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THE FEED GRAIN MARKET FOR ALABAMA

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SUMMARY AND CONCLUSIONS

The general purpose of this study was to determine quantities and establish flow patterns of feed grains imported into Alabama in 1970, and to predict the State's feed grain situation for 1975 and 1980. This information should be useful in evaluating changes that have occurred in the marketing of feed grains in Alabama since 1964. Also, it should assist grain handling firms in predicting probable changes in the market structure of the feed grain industry in Alabama.

Major findings were:

- There has been declining production of feed grains in Alabama accompanied by increasing feed grain utilization.
- Alabama's feed grain deficit in 1970, excluding soybeans, was estimated at 3,675,000 tons.
- Projections indicate that feed grain production, excluding soybeans, will continue to decline while utilization continues to increase, and that the State's feed grain deficit will reach 4.25 million tons by 1975 and 4.6 million tons by 1980.
- Estimates for 1975 and 1980 indicate that production of corn and oats in Alabama will further decline, while production increases are indicated for soybeans, wheat, and grain sorghum.
- Alabama's feed grain deficit required the importation of 105,259,000 bushels of feed grains from out-of-state sources in 1970, of which approximately 54 per cent came from Illinois and nearly 18 per cent from Indiana.
- Corn was the most important feed grain received by Alabama grain marketing firms in 1970, in terms of volume handled, accounting for more than 64 per cent of total receipts and nearly 80 per cent of that received from out-of-state.
- There was an increase of 23 grain marketing firms in Alabama from 1964 to 1970. Country elevators increased by 16, terminal elevators by 5, and feed manufacturers by 2.
- Bulk storage capacity in Alabama increased from an estimated 16,626,000 bushels in 1965 to 19,273,000 bushels in 1970.
- Of total feed grain receipts by Alabama grain marketing firms in 1970, nearly 42 per cent was received by water, approximately 30 per cent by truck, and about 28 per cent by rail.

- Feed grain shipments by truck and water each accounted for approximately 37 per cent of the total shipped by Alabama grain handling firms in 1970, while rail accounted for the remaining 26 per cent.
- Of 70,729,000 bushels of feed grains shipped by Alabama grain firms in 1970, 21,713,000 bushels went to surrounding southeastern states, 19,025,000 bushels to foreign countries, and 29,991,000 bushels to local receivers and other firms within the State.
- Slightly more than 73 per cent of feed grains received by rail came in 100-ton capacity hopper cars in 1970.
- Net grain imports into Alabama approximated 70,703,000 bushels in 1970, of which nearly 89 per cent was corn.
- Comparison of 1964 and 1970 data indicated that Alabama met increased demand for feed grains in 1970 by not only importing larger quantities of feed grains, but also by shipping smaller quantities out-of-state than in 1964.
- Alabama's agricultural economy in 1980 is expected to be highly dependent on the availability of feed grains from surplus-producing regions, principally Illinois and Indiana, and on an efficient transportation system for receiving feed grains into the State.
- Corn is expected to approximate 90 to 95 per cent of total feed grains imported into Alabama in 1980.

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The Feed Grain Market for Alabama*

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INTRODUCTION

ALABAMA'S AGRICULTURAL ECONOMY has changed from one based primarily on crop production to one where the first five enterprises in 1969, from the standpoint of cash farm receipts, were livestock enterprises.[1]

Although animal production and feed grain utilization have been increasing in Alabama in the past several years, feed grain production has been declining *(7)*. Thus, Alabama has a feed grain deficit and depends heavily on imports of feed grains from regions producing a surplus. Since Alabama's leading agricultural enterprises are now largely grain and forage consuming livestock, any significant changes in feed grain availability from surplus states, or in methods used to transport feed grains to the State, would have an important impact on the State's agricultural economy.

The trend of increasing feed grain utilization and decreasing feed grain production is expected to continue. Estimates indicate that the feed grain deficit in Alabama went from 2,036,000 bushels in 1964 *(4)* to 3,675,000 bushels in 1970 *(7)*. Utilization increased by an estimated 33 per cent while production in 1970 was an estimated 57 per cent below that of 1964.

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* This study was supported by Hatch and State Research funds. It was carried out as Alabama Research Project Hatch 629 and was a contributing project to Southern Regional Project SM-42, "Predicted Effects of Selected Policy and Technological Changes in the Grain Marketing System." Feed grains in this publication include soybeans and wheat.

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[1] Alabama Crop and Livestock Reporting Service.

Increased quantities of imported feed grains are expected to require additional changes in the market structure of Alabama's grain industry. To predict changes, and perhaps help guide such changes, information was needed on quantities, flow patterns, and transportation methods used for grains received from out-of-state sources. Information was also needed concerning projected feed grain production-utilization balances to 1975 and 1980 to enable grain handling firms to predict future market adjustments.

Objectives

Objectives of this study were:

1. To determine present production-utilization balances for different feed grains in Alabama.

2. To identify marketing facilities and flows of feed grains.

3. To determine quantities of feed grains received by grain marketing firms in Alabama by different modes of transportation and in different time periods.

4. To predict production-utilization balances, and other aspects of the feed grain situation for Alabama, in 1975 and 1980.

5. To determine recent changes in different aspects of feed grain marketing in Alabama.

Method of Study

Data on production and utilization of feed grains were obtained from information reported by the Alabama Crop and Livestock Reporting Service and the Economic Research Service, U.S. Department of Agriculture. Projections to 1975 and 1980 were estimated from historical data.

Analysis of 1970 grain movements was based on information from a survey of 81 grain and feed handling and processing firms in Alabama. Data were collected on whole, unprocessed grains only. A list of firms handling raw grain in Alabama was compiled from information supplied by County Extension Chairmen, the State Department of Agriculture, the Federal-State Inspection Service, and various other sources.

The survey was taken on the basis of a stratified random sample. Feed manufacturers were stratified according to feed tonnage produced in 1969, based on information furnished by the State Department of Agriculture, the Federal-State Inspection

Service, and the Economic Research Service of the U.S. Department of Agriculture. Country elevators were classified according to annual gross sales volumes in 1969, based on estimates from County Extension Chairmen.

A list of integrated poultry operations in Alabama handling raw grain on a large scale and not otherwise classified as a feed manufacturer was obtained from the Extension Poultry Specialist, Alabama Cooperative Extension Service.

Total firms in each strata for Alabama and the number of each interviewed were as follows:

Type of firm	*Total firms*	*Number interviewed*
Feed manufacturers		
Under 1,000 tons production	95	7
1,001 to 5,000 tons production	59	9
5,001 to 20,000 tons production	21	5
20,001 to 30,000 tons production	2	2
Over 30,000 tons production	7	7
Country elevators		
Under $500,000 gross sales	10	3
$500,001 to $1,000,000 gross sales	10	5
Over $1,000,000 gross sales	7	7
Terminal elevators	11	11
Integrated poultry and livestock operations	25	25

Data were collected by use of a questionnaire and personal interview of firms sampled, except integrated poultry and livestock operators were interviewed by telephone. Data were collected for raw, unprocessed grains only for the fiscal year 1970. Throughout the remainder of this bulletin, 1970 refers to the period July 1, 1969, to June 30, 1970, unless otherwise noted. Interviews were conducted with managers, bookkeepers, grain buyers, and other personnel familiar with operations of the firms.

Grains studied were corn, soybeans, oats, soft wheat, hard wheat, grain sorghum, barley, and rye. These are referred to in the remainder of the publication as "feed grains," although it is recognized that part of the wheat and other grains are "food grains" and soybeans are traditionally classified as an "oil crop." Information was obtained on receipts and shipments of grains; quantities handled; and areas of origin and destination, by months and by methods of transportation. Data were also obtained on purchasing methods, transportation facilities, drying facilities, marketing services performed, and storage capacities. Data were expanded for sampled firms to yield estimates for the State of Alabama.

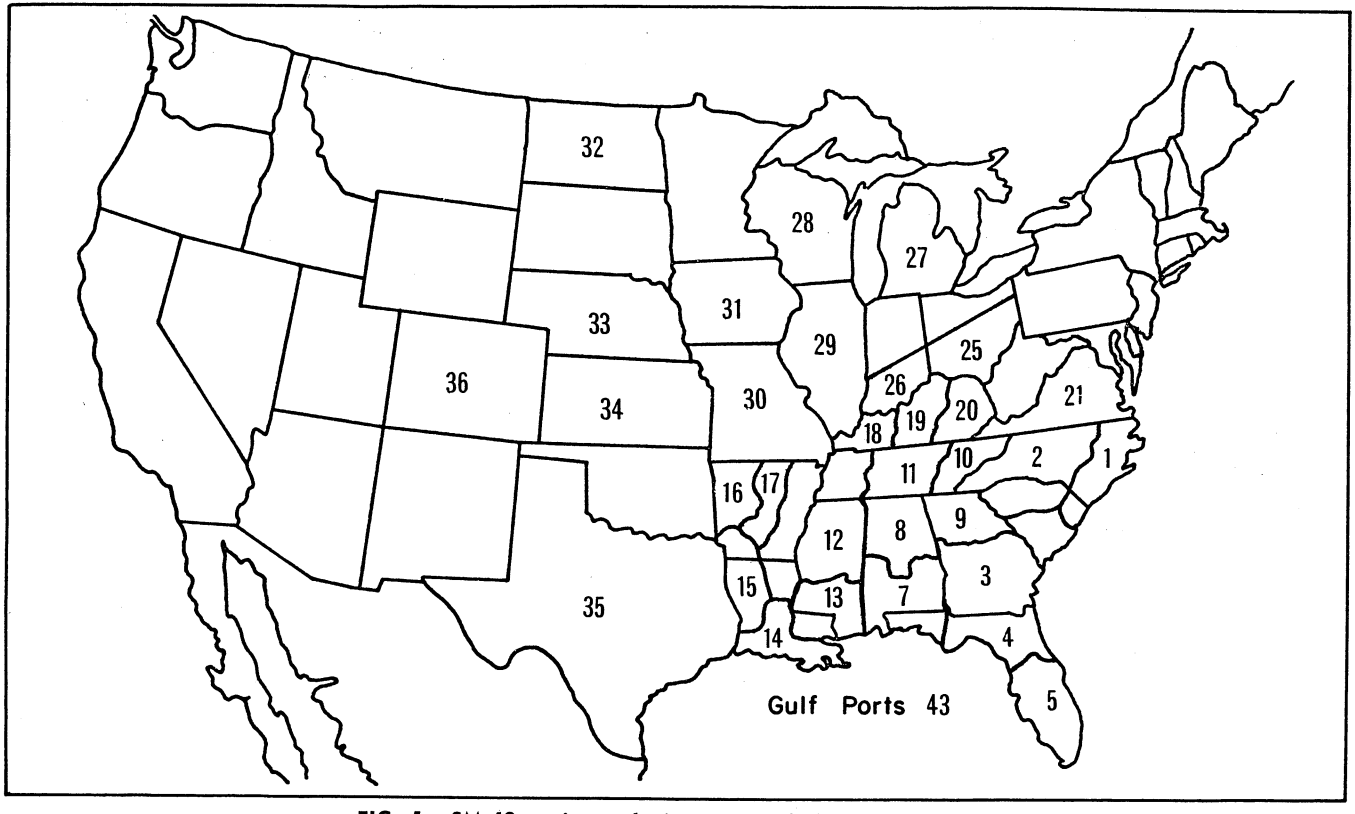


FIG. 1. SM-42 grain marketing areas of the United States.

Alabama was divided into two regions to show general differences in the utilization and marketing of grain, and to provide contributing data for Regional Research Project SM-42, "Predicted Effects of Selected Policy and Technological Changes in the Grain Marketing System," Figure 1.

CHARACTERISTICS OF FEED GRAIN PRODUCTION AND UTILIZATION IN ALABAMA

Current Production Trends and Projections

There has been a general downward trend in production of all feed grains in Alabama since 1958. Trends for specific grains are as follows:

Corn. Alabama corn production has been erratic while following a general downward trend from 1958 to 1970, Figure 2 and Appendix Table 1. The decline was from 37,840,000 bushels in 1967 to 12,535,000 bushels in 1970. Extensive damage from drought in 1969 and Southern corn leaf blight in 1970 contributed to the rapid decline in these years. Corn has also decreased in importance in relation to other feed grain produced in Alabama. Traditionally accounting for about 90 per cent of feed grains produced in the past (excluding soybeans), corn represented only approximately 75 per cent of the State's 1970 feed grain production.

