



# Current Report

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## Custom Feed Milling Operations

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An important feed source for Oklahoma's livestock industry is the custom feed mill. Custom feed Milling is the process of grinding, crimping or cracking grains and forages and mixing in other ingredients to prepare animal feeds to individual farmers' specifications. Custom services allow livestock producers to fine-tune feed rations for greater efficiency in individual situations. This current report describes the structure and pricing behavior of Oklahoma's custom feed milling industry.

This information has been developed from a 1977 survey of 120 Oklahoma firms performing custom feed milling services. Information represents actual conditions in the industry during calendar year 1976.

### A Sideline Enterprise

In Oklahoma, custom feed milling typically occurs as a sideline enterprise of grain storage and marketing firms. Ninety-four percent of custom feed millers also store and handle raw grains for marketing. On the average, firms offering custom feed milling services derive ten percent of gross revenues from this enterprise. Only one firm surveyed obtained more than half of gross revenues from feed milling activities.

Motivation for performing milling services is largely promotional. Profitability of the feed milling enterprise is the primary objective of only one third of Oklahoma's feed mill managers (Table 1). Nearly one-half of firm managers list either customer retention or attraction of customers to other services offered as the primary reason for engaging in milling services. Attracting new customers is an important secondary objective. Use of feed milling as a way to utilize excess equipment and storage space is a relatively unimportant reason for offering these services.

### Industry Structure:

#### Enterprise Size, Volume, and Seasonality

The Oklahoma custom feed milling industry is composed of numerous, small enterprises offering

a variety of service packages and ingredient compositions. Feed production is highly seasonal, resulting in substantial excess mill capacity.

Table 2 shows the relative frequency with which various services are performed by millers. The most common service package includes grinding or crimping of grain, mixing with additives and delivering the feed to farms in bulk form. The variety of ingredients composing feeds is shown in Table 3. Virtually all firms use grain sorghum, corn, wheat and oats as basic feed grains. Cottonseed and soybean meals are the most popular protein meals.

Enterprise size can be measured either by physical output capacity or by actual output volume. Physical capacity is typically restricted by the mixer size. Mixing capacities of Oklahoma custom millers range from 2 to 30 tons per hour, with an average of 7.9 tons per hour. Four-

TABLE 1. Reasons for Engaging in Custom Feed Milling

Reason	Percent of Firms Choosing As	
	Primary Reason	One of Top 3 Reasons
To keep customers	31.1	64.4
To increase revenue from other services	17.8	57.8
To make a profit	33.3	55.6
To make new customers	0.0	37.8
To utilize excess labor	8.9	24.4
To utilize excess facilities	0.0	17.8
To serve customers	6.6	8.9
To meet competition	2.2	6.7
To utilize excess storage	0.0	6.7
	99.9 <sup>a</sup>	

<sup>a</sup>The total does not add to 100 due to rounding.

Source: 1977 Custom Feed Milling Survey.

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TABLE 2. Services Offered by Oklahoma Custom Feed Milling Firms

Service	Percentage of Oklahoma Firms Offering Service
Storage Service	
Grain banking	62.5
Processing Services	
Grain grinding	91.7
Hay grinding	20.8
Crimping	79.2
Cracking	20.8
Mixing	90.0
Pelleting	14.6
Auxiliary Services	
Bagging	70.8
Bulk delivery	81.2
Bagged delivery	20.8

fifths of custom millers have hourly mixing capacities of 10 tons or smaller. Common mixing capacities are 3-, 5-, and 10-tons per hour. Among specialized feed manufacturing firms, a mixing capacity of 20 tons per hour is considered very small.

Annual production volumes range from 38 tons to 49,000 tons, with an average of 3,608 tons. Four-fifths of Oklahoma custom feed millers produce less than this average volume.

A pronounced seasonal production pattern is evident in the first column of Table 4. Fifty-six percent of annual feed production occurs in the five cold-weather month of rangeland dormancy from November through March. Volume for a winter month is typically more than twice that for a summer month. Peak production volume, in February (48,000 tons) is 145 percent of the monthly average of 33,000 tons. This seasonal pattern is created chiefly by winter feeding in cow-calf and feeder cattle operations. Dairy and swine rations are produced in a much more uniform pattern through the year.

Seasonality of output volume also creates seasonality of plant capacity utilization, daily hours of operation and storage space devoted to feed ingredients. Plant capacity is measured by multiplying hourly mixer capacity by 40 hours per week and 52 weeks per year. Capacity utilization is measured as the percent of available time the mill is actually in use. The last column of Table 4 shows that the percent of plant capacity used ranges from 13.5 percent, in August, to 32.4 percent, in February. Even during the peak season, less than a third of available capacity is being utilized. Larger volume mills tend toward higher capacity utilization than do small mills. Many of the smaller mills use less than 15 percent of their potential annual capacity.

