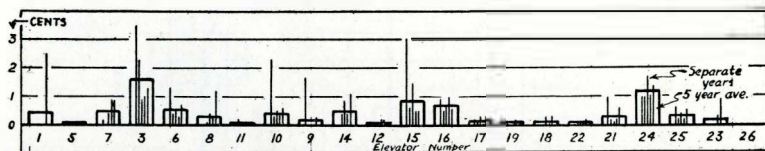


Chart 6a.—Additional net income per dollar of total sales, by elevators, 1921-22 to 1925-26. Based on Table 6.

Charts 3a and 3b present income and net income figures annually and for the two five-year periods. These charts also serve to measure the expenses, which appear as differences between incomes and net incomes. The sequence is based on the array of total sales for the last five-year period. For ease of comparison the incomes and net incomes for the last five years are shown on Chart 3a as narrow bars to the right of the five-year average bars. The following tabulation indicates the range by years, and by elevators, of income per dollar of sales, out of which to pay for operations. It will be observed that in all cases the small margins occur in years in which the volume handled is greater, and by elevators which handle the greater amount. The tabulation also indicates that the average income per bushel and the average sales in the first five-year period was approximately the same as in the second five-year period.

| Income | 1st 5-year average | | 2nd 5-year average | |
|----------|----------------------------|-------------|----------------------------|-------------|
| | Income per dollar of sales | sales | Income per dollar of sales | Av. sales |
| | (\$) | (Thous. \$) | (\$) | (Thous. \$) |
| Average | .073 | 176 | .075 | 172 |
| Year | | | | |
| Low | .063 for 1923-24 | 166 | .057 for 1930-31 | 176 |
| High | .082 for 1921-22 | 104 | .10 for 1926-27 | 89 |
| Elevator | | | | |
| Low | .030 for #25 | 315 | .039 for #22 | 224 |
| High | .134 for #15 | 81 | .124 for #4 | 65 |

A discussion in greater detail regarding incomes is not possible in connection with individual elevators because in so doing the identity of the elevators will be more or less disclosed. A later discussion of the various factors will have to suffice.

Charts 4a and 4b (Table 4) show the amounts of stock dividends which have been calculated at 7 per cent and which are deducted in order to take into consideration all costs before arriving at economic profit. There seems to be no general degree of over or under capitalization of elevators, considering size of business, in the first period. However, in the second period, the smaller business appears to have a greater capital investment charge than the larger business.

On Charts 5a and 5b are shown, as shaded bars, the economic profits from trading, and the unshaded bars, the economic profits including additional net income. Using five-year averages for each elevator and identical elevators in both periods, the following tabulation indicates a decrease in the economic profits for all three groups shown, with the smallest volume group showing the greatest percentage decrease. The eight elevators having less than 100 thousand bushels in the last five-year period decreased

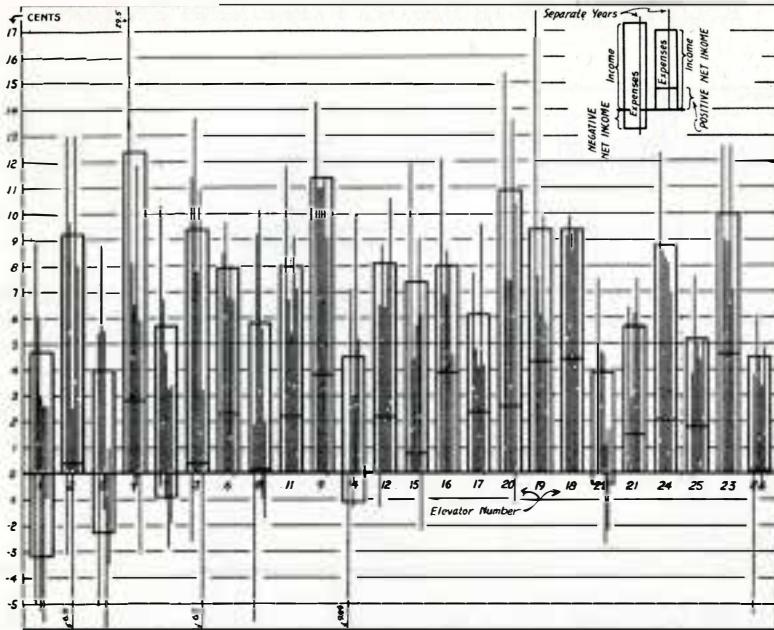


Chart 3b.—Income and net income per dollar of total sales by elevators, 1926-27 to 1930-31. Based on Table 3b.

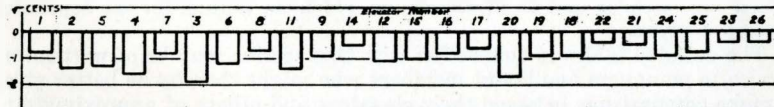


Chart 4b.—Computed stock dividends per dollar of five-year average total sales, by elevators, 1926-27 to 1930-31. Based on Table 4.

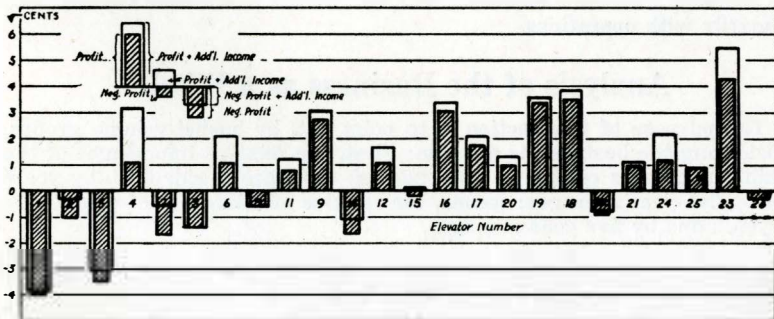


Chart 5b.—Profit per dollar of total sales, with and without additional income, by elevators, 1926-27 to 1930-31. Based on Table 5.

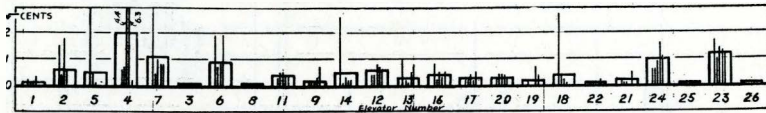


Chart 6b.—Additional net income per dollar of total sales, by elevators, 1926-27 to 1930-31. Based on Table 6.

their economic profit from \$.011 to a negative \$.008 profit; the 100 to 200 thousand-bushel group decreased from \$.019 to \$.012 and the group with over 200 thousand bushels from \$.025 to \$.015. Expressed in percentages, the decreases were 170, 36 and 39 per cent respectively.

| Elevator-volumes in last 5 years | Number of identical elevators | Av. profits per elevator | | % change 2nd period over 1st period |
|-------------------------------------|-------------------------------------|--------------------------|-----------------------|---|
| | | 1st 5-year average | 2nd 5-year average | |
| (Thous. bus.) | (Number) | (\$) | (\$) | (%) |
| Less than 100 ----- | 8 | .011 | -.008 | -170 |
| 100 to 200 ----- | 10 | .019 | .012 | - 36 |
| Over 200 ----- | 4 | .025 | .015 | - 39 |

It will be observed that in the 24 elevators reported on Chart 5a that only three had negative economic profits for the first five-year period. On Chart 5b, covering the last five-year period, 10 out of 24 elevators had negative economic profits.

Charts 5a and 5b (Table 5) include additional net income, which is also shown on Charts 6a and 6b (Table 6), on which the details for the separate years are given.

The detailed tables in connection with this section may be of particular service to managers and board members who might thereby be better able to make comparisons between their elevators and others of approximately the same business size. A further reason for inclusion of detailed tables is that the sample is not large enough in many respects to rely entirely upon statistical methods.

This series of charts completes the introduction of information covering the individual elevator business. The rest of the publication is concerned primarily with operations.

Analysis of the Business as a Whole

The purpose of this section is to point out, by bushel-volume groups, considering the business as a whole: First, the relative importance of the grain business as compared with general and special sidelines, by years and by five-year averages; second, the relative effectiveness of operations, by years and by five year averages.

The following tabulation indicates a range of dollar sales for the first five years, from 85 per cent for grain in the low volume group to 92 per cent for grain in the high volume group, and a range for the last five years of 77 per cent, for grain in the low volume group, to 93 per cent in the high volume group. On the other hand, the tabulation indicates an increase in general sideline sales for the small-volume group for the last five-year

| Volume Group (Thous. bus.) | Number of elevators (No.) | Average volume (Thous. bus.) | Total (%) | Grain (%) | Sidelines | |
|-------------------------------|------------------------------|---------------------------------|--------------|--------------|----------------|----------------|
| | | | | | General (%) | Special (%) |
| First five years.— | | | | | | |
| A Below 100 | 41 | 76 | 100 | 85 | 12 | 3 |
| B 100 to 200 | 47 | 155 | 100 | 89 | 9 | 2 |
| C 200 to 300 | 16 | 257 | 100 | 90 | 10 | — |
| D 300 to 400 | 11 | 353 | 100 | 90 | 10 | — |
| E Over 400 | 6 | 457 | 100 | 92 | 8 | — |
| Second five years.— | | | | | | |
| A Below 100 | 60 | 76 | 100 | 77 | 17 | 6 |
| B 100 to 200 | 37 | 168 | 100 | 85 | 11 | 4 |
| C 200 to 300 | 16 | 273 | 100 | 87 | 8 | 5 |
| D 300 to 400 | 9 | 368 | 100 | 86 | 8 | 6 |
| E Over 400 | 6 | 486 | 100 | 93 | 7 | — |

period as compared with the first five-year period. An increase in the handling of special sidelines is also indicated in the second five-year period.

These percentage relationships are pictured on Chart 7 which is drawn from the figures contained in Tables 7a and 7b. Chart 8 (Tables 8a and 8b) shows the dollar distribution of grain, general and special sideline sales. It will be observed that in the small-volume group the total dollars of business was about the same for the two five-year periods, and that in the second period a decrease in grain sales was made up by an increase in sideline sales. It should be pointed out, however, that some of this relative increase in sideline sales is due to the fact that some elevators with somewhat larger sideline sales were forced into the small volume group

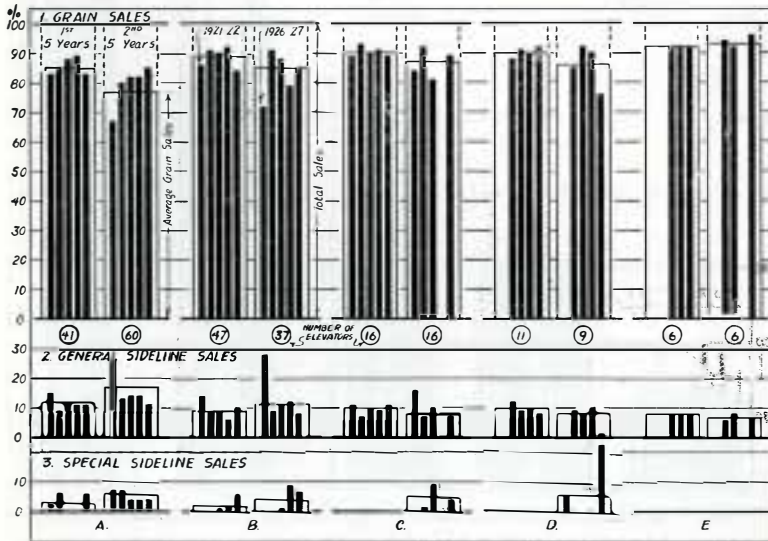


Chart 7.—Percentage distribution of grain, general sideline and special sideline sales, 1921-22 to 1930-31. Based on Tables 7a and 7b. (Analysis of elevator sales by bushel-volume groups.)

in the second period because of the extremely poor crop of 1926-27. It will be observed that the second period includes 60 elevators as compared with 41 in the first period.

All groups except the smallest showed increases as between the two periods in total dollars of sales. Other facts brought out in connection with the percentage relationships of sales are here presented in dollars of sales. The number of cases in each volume group range from 60 in the smallest group to 6 in the largest. While it may at first appear that there are few elevators in the large volume groups, it can be reasonably assumed that the sample contains at least its proportionate number of large volume busi-

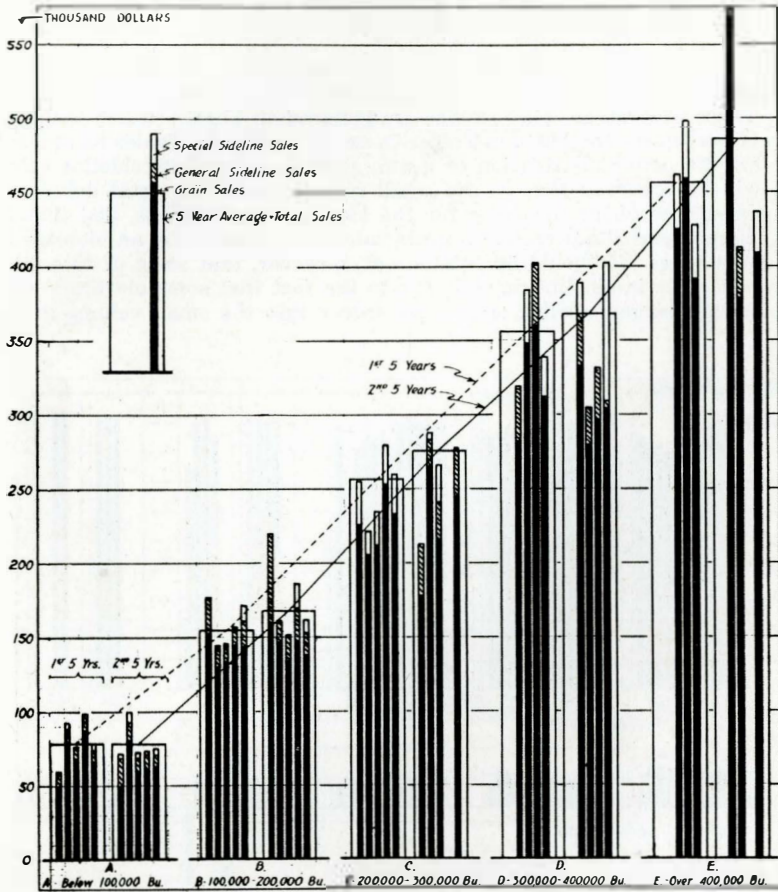


Chart 8.—Dollar distribution of grain, general sideline and special sideline sales, 1921-22 to 1930-31. Derived from Tables 8a and 8b. (Analysis of elevator sales by bushel-volume groups.)

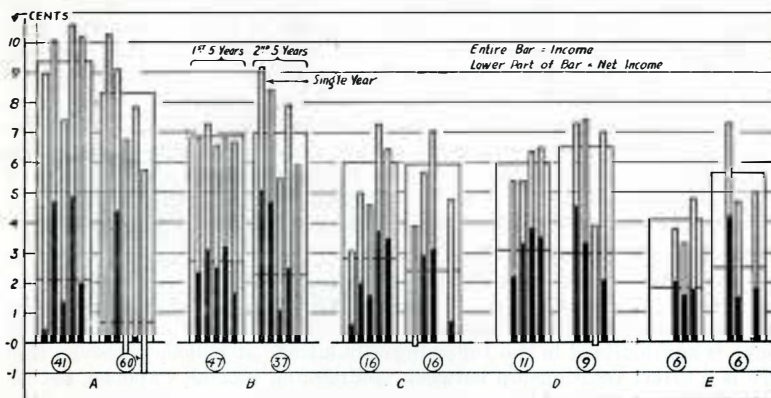


Chart 9.—Income, and net income per dollar of total sales, 1921-22 to 1930-31. Based on Tables 9a and 9b. (Analysis of elevator sales by bushel-volume groups.)

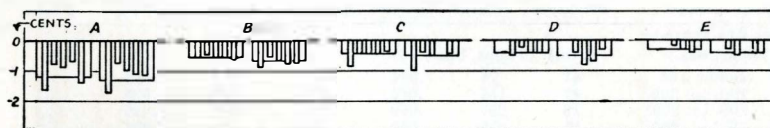


Chart 10.—Stock dividends per dollar of total sales, 1921-22 to 1930-31. Based on Tables 9a and 9b. (Analysis of elevator sales by bushel-volume groups.)

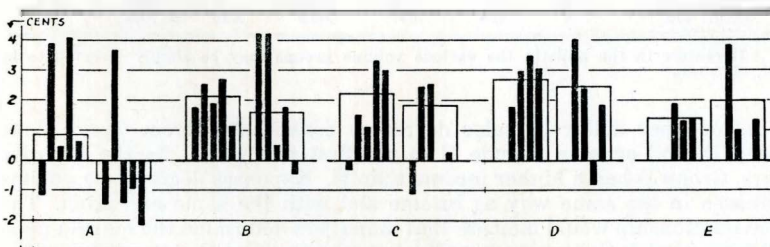


Chart 11.—Profit per dollar of total sales, 1921-22 to 1930-31. Based on Tables 9a and 9b. (Analysis of elevator sales by bushel-volume groups.)

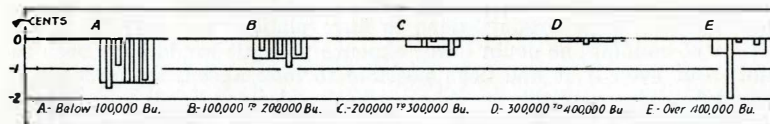


Chart 12.—Interest paid per dollar of total sales (not included in expenses), 1921-22 to 1930-31. Based on Table 10. (Analysis of elevator sales by bushel-volume groups.)

nesses considering the area as a whole. The two five-year periods in Group C may be considered fairly comparable because it may be assumed that the missing year is estimated to be about average for the last five-year period. The two five-year periods in Groups D and E lack comparability to the extent that they do not have all years represented. It is therefore necessary to place most emphasis on the data by years in these two groups and consider the averages as averages only of the years available. On the other hand, it is possible that very few elevators, if any, handled a large enough volume to be included in the volume groups in the years in which the sample is small; in which event, the sample might be representative.

Charts 9, 10, 11 and 12 continue the analysis of total dollar sales by bushel-volume groups. On Chart 9 (Table 9a and 9b) is presented income and net income per dollar of total sales for ten years, by years and by five-year averages. The analysis of total dollar sales by bushel-volume groups is summarized in the following tabulation. It will be observed that there is a direct relationship between volume and income, expense, net income, dividends and profit.

| Volume group* | Number of elevators | Av. volume | Per dollar of total sales | | | | |
|----------------------------|---------------------|---------------|---------------------------|---------|------------|-----------------|--------|
| | | | Income | Expense | Net income | Dividends at 7% | Profit |
| First five years.— | | | | | | | |
| (Thous. bus.) | (No.) | (Thous. bus.) | (\$) | (\$) | (\$) | (\$) | (\$) |
| A Below 100 | 41 | 76 | .094 | .073 | .021 | .012 | .009 |
| B 100 to 200 | 47 | 155 | .069 | .042 | .027 | .006 | .021 |
| C 200 to 300 | 16 | 257 | .060 | .033 | .027 | .005 | .023 |
| D 300 to 400 | 11 | 353 | .060 | .029 | .031 | .004 | .027 |
| E Over 400 | 6 | 457 | .041 | .024 | .017 | .003 | .014 |
| Second five years.— | | | | | | | |
| A Below 100 | 60 | 76 | .083 | .076 | .007 | .013 | -.006 |
| B 100 to 200 | 37 | 168 | .071 | .048 | .023 | .007 | .016 |
| C 200 to 300 | 16 | 273 | .060 | .036 | .024 | .005 | .019 |
| D 300 to 400 | 9 | 368 | .065 | .035 | .030 | .005 | .025 |
| E Over 400 | 6 | 486 | .057 | .032 | .025 | .004 | .021 |

* Hereafter in the bulletin the various volume groups may be simply referred to by "A", "B", etc.

Income per dollar of sales decreases consistently from Group A to Group D, and even to include E in the first five years. In the last five years, Group D has a higher income than E. Expenses decrease as volume increases in the same way as income and with the same exception. The close relationship would indicate that managers determine the margin upon which they wish to operate largely upon the basis of their expenses. The one exceptional group includes elevators which have their buildings so scattered that their expenses are out of line with the volume relationships. In other words, their physical set-up reduces their efficiency and thereby increases per unit expense. Had it been possible in the case of many of these large organizations to have planned on large volume at the time of building, no doubt lower expense per unit would have been the result. But even if it had been possible to look ahead, the problem of original financing probably would have been a decided handicap. As a result, expansion of buildings and equipment has been largely a matter of gradually growing into the investment involved. Even though the expenses of some of these large size organizations seem to be out of line with their

volume, nevertheless they seem to be doing a more efficient job, even under existing conditions, than smaller ones competing for volume.

Net income increases as volume increases as does also economic profit with the one exception of Group D. Dividend figures computed at 7 per cent on capital stock indicate that the greatest capital burden is incurred by the small elevators. These elevators were all organized to take care of larger volumes than they are now getting, with the result that they are at present overcapitalized. This situation would indicate the advisability of reappraisal of assets. Undoubtedly the plants are worth less under present conditions than at the time they were built and a valuation based on replacement costs today, less depreciation, would bring them in closer line with earning power. With the value of stock marked down, they could more easily pay a reasonable rate on capital.

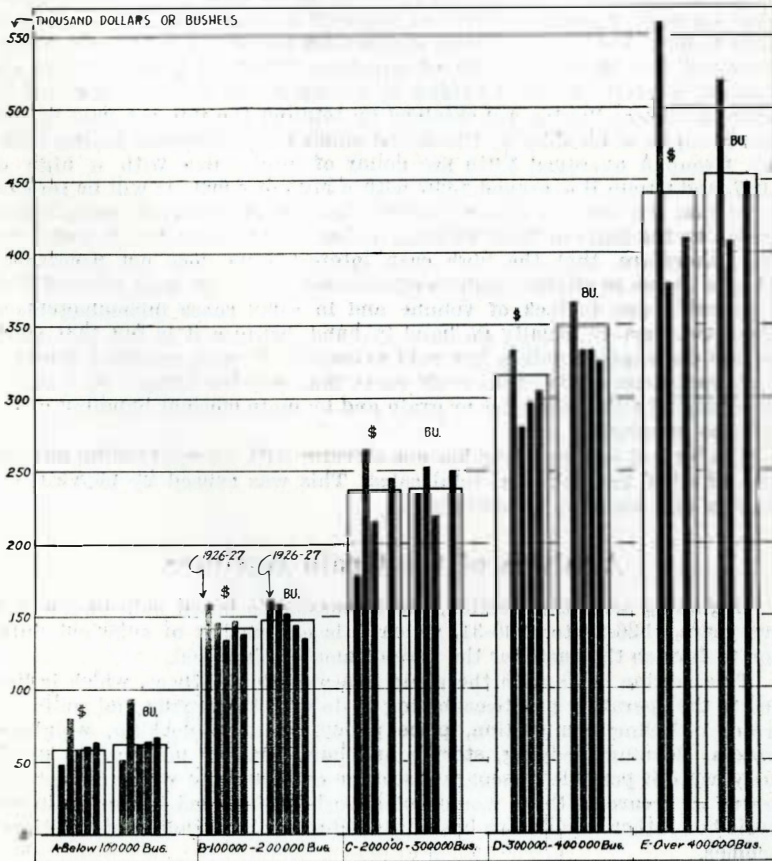


Chart 13.—Grain dollar-volumes and grain bushel-volumes, 1926-27 to 1930-31. Based on Table 11. (Analysis of elevator grain operations by bushel-volume groups.)

It will be further observed that the greatest differences in income, expense, etc., occur between Groups A and B and that the other differences are less marked. It would appear that elevators with small volumes could greatly strengthen their position by building up their dollar volume of business. If this is not possible with grain, it might be possible with sidelines. Later in this publication the various sidelines are compared as to demand and relative profitableness.

This financial analysis is shown by years as well as five-year periods on Charts 9, 10 and 11, which are based on Tables 9a and 9b. Reasons for variations will be discussed under the respective analysis of grain and sideline business. It is the purpose of this section merely to present a picture of the business as a whole, grain being combined with sidelines on a dollar basis.

Chart 12, based on Table 10, shows the interest burden by the various volume groups. Because interest is computed on capital investment, cash amounts paid or payable were not included in expenses. This is done in order to make the elevators more comparable and at the same time to separate out the important item of expense. Chart 12 indicates that the greatest interest burden is carried by Group A and the next heaviest by Group B. These figures are obtained by totaling the interest paid by volume groups and dividing by the actual number of businesses paying interest. Group A averaged \$.015 per dollar of total sales with a high of \$.017, and Group B averaged \$.007 with a high of \$.009. It will be remembered that the smaller sized elevators also had the greatest capital stock burden on the basis of their volumes of business (Chart 10). It would appear, therefore, that the high cash interest item does not necessarily seem to be due to original undercapitalization. The high cash interest item is probably due to lack of volume and in some cases mismanagement. These two factors usually go hand in hand, because it is felt that small volume can support only a low paid manager. A more qualified manager in at least some of the cases could more than pay for himself by building up volume of either sidelines or grain and by more efficient handling of the business generally.

The largest volume group has one elevator with an outstanding interest item of \$.020 per dollar of total sales. This was caused by physical expansion and was only temporary.

Analysis of the Grain Business

Beginning with this section, the discussion is based only on the last five years, 1926-27 to 1930-31, which it is assumed is of sufficient duration to furnish the basis for the type of analysis involved.

This section deals with the grain phase of the business, which is limited to the operating practices having to do with the buying and selling of grain, including competition, price policy, grading, docking, weighing, protein, cleaning, hedging, storing and handling. As pointed out previously, were it possible to separate storage and handling with a reasonable degree of accuracy, these would not have been included in the grain analysis but rather would have been included under the heading of additional incomes.

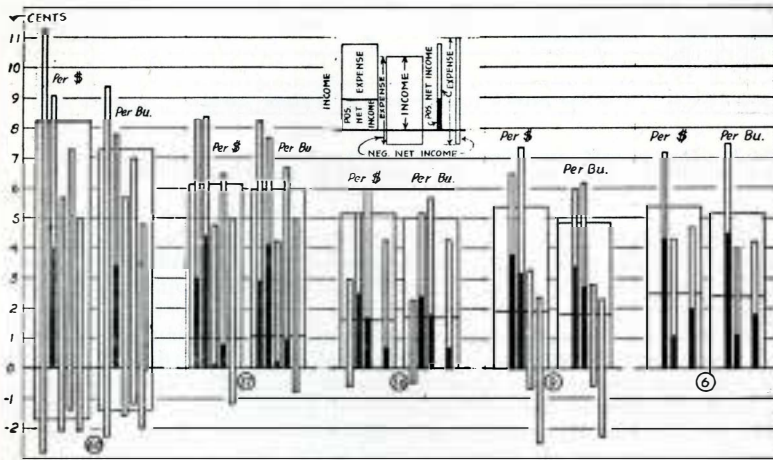


Chart 14.—Income and net income, per dollar of grain sales and per bushel of grain handled, 1926-27 to 1930-31. Based on Table 12. (Analysis of elevator grain operations by bushel-volume groups.)