There are several reasons for Alabama's steady decrease in corn production. Yields are low relative to Midwestern Corn Belt

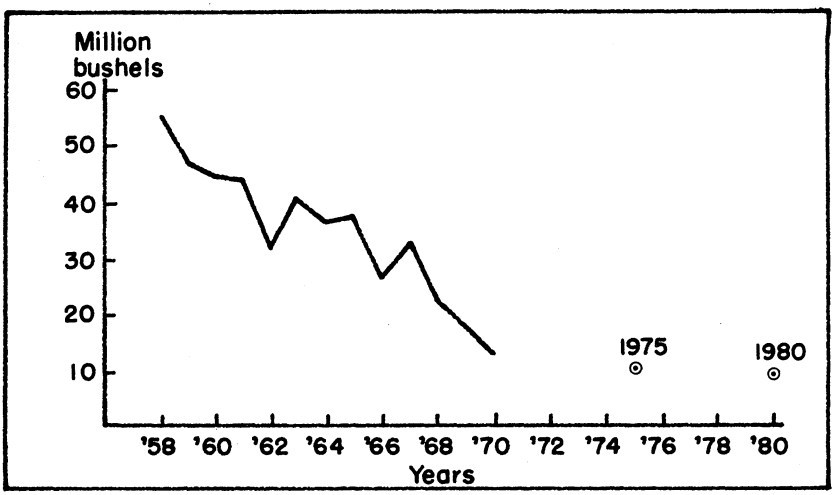


FIG. 2. Production of corn in Alabama, actual and projected, 1958-80.

States, making it more economical to import corn. In addition, soybeans, cotton, and peanuts are more profitable cash crops, for producing in Alabama. Government programs for feed grains have also contributed to the drop in production.

Leading corn production areas in Alabama are in the northeast where corn is an important cash crop, and in the southeast where it is mostly utilized on the farm where produced.

Future prospects are for corn production to continue the gradual decrease despite possible short run fluctuations, but to generally level off by 1975 and 1980, Figure 2.

Projections based on Alabama Crop Reporting Service data and other information indicate an estimated corn production of 10,000,000 bushels in 1975 and 9,500,000 bushels in 1980, Figure 2 and Appendix Table 1. Of course, government programs, prices, improved production techniques, and other factors could alter these estimates.

Oats. Important in the past, oats has been a relatively minor feed grain in Alabama in recent years. Production has steadily decreased since 1964 and was only slightly over 1 million bushels in 1970, Figure 3 and Appendix Table 1.

A continued slow decline in production of oats for grain in Alabama is anticipated. Oat production is estimated at 775,000 bush-

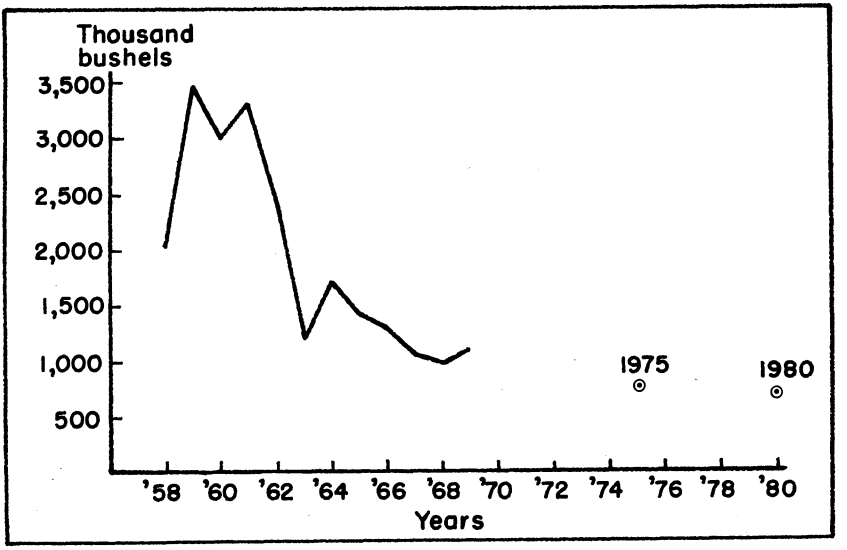


FIG. 3. Production of oats in Alabama, actual and projected, 1958-80.

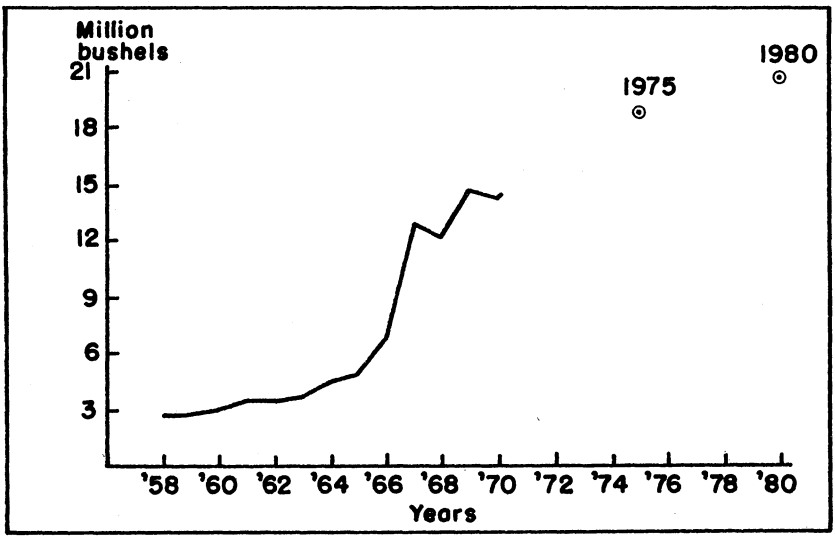


FIG. 4. Production of soybeans in Alabama, actual and projected, 1958-80.

els in 1975 and 700,000 bushels in 1980, Figure 3 and Appendix Table 1.

Production of oats for grain in Alabama occurs mainly in Baldwin County, with smaller quantities produced in the Black Belt, the Tennessee Valley, and the southeastern areas.

Soybeans. A large increase in soybean production has occurred in Alabama since 1964. Production went from 4,554,000 bushels in 1964 to a high of 14,743,000 bushels in 1969, Figure 4 and Appendix Table 1. Alabama has several advantages over other areas of the United States in producing soybeans: a long growing season, relatively low land values and taxes, convenient and favorable markets, and prices and yields generally equal to or greater than the national average.

Currently, soybeans are grown mostly in Baldwin and other southwestern counties, the Tennessee Valley Area, and in the Black Belt. The Inland Division of the State Docks Authority plans construction of several new grain handling facilities that may provide additional market outlets and stimulate future soybean production in areas served by the new facilities.

The outlook is for continued increases in soybean production in Alabama, but at a slower rate than in the immediate past. Production is expected to reach 18,750,000 bushels in 1975 and 20,-

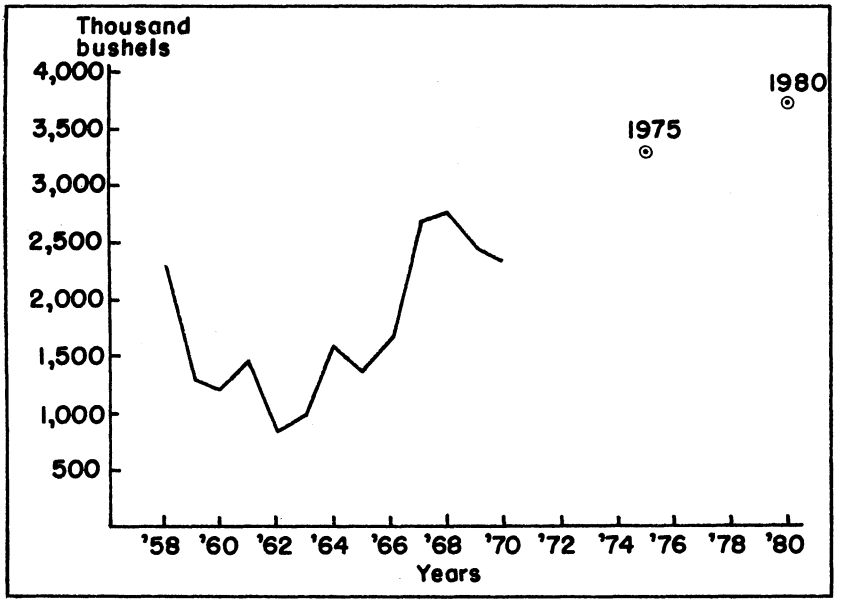


FIG. 5. Production of soft wheat in Alabama, actual and projected, 1958-80.

700,000 bushels in 1980, Figure 4 and Appendix Table 1. These predictions may be altered by possible acreage controls under some type of government program.

Soft wheat. Wheat production in Alabama has been characterized by large year-to-year fluctuations, some of which have been caused by government programs. Some Alabama wheat is used as a feed grain and some in milling flour.

Alabama wheat production has been on a definite upward trend since 1962. Production more than doubled from 1,348,000 bushels in 1965 to 2,775,000 bushels in 1968, but dropped to 2,324,000 bushels in 1970, Figure 5 and Appendix Table 1. In spite of some decline in recent years, however, production is expected to be 3,300,000 bushels by 1975 and 3,750,000 by 1980, Figure 5 and Appendix Table 1.

Grain sorghum. Grain sorghum production in Alabama has been characterized by three major trends since 1958. First, production dropped from 912,000 bushels in 1958 to 240,000 bushels in 1962. Then from 1962 to 1968, production remained fairly steady with minor fluctuations. Since 1968, production has increased from 280,000 bushels to 748,000 bushels in 1970, Figure

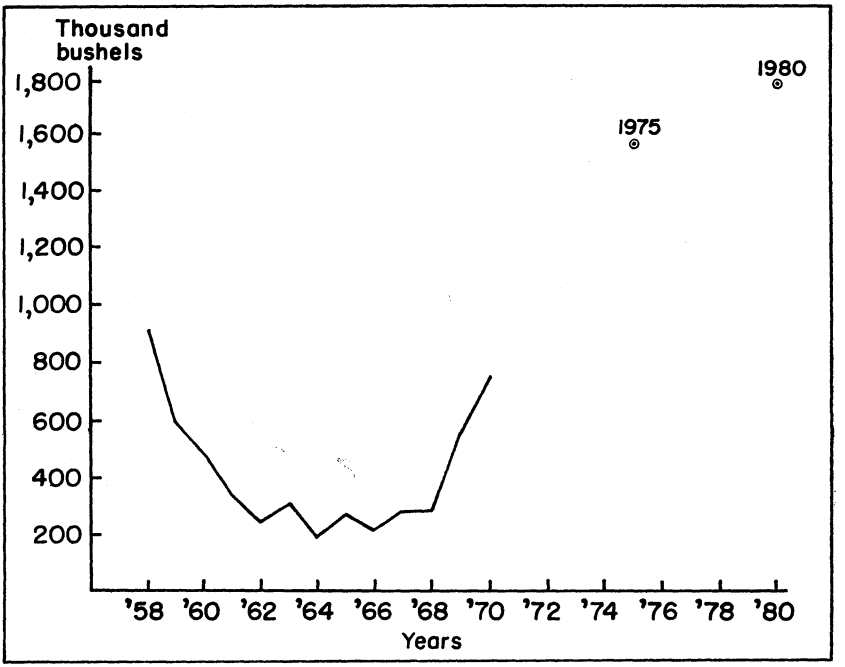


FIG. 6. Production of grain sorghum in Alabama, actual and projected, 1958-80.

6 and Appendix Table 1. Grain sorghum is an alternative to corn, in some cases, and its recent production increase may be partially attributed to a shift of corn acreage to grain sorghum.

Future prospects for grain sorghum are uncertain. Acreage for harvest in 1971 is expected to total 66,000 acres, an increase of 44,000 over 1970 *(9)*.

It is estimated that grain sorghum production will continue to increase, reaching 1,570,000 bushels in 1975 and 1,780,000 bushels in 1980, Figure 6 and Appendix Table 1. However, such problems as bird damage, insects, disease, insufficient drying and storage facilities, and marketing problems may hinder production increases.

Production-Utilization Balances and Projections

Utilization of feed grains in Alabama increased from 3,082,000 tons in 1964 to 4,100,000 tons in 1970, Figure 7 and Appendix Table 2. Increased utilization in the 1960's was largely the result of significant growth in poultry production, mostly in northern Alabama. In 1968, poultry production accounted for 37 per cent

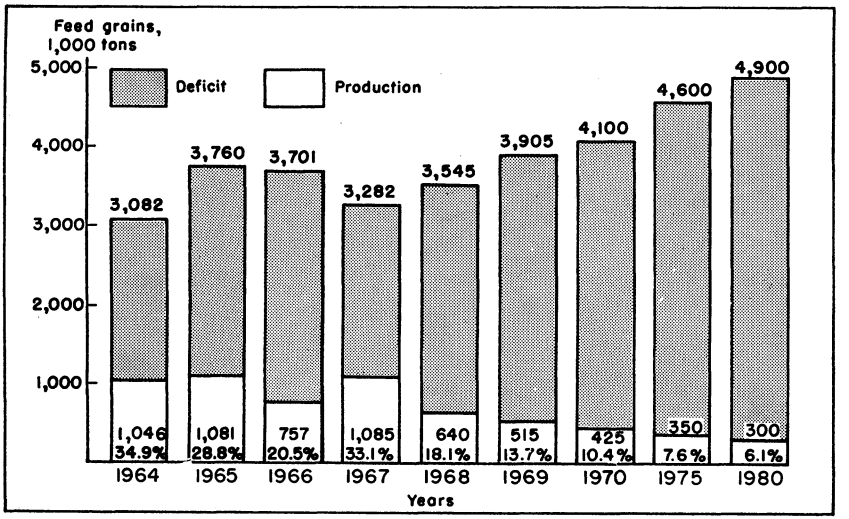


FIG. 7. Feed grain production, utilization, and deficit in Alabama, actual and projected, 1964-80.

of all cash receipts from farm marketings, while all livestock and products (including poultry) represented 70.5 per cent of the total *(1)*.

