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CURRENT AND ALTERNATIVE MARKETING SYSTEMS  
FOR TEXAS GRAIN SORGHUM

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Texas Agricultural Market Research and Development Center  
in cooperation with  
Department of Agricultural Economics and Rural Sociology  
The Texas Agricultural Experiment Station  
The Texas Agricultural Extension Service  
College Station, Texas

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Robert E. Branson  
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HIGHLIGHTS OF RESEARCH FINDINGS  
FROM THE 1972-73 SURVEY

*The Importance of Grain Sorghum in the United States*

For the total U.S., grain sorghum represents 12 percent of the grains fed to livestock and poultry. Corn, by comparison, represents 71 percent.

Two-thirds of all grain sorghum is fed to beef cattle, whereas two-fifths of all corn is fed to hogs. Thus, grain sorghum is more dependent on the beef cattle feeding market.

Carryover stocks of grain sorghum at the end of 1972-73 season were 73 million bushels, the lowest since 1955.

*Grain Sorghum Importance in Texas*

Texas is the nation's principal producer of grain sorghum, with just over 40 percent of the national production.

*Price of Grain Sorghum vs. Corn*

During the past eight years, grain sorghum has sold for 8¢ to 40¢ per hundredweight less than has #2 yellow corn, or at a 3 to 31 percent discount compared with corn, based on Kansas City market prices.

During the four years, 1968-71, grain sorghum has sold for as little as 14¢ below #2 yellow corn, as of the month of December, and as much as 30¢ below corn in the month of May, based on Kansas City market quotations, on a hundredweight basis.

Texas Panhandle annual average farm prices for grain sorghum have exceeded the U.S. average prices during the last four years, by from 4 to 16 cents per hundredweight. This is understandable because of the High Plains heavy feedlot demand for grain sorghum.

*Feedlot Demand for High Plains Grain Sorghum*

Number of cattle on feed in Texas has expanded dramatically from a level of about 1.4 million head in 1969 to one of 2.2 million in 1973, a gain of 57 percent. Texas, as a result, is now the number one cattle feeding state in the nation.

Seventy-five percent of the cattle on feed in Texas in 1973 were in the feedlots of the Texas High Plains area.

In 1972, latest year of available data, feedlots used 75 percent of the High Plains grain sorghum, 17 percent was exported and 8 percent moved to feed mills for other uses.

Projected feed requirements of Texas cattle feeders for 1980 indicate a need for an additional 1,500,000 tons of feed, plus 108,000 more tons of protein supplements. That will represent a 37 percent increase in grain needs.

Three out of five feedlot managers rated grain sorghum at 85 to 90 percent of the feeding value of corn. One out of four considers grain sorghum to be 95 percent of the feeding value of corn, and about one in six considers grain sorghum to be from 96 to 100 percent of the value of corn.

### *Feedlot Age, Ownership, Integration and Size*

Three out of five feedlots in the Texas Panhandle, by 1973, had been in business less than five years.

A third of the feedlots operates independently, a third is tied in with feed suppliers, and the other third is owned by packers, elevators, chemical companies, other feedlots, or some form of conglomerate corporation.

Ninety-six percent of the feedlots are privately owned. Only four percent are cooperatives.

Size of the Texas Panhandle feedlots varies as follows: about 3 out of 10 feedlots are of sufficient size to accommodate 30,000 or more cattle at one time; a fourth has a 20,000 to 30,000 head capacity, a fifth ranges from 10,000 to 20,000 and the remaining fourth is limited to 10,000 head or less.

### *Grain Elevators*

About 90 percent of the grain sorghum fed by Texas High Plains feedlots came from grain elevators. A little over 5 percent came from producers, and less than 5 percent from the feedlots own production facilities.

Storage capacity and grain receipts in the area are divided approximately equally between cooperatives and other ownership forms of grain elevators.

The average length of present ownership for the grain elevators is 26 years.

About 85 percent of the Texas High Plains grain elevators has been in business over 10 years. At least half has operated for 20 or more years. This partly reflects the relatively stable level of grain sorghum production in the area in recent years.

Almost two-thirds of the elevators do some forward contracting with producers, while 85 percent engage in forward selling.

Forty percent of the elevators are vertically or horizontally integrated. Most of the integration is with feedlots. Cooperatively owned elevators generally are not integrated.

RECOMMENDATIONS TO THE TEXAS  
GRAIN SORGHUM PRODUCERS BOARD

*Improve Producer Market Information*

Establish a comprehensive market news service for grain sorghum. Present price information is highly inadequate from a producer marketing standpoint.

Provide information on grain movement during the marketing year, in state, out of state, and for export. Producers would thereby have better information concerning existing supply and demand conditions in the market, when negotiating sales. This can be expanded to having a market analyst on the staff to assist in market information analysis and dissemination.

*Adopt Reporting and Service for Crop Contracting*

Provide market information daily or weekly pertaining to crop contracting for grain sorghum especially if it becomes a more prevalent method of marketing in the Texas High Plains area.

Offer legal counsel, or evaluation, for crop contracts, to assist producers, elevators and buyers in formulating improvements in contracts.

*Research and Education*

Sponsor technical research to evaluate and improve grain sorghum processing methods for feeding use. Several methods are currently used and there appears to be a lack of objective data concerning resultant effects on feeding value of grain sorghum. This in turn can influence prices producers and elevators can obtain for grain sorghum.



Evaluate need for possible modifications in grain sorghum grade standards. New processing methods can make changes in the relative value of various kinds or classes of grain. Benefits of better processing technology should be shared by both producers and processors.

Conduct export market research and formulate market development programs to expand export demand for grain sorghum.

Analyze in-state and out-of-state freight rate structures and transportation mode alternatives for grain sorghum and their effect on producer returns as well as the market area that can be profitably served by the Texas High Plains grain sorghum producers.

Inaugurate a series of marketing workshop programs to inform producers about the fundamentals of marketing, as contrasted to the usual practice of merely selling grain sorghum. Various methods and systems of marketing should be understood, whether the producer chooses to sell as an individual, as part of a private marketing group, or through a cooperative.

Encourage formation of and joint efforts with grain sorghum producer associations in other states.

#### *Suggestions to Existing Elevators*

Those associated with grain sorghum marketing through existing Texas High Plains elevators should give consideration to the possibilities for greater coordination of their marketing programs.

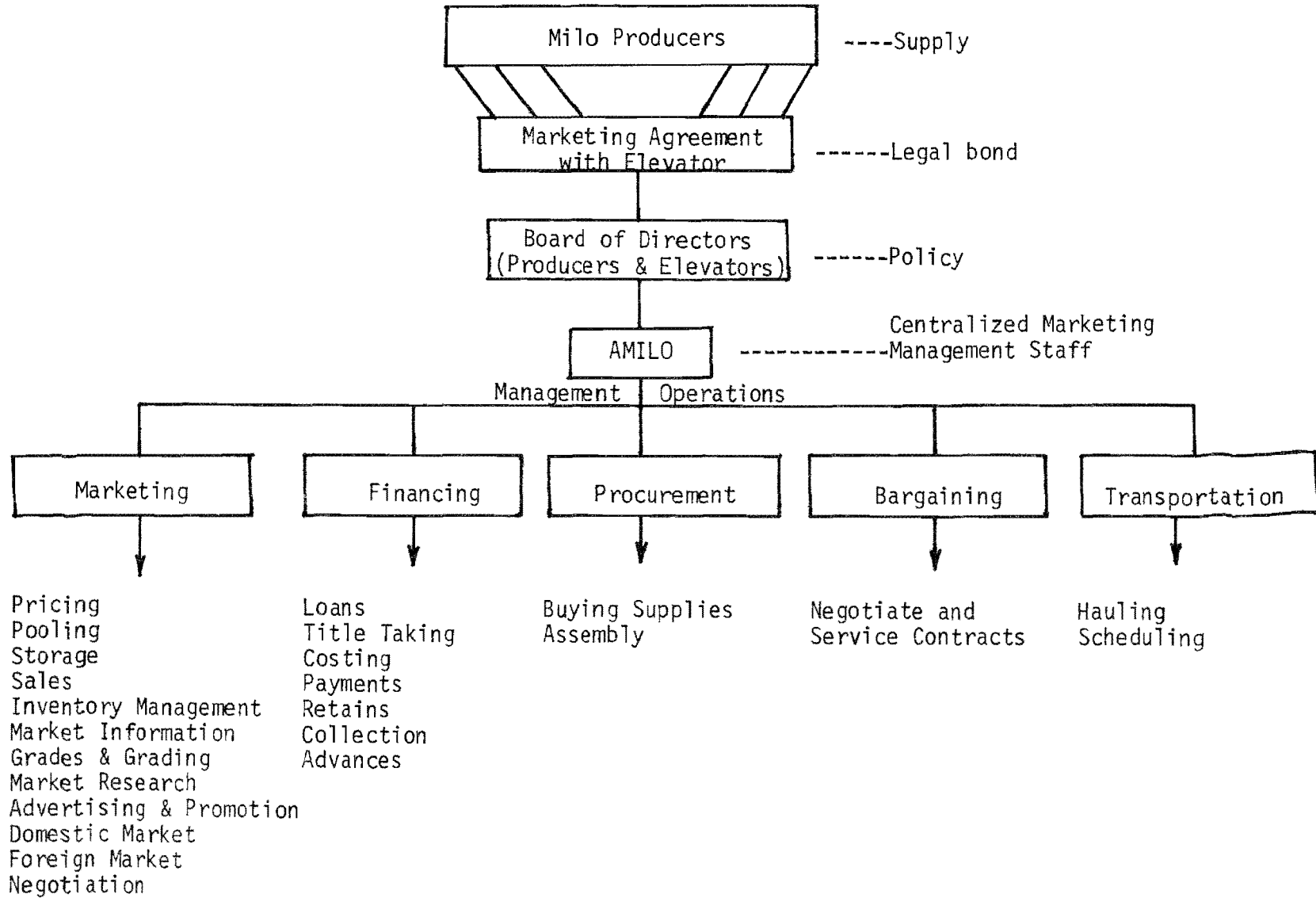
Producers can improve the strength of their own and their elevators' marketing program by precommitting all, or a significant part, of their grain to a centralized marketing effort.