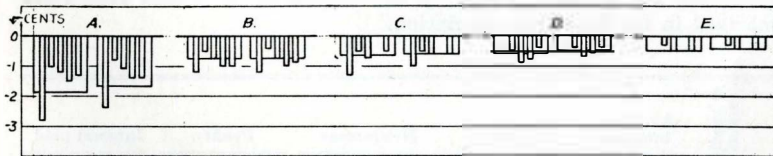


Chart 15.—Stock dividends, computed at 7 per cent, per dollar of grain sales and per bushel of grain handled, 1926-27 to 1930-31. Based on Table 12. (Analysis of elevator grain operations by bushel-volume groups.)

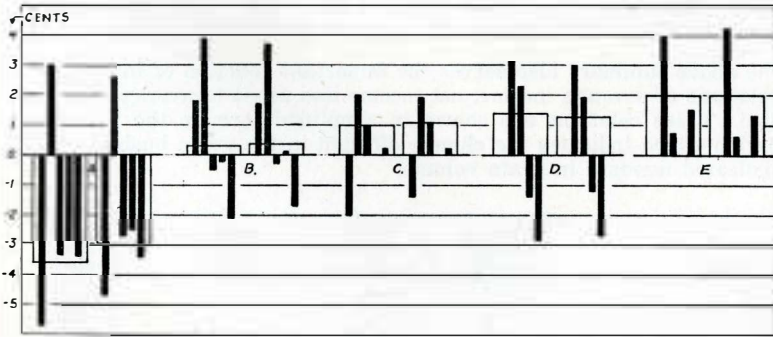


Chart 16.—Profit, per dollar of grain sales and per bushel of grain handled, 1926-27 to 1930-31. Based on Table 12. (Analysis of elevator grain operations by bushel-volume groups.)

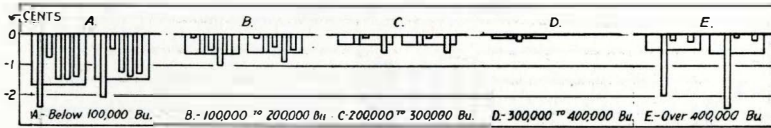


Chart 17.—Interest paid, per dollar of grain sales and per bushel of grain handled, 1926-27 to 1930-31. Based on Table 13. (Analysis of elevator grain operations by bushel-volume groups.)

In Chart 7 and Tables 7a and 7b, grain is shown to constitute on the average at least 85 per cent of the total business. The analysis of the grain business, therefore, is of primary importance from the point of view of volume of business. In the previous section, the business was discussed from the point of view of dollars of sales in order to include sidelines. In this connection, as has already been pointed out, it seemed advisable to attempt to eliminate annual price differences by multiplying bushel volumes for each grain by the average ten-year South Dakota prices. Now, in order to eliminate all possible variations due to price changes, grain in this section is analyzed solely on the basis of the bushels handled.

One reason for presenting Tables 11 to 13, pictured in Charts 13 to 17, is to bring out the similarity of the grain-business totals of income, net income, stock dividends, economic profit and interest paid on the per dollar and the per bushel basis, and thereby make an easy transition from analysis on the dollar basis to that on the bushel basis. These tables are summarized in the following tabulation.

| Volume Group | elevators | Number of | Av. grain handled | | Income | | Net income | | Profit | | Interest paid | |
|--------------|-----------|-----------|-------------------|------|--------|----------|------------|----------|--------|----------|---------------|----------|
| | | | \$ | Bus. | Per \$ | Per bus. | Per \$ | Per bus. | Per \$ | Per bus. | Per \$ | Per bus. |
| A | 60 | 58 | 62 | .083 | .073 | -.017 | -.014 | -.036 | -.031 | .017 | .015 | |
| B | 37 | 142 | 148 | .062 | .060 | .010 | .011 | .003 | .004 | .007 | .006 | |
| C | 16 | 237 | 238 | .052 | .050 | .017 | .017 | .010 | .011 | .003 | .003 | |
| D | 9 | 316 | 350 | .054 | .049 | .020 | .018 | .014 | .013 | .001 | .001 | |
| E | 6 | 452 | 465 | .054 | .052 | .025 | .024 | .020 | .021 | .005 | .006 | |

The above summary also serves the important function of introducing the relations of average income, net income and profit to average bushels handled. These relations are shown in simplified form in the following tabulation which indicates the change effected in the grain business with the indicated increase in grain volume.

| Group changes | Change in av. bushels handled | Change in income per bus. | Change in net income per bus. | Change in profit per bus. |
|---------------|-------------------------------|---------------------------|-------------------------------|---------------------------|
| | (Bus) | (\$) | (\$) | (\$) |
| From A to B | + 86 | -.013 | +.025 | +.035 |
| From B to C | + 90 | -.010 | +.006 | +.007 |
| From C to D | +112 | -.001 | +.001 | +.002 |
| From D to E | +115 | +.003 | +.006 | +.008 |

It will be observed that the greatest change in all cases occurs between Group B and A. In other words, it is especially important that the small elevators, falling below 100 thousand bushels on the average, do everything possible to increase their volumes. Increases in volume from the 200 thousand to the 300 thousand group appear to result in a decided gain but not nearly so great an advantage as from the 100 thousand bushel class to the 200 thousand bushel class. It will be observed also that the advantage of the last class over the one preceding is much greater than the 300 thousand bushel class over the 200 thousand bushel class.

Expenses in Handling Grain

Bell (1)⁴, using grain costs as total costs less extra costs due to side-line handling, found in the case of 60 cumulative records of some 24 Montana farmers' elevators for the crop years 1925, 1926 and 1927 that grain costs exceeded 6 cents per bushel for farmers' elevators handling less than 100 thousand bushels, 3.8 cents for 200 thousand bushels and 2 cents at a volume of 500 thousand bushels or over.

Benton and Peightal (2), using total elevator costs from elevators deriving 89 per cent of their income from grain, found in the case of 422 cumulative records from 16 to 100 individual elevators for the 1919 to 1925 crop years that costs amounted to 5.99 cents per bushel for farmers' elevators handling between 50 and 100 thousand bushels, and 2.64 cents per bushel for 300 thousand bushels or over.

Price and Arthur (12), using total elevator costs, found in the case of 109 elevators in the Minneapolis-Duluth grain marketing area in 1922-23 that the range in costs per bushel was from 1.7 cents to 13.0 cents, averaging 4.7, and that 100 elevators, or 90 per cent, had costs from 2 to 9 cents. These authors pointed out that these figures implied great opportunities for better economy in organization and management.

Price and Rowe (13), using total elevator costs, found in the case of 50 Minnesota elevators, including those which handled principally feed grains as well as those handling principally wheat, in 1925-26 that the range in costs per bushel was from 2 to 13 cents, and averaged 4.3 cents, that elevators in the corn and oats section had lower costs, 24 elevators in the southwestern part of the state having costs which ranged from 2 to 7 cents per bushel while the 26 elevators in the other sections ranged from 3 to 13 cents per bushel. Eighty-four per cent of all the elevators had costs of less than 6 cents with the most common costs from 2 to 4 cents.

Kuhrt's (10) figures for two years supplemented by unpublished figures covering two additional years, prepared under the direction of E. J. Bell, Jr., who continued the work done by Kuhrt, indicated the following expenses for handling grain based on 277 records from 40 to 85 elevators in the spring wheat area of Montana, North and South Dakota and Minnesota, covering the period 1925-26 to 1928-29 inclusive: Seventeen records with under 50 thousand bushels, an average expense per bushel for handling grain of 12.02; 51 records between 50 and 100 thousand bushels, 7.30 cents; 64 records between 100 and 150 thousand bushels, 5.04 cents; 55 records between 150 and 200 thousand bushels, 3.95 cents; 34 records between 200 and 250 thousand bushels, 3.67 cents; 17 records between 250 and 300 thousand bushels, 3.06 cents; 20 records between 300 and 350 thousand

4. Reference is made by number to Literature Cited, page 89.

bushels, 2.80 cents; 8 records between 350 and 400 thousand bushels, 2.31 cents, and 10 records with over 400 thousand bushels, 2.58 cents. Grain expense was separated from sideline and service expense on the estimated division of total expense chargeable to each phase of the business.

Donaldson and Hemphill (5), considering grain and sideline costs divided on the basis of dollars of sales, found in the case of 40 records from 20 Colorado winter-wheat elevators for the crop years 1929 and 1930 that grain costs would likely be more than 5 cents and may be as much as 13 cents per bushel for 100 thousand bushels or less. In this study the authors recommended a minimum volume of 175 thousand bushels with a desirable volume of upwards of 300 thousand bushels.

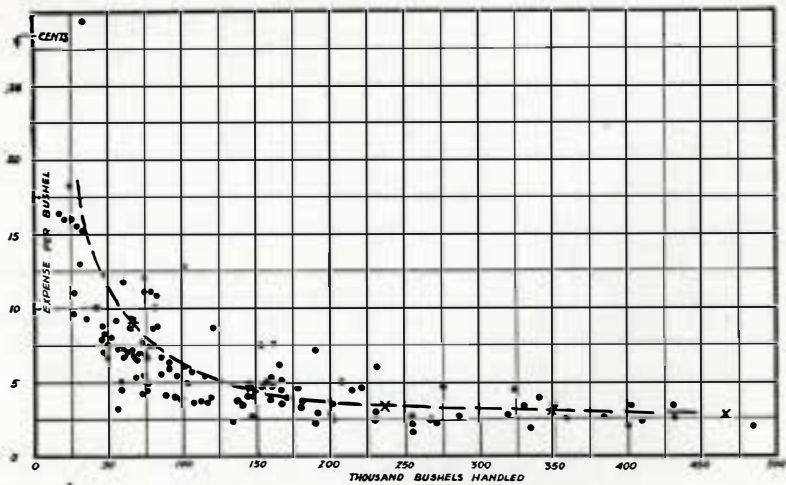


Chart 18a.—Relation between volume handled and per bushel expense of handling grain, for five years, 1926-27 to 1930-31.

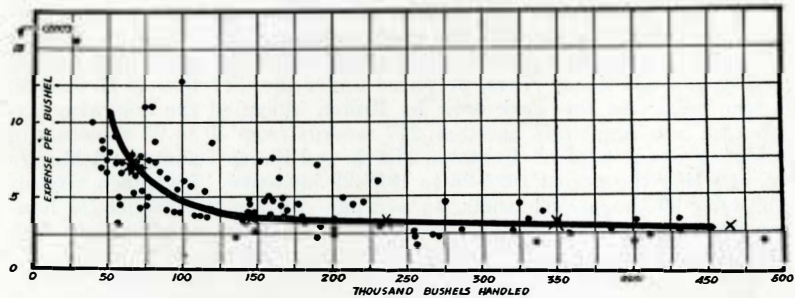


Chart 18b.—Relation between volume handled and per bushel expense of handling grain, for four years, 1927-28 to 1930-31.

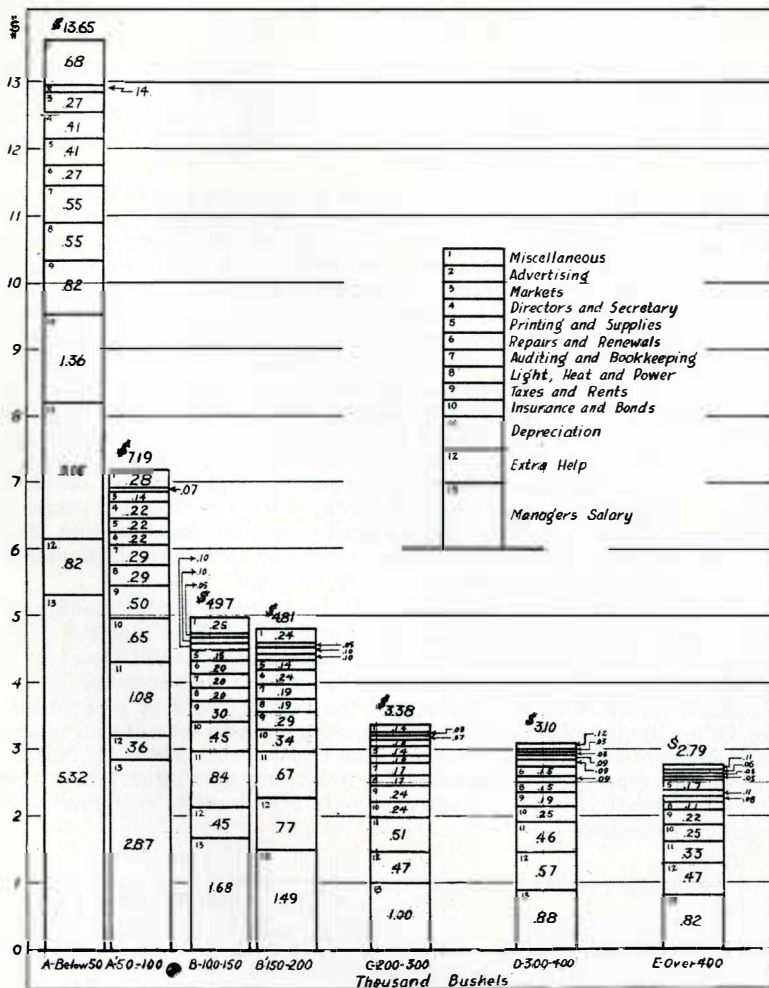


Chart 19.—Dollar distribution of expenses in handling 100 bushels of grain, 1926-27 to 1930-31. (Analysis of elevator grain operations by bushel-volume groups.)

Net returns from grain operations are dependent upon trading incomes and the expenses involved. With large volumes, expenses are subordinated to income, but with seriously curtailed volume in any year the maintaining of expenses at a minimum is of primary concern. In order to insure greatest returns to the grower, it is necessary to keep expenses at a minimum at all times, consistent with efficiency of operation.

Grain expense per unit, as pointed out under tests of effectiveness, provides a measure by which one elevator may be compared with others

in the same volume group, and includes only such estimated expense as would conceivably be borne if only grain was handled.

The most common grain expense of elevators handling less than 100 thousand bushels was more than 6 cents and less than 8 cents per bushel, while the mode for all other volume groups together with the total of all volumes fell in the class of more than 2 cents and less than 4 cents per bushel.

Chart 18a presents an expense-per-unit curve based on 128 records for the five years, 1926-27 to 1930-31, and Chart 18b presents the same curve based on 104 records for four years, omitting the 1926-27 year. Both of these curves are constructed on group average values which are shown as crosses. In addition to indicating the general tendency these charts show variation from that tendency. Each dot represents the volume and expense per bushel for one elevator for one year. Chart 18a includes a greater number of elevators with high grain expenses in the small volume group. This is caused by several elevators being forced into the group average because of the 1926-27 crop failure. On the other hand, Chart 18b includes a very good year, 1927-28, but does so in such a way that it affects the results but little because the items are not concentrated in the interval of greatest change. It will be observed that expenses decrease rapidly as volume is stepped up in the lower volume groups and decrease much less rapidly thereafter. These charts are significant in that they point out the disadvantage the smaller sized elevators have in trying to meet competition with expenses per bushel so high.

In Chart 19 (Table 14), dollars of expense incurred in the handling of 100 thousand bushels of grain are shown distributed by bushel-volume groups for the complete five-year period. The construction of the chart is self explanatory. The greatest decrease in expense with increase in volume occurs in the case of salaries and the next in the case of depreciation. Other items which decrease to a less degree with increase in volume are, in order of importance, insurance and bonds, taxes and rents, miscellaneous, and repairs and renewals. The following tabulation taken from Table 14, indicates the percentage change in each item as compared with the group preceding.

| Item | Per cent change in expense items | | | |
|---|----------------------------------|----------------|----------------|----------------|
| | From A to B | From B to C | From C to D | From D to E |
| | (%) | (%) | (%) | (%) |
| Total expense ----- | -39 | -29 | - 8 | -10 |
| Salary ----- | -48 | -36 | -12 | - 7 |
| Extra help ----- | +28 | -30 | +21 | -18 |
| Depreciation ----- | -43 | -24 | -10 | -28 |
| Insurance and bonds ----- | -46 | -36 | + 4 | 0 |
| Taxes and rents ----- | -47 | -17 | -21 | +16 |
| Light, heat and power ----- | -40 | -10 | +50 | -27 |
| Auditing and bookkeeping ----- | -40 | -10 | -47 | -11 |
| Repairs and renewals ----- | -21 | -47 | +50 | -27 |
| Printing and supplies ----- | -42 | 0 | -36 | -89 |
| Directors and secretary ----- | -58 | 0 | -10 | -67 |
| Markets ----- | -37 | -30 | -57 | 0 |
| Advertising ----- | -50 | -25 | 0 | +50 |
| Miscellaneous ----- | -38 | -41 | -14 | - 9 |
| Thousand bushels change in average bushels handled ----- | 86 | 90 | 112 | 115 |

Table 15 indicates the percentage distribution of grain expense items, showing that managers' salaries ranging from 28 to 40 per cent, depreciation ranging from 12 to 17 per cent and extra help ranging from 5 to 18 per cent are outstandingly important, and that the other items all are 10 per cent or less of the total.

1. **Managers' Salaries.**—This item refers to estimated amounts paid for management in the grain business. In most of the elevators this work is done by one man, but in some organizations where there is more than one house and the houses are widely separated or the work is departmentalized the work is done by two men. Managers' salaries constitute the largest expense item. It will be observed in the summary tabulation that it decreased 46 per cent between the A group and the B group, by 36 per cent between the D and E group. It may be assumed that expense per bushel for management decreases until the time of the manager or managers is fully used; also that the expense per unit continues to decline even after extra labor is required but at a slower rate.

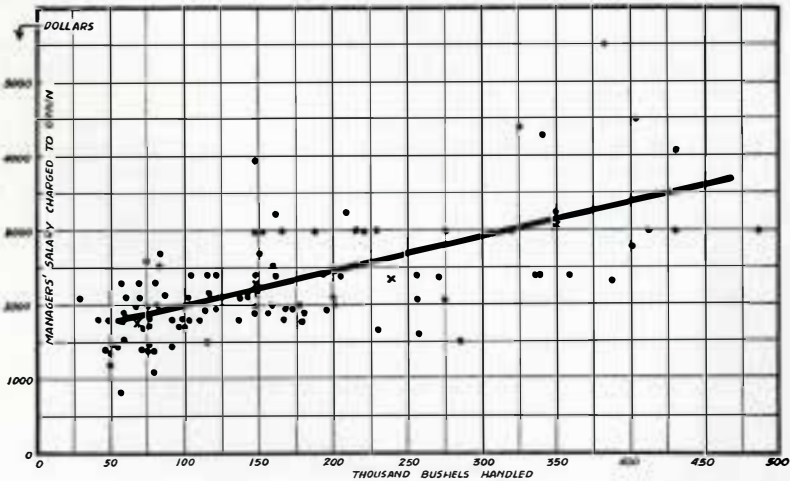


Chart 20.—Relation between volume handled and manager's salary charged to grain operations, for four years, 1927-28 to 1930-31.

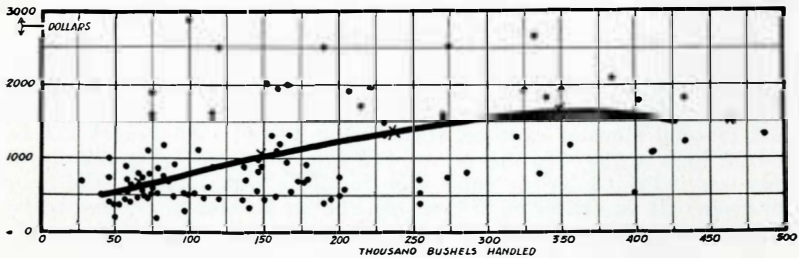


Chart 21.—Relation between volume handled and depreciation charged to grain operations, for four years, 1927-28 to 1930-31.

Total managers' salaries for the four years, based on 104 records for 1927-28 to 1930-31 are shown on Chart 20 as they are related to volume. The straight line is based on group average salaries and volumes, which are designated by crosses. It will be observed that this curve of total salaries runs opposite to the per-bushel expense figures. Total salaries are largest for the large volumes while the small elevators pay most to handle each bushel. Salaries seem to go up from about \$2,000 at 100 thousand-bushel volume to \$3,500 at 425 thousand bushels. There is probably a tendency for the managers' salaries to increase as business grows and to offset to some extent the lower wages paid for helpers. Attention is again called to the deviations as well as the central tendency. Dispersion is especially noticeable in the higher volume groups. Careful investigation and judgment in employing management is necessary to efficient operation. Some managers are high priced at \$1,200 while others are relatively cheap at a much higher figure.

2. **Extra Labor.**—This item refers to the estimated amount paid for handling grain in addition to the managers' salaries. It increases between Groups A and B and between C and D, and decreases between B and C, and D and E. This would indicate, no doubt, that in the former two cases the time of the manager and other regular labor is used more fully than in the latter two cases.

This item is closely related to management expenses; in some establishments the second of two men is designated as a second manager and in others as second man. It probably comes down to a consideration as to the degree of indispensability considered in terms of year-around employment. Combining both management and extra labor, there is a close resemblance to the management relationships of expense per bushel to volume. Combined expense per bushel declines rapidly to about 250 thousand, when it tends to maintain itself without change until about 350 thousand bushels, when a moderate decline is again in evidence. Different rates paid the extra help from that paid for management must be taken into consideration; also that extra labor is in many cases only an expense during the season of greatest grain movement. In short years the extra labor expense is one of the first to be curtailed or eliminated.

Benton and Peightal (2) found that management and labor averaged 47.4 per cent of the total elevator expense in 1919-20 to 1925-26 and that elevators handling the larger volumes of grain employed labor more efficiently. Sales per one dollar of management and labor expense were \$43 for those handling 50,000 to 100,000 bushels and \$88 for those handling over 300,000 bushels of grain.

Unpublished summaries of the cooperative Regional Spring Wheat Area Study based on 328 records in 1924-25 to 1928-29 from Montana, North and South Dakota and Minnesota, prepared by the federal Division of Cooperation indicated that management and labor constituted 43.8 per cent of total elevator expense, with 43.0 as low in 1925-26 and 45.0 per cent as high in 1927-28; 42.9 per cent of total expense for handling grain only was indicated for the same item for 1925-26 to 1928-29. The figure for grain only was based on 278 records, and the division of expense was on the basis of estimated time spent on grain, sidelines and services.

3. **Depreciation.**—This item is made up of the amounts set aside as reserves for depreciation of plant and equipment estimated chargeable to

grain. The auditors' figures on depreciation were taken except in cases where more than one year were combined or in cases where depreciation was not shown for particular years, in which cases the year previous and the year following together with changed physical assets determined the amount charged. Depreciation in four out of the seven groups constituted the second highest expense item, ranging from \$380 to \$2,894. Depreciation per bushel decreases very rapidly with increased volume up to about 200 thousand bushels, beyond which the decrease per bushel continues only moderately. Putting it in another way, building and equipment expense per bushel tend to decrease rapidly with expanding business up to the point where additional equipment and building must be provided.

On Chart 21, based on 104 records for four years, total depreciation is shown to be about \$500 at 40 thousand bushels, about \$1,000 at 140 thousand bushels, \$1,187 at 238 thousand bushels, reaching high at \$1,612 at 350 thousand bushels, after which it turns slightly downward.

4. **Insurance and Bonds.**—All grain insurance and bond expense were charged in this item. In cases where premiums had been paid for more than one year, this amount was divided if possible. This item tends to decrease because stocks of grain on hand form a smaller proportion of the total business when volume is large.

5. **Taxes and Rents.**—Included in the item of taxes are the estimated amounts paid on assessed valuations of plant and equipment and other property which were used in the grain business and also the estimated taxes paid upon stocks of grain. Federal income taxes were not included, this item being considered a deduction from surplus. Rents paid for elevator sites, plants or other buildings, having to do with the grain business, were included in this expense item.

6. **Light, Heat and Power.**—In this item are the estimated grain expenses of heating and lighting the elevator plant and the expenditures for power either in the form of electricity for motors or in fuel for engines. Variations in this item as between elevators are largely due to the differences in volume of grain handled, to whether cleaning was done, and to rates for electric power, or to the quantities of fuel used in engines and the prices paid for it. Some differences are also caused by variations in efficiency of motors and engines and other elevator equipment. In recent years there has been a noticeable increase in the number of elevators which have increased their use of electric power through the installation of motors for general and special power purposes. Electricity and gasoline costs tend to decrease slightly with larger volumes because there is less starting and stopping and more efficient utilization of motors and engines.

7. **Auditing and Bookkeeping.**—In this item is included principally the estimated expense of auditors' services in preparing audits, reports and income tax statements estimated chargeable to grain. In a few cases, wages paid to bookkeepers were included. Variations in this item as between elevators come about through differences in the extent of employment and rates paid to auditors and bookkeepers.

8. **Repairs and Renewals.**—This item includes all expenses for repairs and renewals to plant and equipment estimated to be used in the grain business. Variations are due to such factors as size and condition of elevator plants and equipment, volume of commodities handled, and availability of time and money for the repairing of physical properties.

9. **Printing and Supplies.**—This item is made up of expenditures for both office and elevator supplies, including stationery and postage, office forms, car liners, oils and greases, and other similar items. Variations in this expense as between elevators may be attributed to such factors as volume of business handled and types of bookkeeping systems used.

10. **Directors and Secretary.**—This item includes fees paid to boards of directors and secretaries. Elevators in satisfactory financial condition pay such fees more frequently than those in financial difficulties.

11. **Markets.**—In this item are included the expenses of price-quoting services such as the Grain Bulletin, and telegraph and telephone reports. Variations in this item are caused by differences in the extent to which various types of market-news-quoting services are used, in the use of long distance calls to markets, etc.

12. **Advertising.**—This item includes all expenditures paid for advertisements in newspapers, together with the amounts paid for such miscellaneous items as calendars, mementoes, etc.

13. **Miscellaneous.**—In this item are included expenditures such as donations, convention expense, and small items which could not be included in the other general classifications.

14. **Interest.**—In this item are included all amounts paid for the use of borrowed funds. It does not include dividends paid on capital stock. As previously pointed out, interest has not been included with other expense items but considered as a separate item. Chart 12 (Table 10) shows the various interest amounts per dollar of total sales by bushel-volume groups. Chart 17 indicates the interest paid per dollar of grain sales and per bushel of grain handled by bushel-volume groups, and shows the greatest amounts for the small volume group. The small-volume elevators might conceivably have a high interest charge because of poor management in some cases caused by the feeling that the management was as good as could be supported by the volume. On the other hand, interest paid for operating funds might be proportionately greater for small-volume elevators because such elevators often retain ownership to a larger percentage of the total grain handled than larger businesses. These large-volume elevators usually accept more grain for storage than they can keep in the house and are forced to ship and sell a part of it, which provides a source of funds for offsetting interest which small-volume elevators may not enjoy to the same extent.