Poultry[2], which accounted for the largest amount of grain utilization in Alabama in 1968, increased from 1,086,000 grain-consuming animal units[3] (GCAU) in 1960, to 2,205,000 GCAU in 1969 *(7)*. Dairy cattle declined 41 per cent in the same period, from 185,000 to 109,000 GCAU. Beef cattle fed showed a GCAU increase of 40 per cent from 1960 to 1969, going from 177,000 to 247,000. Hogs fed increased slightly, 525,000 to 578,000 GCAU, from 1960 to 1969. Horses and mules fed annually remained at 65,000 GCAU in 1960 and 1969.

With the combination of increased feed grain utilization and

[2] Includes hens, pullets, replacement chickens, broilers, and turkeys.

[3] Livestock numbers, when converted into animal units, can be compared with the supply and consumption of feed at the state, regional, or national level to determine the relative abundance or scarcity of feed available per animal unit. Numbers of each kind of livestock, including poultry, are converted into animal units by weighting such numbers by a factor—the amount of feed consumed per head per year by this kind of livestock divided by the average amount consumed by one milk cow. The base period for this computation is 1940-45 for all classes of livestock except broilers, for which the base period is 1950-53. Animal units were computed by multiplying livestock numbers in the State by a similar factor based on feed consumption within Alabama. Grain-consuming animal units were determined by multiplying livestock numbers by a set of weights (or factors) that represented consumption of concentrates.

decreased production, Alabama's feed grain deficit grew from 2,036,000 tons in 1964 to an estimated 3,675,000 tons in 1970, Figure 7 and Appendix Table 2. In 1964, Alabama produced nearly 35 per cent of feed grains utilized in the State, but this dropped to about 10.4 per cent in 1970, Figure 7.

If current trends are maintained, utilization of feed grains in Alabama will continue to increase and their production will continue to decline. By 1975, it is estimated that Alabama will produce only about 7.7 per cent of feed grains it will utilize, leaving a deficit of approximately 4,250,000 tons, Figure 7 and Appendix Table 2. Projections for 1980 indicate State production of only about 6.1 per cent of feed grains utilized, resulting in a deficit of about 4,600,000 tons, Figure 7 and Appendix Table 2. These data indicate that Alabama's agricultural economy will be even more dependent in the future on an inexpensive source of feed grains from surplus-producing regions and efficient transportation methods to get them to the State.

CHARACTERISTICS OF GRAIN AND FEED HANDLING AND PROCESSING FIRMS IN ALABAMA

Classification of Firms

Alabama's grain industry in 1970 was highly diversified, compared with the more homogeneous nature of those in the Midwest and some other regions. The State's industry was composed of a large number of firms that varied considerably according to size and functions performed, which made classification difficult. Since most firms performed more than one function in marketing grain, each was classified on the basis of its most important function.

Grain marketing firms were classified as terminal elevators (received more than 50 per cent of their grain from firms other than farmers), feed manufacturers, integrated poultry and livestock firms (not otherwise classified as feed manufacturers), soybean processors, and flour mills.[4] Firms classified as feed manufacturers also included custom grinders and feed mixers. Data from soybean processors and flour mills were combined with data from feed manufacturers to prevent possible disclosure of confidential information. Only firms that handled some raw grain were included in this study.

[4] See more detailed description, Appendix B.

TABLE 1. GRAIN AND FEED HANDLING AND PROCESSING FIRMS IN ALABAMA, BY TYPE AND AREA, WITH CHANGE IN NUMBER AND PER CENT, 1964 TO 1970[1]

Type of firm	Firms in Alabama					
	Total 1964[2]	Area 7 1970	Area 8 1970	Total 1970	Change from 1964 to 1970	
	No.	*No.*	*No.*	*No.*	*No.*	*Pct.*
Terminal elevators	6	5	6	11	+5	+83.3
Country elevators	10	18	8	26	+16	+160.0
Feed manufacturers	180	107	75	182	+2	+1.1
Soybean processors	2	1	1	2	0	0.0
Flour mills	1	0	1	1	0	0.0
Sub total	199	131	91	222	+23	+11.6
Integrated poultry and livestock firms[3]	----	7	18	25	----	----
STATE TOTAL	199	138	109	247	----	----

[1] Includes only firms that handle or use raw grain in some way. Does not include strictly retail and/or wholesale feed stores.
[2] See Literature Citation No. 3, page 22.
[3] Integrated poultry and livestock firms are separated from other types of firms for comparing 1964 data with 1970 data. There are no data available on number of integrated poultry and livestock firms in Alabama in 1964.

There were 247 Alabama firms classified as grain and feed handling and processing firms for purposes of this study in 1970, Table 1. Excluding integrated poultry and livestock operations, there was an increase of 23 grain handling firms in Alabama, or approximately 11.6 per cent, from 1964 to 1970. The largest increase was in terminal and country elevators, with terminal elevators increasing from 6 to 11 and country elevators from 10 to 26. Increased demand for imported corn is a possible reason for

TABLE 2. FEED MANUFACTURERS, BY ANNUAL FEED PRODUCTION AND AREA, ALABAMA, 1970[1]

Annual production, tons	Feed manufacturers		
	Southern Alabama (Area 7)	Northern Alabama (Area 8)	State
	No.	*No.*	*No.*
Under 1,000	59	36	95
1,001-2,000	23	14	37
2,001-5,000	14	8	22
5,001-10,000	4	7	11
10,001-20,000	5	5	10
Over 20,000[2]	2	7	9
TOTAL	107	77	184

[1] Includes soybean processors and flour mills.
[2] The number of feed manufacturers producing 20,000 to 30,000 tons and over 30,000 tons of feed annually are combined to prevent possible disclosure of confidential information.

TABLE 3. COUNTRY ELEVATORS, BY ANNUAL GROSS SALES VOLUME AND AREA, ALABAMA, 1970[1]

Annual gross sales volume	Country elevators		
	Southern Alabama (Area 7)	Northern Alabama (Area 8)	State
	No.	*No.*	*No.*
Under $500,000	4	6	10
$500,000-$1 million	7	3	10
Over $1 million	7	0	7
TOTAL	18	9	27

[1] Includes soybean processors.

the increase in terminal elevators, while large growth in soybean production may explain the large increase in country elevators. Feed manufacturers increased by only two, and there was no change in number of flour mills and soybean processors from 1964 to 1970.

More than half of the State's feed manufacturers produced less than 1,000 tons of feed in 1970, Table 2. Only nine produced more than 20,000 tons. Nearly 75 per cent of the country elevators in Alabama grossed less than $1 million in 1970, Table 3.

Personnel at 25 of the integrated operations in Alabama were interviewed by phone to determine quantities, area of origin, and transportation modes of any raw grain they received. Some of the firms classified as feed manufacturers also had integrated poultry and livestock operations.

Distribution of Firms

Distribution of firms throughout the State varied according to type and size of firm, Figure 8. Two-thirds of the country elevators, including all with annual gross sales exceeding $1 million in 1970, were located in Area 7, Figure 8 and Table 3. This was partially a result of large soybean production in this area. Most of the small feed manufacturers are also located in Area 7, where the main livestock enterprises are beef cattle, dairy cattle, and hogs. Such livestock utilize forage and locally produced grain, so this area does not require as large a total volume of concentrate feeds as do northern Alabama broiler areas.

Most of the terminal elevators, feed manufacturers that produced over 20,000 tons of feed in 1970, and integrated poultry and livestock firms were located in Area 8, Figure 8 and Tables

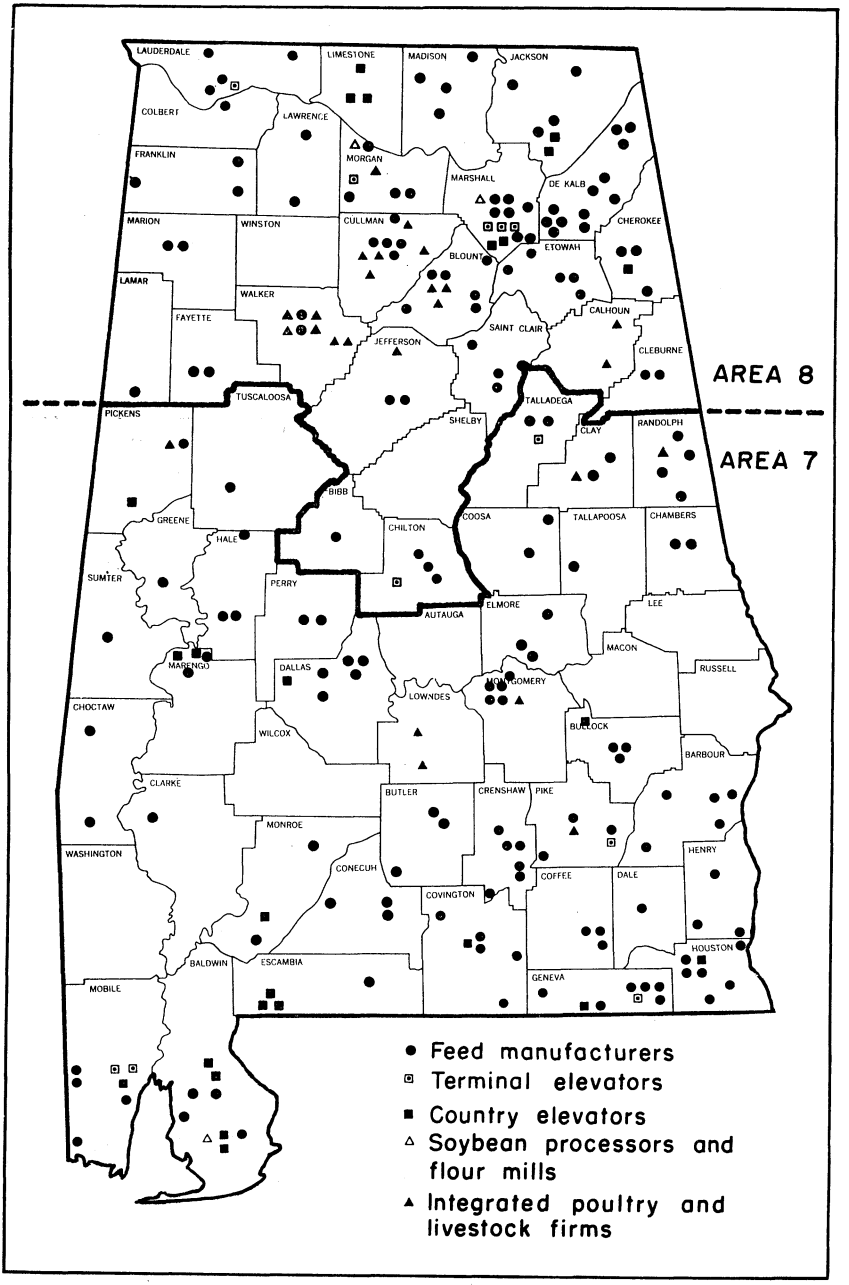


FIG. 8. Location of grain and feed facilities in Alabama in 1970.

1 and 2. This reflects the heavy concentration of poultry production in northern Alabama and the grain facilities on the Tennessee River that are capable of receiving large amounts of grain by water.

Bulk Storage Capacity of Firms

Alabama grain marketing firms had a bulk storage capacity of 19,273,000 bushels in 1970, up from 13,637,000 bushels in 1965, Table 4. Of this total, bulk upright storage accounted for 16,626,000 bushels and bulk flat storage 2,647,000 bushels.

TABLE 4. BULK GRAIN STORAGE CAPACITY, BY TYPE OF FIRM, ALABAMA, 1965 AND 1970

Type of firm	Storage capacity			
	Total 1965[1]	Bulk upright 1970	Bulk flat 1970	Total 1970
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Terminal elevators	3,714[2]	4,522	600	5,122
Country elevators	---	1,865	903	2,768
Feed manufacturers[3]	9,923	10,239	1,144	11,383
TOTAL	13,637	16,626	2,647	19,273

[1] See Literature Citation No. 3.
[2] Includes country elevators.
[3] Does not include integrated poultry and livestock firms.

Although terminal and country elevators represented less than 18 per cent of grain firms, they had 41 per cent of the bulk storage capacity in Alabama. This was expected because of the nature of business of elevators.

Bulk storage capacity in Alabama increased 5,636,000 bushels, 41 per cent, from 1965 to 1970. A substantial increase in soybean production since 1965, plus an increased deficit requiring importation of more grain, were probably responsible for this increased capacity.