Precommitted, centralized supplies of grain sorghum in turn allow elevators, private or cooperative, to provide better services to feedlots, and other buyers, and thereby return premium prices to their producer members. Such a system is, for example, proving successful for Texas' rice growers.

Local private and/or cooperative elevators may gain further marketing successes by forming marketing groups or even a regional marketing program of which each is a part. Such joint marketing programs can be especially effective in foreign market development efforts as well as in expanding domestic market demand.

Some U.S. grain producer groups have established highly organized and successful marketing programs formulated under a system comparable to the following diagram. Such a system somewhat parallels the approach followed by major business corporations in the United States.

ORGANIZATION FOR MARKETING



CURRENT AND ALTERNATIVE MARKETING SYSTEMS  
FOR TEXAS GRAIN SORGHUM

Randall Stelly, Roland D. Smith, Robert L. Degner  
William E. Black, and Robert E. Branson \*

INTRODUCTION

The grain sorghum industry plays a major role in the overall economy of the High Plains of Texas. In addition to the sorghum moving into the general grain trade, it also is quite important to the commercial cattle feeding industry located in the same area. The growth and importance both in terms of grain sorghum production and cattle feeding to the 29-county area covered by the Texas Grain Sorghum Producers Board, for which this research was conducted, are indicated by the following comparison statements:

In 1969, this 29-county area produced 168 million bushels of grain sorghum, which was 54 percent of the Texas total; in 1971, it produced 189 million bushels or 62 percent of the total.

In 1969, about 1.7 million head of cattle were marketed from feedlots in the area which accounted for 62 percent of the total in the state; in 1972, this increased to 3.2 million head, or 72 percent of the state's total.

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As the quantity of grain sorghum produced each year increases, grain sorghum producers are becoming more concerned about increasing the efficiency of marketing their grain. Therefore, the Texas Agricultural Market Research and Development Center, as a joint service of the Texas Agricultural Experiment Station and the Texas Agricultural Extension Service, was asked to review the current marketing operations for the purpose of suggesting possible improvements.

### Objectives

In order to accomplish the general purposes of the research, the following objectives were established:

To identify the marketing channels, as of 1973, for grain sorghum produced in the Texas Panhandle.

To analyze the disposition of the U.S. grain sorghum crop.

To ascertain the general competitive position of grain sorghum versus corn in the Panhandle cattle feeder markets.

To ascertain the transportation modes used in marketing grain sorghum and competing feeds, and

To suggest alternative methods of improving the marketing strategies of grain sorghum in the Texas Panhandle.

### Research Plan

This study focuses primarily upon information obtained through interviews with feedlot and elevator operators in a 29-county area of the

Texas Panhandle. Areas of concentration in the elevator interviews were the primary markets, product flow, transportation and management practices of the operators. Feedlot operators were interviewed to determine their sources of supply of grain sorghum and other feed grains, volume used and other pertinent competitive factors.

The 29-county area in the Texas Panhandle was selected because of its primary importance both in grain sorghum production and commercial feedlot operations. A list of all commercial grain elevators and feedlots in the area was obtained from the Texas Crop and Livestock Reporting Service. From these, a representative sample was drawn according to size, location, ownership, etc. of 48 feedlots and 58 elevators. This represented 53 percent of the 91 feedlots in the area, and 17 percent of the 347 elevators operating at the time of the survey.

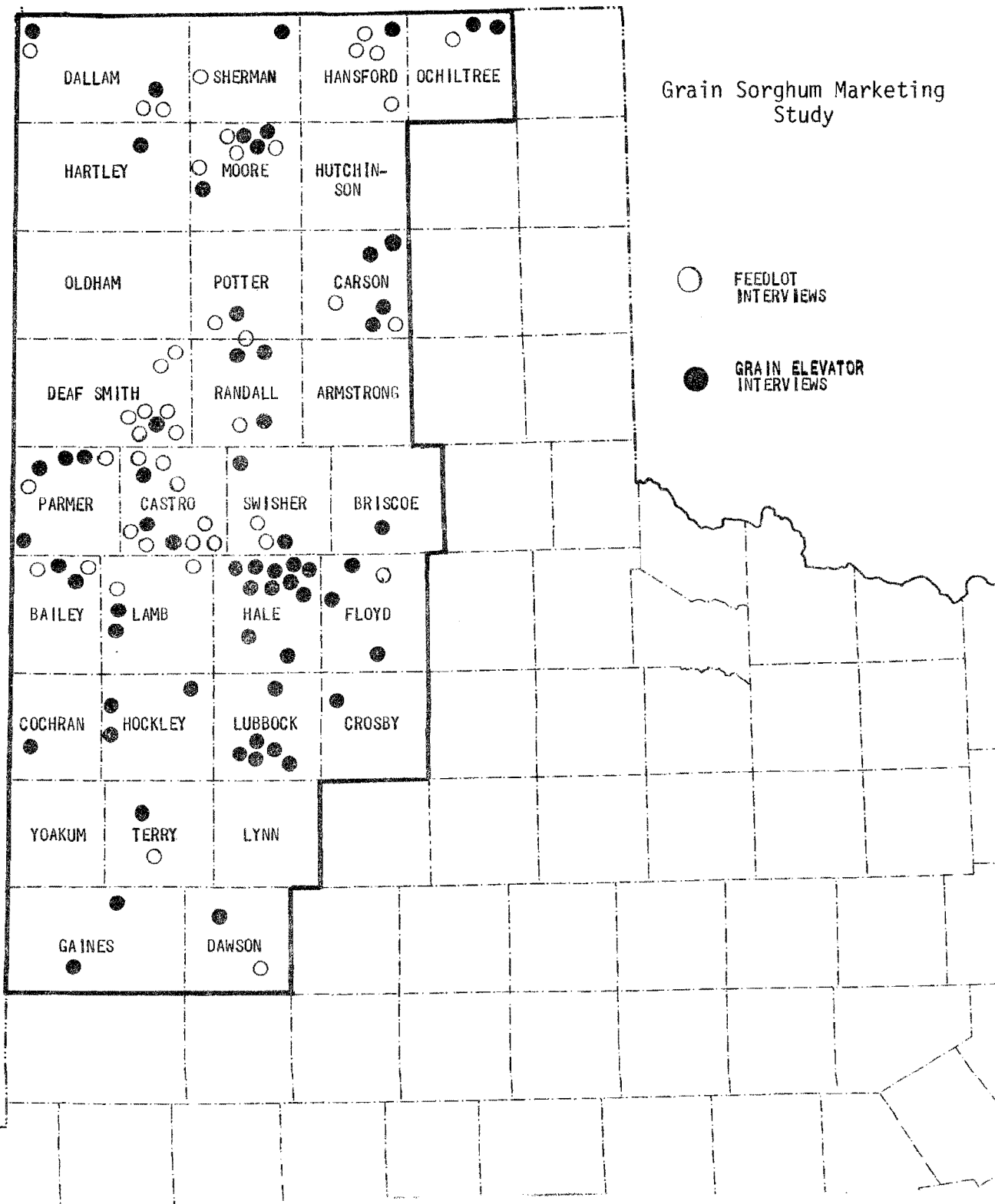
Figure 1 shows the location of the interviews in the study area. Both personal and telephone interview techniques were used to obtain answers to a pre-structured questionnaire. In addition to data obtained from these interviews, nutritionists for several feedlots in this area were interviewed concerning their opinion of grain sorghum relative to competitive feed grains in the cattle ration.

#### CURRENT SITUATION--OVERVIEW

##### Production

Total production of grain sorghum in both Texas and the U.S. as a whole increased by about 40 percent during the past seven or eight years. Texas

Figure 1. Location of feedlots and grain elevators interviewed.



farmers produce two out of every five bushels of grain sorghum in the United States, and fifty percent more than producers in the next highest producing state of Kansas. For the past several years over 300 million bushels were produced annually in Texas. This utilized about seven million acres of Texas farm land (Tables 1, 2 and 3), or about two million more than is planted to cotton--the second most important Texas crop from the standpoint of acreage. Texas production is concentrated in the Panhandle, where about 55 percent is produced (Tables 4 and 5). About one-fourth of Texas production originates in the southern portion of the state. Figure 2 shows the highly concentrated production area termed "The Grain Sorghum Belt."

#### Utilization

Normally, about 80 percent of the U.S. grain sorghum production is used domestically for animal feeding and about 20 percent is exported (Table 6). Major foreign markets for U.S. grain sorghum traditionally have been Japan and Western Europe. Domestic utilization is largely influenced by the rapidly expanding cattle feeding industry which currently accounts for about two-thirds of the domestic disappearance, with poultry utilizing another 20 percent. Hogs and dairy cattle are among other users.

The proportion of grain sorghum used for feed and seed on the farms where it is produced is substantially different from that of other feed grains, especially corn. <sup>1/</sup> While about 40 percent of the corn produced in the United

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<sup>1/</sup> Agricultural Statistics--1971, USDA.



Table 1. Grain sorghum: production in leading states, annually, 1963-72.

Year	Texas	Oklahoma	Kansas	Nebraska	New Mexico	Arizona	California	Other States	United States
(1,000 bushels)									
1963	242,660	21,535	147,771	102,465	12,152	7,488	16,974	34,349	585,394
1964	215,648	14,050	98,508	90,850	9,200	9,286	19,600	32,654	489,796
1965	294,056	21,830	139,426	121,498	12,488	12,450	23,700	47,250	672,698
1966	311,696	20,280	139,601	142,052	15,939	15,015	27,504	42,905	714,992
1967	343,485	25,802	149,408	123,904	19,154	19,926	27,560	46,697	755,936
1968	340,780	26,158	163,325	101,732	16,182	18,249	25,200	48,069	739,695
1969	309,800	25,474	182,896	118,636	16,856	15,522	29,049	49,047	747,280
1970	329,616	23,306	145,960	77,520	17,499	12,670	29,304	60,579	696,454
1971	303,004	27,000	233,550	125,160	24,131	12,702	28,755	141,047	895,349
1972	319,780	27,090	217,000	126,504	19,305	10,608	17,424	84,087	821,798
Average 1968-72	320,596	25,806	128,546	109,910	18,795	13,950	25,947	76,566	780,115

SOURCE: U.S.D.A., SRS - Annual Crop Reports.