Net Income From Handling Grain

Net income consists of the difference between income and expense. Expense per bushel was discussed in the previous section. In presenting data on net income per bushel in this section, the need for a separate analysis of income per bushel is obviated, and the material which could have been discussed under the latter heading will be taken up in connection with net income.

The most common net income from grain trading by elevators handling between 300 and 400 thousand bushels was more than 2 cents and less than 1 cent. All other volume groups, together with the total of all volumes, had less than 2 cents per bushel net income as modal.

Charts 22a and 22b, based on 128 and 104 records respectively, show the relation between volumes handled and net income per bushel from handling grain. The curves were again drawn on the basis of group aver-

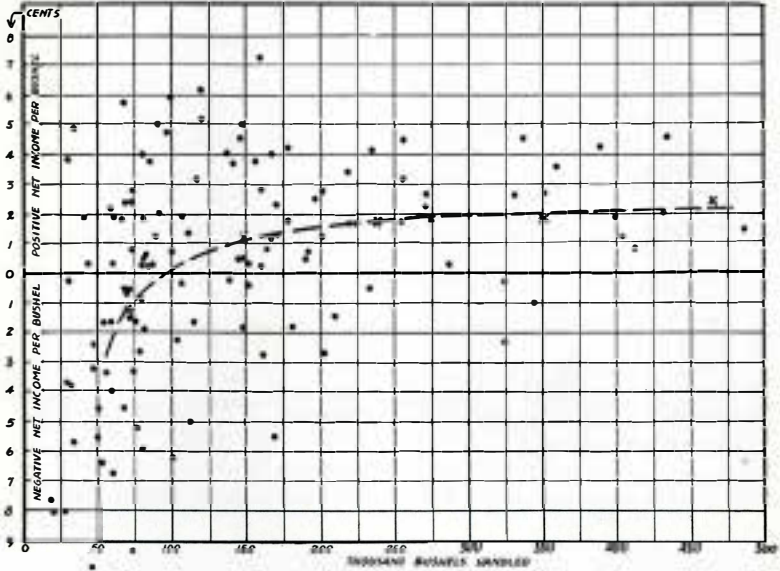


Chart 22a.—Relation between volume handled and net income per bushel from handling grain, for five years, 1926-27 to 1930-31.

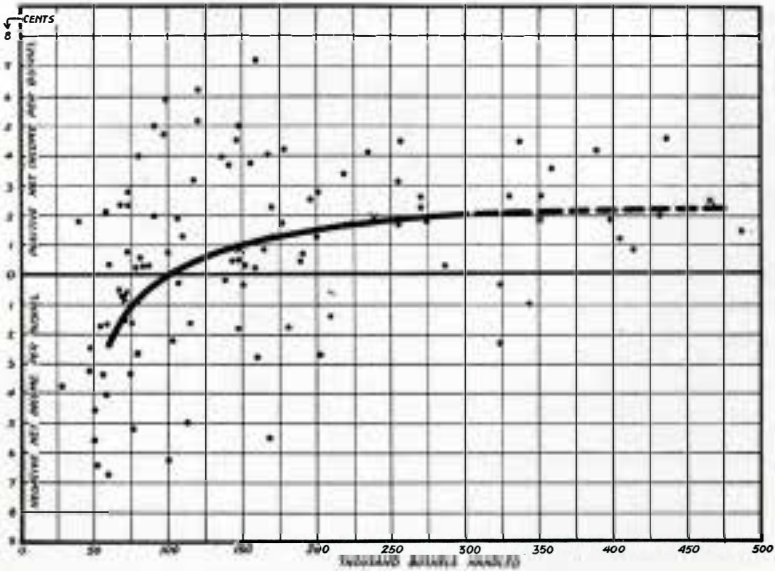


Chart 22b.—Relation between volume handled and net income per bushel from handling grain, for four years, 1927-28 to 1930-31.

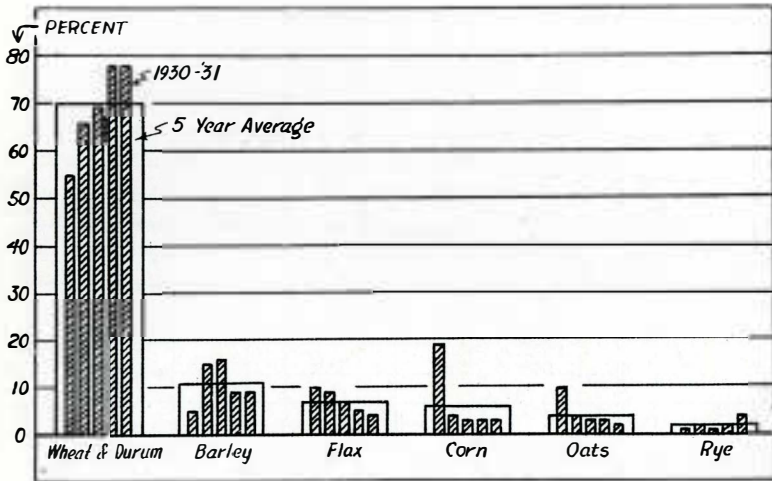


Chart 23.—Percentage distribution of total grains based on pounds handled, 1926-27 to 1930-31. Based on Table 16. (Analysis of separate grain operations.)

ages which are shown by crosses on the charts. Chart 22b differs from 22a in that the former considers only four years, 1927-28 to 1930-31, while the latter includes 1926-27 in addition. Chart 22b was constructed with a view of avoiding the extreme variation in the lower volume group caused by the inclusion of elevators which ordinarily handle comparatively larger volumes but which had low average volumes because of the crop failure of 1926-27. Emphasis should again be placed on the amount and extent of deviation from the central tendency and reliance placed upon the values expressed by the curve only as a tendency from which there is considerable deviation. For example, in Chart 22b, while the deviation of some cases from the curve, in the interval between 50 and 100 thousand, is relatively small, at the same time we also find some extreme variations. The same reasoning obtains in the 100 to 200 thousand-bushel groups. When we get to the 300 and 400 thousand groups, the number of cases become materially less and the curve is drawn to try to accommodate the average point in both classes, necessitating that much more emphasis be placed on the individual case values instead of those expressed by the curve.

Chart 22b indicates that net income increases rapidly to about the 100 thousand bushel point, then less rapidly until the 300 thousand bushel-volume is reached. It indicates a net income of zero at 100 thousand bushels, $1\frac{1}{2}$ cents at 200 thousand bushels and 2 cents per bushel at 300 thousand. There are relatively too few observations over 300 thousand bushels from which to draw definite conclusions. For this reason the curve is broken in the last two volume groups. A similar curve, unpublished to date, constructed by the federal Division of Cooperation from figures collected in the cooperative regional study shows a moderate downward tendency after 270 thousand bushels. The curve referred to relates volume handled to net per bushel profit or loss from handling grain for a group of farmers' elevators in the spring wheat area for four years, 1927-28 to 1930-31.

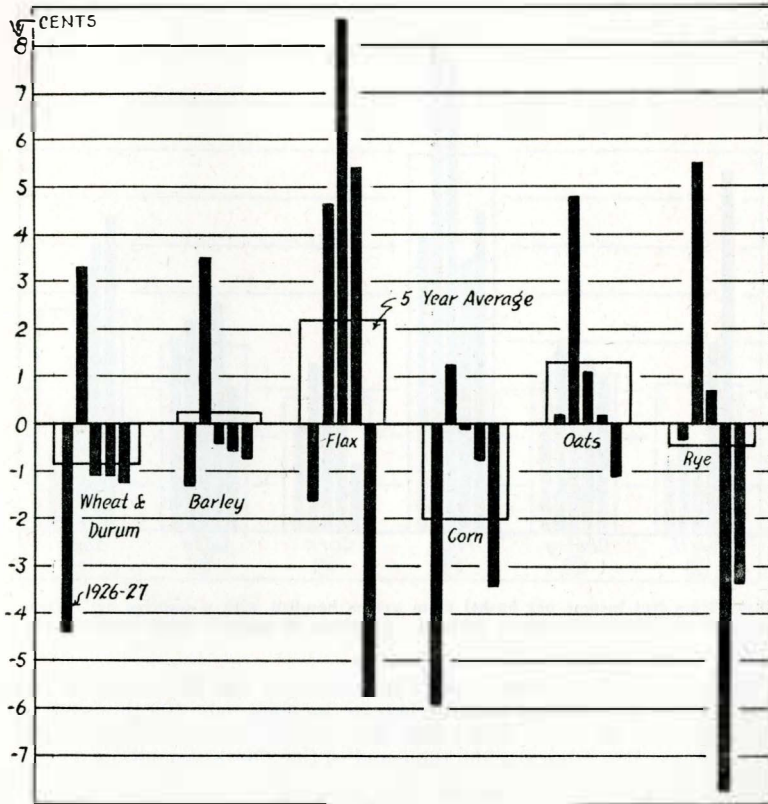


Chart 24a.—Net income per bushel from the various grains, 1926-27 to 1930-31. Based on Table 17. (Analysis of separate grain operations.)

The curve is based on 277 observations, and an estimated division of expenses on the basis of amount of the total chargeable to each phase. This curve indicates that the net per bushel profit at 100 thousand bushels was zero dollars, at 150 thousand bushels \$.013, at 200 thousand bushels \$.017, reaching a high of \$.020 at 270 thousand bushels after which it curved downward so that at 300 thousand it was \$.019 and at 400 thousand \$.016. As in the case of the South Dakota sample the regional sample did not have many observations in the large size groups. It had 41 cases out of the 277 or 15 per cent above 300 thousand bushels and the state study had 15 cases out of 128 or 12 per cent. A few extreme cases in either study might greatly influence the direction of the curve. It may be assumed that every elevator business set-up may finally reach a size beyond which added volume would either not increase returns or actually decrease returns per bushel.

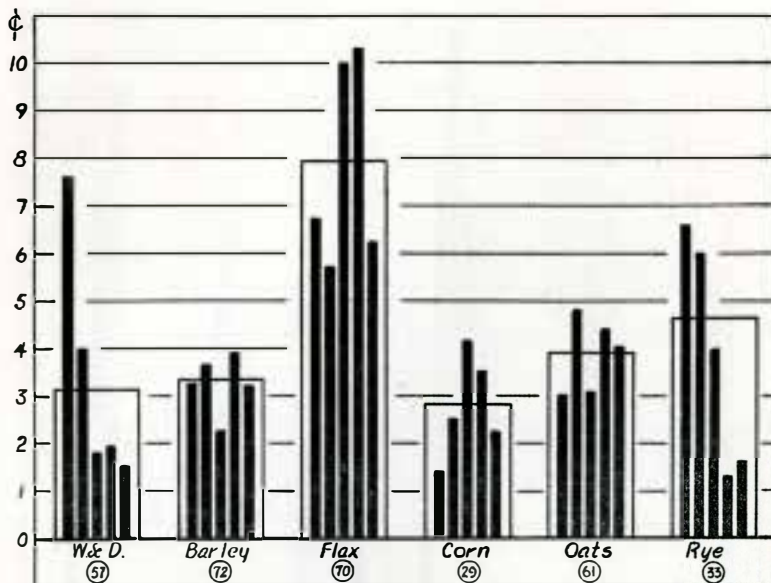


Chart 24b.—Net income per bushel from grains handled with a positive net income, 1926-27 to 1930-31. Based on Table 17. (Analysis of separate grain operations.)

The summary tabulation on page 28 recognizes that the rate of increase from 300 thousand bushel-volume class to the class over 400 thousand was greater than is shown in Chart 22b, also that the rate of increase in the summary was less from the 200 thousand to the 300 thousand-bushel class.

Chart 23 (Table 16) indicates the percentage distribution of total poundage of grains handled during the five year period, 1926-27 to 1930-31 and shows that wheat and durum averaged about 70 per cent of all grain handled. While this distribution is on a poundage basis which would not weigh lighter grains heavy enough, it indicates that wheat and durum are outstandingly the most important grains handled. It is because of this fact, together with the fact that the combination of grain ran very uniform, that the analysis in this study on the basis of volume groups has been especially justified.

Chart 24a (Table 17) consists of figures on net income per bushel for the various grains during the five-year period. It will be observed that in most cases a loss was taken in the first year of the five, the one exception being negligible. Without exception the second year was profitable. It was a year of large crops. The other years consisted of more or less normal marketings, figures of which are pointed out in an earlier section. In these other years, wheat and durum, together with corn, took a loss on the average, while flax, oats and rye had profits as well as losses.

The greatest average positive net income is shown in the case of flax (Chart 24a). This is due in no small degree to the fact that flax may be sold "to arrive" in small lots.

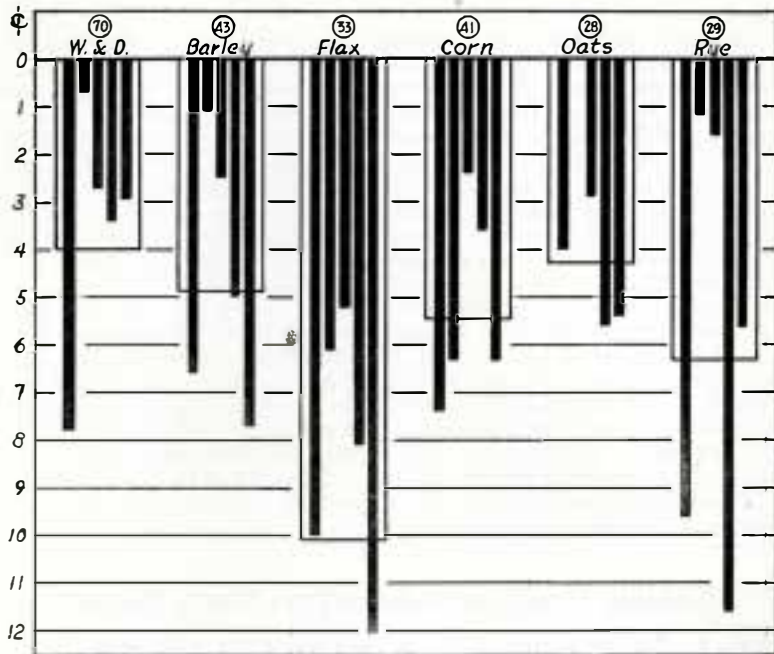


Chart 24c.—Net income per bushel from grains handled with a negative net income, 1926-27 to 1930-31. Based on Table 17. (Analysis of separate grain operations.)

The next best average positive net income was in the case of oats. The fact that this grain was handled only in limited quantities and that there was considerable local demand, makes it possible to handle them on a fairly definite margin over purchase price.

Barley shows some positive net income as an average for the period. This was due no doubt to the reasons given for oats and the fact that there was enough handled to make some effective hedging possible. On the other hand, losses are no doubt often incurred because of the desire of the elevator to pay up for barley, even though sufficient quantities are not handled to enable the elevator to sell well in the market.

The loss in the case of corn might easily be caused by the fact that the amounts handled were too small to make it possible to take advantage of protection afforded by hedging. The method used in allocating expenses to the different grains in this study might account for some of the variation.

There are many reasons why the handling of wheat and durum might have shown a loss in four out of five years. In these cases, protection from hedging was possible. The fact that wheat and durum were not hedged as perfectly as practical accounts for a part of the loss, especially in the light of uncertain and declining markets. Some losses were sustained also in

the untimely selling of grain which was high in protein or high in test weight.

Chart 24b (Table 17) shows average annual and five-year average net income per bushel from grains handled only with a positive net income, while Chart 24c (Table 17) shows the same averages of net income per bushel from grains handled with only a negative net income. It will be observed that there were cases in which positive net incomes were made in all years, which implies that even under adverse conditions all grains are handled with a positive net return. The figures on the chart indicate the number of cases. It should be stated that these cases were annual averages by grains without respect to elevators. For example, wheat might have been handled at a profit and oats at a loss by the same elevator in which case wheat would be included with positive net incomes and oats with negative net incomes. The margin taken on one grain as compared with another, together with the method used in distributing expenses would be factors which would tend to cause a degree of non-comparability, but it is reasonable to assume that the figures in Charts 24b and 24c are indicative of the situation. Greatest profits per bushel were made in flax and at the same time greatest losses. Flax which was not sold "to arrive" would take either wide gains or wide losses. The annual averages of the other grains were fairly uniform in both positive net income and negative net income, with rye being most out of line both with a great positive net income and a greater negative net income.

Operating Practices Which Affect Grain Income

Incomes and net incomes from handling grain are affected by the efficiency with which a number of operating practices are carried out. Among these, the most important are buying-selling-hedging, storing, handling and cleaning. Data for these operations were taken directly from audit reports and reduced to a per bushel basis. They are shown in the following tabulation:

| | Av. bushels handled | | Net grain income per bushel | | Buying-selling-hedging | | Storage* | | Handling | | Screenings | |
|----------------------------|---------------------|-------|-----------------------------|-------|------------------------|----------|-------------|-----------|-------------|----------|-------------|----------|
| | (Thous. \$) | (\$) | (Thous. \$) | (\$) | Total | Per bus. | Total | Per bus.† | Total | Per bus. | Total | Per bus. |
| | | | | | (Thous. \$) | (\$) | (Thous. \$) | (\$) | (Thous. \$) | (\$) | (Thous. \$) | (\$) |
| Total and weighted average | 146 | .001 | 219 | .012 | 118 | .006 | 22 | .001 | 55 | .003 | | |
| 1926-27 | 62 | -.020 | 11 | -.007 | 14 | .009 | 2 | .002 | 4 | .003 | | |
| 1927-28 | 236 | .035 | 248 | .040 | 16 | .003 | 10 | .002 | 9 | .001 | | |
| 1928-29 | 166 | .002 | 50 | .012 | 19 | .004 | 3 | .001 | 21 | .005 | | |
| 1929-30 | 118 | -.002 | 40 | .013 | 27 | .009 | 3 | .001 | 16 | .005 | | |
| 1930-31 | 149 | -.010 | 10 | .003 | 42 | .011 | 3 | .001 | 6 | .002 | | |

* Item includes only amounts as paid by growers for storage.

† Per bushel on basis of total bushels handled.

The net grain income per bushel may be accepted as an independent measurement of effectiveness of grain trading, but buying-selling-hedging, storage, handling and cleaning are not independent measurements but rather interdependent, and must be so considered.

Buying and selling are combined with hedging, because losses and gains in actual trading are largely offset by gains and losses in hedging transactions. In the case of storage, the returns from operations, as shown above, constitute only a partial picture; the other part consists of hedging the stored grain which is shipped and sold prior to purchase, involving as it does, some loss or gain due to spreads between cash and futures, besides requiring extra time and expense in making out storage tickets and keeping storage records, placing of future trades, etc. The time and expense necessary, together with the fact that information was not available to enable computed daily "long" and "short" records to check out sufficiently accurately, has made it impractical to attempt to separate hedging operations from related operations for many of the elevators. Handling is almost entirely a part of selling, there being a very small proportion of the grain redelivered to patrons or consigned for the account of others in the case of the elevators in the study. Cleaning is also primarily a part of selling in that it results in a higher local net price for grain, the result of savings in freight on dockage and the conditioning of the grain shipped. It is therefore impossible to set up cleaning as an independent item, it being impractical to try to determine the amount of the increase in price due to cleaning. Screenings which are the by-product of cleaning are included with the grain business in this study.

Competition and Buying Practices

Incomes from grain are to a large extent influenced by local competition and buying practices, including price policy, payment for protein, grading and docking.

Competition.—All the elevators in the study had competition from elevators located in near-by towns. Competition in the same town, according to the records enumerated for 21 elevators in the study, was as follows: No competition four cases, one competitor 12 cases, two competitors five cases, three competitors one case and five competitors one case. These competitors consisted of 22 line houses and eight independently owned houses. There were no track or mill-buyer competitors. Three managers reported that their competitive situation did not cause them any concern, seven reported that there was a moderate degree of competition, and twelve reported the competition to be keen.

A cooperative elevator which is operating at comparatively low unit costs, getting its proportionate share of the local business and having a manager who knows how to judge grain values, should have little fear of competition. Possible exceptions to this might be competition from: (1) A line company, which pays higher than market price at one of its stations, absorbing the loss by excessive profits at other stations; (2) A line company which enjoys certain economies associated with large-scale elevator business, such as the opportunity to hedge more closely on the basis of a composite of all the reports from its many stations, etc.; (3) A line house, subsidiary to a mill firm which is willing to pay for milling quality at selected points. Competition in local grain buying rests primarily on costs per unit, the grain being sold on a competitive basis by practically all types of elevator ownership.

Price Policy.—The following tabulation, based on reports by managers, indicates the extent to which prices paid are over "card."⁵

| Grain | 1926-27 | | | | | | 1927-28 | | | | | | | | | |
|--------|---------|------|----|----|----|----|---------|------|-------|------|----|----|----|----|----|------|
| | Total | Card | 1c | 2c | 3c | 4c | 5c | 6-8c | Total | Card | 1c | 2c | 3c | 4c | 5c | 6-8c |
| Wheat | 20* | 6 | 1 | 2 | 1 | 2 | 7 | | 24† | 4 | | 5 | 4 | 1 | 6 | 2 |
| Durum | 13‡ | 8 | | | | 1 | 3 | | 22‡ | 5 | 3 | 3 | 2 | 2 | 5 | 1 |
| Barley | 17 | 10 | | 3 | 1 | 1 | | | 23 | 4 | 2 | 8 | 3 | 3 | 2 | 1 |
| Flax | 19 | 13 | | | 1 | 1 | 2 | 2 | 20 | 7 | 1 | 4 | 2 | 2 | 1 | 3 |
| Oats | 15 | 12 | 1 | | 1 | | | | 21 | 9 | 1 | 9 | 1 | | 1 | |
| Rye | 16 | 14 | | | | 1 | 1 | | 21 | 11 | 2 | 5 | 2 | | | 1 |

* One case under card.

† One case 15c, and one "as high as 20c."

‡ One case "as high as 20c."

Of the 20 managers reporting in the case of wheat in 1926-27 this tabulation indicates that six paid card, one paid 1 cent over, two paid 2 cents over, etc. Paying more than card does not necessarily imply that the elevator is paying more than the grain will bring at the market, whereas it does imply that elevators, especially in the same area, are operating on different margins, provided grading and docking are accurately done. The overpayments in the cases of wheat and durum are largely due to the extra value obtained because of protein and other quality factors, which are not reflected in grade. A less amount over card is paid in the case of barley than wheat and durum because quality barley has not demanded the premium that quality wheat and durum ordinarily have. In special cases where volume was sufficient and quality high a premium was paid for malting barley. On the other hand, a moderate overpayment is, in some few cases, made possible because barley is sold locally at a price which may approximate the price of shipped-in grain. Most of the oats and rye are purchased at card. Occasionally some overpayment is made in the case of the minor grains in order to handle a sufficient volume of these grains to make handling worth while, considering binning and loading in carload lots. One elevator in a town may try to get most of a particular grain during the entire season or merely to get enough for a car in anticipation of loading out.

Elevator managers must estimate what income is necessary to meet their total costs for all operations and then adopt margins to cover, degree of curtailment of expenses considered. This may even be done by paying more for some grains than they will net to the elevator when sold, in the event other grains are being purchased at less than value. The principle of overpaying some and underpaying others, it must be admitted, is fundamentally wrong. A farmer marketing mostly wheat of high protein content in years when premiums are substantial is not being treated entirely fair if at the same time other farmers, who are marketing some of the other grains, are getting more than their grain is worth, even though total costs are being met, all operations considered.

Some overpayment of card prices may be justified in the event that the "card" reflects a larger margin than is necessary to take care of freight and handling, in cases when additional amounts might be netted due to

5. "Card" prices are local-station quotations sent out to subscribers by a market reporting agency; grade prices are based on the terminal "to arrive" quotations from which has been deducted an operating margin to take care of local and terminal handling charges.

reduced freight on increased sized shipments of minor grains, or in the event that it is possible to mix out so as to raise grades.

Grading.—Overgrading is practiced to no little extent. This fact is brought out in the following tabulation which is based on reports by managers. While too much weight can not be placed on accuracy of verbal reports, these figures are nevertheless indicative of the situation. It will be observed that 15 to 20 operators graded as follows: Six overgraded wheat and five durum in 1926-27 and eight overgraded wheat and seven durum in 1927-28, overgrading one-half to five grades.

| Grain | 1926-27 | | | | | | 1927-28 | | | | |
|--------|---------|----|---|---|----|---|---------|----|---|---|---|
| | Total | 0 | ½ | 1 | 1½ | 3 | Total | 0 | ½ | 1 | 2 |
| Wheat | 19 | 13 | 2 | 2 | 1 | 1 | 15 | 7 | 1 | 5 | 2 |
| Durum | 17 | 12 | 1 | 2 | 1 | 1 | 16 | 9 | 3 | 2 | 2 |
| Barley | 16 | 12 | 1 | 1 | 1 | 1 | 15 | 12 | 1 | 1 | 1 |
| Flax | 14* | 12 | 1 | | | | 13 | 10 | 2 | 1 | |
| Oats | 16 | 13 | | 2 | | | 13 | 2 | 1 | 7 | 3 |
| Rye | 15 | 13 | 1 | 1 | | | 11 | 11 | | | |

* One over 5.

Overgrading results in selling a smaller quantity of high grades than is purchased. Assuming that weighing and docking are done accurately and competitive prices are paid for grade and premium, elevators can not stay in business long if overgrading is practiced to any considerable extent. Audit records of elevators in the study bear out this statement.

Much of the overgrading is due to the fear of losing patronage. Unless some adjustment is made by the operator in weights, dockage or prices, overgrading will eventually prove disastrous to the elevator. Such adjustments are always unfair and discriminating as between patrons.

Another reason for overgrading is to eliminate the necessity of too careful grading and at the same time not to cause any dissatisfaction on the part of the farmer. Still another reason is a relative lack of ability to judge grain grades. Grading of grain requires a considerable amount of judgment because of the number of characteristics to be taken into consideration. Managers, generally, have the ability to do a fairly accurate job of grading. However, considerable difficulty is encountered at the beginning of the marketing season before getting official terminal grading reports back on the first grain shipments. Many operators minimize possible losses due to this uncertainty by submitting samples to the terminal inspecting department when grain first starts to be delivered to the elevator, and then carefully testing each lot of grain purchased.

Some raising of grades is possible in mixing but the opportunities along this line are very limited as a means of offsetting extensive overgrading. The field enumerator in the study was aware of some underpayments in connection with overgrading. Because of the degree of competition at local points, however, it may be assumed that operators do not overcome a very great proportion of overgrading by lowered prices.