Other Market Characteristics of Firms

Drying facilities. Of the 56 firms surveyed to determine the extent of grain drying facilities in Alabama, only 19 possessed drying equipment, Table 5. Five dryers were batch type, 11 were continuous flow type, and 3 were bin type. Of firms sampled, feed manufacturers with facilities capable of drying 15,455 bushels per hour had the largest capacity for drying grain in 1970.

TABLE 5. TOTAL RATED CAPACITY OF GRAIN DRYING FACILITIES OF FIRMS INTERVIEWED, BY TYPE OF FIRM AND TYPE OF DRYER, ALABAMA, 1970

Type of firm	Dryer numbers and capacity						Total	
	Batch		Continuous flow		Bin			
	No.[1]	*Capacity*[2]	*No.*[1]	*Capacity*[2]	*No.*[1]	*Capacity*[2]	*No.*[1]	*Capacity*[2]
Terminal elevators	2	2,000	6	5,550	0	0	8	7,550
Country elevators	2	820	2	1,150	0	0	4	1,970
Feed manufacturers[3]	1	280	3	13,000	3	2,175	7	15,455
TOTAL	5	3,100	11	19,700	3	2,175	19	24,975

[1] Number is for sample only.
[2] Total drying capacity of firms sampled, rated in bushels per hour at 5 points.
[3] Does not include integrated poultry and livestock firms.

Transportation facilities. In determining transportation capabilities of Alabama grain handling firms in 1970, respondents to questionnaires were asked if their firms were equipped and capable of handling grain receipts and/or shipments by rail, truck, and water in 1970. Results indicated the firms were better equipped to receive than to ship grain, Table 6. Terminal elevators were best equipped for receiving grain by rail, followed by feed manufacturers and country elevators. Only one-third of the country elevators and less than half of the feed manufacturers could receive grain by rail. As expected, most feed manufacturers and country elevators with rail facilities were feed manufacturers that produced more than 20,000 tons of feed in 1970 and country elevators that grossed more than $1 million. Few medium sized

TABLE 6. NUMBER AND PER CENT OF FIRMS INTERVIEWED THAT WERE CAPABLE OF RECEIVING AND SHIPPING GRAIN BY VARIOUS TRANSPORTATION METHODS, BY TYPE OF FIRM, ALABAMA, 1970

Transportation capabilities	Firms reporting[1]					
	Terminal elevators		Country elevators		Feed manufacturers[1]	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
Able to receive grain						
In boxcars	6	55	5	33	13	43
In covered hopper cars	9	82	5	33	13	43
By rail in 5 car lots	9	82	5	33	13	43
By truck	11	100	15	100	30	100
By water	7	64	2	13	5	17
Able to ship grain						
In boxcars	6	55	5	33	8	27
In covered hopper cars	9	82	5	33	8	27
By rail in 5 car lots	9	82	5	33	8	27
By truck	11	100	9	60	23	77
By water	6	55	2	13	5	17

[1] Does not include integrated poultry and livestock firms.

and small feed manufacturers had rail facilities. Seven terminal elevators, two country elevators, and five feed manufacturers were located on a river and could receive and/or ship grain by water in 1970. Terminal elevators were also better equipped to ship grain by all modes of transportation than either country elevators or feed manufacturers.

These results identify the number and proportion of sampled firms that were capable of shipping and receiving grain by various transportation methods, not those that actually shipped and received by these various transportation methods in 1970. Some firms had facilities that were not used.

Receiving and shipping capacity of firms. Data were also gathered on the maximum volume of grain that Alabama grain marketing firms were capable of receiving and shipping in a 24-hour period in 1970. Terminal elevators were better equipped to receive and ship grain than either country elevators or feed manufacturers, Table 7. Half of the feed manufacturers interviewed were unable to ship grain.

Respondents were also asked what factors limited their ability to receive and ship grain in 1970. Results were erratic, but some of the reasons most frequently listed were insufficient facilities,

TABLE 7. MAXIMUM VOLUME THAT FIRMS INTERVIEWED WERE CAPABLE OF RECEIVING AND/OR SHIPPING IN 24 HOURS, BY CATEGORY AND TYPE OF FIRM, ALABAMA, 1970

Categories of maximum amounts possible in 24 hours	Capabilities reported					
	Terminal elevators		Country elevators		Feed manufacturers	
Bushels	*No.*	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
			RECEIPTS			
Under 5,000	1	9.1	0	0.0	12	40.0
5,001-25,000	0	0.0	6	40.0	8	26.7
25,001-50,000	1	9.1	5	33.3	5	16.7
50,001-75,000	7	63.6	3	20.0	3	10.0
75,001-100,000	1	9.1	1	6.7	1	3.3
Over 100,000	1	9.1	0	0.0	1	3.3
TOTAL	11	100.0	15	100.0	30	100.0
			SHIPMENTS			
Under 5,000	1	9.1	1	6.7	5	16.7
5,001-25,000	0	0.0	5	33.3	4	13.3
25,001-50,000	2	18.2	5	33.3	4	13.3
50,001-75,000	6	54.5	3	20.0	1	3.3
75,001-100,000	1	9.1	1	6.7	1	3.3
Over 100,000	1	9.1	0	0.0	0	0.0
Unable to ship	0	0.0	0	0.0	15	50.0
TOTAL	11	100.0	15	100.0	30	100.0

limited capacity of facilities, inadequate rail service, and limited storage capacity. Grain handling firms were able to receive more grain in a 24-hour period than they could ship in 24 hours, mainly because of inadequate loading facilities.

Marketing services performed by firms. Alabama grain handling firms performed a wide variety of marketing services in 1970, Table 8. Feed manufacturers performed the greatest number of functions, followed by country elevators and terminal elevators.

TABLE 8. NUMBER AND PER CENT OF FIRMS INTERVIEWED THAT PERFORMED CERTAIN MARKETING SERVICES, BY TYPE OF FIRM, ALABAMA, 1970

Services performed	Firms reporting					
	Terminal elevators		Country elevators		Feed manufacturers[1]	
	No.	*Pct.*	*No.*	*Pct.*	*No.*	*Pct.*
Received grain from farmers	9	82	15	100	22	73
Received grain from firms other than farmers	11	100	7	47	30	100
Shipped or sold whole grain to farmers	8	73	10	67	9	30
Shipped or sold whole grain to firms other than farmers	11	100	14	93	5	17
Stored grain commercially	4	36	4	27	4	13
Dried grain	8	73	4	27	7	23
Transported grain in own equipment	6	55	6	40	8	27
Manufactured a feed ingredient(s)	0	0	0	0	10	33
Manufactured a complete feed(s)	0	0	2	13	27	90
Custom ground feed for farmers	0	0	1	7	18	60
Delivered feeds to farmers	0	0	4	27	19	63
Contracted for production of broilers	0	0	0	0	7	23
Contracted for production of eggs	0	0	0	0	4	13
Produced livestock under contract	0	0	0	0	2	7
Retailed farm supplies	4	36	8	53	16	53
Crushed soybeans	0	0	1	7	1	3
Shelled corn	0	0	3	20	8	27

[1] Does not include integrated poultry and livestock firms.

Methods used in purchasing grain. Alabama firms interviewed in 1970 purchased grain by the following arrangements: (1) through a grain broker, (2) directly from farmers, (3) directly from other firms, (4) from an exporter, and (5) by contracts previously arranged with producers. Approximately two-thirds of all feed grains received was purchased from other firms, grain brokers were agents for an estimated 7.3 per cent, and 11.3 per cent received by Alabama firms was purchased from exporters, Table 9. Less than 1 per cent was produced on contract.

Only 5.4 per cent of corn received in Alabama in 1970 was

TABLE 9. VOLUME AND PER CENT OF FEED GRAINS PURCHASED BY GRAIN HANDLING FIRMS, BY VARIOUS METHODS, ALABAMA, 1970

Method of purchase	Volume purchased							
	Corn		Soybeans		Oats		Grain sorghum	
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*
Through grain brokers	8,808	8.6	0	0	1,214	18.5	456	19.2
Directly from farmers	5,546	5.4	13,032	37.1	309	4.7	86	3.6
Directly from other firms[1]	83,827	82.0	11,157	31.9	4,814	73.4	1,787	75.4
From exporters	4,050	4.0	9,428	26.8	225	3.4	41	1.8
Produced on contract	0	0	1,466	4.2	0	0	0	0
TOTAL	102,231	100.0	35,173	100.0	6,562	100.0	2,370	100.0

Method of purchase	Volume purchased									
	Soft wheat		Hard wheat		Barley		Rye		Total	
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*
Through grain brokers	1,113	16.0	0	0	0	0	0	0	11,591	7.3
Directly from farmers	1,608	23.2	0	0	348	87.4	4	100	20,933	13.2
Directly from other firms[1]	2,287	32.9	3,088	57.4	50	12.6	0	0	107,010	67.3
From exporters	1,885	27.1	2,288	42.6	0	0	0	0	17,917	11.3
Produced on contract	50	0.8	0	0	0	0	0	0	1,516	0.9
TOTAL	6,943	100.0	5,376	100.0	398	100.0	4	100	159,057	100.0

[1] Includes receipts from firms within own company.

purchased directly from farmers, while 82.0 per cent was bought directly from other firms and 8.6 per cent through grain brokers. Also, grain brokers purchased corn for some farmers but these purchases were not included in this study. The remaining 4 per cent came from exporters.

More than one-third of all soybeans received by Alabama firms was purchased directly from farmers. Second and third most important sources were other firms and an exporter. Few soybeans were produced on contract.

Grain brokers accounted for an estimated 18.5 per cent of oat purchases by Alabama firms, while 73.4 per cent came from other firms. Small amounts of oats were bought from farmers and an exporter.

Most grain sorghum receipts in 1970 were purchased from other firms. Grain brokers accounted for 19.2 per cent, while an estimated 3.6 and 1.8 per cent, respectively, were purchased from farmers and an exporter.

Nearly one-third of soft wheat was purchased from other firms, making this the most important source. An exporter was second with just over one-fourth, followed by farmers (23.2 per cent of total) and grain brokers (16 per cent). Approximately 50,000 bushels of soft wheat were produced on contract in 1970.

No hard wheat was produced in Alabama in 1970. Of that received by Alabama grain marketing firms in 1970, 57.4 per cent came from other firms and the remainder from exporters.

All rye and nearly 88 per cent of barley received by Alabama grain marketing firms in 1970 was purchased from farmers. The remaining barley was bought from other firms.

MOVEMENTS OF FEED GRAINS

Since feed grain utilization exceeded production in 1970, it was necessary to import large quantities of grain from outside the State. A primary objective of this study was to establish flow patterns of grain movements to and from Alabama in 1970 and to estimate grain volumes, origins, and destinations.

To facilitate analysis of feed grain movements, the United States was divided into 36 grain marketing regions, Figure 1. These regions are also being used in analysis under Southern Regional Marketing Project, SM-42. Alabama was divided into Area 7 (southern Alabama) and Area 8 (northern Alabama), Figure 1 and Figure 8.

Total Receipts

More than 159 million bushels of feed grains were received by Alabama grain and feed marketing firms in 1970—local, intrastate,[5] and interstate, Table 10. Corn was the most important grain received, accounting for 102,231,000 bushels, or about 64.25 per cent of total receipts. However, the total includes soybeans, which are not included in some concepts of "feed grains." If soybeans are not included, corn accounted for approximately 82.5 per cent of total feed grain receipts. Soybean receipts amounted to 35,173,000 bushels, or about 22.1 per cent of the total. Relatively small amounts of oats, soft wheat, hard wheat, grain sorghum, barley, and rye were also received by Alabama grain firms in 1970.

TABLE 10. FEED GRAIN RECEIPTS, BY KIND OF GRAIN AND SOURCE, ALABAMA, 1970

Kind of grain	Receipts					
	Local[1]	Intrastate[2]	Interstate[3]	Total	Per cent of total	Per cent interstate[3]
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Per cent*	*Per cent*
Corn	5,546	13,577	83,108	102,231	64.25	81.3
Soybeans	14,498	12,981	7,694	35,173	22.1	21.9
Oats	309	1,194	5,059	6,562	4.1	77.1
Soft wheat	1,658	3,487	1,798	6,943	4.4	25.9
Hard wheat	0	0	5,376	5,376	3.4	100
Grain sorghum	86	60	2,224	2,370	1.5	93.8
Barley	348	50	0	398	0.25	0
Rye	4	0	0	4	--	0
TOTAL	22,449	31,349	105,259	159,057	100.00	
Per cent	14.1	19.7	66.2	100.0		

[1] Received from producers.
[2] Received from firms other than producers within Alabama
[3] From outside Alabama.

More than two-thirds of all feed grains received in Alabama in 1970 went to firms in Area 8, northern Alabama, Table 11. Slightly more than 80 per cent of the corn and 78 per cent of oats were received by firms in Area 8. The heavy concentration of poultry production in northern Alabama and the location of terminal elevators and feed manufacturers on the Tennessee River capable of receiving and shipping large amounts of grain by barge, largely explain the greater receipts in Area 8 than Area 7.

[5] Intrastate movements included grain that moved within the State, which resulted in some double and triple counting.