Table 2. Grain sorghum: acreage planted in leading states, annually, 1963-72

Year	Texas	Oklahoma	Kansas	Nebraska	New Mexico	Arizona	California	Other States	United States
(1,000 acres)									
1963	6,579	1,234	5,066	2,148	328	140	276	1,745	17,516
1964	6,250	1,061	4,306	2,341	285	147	306	2,074	16,770
1965	6,125	987	4,048	2,692	294	187	343	2,403	17,079
1966	6,370	938	3,805	2,423	326	208	410	1,892	16,372
1967	7,771	1,097	4,338	2,544	424	254	451	2,128	19,007
1968	7,538	976	4,468	2,035	390	239	383	1,985	18,014
1969	7,538	986	4,066	1,852	398	208	448	1,961	17,457
1970	7,010	937	4,391	1,778	410	193	421	2,128	17,268
1971	7,641	1,200	5,180	2,406	492	189	434	3,730	21,272
1972	6,800	1,100	4,400	1,997	366	153	271	2,368	17,455
Average 1968-72	7,305	1,036	4,501	2,016	411	196	381	2,434	18,293

SOURCE: U.S.D.A., SRS. Annual Acreage Reports.

Table 3. Percent of U.S. Grain Sorghum production in major producing states

State	Year			
	1965-69	1963	1968	1972
	(percent)			
Texas	44.1	41.5	46.1	39.0
Kansas	21.3	25.0	22.1	26.4
Nebraska	16.7	17.5	14.0	15.4
Oklahoma	3.3	3.7	3.5	3.3
New Mexico	2.2	2.1	2.2	2.3
Arizona	2.2	1.3	2.5	1.3
California	3.7	2.9	3.4	2.1
Others	6.4	5.9	6.5	10.2
TOTAL	100.0	100.0	100.0	100.0

SOURCE: Computations from Annual Crop Reports, SRS, USDA.

Table 4. Acreage and production of grain sorghum and corn: High Plains study area compared to state total, 1969-72

	Year			
	1969	1970	1971	1972
<b>GRAIN SORGHUM:</b>				
<u>Acreage:</u> (1,000 ac.)				
In area	2,559	2,625	2,862	2,553
In state	6,169	5,886	5,827	6,800
Percent area is of state	41	45	49	38
<u>Production:</u> (1,000 bu.)				
In area	168,271	171,816	188,551	177,180
In state	309,800	329,616	303,004	319,780
Percent area is of state	54	52	62	55
<b>CORN:</b>				
<u>Acreage:</u> (1,000 ac.)				
In area	143	139	243	274
In state	571	531	552	580
Percent area is of state	25	26	44	47
<u>Production:</u> (1,000 bu.)				
In area	12,433	16,224	29,515	26,817
In state	25,124	32,391	43,056	39,560
Percent area is of state	49	50	69	68

SOURCE: Texas Field Crop Statistics, Texas Crop and Livestock Reporting Service, Selected Issues.

Table 5. Percentage of state total grain sorghum produced in study area

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Year	Percent
1969	54
1970	52
1971	62
1972	55

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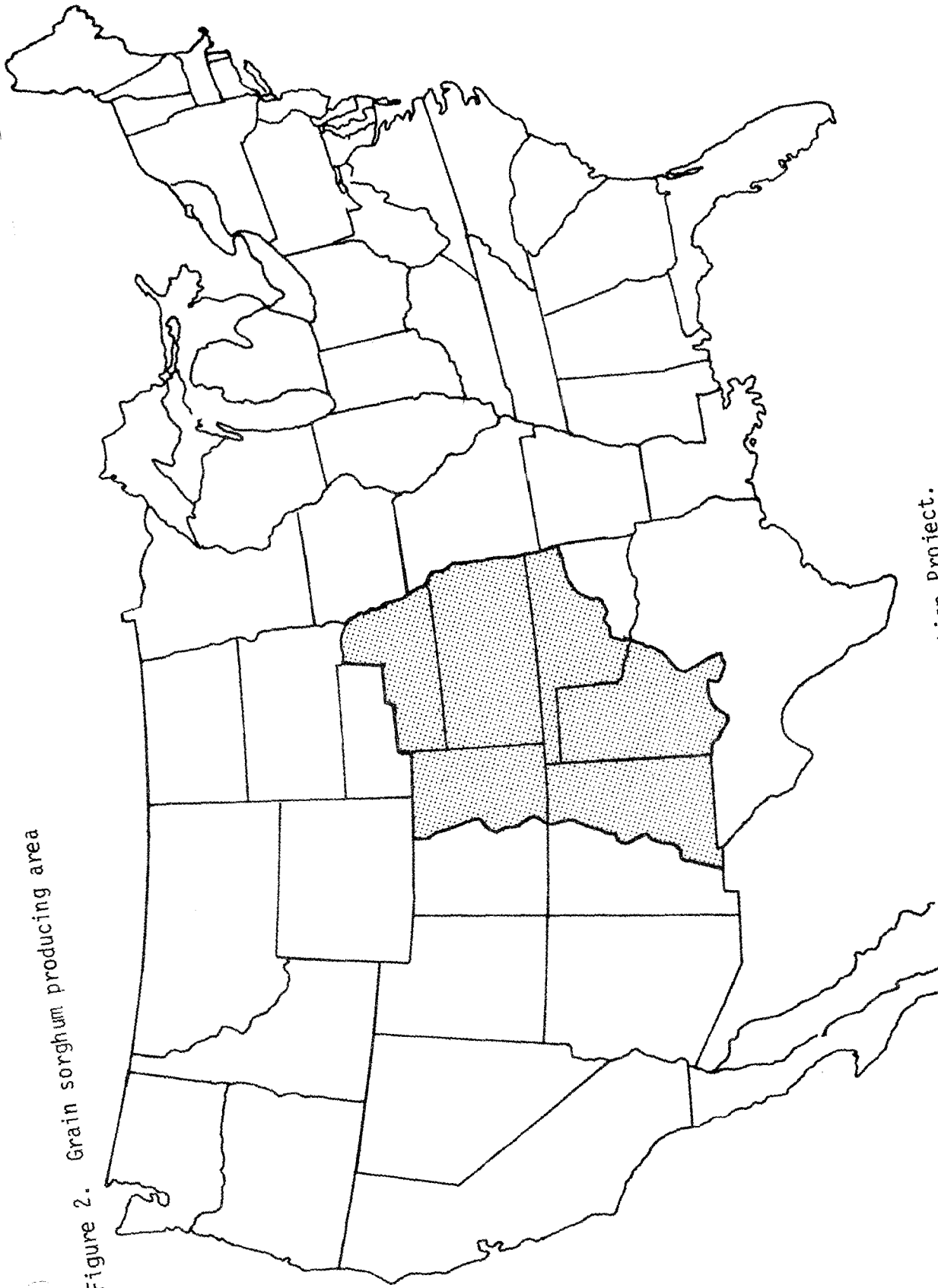
SOURCE: Texas Field Crop Statistics, Texas Crop and Livestock Reporting Service, Selected Issues.

Table 6. Grain sorghum: supply and distribution, United States annual 1965-72.

Item	Year beginning October							
	1965	1966	1967	1968	1969	1970	1971	1972
	(million bushels)							
<u>Supply</u>								
Carryover (October 1)	566	391	244	289	288	246	91	142
Production	673	715	756	740	747	696	895	822
Total Supply	<u>1,239</u>	<u>1,106</u>	<u>1,000</u>	<u>1,029</u>	<u>1,035</u>	<u>942</u>	<u>986</u>	<u>964</u>
<u>Distribution</u>								
Domestic use								
Food, industry and seed	13	13	13	13	9	10	10	8
Livestock feed	<u>569</u>	<u>601</u>	<u>532</u>	<u>622</u>	<u>654</u>	<u>697</u>	<u>711</u>	<u>693</u>
Total domestic use	<u>582</u>	<u>614</u>	<u>545</u>	<u>635</u>	<u>663</u>	<u>707</u>	<u>721</u>	<u>701</u>
Exports (grain only)	266	248	166	106	126	144	123	190
Total utilization	848	862	711	741	789	851	844	891
Carryover at end of year	391	244	289	288	246	91	142	73

SOURCE: Feed Statistics and Feed Situation, ERS, USDA.

Figure 2. Grain sorghum producing area



Source: Western Livestock Marketing Information Project.

States is used on the farms where it is produced, only about 10 percent of the grain sorghum is utilized for feed and seed on farms of origination. Grain sorghum producers, therefore, are almost entirely dependent on commercial marketing channels for disposition of their product.

Grain sorghum producers are more heavily dependent upon beef cattle feeding as a domestic market for their output than is the case of corn and other feed grains. While two-thirds of total domestic disappearance of grain sorghum is fed to beef cattle, corn producers enjoy a much greater diversity of uses. For example, 40 percent of the corn is fed to hogs, 20 percent to beef cattle, 19 percent to poultry and 13 percent to dairy cattle (Table 7).

This dependence upon beef cattle feeding as a market is probably more critical to Texas producers than is the case with producers in other major grain sorghum producing states, such as Kansas and Nebraska. According to results of this study, it is estimated that about 60 percent of Texas grain sorghum is consumed by the Texas cattle feeding industry, grain sorghum accounts for more than 85 percent of the feed grains consumed by the Texas cattle feeding industry.

The feedlot industry in the U.S., and the 29-county study area of the Texas Panhandle in particular, has witnessed exceptional growth during the past few years. For example, the total feeding capacity of Texas feedlots (of 1,000 head or more) more than doubled during the past five years (Tables 8 and 9). Fed cattle marketings from Texas feedlots has mushroomed from less than two million head to more than four million head in the same period (Tables 10 and 11).



Table 7. Feed grains fed to livestock in the U.S., 1970-71\*

	All Grain		Corn		Grain Sorghum		Other Grains	
	M.T.	%	M.T.	%	M.T.	%	M.T.	%
Hogs	47.2	33	41.7	41	1.4	8	4.5	18
Beef Cattle	40.3	28	20.0	20	11.8	64	8.5	34
Poultry	27.0	19	18.8	19	3.5	19	4.6	18
Dairy Cattle	19.5	13	13.3	13	1.0	6	5.2	20
Other Livestock	9.7	7	6.6	7	.6	3	2.5	10
TOTAL	143.7	100	100.4	100	18.3	100	25.3	100

Specific Feed grains: Percentage of total feed grains fed to livestock, 1970-71

Corn	71
Grain Sorghum	12
Oats	8
Wheat	5
Barley	4
TOTAL	100

\*Adopted from National, State Livestock--Feed Relationships: Supplement for 1972 to Statistical Bulletin #446, USDA-ERS, 1973.