Cooperative elevators which are handling appreciably smaller volumes than competitors are at a serious disadvantage. Operating on a smaller margin than necessary, the result of overgrading, is not the proper way of solving this problem. It may be a matter of choosing between staying in business and doing the job at the lowest possible charge considering honest service, or going out of business. Staying in business might require

such measures to be taken as reorganizing with a view of reducing all possible capital handicaps, or conducting meetings and circulating printed matter to explain the real facts with a view of increasing volume and gaining, or at least maintaining, the loyalty of the patrons. Going out of business might require that the farmers in the community pay more for the marketing of their grain in the absence of competition than for the handicap due to small size.

Docking and Weighing.—The data collected in the study do not lend themselves to any accurate measurement of the amount of over and under docking and weighing. Overages and shortages due to inaccuracies in docking and weighing could not be separated in weight statements. In many of the statements, these figures were either not given or not separated from screenings, grinding and sales of mixed feeds. Such information as is available indicates that inaccuracies in many cases are sufficiently large to materially affect incomes.

The degree of inaccuracy in docking often depends upon the amount of foreign material. Operators are likely to underdock grain with excessive amounts of foreign material and overdock grain which has little such material.

The possibilities of errors in weighing are greatly minimized by inspections by state officials. The experience of managers indicates that in addition to this service, it is well for the operator to make frequent examinations between inspections to detect any maladjustments.

Two undesirable aspects of deliberately grading, docking and weighing inaccurately are: First, it is unbusiness-like to try to balance one inaccuracy with another. Second, it results in inequitable payments to patrons. In order to eliminate the necessity of meeting competition of buyers who manipulate grades, weights, dockages, and prices, wholehearted support is required of board members and stockholders.

Paying for Protein.⁶—A cooperative elevator's "profit" is primarily the grower's patronage refund, which considered with the scale payment determines the price to the farmer for his individual grain. Growers should get the highest possible price consistent with grain grade and quality if the cooperative method of grain marketing is fulfilling its complete mission.

The problem of paying for protein in years when it is a factor in the market is twofold. First, payment ought to be made to each farmer on the basis of his individual protein test insofar as practical. With one farmer's wheat worth much more than his neighbors, and the wheat from one section different from that of another hauling to the same elevator, it is unfair to pay for all the grain on the same basis. Second, protein should be so handled that no loss will result to the elevator.

Income from handling high protein wheat varies with elevators depending upon practices used. Payment on the basis of individual growers' tests did not become a problem in South Dakota until about 1927. Of 21 managers interviewed in 1928-29, eight stated that they tried to reflect protein premiums to individual growers, especially on lots of about 1,000 bushels or more, seven stated they paid a station average, and six claimed

6. For further information relative to the protein problem in marketing wheat, the reader is referred to the following publications listed under Literature Cited: 7, 10, 15, 16, 17 and 19.

there was no problem or that they did not try to pay on the basis of individual tests. A check-up, however, on the protein variations of the elevators which reported "no problem" did not substantiate their claims.

Tables 18 to 20 indicate the relation for three years between protein content, considering test weight, and premium or discount and price received at Minneapolis for shipments of spring wheat from South Dakota stations. These figures, as were also those in Tables 21 and 22, were determined by the Division of Cooperative Marketing, formerly with the Department of Agriculture, Washington, D. C. The following tabulation summarizes Tables 18, 19 and 20.

| Year | Elevator | Car lot tests | Average for elevators | | | | | |
|---------|----------|---------------|-----------------------|-------------|---------|-------|-------------------|-------|
| | | | Selling price | Test weight | Protein | | Premium per bus.* | |
| | | | | | Average | Range | Average | Range |
| (No.) | (No.) | (\$) | (Lbs.) | (%) | (%) | (c) | (c) | |
| 1926-27 | 18 | 238 | 1.41 | 58.0 | 14.1 | 5.4 | -0.4 | 34.9 |
| 1927-28 | 20 | 1,142 | 1.37 | 58.6 | 12.0 | 1.6 | +6.0 | 14.7 |
| 1928-29 | 19 | 723 | 1.56 | 58.1 | 12.4 | 1.8 | +4.1 | 18.1 |

* Premium or discount per bushel over prevailing Minneapolis future.

Tables 21 and 22 imply the interdependence of protein and test weight as quality factors and indicate the much greater importance of protein as a quality factor than test weight. Test weight is recognized in the summary tabulation but emphasis is placed on the protein factor. It will be observed in the summary that there may be a considerable variation between elevators in average protein content of the wheat handled. In terms of per cent of protein as tested, a range of 5.4 per cent is shown for the 1926 crop, 1.6 per cent for the 1927 crop and 1.8 per cent for the 1928 crop. Variations in tests reflected themselves in premium variations of 35 cents, 15 cents and 18 cents respectively, for the three years.

It was impossible to show the total variations within the stations because different protein tests were mixed in the cars shipped. However, data on all individual tests were obtained in isolated cases. One elevator manager, who submitted 217 samples for individual growers in 1928, had a station variation of 1.6 compared with 1.8 as between the 20 elevators in the same year.

Variation in payment for protein arises out of the need of millers to have wheat of a certain protein content in order to blend with other wheat to produce a uniform flour. Since the production of high protein wheat is usually more limited than that of low protein wheat, the former often commands a premium because of its scarcity. In January of 1928, high protein wheat became very scarce at Minneapolis and premiums as high as 50 cents per bushel and over were paid for individual cars. On the other hand, premiums have been paid by millers, though not frequently, for low protein test, because they needed such test to obtain their uniform flour. In years when there is a sufficient supply of wheat with protein to meet the requirements of all millers, no premium is paid. High protein test milling wheat was sold at little or no premium in the fall of 1926 when supplies of such wheat were large.

The term premium is used on the terminal market to mean the amount paid over the prevailing future price for a particular lot of actual wheat. While protein is the quality factor of greatest importance, as shown by

Tables 21 and 22, millers often pay premiums for wheat because of its test weight, its freedom from smut and its dryness. In fact, they pay for any factor, the supply of which is scarce and which they need in order to make a flour which is uniform.

The managers who have tried to reflect protein premiums to their individual patrons have used the following method with variations, according to the information obtained in the study.

1. They made a preliminary survey when the grain was ripe but before it was harvested. Samples of wheat growing under different conditions in the area served by the elevator were sent to a testing laboratory. The reports on these tests then served as a basis for binning.

2. Farmers were encouraged to hold back high quality wheat because (1) during the heavy deliveries of grain, it is extremely difficult and frequently impossible for elevators to handle wheat of similar protein content in special bins, and (2) frequently protein values are not established during the early marketing season at a time when sufficient supplies of quality wheat are being marketed.

3. Each load delivered by a grower was sampled and a composite sample made. This was placed in an air-tight container and sent to an official testing laboratory.

4. Payment on the basis of grain grade was made at the time of delivery. Final settlement for protein premium was made either after the report on the sample was returned, or, in a few cases, after the grain was sold at the terminal and final protein test returned.

While equitable returns to growers are of primary concern insofar as it is practical, the handling of high protein wheat by elevators in such a way as to incur no financial loss is also important. Managers of elevators in this study have been reflected from 50 to 100 per cent of the premium amount shown on the "card." The one manager who reflected 100 per cent lost on his protein transactions and stated he would reflect a less proportion of the value the next season. Seventy-five per cent is probably a safe average.

The reasons for allowing a margin of buying safety are:

1. Tests on samples, due largely to variations in moisture content, may be slightly higher than the tests of the same grain in carload lots when received at terminals.

2. Mixing of different tests, which is so often necessary because of limited binning space and in order to make up car-load lots, often results in losing part of the premium values. This is due to the fact that there are unequal changes in premium values between different percentages of test. For example, 1,000 bushels of No. 1 Dark Northern Spring, 11% protein, at \$1,200 and another 1,000 bushels of the same grade with 13% protein at \$1,600 might sell at \$2,800 if sold separately, but when mixed, forming a 12% protein test, sells for \$2,750, resulting in a loss of \$50 due to mixing.

3. Hedging affords no protection against fluctuations in premium values. In years in which premiums are likely to be paid, high quality wheat must be specially binned and marketed later when it is assumed millers can not get all the quality needed. During the fall months sufficient amounts of high quality grain are usually marketed so that little or no premium need be paid, while later premiums may become an important consideration.

Grain Selling⁷

The following will be discussed under selling grain: Cleaning, mixing for grade, and marketing methods used.

Cleaning.⁸—Cleaning grain makes it possible to keep dockage and foreign material, and ship only the clean grain. Freight is thereby reduced and grain "conditioned." The screenings are in demand as feed for livestock, especially if ground, and furnish an additional source of revenue to the grain business. Elevators which ship grain uncleaned get very little if anything for the dockage. The amount of grain cleaned varies from year to year, depending on the amount of grain and rate of delivery to the elevator and the amount of dockage and foreign material.

The number of elevators out of the 26 which had an income from screenings were as follows: 15 for 1926-27, 14 for 1927-28, 22 for both 1928-29 and 1929-30, and 20 for 1930-31. This is indicative of the extent to which cleaners were a part of the elevator equipment.

Eleven operators out of 20 felt that clean grain brought a higher price than dirty grain, while seven did not think so, and two expressed themselves as not knowing. Out of the 26 elevators, those which had an income from cleaning seed for farmers were: Seven for 1926-27, eight for both 1927-28 and 1928-29, fourteen for 1929-30 and twelve for 1930-31. With one exception, the amount of seed cleaned was not great.

All expenses incurred in cleaning are charged to the grain business in this analysis. As already pointed out, it is impossible accurately to measure the advantages of cleaning, and thereby permit an analysis of cleaning operations not associated with the grain business.

Mixing for Grade.—Fifteen of the 26 managers reported that they practiced some mixing. In almost all cases the mixing was done when loading out by mingling streams of grain from bins of different grades. Mixing was done chiefly for two reasons, (1) to dispose of inferior grain at a higher price, and (2) with a view of raising grade. Inferior grain in limited amounts were run in with regular grain to a point where it did not lower the grade of the regular grain. Grain which falls slightly short in making a grade is occasionally mixed to raise grade. For example, wheat slightly under the test weight for a particular grade might be mixed with heavier wheat to raise the grade on the one, or if other characteristics are just right, to raise the grade on both lots.

As already pointed out mixing of wheat with varying protein tests can easily lower the value of the grain. It is, therefore, highly important to consider whether the grain has qualities for which a premium may be paid before mixing is undertaken.

Marketing Methods.—The common method of selling grain by the spring wheat elevators in the study is by consignment. Only a few sales are by other methods. Of the total shipments in 1926-27 by 22 elevators, all grain was consigned except 21 cars which were sold to mills, 10 cars sold "on track" and seven sold "to arrive." Of the total shipments in

7. For further information relative to selling, the reader is referred to Price and Arthur (12).

8. Advantages of clean grain are pointed out by Black and Boerner (3).

1927-28 by 23 elevators, all were consigned except 80 cars sold "on track," 55 sold "to arrive" and two sold locally. There were no mill sales. The one general exception to the consignment method is in the case of flax which is commonly sold "to arrive." This is due to the fact that the Minneapolis Chamber of Commerce and the Duluth Board of Trade permit elevators to sell flax "to arrive" in small lots.

Grain Hedging⁹

Income is greatly affected by hedging operations. Hedging is practiced in varying degrees of completeness by all the elevators in the study. Daily "long" and "short" statements were figured by the cooperating Federal Division of Cooperative Marketing on many of the elevators, which disclosed the fact that while some of the managers were keeping closely hedged, most of them were not. Reasons for not keeping wheat and durum closely hedged may be unintentional due to the lack of time during the rush season, to inexperience in keeping a daily "long" and "short" record, or to carelessness. It may also be intentional on the part of managers or board members not to hedge transactions in the hope of profiting by market price changes. Hedging in the case of other grains than wheat, with the exception of flax which may be sold "to arrive" in small lots, is often very imperfect protection against price changes because of the small total volumes handled and the time it takes to accumulate car-load lots.

While it is possible to balance ones position by "to arrive" or "on track" sales, or to a limited extent by contracts with farmers to purchase actual grain, these methods are not used to any great extent. Hedging by the use of futures is most commonly used. Managers who find their condition "long," signifying an excess of purchases over sales, sell futures to the nearest thousand bushels; and those who find their condition "short," signifying an excess of sales over purchases, buy futures.

Some of the managers of the elevators in the study in this way balanced their cash and future grain purchases against their cash and future grain sales daily in order to keep closely hedged. Other managers determined their position once or twice a week or even less often. Some managers placed their hedges merely on the basis of memory or impressions.

The analysis of the hedging operations in the Regional Study are summarized in Table 23, in which hard spring wheat trading gains and losses under complete hedging with futures and without hedging with futures for the years 1925-26 to 1928-29 are shown in the cases of (1) seven to eighteen elevators, and (2) one selected elevator. These results have recently been published by Benton (20). In each of the four years prices in the cash market rose during the marketing season following a more or less stabilized price during harvest. The peak of prices occurred about January in the first of the four years, about February the fourth year, in April and May the third year, and in July the second year.

9. For a general description of hedging the reader is referred to any standard agricultural marketing text, such as Clark and Weld (4). A number of informational and analytical studies in future trading have been made, some of which are listed under Literature Cited as 4, 6, 9, 10, 11, 12, 18, and 20. It is understood that The Food Research Institute of Stanford University will soon publish a study of price relations between Chicago July and September wheat futures.

Table 23-1 indicates that twelve elevators, on the average, had a gross trading profit of \$3737 as shown on their audit, as compared with \$3671 if they had been completely hedged and \$4513 if no futures had been bought or sold. Table 23-2 indicates the results obtained and estimated in the case of the selected elevator over the same four-year period. A North Dakota elevator was chosen because South Dakota was not a party to the cooperative regional study the first year. Table 23-2 indicates that this elevator had an average gross trading profit of \$2845 as taken from the audit reports, and that had this elevator been closely hedged the estimated average would have been \$2511, or \$334 in favor of the incomplete hedging as practiced. The table also indicates that an average estimated gross trading profit of \$4241 would have been obtained had no futures been bought or sold as compared with an estimated average amount of \$2511 if the elevator had been completely hedged, or \$1730 in favor of no hedging.

In order to make the figures more comparable, Table 23-2 is presented on a per bushel basis in the following tabulation. The letters at the head of the columns refer to the columns in Figure 23. Column HH is in addition. Figures are in dollars.

| Year | Gross trading profit as shown on audit | Est. gross trading profit with elev. completely hedged | Est. gross trading profit with elev. not buying or selling futures | |
|---|--|--|--|--|
| | | | Taking advantage of rising market | No profit or loss from changing market |
| | A | C | H | HH |
| Dollars per bushel of wheat handled | | | | |
| 1925-26 | .0371 | .0059 | .0771 | .0735 |
| 1926-27 | .0642 | .0717 | .0686 | .0688 |
| 1927-28 | .0579 | .0547 | .0744 | .0602 |
| 1928-29 | .455 | .0500 | .0689 | .0539 |
| Weighted Av. | .0485 | .0428 | .0723 | .0613 |
| Deviations from estimated gross trading profit with the elevator completely hedged | | | | |
| Weighted Av. | +.0057 | .0000 | +.0295 | +.0185 |

Compared with a situation of complete hedging, this tabulation indicates an estimated advantage of \$.0057 per bushel in favor of the incomplete hedging as practiced, of \$.0295 per bushel in favor of not buying or selling futures but taking advantage of a rising market, as it were in this case, and \$.0185 in favor of no buying or selling of futures if no rise in the cash market could be assumed.

In short, these data indicate that elevators which did not hedge at all or hedged only partially during a period of rising prices made gains by so doing. In an attempt to picture a situation of falling prices, the results for Elevator No. 12 were refigured using the 1929-30 prices with the same monthly dates for the various cash and future transactions. The weighted average estimates which resulted for the four years for columns A, C, H and HH were \$.0485, \$.0567, \$.0342 and \$.0462 per bushel, respectively. From this it will be seen that the estimated gross trading profit was greatest when the elevator was completely hedged. Complete hedging shows an advantage of \$.0082 per bushel over incomplete hedging as actually practiced, an advantage of \$.0225 over no buying or selling of futures but taking the losses of a falling cash market, and an advantage of \$.0105 over no buying or selling of futures when assuming no price changes in the cash

market between the time of buying and selling of the cash grain. In this assumed situation, using the falling prices which occurred in 1929-30, we find that hedging saved the elevator estimated amounts which correspond closely with the amounts shown above in favor of no hedging and partial hedging on a rising market.

We may assume from the figures that over a period of years, there would be very little difference in gross trading profit per bushel with 100 per cent hedging and with no hedging in the case of the elevators in the study. The losses possible in any one year, however, the results of no hedging, could easily be great enough to seriously cripple an elevator or even render it insolvent. With large surpluses, which are not the general rule in the case of farmers' elevators, losses of a single year might be taken care of, but there is always the danger of repeated losses over a series of years, in which case even large surpluses may be wiped out. Large losses also affect confidence and loyalty among members and patrons. Not only may ruinous results be reflected in current financial statements but, it can be assumed, future financial statements may be affected by a falling off in business, the result of reduced patronage. It would appear that the safe policy for cooperative wheat elevators in South Dakota, which are similar to those included in the study, would be to keep closely hedged at all times. Close hedging would tend to protect trading margins and stabilize incomes.

Benton (20) indicates that most of the elevators in the regional study hedged but did not hedge closely. To be considered closely hedged an elevator had to be under 1000 bushels average "long" or "short." In the case of hard spring wheat, 67 per cent of 15 cases in 1925-26, 72 per cent of 18 cases in 1926-27, 78 per cent of 9 cases in 1927-28 and 57 per cent of 7 cases in 1928-29 were not closely hedged.

It is needless to say that an elevator which trades in futures only in a limited way and does not attempt to balance its purchases and sales is speculating. For example, an elevator which buys much grain from farmers and sells only a limited amount in the futures market, in the absence of other sales, is thereby speculating. It is speculating to no less extent than an elevator which has little actual wheat but trades extensively in the futures market. It can logically be assumed that the practice of speculating in a cooperative business is undesirable. Robotka (14) reports:

Many a manager has lost his position and has been more or less discredited because of speculative operations which resulted disastrously, in spite of the fact that the board of directors may have dictated the policy. The chief argument against speculative operations, however, is that no rational technique is available for carrying on such operations. And until the country handling of grain is reduced to some rational basis, progress in the direction of building a grain merchandising system on a cooperative basis cannot be hoped for.

In order to keep closely hedged at all times it is necessary (1) to keep complete and up-to-date records of purchases and sales of grain and futures, and (2) hedge completely and promptly, closing out futures as early as possible in advance of their expiration date.

Storing¹⁰ and Handling

Instead of selling their grain outright to the elevator, farmers may take a storage ticket when they deliver their grain and sell it later, or they may consign their grain paying the local elevator for loading it out. All the elevators in the study stored grain for farmers every year and, during the last five years of the study, most of them handled some grain for the state pool organization. Very little grain was loaded for farmers by these elevators aside from that which was handled for the pool members.

Most of the elevators find it necessary to ship and sell stored grain because of limited space. The usual practice is for the operator to buy an equal number of bushels of the same kind of grain on the exchange for future delivery. When the storage tickets are presented and the grain is purchased from the farmers, futures are sold to cancel the futures which were purchased at the time the stored grain was sold. Twelve managers out of 20 reported that it was necessary for them every year to ship and sell stored grain before purchasing. All managers stated that they had to do it part of the time. All reported that they hedged stored grain which they sold.

Eight managers out of 20 reported that their local storage facilities were ample in some years and that it was not necessary under those conditions to sell stored grain prior to purchase. These elevators tried to hold back a sufficient quantity of grain to cover their storage liability.

Managers reported no special binning of stored grain nor any terminal storing, except terminal storing of flax for which no charge was made.

The storing of grain for farmers involves not only the expense to the elevator of insurance and bonds, tickets, auditing, etc., but subjects the elevator to possible losses from "spreads" when stored grain is sold and hedged. Seven elevator managers expressed themselves as losing on their storage operations while three felt that they made a slight gain over a period of years.

All managers reported that they tried to charge the full legal storage rates. In actual practice many did not start the charges promptly, some made adjustments depending upon patronage, and some waived collectable charges because of competitive conditions. By failing to charge full storage, operators either are not offsetting the costs incident to storing, or they are foregoing a possible net income. It may be reasoned, moreover, that farmers who store their grain on their own farms help pay the storage charges on the grain stored by farmers at the elevator if full storage charges are not collected.

About half the managers reported that they thought farmers, after paying storage charged, lost by storing their grain in local elevators. Such observations as were made in connection with working with the storage records indicated that farmers surely do not sell at peak or near peak prices. Local custom and the necessity of meeting certain financial obligations are probably more important factors than relatively high prices in determining the time of selling stored grain by farmers.

10. Kuhrt (10) published information on storage operations in the regional spring wheat area study for the 1924-25 year. Price and Arthur (12) give an extended discussion on storing for farmers.

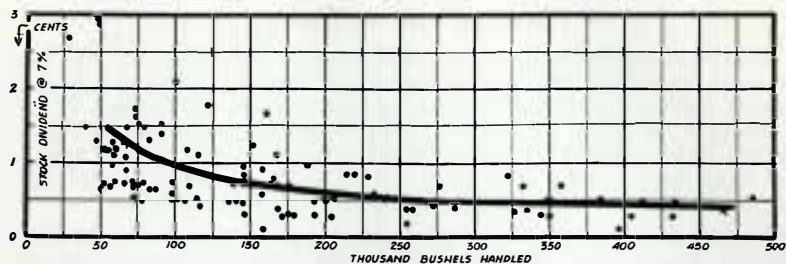


Chart 25.—Relation between volume handled and dividends at 7 per cent on capital stock, for four years, 1927-28 to 1930-31.

Grain handling for the account of others was limited almost entirely to the state pool organization, which controlled between 1 and 5 per cent of the total bushels handled by the elevators in the study. During the five years from 1926-27 to 1930-31, they handled 1 per cent or less for two years, 2 per cent for one year, 3 per cent for one year and about 5 per cent in their best year. Some elevators, because of such factors as limited volume, made more money handling grain for the pool than they did by buying and selling on their own account, while others with large volume and good management, etc., either just made expenses or lost money in the handling of the grain for pool members.

In view of the facts that the amount of pool grain handled was not great in proportion to the total amount handled by the elevators in the study, and that any real differences between the handling margin of the elevator and the margin allowed by the pool organization would probably be lost in average figures, it is assumed that averages of net income by bushel-volume groups were not affected when considered on the per bushel or per dollar basis by the handling of grain for the pool membership.

In all the sections of this bulletin, expenses and incomes having to do with storing and handling have been distributed to the various grain accounts concerned and are reflected in their quantitative expressions.

Profits From Grain Operations

In this section net income from grain is corrected by the computed fiscal charge for the use of capital which is estimated as primarily assignable to the grain business.

The most common profit from grain trading by elevators handling between 300 and 400 thousand bushels was more than 2 cents and less than 4 cents per bushel. All other volume groups together with the total of all volumes had less than 2 cents as modal.

Chart 25, based on 104 records and constructed on the four-year basis, 1927-28 to 1930-31, indicates that computed dividends per bushel handled, declined most rapidly as volume increased up to about 75 thousand bushels, and less rapidly until about 175 thousand bushels, after which the rate of decrease changed little. In other words, the extremely low grain-volume

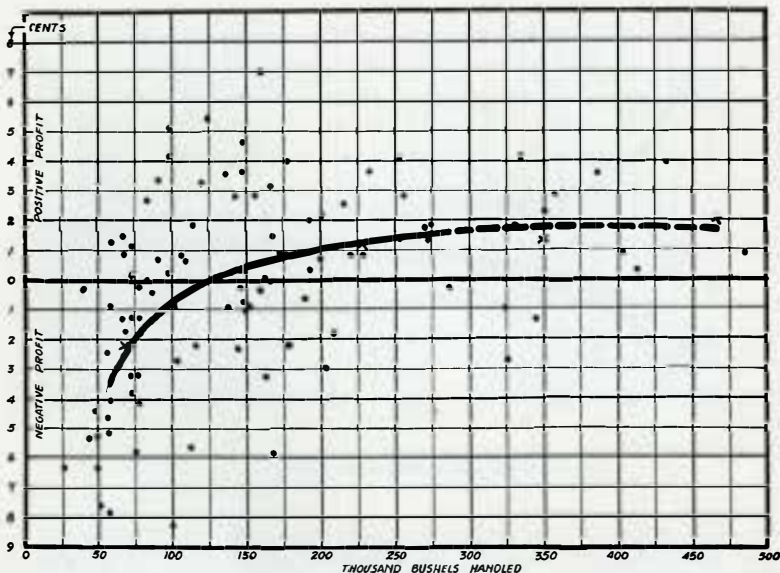


Chart 26.—Relation between volume handled and profit, for four years, 1927-28 to 1930-31.

elevators had a capital overhead item per-bushel which was much greater than the larger size elevators.

Chart 26, also based on 104 records and constructed on the 1927-28 to 1930-31 basis, presents the relation between volume handled and economic profit per bushel from handling grain. Elevators handling less than about 130 thousand bushels of grain tended to operate at a loss per bushel, the smaller the elevator, the greater the likelihood of loss. Economic profit per bushel tended to increase with increased volume up to about 275 thousand bushels, beyond which point definite generalizations were not assumed because of the limited number of cases. The curve is shown by a broken line beyond the 275 thousand-bushel point.

Economic profit takes into consideration all of the other measurements of effectiveness. Under competitive conditions, economic profits year after year indicate a high degree of successfulness. These profits may be due to an efficient arrangement of adequate buildings and equipment, good local conditions, good management and labor, a minimum of capital investment, or a particular combination of these factors.

The study has implied that increased business would tend to reduce costs and increase profits. The fact that we have many elevators above the curve on Chart 26 with relatively high positive profits is proof that small sized elevators may have high profits per bushel. On the other hand, we have cases of large elevators which have relatively low profits.

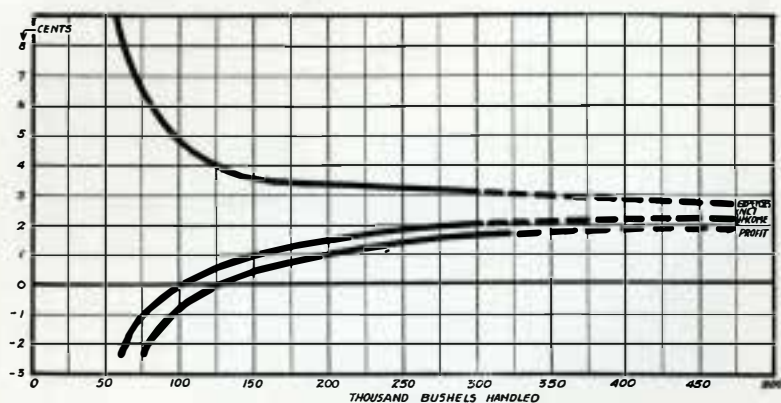


Chart 27.—Relation between volume handled and expense, net income, and profit, for four years, 1927-28 to 1930-31.