TABLE 11. FEED GRAIN RECEIPTS, BY KIND OF GRAIN AND AREA OF STATE, ALABAMA, 1970

Kind of grain	Receipts			
	Southern Alabama (Area 7)	Northern Alabama (Area 8)	State	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*Per cent*
Corn	20,045	82,186	102,231	64.25
Soybeans	21,408	13,865	35,173	22.1
Oats	1,423	5,139	6,562	4.1
Soft wheat	4,343	2,600	6,943	4.4
Hard wheat	2,288	3,088	5,376	3.4
Grain sorghum	1,510	860	2,370	1.5
Barley	119	279	398	0.25
Rye	4	0	4	--
TOTAL	51,140	108,017	159,057	100.00
Per cent	32.2	67.8	100.0	

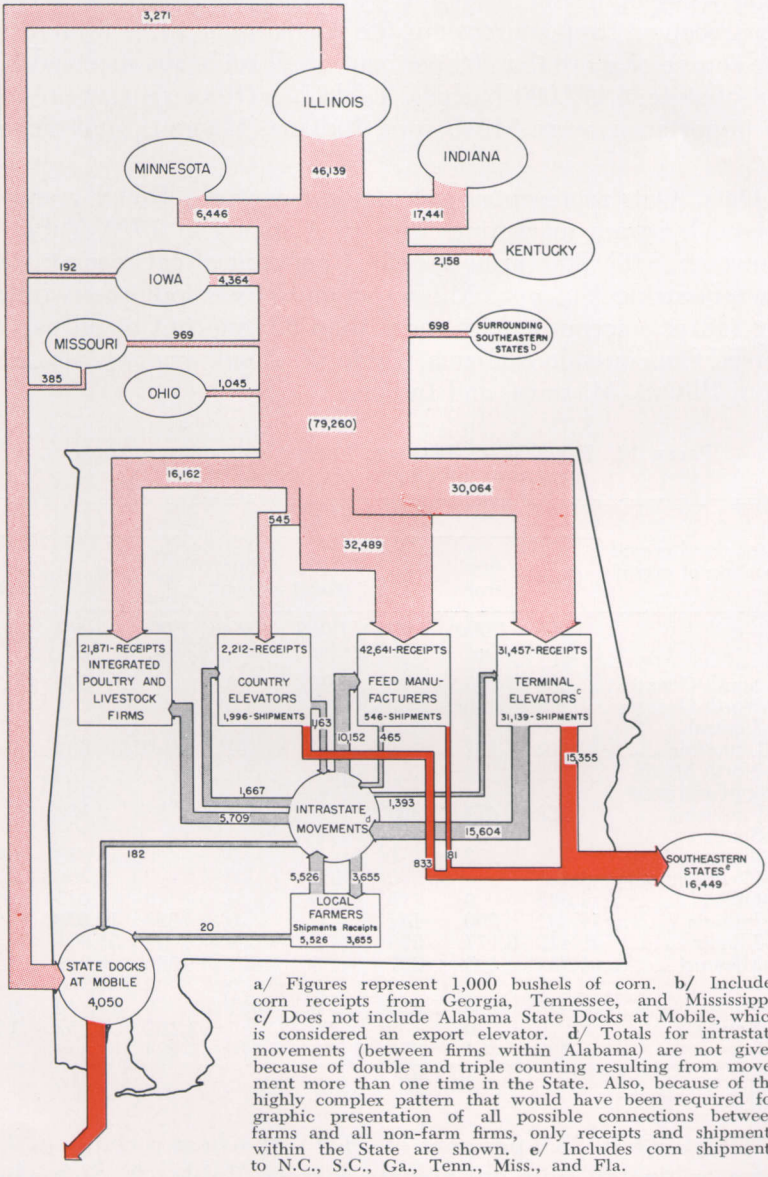
Nearly 61 per cent of soybean receipts were by firms in Area 7, southern Alabama, mostly because of that area's heavy production and large volumes of soybeans exported through the Port of Mobile. Most of the soft wheat, grain sorghum, and rye was also received by firms in Area 7, while most of the barley went to northern Alabama.

Receipts by Area of Origin

Approximately two-thirds of all feed grain receipts originated from out-of-state sources, Table 10. Feed grains received from local producers amounted to only about 14 per cent of the total in 1970, and 19.7 per cent was received from other firms within Alabama.

Corn. More than 81 per cent of total corn receipts, or 83,108,000 bushels, was from sources outside Alabama, while only a little more than 5 per cent came from local producers, Figure 9 and Table 10. Most of the interstate corn receipts in 1970 originated in the Midwest. Of total corn from out-of-state sources, 49,410,000 bushels, nearly 60 per cent, were received from Illinois and 17,441,000 bushels, about 21 per cent, came from Indiana, Table 12. Other important interstate sources were Minnesota (6,446,000 bushels), Iowa (4,556,000 bushels), Kentucky (2,158,000 bushels), Missouri (1,354,000 bushels), and Ohio (1,045,000 bushels). Small amounts of corn were also received from the surrounding states of Georgia, Tennessee, and Mississippi.

Soybeans. Alabama produced large quantities of soybeans in



a/ Figures represent 1,000 bushels of corn. b/ Includes corn receipts from Georgia, Tennessee, and Mississippi. c/ Does not include Alabama State Docks at Mobile, which is considered an export elevator. d/ Totals for intrastate movements (between firms within Alabama) are not given because of double and triple counting resulting from movement more than one time in the State. Also, because of the highly complex pattern that would have been required for graphic presentation of all possible connections between farms and all non-farm firms, only receipts and shipments within the State are shown. e/ Includes corn shipments to N.C., S.C., Ga., Tenn., Miss., and Fla.

FIG. 9. Interstate and intrastate movements of corn, Alabama, 1970[a].

1970. In fact, local producers were the largest source of soybeans in Alabama, accounting for 14,498,000 bushels, or 41.2 per cent of total receipts, Table 10. Only 21.9 per cent (7,694,000 bushels) was received from sources outside Alabama in 1970. Illinois was the source of more than 80 per cent of all soybeans received from out-of-state, 6,177,000 bushels, Table 12. Other sources, in order of importance, were Mississippi, Indiana, Missouri, and Tennessee.

Oats. Oats represented only 4.1 per cent of all feed grains received by grain marketing firms in Alabama in 1970, Table 10. However, 5,059,000 bushels, or 77.1 per cent of oat receipts, originated outside Alabama. Minnesota and Mississippi, the two leading sources, accounted for more than 85 per cent of all oats received from outside Alabama, Table 12. Small amounts also came from Illinois, Missouri, and Indiana.

TABLE 12. FEED GRAIN RECEIPTS FROM OUT-OF-STATE SOURCES, BY AREA OF ORIGIN, ALABAMA, 1970

Area number and location of origin[1]	Receipts							
	Corn	Soybeans	Oats	Soft wheat	Hard wheat	Grain sorghum	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
3-South Georgia	256	0	0	100	0	0	356	0.3
9-North Georgia		0	0	4	0	0	4	--
11-Central Tennessee	263	157	0	0	14	0	434	0.4
12-North Mississippi and west Tennessee	150	471	1,485	393	0	83	2,582	2.5
13-South Mississippi	29	290	0	0	0	0	319	0.3
18-West Kentucky	2,158	0	0	151	0	0	2,309	2.2
25-Ohio	1,045	0	0	0	0	0	1,045	1.0
26-Indiana	17,441	300	141	152	0	335	18,369	17.5
29-Illinois	49,410	6,177	393	908	0	83	56,971	54.1
30-Missouri	1,354	299	207	0	4,401	556	6,817	6.5
31-Iowa	4,556	0	0	0	0	0	4,556	4.3
32-Minnesota	6,446	0	2,833	0	961	0	10,240	9.7
34-Kansas	0	0	0	90	0	1,167	1,257	1.2
TOTAL	83,108	7,694	5,059	1,798	5,376	2,224	105,259	

[1] See Figure 9.

Wheat. Only 25.9 per cent of 1970 soft wheat receipts in Alabama originated from out-of-state sources, Table 10. Soft wheat was received from several out-of-state origins, but approximately half of interstate receipts originated from Illinois, Table 12. Small

volumes of soft wheat also came from Mississippi, Indiana, Kentucky, and Georgia. All hard wheat received in Alabama in 1970 was from outside the State, Table 10. Missouri accounted for approximately 82 per cent and Minnesota most of the remainder, Table 12. Missouri receipts were mostly from Kansas City, with wheat probably originating in the Great Plains. A small amount of hard wheat was also received from Memphis, Tennessee.

Grain sorghum and other grains. Grain sorghum, barley, and rye accounted for less than 2 per cent of all feed grains received by Alabama grain marketing firms in 1970, Table 10. Nearly 94 per cent of the grain sorghum was received from sources outside Alabama, while no barley or rye came from outside the State. Kansas was the primary source of interstate grain sorghum receipts, followed by Missouri, Indiana, Illinois, and Mississippi, Table 12.

Receipts by Type of Firm

Feed manufacturers handled 61,400,000 bushels in 1970, nearly 39 per cent of total feed grain receipts in Alabama, Table 13. Terminal elevators accounted for 37 per cent, country elevators 7 per cent, and integrated poultry and livestock firms about 17 per cent of the 159,057,000-bushel total received from all sources —local, interstate, and intrastate.

Terminal elevators. Corn and soybeans were the most important grains handled by terminal elevators in 1970. Corn represented 35,507,000 bushels, or about 60 per cent of the 59,068,000

TABLE 13. FEED GRAIN RECEIPTS, BY KIND OF GRAIN AND TYPE OF FIRM, ALABAMA, 1970

Kind of grain	Receipts			
	Terminal elevators	Country elevators	Feed manufacturers	Integrated poultry and livestock
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Corn	35,507	2,212	39,001	25,511
Soybeans	15,275	7,908	11,990	0
Oats	2,926	106	3,455	75
Soft wheat	2,891	995	3,057	0
Hard wheat	2,288	0	3,088	0
Grain sorghum	51	0	652	1,667
Barley	128	113	157	0
Rye	2	2	0	0
TOTAL	59,068	11,336	61,400	27,253
Per cent	37.1	7.1	38.6	17.2

bushels of feed grains handled. Soybeans accounted for 15,275,000 bushels, nearly 26 per cent of the total, Table 13. Terminal elevators also handled over 8 million bushels of soft wheat, hard wheat, and oats combined, plus small quantities of grain sorghum, barley, and rye.

It is pointed out that data for terminal elevators include the State Docks at Mobile, which actually functioned as an export elevator. All grain received by the State Docks—17,917,000 bushels in 1970—was exported to foreign countries. This consisted of 9,428,000 bushels of soybeans, 4,050,000 bushels of corn, 2,288,000 bushels of hard wheat, 1,885,000 bushels of soft wheat, 225,000 bushels of oats, and 40,500 bushels of grain sorghum.

Country elevators. Country elevators in Alabama handled 11,336,000 bushels of feed grains in 1970, with soybeans representing 7,908,000 bushels (nearly 70 per cent of the total), Table 13. Only 2,212,000 bushels of corn moved through country elevators, along with relatively small amounts of soft wheat, oats, barley, and rye. Most country elevators were in southern Alabama.

Feed manufacturers. Nearly 64 per cent of the total volume of feed grains handled by feed manufacturers was corn. They handled 39,001,000 bushels of corn in 1970, Table 13, more than any other type firm in the State. Soybeans followed with almost 12 million bushels of receipts. The remaining volume handled by feed manufacturers in 1970 consisted of 9,590,000 bushels of oats, soft wheat, and hard wheat combined, and small amounts of grain sorghum and barley.

Integrated poultry and livestock firms. Corn accounted for 25,511,000 bushels, nearly 94 per cent of total feed grains received by integrated poultry and livestock firms in 1970, Table 13. The remaining 1,667,000 bushels consisted of grain sorghum and a small amount of oats. These firms handled slightly more than 70 per cent of grain sorghum received by all grain marketing firms in Alabama in 1970. This class of firms consists of integrated poultry and livestock firms that were not otherwise classified as feed manufacturers. Actually, much of the feed grains received by feed manufacturers was utilized in integrated poultry and livestock operations.

Receipts by Month

Feed grains were received by Alabama grain marketing firms at fairly constant levels throughout the year in 1970, Table 14.

TABLE 14. FEED GRAIN RECEIPTS, BY KIND OF GRAIN AND MONTH OF RECEIPTS, ALABAMA, 1970

Month	Receipts									
	Corn	Soybeans	Oats	Soft wheat	Hard wheat	Grain sorghum	Barley	Rye	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
Jan.	8,946	574	616	147	277	194	0	0	10,754	6.8
Feb.	8,343	2,465	485	135	223	183	0	0	11,834	7.4
Mar.	8,087	803	502	179	486	185	0	0	10,242	6.4
Apr.	8,682	2,200	549	84	428	242	0	0	12,185	7.7
May	8,225	672	694	1,357	609	288	29	2	11,876	7.5
June	8,834	586	748	2,112	363	220	318	2	13,183	8.3
July	9,484	705	368	1,132	685	158	26	0	12,558	7.8
Aug.	8,577	375	523	980	586	170	15	0	11,226	7.1
Sept.	7,773	3,087	422	102	495	184	5	0	12,068	7.6
Oct.	8,291	9,239	755	52	336	177	5	0	18,855	11.8
Nov.	7,790	10,125	395	573	431	169	0	0	19,503	12.3
Dec.	9,199	4,322	505	90	457	200	0	0	14,773	9.3

Since it was necessary to import large quantities of feed, especially corn, the monthly pattern of receipts indicates that grain demands were met by fairly regular size receipts from out-of-state sources throughout the year, rather than buying seasonally and storing in Alabama. Part of the reason for this was lack of adequate storage. November, October, and December were leading months in grain receipts, mostly because of large local soybean receipts in those months.