Table 8. Size and capacity of Texas cattle feedlots, January 1, 1955-73

Year	1,000 head or more	
	Feedlots	Total capacity
	(Number)	(1,000 Head)
1955	61	160
1960	120	350
1965	234	805
1968	275	1,229
1969	277	1,452
1970	279	2,088
1971	257	2,345
1972	287	2,508
1973	270	2,825

SOURCE: Texas Livestock Statistics, Texas Crop and Livestock Reporting Service, Selected Issues.

Table 9. Number of cattle on feed: High Plains study area compared to state total, annually, 1968-73

	Year					
	1968	1969	1970	1971	1972	1973
	(1,000 head)					
<u>Cattle on Feed</u> (as of January 1)						
In area	667	941	1,036	1,152	1,314	1,669
In state		1,417	1,417	1,480	1,781	2,245
Percent study area is of state total		66	73	78	74	75

SOURCE: Texas Livestock Statistics, Texas Crop and Livestock Reporting Service, Selected Issues.

Table 10. Fed cattle marketings in Texas

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Year	1,000 Head
1965	1,000
1966	1,300
1967	1,654
1968	1,970
1969	2,706
1970	3,138
1971	3,663
1972	4,308

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SOURCE: Texas Livestock Statistics, Texas  
Crop and Livestock Reporting Service,  
Selected Issues.

Table 11. Number of cattle marketed from feedlots, annually, 1968-72

	Year				
	1968	1969	1970	1971	1972
	(1,000 Head)				
<u>Cattle Marketed from Feedlots</u>					
In area	1,162	1,687	2,124	2,536	3,180
In state	<u>1,970</u>	<u>2,706</u>	<u>3,138</u>	<u>3,663</u>	<u>4,308</u>
Percent area is of state	59	62	68	69	72

SOURCE: Texas Livestock Statistics, Texas Crop and Livestock Reporting Service, Selected Issues.

In Texas, at least, prospects for increased use of feed grains, and grain sorghum in particular, look very promising. Based upon unpublished projection estimates by production specialists in the Department of Animal Science, Texas A&M University, the total amount of feed grain requirements by Texas livestock and poultry feeders is expected to increase by over two million tons between now and 1980. Commercial cattle feeders are expected to account for 1.5 million tons of this 2 million ton increase. According to these estimates, the number of beef calves are expected to increase by 1.0 million head and slaughter cattle by 1.2 million by 1980 (Table 12). If grain sorghum continues to play the dominant role as a cattle feed in Texas, this could mean an increase of from 60 to 70 million bushels required for cattle feeding alone.

#### Value

For the past several years, average prices received for grain sorghum by producers in the Texas Panhandle study area have been slightly above the average prices received by farmers for the U.S. as a whole (Tables 13, 16, and 17). The proximity of production in the study area to their primary market (local feedlots) probably accounts for most of this differential.

The value of feed grain substitutes is also important to understanding potential gains in grain sorghum prices. Grain sorghum's major competitor as a feed grain is corn, although in 1970-71 only 18 percent as much grain sorghum as corn was fed to livestock. Another way to compare the extent of corn usage relative to grain sorghum is to consider that in 1971-72 corn comprised 71 percent of all grains fed to livestock while grain sorghum's share was 12 percent (Figure 3).

Table 12. Projected change in feed requirements for Texas livestock: 1972 to 1980

	Grain used in 1972	Estimated change by 1980	
		Feed grains	Protein supplements
		(tons)	
Dairy cattle	495,000	-109,500	-37,600
Swine	550,000	+320,000	+80,000
Poultry	825,000	+173,900	+49,666
Beef cattle			
Cows and calves	650,000	+160,000	+110,000
Steers	3,350,000	+1,500,000	+108,000
Total	5,870,000	+2,044,400	+310,066

SOURCE: Projection estimates by production specialists in the Animal Science, Dairy Science and Poultry Science Departments, Texas Agricultural Experiment Station, Texas A&M University, 1973.

Table 13. Grain sorghum: average price received by farmers, United States, by months, 1965-72.

Year Beginning Oct.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Average Weighted by Sales
(Dollars per 100 Pounds)													
1965	1.70	1.71	1.73	1.74	1.79	1.77	1.76	1.77	1.78	1.79	1.87	1.88	1.76
1966	1.73	1.77	1.84	1.86	1.90	1.94	1.94	1.97	1.97	2.08	1.95	1.80	1.82
1967	1.68	1.68	1.73	1.75	1.86	1.86	1.83	1.84	1.80	1.74	1.63	1.62	1.77
1968	1.60	1.68	1.72	1.74	1.77	1.76	1.76	1.81	1.81	1.82	1.92	1.97	1.70
1969	1.91	1.94	1.92	1.92	1.92	1.87	1.80	1.80	1.80	1.92	1.91	2.07	1.91
1970	2.02	2.02	2.04	2.10	2.16	2.17	2.19	2.33	2.43	2.37	2.27	2.01	2.05
1971	1.76	1.78	1.86	1.89	1.86	1.87	1.87	1.88	1.90	1.98	2.05	2.11	1.89
1972	2.09	2.19	2.72	2.72	2.60	2.60	2.56	2.66	3.10	3.46	3.64	3.87	2.32 <sup>1/</sup>

<sup>1/</sup> Preliminary

SOURCE: Agricultural Prices, ERS, USDA, selected issues.



Table 14. Corn: average price received by farmers United States, by months, 1965-72

Year Beginning Oct.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Average Weighted by Sales
(Dollars per 100 Pounds)													
1965	1.96	1.86	2.02	2.12	2.14	2.09	2.12	2.16	2.14	2.27	2.40	2.41	2.07
1966	2.30	2.25	2.30	2.29	2.25	2.29	2.25	2.23	2.25	2.16	1.98	2.00	2.21
1967	1.86	1.74	1.84	1.86	1.89	1.89	1.89	1.95	1.91	1.86	1.76	1.80	1.84
1968	1.72	1.86	1.87	1.93	1.95	1.95	2.00	2.12	2.11	2.11	2.11	2.05	1.93
1969	2.00	1.91	1.95	2.00	2.04	2.02	2.05	2.11	2.16	2.22	2.27	2.46	2.05
1970	2.40	2.30	2.43	2.54	2.55	2.55	2.52	2.46	2.55	2.43	2.12	1.98	2.37
1971	1.78	1.74	1.93	1.95	1.95	1.96	2.02	2.05	2.01	2.03	2.05	2.18	1.93
1972	2.12	2.14	2.54	2.48	2.41	2.45	2.54	2.88	3.55	3.63	4.79	3.84	2.34 <sup>1/</sup>

<sup>1/</sup> Preliminary

SOURCE: Agricultural Prices, ERS,USDA, Selected Issues.

Table 15. Average difference in corn and grain sorghum prices received by farmers, United States, 1965-72.

Marketing Year	Corn	Grain Sorghum	Difference	% Above Grain Sorghum Price
1965-66	2.07	1.76	+ .31	17
1966-67	2.21	1.82	+ .39	21
1967-68	1.84	1.77	+ .07	4
1968-69	1.93	1.70	+ .23	15
1969-70	2.05	1.91	+ .14	7
1970-71	2.37	2.05	+ .32	16
1971-72	1.93	1.89	+ .04	2

SOURCE: Agricultural Prices, ERS, USDA, Selected Issues.

Table 16. Prices received by farmers in study area, 1967-1973

Yr. Beginning Oct. 1	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Avg.
(Dollars per 100 pounds)													
1967-68	1.69	1.69	1.72	1.73	1.85	1.84	1.80	1.76	1.75	1.73	1.61	1.53	1.73
1968-69	1.63	1.89	1.72	1.73	1.74	1.73	1.72	1.72	1.76	1.81	1.87	1.98	1.78
1969-70	1.98	2.02	2.01	1.98	2.02	1.98	1.92	1.90	1.87	1.90	1.84	2.01	1.95
1970-71	2.00	2.00	2.01	2.01	2.14	2.11	2.25	2.50	2.50	2.51	2.43	2.03	2.21
1971-72	1.89	1.89	1.91	1.97	1.95	1.94	1.96	1.97	1.96	1.98	2.00	2.03	1.95
1972-73	2.14	2.21	2.76	2.68	2.76	2.76	2.81	2.85	3.31	3.45	4.14	Data not available	

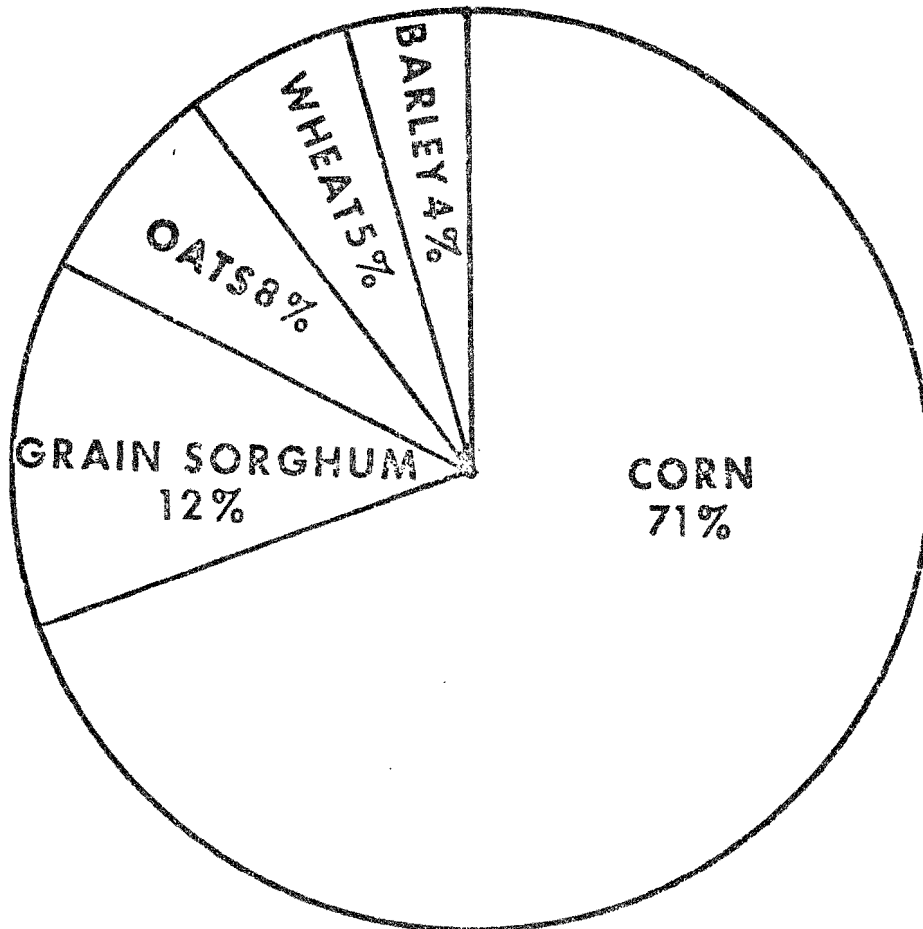
SOURCE: Texas Crop and Livestock Reporting Service