In other words, while volume has been considered in relation to the various measurements, it would be wrong to assume that all managers ought to run large or moderately large businesses. Increasing volume might not be feasible for two reasons. First, it is altogether probable that managers differ in their capacity for handling a certain size of business, and if the volume was increased materially, costs could increase to such an extent that total profits would be reduced. Second, location factors might limit volume or make increased volume undesirable. Factors having to do with location would include competition in the area, size of area served, and roads, and the number of people in the area. Under certain competitive conditions, for example, it could be assumed that additional volume could be obtained only in paying higher prices than the value of the grain would warrant.

Theoretically patronage dividends can be paid only in the event that there is an economic profit. Actually, capital is often depleted in order to pay dividends. Managers can not determine the exact amount to charge for handling grain. The safe practice is to operate on a sufficiently wide margin so as to have some economic profit at the end of the year. Whether the amount in excess of actual costs are paid at the scale or at the end of the year should make little difference to farmers because either way they obtain all the grain is worth less expenses of handling under the particular operating conditions. Payment of patronage dividends encourages loyalty and tends to increase business when and where such payment is possible.

Emphasis thus far in this grain analysis has been placed upon the relative rates of change in a single curve. Chart 27 indicates the relationships between the three important curves—expense, net income and profit. Decreasing expenses per bushel are here shown associated with increasing net income per bushel as volume increases; and economic profit is shown to increase in proportion to the difference between net income and computed dividends per bushel.

Enterprises Supplementary to the Grain Business

Most of the elevators in the spring wheat area have supplemented the earnings of the grain business with a general sideline business, some have added special lines such as gasoline, lumber, or hardware, while several are rendering services such as handling livestock, grinding, etc. In this section of the bulletin the demand and relative profitableness of the various supplements to the grain business in the spring wheat area are discussed.

The advantage of added business volume, especially in the case of small-volume elevators, has been repeatedly inferred. Added business volume is possible and desirable, under many conditions, by the addition of sidelines. If, however, sidelines are added with a view of increasing total dollars of business, they should be handled with an economic profit. Large losses are taken annually by unwise extension of credit. Losses incurred due to too liberal credit should not be confused with sound business opportunities in building up volume with sidelines. Close scrutiny of accounts by members of the board of directors at their regular meetings, and the limiting of credit to patrons, is doing much to strengthen the sideline situation. Some elevators are charging interest on their open accounts to offset the cost of borrowed capital. Some elevators have two charges, one "on time" and the other cash. Some are on a strictly cash basis. Unwise buying on the part of the operator also serves to tie up funds. Commission companies which are advancing money for the purchase of grain do not like to feel that they are financing sideline operations in which capital is tied up in credit sales and in stocks on hand.

As already pointed out, expenses assigned to the grain business were those which had to do with the buying and selling and physical handling of grain. In the case of sideline expenses, they consist of those expenses which are assumed in addition to the grain business. If the manager can handle flour, for example, without hiring extra help, no labor is charged to flour. On the other hand, if an extra building is provided in which to store flour, the depreciation, etc., is an extra expense to the flour account. Likewise, interest on the capital used in the sideline operations, is a direct charge against sidelines. One sideline could easily be more profitable than another due to the length of time capital is tied up.

General Sidelines

Chart 28 shows the percentage distribution of total sales of general sidelines for the five year period, 1926-27 to 1930-31. It indicates that 71 per cent of the total sideline sales by all elevators was coal, 12 per cent flour and feed, 9 per cent twine, 2 per cent salt, 1 per cent each for fencing and tankage, and 4 per cent miscellaneous. The chart indicates that the average amount of coal handled by an elevator was \$1,379, flour and feed \$305, twine \$256, salt \$122, fencing \$190 and tankage \$123.

Chart 29a, which is an insert on Chart 29b, shows the gross income and net income per dollar of total general sidelines sales. The gross income averaged \$.097 and expense \$.045, leaving a net income of \$.052 per dollar of total general sidelines sales. Considering that the expense

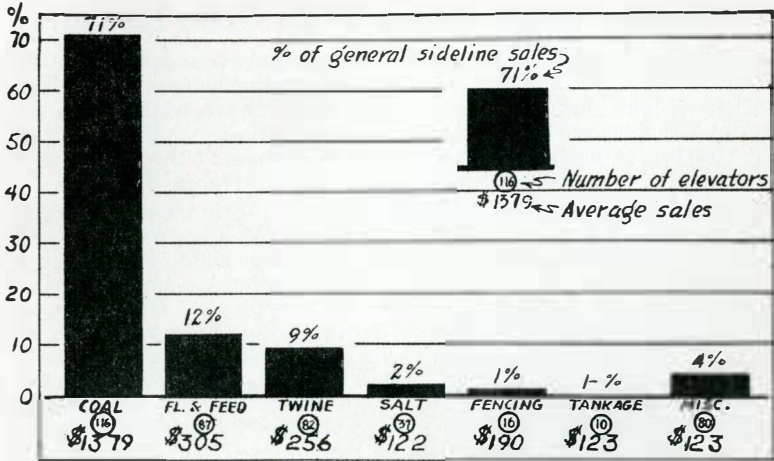


Chart 28.—Percentage distribution of total sales of general sidelines, 1926-27 to 1930-31.

charged to the handling of these sidelines consists of only extra expenses, this return is extremely low. It would appear that general sidelines were handled too frequently merely as accommodation items in order to attract grain trade. Whereas this might logically be a motive in handling general sidelines, managers and boards of directors should not confuse this with the profit motive. It would appear that here is an opportunity for elevators handling small volumes of grain to add income-yielding lines. All elevators, where local conditions seem to justify, might well utilize the elevator facilities and manager's time by handling some general sidelines. It might conceivably be advisable to add other lines than those handled by the elevators in this study.

Once the expenses chargeable to grain were determined it was a comparatively easy matter to separate general sidelines and special sidelines and determine the net income for each group. However, no attempt has been made to determine net income per dollar of sales for each separate sideline. Chart 29b shows the gross income, without the extra expenses deducted, which serves to indicate relative profitableness. The gross income per dollar of sales in each case was as follows, coal 11 cents, flour and feed 6 cents, twine 9 cents, salt 15 cents, fencing 9 cents, tankage 8 cents and miscellaneous 9 cents per dollar of total general sideline sales. In order to compare these as to profitableness it is of course necessary to consider gross income per dollar in connection with quantity sold as given above. The number of elevators selling each sideline is shown in circles at the base of the bars on Chart 29b.

Chart 30 shows the distribution of the 116 elevators handling coal over five years according to gross incomes from coal sales. It will be observed that 69 elevators, or about 50 per cent, had gross incomes between 8 and 14 cents, and 87 elevators, or about 75 per cent, had gross incomes between 8 and 16 cents per dollar of sales.

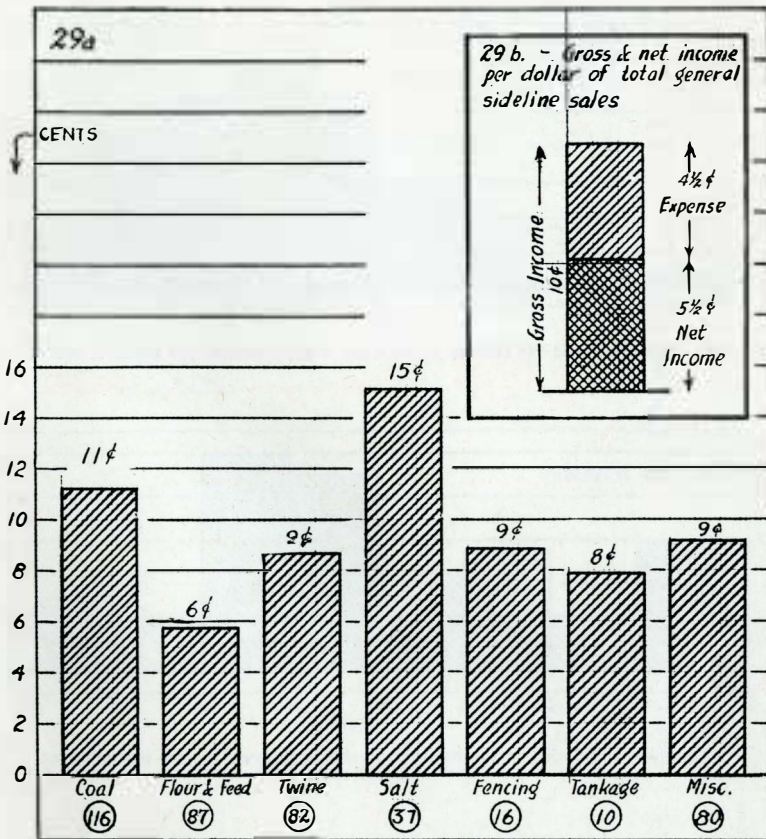


Chart 29a.—Gross income per dollar of sales from the various general sidelines, 1926-27 to 1930-31.

Chart 29b.—Gross and net income per dollar of total general sideline sales. Insert on Chart 29a.

Chart 31 shows the distribution of 87 elevators according to flour and feed gross incomes. In this case, 38 elevators, or about 44 per cent, had a gross income between 6 and 10 cents, and 12, or about 14 per cent of the elevators, had a negative gross income per dollar of sales of flour and feed.

Chart 32 shows the distribution of 83 elevators according to gross income per dollar of twine sales. Here it will be observed that most of the elevators operate with a gross income between 4 cents and 12 cents per dollar of sales.

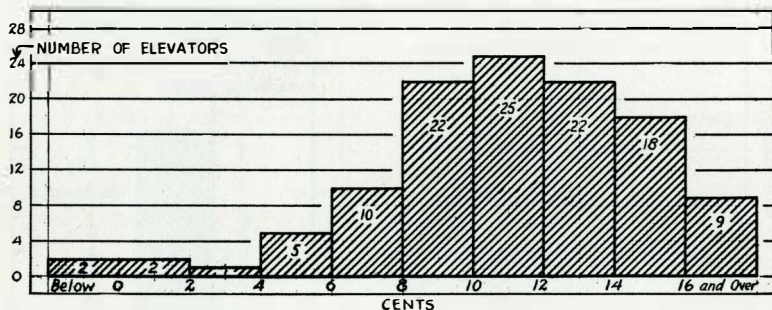


Chart 30.—Distribution of 116 elevators according to gross income per dollar of coal sales.

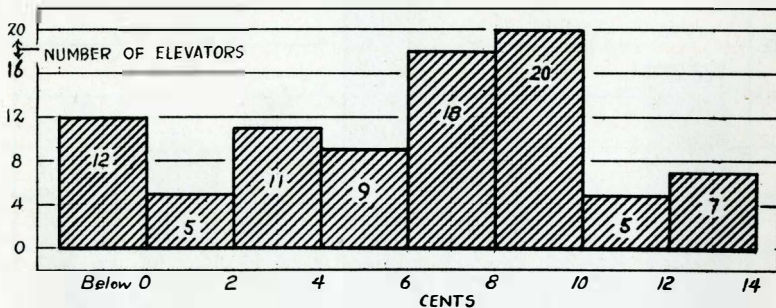


Chart 31.—Distribution of 87 elevators according to gross income per dollar of flour and feed sales.

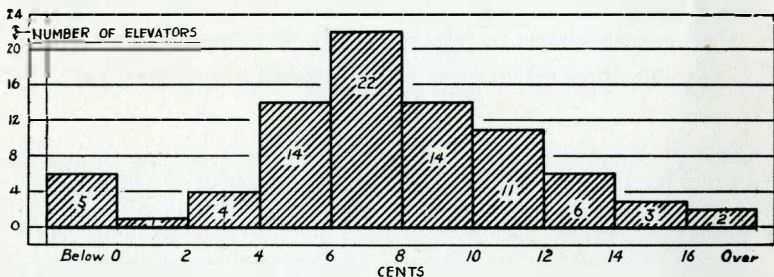


Chart 32.—Distribution of 79 elevators according to gross income per dollar of twine sales.

Special Sidelines

Chart 33 shows the percentage distribution of total sales of special sidelines. The gasoline-oil business leads in importance with 78 per cent of the total special sideline sales; the implement-hardware business is next with 16 per cent, and lumber last with 5 per cent. This considers the five-year period, 1926-27 to 1930-31. There were seven elevators handling gasoline and oil at the close of the study, with a five-year annual average of five elevators; two handling implements and hardware at the close of the study, with a five-year annual average of 3.6, and one handling lumber at the close of the study, with a five-year annual average of 1.6. The average amount of business per year per sideline business was \$4,847 for gasoline and oil, \$1,485 for implements and hardware, and \$977 for lumber.

The gross income and net income per dollar of total special sideline sales are as follows: The gross income averages \$.15 per dollar of sales, with expense at \$.077 (interest not included with expense deductions), and net income at \$.073 per dollar of total special sideline sales. The expense charged to these various special sidelines are again only the extra charges in addition to the regular grain business expenses.

The gasoline-oil business shows a gross income of \$.178, the implement-hardware business \$.149, and the lumber business \$.150 per dollar of total sales.

Froker and Price (8) report that it is common in Minnesota for oil to be handled by separate associations rather than through farmers' elevators. The number of associations in that state increased from one in 1921 to 48 in 1928. The average volume of sales of four of the oldest companies increased from \$44,163 in 1922 to \$179,021 in 1927. The study showed the average total investment, including cash on hand, of the 13 companies for which detailed records were available, to range from \$10,000 to \$60,000. These Minnesota companies sell at prevailing prices and give to their members the benefit of wholesale buying through patronage dividends according to cooperative principles. The average patronage refunds of 40 associations amounted to 10.3 per cent in 1927. These refunds were net amounts after allowances were made for operating expenses, special reserves and 8 per cent interest on capital stock. Froker and Price (8) report regarding elevators handling gasoline as follows:

Only six farmers' elevators in Minnesota operated bulk stations and tank wagons during 1927. The retailing of gasoline and the handling of grain are two separate businesses and the labor and capital demands of the one fail to supplement those of the other. The peak load periods of the two come at the same time of the year and the building and equipment demands are entirely different. Separate employees must be hired to operate the delivery trucks and even separate managers for the two enterprises may be necessary.

Bell (1), on the other hand, reports:

Tractor farmers in Montana make heavy use of gas and oil in the spring and summer months when spring seeding and summer tillage are under way. This is a season of the year when the elevator manager has little to do. Furthermore, the two farmers' elevators which sell petroleum products really operate their oil stations as separate businesses with separate operators who are responsible to the elevator managers. Certain advantages might accrue to such an arrangement

whereby the oil business starts as a part of a going concern rather than as a new enterprise. The good will of the elevator company helps the new undertaking to get started.

Separate managers were engaged and separate employees hired to operate the delivery trucks in the case of most of the South Dakota elevators in the study. The gasoline business was handled either as a subsidiary of the cooperative grain elevator or as an independent department which had to stand on its own feet.

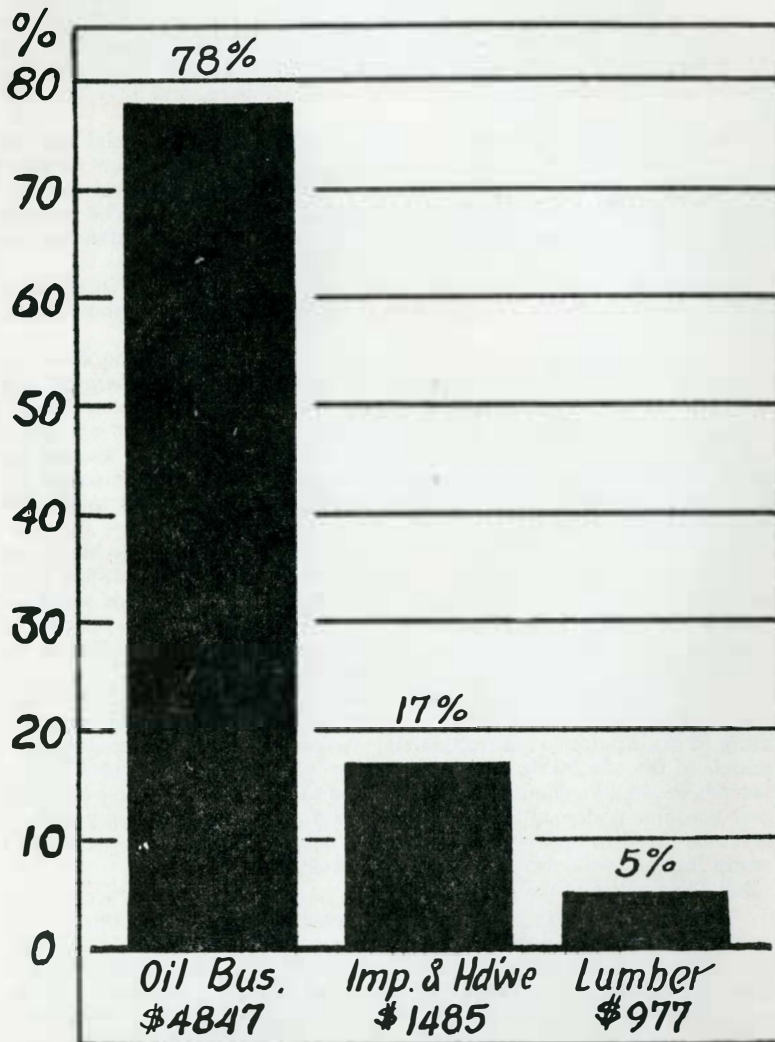


Chart 33.—Percentage distribution of total sales of special sidelines, 1926-27 to 1930-31.

The handling of general sidelines usually permits of the better utilization of elevator plant and labor and incurs little additional expense. This is not the case, however, with special sidelines. The gasoline, hardware and lumber businesses require considerable additional capital outlay for specialized facilities. They also require special skill on the part of the operator and may necessitate the hiring of additional help. These facts should be taken into consideration in comparing general and special sideline possibilities. It is highly important, also, to recognize the relative rates of capital turnover in figuring interest on operating capital. The figures on gross income show up reasonably well for hardware and lumber as compared with gasoline and oil from the point of view merely of margin. However, the same capital is used over again many times in the case of the gasoline-oil business when it is used only once in the case of the other two special sidelines. Cooperative elevators have been going into the oil business during the last five years, and have been going out of the hardware and lumber business. This should be somewhat indicative of the relative possibilities in the different lines.

Services and Miscellaneous

Additional net income is shown on Charts 6a and 6b for the various elevators. While this general head does not include any products which are bought and sold, incomes are related to total elevator sales in order to place them on a denominator so as to make them readily comparable.

Items included as miscellaneous are all net amounts, expenses having been deducted. This is because complete expenses were not available, most of the items being shown on the audit reports only as net amounts.

Under miscellaneous additional incomes are included two important sources of income, the handling of livestock and grinding. Such general items are also included as returns on investments, amounts recovered on accounts charged off as non-collectable, and payment of old railroad claims, besides truck earnings, rent, and miscellaneous adjustment items.

Livestock handling, and grinding are often classed as sidelines, but they are included with services in this study because they are not concerned primarily with the purchase and sale of supplies. Livestock may be handled with practically no additional cash outlay for equipment and usually little or no extra labor. The livestock is consigned to the market without purchase by the elevator and commissions are deducted before making returns to growers. Livestock handling presents an opportunity for additional income to trading where there is a need for cooperative livestock marketing.

Five elevators out of the 26 had grinding equipment by the close of the study. All cases showed a substantial net income after allowing all possible deductions. Actual figures on expenses and net incomes are not given here because grinding is a new undertaking by the elevators in the study and the conditions under which the grinding is done are so different that it was felt that the figures obtained were not representative.

Most of the service items included, other than livestock handling and grinding, are more or less incidental. One of the important services not mentioned, because it is difficult to evaluate quantitatively, is the introduction into the community of good seed which is adapted to the area. The introduction of such seed tends to improve the quality of grain produced and reduce the number of varieties necessary to be handled by the elevator.

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TABLE 1.—Bushel volumes* by elevators, 1921-22 to 1930-31
(Figures in thousand bushels)

| Elevator number† | Averages | | | Fiscal Years | | | | | | | | | |
|---------------------|-------------|----------------|----------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 10 years | 1st 5 years | 2nd 5 years | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 | 1930-31 |
| | All elev. | 154 | 163 | 146 | 92 | 152 | 158 | 218 | 194 | 62 | 236 | 166 | 118 |
| 1 | 61 | 71 | 51 | 62 | 63 | 78 | 86 | 68 | 20 | 78 | 50 | 51 | 56 |
| 2 | 62 | 70 | 55 | 41 | 44 | 70 | 85 | 109 | 17 | 97 | 51 | 40 | 68 |
| 3 | 74 | 88 | 59 | 438 | 83 | 128 | 129 | 63 | 37 | 90 | 73 | 47 | 47 |
| 4 | 64 | 68 | 60 | 38 | 67 | 108 | 114 | 12 | 19 | 142 | 58 | 28 | 54 |
| 5 | 81 | 97 | 65 | 95 | 102 | 120 | 110 | 56 | 28 | 135 | 48 | 58 | 58 |
| 6 | 115 | 155 | 75 | 56 | 132 | 140 | 179 | 267 | 44 | 99 | 109 | 58 | 68 |
| 7 | 90 | 103 | 76 | 62 | 100 | 98 | 134 | 122 | 31 | 99 | 103 | 75 | 73 |
| 8 | 90 | 97 | 82 | 63 | 110 | 116 | 164 | 34 | 22 | 148 | 58 | 66 | 116 |
| 9 | 78 | 65 | 91 | 15 | 85 | 44 | 95 | 86 | 61 | 159 | 83 | 77 | 75 |
| 10 | 89 | 80 | 99 | 8 | 86 | 65 | 149 | 93 | 57 | 179 | 73 | 82 | 102 |
| 11 | 126 | 148 | 104 | 94 | 96 | 138 | 158 | 253 | 29 | 194 | 158 | 66 | 73 |
| 12 | 164 | 218 | 111 | 182 | 237 | 180 | 252 | 239 | 66 | 146 | 162 | 106 | 73 |
| 13 | 148 | 164 | 128 | 141 | 137 | 183 | 163 | 198 | 24 | 254 | 192 | 113 | 77 |
| 14 | 151 | 173 | 128 | 64 | 209 | 101 | 281 | 210 | 67 | 172 | 179 | 86 | 138 |
| 15 | 101 | 71 | 131 | 15 | 85 | 60 | 99 | 97 | 65 | 273 | 148 | 90 | 79 |
| 16 | 125 | 96 | 154 | 74 | 119 | 69 | 79 | 137 | 70 | 232 | 167 | 155 | 145 |
| 17 | 136 | 110 | 162 | 27 | 141 | 102 | 188 | 90 | 84 | 255 | 200 | 121 | 150 |
| 18 | 195 | 207 | 183 | 67 | 129 | 212 | 331 | 294 | 161 | 215 | 221 | 166 | 152 |
| 19 | 206 | 222 | 191 | 101 | 171 | 230 | 263 | 344 | 33 | 335 | 200 | 117 | 270 |
| 20 | 211 | 227 | 195 | 110 | 176 | 235 | 279 | 338 | 33 | 387 | 333 | 121 | 101 |
| 21 | 167 | 140 | 195 | 40 | 148 | 162 | 189 | 159 | 89 | 286 | 254 | 167 | 178 |
| 22 | 282 | 365 | 199 | 190 | 319 | 458 | 541 | 317 | 80 | 400 | 146 | 168 | 204 |
| 23 | 247 | 268 | 225 | 173 | 313 | 373 | 290 | 193 | 79 | 350 | 207 | 161 | 325 |
| 24 | 269 | 296 | 242 | 197 | 310 | 152 | 393 | 429 | 81 | 433 | 229 | 189 | 276 |
| 25 | 367 | 372 | 362 | 296 | 309 | 299 | 544 | 415 | 234 | 357 | 412 | 321 | 486 |
| 26 | 316 | 257 | 375 | 150 | 168 | 184 | 367 | 416 | 74 | 624 | 403 | 344 | 432 |

* Bushel volumes = sales $-\frac{1}{2}$ opening inventory $+\frac{1}{2}$ closing inventory.

† Sequence based on bushel-volumes of last 5 years.

TABLE 2a.—Dollars* of total sales by elevators, 1921-22 to 1930-31
(Figures in thousand dollars)

| Elevator number† | Averages‡ | | | Fiscal Years | | | | | | | | | |
|---------------------|-------------|----------------|----------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 10 years | 1st 5 years | 2nd 5 years | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 | 1930-31 |
| All elev. | 174 | 176 | 172 | 104 | 168 | 166 | 233 | 212 | 89 | 263 | 185 | 149 | 176 |
| 1 | 62 | 71 | 53 | 65 | 63 | 75 | 83 | 69 | 27 | 84 | 51 | 47 | 55 |
| 2 | 74 | 66§ | 57 | — | — | — | 81 | 102 | 23 | 96 | 52 | 44 | 71 |
| 3 | 90 | 101 | 80 | 52 | 96 | 129 | 137 | 91 | 41 | 113 | 99 | 73 | 71 |
| 4 | 71 | 68§ | 65 | — | — | 109 | 113 | 13 | 21 | 140 | 64 | 40 | 58 |
| 5 | 72 | 85 | 59 | 84 | 90 | 104 | 95 | 50 | 28 | 101 | 49 | 56 | 59 |
| 6 | 119 | 157 | 81 | 65 | 141 | 140 | 179 | 259 | 62 | 111 | 98 | 68 | 68 |
| 7 | 93 | 107 | 79 | 70 | 104 | 102 | 134 | 123 | 41 | 96 | 94 | 82 | 82 |
| 8 | 96 | 106 | 86 | 67 | 117 | 125 | 172 | 48 | 55 | 134 | 58 | 70 | 116 |
| 9 | 103 | 86 | 121 | 31 | 107 | 60 | 123 | 112 | 78 | 202 | 122 | 109 | 93 |
| 10 | 104 | 91 | 117 | 12 | 98 | 73 | 165 | 107 | 108 | 195 | 88 | 91 | 106 |
| 11 | 124 | 143 | 105 | 92 | 98 | 132 | 152 | 239 | 33 | 181 | 146 | 84 | 82 |
| 12 | 187 | 243 | 131 | 198 | 261 | 200 | 288 | 270 | 83 | 181 | 181 | 123 | 85 |
| 13 | 119 | 133 | 106 | 115 | 114 | 147 | 132 | 158 | 34 | 186 | 144 | 101 | 66 |
| 14 | 142 | 162 | 123 | 63 | 184 | 100 | 262 | 200 | 86 | 157 | 157 | 86 | 131 |
| 15 | 118 | 81 | 155 | 23 | 95 | 69 | 108 | 113 | 68 | 315 | 173 | 115 | 106 |
| 16 | 151 | 116 | 187 | 91 | 141 | 87 | 99 | 162 | 89 | 290 | 201 | 188 | 169 |
| 17 | 163 | 131 | 195 | 36 | 167 | 124 | 219 | 107 | 110 | 303 | 223 | 145 | 195 |
| 18 | 226 | 231 | 222 | 78 | 148 | 228 | 368 | 334 | 220 | 246 | 237 | 206 | 200 |
| 19 | 218 | 217 | 220 | 105 | 171 | 221 | 256 | 332 | 53 | 361 | 227 | 166 | 291 |
| 20 | 261 | 224§ | 209 | — | — | — | 285 | 344 | 67 | 390 | 305 | 147 | 135 |
| 21 | 218 | 178 | 259 | 61 | 187 | 202 | 236 | 203 | 125 | 387 | 307 | 225 | 249 |
| 22 | 301 | 379 | 224 | 214 | 330 | 462 | 548 | 342 | 117 | 403 | 172 | 209 | 219 |
| 23 | 319 | 301 | 337 | 201 | 339 | 384 | 311 | 269 | 172 | 472 | 342 | 297 | 402 |
| 24 | 300 | 326 | 274 | 229 | 343 | 179 | 420 | 462 | 107 | 446 | 261 | 233 | 320 |
| 25 | 313 | 315 | 312 | 255 | 265 | 258 | 449 | 349 | 213 | 321 | 349 | 268 | 409 |
| 26 | 368 | 295 | 442 | 182 | 199 | 207 | 416 | 473 | 104 | 770 | 475 | 394 | 466 |

* See page 12 for method used to determine dollars of grain sales.