There was seasonal variation in receipts of soybeans, soft wheat, barley, and rye. Alabama was a large producer of soybeans in 1970, and approximately two-thirds of the soybeans was received during the fall harvest season. Nearly two-thirds of the soft wheat was received during May, June, and July. About 80 per cent of the barley was received in June and all rye in May and June. Corn, oats, hard wheat, and grain sorghum were received in fairly constant amounts throughout the year.

Total Shipments

Alabama grain marketing firms shipped 70,729,000 bushels of feed grains in 1970, Table 15. Most (29,991,000 bushels) went to local receivers and other grain firms in Alabama. An estimated 21,713,000 bushels, or about 30.7 per cent, were shipped to other states and more than 19 million bushels were exported to other

TABLE 15. FEED GRAIN SHIPMENTS, BY KIND OF GRAIN AND DESTINATION, ALABAMA, 1970

Kind of grain	Shipments, by destination					
	Southern Alabama (Area 7[1])	Northern Alabama (Area 8[1])	Interstate	Export	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
Corn	6,059	11,173	16,449	4,050	37,731	53.3
Soybeans	7,486	2,215	3,157	10,536	23,394	33.1
Oats	432	435	2,007	225	3,099	4.4
Soft wheat	1,703	325	54	1,885	3,967	5.6
Hard wheat	0	0	0	2,288	2,288	3.2
Grain sorghum	0	5	4	41	50	0.1
Barley	80	74	42	0	196	0.3
Rye	4	0	0	0	4	–
TOTAL	15,764	14,227	21,713	19,025	70,729	100.0
Per cent	22.3	20.1	30.7	26.9	100.0	

[1] Includes local and intrastate grain shipments.

countries. (This includes 1,108,000 bushels of Alabama soybeans exported through the Port of Pascagoula, Mississippi.)

More than half of total feed grains shipped by Alabama grain firms was corn and about one-third was soybeans. Small amounts of soft wheat, oats, hard wheat, grain sorghum, barley, and rye were also shipped in 1970. Grain marketing firms in Area 8 (northern Alabama) accounted for about 53.5 per cent of the State's total shipments in 1970, Table 16.

More than 84 per cent of the corn and nearly 87 per cent of the oats were shipped from Area 8. Exports accounted for nearly 58

TABLE 16. FEED GRAIN SHIPMENTS, BY KIND OF GRAIN AND AREA OF ORIGIN, ALABAMA, 1970

Kind of grain	Shipments, by origin			
	Southern Alabama (Area 7)	Northern Alabama (Area 8)	State	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*Pct.*
Corn	5,905	31,826	37,731	53.3
Soybeans	20,580	2,814	23,394	33.1
Oats	413	2,686	3,099	4.4
Soft wheat	3,594	373	3,967	5.6
Hard wheat	2,288	0	2,288	3.2
Grain sorghum	45	5	50	0.1
Barley	63	133	196	0.3
Rye	0	4	4	–
TOTAL	37,888	37,841	70,729	100.0
Per cent	46.5	53.5	100.0	

per cent of grains shipped from Area 7. Close to 88 per cent of all soybeans was shipped from southern Alabama, where production is concentrated. Also, nearly 91 per cent of soft wheat shipments originated in Area 7, of which more than half was exported from the State Docks in Mobile. All hard wheat shipments and 82 per cent of grain sorghum shipments were exported from the Port of Mobile.

Shipments by Area of Destination

An estimated 40,738,000 bushels of feed grains were shipped to points outside of Alabama in 1970. Approximately 21,713,000 bushels went to other southeastern states and 19,025,000 bushels were exported.

Corn. Corn accounted for 20,499,000 bushels, approximately half of all feed grains shipped outside of Alabama, Table 17. More than 75 per cent of this, 16,449,000 bushels, went to other southeastern states in 1970. Another 4,050,000 bushels of corn were exported through the State Docks at Mobile. Georgia was the main recipient of interstate corn shipped by Alabama firms in 1970, but shipments were also made to Florida, North Carolina, South Carolina, Tennessee, and Mississippi. Much of the corn shipped to Georgia came by barge to northern Alabama points and was then trucked to northern Georgia.

Soybeans. Nearly 77 per cent of the soybean shipments, 10,536,000 bushels, was exported through the ports of Mobile and Pascagoula, Table 17. Soybeans was the primary grain exported in 1970, representing 55.4 per cent of all grains exported from Alabama. Another 2,957,000 bushels of soybeans went to processors in Georgia and a small amount was shipped to north Mississippi and west Tennessee.

Other grains. Only 2,232,000 bushels of oats were shipped out of state or exported from Alabama in 1970, Table 17. Small amounts of oats were shipped to Georgia, Florida, North Carolina, and South Carolina, and a small amount was exported through the State Docks at Mobile.

All of the hard wheat shipments and 1,885,000 bushels of soft wheat shipped out of state were exported through the Port of Mobile, Table 17. A small amount of soft wheat went to South Carolina and Georgia.

TABLE 17. FEED GRAIN SHIPMENTS TO POINTS OUT OF STATE, BY KIND OF GRAIN AND AREA OF DESTINATION, ALABAMA,[1] 1970

Area number and location of destination[2]	Shipments out of state								
	Corn	Soybeans	Oats	Soft wheat	Hard wheat	Grain sorghum	Barley	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
1-East North Carolina and east South Carolina	2,091	0	400	0	0	0	0	2,491	6.1
2-West North Carolina and northwest South Carolina	2,627	0	425	0	0	0	0	3,052	7.5
3-South and southwest South Carolina and south Georgia	3,519	1,762	425	54	0	0	42	5,802	14.2
4-North Florida	1,464	0	250	0	0	0	0	1,714	4.2
5-South Florida	1,368	0	250	0	0	4	0	1,622	4.0
9-North Georgia	4,360	1,195	257	0	0	0	0	5,812	14.3
10-East Tennessee	45	0	0	0	0	0	0	45	0.1
11-Central Tennessee	531	0	0	0	0	0	0	531	1.3
12-North Mississippi, west Tennessee	444	200	0	0	0	0	0	644	1.6
43-Export	4,050	10,536[1]	225	1,885	2,288	41	0	19,025	46.7
TOTAL	20,499	13,693	2,232	1,939	2,288	45	42	40,738	100.0

[1] Includes exports from the Port of Pascagoula, Mississippi.
[2] See Figure 9.

Shipments by Type of Firm

Terminal elevators. Terminal elevators were the most important shippers of feed grains in Alabama. In 1970 they shipped 58,797,000 bushels of feed grains, or 83.1 per cent of total shipments (local, intrastate, interstate, and export), Table 18. The State Docks at Mobile exported 17,917,000 bushels, nearly 37 per cent of total shipments by terminal elevators. Corn accounted for nearly 60 per cent and soybeans about 26 per cent of shipments by terminal elevators. A total of 8,139,000 bushels of oats, soft wheat, and hard wheat, plus small amounts of grain sorghum, barley, and rye were also shipped by terminal elevators.

Country elevators. An estimated 10,805,000 bushels of feed grains were shipped by Alabama country elevators in 1970, Table 18. Soybeans accounted for nearly 71 per cent of this total, 7,636,000 bushels. Almost 2 million bushels of corn and small quantities of soft wheat, oats, barley and rye were also shipped by country elevators.

Feed manufacturers. The vast majority of feed grains received by feed manufacturers in 1970 was apparently used in making feed. Only 1,067,000 bushels, consisting of corn, soybeans, soft wheat, and hard wheat, were shipped by Alabama feed manufacturing firms, Table 18.

TABLE 18. FEED GRAIN SHIPMENTS, BY KIND OF GRAIN AND TYPE OF FIRM, ALABAMA, 1970

Kind of grain	Shipments		
	Terminal elevators	Country elevators	Feed manufacturers
	1,000 bu.	*1,000 bu.*	*1,000 bu.*
Corn	35,189	1,996	546
Soybeans	15,334	7,636	424
Oats	2,956	114	29
Soft wheat	2,955	944	68
Hard wheat	2,228	0	0
Grain sorghum	50	0	0
Barley	83	113	0
Rye	2	2	0
TOTAL	58,797	10,805	1,067
Per cent	83.1	15.3	0.6

Shipments by Month

The monthly pattern of feed grain shipments from Alabama grain firms in 1970 was similar to the monthly pattern of feed

TABLE 19. FEED GRAIN SHIPMENTS, BY KIND OF GRAIN AND MONTH OF SHIPMENTS, ALABAMA, 1970

Month	Shipments								
	Corn	Soy-beans	Oats	Soft wheat	Hard wheat	Grain sor-ghum	Barley and rye	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
Jan.	3,193	376	313	3	99	12	6	4,002	5.7
Feb.	2,476	1,923	164	5	0	0	0	4,559	6.4
Mar.	2,901	474	269	77	278	0	1	4,000	5.7
Apr.	3,279	1,290	295	1	130	30	0	5,025	7.1
May	3,153	420	281	1,202	278	0	1	5,335	7.5
June	3,839	87	255	990	278	0	137	5,586	7.9
July	4,326	179	162	303	278	0	124	5,272	7.5
Aug.	3,804	4	302	601	277	0	13	5,001	7.1
Sept.	2,481	2,081	175	148	114	4	4	5,007	7.1
Oct.	2,451	5,330	501	37	134	1	6	8,460	11.9
Nov.	2,317	7,952	158	581	277	1	3	11,289	15.9
Dec.	3,520	3,278	224	19	145	2	5	7,193	10.2

grain receipts. Amounts shipped were relatively constant throughout the year. November, October, and December were the leading months in grain shipments, mainly because of large soybean shipments. Nearly 71 per cent of total soybean shipments occurred in those months, Table 19.

Slightly more than 55 per cent of the soft wheat was shipped in May and June. All other grains showed no significant seasonal variation in shipment patterns.

Net Imports and Exports

"Net import balance" refers to the amount of imported grain that remained in the State and was available for utilization. It was determined by subtracting shipments out of state from out-of-state receipts. "Net export balance" was determined by subtracting receipts from out-of-state shipments.

The net import balance amounted to 70,703,000 bushels of feed grains in 1970, Table 20. Of this, corn accounted for 88.6 per cent, (62,609,000 bushels), hard wheat 4.4 per cent, oats 3.9 per cent, and grain sorghum 3.1 per cent.

The net export balance—only 6,182,000 bushels—was less than net imports in 1970, Table 20. Most of this (97 per cent) was soybeans that were exported through the Port of Mobile.

TABLE 20. NET GRAIN IMPORTS AND EXPORTS, BY KIND OF GRAIN, ALABAMA, 1970

Kind of grain	Receipts from out of state	Shipments out of state	Net imports		Net exports	
			Balance	Per cent	Balance	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*Pct.*	*1,000 bu.*	*Pct.*
Corn	83,108	20,499	62,609	88.6	----	----
Soybeans	7,694	13,693	----	----	5,999	97.0
Oats	5,059	2,232	2,827	3.9	----	----
Soft wheat	1,798	1,939	----	----	141	2.3
Hard wheat	5,376	2,288	3,088	4.4	----	----
Grain sorghum	2,224	45	2,179	3.1	----	----
Barley	0	42	----	----	42	0.7
Rye	0	0	----	----	----	----
TOTAL	105,259	40,738	70,703	100.0	6,182	100.0

TRANSPORTATION METHODS FOR FEED GRAINS

Receipts by Method of Transportation

Barge transportation was the most important method of receiving feed grain by Alabama grain handling firms in 1970 from all sources. Water receipts amounted to 66,349,000 bushels, approximately 41.7 per cent of the total amount received, Table 21. Truck transportation was second with 47,800,000 bushels (about 30.1 per cent) and rail receipts followed closely with 44,909,000 bushels (approximately 28.2 per cent).