TABLE 3. Ingredients Used in Feed Mixes

Ingredient	Percentage of Firms Using	Ingredient	Percentage of Firms Using
Grain Sorghum	100	Meat and Bone Meal	48
Corn	98	Tankage	24
Feeding Wheat	98	Fish Meal	8
Oats	98	Millfeeds	34
Barley	72	Dried Beet Pulp	4
Alfalfa Pellets	54	Salt	100
Cottonseed Hulls	4	Minerals	94
Peanut Hulls	2	Vitamins	78
Cottonseed Meal	90	Drugs	30
Soybean Meal	78	Molasses	96

Source: 1977 Custom Feed Milling Survey.

Three explanations for this low capacity utilization during the peak season are plausible: a) seasonal peak production may vary broadly over the years requiring reserve capacity to fulfill feed demands in unusual years, b) at many locations feed demands may be less in volume than what minimum-size machinery can produce, or c) the industry may have overinvested in physical plant as a promotional investment. Information for more than one year is necessary to test the truth of the first explanation. If either of the remaining two explanations are correct, there will be continual economic pressure opposing establishment and maintenance of small mills. Substantial promotional results must be apparent to justify small mill operations.

Hours of plant operation per week also reflect the seasonal feed production pattern. The average work week for mills ranges from 8 to 56 hours per week, with an average of 36.8 hours. The average peak weekly operation runs 47.1 hours, about a third greater than the yearly average. Ninety-five percent of custom feed mills reach peak weekly hours of operation sometime during the November to March period.

The seasonal pattern of feed ingredient storage is less pronounced than that of production volume. Average peak (February) feed ingredient storage per firm for 1976 is 60,300 bushels, or 113 percent of the annual average of 53,000 bushels. This compares with peak production volume which is 145 percent of the annual average. The seasonal pattern of feed ingredient storage tends to lead the pattern of production volume as millers adjust inventories in anticipation of conventional patterns of service demand. This can be seen in the next to the last column of Table 4 as firms reach peak ingredient storage earlier than peak feed production.

#### Pricing Behavior

Industry pricing behavior can be described by factors influencing pricing, types of pricing formulas and levels and variation of prices relative to costs. Cost factors tend to dominate

TABLE 4. Seasonal Patterns of Volume, Peak Ingredient Storage and Capacity Utilization in Oklahoma Custom Feed Mills, 1976

Month	Volume	Average Volume Per Firm (tons)	Percentage of Annual Volume	Percentage of Firms With Peak Ingredient Storage	Percentage Capacity Utilization
January	47,603	433	12.0	22.0	32.1
February	47,982	436	12.1	4.9	32.4
March	42,462	386	10.7	2.4	28.7
April	31,627	288	8.0	0.0	21.3
May	27,052	246	6.8	0.0	18.3
June	21,389	194	5.4	12.2	14.4
July	20,173	183	5.1	0.0	13.6
August	20,001	182	5.0	7.3	13.5
September	22,713	206	5.7	4.9	15.3
October	30,030	273	7.6	9.8	20.3
November	39,605	360	10.0	24.4	26.7
December	46,268	421	11.7	12.2	31.2
Total	396,905	3,608	100.1 <sup>a</sup>	100.1 <sup>a</sup>	22.3

<sup>a</sup>The total does not add to 100 due to rounding.

Source: 1977 Custom Feed Milling Survey.

pricing decisions of custom feed mill managers. Nearly 70 percent of managers identify cost items as the primary factor influencing prices (Table 5). Charges of competitors and desired profit margin also appear as important factors. Effects of charges on feed volume demanded, past charges, livestock prices and season of the year influence prices little. Consequently, the motivation for setting prices is consistent with that prevailing in any competitive industry.

However, unlike most competitive industries, prices for custom feed mill services vary broadly across firms. The average and the range for service charges are shown in the first two columns of Table 6. It is unlikely that labor, energy, and ingredient costs vary as broadly as do service prices. It is also unlikely that charges are actually set with great sensitivity to competitors' charges, with a range of charges this broad. Two explanations for such variation in service charges are possible; a) service charges may be a small and relatively unimportant part of total feed costs as judged by farmers, releasing feed firms from the worry of competition or b) individual feed mills may tend to be the sole source of milling services in a particular area, permitting some flexibility of charges without a response in service quantity demanded.