Table 17. Grain sorghum average price in study area compared to U.S. average prices, 1967-72

Year	Area	U.S.	Difference
(Dollars per cwt.)			
1967-68	1.73	1.77	- .04
1968-69	1.78	1.70	+ .08
1969-70	1.95	1.91	+ .04
1970-71	2.21	2.05	+ .16
1971-72	1.95	1.89	+ .06

SOURCE: Texas Crop and Livestock Reporting Service

Figure 3. Grains used for livestock feed, 1971-72.



SOURCE: Western Livestock Marketing Information Project.

Since 1965, the average difference in corn and grain sorghum prices received by farmers in the U.S. ranged from 39 cents per hundredweight in favor of corn in 1966-67 to 4 cents in 1971-72 (Tables 13-15). Percentage wise, this represented 21 percent more than grain sorghum prices in 1966-67 but only 2 percent in 1971-72.

In a recent study by researchers at Texas A&M University <sup>2/</sup> it was found that the nutritive value of grain sorghum was at least 95 percent that of corn when fed to beef cattle in a study using current methods of grain processing and grain varieties in a feedlot trial, a carcass evaluation and digestion trials. Data from this study were instrumental in establishing the loan and support price calculations for grain sorghum at 95 percent that of corn by USDA. The previous value used was 92 percent that of corn. Therefore, it can be expected that when everything else is equal, and the delivered price differential of the two grains narrows to within this 5 percent range, some substitution of corn for grain sorghum will occur. Nevertheless, during recent years the transportation differentials have been too wide for much substitution to occur.

#### Summary

Recent research suggests that large commercial feedlots may increase in size and number within Texas during the next decade. These projected feedlot increases raise questions concerning the adequacy of future feed resources. Current and future supplies of grain sorghum are of prime importance to current feeding programs employed by Texas feedlot operators.

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<sup>2/</sup> L.M. Schake and Arno Drildger, "Evaluation of Corn and Grain Sorghum Rations for Finishing Beef Cattle," Progress Report 3125, Texas Agricultural Experiment Station, Texas A&M University, 1972.

The continued success of the expanding Texas cattle feeding industry, the poultry industry and the emerging hog industry will be dependent to a large degree on the local production and/or accessibility of grain sorghum and other feed grains from nearby surplus producing areas. But, of course, the continued success of grain sorghum production and marketing in turn depends measurably on the additional expansion of livestock feeding operations in the grain sorghum production areas.

## FEEDLOT SURVEY

Of critical importance to an analysis of marketing strategy for a particular product is an understanding of its potential buyers. The major consumer of grain sorghum from the study area is, of course, the local feedlot industry, and a study of this market was conducted. Market potential, attitudes, and opinions concerning the use of grain sorghum and other feed grains were evaluated. The objective of this evaluation was to obtain insights into how grain sorghum market share could be maintained and strengthened while returning maximum number of dollars to grain sorghum producers.

Out of the feedlot population in the 29-county study area, 48 feedlots were randomly selected for interviews. This was 53 percent of the 91 registered feedlots in this area. The research results that follow are based on analysis of this sample.

### General Industry Information

#### Age

As was described in the preceding section, the feedlot industry in the Texas Panhandle has experienced rapid growth recently. Indicative of this is the average number of years in operation for feedlots in the sample--7 years. Perhaps more important is the fact that feedlots with over 25,000 head capacity have been in operation an average of less than four years. Table 18 gives a more detailed analysis of years in operation.



Table 18. Number of years in operation of feedlots included in this study, 1973

Years	Feedlots	
	(number)	(percent)
5 or less	29	61
6 - 10	13	27
11 - 15	2	4
16 - 20	2	4
20+	<u>2</u>	<u>4</u>
Total	48	100

SOURCE: 1972-73 Field Survey

There are several reasons for this increase in the cattle feeding industry in this area. Climate, sparse population and likelihood of fewer pollution constraints are no doubt among the more prominent reasons. However, an important incentive for the expansion was the source of a major feed supply at a relatively lower cost--grain sorghum.

#### Capacity

The size of feedlots varied considerably in the 29-county area of the study. Capacity ranged from 800 head to 80,000 head. A stratification based on capacity size is given in Table 19. Total capacity of all lots in the sample was 1.2 million head. Marketings in 1971-72 from the sample lots were near 2.3 million head, up 21 percent from 1.9 million for the previous year. Feedlots included in the sample accounted for about 57 percent of the total cattle marketed from Texas during 1971-72.

From indications provided by the feedlot managers, total capacity will continue to grow for the sample lots. Managers of 16 of the 48 lots said they definitely planned to expand the size of their operations. The remaining 32 indicated no change, or were undecided. No one said they planned to cut capacity, however. Therefore, in the short run, one can expect cattle feeding to continue to expand in this area, but perhaps at a slower rate than the last few years.

#### Type of Ownership

Corporate ownership is the predominant type of ownership among the feedlots. Three of every four cattle feeding operations were under this type of control. Some 21 percent of the feedlots were either individually

Table 19. Breakdown of feedlot sample by capacity.

Number of head capacity	Feedlots	
	(number)	(percent)
0 - 9,999	12	25
10 - 19,999	10	21
20 - 29,999	12	25
30 - 50,000	10	21
Over 50,000	<u>4</u>	<u>8</u>
Total	48	100

SOURCE: 1972-73 Field Survey

owned or a partnership. In addition, there were three cooperatively owned feedlot operations.

The feedlot ownership is arrayed according to capacity size in Table 20. The implication is that a substantial percentage of total feed volume will be purchased by a relatively few large corporately-owned feedlots. It was noted during the survey that several of these feedlot managers had a background of using other grains besides grain sorghum; therefore, a switch to another feed grain would not be a difficult transition, provided it was equally economical. Should this occur, loss of potential market power could be significant to the grain sorghum producers in the study area.

#### Extent of Integration

This section is based on the dual analysis of two separate questions asked to feedlot operators. These two questions were: (1) Is this an independent firm? and (2) Are you using, or are you a part of, any kind of associated business arrangement with feed suppliers? Of interest were the types of related operations connected with the feedlot industry, and the percentage of feedlots which were integrated backward to the feed grain supply.<sup>3/</sup> This information would be pertinent in studying market organization and planning from a producer viewpoint. Tables 21 and 22 show the responses to these questions.

Type of business relations other than with feed suppliers varies considerably. However, these operations are usually closely associated with

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<sup>3/</sup> A few of these integrated operations were actually formed by grain elevators that had integrated forward to begin cattle feeding operations.

Table 20. Feedlot capacity by type of ownership

Capacity (000 Head)	Individual- Partnership	Corporate	Co-op
0 - 9,999	6	5	1
10 - 19,999	2	7	1
20 - 29,999	1	10	1
30 - 49,999	1	9	-
50 - 79,999	-	4	-
Total	10	35	3

SOURCE: 1972-73 Field Survey.

Table 21. Extent of association of sample feedlots with other businesses

Type	Number	Percent
Related to other firms	33	72
Independent	<u>13</u>	<u>28</u>
Total	46 <sup>1/</sup>	100

<sup>1/</sup> Incomplete data eliminated 2 feedlots from analysis.

SOURCE: 1972-73 Field Survey.

Table 22. Extent of business association of feedlots with feed suppliers

Associated with Feed Suppliers	Number	Percent
Yes	15	33
No	<u>31</u>	<u>67</u>
Total	46 <sup>1/</sup>	100

<sup>1/</sup> Incomplete data eliminated 2 feedlots from analysis.

SOURCE: 1972-73 Field Survey.

the livestock-grain complex. The most common type was joint ownership of other feedlots in the area. Chemical companies and packing plants were also mentioned. These responses further substantiate the high concentration of the cattle feeding industry.

According to Table 22, one-third of the feedlot managers indicated that they were involved in associated business arrangements with feed suppliers. The association might be dual ownership by the same individuals, or an agreement for an elevator to supply only one feedlot exclusively. Usually, some joint ownership interest also occurs in this latter situation.

Under these integrated operations, grain sorghum is charged to the feedlots primarily on a basis of purchase price, plus any additional charges agreed upon by the two facilities. This depends on how independent the companies are and where the owners want the profits to show up. A majority of the elevators in these arrangements are reimbursed the price paid the farmer, plus a margin of 15 cents per hundredweight to cover handling costs. If the elevator delivered the grain sorghum to the feedlots, then additional transportation charges usually would be added to the mark-up. Only a few feedlot managers indicated they would incur any storage charges under these arrangements.

Table 23 shows the relationship of ownership type with level of integration back to feed supply. One item to note is the fact that two of the three cooperatives in the feedlot sample were also in the grain business.

Another relationship explored was the size breakdown between feedlot capacity and feed grain integration. The data presented in Table 24

Table 23. Relationship between feedlot ownership and feed grain integration

Ownership Type	Feed grain integration	
	Yes	No
	( number )	
Individual/partnership	3	6
Corporate	10	24
Cooperative	<u>2</u>	<u>1</u>
Total	15	31

SOURCE: 1972-73 Field Survey

Table 24. Relationship between feedlot size and feed grain integration

Number of head capacity	Feed grain integration		No feed grain integration	
	(number)	(percent)	(number)	(percent)
0 - 9,999	2	13	8	26
10 - 19,999	4	27	6	19
20 - 29,999	4	27	9	29
30 - 49,999	3	20	6	19
50 - 79,999	<u>2</u>	<u>13</u>	<u>2</u>	<u>7</u>
Total	15	100	31	100

SOURCE: 1972-73 Field Survey

indicates that there does not appear to be a significant difference based on feed grain integration for the three medium capacity ranges. However, comparing the 0-9,999 and 50-79,999 head capacity size groups indicates a tendency for the larger lots to be integrated backward to feed grain supplies. On a volume basis, it is implied that more than one-third of the total feed grain used by the feedlots in the sample reached the animals through integrated channels.