Corn. Corn receipts by barge amounted to 44,677,000 bushels in 1970, Table 21. This was nearly 44 per cent of total corn receipts and more than two-thirds of all feed grain water receipts. Rail was next in importance with 35,059,000 bushels, followed by

TABLE 21. FEED GRAIN RECEIPTS, BY KIND OF GRAIN AND METHOD OF TRANSPORTATION, ALABAMA, 1970

Kind of grain	Receipts by method of transportation		
	Rail	Truck	Water
	1,000 bu.	*1,000 bu.*	*1,000 bu.*
Corn	35,059	22,505	44,667
Soybeans	2,529	19,401	13,243
Oats	1,662	1,907	2,993
Soft wheat	747	3,424	2,772
Hard wheat	2,998	14	2,364
Grain sorghum	1,914	146	310
Barley	0	398	0
Rye	0	4	0
TOTAL	44,909	47,799	66,349
Per cent	28.2	30.1	41.7

truck with 22,505,000 bushels of corn received. A significant amount of corn coming to Alabama firms by truck was "backhauled" from the Midwest. Backhauling refers to the situation where trucks transport other commodities to points in the Midwest, or elsewhere, and return with loads of feed grains. Also, a large amount of corn was trucked from elevators on the Tennessee River to poultry operations in northern Alabama.

Soybeans. Truck was the most important method of transporting soybean receipts in 1970. An estimated 19,401,000 bushels, more than 55 per cent of the soybeans, came by truck, Table 21. Approximately 13,243,000 bushels (nearly 38 per cent) were received by water and the remaining 2,529,000 bushels (about 7 per cent) by rail. Most of the 1970 soybean truck receipts consisted of 14,498,000 bushels received by Alabama grain marketing firms from local producers.

Other grains. Oats, soft wheat, hard wheat, and grain sorghum receipts were handled by all three types of transportation modes in 1970. Water transportation predominated for oat receipts, while truck was most important for soft wheat, Table 21. Rail moved most of the grain sorghum and hard wheat receipts. All barley and rye were received by truck.

Development of Large Hopper Cars

In May 1963, Southern Railway System introduced extra large hopper cars capable of hauling approximately 100 tons of grain. These "Big Johns" are able to transport large quantities of grain at lower rates than with standard hopper cars (approximate capacity of 50 tons). Several other railroad companies have followed Southern Railway's example and now use extra large hopper cars. Approximately 32,854,000 bushels, about 73.2 per cent of all feed grains received by Alabama grain marketing firms by rail in 1970, were received in extra large hopper cars, Table 22. Corn accounted for the largest volume of this, an estimated 28,615,000 bushels, or 81.6 per cent of the year's corn receipts by rail. This amounted to about 87.1 per cent of all feed grains received in extra large hopper cars. Approximately 88.2 per cent of grain sorghum, 57.6 per cent of hard wheat, 13.4 per cent of soft wheat, 23.6 per cent of soybeans, and 13.0 per cent of oats received by rail by Alabama grain marketing firms in 1970 came by extra large hopper cars. Nearly all grain coming by rail to inte-

TABLE 22. FEED GRAIN RECEIPTS, BY RAIL AND BY TYPE OF RAIL CAR, ALABAMA, 1970

Kind of grain	Receipts				
	100-ton capacity[1] hopper cars	Per cent	Other type rail cars	Per cent	Total
	1,000 bu.	*Pct.*	*1,000 bu.*	*Pct.*	*1,000 bu.*
Corn	28,615	81.6	6,444	18.4	35,059
Soybeans	597	23.6	1,932	76.4	2,529
Oats	216	13.0	1,446	87.0	1,662
Soft wheat	10	13.4	737	86.6	747
Hard wheat	1,728	57.6	1,270	42.4	2,998
Grain sorghum	1,688	88.2	226	11.8	1,914
TOTAL	32,854		12,055		44,909
Per cent	73.2		26.8		100.0

[1] Approximate.

grated poultry and livestock firms was received in extra large hopper cars.

Receipts by Type of Firm and Method of Transportation

Terminal elevators. Water transportation accounted for approximately 71.5 per cent of the feed grains received by terminal elevators in Alabama in 1970, Table 23. Trucks (about 16.9 per

TABLE 23. FEED GRAIN RECEIPTS, BY KIND OF GRAIN, TYPE OF FIRM, AND METHOD OF TRANSPORTATION, ALABAMA, 1970

Type of firm and method of transportation	Receipts								
	Corn	Soy-beans	Oats	Soft wheat	Hard wheat	Grain sor-ghum	Barley and rye	Total	Per cent
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*Pct.*
Terminal elevator									
Rail	2,898	1,520	0	95	2,288	40	0	6,841	11.6
Truck	1,507	7,035	76	1,194	0	11	130	9,953	16.9
Water	31,102	6,720	2,850	1,602	0	0	0	42,274	71.5
Country elevator									
Rail	537	0	0	0	0	0	0	537	4.7
Truck	1,675	7,908	106	995	0	0	115	10,799	95.3
Water	0	0	0	0	0	0	0	0	0.0
Feed manufacturers									
Rail	13,244	1,009	1,662	652	710	206	0	17,483	28.5
Truck	12,192	4,458	1,650	1,235	14	136	157	19,842	32.3
Water	13,565	6,523	143	1,170	2,364	310	0	24,075	39.2
Integrated poultry and livestock									
Rail	18,380	0	0	0	0	1,667	0	20,047	73.6
Truck	7,131	0	75	0	0	0	0	7,206	26.4
Water	0	0	0	0	0	0	0	0	0

cent) and rail (11.6 per cent) moved the remainder. Nearly three-fourths of water receipts consisted of corn, received mostly in northern Alabama. Soybeans made up the majority of truck receipts, mostly in southern Alabama. Rail receipts were mainly corn, hard wheat, and soybeans.

Country elevators. Of the feed grain receipts handled by country elevators in 1970, most were received by truck, Table 23. Most of this was soybean receipts in southern Alabama. Country elevators also received a small amount of corn by rail.

Feed manufacturers. Alabama feed manufacturers received large quantities of feed grains in 1970. Water receipts, primarily corn and soybeans, accounted for 24,075,000 bushels received by these firms, Table 23. Rail receipts totaled 17,483,000 bushels, of which nearly 76 per cent was corn. Another 19,842,000 bushels of feed grains received by feed manufacturers, mostly corn and soybeans, was moved by truck.

Integrated poultry and livestock firms. Rail was the most important method for receiving feed grains by integrated poultry and livestock firms in Alabama in 1970, Table 23. Nearly two-thirds of the corn and all the grain sorghum received by these firms were moved by rail. The remaining corn and all the oats came by truck.

Interstate Feed Grain Receipts by Area of Origin and Method of Transportation

Corn. Grain marketing firms in Alabama received 83,108,000 bushels of corn from sources outside the State in 1970, Table 24. More than half of this arrived by barge. Approximately 37 per cent was received by rail and less than 10 per cent by truck.

Corn originating in Illinois amounted to 49,410,000 bushels in 1970, or nearly 60 per cent of all out-of-state corn received in Alabama. Of this amount, about 56.4 per cent came by water, 36.7 per cent by rail, and less than 7 per cent by truck.

Indiana was the second most important source of corn received from out of state with 17,441,000 bushels. However, transportation differed from that reported for Illinois. More than 58 per cent of Indiana corn receipts was received by rail, 26 per cent arrived by truck, and approximately 16 per cent was transported by barge.

TABLE 24. CORN RECEIPTS FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
3-South Georgia	0	0	256	100	0	0	256
11-Central Tennessee	263	100	0	0	0	0	263
12-North Mississippi and west Tennessee	150	100	0	0	0	0	150
13-South Mississippi	0	0	29	100	0	0	29
18-West Kentucky	979	45.4	0	0	1,179	54.6	2,158
25-Ohio	0	0	0	0	1,045	100	1,045
26-Indiana	10,176	58.3	4,481	25.7	2,784	16.0	17,441
29-Illinois	18,123	36.7	3,438	6.9	27,849	56.4	49,410
30-Missouri	546	40.3	0	0	808	59.7	1,354
31-Iowa	192	4.2	0	0	4,364	95.8	4,556
32-Minnesota	0	0	0	0	6,446	100	6,446
TOTAL	30,429		8,204		44,475		83,108
Per cent	36.6		9.9		53.5		100.0

[1] See Figure 9.

All corn received in Alabama from Minnesota, 6,446,000 bushels, was received by barge. Of the 4,556,000 bushels of corn from Iowa, nearly 96 per cent arrived by barge and a small amount from there was received by rail.

Corn that originated in Missouri and Ohio came to Alabama entirely by water transportation in 1970. Nearly 55 per cent of the 2,158,000 bushels of corn received from western Kentucky was transported by barge and approximately 45 per cent received by rail.

Alabama also received 698,000 bushels of corn from the surrounding states of Tennessee, Mississippi, and Georgia in 1970. Nearly 60 per cent of this moved by rail while the remainder came by truck.

Soybeans. Only 7,694,000 bushels of soybeans were received from sources out of state in 1970, Table 25. More than 80 per cent of this was from Illinois, of which 5,382,000 bushels were received by water. Another 795,000 bushels of Illinois soybeans arrived by rail.

Alabama grain firms also received 599,000 bushels of soybeans from Indiana and Missouri by barge. Another 918,000 bushels came from Tennessee and Mississippi, approximately half by rail and half by truck.

TABLE 25. SOYBEANS RECEIPTS FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
11-Central Tennessee	0	0	157	100	0	0	157
12-North Mississippi and west Tennessee	471	100	0	0	0	0	471
13-South Mississippi	0	0	290	100	0	0	290
26-Indiana	0	0	0	0	300	100	300
39-Illinois	795	12.9	0	0	5,382	87.1	6,177
30-Missouri	0	0	0	0	299	100	299
TOTAL	1,266		477		5,981		7,694
Per cent	16.5		5.8		77.7		100.0

[1] See Figure 9.

Oats. The primary sources of oats received in Alabama from out of state in 1970 were Minnesota and the Mississippi Delta region, Table 26. Most from Minnesota came by barge, with a small amount transported by rail. Oats from Mississippi were received almost half and half by rail and truck.

A small amount of oats was also received from Illinois in 1970. About 63 per cent of this was received by water and the rest by truck. Some oats also came into Alabama from Indiana by truck and from Missouri by rail.

TABLE 26. OATS RECEIPTS FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
12-North Mississippi and west Tennessee	749	51.4	726	48.9	0	0	1,485
26-Indiana	0	0	141	100	0	0	141
29-Illinois	0	0	145	36.9	248	63.1	393
30-Missouri	207	100	0	0	0	0	207
32-Minnesota	0	0	88	3.1	2,745	96.9	2,833
TOTAL	966		1,100		2,993		5,059
Per cent	19.1		21.7		59.2		100.0

[1] See Figure 9.

Soft wheat. Only 1,798,000 bushels of soft wheat were received into Alabama from out-of-state origins in 1970, but this came from several different sources, Table 27. Approximately 65 per cent,

TABLE 27. SOFT WHEAT RECEIPTS FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
3-South Georgia	0	0	100	100	0	0	100
9-North Georgia	0	0	4	100	0	0	4
12-North Mississippi and west Tennessee	300	77.1	90	22.9	0	0	393
18-West Kentucky	20	13.2	0	0	131	86.8	151
26-Indiana	20	13.2	0	0	132	86.8	152
29-Illinois	0	0	0	0	908	100	908
34-Kansas	90	100	0	0	90	0	90
TOTAL	433		194		1,171		1,798
Per cent	24.1		10.8		65.1		100.0

[1] See Figure 9.

24 per cent, and 11 per cent of this total was received by water, rail, and truck, respectively.

More than half of the soft wheat from out of state came from Illinois by rail. Alabama grain handling firms also received some soft wheat in 1970 from Indiana and western Kentucky by water and rail, from Mississippi by truck and rail, from Georgia by truck, and from Kansas by rail.

Hard wheat. All the hard wheat received in 1970 originated from points outside Alabama. The major source was Missouri, Table 28. Approximately 61 per cent of the hard wheat from Missouri arrived by rail and 39 per cent by barge. Some hard wheat was received from Minnesota, of which two-thirds came by water and one-third by truck. A small amount of wheat was received from Tennessee by rail.

Grain sorghum. More than half of the grain sorghum received

TABLE 28. HARD WHEAT RECEIPTS FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
11-Central Tennessee	0	0	14	100	0	0	14
30-Missouri	2,678	60.9	0	0	1,723	39.1	4,401
32-Minnesota	320	33.3	0	0	641	66.7	961
TOTAL	2,998		14		2,364		5,376
Per cent	55.8		0.3		43.9		100.0

[1] See Figure 9.

TABLE 29. GRAIN SORGHUM FROM OUT-OF-STATE ORIGINS, BY METHOD OF TRANSPORTATION, ALABAMA, 1970

Area number and location of origin[1]	Receipts, by method of transportation						
	Rail		Truck		Water		Total
	1,000 bu.	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*	*Per cent*	*1,000 bu.*
12-North Mississippi and west Tennessee	83	100	0	0	0	0	83
26-Indiana	335	100	0	0	0	0	335
29-Illinois	83	100	0	0	0	0	83
30-Missouri	246	44.3	0	0	310	55.8	556
34-Kansas	1,167	100	0	0	0	0	1,167
TOTAL	1,915		0		310		2,224
Per cent	86.1		0.0		13.9		100.0

[1] See Figure 9.

in 1970 from out of state originated in Kansas, Table 29, with other coming from Missouri, Indiana, Illinois, northern Mississippi, and western Tennessee. Approximately 1,915,000 bushels of grain sorghum came into Alabama by rail and an estimated 310,000 bushels by barge (all from Missouri) in 1970.