The average and the range of manager-estimated service costs are shown in the third and fourth columns of Table 6. In five of the seven cost categories the range of estimated costs is broader than the range of charges. Only half of managers responding to the survey even attempted to estimate service costs. The combination of these facts indicate that there is a

TABLE 5. Factors Considered in Setting Custom Feed Milling Service Charges

Factor	Percentage of Firms Choosing as Primary Factor	Percentage of Firms Choosing as One of Top Three Factors
Cost of Labor	22.2	64.4
Overall Cost of Operation	24.4	62.2
Charges of Competitors	22.2	40.0
Cost of Machinery	2.2	40.0
Desired Profit Margin	6.7	31.1
Cost of Ingredients	20.0	24.4
Effect of Charges on Volume	2.2	11.1
Past Charges	0.0	8.9
Livestock Prices	0.0	2.2
Season of the Year	0.0	0.0
	99.9 <sup>a</sup>	

<sup>a</sup>Total does not add to 100 due to rounding.

Source: 1977 Custom Feed Milling Survey.

widespread lack of knowledge of operating costs. Introduction of enterprise cost accounting could enhance knowledge of operating costs and, in turn, provide information necessary for pricing to meet firm objectives.

Charges for feed delivery are determined with a variety of formulas. Cost of performing delivery services is composed of two elements: a) a fixed cost per load for labor and fuel involved in loading the feed at the mill and unloading the feed at the farm and b) a distance-related cost for labor and fuel when moving over the road. A delivery charge of this type would impose a per load charge plus a per mile charge. This type of charge calculation is used by only 16 percent of feed mill managers (Table 7).

Nearly half have a flat charge per volume unit. The radius of the market area served by feed mills ranges from 4 to 125 miles, with an average radius of 30 miles. The flat, per unit charge tends to collect more revenue relative to service cost from customers located near the mill than from those located at a greater distance from the mill. This type of delivery service pricing tends to expand the area served by a particular mill by asking a lower revenue contribution to cost from customer located at the competitive fringe of market areas served by numerous mills, than from nearby customers with fewer local options.

### Conclusions

The Oklahoma custom feed milling industry consists of a large number of small mills operating as sideline enterprises of grain storage and marketing firms. Operations are highly seasonal, which contributes to excess capacity in the industry. Each mill is somewhat isolated by the cost of transportation, permitting a degree

TABLE 6. Charges and Estimated Costs for Custom Feed Milling Services

Service	Mean Charge Per Cwt. (Cents)	Range In Charges Per Cwt. (Cents)	Mean Estimated Cost Per Cwt.	Range In Estimated Cost Per Cwt.	% of Firms With Charges Estimated	Percentage of Firms Estimating Charges But Not Estimating Costs
Grain Banking <sup>a</sup>						
Grain Grinding	27.1	10 - 50	21.5	5 - 50	91.3	46.5
Hay Grinding	46.5	30 - 80	57.8	25 - 100	50.0	60.0
Crimping	24.4	10 - 55	20.5	5 - 45	81.0	43.2
Cracking	27.5	10 - 50	18.8	5 - 30	75.0	60.0
Mixing	13.9	5 - 25	11.4	1 - 30	86.4	46.3
Pelleting	52.9	20 - 100	40.0	30 - 50	66.7	57.1
Bagging	21.2	5 - 50	20.3	10 - 45	84.2	45.7

Source: 1977 Custom Feed Milling Survey.

TABLE 7. Pricing Schemes for Bulk Delivery of Custom Feed Milling

Pricing	Percentage of Firms Using
Flat per cwt. or per ton charge	29.7
Per cwt. or per ton charge with minimum charge	18.9
Flat per mile charge	16.2
Per load charge plus per mile charge	16.2
Per mile charge with minimum charge	8.1
Miscellaneous Schemes	10.8
	99.9 <sup>a</sup>

<sup>a</sup>Total does not add to 100 due to rounding.

Source: 1977 Custom Feed Milling Survey.

of pricing flexibility for most mills; charges for services vary broadly.

The typical objective for operating a feed mill is to promote use by customers of other services offered by the firm. However, cost-based pricing strategies do not suggest that mill managers are operating in a manner to achieve the promotional objective. Evidence from the survey suggests that a major reason for failure to manage feed mills to achieve the promotional objective is a lack of information necessary to control the mill enterprise. To design effective, goal-oriented pricing strategies requires information from individual enterprise costs and demand response in primary enterprises attributable to changes in feed mill volume. Sideline enterprises likely are afforded less attention from management than are primary enterprises. However, when sideline enterprises are undertaken to promote central activities, finely-tuned management of sideline activities is an integral part of primary activity management. Greater efforts in developing enterprise cost accounting and service demand response information permit managers to develop finely-tuned pricing strategies for maximum profit payoff.