† Sequence based on dollar-volumes of last 5 years.

‡ Average of 23 elevators only, because records were not available for all 10 years in case of 3 elevators.

§ Estimated, not included in averages for all elevators.

TABLE 2b.—Dollars* of grain sales by elevators, 1921-22 to 1930-31
(Figures in thousand dollars)

| Elevator number† | Averages | | | Fiscal Years | | | | | | | | | |
|------------------|----------|-------------|-------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 10 years | 1st 5 years | 2nd 5 years | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 | 1930-31 |
| All elev. | 146 | 152 | 140 | 85 | 143 | 147 | 204 | 182 | 59 | 229 | 154 | 115 | 144 |
| 1 | 53 | 61 | 44 | 53 | 54 | 66 | 73 | 58 | 16 | 72 | 42 | 42 | 51 |
| 2 | 53 | 59 | 48 | 35 | 38 | 59 | 72 | 93 | 13 | 87 | 44 | 34 | 62 |
| 3 | 57 | 68 | 45 | 29 | 64 | 98 | 100 | 48 | 21 | 63 | 60 | 40 | 43 |
| 4 | 54 | 56 | 52 | 31 | 55 | 89 | 94 | 10 | 10 | 122 | 51 | 26 | 49 |
| 5 | 66 | 79 | 52 | 78 | 84 | 99 | 90 | 46 | 22 | 93 | 40 | 50 | 54 |
| 6 | 106 | 143 | 68 | 52 | 122 | 129 | 165 | 246 | 44 | 98 | 85 | 56 | 59 |
| 7 | 80 | 93 | 67 | 56 | 90 | 88 | 121 | 110 | 29 | 84 | 82 | 69 | 73 |
| 8 | 88 | 97 | 78 | 62 | 109 | 116 | 163 | 34 | 26 | 128 | 54 | 68 | 116 |
| 9 | 86 | 71 | 101 | 16 | 93 | 48 | 104 | 94 | 60 | 182 | 101 | 84 | 79 |
| 10 | 100 | 86 | 113 | 9 | 92 | 69 | 158 | 100 | 103 | 186 | 84 | 87 | 103 |
| 11 | 113 | 133 | 92 | 84 | 86 | 124 | 142 | 227 | 21 | 164 | 134 | 71 | 72 |
| 12 | 167 | 220 | 113 | 183 | 239 | 182 | 255 | 241 | 61 | 159 | 162 | 107 | 74 |
| 13 | 112 | 124 | 99 | 106 | 104 | 138 | 123 | 149 | 28 | 175 | 135 | 94 | 62 |
| 14 | 124 | 143 | 104 | 53 | 173 | 84 | 233 | 174 | 63 | 139 | 140 | 68 | 113 |
| 15 | 105 | 73 | 138 | 16 | 87 | 62 | 101 | 99 | 55 | 300 | 153 | 95 | 86 |
| 16 | 137 | 104 | 169 | 81 | 130 | 75 | 86 | 149 | 74 | 268 | 180 | 167 | 158 |
| 17 | 154 | 125 | 183 | 31 | 161 | 116 | 214 | 103 | 107 | 296 | 216 | 131 | 167 |
| 18 | 181 | 193 | 169 | 62 | 120 | 198 | 309 | 274 | 159 | 187 | 185 | 159 | 152 |
| 19 | 192 | 205 | 179 | 93 | 158 | 212 | 243 | 318 | 25 | 317 | 184 | 123 | 248 |
| 20 | 199 | 218 | 179 | 105 | 169 | 225 | 267 | 324 | 36 | 363 | 280 | 121 | 91 |
| 21 | 199 | 166 | 231 | 48 | 176 | 193 | 225 | 189 | 109 | 361 | 283 | 195 | 209 |
| 22 | 261 | 339 | 184 | 176 | 296 | 425 | 502 | 294 | 69 | 355 | 134 | 170 | 193 |
| 23 | 231 | 250 | 212 | 161 | 292 | 348 | 271 | 180 | 70 | 339 | 196 | 151 | 305 |
| 24 | 264 | 290 | 239 | 193 | 303 | 149 | 384 | 420 | 70 | 409 | 224 | 198 | 295 |
| 25 | 281 | 284 | 277 | 226 | 236 | 228 | 415 | 317 | 178 | 289 | 315 | 230 | 373 |
| 26 | 340 | 271 | 410 | 158 | 177 | 194 | 387 | 438 | 67 | 729 | 443 | 365 | 446 |

* See page 12 for method used to determine dollars of grain sales.

† Sequence based on dollar-volumes of last 5 years.

TABLE 3a.—Income*, expense†, and net income per dollar of total sales, by elevators, 1921-22 to 1925-26
(Figures in dollars)

| Elevator number‡ | 5-year average§ | | | 1921-22 | | | 1922-23 | | | 1923-24 | | | 1924-25 | | | 1925-26 | | |
|------------------|-----------------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|
| | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income |
| All elev. | .073 | .048 | .025 | .082 | .072 | .010 | .076 | .041 | .034 | .063 | .044 | .019 | .072 | .035 | .038 | .070 | .047 | .023 |
| 1 | .079 | .054 | .024 | .146 | .049 | .097 | .043 | .058 | -.015 | .061 | .042 | .019 | .083 | .050 | .033 | .061 | .073 | -.011 |
| 2 | .084# | .063# | .021# | | | | | | | | | | .094 | .066 | .028 | .073 | .059 | .014 |
| 5 | .071 | .041 | .030 | .059 | .039 | .020 | .085 | .037 | .048 | .070 | .029 | .040 | .056 | .044 | .011 | .087 | .059 | .029 |
| 4 | .140# | .097# | .043# | | | | | | | .117 | .047 | .071 | .082 | .050 | .032 | .220 | .194 | .026 |
| 7 | .034 | .051 | -.017 | -.011 | .056 | -.068 | .053 | .040 | .014 | .065 | .045 | .021 | .097 | .046 | .052 | -.034 | .070 | -.104 |
| 3 | .108 | .070 | .039 | .161 | .119 | .043 | .110 | .071 | .039 | .073 | .057 | .016 | .093 | .021 | .072 | .106 | .081 | .025 |
| 6 | .063 | .036 | .027 | .052 | .059 | -.008 | .073 | .037 | .037 | .055 | .033 | .022 | .071 | .030 | .041 | .065 | .024 | .041 |
| 8 | .073 | .060 | .013 | .071 | .071 | -.001 | .057 | .053 | .004 | .040 | .036 | .004 | .069 | .035 | .034 | .128 | .107 | .021 |
| 11 | .049 | .036 | .013 | .036 | .047 | -.011 | .055 | .037 | .018 | .054 | .029 | .026 | .053 | .030 | .023 | .045 | .037 | .008 |
| 13 | .055# | .042# | .014# | .064 | .048 | .015 | .061 | .059 | .003 | .041 | .024 | .017 | .055 | .036 | .019 | | | |
| 10 | .067 | .068 | -.001 | .010 | .131 | -.121 | .151 | .055 | .096 | .047 | .062 | -.014 | .089 | .047 | .042 | .037 | .045 | -.008 |
| 9 | .125 | .079 | .046 | .189 | .139 | .050 | .093 | .047 | .046 | .112 | .084 | .029 | .104 | .057 | .047 | .126 | .069 | .057 |
| 14 | .048 | .041 | .008 | .054 | .056 | -.003 | .029 | .027 | .002 | .037 | .045 | -.008 | .074 | .044 | .030 | .047 | .032 | .016 |
| 12 | .059 | .035 | .024 | .017 | .047 | -.031 | .072 | .035 | .038 | .060 | .037 | .024 | .061 | .026 | .035 | .086 | .030 | .056 |
| 15 | .134 | .092 | .042 | .253 | .203 | .050 | .156 | .056 | .100 | .092 | .076 | .016 | .093 | .061 | .031 | .076 | .062 | .014 |
| 16 | .096 | .042 | .054 | .060 | .036 | .024 | .068 | .025 | .042 | .072 | .060 | .012 | .158 | .053 | .105 | .122 | .037 | .085 |
| 17 | .081 | .052 | .029 | .136 | .100 | .036 | .092 | .042 | .049 | .063 | .043 | .020 | .035 | .025 | .009 | .080 | .049 | .031 |
| 20 | .088# | .053# | .034# | | | | | | | | | | .088 | .063 | .026 | .087 | .044 | .043 |
| 19 | .060 | .027 | .033 | .072 | .033 | .039 | .057 | .031 | .026 | .054 | .029 | .026 | .066 | .023 | .042 | .053 | .019 | .034 |
| 18 | .073 | .038 | .035 | .073 | .064 | .009 | .075 | .051 | .024 | .060 | .034 | .026 | .076 | .009 | .067 | .081 | .030 | .051 |
| 22 | .045 | .023 | .022 | .051 | .029 | .021 | .048 | .024 | .025 | .038 | .018 | .020 | .035 | .018 | .018 | .055 | .027 | .028 |
| 21 | .059 | .050 | .007 | .063 | .106 | -.043 | .075 | .039 | .036 | .050 | .036 | .014 | .046 | .031 | .015 | .049 | .037 | .012 |
| 24 | .075 | .057 | .018 | .087 | .071 | .016 | .073 | .051 | .022 | .107 | .083 | .024 | .048 | .041 | .008 | .062 | .041 | .021 |
| 25 | .029 | .027 | .002 | .032 | .038 | -.006 | .034 | .029 | .005 | .024 | .029 | -.005 | .030 | .016 | .014 | .026 | .022 | .003 |
| 23 | .081 | .031 | .050 | .085 | .039 | .046 | .061 | .023 | .037 | .054 | .021 | .033 | .081 | .027 | .054 | .125 | .047 | .077 |
| 26 | .086 | .037 | .050 | .102 | .043 | .059 | .108 | .044 | .064 | .098 | .042 | .056 | .069 | .027 | .042 | .057 | .028 | .029 |

* Income from trading only; other income, usually designated as "additional income," not included.

† Interest not included in expense.

‡ Sequence based on total sales of last 5 years.

§ Average of 22 elevators only because records were not available for all 5 years in case of figures for 4 elevators marked #. Average for 22 cases=total of 5 annual incomes (expenses, or net income) per dollar of total sales per elevator divided by 5.

TABLE 3b.—Income*, expense†, and net income per dollar of sales, by elevators, 1926-27 to 1930-31
(Figures in dollars)

| Elevator number‡ | 5-year averages§ | | | 1926-27 | | | 1927-28 | | | 1928-29 | | | 1929-30 | | | 1930-31 | | |
|------------------|------------------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|
| | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income | Income | Expense | Net income |
| All elev. | .075 | .061 | .015 | .100 | .095 | .005 | .077 | .036 | .042 | .063 | .051 | .012 | .079 | .065 | .014 | .057 | .057 | -.001 |
| 1 | .047 | .078 | -.032 | .089 | .139 | -.050 | .061 | .050 | .011 | .030 | .083 | -.053 | .026 | .083 | -.057 | .026 | .037 | -.010 |
| 2 | .092 | .089 | .004 | .130 | .161 | -.031 | .097 | .040 | .054 | .025 | .092 | -.068 | .130 | .095 | .035 | .080 | .052 | .028 |
| 5 | .040 | .062 | -.023 | .054 | .115 | -.061 | .088 | .031 | .057 | .055 | .069 | -.014 | -.008 | .053 | -.060 | .010 | .045 | -.035 |
| 4 | .124 | .096 | .028 | .296 | .162 | .134 | .081 | .037 | .044 | .065 | .072 | -.007 | .119 | .120 | -.002 | .059 | .091 | -.031 |
| 7 | .057 | .066 | -.009 | .103 | .108 | -.005 | .067 | .048 | .019 | .047 | .057 | -.010 | .033 | .062 | -.029 | .034 | .053 | -.019 |
| 3 | .094 | .090 | .004 | .114 | .141 | -.026 | .137 | .059 | .078 | .078 | .061 | .017 | .109 | .094 | .015 | .032 | .094 | -.062 |
| 6 | .079 | .056 | .023 | .085 | .063 | .022 | .097 | .037 | .060 | .067 | .045 | .021 | .080 | .067 | .013 | .067 | .068 | -.001 |
| 8 | .058 | .057 | .001 | .019 | .076 | -.057 | .092 | .035 | .057 | .102 | .071 | .031 | .056 | .065 | -.009 | .020 | .037 | -.017 |
| 11 | .080 | .058 | .022 | .118 | .089 | .029 | .067 | .034 | .034 | .054 | .044 | .010 | .091 | .058 | .033 | .071 | .064 | .007 |
| 13 | .037# | .040# | -.002# | ----- | ----- | ----- | .056 | .029 | .027 | .048 | .030 | .018 | -.008 | .044 | -.053 | .053 | .055 | -.002 |
| 10 | .074# | .059# | .015# | ----- | ----- | ----- | .080 | .037 | .044 | .075 | .066 | .010 | .079 | .072 | .007 | .060 | .060 | .000 |
| 9 | .114 | .076 | .038 | .143 | .101 | .041 | .110 | .043 | .067 | .110 | .061 | .049 | .114 | .082 | .032 | .091 | .092 | -.001 |
| 14 | .045 | .056 | -.011 | -.026 | .073 | -.099 | .071 | .046 | .025 | .030 | .043 | -.013 | .100 | .073 | .026 | .052 | .045 | .007 |
| 12 | .081 | .059 | .022 | .065 | .079 | -.013 | .088 | .038 | .051 | .064 | .045 | .020 | .081 | .058 | .024 | .106 | .078 | .027 |
| 15 | .074 | .066 | .008 | .119 | .103 | .016 | .043 | .027 | .017 | .057 | .048 | .008 | .091 | .071 | .021 | .061 | .083 | -.022 |
| 16 | .080 | .041 | .039 | .121 | .063 | .058 | .069 | .027 | .042 | .085 | .039 | .046 | .080 | .041 | .039 | .045 | .037 | .008 |
| 17 | .061 | .036 | .024 | .077 | .045 | .032 | .048 | .019 | .029 | .041 | .027 | .014 | .096 | .048 | .048 | .042 | .042 | -.001 |
| 20 | .109 | .082 | .026 | .154 | .145 | .009 | .075 | .036 | .039 | .074 | .040 | .033 | .135 | .076 | .060 | .104 | .116 | -.012 |
| 19 | .094 | .051 | .043 | .178 | .120 | .058 | .076 | .024 | .052 | .061 | .028 | .033 | .099 | .049 | .050 | .058 | .035 | .023 |
| 18 | .094 | .050 | .044 | .092 | .041 | .051 | .099 | .043 | .056 | .092 | .048 | .044 | .094 | .054 | .040 | .093 | .061 | .032 |
| 22 | .039 | .043 | -.004 | .075 | .071 | .004 | .047 | .023 | .025 | .046 | .047 | -.001 | .011 | .038 | -.027 | .017 | .039 | -.022 |
| 21 | .057 | .043 | .015 | .064 | .060 | .005 | .029 | .026 | .002 | .062 | .031 | .031 | .075 | .050 | .025 | .057 | .047 | .010 |
| 24 | .088 | .067 | .021 | .123 | .111 | .012 | .086 | .039 | .046 | .083 | .063 | .020 | .081 | .074 | .007 | .069 | .048 | .021 |
| 25 | .052 | .034 | .018 | .039 | .040 | -.001 | .076 | .029 | .047 | .049 | .033 | -.017 | .044 | .041 | .003 | .051 | .030 | .021 |
| 23 | .100 | .054 | .046 | .126 | .075 | .051 | .090 | .036 | .053 | .089 | .047 | .043 | .126 | .062 | .065 | .071 | .049 | .021 |
| 26 | .045 | .044 | .001 | .038 | .092 | -.054 | .061 | .023 | .037 | .045 | .032 | .013 | .034 | .040 | -.006 | .049 | .035 | .015 |

* Income from trading only; other income, usually designated as "additional income," not included.

† Interest not included in expense.

‡ Sequence based on total sales of last 5 years.

§ Average of 24 elevators only because records were not available for all 5 years in case of 2 elevators marked #. Average for 24 cases = total of 5 annual incomes (expenses, or net incomes) per dollar of total sales per elevator divided by 5.

TABLE 4.—Stock dividends* per dollar of five-year average total sales by elevators, 1921-22 to 1930-31
(Figures in dollars)

| Elevator number† | Averages‡ | | | Elevator number† | Averages‡ | | | Elevator number† | Averages‡ | | | Elevator number† | Averages‡ | | |
|------------------|--------------------|--------------------|-------------|------------------|--------------------|--------------------|--------------------|------------------|--------------------|--------------------|-------------|------------------|-----------|-------------|-------------|
| | 10 years | 1st 5 years | 2nd 5 years | | 10 years | 1st 5 years | 2nd 5 years | | 10 years | 1st 5 years | 2nd 5 years | | 10 years | 1st 5 years | 2nd 5 years |
| 1 | .0069 | .0055 | .0084 | 8 | .0066 | .0064 | .0069 | 15 | .0138 | .0177 | .0099 | 21 | .0056 | .0062 | .0050 |
| 2 | .0103 ^s | .0070 ² | .0137 | 11 | .0117 | .0090 | .0144 | 16 | .0084 | .0086 | .0082 | 24 | .0078 | .0066 | .0090 |
| 5 | .0104 | .0080 | .0128 | 13 | .0052 ^s | .0048 ⁴ | .0056 ⁴ | 17 | .0074 | .0087 | .0061 | 25 | .0078 | .0073 | .0084 |
| 4 | .0140 | .0119 | .0162 | 10 | .0109 ⁹ | .0173 | .0045 ⁴ | 20 | .0128 ⁷ | .0091 ² | .0166 | 23 | .0037 | .0037 | .0073 |
| 7 | .0066 | .0055 | .0078 | 9 | .0105 | .0117 | .0093 | 19 | .0070 | .0051 | .0089 | 26 | .0031 | .0025 | .0038 |
| 3 | .0138 | .0091 | .0185 | 14 | .0044 | .0036 | .0052 | 18 | .0103 | .0117 | .0090 | | | | |
| 6 | .0091 | .0065 | .0118 | 12 | .0084 | .0063 | .0106 | 22 | .0027 | .0020 | .0035 | | | | |

* Computed at 7%.

† Sequence based on last 5 year total sales.

‡ Total of 5 annual computed dividends per dollar of sales per elevator divided by 5.

NOTE.—Number to right of average indicates number of years in cases where less than 5 years were available.

TABLE 5.—Profit per dollar of total sales with and without additional income, by elevators, 1921-22 to 1930-31
(Figures in Dollars)

| Elevator number* | Averages† | | | | | | Elevator number* | Averages† | | | | | |
|------------------|----------------------------|--------------------|-------------|----------------------------|--------------------|-------------|------------------|----------------------------|--------------------|-------------|----------------------------|--------------------|-------------|
| | Additional income excluded | | | Additional income included | | | | Additional income excluded | | | Additional income included | | |
| | 10 years | 1st 5 years | 2nd 5 years | 10 years | 1st 5 years | 2nd 5 years | | 10 years | 1st 5 years | 2nd 5 years | 10 years | 1st 5 years | 2nd 5 years |
| 1 | -.0107 | .0188 | -.0403 | -.0077 | .0237 | -.0392 | 12 | .0145 | .0181 | .0110 | .0178 | .0189 | .0167 |
| 2 | .0020 ⁷ | .0141 ² | -.0100 | -.0070 ⁷ | .0175 ² | -.0034 | 15 | .0112 | .0245 | -.0020 | .0171 | .0328 | .0014 |
| 5 | -.0068 | .0217 | -.0353 | -.0042 | .0223 | -.0308 | 16 | .0378 | .0451 | .0305 | .0431 | .0520 | .0343 |
| 4 | .0212 ^s | .0311 ^s | .0113 | .0314 ^s | .0311 ^s | .0317 | 17 | .0193 | .0203 | .0183 | .0216 | .0219 | .0214 |
| 7 | -.0196 | -.0226 | -.0167 | -.0116 | -.0174 | -.0059 | 20 | .0174 ⁷ | .0253 ² | .0095 | .0223 ⁷ | .0317 ² | .0129 |
| 3 | .0077 | .0297 | -.0142 | .0160 | .0460 | -.0140 | 19 | .0312 | .0284 | .0341 | .0327 | .0293 | .0362 |
| 6 | .0158 | .0204 | .0113 | .0233 | .0259 | .0207 | 18 | .0295 | .0237 | .0354 | .0322 | .0252 | .0393 |
| 8 | .0001 | .0062 | -.0061 | .0018 | .0094 | -.0057 | 22 | .0063 | .0204 | -.0078 | .0073 | .0215 | -.0069 |
| 11 | .0058 | .0037 | .0080 | .0080 | .0043 | .0118 | 21 | .0051 | .0006 | .0096 | .0074 | .0036 | .0112 |
| 13 | .0005 ⁹ | .0087 ⁴ | -.0077 | .0063 ⁹ | .0100 ⁴ | .0027 | 24 | .0119 | .0115 | .0123 | .0226 | .0233 | .0220 |
| 10 | -.0039 | -.0183 | .0104 | -.0014 | -.0137 | .0108 | 25 | .0020 | -.0051 | .0091 | .0040 | -.0014 | .0095 |
| 9 | .0311 | .0339 | .0284 | .0333 | .0358 | .0308 | 23 | .0443 | .0459 | .0427 | .0516 | .0483 | .0549 |
| 14 | -.0060 | .0039 | -.0159 | -.0006 | .0098 | -.0111 | 26 | .0220 | .0473 | -.0032 | .0223 | .0473 | -.0027 |

* Sequence based on last five year total sales.

† Total of 5 annual profits per dollar of total sales per elevator divided by 5.

NOTE.—Small figure to right of average indicates the number of years in cases where less than 5 years were available.

TABLE 6.—Additional net income per dollar of total sales, by elevators, 1921-22 to 1930-31
(Figures in Dollars)

| Elevator number* | Averages† | | | Fiscal Years | | | | | | | | | |
|------------------|-----------|-------------|-------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 10 years | 1st 5 years | 2nd 5 years | 1921-22 | 1922-23 | 1923-24 | 1924-25 | 1925-26 | 1926-27 | 1927-28 | 1928-29 | 1929-30 | 1930-31 |
| 1 | .0032 | .0049 | .0011 | ----- | ----- | ----- | ----- | .0252 | .0021 | .0002 | .0008 | .0034 | .0002 |
| 2 | .0053 | .0034 | .0066 | ----- | ----- | ----- | .0076 | ----- | .0151 | .0030 | .0182 | .0065 | .0001 |
| 5 | .0025 | .0006 | .0045 | .0003 | .0015 | .0004 | .0002 | .0008 | .0308 | .0047 | .0008 | ----- | ----- |
| 4 | .0118 | ----- | .0204 | ----- | ----- | ----- | ----- | ----- | .0060 | .0073 | .0443 | .0629 | .0015 |
| 7 | .0076 | .0052 | .0108 | .0019 | ----- | .0035 | .0091 | .0086 | .0280 | .0051 | .0098 | .0080 | .0084 |
| 3 | .0104 | .0163 | .0002 | .0447 | .0228 | .0093 | .0099 | .0129 | .0005 | .0001 | .0001 | .0003 | .0001 |
| 6 | .0070 | .0055 | .0094 | .0132 | .0043 | .0047 | .0025 | .0068 | .0192 | .0067 | .0079 | .0193 | .0001 |
| 8 | .0019 | .0032 | .0004 | .0005 | .0012 | .0039 | .0027 | .0117 | .0011 | ----- | .0003 | .0007 | .0003 |
| 11 | .0019 | .0006 | .0038 | .0023 | ----- | ----- | ----- | .0008 | .0027 | .0051 | .0050 | .0038 | .0038 |
| 13 | .0063 | .0013 | .0104 | ----- | ----- | .0045 | ----- | ----- | .0558 | .0010 | .0006 | .0099 | .0038 |
| 10 | .0024 | .0046 | .0004 | .0227 | .0031 | .0047 | .0035 | .0057 | ----- | .0002 | ----- | .0004 | .0019 |
| 9 | .0022 | .0019 | .0024 | .0173 | ----- | ----- | ----- | .0026 | .0010 | .0013 | .0013 | .0029 | .0069 |
| 14 | .0054 | .0059 | .0048 | ----- | .0036 | .0088 | ----- | .0041 | .0108 | .0260 | .0005 | .0025 | .0022 |
| 12 | .0024 | .0008 | .0057 | .0003 | ----- | ----- | .0015 | .0018 | .0035 | .0038 | .0080 | .0074 | .0062 |
| 15 | .0051 | .0083 | .0034 | .0297 | .0064 | .0147 | .0053 | .0045 | .0097 | .0017 | .0009 | .0053 | .0070 |
| 16 | .0050 | .0069 | .0038 | .0091 | .0049 | .0068 | .0102 | .0055 | .0081 | .0019 | .0045 | .0034 | .0046 |
| 17 | .0025 | .0016 | .0031 | .0019 | .0009 | .0028 | .0008 | .0025 | .0023 | .0020 | .0036 | .0024 | .0052 |
| 20 | .0044 | .0064 | .0034 | ----- | ----- | ----- | .0062 | .0065 | .0022 | .0038 | .0036 | .0044 | .0028 |
| 19 | .0015 | .0009 | .0021 | .0007 | ----- | .0001 | .0002 | .0024 | .0009 | .0001 | .0001 | .0067 | .0038 |
| 18 | .0026 | .0015 | .0039 | ----- | ----- | .0029 | .0001 | .0031 | .0265 | .0042 | .0015 | .0014 | .0004 |
| 22 | .0010 | .0011 | .0009 | ----- | .0008 | .0006 | .0012 | .0023 | .0013 | .0011 | ----- | .0001 | .0020 |
| 21 | .0020 | .0030 | .0016 | .0098 | .0019 | .0008 | .0024 | .0050 | .0018 | .0008 | .0010 | ----- | .0053 |
| 24 | .0107 | .0118 | .0097 | .0101 | .0100 | .0168 | .0101 | .0136 | .0060 | .0057 | .0087 | .0160 | .0113 |
| 25 | .0020 | .0037 | .0004 | .0056 | .0023 | .0037 | .0020 | .0054 | ----- | .0005 | .0006 | ----- | .0006 |
| 23 | .0070 | .0024 | .0122 | .0002 | .0001 | .0004 | .0029 | .0092 | .0167 | .0096 | .0141 | .0134 | .0119 |
| 26 | .0003 | ----- | .0005 | ----- | ----- | ----- | ----- | ----- | ----- | .0007 | .0009 | .0002 | .0005 |

* Sequence based on total sales of last 5 years.