#### Feed Grain Procurement

The individual in charge of operating and managing the feedlot usually has the responsibility for procuring feed grain supplies. In certain isolated situations, a grain purchaser might be employed by a large feedlot or by 2 or 3 feedlots combined. However, this occurred only about 5 percent of the time.

#### Market Information Sources

In connection with marketing of their fed beef, many feedlots subscribe to a teletype service. This is an important source of market information on feed grains for feedlot managers. They can conveniently check futures quotations and other important national and international market conditions.

Nevertheless, the most cited source of market information was the local market, via local elevators and local brokers. Feedlot managers keep abreast of national trends, but since most purchases are made locally, they keep up with the local buying and selling competition.



### Frequency of Grain Sorghum Purchases

The frequency of purchase of grain sorghum supplies by feedlots ranged from daily to once a year. However, the tendency is to purchase 1 to 3 months in advance of needs. Table 25 gives a break-down of the responses received. There did not appear to be a relationship between purchasing frequency and feedlot capacity.

### Source of Grain Supply

At the time this study was conducted, most of the feed grain fed in the feedlots came from local elevators. This is indicated in Table 26. Most of the feedlots do not have much storage capacity at the feeding facility; therefore, it is convenient for them to work closely with local elevators in buying and storing feed grain for their consumption. This is also advantageous for the elevators in the feedlot region.

Virtually all feedlot managers interviewed said that they received a very high percentage of their grain sorghum from local Texas elevators and farms--or at least within a 100-mile radius of their lot. Of course, those lots located near the New Mexico or Oklahoma borders tended to purchase more grain sorghum from out-of-state. Likewise, feedlots located in Oklahoma and New Mexico near the state line fed some Texas grain sorghum. Apparently, only a very small amount of Kansas grain sorghum was moving into Texas feedlots at the time of the study. However, as the grain situation tightened during the spring and summer of 1973, more grain sorghum and corn may have been trucked in from out-of-state directly to the feedlots.

Table 25. Frequency of purchase of grain sorghum by feedlots

Frequency of Purchase	Responses	
	(number)	(percent)
Daily	6	15
7 - 14 days	5	13
30 days	12	31
60 - 90 days	8	21
120 - 180 days	2	5
Annually	6	15
Total	39	100

SOURCE: 1972-73 Field Survey.

Table 26. Relative importance of delivery sources for grains fed by feedlots

Source	Grain Sorghum	(percent)	
		Corn	Wheat
Elevator	91	84	97
Feed Mills	0	0	0
Producers	7	15	3
Own Production	2	1	0
Total	100	100	100

SOURCE: 1972-73 Field Survey.

Relative to grain sorghum, more corn fed in the Texas feedlots was shipped in from Kansas and Nebraska. Distance wise these are the nearest supply points. However, due to increased corn production in the Texas High Plains, it is estimated that over one-half of the corn fed in Texas feedlots is produced in the area.

Prior to increased wheat prices in the fall of 1972, several feedlots were feeding some wheat, mixed with a feed grain. This wheat, with little exception, was also purchased from local elevators (Table 26).

#### Contracting for Production

Feedlots do not contract measurably with producers directly for the production of feed grains. This is done through elevators that can provide a larger source of supply as well as storage. However, production contracts do exist and, percentage wise, more corn is contracted than grain sorghum.

A majority of feedlots, however, do purchase silage (primarily corn) from producers on a forward contract basis. The contracts are consummated prior to planting time for fall harvest. This is usually on an acreage basis wherein the feedlot will accept all silage produced on the acres contracted by the farmer. The contract terms are for a specified price per ton, f.o.b. pit at the feedlot, paid at close of the silage harvest. Price in 1972 ranged from \$7 to \$8 per ton.

#### Financial Arrangements

Financial arrangements ranged from "cash on delivery" to 30-day accounts for regularly purchased grain. Managers indicated that it

varied greatly with the elevator involved as to how often they were billed (Table 27).

Fifty percent of those responding said that they paid cash on a monthly basis after delivery. Twenty-five percent were billed every 15 days. "COD" was the arrangement for 15 percent of the feedlots with the other 10 percent being on a weekly basis.

It appeared that feedlots were willing to adjust to the requirements of the elevators as to billing periods without many problems. Their major concern was to find the feed grain available; financial arrangements as to time were secondary.

#### Transportation

The feedlot pays for the transportation of grain from the elevator to the feedlot. The larger lots usually maintain a truck fleet to pick up grain from sources of supply. Independent truckers are also used extensively. If an elevator delivers, the charge for this service is built into the price of the grain sorghum. Rail transportation to feedlots is negligible.

#### Storage

The feedlots normally do not have extensive grain storage facilities at the feedlot. Storage space for 2 to 3 days' supply of grain is the usual situation. Of course, a few of the integrated lots located close to the elevator facility reported the storage capacity of the elevator as being for the feedlot as well, but this is atypical. As the grain is moved in

Table 27. Frequency of payment for grain sorghum  
purchased by feedlots

Payment basis	Percent of feedlots responding
C.O.D.	15
Weekly	10
Semi-monthly	25
Monthly	<u>50</u>
Total	100

SOURCE: 1972-73 Field Survey

and out rapidly, no feedlots reported using the futures market to hedge grain in storage. Excluding the four large elevators, the storage capacity of feedlots ranged from zero to eight million pounds. Those operations reporting having no storage capacity take daily delivery of the feed grain directly at the feed mill.

#### Grain Sorghum Grades

It would probably be advantageous to review briefly the U.S. grade standards for grain sorghum prior to discussing them as a factor in procurement. These grade standards are presented in Table 28. All of the specifications for a particular grade must be met before a sample can receive that particular grade.

Over 80 percent of the feedlot managers indicated they were satisfied with current U.S. grain sorghum grades and grading systems. Those not satisfied made the following two general suggestions for change: (1) decrease the percentage allowable of foreign material to grade #2 and (2) add a protein specification as an indication of feed value.

Moisture in feed grains continues to be a major problem for feedlots. Consequently, this is a key grade factor in checking grain on delivery. Approximately 80 percent of the managers indicated that they had employees check moisture of grain sorghum on a routine basis. Some 20 percent indicated that they made no tests at the feedlots--they relied on the elevator to send them the specified quality. Test weight and foreign matter were also checked periodically.

Table 28. U.S. grade standards for grain sorghum

Grade	Minimum test weight per bushel	Maximum limits of --			
		Moisture	Damaged Kernels		Broken Kernels, foreign, material, and other grains
			Total	Heat Damaged Kernels	
U.S. No. 1	57.0	13.0	2.0	0.2	4.0
U.S. No. 2	55.0	14.0	5.0	.5	8.0
U.S. No. 3 <sup>1/</sup>	53.0	15.0	10.0	1.0	12.0
U.S. No. 4	51.0	18.0	15.0	3.0	15.0
U.S. Sample grade.	U.S. Sample grade shall be grain sorghum which does not meet the requirements of any of the grades from U.S. No. 1 to U.S. No. 4, inclusive; or which contains stones; or which is musty; or sour, or heating; or which is badly weathered; or which has any commercially objectionable foreign odor except of smut; or which is otherwise of distinctly low quality.				

<sup>1/</sup> Grain sorghum which is distinctly discolored shall not be graded higher than U.S. No. 3.

Almost 20 percent of the managers interviewed indicated that they had sent off samples to a grain exchange to be officially graded. This was done on a periodic basis when discrepancies occurred. Protein analysis was determined by over 20 percent of the feedlots interviewed. Experience and visual inspection were also rated as effective in checking quality of grain sorghum received.

The policy for testing corn by feedlots is usually the same as for grain sorghum. Most do check moisture and visually inspect the grain prior to dumping. If a major discrepancy is evident, samples are drawn and sent to be officially graded. Protein analysis on the grain may be performed initially in the season and periodically thereafter.

All feedlots contacted in the survey reported purchasing grain sorghum and corn on a U.S. #2 yellow basis. However, a large percentage of the feedlots were willing to accept moisture levels up to 15 percent without discounting on grain sorghum. This was particularly true in 1972 when grain sorghum was harvested at a higher level of moisture than normal.

#### Procurement Problems

According to the feedlot managers interviewed, they have not experienced any major problem in procuring grain sorghum supplies. Some managers did anticipate some local shortages before the 1973 harvest. Also, a few others did mention that the moisture last year did cause some quality problems.



## Feed Grain Utilization

### Nutritionist Services

Over 90 percent of the feedlot managers interviewed employed a nutritionist for ration formulation. Feedlots not having a nutritionist on a part-time basis tended to be small (less than 2,000 head capacity). The ultimate decision of ration formulation rests with the manager in a high percentage of the feedlots. However, the decision usually considers the nutritionist's advice. In fact, two-thirds of the managers employing nutritionists said they always followed their suggestions. Reasons given for occasionally diverting from the nutritionist's suggestions were (a) feed availability and (b) managerial experience.

### Rations/Feed Grain Usage

The number of rations used by various feedlots differs somewhat based on nutritionist and managerial opinions. Likewise, the specific make-up of a particular ration, for example a finishing ration, will also vary among feedlots depending on feed availability and other factors. However, some representative information in these two areas will be highlighted.

The average number of specific rations used by feedlots was four. However, approximately 35 percent actually reported having four rations while 33 percent reported using 3 primary rations. The range was from 2 to 7. Although terminology differs, the four rations could be termed "grower," "starter," "intermediate" and "finishing." If only three rations

were used, the "grower" and "starter" rations would be replaced by a single ration. The percentage of concentrates (including feed grains) increased with each ration in the chain.