† Total additional income by elevators for 5 years divided by total sales by elevators for 5 years.

TABLE 7a.—Percentage distribution of grain, general sideline and special sideline sales, elevators by bushel-volume groups, 1921-22 to 1925-26

| Bushel-volume groups | No. of elevators | Av. total volume | Percentage distribution of dollar sales | | | |
|------------------------|------------------|------------------|---|-------|-------------|-------------|
| | | | Total | Grain | Sidelines | |
| | (No.) | (thous. \$) | (%) | (%) | General (%) | Special (%) |
| Below 100,000 | | | | | | |
| 5-year average | 41 | 76 | 100 | 85 | 12 | 3 |
| 1921-22 | 15 | 59 | 100 | 83 | 15 | 2 |
| 1922-23 | 6 | 93 | 100 | 85 | 9 | 6 |
| 1923-24 | 6 | 78 | 100 | 88 | 12 | - |
| 1924-25 | 5 | 99 | 100 | 89 | 11 | - |
| 1925-26 | 9 | 78 | 100 | 83 | 11 | 6 |
| 100,000-200,000 | | | | | | |
| 5-year average | 47 | 155 | 100 | 89 | 9 | 2 |
| 1921-22 | 7 | 177 | 100 | 86 | 14 | - |
| 1922-23 | 11 | 144 | 100 | 91 | 9 | - |
| 1923-24 | 13 | 146 | 100 | 90 | 9 | 1 |
| 1924-25 | 11 | 157 | 100 | 92 | 6 | 2 |
| 1925-26 | 5 | 172 | 100 | 84 | 10 | 6 |
| 200,000-300,000 | | | | | | |
| 5-year average | 16 | 257 | 100 | 90 | 10 | - |
| 1921-22 | 1 | 255 | 100 | 89 | 11 | - |
| 1922-23 | 2 | 222 | 100 | 93 | 7 | - |
| 1923-24 | 3 | 235 | 100 | 90 | 10 | - |
| 1924-25 | 5 | 280 | 100 | 91 | 9 | - |
| 1925-26 | 5 | 260 | 100 | 89 | 11 | - |
| 300,000-400,000 | | | | | | |
| 5-year average | 11 | 353 | 100 | 90 | 10 | - |
| 1921-22 | - | - | - | - | - | - |
| 1922-23 | 4 | 319 | 100 | 88 | 12 | - |
| 1923-24 | 1 | 384 | 100 | 91 | 9 | - |
| 1924-25 | 3 | 402 | 100 | 90 | 10 | - |
| 1925-26 | 3 | 339 | 100 | 92 | 8 | - |
| Over 400,000 | | | | | | |
| 5-year average | 6 | 457 | 100 | 92 | 8 | - |
| 1921-22 | - | - | - | - | - | - |
| 1922-23 | - | - | - | - | - | - |
| 1923-24 | 1 | 462 | 100 | 92 | 8 | - |
| 1924-25 | 2 | 498 | 100 | 92 | 8 | - |
| 1925-26 | 3 | 428 | 100 | 92 | 8 | - |

TABLE 7b.—Percentage distribution of grain, general sideline and special sideline sales, elevators by bushel-volume groups, 1926-27 to 1930-31

| Bushel-volume groups | No. of elevators | Av. total volume | Percentage distribution of dollar sales | | | |
|------------------------|------------------|------------------|---|-------|-------------|-------------|
| | | | Total | Grain | Sidelines | |
| | (No.) | (thous. \$) | (%) | (%) | General (%) | Special (%) |
| Below 100,000 | | | | | | |
| 5-year average | 60 | 76 | 100 | 77 | 17 | 6 |
| 1926-27 | 22 | 72 | 100 | 67 | 26 | 7 |
| 1927-28 | 5 | 100 | 100 | 80 | 13 | 7 |
| 1928-29 | 8 | 73 | 100 | 82 | 14 | 4 |
| 1929-30 | 13 | 74 | 100 | 82 | 14 | 4 |
| 1930-31 | 12 | 75 | 100 | 85 | 11 | 4 |
| 100,000-200,000 | | | | | | |
| 5-year average | 37 | 168 | 100 | 85 | 11 | 4 |
| 1926-27 | 1 | 220 | 100 | 72 | 28 | - |
| 1927-28 | 8 | 161 | 100 | 91 | 9 | - |
| 1928-29 | 9 | 152 | 100 | 88 | 11 | 1 |
| 1929-30 | 11 | 186 | 100 | 79 | 12 | 9 |
| 1930-31 | 8 | 162 | 100 | 85 | 8 | 7 |
| 200,000-300,000 | | | | | | |
| 5-year average | 16 | 273 | 100 | 87 | 8 | 5 |
| 1926-27 | 1 | 213 | 100 | 84 | 16 | - |
| 1927-28 | 6 | 288 | 100 | 92 | 7 | 1 |
| 1928-29 | 6 | 266 | 100 | 81 | 10 | 9 |
| 1929-30 | - | - | - | - | - | - |
| 1930-31 | 3 | 277 | 100 | 89 | 7 | 4 |
| 300,000-400,000 | | | | | | |
| 5-year average | 9 | 368 | 100 | 86 | 8 | 6 |
| 1926-27 | - | - | - | - | - | - |
| 1927-28 | 5 | 389 | 100 | 85 | 9 | 6 |
| 1928-29 | 1 | 305 | 100 | 92 | 8 | - |
| 1929-30 | 2 | 331 | 100 | 90 | 10 | - |
| 1930-31 | 1 | 402 | 100 | 76 | 1 | 23 |
| Over 400,000 | | | | | | |
| 5-year average | 6 | 486 | 100 | 93 | 7 | - |
| 1926-27 | - | - | - | - | - | - |
| 1927-28 | 2 | 607 | 100 | 94 | 6 | - |
| 1928-29 | 2 | 412 | 100 | 92 | 8 | - |
| 1929-30 | - | - | - | - | - | - |
| 1930-31 | 2 | 437 | 100 | 93 | 7 | - |

TABLE 8a.—Dollar distribution of grain, general sidelines and special sidelines, elevators by bushel-volume groups, 1921-22 to 1925-26
(Figures in thousand dollars)

| Bushel-volume groups | No. of elevators | Average total volume | Dollar sales | | | |
|------------------------|------------------|----------------------|--------------|-------|-----------|---------|
| | | | Total | Grain | Sidelines | |
| | | | | | General | Special |
| Below 100,000 | | | | | | |
| 5-year total | 41 | 76 | 3,114 | 2,644 | 370 | 90 |
| 1921-22 | 15 | 59 | 887 | 730 | 137 | 20 |
| 1922-23 | 6 | 93 | 557 | 476 | 51 | 30 |
| 1923-24 | 6 | 78 | 467 | 409 | 55 | 3 |
| 1924-25 | 5 | 99 | 494 | 438 | 53 | 3 |
| 1925-26 | 9 | 78 | 709 | 591 | 74 | 44 |
| 100,000-200,000 | | | | | | |
| 5-year total | 47 | 155 | 7,312 | 6,527 | 665 | 120 |
| 1921-22 | 7 | 177 | 1,243 | 1,071 | 170 | 2 |
| 1922-23 | 11 | 144 | 1,579 | 1,431 | 144 | 4 |
| 1923-24 | 13 | 146 | 1,897 | 1,709 | 162 | 26 |
| 1924-25 | 11 | 157 | 1,733 | 1,595 | 104 | 4 |
| 1925-26 | 5 | 172 | 860 | 721 | 85 | 54 |
| 200,000-300,000 | | | | | | |
| 5-year total | 16 | 257 | 4,110 | 3,707 | 400 | 3 |
| 1921-22 | 1 | 255 | 255 | 226 | 29 | - |
| 1922-23 | 2 | 222 | 445 | 412 | 33 | - |
| 1923-24 | 3 | 235 | 707 | 638 | 69 | - |
| 1924-25 | 5 | 280 | 1,401 | 1,268 | 132 | 1 |
| 1925-26 | 5 | 260 | 1,302 | 1,163 | 137 | 2 |
| 300,000-400,000 | | | | | | |
| 5-year total | 11 | 353 | 3,883 | 3,491 | 390 | 2 |
| 1921-22 | - | --- | --- | --- | --- | - |
| 1922-23 | 4 | 319 | 1,276 | 1,127 | 148 | 1 |
| 1923-24 | 1 | 384 | 384 | 348 | 36 | - |
| 1924-25 | 3 | 402 | 1,205 | 1,080 | 124 | 1 |
| 1925-26 | 3 | 339 | 1,018 | 936 | 82 | - |
| Over 400,000 | | | | | | |
| 5-year total | 6 | 457 | 2,743 | 2,517 | 226 | - |
| 1921-22 | - | --- | --- | --- | --- | - |
| 1922-23 | - | --- | --- | --- | --- | - |
| 1923-24 | 1 | 462 | 462 | 425 | 37 | - |
| 1924-25 | 2 | 498 | 997 | 917 | 80 | - |
| 1925-26 | 3 | 428 | 1,284 | 1,175 | 109 | - |

TABLE 8b.—Dollar distribution of grain, general sidelines and special sidelines, elevators by bushel-volume groups, 1926-27 to 1930-31

(Figures in thousand dollars)

| Bushel-volume groups | No. of elevators | Av. total volume | Dollar sales | | | |
|------------------------|------------------|------------------|--------------|-------|-------------------|---------|
| | | | Total | Grain | General Sidelines | Special |
| Below 100,000 | | | | | | |
| 5-year total | 60 | 76 | 4,534 | 3,502 | 787 | 245 |
| 1926-27 | 22 | 72 | 1,587 | 1,068 | 408 | 111 |
| 1927-28 | 5 | 100 | 501 | 403 | 65 | 33 |
| 1928-29 | 8 | 73 | 584 | 476 | 81 | 27 |
| 1929-30 | 13 | 74 | 966 | 790 | 135 | 41 |
| 1930-31 | 12 | 75 | 896 | 765 | 98 | 33 |
| 100,000-200,000 | | | | | | |
| 5-year total | 37 | 168 | 6,218 | 5,261 | 680 | 277 |
| 1926-27 | 1 | 220 | 220 | 159 | 61 | -- |
| 1927-28 | 8 | 161 | 1,290 | 1,172 | 118 | 1 |
| 1928-29 | 9 | 152 | 1,366 | 1,204 | 147 | 14 |
| 1929-30 | 11 | 186 | 2,041 | 1,617 | 247 | 177 |
| 1930-31 | 8 | 162 | 1,301 | 1,109 | 107 | 85 |
| 200,000-300,000 | | | | | | |
| 5-year total | | | | | | |
| 1926-27 | 1 | 213 | 213 | 178 | 35 | -- |
| 1927-28 | 6 | 288 | 1,726 | 1,587 | 116 | 23 |
| 1928-29 | 6 | 266 | 1,597 | 1,288 | 160 | 149 |
| 1929-30 | -- | -- | -- | -- | -- | -- |
| 1930-31 | 3 | 277 | 830 | 736 | 62 | 32 |
| 300,000-400,000 | | | | | | |
| 5-year total | 9 | 368 | 3,314 | 2,842 | 265 | 207 |
| 1926-27 | -- | -- | -- | -- | -- | -- |
| 1927-28 | 5 | 389 | 1,946 | 1,663 | 169 | 114 |
| 1928-29 | 1 | 305 | 305 | 280 | 25 | -- |
| 1929-30 | 2 | 331 | 662 | 594 | 67 | -- |
| 1930-31 | 1 | 402 | 402 | 305 | 4 | 93 |
| Over 400,000 | | | | | | |
| 5-year total | 6 | 486 | 2,914 | 2,715 | 199 | -- |
| 1926-27 | -- | -- | -- | -- | -- | -- |
| 1927-28 | 2 | 607 | 1,215 | 1,137 | 78 | -- |
| 1928-29 | 2 | 412 | 824 | 759 | 65 | -- |
| 1929-30 | -- | -- | -- | -- | -- | -- |
| 1930-31 | 2 | 437 | 875 | 819 | 56 | -- |

TABLE 9a.—Income, net income, stock dividends at 7 per cent, and profit per dollar of total sales, elevators by bushel-volume groups, 1921-22 to 1925-26

| Bushel-volume groups | No. of elevators | Av. total volume | Income | Net* income | Stock dividends at 7% | Profit† |
|------------------------|------------------|------------------|--------|-------------|-----------------------|---------|
| | (No.) | (Thous. \$) | (\$) | (\$) | (\$) | (\$) |
| Below 100,000 | | | | | | |
| 5-year average‡ | 41 | 76 | .0941 | .0211 | .0124 | .0087 |
| 1921-22 | 15 | 59 | .0901 | .0049 | .0163 | -.0114 |
| 1922-23 | 6 | 93 | .1012 | .0472 | .0079 | .0393 |
| 1923-24 | 6 | 78 | .0749 | .0135 | .0090 | .0045 |
| 1924-25 | 5 | 99 | .1063 | .0488 | .0074 | .0414 |
| 1925-26 | 9 | 78 | .1022 | .0204 | .0140 | .0064 |
| 100,000-200,000 | | | | | | |
| 5-year average | 47 | 155 | .0686 | .0271 | .0056 | .0215 |
| 1921-22 | 7 | 177 | .0680 | .0237 | .0061 | .0176 |
| 1922-23 | 11 | 144 | .0730 | .0314 | .0059 | .0265 |
| 1923-24 | 13 | 146 | .0665 | .0250 | .0059 | .0191 |
| 1924-25 | 11 | 157 | .0678 | .0319 | .0047 | .0272 |
| 1925-26 | 5 | 172 | .0670 | .0169 | .0054 | .0115 |
| 200,000-300,000 | | | | | | |
| 5-year average | 16 | 257 | .0603 | .0274 | .0046 | .0228 |
| 1921-22 | 1 | 255 | .0315 | .0062 | .0088 | -.0026 |
| 1922-23 | 2 | 222 | .0504 | .0199 | .0047 | .0152 |
| 1923-24 | 3 | 235 | .0463 | .0155 | .0045 | .0110 |
| 1924-25 | 5 | 280 | .0739 | .0373 | .0044 | .0329 |
| 1925-26 | 5 | 260 | .0649 | .0345 | .0039 | .0306 |
| 300,000-400,000 | | | | | | |
| 5-year average | 11 | 353 | .0598 | .0312 | .0042 | .0270 |
| 1921-22 | - | - | - | - | - | - |
| 1922-23 | 4 | 319 | .0539 | .0224 | .0048 | .0176 |
| 1923-24 | 1 | 384 | .0540 | .0326 | .0027 | .0299 |
| 1924-25 | 3 | 402 | .0641 | .0388 | .0039 | .0349 |
| 1925-26 | 3 | 339 | .0651 | .0350 | .0044 | .0306 |
| Over 400,000 | | | | | | |
| 5-year average | 6 | 457 | .0413 | .0173 | .0034 | .0139 |
| 1921-22 | - | - | - | - | - | - |
| 1922-23 | - | - | - | - | - | - |
| 1923-24 | 1 | 462 | .0378 | .0202 | .0014 | .0188 |
| 1924-25 | 2 | 498 | .0328 | .0158 | .0031 | .0127 |
| 1925-26 | 3 | 428 | .0481 | .0177 | .0043 | .0134 |

* Interest on stock not deducted from expense.

† Economic profit on trading, exclusive of additional income.

‡ Total annual income (net income, dividends, or profit) for 5 years per dollar of sales per elevator divided by number of elevators.

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TABLE 9b.—Income, net income, stock dividends at 7 per cent, and profit per dollar of total sales, elevators by bushel-volume groups, 1926-27 to 1930-31

| Bushel-volume groups | No. of elevators | Av. total volume | Income | Net* income | Stock dividends at 7% | Profit† |
|------------------------|------------------|------------------|--------|-------------|-----------------------|---------|
| | (No.) | (Thous. \$) | (\$) | (\$) | (\$) | (\$) |
| Below 100,000 | | | | | | |
| 5-year average‡ | 60 | 76 | .0829 | .0074 | .0131 | -.0057 |
| 1926-27 | 22 | 72 | .1030 | .0030 | .0176 | -.0146 |
| 1927-28 | 5 | 100 | .0918 | .0442 | .0075 | .0367 |
| 1928-29 | 8 | 73 | .0674 | -.0044 | .0098 | -.0142 |
| 1929-30 | 13 | 74 | .0785 | .0018 | .0111 | -.0093 |
| 1930-31 | 12 | 75 | .0575 | -.0100 | .0115 | -.0215 |
| 100,000-200,000 | | | | | | |
| 5-year average | 37 | 168 | .0705 | .0225 | .0068 | .0157 |
| 1926-27 | 1 | 220 | .0923 | .0508 | .0087 | .0421 |
| 1927-28 | 8 | 161 | .0846 | .0470 | .0051 | .0419 |
| 1928-29 | 9 | 152 | .0555 | .0111 | .0061 | .0050 |
| 1929-30 | 11 | 186 | .0791 | .0252 | .0077 | .0175 |
| 1930-31 | 8 | 162 | .0588 | .0034 | .0078 | -.0044 |
| 200,000-300,000 | | | | | | |
| 5-year average | 16 | 273 | .0596 | .0237 | .0053 | .0185 |
| 1926-27 | 1 | 213 | .0388 | -.0007 | .0105 | -.0112 |
| 1927-28 | 6 | 288 | .0573 | .0289 | .0043 | .0246 |
| 1928-29 | 6 | 266 | .0711 | .0306 | .0054 | .0252 |
| 1929-30 | — | — | — | — | — | — |
| 1930-31 | 3 | 277 | .0480 | .0074 | .0047 | .0027 |
| 300,000-400,000 | | | | | | |
| 5-year average | 9 | 368 | .0652 | .0297 | .0051 | .0246 |
| 1926-27 | — | — | — | — | — | — |
| 1927-28 | 5 | 389 | .0728 | .0452 | .0043 | .0409 |
| 1928-29 | 1 | 305 | .0742 | .0330 | .0081 | .0249 |
| 1929-30 | 2 | 331 | .0391 | -.0014 | .0066 | -.0080 |
| 1930-31 | 1 | 402 | .0705 | .0212 | .0029 | .0183 |
| Over 400,000 | | | | | | |
| 5-year average | 6 | 486 | .0567 | .0248 | .0040 | .0208 |
| 1926-27 | — | — | — | — | — | — |
| 1927-28 | 2 | 607 | .0730 | .0416 | .0031 | .0385 |
| 1928-29 | 2 | 412 | .0471 | .0148 | .0045 | .0103 |
| 1929-30 | — | — | — | — | — | — |
| 1930-31 | — | 437 | .0501 | .0179 | .0046 | .0133 |

* Interest on stock not deducted from expense.

† Economic profit on trading, exclusive of additional income.

‡ Total annual income (net income, dividends, or profit) for 5 years per dollar of sales per elevator divided by number of elevators.

TABLE 10.—Interest paid per dollar of total sales (not included in expense)
1926-27 to 1930-31

| Bushel-volume groups | Elevators (Number) | Interest paid (\$) |
|------------------------|-----------------------|-----------------------|
| Below 100,000 | | |
| 5-year average* ----- | 41 | .0149 |
| 1926-27† ----- | 14 | .0169 |
| 1927-28 ----- | 3 | .0088 |
| 1928-29 ----- | 5 | .0148 |
| 1929-30 ----- | 11 | .0144 |
| 1930-31 ----- | 8 | .0144 |
| 100,000-200,000 | | |
| 5-year average ----- | 27 | .0066 |
| 1926-27 ----- | 1 | .0004 |
| 1927-28 ----- | 7 | .0064 |
| 1928-29 ----- | 7 | .0053 |
| 1929-30 ----- | 7 | .0094 |
| 1930-31 ----- | 5 | .0055 |
| 200,000-300,000 | | |
| 5-year average ----- | 11 | .0026 |
| 1926-27 ----- | - | - |
| 1927-28 ----- | 5 | .0029 |
| 1928-29 ----- | 2 | .0008 |
| 1929-30 ----- | - | - |
| 1930-31 ----- | 2 | .0059 |
| 300,000-400,000 | | |
| 5-year average ----- | 5 | .0013 |
| 1926-27 ----- | - | - |
| 1927-28 ----- | 4 | .0007 |
| 1928-29 ----- | 1 | .0021 |
| 1929-30 ----- | 2 | .0007 |
| 1930-31 ----- | - | - |
| Over 400,000 | | |
| 5-year average ----- | 5 | .0052 |
| 1926-27 ----- | - | - |
| 1927-28 ----- | 1 | .0202 |
| 1928-29 ----- | 2 | .0009 |
| 1929-30 ----- | - | - |
| 1930-31 ----- | 2 | .0020 |

† Total interest paid for one year per dollar of total sales per elevator divided by number of elevators paying interest.

* Total annual interest paid for the 5-year period per dollar of total sales per elevator divided by number of elevators paying interest.

TABLE 11.—Grain dollar volumes and grain bushel volumes compared, elevators by bushel-volume groups, 1926-27 to 1930-31

| Bushel volume groups | Number of elevators | Av. bushel volume | Grain sales by bushel-volume groups | |
|------------------------|---------------------|-------------------|-------------------------------------|---------------|
| | | | Dollars | Bushels |
| | (Number) | (Thous. bus.) | (Thous. \$) | (Thous. bus.) |
| Below 100,000 | | | | |
| 5-year average | 60 | 62 | 58 | 62 |
| 1926-27 | 22 | 51 | 49 | 51 |
| 1927-28 | 5 | 93 | 80 | 93 |
| 1928-29 | 8 | 62 | 59 | 62 |
| 1929-30 | 13 | 64 | 61 | 64 |
| 1930-31 | 12 | 67 | 63 | 67 |
| 100,000-200,000 | | | | |
| 5-year average | 37 | 148 | 142 | 148 |
| 1926-27 | 1 | 161 | 159 | 161 |
| 1927-28 | 8 | 159 | 146 | 159 |
| 1928-29 | 9 | 152 | 134 | 152 |
| 1929-30 | 11 | 144 | 147 | 144 |
| 1930-31 | 8 | 135 | 138 | 135 |
| 200,000-300,000 | | | | |
| 5-year average | 16 | 238 | 237 | 238 |
| 1926-27 | 1 | 234 | 178 | 234 |
| 1927-28 | 6 | 253 | 265 | 253 |
| 1928-29 | 6 | 219 | 215 | 219 |
| 1929-30 | - | - | - | - |
| 1930-31 | 3 | 250 | 245 | 250 |
| 300,000-400,000 | | | | |
| 5-year average | 9 | 350 | 316 | 350 |
| 1926-27 | - | - | - | - |
| 1927-28 | 5 | 366 | 333 | 366 |
| 1928-29 | 1 | 333 | 280 | 333 |
| 1929-30 | 2 | 333 | 297 | 333 |
| 1930-31 | 1 | 325 | 305 | 325 |
| Over 400,000 | | | | |
| 5-year average | 6 | 465 | 452 | 465 |
| 1926-27 | - | - | - | - |
| 1927-28 | 2 | 529 | 569 | 529 |
| 1928-29 | 2 | 408 | 379 | 408 |
| 1929-30 | - | - | - | - |
| 1930-31 | 2 | 459 | 409 | 459 |

TABLE 12.—Income, net income, stock dividend at 7 per cent and profit, per dollar and per bushel compared, elevators by bushel-groups, 1926-27 to 1930-31

| Bushel-volume groups | Number of elevators | Average bushel volume | Elevators by bushel volume groups | | | | | | | |
|------------------------|---------------------|-----------------------|-----------------------------------|---------|------------|---------|------------------|---------|---------|---------|
| | | | Income | | Net income | | Stock div. at 7% | | Profit* | |
| | | | Per \$ | Per bu. | Per \$ | Per bu. | Per \$ | Per bu. | Per \$ | Per bu. |
| (No.) | (Thous. bus.) | (\$) | (\$) | (\$) | (\$) | (\$) | (\$) | (\$) | (\$) | |
| Below 100,000 | | | | | | | | | | |
| 5-year average | 60 | 62 | .0824 | .0733 | -.0172 | -.0141 | .0187 | .0167 | -.0359 | -.0308 |
| 1926-27 | 22 | 51 | .1129 | .0941 | -.0284 | -.0229 | .0284 | .0239 | -.0568 | -.0468 |
| 1927-28 | 5 | 93 | .0911 | .0776 | -.0399 | -.0340 | .0099 | .0080 | .0300 | .0260 |
| 1928-29 | 8 | 62 | .0568 | .0567 | -.0213 | -.0157 | .0124 | .0114 | -.0337 | -.0271 |
| 1929-30 | 13 | 64 | .0734 | .0702 | -.0141 | -.0117 | .0145 | .0135 | -.0286 | -.0252 |
| 1930-31 | 12 | 67 | .0498 | .0480 | -.0210 | -.0197 | .0132 | .0142 | -.0342 | -.0339 |
| 100,000-200,000 | | | | | | | | | | |
| 5-year average | 37 | 148 | .0619 | .0603 | .0104 | .0114 | .0078 | .0075 | .0026 | .0039 |
| 1926-27 | 1 | 161 | .0829 | .0818 | .0295 | .0291 | .0119 | .0117 | .0176 | .0174 |
| 1927-28 | 8 | 159 | .0835 | .0773 | .0442 | .0410 | .0049 | .0043 | .0393 | .0367 |
| 1928-29 | 9 | 152 | .0476 | .0429 | .0013 | .0022 | .0065 | .0058 | -.0052 | -.0030 |
| 1929-30 | 11 | 144 | .0648 | .0674 | .0079 | .0101 | .0095 | .0096 | -.0016 | .0004 |
| 1930-31 | 8 | 135 | .0499 | .0501 | -.0119 | -.0080 | .0095 | .0094 | -.0214 | -.0174 |
| 200,000-300,000 | | | | | | | | | | |
| 5-year average | 16 | 238 | .0517 | .0504 | -.0166 | -.0169 | .0062 | .0059 | .0104 | .0110 |
| 1926-27 | 1 | 234 | .0303 | .0231 | -.0063 | -.0048 | .0126 | .0096 | -.0189 | -.0144 |
| 1927-28 | 6 | 253 | .0524 | .0521 | .0246 | .0244 | .0049 | .0050 | .0197 | .0194 |
| 1928-29 | 6 | 219 | .0589 | .0571 | .0172 | .0178 | .0068 | .0064 | .0104 | .0114 |
| 1929-30 | - | - | - | - | - | - | - | - | - | - |
| 1930-31 | 3 | 250 | .0430 | .0429 | .0069 | .0072 | .0053 | .0052 | .0016 | .0020 |
| 300,000-400,000 | | | | | | | | | | |
| 5-year average | 9 | 350 | .0543 | .0488 | .0199 | .0178 | .0058 | .0050 | .0141 | .0128 |
| 1926-27 | - | - | - | - | - | - | - | - | - | - |
| 1927-28 | 5 | 366 | .0652 | .0596 | .0371 | .0340 | .0048 | .0044 | .0323 | .0296 |
| 1928-29 | 1 | 333 | .0742 | .0624 | .0318 | .0267 | .0088 | .0074 | .0230 | .0193 |
| 1929-30 | 2 | 333 | .0326 | .0282 | -.0065 | -.0064 | .0076 | .0060 | -.0141 | -.0124 |
| 1930-31 | 1 | 325 | .0241 | .0226 | -.0248 | -.0233 | .0038 | .0036 | -.0286 | -.0269 |
| Over 400,000 | | | | | | | | | | |
| 5-year average | 6 | 465 | .0540 | .0524 | .0247 | .0244 | .0044 | .0039 | .0203 | .0205 |
| 1926-27 | - | - | - | - | - | - | - | - | - | - |
| 1927-28 | 2 | 529 | .0721 | .0747 | .0432 | .0451 | .0033 | .0033 | .0399 | .0418 |
| 1928-29 | 2 | 408 | .0432 | .0401 | .0114 | .0105 | .0049 | .0042 | .0065 | .0063 |
| 1929-30 | - | - | - | - | - | - | - | - | - | - |
| 1930-31 | 2 | 459 | .0469 | .0422 | .0195 | .0175 | .0049 | .0042 | .0146 | .0133 |

* Additional income not included.