All rations except the finishing ration are used only for a relatively short period of time. They are higher roughage combinations to help the animal make the transition from range to the feedlot and stretch its eating capacity. The first two or three rations would normally be used 10 to 20 days each, and the animal would be on the high grain ration for the remainder of the time (about 150 days, or 85 percent of the average total time).

As indicated above, feed grains make up a large percentage of these rations, especially the finishing ration. Feed grains used were either grain sorghum or corn, or a combination of the two.<sup>4/</sup> Table 29 portrays the representative percentages of feed grains in each ration combination. Of course, these would vary slightly according to starting weights of the cattle, and other factors. What is significant is the high percentage of feed grains in the "most-used" ration, leading to large quantities of grains (predominantly grain sorghum) being used in the area feedlots.

#### Processing

Feed grains are processed prior to feeding to secure maximum feed-conversion efficiency. The most widely used processing procedure in Texas

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<sup>4/</sup> Some nutritionists assert that using the grains in combination gives a more favorable gain response than when either grain is used separately. Therefore, some feedlots feed grain sorghum and corn in a 2:1 ratio regularly.

Table 29. Representative feed grain percentages of common feedlot rations

Ration combination	Grower	Starter	Intermediate	Finishing
(Percent of grain in ration)				
4 rations	36	47	67	73
3 rations	48		60	75

SOURCE: 1972-73 Field Survey.

feedlots is steam-flaking. This was the process used in 95 percent of those lots with more than 3,000 head capacity. One feedlot manager reported using a popper technique and another indicated the use of the newer, micronizing procedure. The only recent changes reported by the feedlots were not in processing techniques, but in adding additional equipment to expand mill capacity.

Three of the managers indicated they were considering switching to the micronizing process. However, the consensus was that this would not affect the percentage of grain sorghum used in the rations. It might affect their total volume of sorghum fed, however, as these are relatively small lots and it can be expected that an expansion would be undertaken in connection with the addition of new processing equipment. Other changes in equipment would be to accommodate normal growth of certain feedlots.

#### Volume of Feed Consumed in 1972

According to data furnished by the respondents, total tonnage of grain sorghum, corn and wheat used in the 48 feedlots surveyed was determined for 1972. These figures are presented in Table 30. The percentage of market share for each of the three primary grains is included. Grain sorghum market share was 84 percent and market share for corn was 15 percent.

#### Managers' Opinion of Grain Sorghum

Grain sorghum appears to have two distinct advantages for Texas Panhandle feedlot managers. These are (1) availability and (2) price, in that order.

Table 30. Estimated tonnage of grain sorghum, corn and wheat used in survey lots, 1972

Grain	Volume (1,000 tons)	Percent of Total
Grain Sorghum	2,640	84
Corn	470	15
Wheat	35	1
Total	3,145	100

SOURCE: 1972-73 Field Survey

Either one or both of these advantages were cited by over 95 percent of the managers.

Three predominant disadvantages were brought out in the interviews. These are: (1) difficult to process, (2) less efficient than corn for cattle finishing, and (3) lack of uniformity in quality and protein content. Numbers (1) and (2) were each cited 38 percent of the time while (3) was noted 15 percent of the time.

A general consensus existed among feedlot managers that corn was a relatively more efficient feed grain than grain sorghum. However, two managers rated corn and grain sorghum even. Table 31 shows a summary of how feedlot managers rated grain sorghum at their feedlots compared with corn.

Although the evidence is nonconclusive, the opinion of feedlot managers concerning the value of grain sorghum appeared to be dependent on the background of the manager. The impression of interviewers was that managers who had experience feeding in the Midwest seemed to be more favorable to corn. Conversely, feeders who were more familiar with grain sorghum tended to rate it higher. Nevertheless, over half of the managers responding rated grain sorghum lower than the fairly widely accepted value of 95 percent which is based on recent research.

#### Additional Information

##### Ownership and Seasonality

All of the feedlots interviewed depended heavily on the contingent of custom feeders to keep their lots in operation. Table 32 shows the breakdown of cattle ownership based on the capacity of the entire sample of feedlots.

Table 31. Feedlot managers' opinions of the feeding efficiency of grain sorghum compared to corn

Grain Sorghum as Percent of Corn	Number Responding	Percent
100	2	6
96-98	3	9
95	8	25
90	12	38
85	<u>7</u>	<u>22</u>
Total	32	100

SOURCE: 1972-73 Field Survey.

Table 32. Cattle ownership in the feedlots interviewed

Ownership	Percent of Cattle
Feedlot owners	17
Feeding for packer	*
Custom feeding	<u>83</u>
Total	100

\*Less than 1%.

SOURCE: 1972-73 Field Survey.

Ideally, a feedlot manager strives to keep his lot at full capacity the year around. In fact, 62 percent of the managers said they experienced no seasonality in the number of cattle going through their lots. Reasons for seasonality among the others appeared to be primarily availability of feeder cattle. There was no apparent consistency among the lots showing seasonality; however, overall, there tended to be a slight percentage decline in feeding during the winter months. For long-run growth, cattle feeders indicated that the highly correlated factors of "cost per pound of gain" and "feed conversion efficiency" keep investors putting cattle in their lots.

Custom feedlots make various charges to their customers to cover the costs of feeding-out their cattle. The most significant of these charges is, obviously, the cost of feed. Essentially all of the feedlots passed along the cost of the feed plus a fixed mark-up per ton of feed to cover processing and overhead. This mark-up usually ranges from \$7 to \$10 per ton above ingredient costs. Some feedlots may make this the only additional charge to the customer, whereas other lots will require other miscellaneous payments. These other charges might include daily yardage fees, a per-head processing charge, and/or likely, a hospital or vet charge. These additional costs vary considerably among feedlots.

#### Summary

Based on the survey results, the feedlot industry appeared relatively well satisfied with the feed grain complex in the 29-county area of the Texas Panhandle. Over 80 percent of the feed grain fed in area feedlots was locally produced grain sorghum. Nevertheless, some suggestions were



made by feedlot managers and these include: (1) need research on nutritional characteristics and processing, (2) research for more improved varieties from feed standpoint, (3) encourage elevators not to blend good with bad grain, (4) encourage orderly marketing and (5) develop incentive payment system for premium grain. Quality appeared to be a key consideration. Therefore, grain sorghum producers may want to increase services to the feedlot industry when it is to the advantage of both.

However, market structure is changing in the feedlot industry toward more concentration and integration, and this change may be intensified in the future. Continued investigation into how this may be affecting marketing patterns for grain sorghum could be important to grain sorghum producers.

## ELEVATOR SURVEY

The country elevator occupies a strategic position in the marketing system for Texas grain sorghum. It is the local farm market and principal outlet through which farmers sell grain. Some farmers bypass country elevators and sell directly to feedlots. However, this practice occurs on a very small percentage of the total volume marketed.

Early in 1973, 347 grain elevators were located in the 29-county study area. These had a combined storage capacity of 425 million bushels. Information was obtained from a sample of 58 elevators.

### General Information

#### Ownership Type

In the sample, cooperatively owned and privately held elevators were about evenly divided on the basis of storage capacity. Approximately 58 percent of the grain sorghum capacity was cooperatively owned and 55 percent of the grain receipts in the study area were by these elevators. Table 33 gives a breakdown of the sample with respect to ownership type.

#### Business Linkage

Approximately 40 percent of the elevators in the sample were linked with other businesses. In nearly all cases, these elevators were not cooperatively owned, and they were linked closely with feedlots; some of the elevators were owned outright by feedlots. Based on information obtained during the interviews, the extent of elevator linkage with feedlots is increasing. This indicates the changing market channels for Texas grain sorghum.

Table 33. Number of grain elevators in the sample, by type of ownership

Type	Number	Percent
Independent	5	9
Partnership	6	10
Cooperative	19	33
Corporation	28	48
Total	58	100

SOURCE: 1972-73 Field Survey.

## Business Functions

Nearly all of the grain elevators buy and sell grain on their own account. However, only one elevator in the study purchased grain for their own exclusive use. Besides grain buying and selling, other activities that grain elevator manager/owner perform include custom storage, input supplies, CCC storage, feed milling, and serving as sales agent (Table 34).

## Age

At the time of the interviews, the average elevator had been in business 26 years (Table 35). Only 15 percent were in business for 10 years or less and the majority had been operating 20 years or more. Therefore, the grain elevator market structure is more firmly established than the evolving feedlot industry.

## Factors Related to Incoming Grain Sorghum

### Origin

Unless there are production contracts, most elevator operators do not know for sure who will deliver grain to their location--nor do they know the volume that will be handled. Farmers do not usually make the decision regarding elevator delivery points until harvest time. This decision may depend upon daily price quotations, storage space, or unloading delay-time.

Some elevators do advertise in local newspapers and farm magazines to encourage farmers to deliver to their elevator. In addition, large elevators may have field agents soliciting grain deliveries.

Table 34. Elevator business functions

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Function	Percent of Elevators
Buy and sell grain on their own account	98
Provide custom storage	88
Provide additional services such as prepared feed, seed, and fertilizer	37
Act as sales agents for producers on occasion	12
Are directly engaged in feed milling	25
Provide CCC storage	88

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SOURCE: 1972-73 Field Survey

Table 35. Grain elevators--years in business

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Years	Elevators	
	(number)	(percent)
1 - 5	2	4
6 - 10	6	11
11 - 15	13	21
16 - 20	7	12
20 and over	<u>30</u>	<u>52</u>
Average = 26	58	100

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SOURCE: 1972-73 Field Survey

Ninety-three percent of the grain sorghum handled by elevators came directly from local farms, while seven percent came from other elevators. Table 36 gives a breakdown of receipts by season.

#### Grain Purchases

Once the grain is in the elevator, chances are that the grain will be bought by the elevator at some time. Farmers seldom remove their grain either to feed their own cattle or for sale direct to a feedlot or another elevator. The primary reason for this is that elevators will invoke an "in-out charge" for handling if the grain is not sold to the elevator. This charge usually more than offsets any price advantage obtainable in another market. The relevant question is, instead, when will the farmer decide to sell to the elevator. The elevator management has little control over this decision.

Elevators usually give farmers some free storage time from harvest until the farmer begins accruing a storage charge on his grain. This varies by region and local competition. Usually the cut-off date is in January. This allows farmers to carry over taxable income without having to pay additional storage charges. The elevator will custom store the grain that is still in farmer's ownership after the cut-off date. A small percentage of the elevators have a free storage cut-off date as late as June 30 of the following year. The reason for this is that the primary market for those elevators is feedlots. A late cut-off date encourages farmers to hold longer thereby reducing the financing requirements of the elevator and feedlots.