TABLE 13.—Interest paid* per dollar of grain sales per bushel of grain handled (not included in expenses), 1926-27 to 1930-31

| Bushel-volume groups | Number of elevators (Number) | Interest paid per dollar (\$) | Interest paid per bushel (\$) |
|------------------------|---------------------------------|----------------------------------|----------------------------------|
| Below 100,000 | | | |
| 5-year average | 41 | .0172 | .0153 |
| 1926-27 | 14 | .0237 | .0208 |
| 1927-28 | 3 | .0082 | .0051 |
| 1928-29 | 4 | .0145 | .0123 |
| 1929-30 | 11 | .0148 | .0136 |
| 1930-31 | 8 | .0140 | .0128 |
| 100,000-200,000 | | | |
| 5-year average | 27 | .0065 | .0059 |
| 1926-27 | 1 | .0006 | .0006 |
| 1927-28 | 7 | .0066 | .0059 |
| 1928-29 | 7 | .0049 | .0040 |
| 1929-30 | 7 | .0096 | .0092 |
| 1930-31 | 5 | .0055 | .0054 |
| 200,000-300,000 | | | |
| 5-year average | 9 | .0032 | .0029 |
| 1926-27 | - | - | - |
| 1927-28 | 5 | .0030 | .0028 |
| 1928-29 | 2 | .0008 | .0008 |
| 1929-30 | - | - | - |
| 1930-31 | 2 | .0060 | .0056 |
| 300,000-400,000 | | | |
| 5-year average | 7 | .0010 | .0009 |
| 1926-27 | - | - | - |
| 1927-28 | 4 | .0008 | .0007 |
| 1928-29 | 1 | .0021 | .0018 |
| 1929-30 | 2 | .0008 | .0007 |
| 1930-31 | - | - | - |
| Over 400,000 | | | |
| 5-year average | 5 | .0052 | .0059 |
| 1926-27 | - | - | - |
| 1927-28 | 1 | .0201 | .0235 |
| 1928-29 | 2 | .0010 | .0010 |
| 1929-30 | - | - | - |
| 1930-31 | 2 | .0020 | .0020 |

* Total annual interest paid per dollar of total sales per elevator (or per bushel handled per elevator) divided by number of elevators paying interest.

TABLE 14.—Dollar distribution of expenses* in handling 100 bushels of grain, by bushel-volume groups, 1926-27 to 1930-31

| Item | Bushel-volume groups in thousand bushels | | | | | | | | | |
|--|--|----------------------|-------------------------------|----------------------|-------------------------------|----------------------|-------------------------------|----------------------|-------------------------------|--|
| | Below 100 | | 100 - 200 | | 200 - 300 | | 300 - 400 | | Over 400 | |
| | Exp. per 100 bus. | Exp. per 100 bus. | % less than prev. group | Exp. per 100 bus. | % less than prev. group | Exp. per 100 bus. | % less than prev. group | Exp. per 100 bus. | % less than prev. group | |
| | (\$) | (\$) | (%) | (\$) | (%) | (\$) | (%) | (\$) | (%) | |
| Total ----- | 7.88 | 4.78 | 39 | 3.38 | 29 | 3.10 | 8 | 2.79 | 10 | |
| Manager's salary ----- | 3.07 | 1.58 | 48 | 1.00 | 36 | .88 | 12 | .82 | 7 | |
| Extra help ----- | .39 | .67 | +23 | .47 | 30 | .57 | +21 | .47 | 18 | |
| Depreciation ----- | 1.18 | .67 | 43 | .51 | 24 | .46 | 10 | .33 | 28 | |
| Insurance and bonds ----- | .70 | .38 | 46 | .24 | 36 | .25 | +4 | .25 | 0 | |
| Taxes and rents ----- | .55 | .29 | 47 | .24 | 17 | .19 | 21 | .22 | +16 | |
| Light, heat and power ----- | .32 | .19 | 40 | .17 | 10 | .15 | +50 | .11 | 27 | |
| Auditing and bookkeeping ----- | .32 | .19 | 40 | .17 | 10 | .09 | 47 | .08 | 11 | |
| Repairs and renewals ----- | .24 | .19 | 21 | .10 | 47 | .15 | +50 | .11 | 27 | |
| Printing and supplies ----- | .24 | .14 | 42 | .14 | 0 | .09 | 36 | .17 | 89 | |
| Directors and secretary ----- | .24 | .10 | 58 | .10 | 0 | .09 | 10 | .03 | 67 | |
| Markets ----- | .16 | .10 | 37 | .07 | 30 | .03 | 57 | .03 | 0 | |
| Advertising ----- | .08 | .04 | 50 | .03 | 25 | .03 | 0 | .06 | +50 | |
| Miscellaneous ----- | .39 | .24 | 38 | .14 | 41 | .12 | 14 | .11 | 9 | |
| Average volume in each 100 thousand bushel-group -- | 62 | | 148 | | 238 | | 350 | | 465 | |

* Interest not included.

FARMERS' ELEVATORS IN S. D. SPRING WHEAT AREA 83

TABLE 15.—Percentage distribution of grain expenses* by bushel-volume groups, 1926-27 to 1930-31

| Item | Bushel-volume groups in thousand bushels | | | | | | |
|--------------------------|--|--------|---------|---------|---------|---------|----------|
| | Below 50 | 50-100 | 100-150 | 150-200 | 200-300 | 300-400 | Over 400 |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Manager's salary | 39 | 40 | 34 | 31 | 30 | 28 | 29 |
| Extra help | 6 | 5 | 9 | 16 | 14 | 18 | 17 |
| Depreciation | 15 | 15 | 17 | 14 | 15 | 15 | 12 |
| Insurance and bonds | 10 | 9 | 9 | 7 | 7 | 8 | 9 |
| Taxes and rents | 6 | 7 | 6 | 6 | 7 | 6 | 8 |
| Light, heat and power | 4 | 4 | 4 | 4 | 5 | 5 | 4 |
| Auditing and bookkeeping | 4 | 4 | 4 | 4 | 5 | 3 | 3 |
| Repairs and renewals | 2 | 3 | 4 | 5 | 3 | 5 | 4 |
| Printing and supplies | 3 | 3 | 3 | 3 | 4 | 3 | 6 |
| Directors and secretary | 3 | 3 | 2 | 2 | 3 | 3 | 1 |
| Markets | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| Advertising | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| Miscellaneous | 5 | 4 | 5 | 5 | 4 | 4 | 4 |

* Interest not included.

TABLE 16.—Percentage distribution of total grains based upon pounds handled, 1926-27 to 1930-31

| Year | All grain | Wheat and durum | Barley | Flax | Corn | Oats | Rye |
|----------------|-----------|-----------------|--------|------|------|------|-----|
| 5-year average | 100% | 70% | 11% | 7% | 6% | 4% | 2% |
| 1926-27 | 100 | 55 | 5 | 10 | 19 | 10 | 1 |
| 1927-28 | 100 | 66 | 15 | 9 | 4 | 4 | 2 |
| 1928-29 | 100 | 70 | 16 | 7 | 3 | 3 | 1 |
| 1929-30 | 100 | 78 | 9 | 5 | 3 | 3 | 2 |
| 1930-31 | 100 | 78 | 9 | 4 | 3 | 2 | 4 |

TABLE 17.—Net income per bushel all elevators, positive net income elevators and negative net income elevators, 1926-27 to 1930-31

| Grain | Wheat and durum | Barley | Flax | Corn | Oats | Rye |
|---------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | (\$) | (\$) | (\$) | (\$) | (\$) | (\$) |
| 5-year average | | | | | | |
| All elevators | -.0084 ¹²⁷ | -.0026 ¹¹⁵ | .0218 ¹⁰³ | -.0202 ⁷⁰ | .0132 ⁵⁹ | -.0048 ⁶² |
| Positive net income | .0315 ⁸⁷ | .0335 ⁷² | .0798 ⁷⁰ | .0282 ²⁹ | .0395 ⁶¹ | .0466 ³³ |
| Negative net income | .0409 ⁷⁰ | .0491 ⁴³ | .0103 ³³ | .0544 ⁴¹ | .0441 ²⁸ | .0633 ²⁹ |
| 1926-27 | | | | | | |
| All elevators | -.0444 ²³ | -.0131 ¹⁵ | -.0159 ¹⁸ | -.0593 ¹⁸ | .0020 ²⁰ | -.0034 ⁷ |
| Positive net income | .0758 ⁵ | .0331 ⁸ | .0678 ⁹ | .0140 ⁸ | .0305 ¹² | .0662 ⁴ |
| Negative net income | .0779 ¹⁸ | .0660 ⁷ | .0997 ⁹ | .0740 ¹⁵ | .0407 ⁸ | .0962 ³ |
| 1927-28 | | | | | | |
| All elevators | .0331 ²⁸ | .0350 ²⁸ | .0464 ²² | .0126 ¹⁴ | .0480 ²¹ | .0555 ¹⁷ |
| Positive net income | .0404 ²² | .0368 ²⁵ | .0572 ²⁰ | .0252 ¹² | .0480 ²¹ | .0597 ¹⁶ |
| Negative net income | .0067 ⁴ | .0114 ¹ | .0615 ² | .0633 ² | | .0119 ¹ |
| 1928-29 | | | | | | |
| All elevators | -.0111 ²⁸ | -.0039 ²⁵ | .0854 ²¹ | -.0001 ¹¹ | .0111 ²¹ | .0071 ¹² |
| Positive net income | .0179 ⁹ | .0228 ¹¹ | .0998 ¹⁹ | .0419 ⁴ | .0310 ¹⁴ | .0395 ⁵ |
| Negative net income | .0266 ¹⁷ | .0249 ¹⁴ | .0518 ² | .0242 ⁷ | .0288 ⁷ | .0160 ⁷ |
| 1929-30 | | | | | | |
| All elevators | -.0113 ²⁸ | -.0054 ²⁴ | .0543 ¹⁹ | -.0075 ¹⁵ | .0016 ¹⁴ | -.0773 ¹⁰ |
| Positive net income | .0195 ¹¹ | .0391 ¹² | .1027 ¹⁴ | .0355 ⁹ | .0442 ⁸ | .0129 ⁸ |
| Negative net income | .0340 ¹⁵ | .0498 ¹² | .0813 ⁵ | .0361 ⁹ | .0552 ⁹ | .1169 ⁷ |
| 1930-31 | | | | | | |
| All elevators | -.0123 ²⁸ | -.0073 ²⁵ | -.0570 ²² | -.0344 ¹² | -.0101 ¹³ | -.0332 ¹⁶ |
| Positive net income | .0151 ¹⁰ | .0317 ¹⁸ | .0625 ⁸ | .0227 ⁴ | .0406 ⁶ | .0182 ⁸ |
| Negative net income | .0294 ¹⁸ | .0768 ⁹ | .1209 ¹⁵ | .0629 ⁸ | .0537 ⁷ | .0577 ¹¹ |

NOTE.—Numbers to right of average indicates number of elevators.

TABLE 18.—Relation between test weight, protein content, premium or discount and price received at Minneapolis for shipments of spring wheat from eighteen stations in northern South Dakota, 1926-27*

| Elevator number | Av. selling price per bushel† | Total car-lot tests | Av. test weights | Av. protein content | Av. premium or discount received over prevailing futures at Minneapolis |
|---------------------|-------------------------------|---------------------|------------------|---------------------|---|
| | (\$) | (No.) | (Lbs.) | (%) | (c per bushel) |
| Total or av. | 1.408 | 238 | 58.0 | 14.13 | - .4 |
| 1 | 1.400 | 2 | 56.5 | 13.08 | + 1.2 |
| 3 | 1.170 | 1 | 58.7 | 16.20 | -27.5 |
| 4 | 1.409 | 2 | 53.5 | 12.15 | - .2 |
| 6 | 1.414 | 3 | 59.1 | 14.77 | - 1.0 |
| 7 | 1.450 | 2 | 59.5 | 12.73 | + 4.3 |
| 12 | 1.315 | 23 | 58.5 | 14.15 | - 7.5 |
| 13 | 1.345 | 1 | 57.5 | 13.85 | - 5.4 |
| 14 | 1.350 | 22 | 57.9 | 14.68 | - 6.8 |
| 15 | 1.449 | 3 | 55.8 | 15.88 | + 2.0 |
| 16 | 1.490 | 26 | 59.0 | 13.29 | + 7.4 |
| 17 | 1.473 | 31 | 56.7 | 14.64 | + 6.1 |
| 18 | 1.372 | 8 | 59.4 | 13.76 | - 2.8 |
| 22 | 1.348 | 17 | 58.1 | 14.78 | - 6.4 |
| 23 | 1.379 | 21 | 58.6 | 14.09 | - 3.9 |
| 24 | 1.489 | 19 | 58.4 | 13.79 | + 5.7 |
| 25 | 1.408 | 48 | 57.9 | 13.71 | - .2 |
| 26 | 1.423 | 3 | 53.6 | 17.57 | - .5 |
| 27 | 1.369 | 6 | 58.5 | 14.46 | - 3.2 |

* Summarized by Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C.

† Includes all grades.

TABLE 19.—Relation between test weight, protein content, premium or discount and price received at Minneapolis for spring wheat shipped from twenty stations in northern South Dakota, 1927-28*

| Elevator number | Av. selling price per bushel† | Total car-lot tests | Av. test weights | Av. protein content | Av. premium or discount received over prevailing futures at Minneapolis |
|---------------------|-------------------------------|---------------------|------------------|---------------------|---|
| | (\$) | (No.) | (Lbs.) | (%) | (c per bushel) |
| Total or av. | 1.37 | 1,142 | 58.61 | 12.0 | + 6.0 |
| 1 | 1.37 | 16 | 59.38 | 12.0 | + 5.0 |
| 2 | 1.30 | 2 | 60.25 | 11.1 | + 1.8 |
| 3 | 1.44 | 14 | 60.58 | 12.5 | + 8.1 |
| 4 | 1.36 | 21 | 60.07 | 11.5 | + 2.5 |
| 6 | 1.40 | 18 | 58.72 | 12.1 | + 8.2 |
| 9 | 1.41 | 49 | 60.11 | 12.5 | +12.2 |
| 11 | 1.35 | 22 | 58.46 | 12.5 | + 5.6 |
| 12 | 1.37 | 52 | 57.93 | 12.0 | + 6.0 |
| 13 | 1.46 | 16 | 59.15 | 12.7 | +15.8 |
| 15 | 1.32 | 84 | 58.52 | 11.7 | + 3.3 |
| 16 | 1.29 | 88 | 57.82 | 11.3 | + 1.1 |
| 17 | 1.34 | 72 | 60.14 | 11.4 | + 4.2 |
| 18 | 1.38 | 5 | 57.30 | 12.0 | + 5.4 |
| 19 | 1.41 | 61 | 58.48 | 12.5 | + 9.2 |
| 20 | 1.35 | 114 | 57.94 | 11.9 | + 4.9 |
| 22 | 1.40 | 121 | 59.39 | 12.2 | + 9.9 |
| 23 | 1.41 | 99 | 59.08 | 12.2 | + 8.2 |
| 24 | 1.36 | 160 | 58.30 | 11.9 | + 4.5 |
| 25 | 1.37 | 45 | 57.10 | 12.2 | + 5.3 |
| 26 | 1.36 | 83 | 57.33 | 11.9 | + 4.7 |

* Summarized by Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C.

† Includes all grades.

TABLE 20.—Relation between test weight, protein content, premium or discount and price received for spring wheat shipped from nineteen stations in northern South Dakota, 1928-29*

| Elevator number | Av. selling price per bushel† | Total car-lot tests | Av. test weights | Av. protein content | Av. premium or discount received over prevailing futures at Minneapolis |
|---------------------|-------------------------------|---------------------|------------------|---------------------|---|
| | (\$) | (No.) | (Lbs.) | (%) | (c per bushel) |
| Total or av. | 1.155 | 723 | 58.1 | 12.43 | + 4.1 |
| 1 | 1.147 | 3 | 59.2 | 12.73 | + 4.3 |
| 3 | 1.220 | 5 | 58.4 | 13.74 | + 5.9 |
| 4 | 1.236 | 4 | 59.7 | 12.46 | + 6.0 |
| 6 | 1.159 | 7 | 58.3 | 12.30 | + 3.3 |
| 9 | 1.173 | 18 | 56.6 | 12.80 | + 6.0 |
| 11 | 1.092 | 8 | 57.7 | 12.90 | + .2 |
| 12 | 1.109 | 48 | 58.1 | 12.03 | - 1.4 |
| 13 | 1.114 | 7 | 57.3 | 12.74 | - 1.8 |
| 15 | 1.127 | 44 | 58.4 | 11.90 | + 2.2 |
| 16 | 1.137 | 92 | 58.7 | 12.14 | + 2.9 |
| 17 | 1.135 | 56 | 57.9 | 12.00 | + 2.8 |
| 18 | 1.135 | 1 | 56.8 | 12.40 | + 2.4 |
| 19 | 1.257 | 19 | 58.5 | 13.50 | + 11.9 |
| 20 | 1.124 | 70 | 57.2 | 12.24 | + .5 |
| 22 | 1.273 | 52 | 59.7 | 13.60 | + 16.3 |
| 23 | 1.187 | 52 | 56.5 | 13.05 | + 8.5 |
| 24 | 1.158 | 101 | 59.2 | 12.35 | + 4.1 |
| 25 | 1.130 | 32 | 57.8 | 12.40 | + 1.4 |
| 26 | 1.131 | 104 | 57.2 | 12.25 | + 3.1 |

* Summarized by Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C.
 † Includes all grades.

TABLE 21.—Variation in the relative importance of certain quality factors of 1,928 cars of the 1926 crop of spring wheat to premiums or discounts received in the Minneapolis or Duluth market by months for fiscal year August 1, 1926 to July 31, 1927. (Montana, North Dakota, South Dakota, Minnesota Spring Wheat Area Study)*

| Quality factor | Percentage of premium attributable to quality factor indicated by months | | | | | | | | | | | |
|-----------------------------------|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|---------|
| | 1926 | | | | | 1927 | | | | | | |
| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June | July |
| | 297 cars | 730 cars | 473 cars | 382 cars | 133 cars | 192 cars | 176 cars | 170 cars | 108 cars | 140 cars | 99 cars | 28 cars |
| Total per cent accountable | 55.8 | 42.6 | 24.8 | 21.1 | 39.8 | 37.0 | 52.3 | 36.8 | 47.2 | 41.4 | 52.8 | 97.9 |
| Dockage | 5.8 | 3.4 | .4 | 2.2 | .3 | 3.4 | .9 | .5 | .5 | .1 | .1 | .3 |
| Test weight | 6.5 | - 1.9 | - 2.1 | - 6.6 | 3.8 | 2.0 | - 1.3 | - 1.0 | - 2.8 | - .1 | - 2.9 | - 1.3 |
| Protein | 31.7 | 18.8 | 7.6 | .4 | 1.1 | 3.1 | 9.8 | 4.3 | 16.9 | 10.4 | 42.6 | 99.9 |
| Moisture | 7.3 | 18.6 | 13.7 | 23.2 | 33.1 | 28.2 | 42.6 | 33.0 | 32.5 | 31.1 | 14.5 | -.1 |
| Foreign material | 4.5 | 3.7 | 5.2 | 2.7 | 1.5 | .3 | .3 | --- | .1 | - .1 | - 1.5 | -.9 |
| Coefficient of correlation | 1926 | | | | | 1927 | | | | | | |
| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June | July |
| First coefficient | .747 | .653 | .498 | .459 | .631 | .608 | .723 | .606 | .687 | .644 | .726 | .989 |

* Determined by Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C.

TABLE 22.—Variation in the relative importance of certain quality factors of 5,053 cars of the 1927 crop of spring wheat to premium or discounts received in the Minneapolis or Duluth markets by months, August 1, 1927 to July 31, 1928. (Montana, North Dakota, South Dakota, Minnesota Spring Wheat Area Study)*

| Quality factor | Percentage of premium attributable to quality factor indicated by months | | | | | | | | | | | |
|-----------------------------------|--|---------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|-------------|--------------|--------------|
| | 1927 | | | | | 1928 | | | | | | |
| | Aug. cars | Sept. cars | Oct. cars | Nov. cars | Dec. cars | Jan. cars | Feb. cars | March cars | April cars | May cars | June cars | July cars |
| Total per cent accountable | 61.8 | 68.7 | 53.6 | 82.1 | 73.3 | 84.9 | 81.4 | 85.0 | 67.2 | 59.6 | 65.4 | 97.2 |
| Dockage | 2.0 | 1.5 | .4 | .2 | -.4 | .0 | 1.0 | .2 | .3 | 1.7 | .2 | 5.9 |
| Test weight | 16.0 | 11.9 | 10.0 | 13.7 | 10.0 | 12.2 | 14.4 | 14.1 | 13.9 | 23.4 | 11.2 | 3.4 |
| Protein | 39.4 | 52.7 | 40.6 | 64.4 | 60.6 | 68.9 | 59.5 | 69.5 | 50.9 | 33.4 | 51.7 | 81.3 |
| Moisture | 3.5 | 2.3 | 2.3 | 3.6 | 2.6 | 3.2 | 5.9 | 1.2 | 1.9 | .5 | 1.0 | .8 |
| Foreign material | .9 | .3 | .3 | .2 | .5 | .6 | .6 | .0 | .2 | .6 | 1.3 | 5.8 |
| Coefficient of correlation | 1927 | | | | | 1928 | | | | | | |
| | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June | July |
| First coefficient | .786 | .829 | .732 | .906 | .856 | .922 | .902 | .922 | .819 | .772 | .808 | .986 |

* Determined by Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C.

TABLE 23.—Comparison of actual gains or losses under complete hedging with futures and without hedging with futures, hard spring wheat trading, 1925-26 to 1928-29 inclusive:¹ (1). By 7 to 18 elevators in spring wheat regional study. (2). By North Dakota Elevator No. 12.²
(Figures in dollars)

| Year | No. of Cases | Gross Gains Using Futures | | Gross trading profit with elevator completely hedged using futures ⁵ | Gains Foregone by Being Completely Hedged in Contrast to Not Buying or Selling Futures | | | | Gross profit with elevator not buying or selling futures |
|---|--------------|---|---|---|--|--|--|---------------------------------------|--|
| | | Trading Profit as shown on audit ³ | Gain if unhedged grain had been hedged ⁴ | | Gain in cash market if futures had not been used ⁶ | Gain made by not hedging unhedged grain ⁷ | Gain due to differences in spreads between cash and future prices ¹ | Savings in hedging costs ⁸ | |
| | | A | B | C | D | E | F | G | H |
| 1. By 7 to 18 elevators in spring wheat regional study | | | | | | | | | |
| Average of annual averages ----- | 12 | 3737 | -66 | 3671 | 275 | 66 | 365 | 136 | 4513 |
| 1925-26 ----- | 15 | 3511 | -176 | 3365 | -372 | 176 | 403 | 141 | 3713 |
| 1926-27 ----- | 18 | 2724 | 340 | 3064 | 80 | -340 | 63 | 102 | 2969 |
| 1927-28 ----- | 9 | 5876 | 492 | 5384 | -50 | -492 | 398 | 149 | 6373 |
| 1928-29 ----- | 7 | 2806 | 63 | 2869 | 1441 | -63 | 598 | 152 | 4997 |
| 2. By North Dakota Elevator No. 12 | | | | | | | | | |
| Average of annual averages ----- | 1 | 2845 | -334 | 2511 | 648 | 334 | 575 | 173 | 4241 |
| 1925-26 ----- | 1 | 1995 | -1675 | 320 | 198 | 1675 | 1686 | 266 | 4145 |
| 1926-27 ----- | 1 | 1107 | 129 | 1236 | -3 | -129 | 29 | 50 | 1183 |
| 1927-28 ----- | 1 | 3902 | -219 | 3683 | 954 | 219 | 3 | 153 | 5012 |
| 1928-29 ----- | 1 | 4375 | 430 | 4805 | 1443 | -430 | 582 | 225 | 6625 |

¹ Determined by the Division of Cooperative Marketing, formerly of the U. S. Department of Agriculture, Washington, D. C. Estimates in all cases except Columns 1 and 7.

² Sales and shipments for each of the four years were 53,733; 17,234; 67,377 and 196,191 bushels of wheat respectively; daily market position averaged 4,628 bushels long, 1,129 bushels long, 2,307 bushels short and 508 bushels long for the four years respectively.

³ Figures reflect results of incomplete hedging.

⁴ Derived from daily market position times change in price.

⁵ Derived from margins secured under complete hedging.

⁶ "Spreads" gains or losses not included.

⁷ Assumes condition of complete hedging.

⁸ Includes commissions and taxes; assumes complete hedging.

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