Table 36. Seasonality of grain sorghum receipts by grain elevators

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Season	Percent
Fall	92
Winter	7
Spring	*
Summer	<u>1</u>
Total	100

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\* Less than 1/2 percent.

SOURCE: 1972-73 Field Survey.



Custom storage rates are about 2.14 cents per hundredweight per month for grain sorghum. Due to the relative high prices during the survey period, only one percent of the grain in storage was owned by the Commodity Credit Corporation.

Pricing. Most elevators maintain a daily quotation on the price they will pay for grain sorghum. A farmer can call in to check these quotes. In a rapidly changing market (such as in 1972-73) the daily quotes might change several times within the day.

The elevator manager decides the buying price. Most of the price information he uses comes from local contacts and reflects local conditions. Brokers are also a source of price information, and the manager usually checks major markets such as Kansas City, Ft. Worth and the Houston export bid price.

Virtually every firm indicated that they buy on the basis of expected sales price, thus buying on a margin basis. Elevator managers look at the current selling price, then back off a margin (handling charge plus interest and operating profit) to determine the price they will pay to the farmer. Buying as well as selling is very competitive and the indicated margin usually ranges only from 15 cents to 25 cents per hundredweight.

Prices offered farmers are usually on U.S. #2 grade basis. A farmer might receive less than this if a discount for high moisture is necessary. Few elevators discount for other grade deficiencies, unless these are excessive. Normally no premiums are offered for grain that grades U.S. #1.

The study revealed that grain elevators avoid price speculation as much as possible. In order to accomplish this, elevators usually sell grain as

quickly as they buy it--the same day if possible. This practice leaves the *elevator--and thereby the farmer--with little bargaining power.* As daily price fluctuations increase, elevators usually increase the margin in order to cover possible drops in market price that might occur between buying and selling time.

Contracting. Approximately 60 percent of the elevator managers indicated that they have entered into forward contracts with producers for the delivery of grain at a set price. However, so far this has involved only a small percentage of total grain purchases. Farmers have indicated an interest in this approach to marketing, and elevator managers said they expected to do more contracting in the future. Nevertheless, some firms do not make forward contracts with producers because they consider them detrimental to their producer relations.

Once again, margin is a big factor in establishing the price on these contracts with producers. Many managers use a "back-to-back" contract, implying that they are selling the grain (via contract) as they buy it and simply include a margin in the pricing to cover the cost of their handling, etc. They also may look at the futures market quotations.

Therefore, if the elevator manager contracts with producers, he usually contracts ahead with a feedlot or terminal elevator for delivery of that grain. If for some reason that grain is not delivered to the local elevator, the firm may be faced with a lawsuit if it cannot, in turn, maintain its contract commitment to the company it contracted with.

As the percentage of grain contracted by producers increases, problems in the contracting market will likely become magnified. Additional inves-

tigation of the contracting mechanism and all of its facets is suggested. In particular, producers need more current and broad-based information on contract prices and specifications.

#### Transportation

Producers arrange for and pay all incoming transportation of grain to the elevators from local farms. During the 1972 season farmers actually provided the transportation for 63 percent of the grain while 37 percent of the locally produced grain was brought in by independent truckers who usually are a part of the custom harvesting operation.

On grain receipts from other elevators, the receiving elevator arranges and pays for the transportation. None of the elevators reported transportation problems associated with incoming shipments.

#### Quality Checks

All elevator managers indicated they tested the moisture of grain sorghum delivered to the elevator. About 75 percent of the elevators occasionally make density tests (test weight) to ascertain if the grain meets #2 specifications. A few (15 to 20 percent) make visual checks for foreign material. Seldom is any sample sent out for official grading as grain comes in.

Ninety percent of the managers said moisture was the grade factor giving the most problems in buying grain sorghum. About ten percent indicated that trash and foreign matter was also a problem.

## Factors Related to Storage

### Capacity

During the last five years, total storage capacity of elevators handling grain sorghum in the 29-county study area was expanded by only one percent. However, while overall storage capacity remained relatively unchanged, substantial changes took place in individual elevators. Many elevators either increased or decreased their storage capacity during the last 5 years. One-third decreased their capacity and about one-fourth made expansions. Table 37 shows the percentage of elevators in each size classification based on survey information.

### Problems

Approximately 33 percent of the elevator managers reported that storage facilities are not adequate during peak harvest. In fact, 26 percent of the sample elevators have stored grain on the ground in each of the last four years. The amount stored on the ground and its frequency depend upon local production and harvesting conditions.

The average quantity stored on the ground by firms resorting to this alternative was 272,000 bushels--but the range was from one thousand to one million bushels. The grain is stored on the ground an average of 65 days. In cases where ground storage is utilized, the elevator storage is allocated on a "first come-first served" basis.

Essentially all grain delivered to the elevator is co-mingled (i.e. different farmers' grain is mixed in storage and identity is lost).

Table 37. Number and percent of grain elevators  
by storage capacity

Bushel volume	Elevators	
	(number)	(percent)
Less than 1,000,000	16	28
1,000,000 - 2,500,000	23	39
Over 2,500,000	<u>19</u>	<u>33</u>
	58	100

SOURCE: 1972-73 Field Survey

Moisture and insects are the two primary storage problems, with moisture being the foremost problem.

#### Factors Related to Grain Sorghum Sales and Shipments

Grain sorghum is moved continually throughout the season from elevators to the various utilization points. However, the winter and spring season appears to be the time for heavier shipments. This is likely a result of timing of export shipments. Almost two-thirds of the grain moves out in this time period.

#### Transportation

About 71 percent of the grain sorghum leaves the elevators by truck and 29 percent by rail. A limitation on rail handling is that many feedlot customers do not have rail facilities. Also, the railcar shortage has been a real problem for elevator managers during the past year in shipping out grain sorghum.

Generally, managers rated railcars over trucks for loading efficiency. But the requirement that all rail shipments be officially graded was a deterrent to using this mode of transportation. Movements to terminal elevators or export elevators usually are via rail, and shipments to feedlots and feed mills most often are by truck.

#### Who Is The Market?

The principal market for High Plains grain sorghum is the feedlots-- either in the Texas area or on the West Coast. Feedlot utilization has

increased sharply in the last five years as cattle-on-feed in the Panhandle area mushroomed in response to heavier demand for grain-fed beef. The export market also is an important market for High Plains sorghum along with feed milling operations. Table 38 gives a breakdown of market share based on grain sorghum users.

#### Grain Pricing Factors

Elevator managers obtain selling price information from essentially the same sources as buying price information. Usually they will check the futures market price and major markets, in addition to calling four or five prominent customers to see what they will pay for grain. Once again, the margin concept plays a big role in pricing as the managers operate on a fixed mark-up over purchasing price.

Elevator managers felt there are several things that affect the overall general price level for sorghum. This was often summed up as "supply and demand." The feedlot and export markets have interplayed to create a heavy demand for grain sorghum in 1972 and 1973 causing increased prices. Other factors mentioned as influencing price were (1) buying price, (2) price of corn (competition) and (3) cattle prices.

#### Contract Sales

Five out of six elevator managers reported marketing a portion of their grain through forward sales contracts. In fact, survey results indicate that over 50 percent of the total grain volume was sold in this manner. Managers reported few problems in marketing by forward selling contacts.

Table 38. Markets and percentage volume for  
High Plains grain sorghum

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Market	Percent of volume
Feedlots	76
Feed mills	7
Export	<u>17</u>
	100

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SOURCE: 1972-73 Field Survey.



Contracts are usually entered into by the elevator manager for 30 to 90-day delivery. The terms of these contracts are highly variable. There is some prepayment, but usually the balance is due on delivery. Buyers may be billed on a regular basis if grain is used in small amounts throughout the contract period.

The price on these contracts is generally the negotiated price for that day--often the current price--plus storage, handling and interest. Those few elevators not utilizing forward contracts either have some prior arrangement with feedlots or sell on a day-to-day basis.

#### Futures Market

Fifteen percent of the elevator managers said that they have used the futures market to hedge some of their grain in storage. Eleven percent stated that they hedged grain sorghum in storage, and only one in twenty indicated they helped producers to use the futures market for hedging of their grain sorghum. Grain sorghum is hedged less frequently than wheat because elevator managers implied the grain sorghum futures market was considered to be too thin for a good hedge.

#### Grading Factors

Less than one-third of the grain sorghum is government graded. Customers that typically ask for grading are the exporters, large mills, and large feedlots. All rail shipments are officially graded by regulation. Moisture is the primary problem in meeting #2 specifications, although foreign matter is sometimes questioned by feedlots.

Two out of three grain elevator operators see no need for change in the grading standards for grain sorghum. Those who suggested a change mentioned raising the maximum moisture content allowable in grade #2 from 14 percent up to 15 percent. Elevator operators generally are of the opinion that the feedlots can use U.S. #3 grain. One other complaint was that methods used for testing foreign matter were not adequate.

#### Market Expansion

About 65 percent of the managers indicated they had made some efforts to develop new outlets for their grain. This usually consisted of the manager contacting a prospective new buyer by phone. In other words, they increase their "selling" efforts by calling on more people. Very few elevator operators actually advertised in an attempt to increase sales other than putting an ad in the grain and feed dealers' directory.

About forty percent of the responding elevator operators did not feel that industry-wide advertising and promotion of grain sorghum would benefit them. Responses to this question may have been affected by the tight supply situation during the survey period. Many managers said they could sell all they had--without advertising.

Product research and development was being assisted by about one out of five elevators. However, this was on a very informal basis and usually was associated with a feedlot with which they were closely aligned.

#### Summary

In general, elevator managers appeared to be content with the status quo. During the survey period, it was evident that grain sorghum was in

short supply and that elevators would have little trouble selling the grain. *If and when this situation reverts back to a surplus situation, elevator personnel might be more interested in some marketing assistance.* The rapidly changing price fluctuations were beginning to cause some concern among managers.

Affiliation of elevators with users of grain sorghum will likely continue and this could have serious implications on the competitive structure of the industry. Producers may want to consider more alternative delivery points for grain based on performance of elevators who are linked with feedlots versus those who are not.