Shipments by Method of Transportation

Feed grain shipments from Alabama grain handling firms in 1970 were fairly evenly divided among rail, truck, and water. Shipments by water amounted to 26,243,000 bushels, Table 30, of which more than 72 per cent (19,025,000 bushels) consisted of exports to other countries. Truck accounted for 26,270,000 bushels of feed grains shipped, while 18,236,000 bushels went by rail.

Most of the corn shipments, 21,244,000 bushels, moved by truck. Rail accounted for 12,252,000 bushels and another 4,255,-

TABLE 30. FEED GRAIN SHIPMENTS, BY KIND OF GRAIN AND METHOD OF TRANSPORTATION, ALABAMA, 1970

Kind of grain	Shipments, by method of transportation		
	Rail	Truck	Water
	1,000 bu.	*1,000 bu.*	*1,000 bu.*
Corn	12,252	21,244	4,255
Soybeans	3,750	3,058	16,586
Oats	1,846	1,028	225
Soft wheat	311	808	2,848
Hard wheat	0	0	2,288
Grain sorghum	4	5	41
Barley	73	123	0
Rye	0	4	0
TOTAL	18,236	26,270	26,243
Per cent	25.8	37.1	37.1

000 bushels were shipped by water. Approximately 95 per cent of the corn shipped by water, 4,050,000 bushels, was exported from the Port of Mobile and the remaining 205,000 bushels went by intrastate barge movements.

Most soybean shipments in 1970 were by water. Nearly 64 per cent of those shipped by water, 10,536,000 bushels, were exported through the ports of Mobile and Pascagoula. The remaining 6,-050,000 bushels were intrastate movements. An estimated 3,750,-000 bushels of soybeans were shipped by rail and 3,058,000 bush-els by truck.

Most of the oat shipments were made by rail. All oats that moved by water and all of the hard wheat shipments consisted of exports from the State Docks at Mobile. Soft wheat shipments were primarily by water, mostly exports from Mobile plus some intrastate barge shipments. Most of the grain sorghum shipments consisted of exports from the State Docks. A small amount of barley and rye was shipped by grain firms in 1970, mostly by truck.

CHANGES IN THE ALABAMA FEED GRAIN MARKET FROM 1964 TO 1970

A comparison of the results of this study with results of a 1964 study of the feed grain situation in Alabama *(3)* indicated several significant changes in grain marketing patterns from 1964 to 1970.

Alabama's feed grain deficit (excluding soybeans) went from 2,036,000 tons in 1964 to 3,390,000 tons in 1969, an increase of approximately 66.5 per cent. However, Alabama grain marketing firms received 159,057,000 bushels of feed grains in 1970[6], an increase of only 18.6 per cent over the 134,106,000 bushels received in 1964, Table 31. It appears that an increase in receipts of more than 24,951,000 bushels since 1964 would have been necessary to meet 1970 feed grain needs in Alabama. However, examination of the 1964 and 1970 data show that shipments of feed grains by Alabama grain handling firms decreased from 73,142,000 bush-els in 1964 to 70,729,000 bushels in 1970, Table 32. This may partially explain how needs were met despite the small increase in feed grain receipts. The decline in shipments would have been

[6] The change in feed grain deficit from 1964 to 1969 is compared with the change in amount of feed grains received by grain handling firms from 1964 to 1970 because 1970 represents the fiscal year, July 1, 1969, to June 30, 1970, and this period includes the 1969 crop year.

TABLE 31. CHANGES IN FEED GRAIN RECEIPTS FROM 1964[1] TO 1970, BY KIND OF GRAIN AND DESTINATION, ALABAMA

Destination and year	Receipts						
	Corn	Soybeans	Oats	Wheat[2]	Grain sorghum	Barley and rye	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Local							
1964	16,719	3,289	490	2,577	0	0	23,075
1970	5,546	14,498	309	1,658	86	352	22,449
Change	−11,173	+11,209	−107	−919	+86	+352	−626
Per cent change	−66.8	+340.8	−25.7	−35.7	∞	∞	−2.7
Intrastate							
1964	9,097	3,044	1,313	0	109	0	13,563
1970	13,577	12,981	1,194	3,487	60	50	31,349
Change	+4,480	+9,937	−119	+3,487	−49	+50	+17,786
Per cent change	+49.2	+326.4	−9.1	∞	−45.0	∞	+131.1
Interstate							
1964	63,482	17,171	5,554	7,567	3,694	0	97,468
1970	83,108	7,694	5,059	7,174	2,224	0	105,259
Change	+19,626	−9,477	−495	−393	−1,470	0	+7,791
Per cent change	+30.9	−55.2	−8.9	−5.2	−39.8	0	+8.0
Total							
1964	89,298	23,504	7,357	10,144	3,803	0	134,106
1970	102,231	35,173	6,562	12,319	2,370	402	159,057
Change	+12,933	+11,669	−795	+2,175	−1,433	+402	+24,951
Per cent change	+14.5	+49.6	−10.8	+21.4	−37.7	∞	+18.6

[1] See Literature Citation No. 3, page 27.
[2] Includes soft wheat and hard wheat.

greater had not soybean shipments increased by over 7 million bushels from 1964 to 1970. The largest decrease in feed grain shipments occurred in interstate shipments, from 33,438,000 bushels in 1964 to 21,713,000 bushels in 1970.

A comparison of net grain imports in 1964 and 1970 shows the situation more clearly. While net receipts of feed grains in Alabama increased by 7,791,000 bushels, or approximately 8 per cent, net shipments from Alabama decreased nearly 12 million bushels or 22.7 per cent, Table 33. Net imports of feed grains increased nearly 58 per cent, from 44,765,000 bushels in 1965 to 70,703,000 bushels in 1970. Thus, from 1964 to 1970 Alabama met its increased need for feed grains—or overcame its increased feed grain deficit—by not only importing more grain into the State but also by shipping less grain out of the State. This accounts for the apparently low increase in receipts from 1964 to 1970. Thus, a larger proportion of feed grain received in 1970 than in 1964 remained in the State to be utilized.

The situation for corn, the most important grain imported, was

TABLE 32. CHANGES IN FEED GRAIN SHIPMENTS FROM 1964[1] TO 1970, BY KIND OF GRAIN AND DESTINATION, ALABAMA

Destination and year	Shipments						
	Corn	Soybeans	Oats	Wheat[2]	Grain sorghum	Barley and rye	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Local and intrastate							
1964	13,125	3,291	2,722	1,282	19	0	20,439
1970	17,232	9,701	867	2,028	5	158	29,991
Change	+4,107	+6,410	−1,855	+746	−14	+158	+9,552
Per cent change	+31.3	+194.8	−68.1	+58.2	−73.7	∞	+46.7
Interstate							
1964	25,205	200	2,700	5,308	25	0	33,438
1970	16,449	3,157	2,007	54	4	42	21,713
Change	−8,756	+2,957	−693	−5,254	−21	+42	−11,725
Per cent change	−34.7	+1,478.5	−25.7	+99.0	−84.0	∞	−35.1
Export							
1964	5,419	12,745	119	0	982	0	19,265
1970	4,050	10,536	225	4,173	41	0	19,025
Change	−1,369	−2,209	+106	+4,173	−941	0	−240
Per cent change	−25.3	−17.3	+89.1	∞	−95.8	0	−1.2
Total							
1964	43,749	16,236	5,541	6,590	1,026	0	73,142
1970	37,731	23,394	3,099	6,255	50	200	70,729
Change	−6,018	+7,158	−2,442	−335	−976	+200	−2,413
Per cent change	−13.8	+44.1	−44.1	−5.1	−95.1	∞	−3.3

[1] See Literature Citation No. 3, page 31.
[2] Includes soft wheat and hard wheat.

TABLE 33. CHANGES IN NET GRAIN IMPORTS FROM 1964[1] TO 1970, BY KIND OF GRAIN, ALABAMA

Out-of-state movement by year	Receipts and shipments						
	Corn	Soybeans	Oats	Wheat[2]	Grain sorghum	Barley	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Receipts							
1964	63,482	17,171	5,554	7,567	3,694	0	97,468
1970	83,108	7,694	5,059	7,174	2,224	0	105,259
Change	+19,626	−9,477	−495	−393	−1,470	0	+7,791
Per cent change	+30.9	−55.2	−8.9	−5.2	−39.8	0	+8.0
Shipments							
1964	30,624	12,945	2,819	5,308	1,007	0	52,703
1970	20,499	13,693	2,232	4,227	45	42	40,738
Change	−10,125	+748	−587	−1,081	−962	+42	−11,965
Per cent change	−33.1	+5.8	−20.8	−20.4	−95.5	∞	−22.7
Net imports							
1964	32,858	4,226	2,735	2,259	2,687	0	44,765
1970	62,609	0	2,827	2,947	2,179	0	70,562
Change	+29,751	−4,226	+92	+829	−508	0	+25,797
Per cent change	+90.5	−100.0	+3.4	+30.5	−18.9	0	+57.6

[1] See Literature Citation No. 3, page 31.
[2] Includes soft wheat and hard wheat.

even more dramatic. Net corn receipts increased by 19,626,000 bushels (about 31 per cent) from 1964 to 1970, while net corn shipments out of the state declined approximately 33 per cent (10,125,000 bushels). Net corn imports registered a 90.5 per cent increase, from 32,858,000 bushels in 1964 to 62,609,000 bushels in 1970.

Soybean production in Alabama jumped from 4,554,000 bushels in 1964 to 14,743,000 bushels in 1969—an increase of nearly 224 per cent, Appendix Table 1. This substantial increase resulted in significant alterations in soybean marketing by grain firms in the State.

Soybean receipts from all sources—local, intrastate, and interstate—increased from 23,504,000 bushels in 1964 to 35,173,000 bushels in 1970[7], Table 31. The largest increase, however, was reflected in soybean receipts from local farmers, from 3,289,000 bushels in 1964 to 14,498,000 bushels in 1970. In the same period, receipts of soybeans by grain marketing firms from out-of-state sources declined from 17,171,000 bushels to 7,694,000 bushels. Also, intrastate receipts of soybeans more than quadrupled (from 3,044,000 bushels in 1964 to 12,981,000 bushels in 1970), possibly reflecting the increase from 10 to 26 country elevators in Alabama, Table 1.

Shipments of soybeans from Alabama grain marketing firms reached 23,394,000 bushels in 1970—a 44 per cent increase since 1964, Table 32. The largest gain occurred in interstate shipments of soybeans, from only 200,000 bushels shipped out of state in 1964 to 3,157,000 bushels in 1970. Soybean exports declined from 12,745,000 bushels in 1964 to 10,563,000 bushels in 1970. However, 95 per cent of the 1970 exports (10,077,384 bushels) were received from firms within Alabama, as compared with only about 60 per cent (7,719,000 bushels) in 1970. The remaining 40 per cent of exported soybeans in 1964 was received from Illinois, Missouri, and Mississippi. Illinois was the source of the remainder of soybeans exported in 1970. Most exported soybeans received from Alabama firms in 1970 originally came from Alabama producers, with some being received from Mississippi.

Net imports of soybeans amounted to 4,226,000 bushels in 1964,

[7] The change in soybean production from 1964 to 1969 is compared with the change in amount of soybeans received by grain handling firms in Alabama from 1964 to 1970 because 1970 represents the fiscal year July 1, 1969, to June 30, 1970, and this period includes the 1969 crop year.

whereas Alabama had net exports in 1970, Table 33. Actually, Alabama was a net exporter of soybeans in 1970 because net shipments exceeded net receipts (by 5,999,000 bushels).

Although soybean production in Alabama increased by 10,189,000 bushels from 1964 to 1970, there was no increase in number of soybean processors in the State, Table 1. The majority of soybeans produced in 1969 were either exported or shipped to soybean processors in other states. Most of the soybean meal needed in Alabama was imported from other states. This indicates that an additional soybean processing firm in Alabama may find a favorable market for soybean meal in the State or for shipment to other states. A study by Free indicated that Area 8 (northern Alabama) could support another 1,200 to 1,500-ton-per-day soybean processor if all the soybean meal consumed within the area were crushed in the area (2). He stated that "additional crushing should occur in Area 8, if the differential between importing soybeans and meal approximates the rail differential, but if meal and

TABLE 34. FEED GRAIN RECEIPTS FROM OUT-OF-STATE SOURCES, BY KIND OF GRAIN AND AREA OF ORIGIN, ALABAMA, 1964[1] AND 1970

Area of origin and year	Receipts					
	Corn	Soybeans	Oats	Wheat[2]	Grain sorghum	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Illinois, 1964	37,625	2,000	625	400	1,415	42,065
Illinois, 1970	49,410	6,177	393	908	83	56,971
Indiana, 1964	2,581	1,235	61	200	0	4,077
Indiana, 1970	17,441	300	141	152	335	18,369
Minnesota, 1964	1,355	0	4,675	750	0	6,780
Minnesota, 1970	6,446	0	2,833	961	0	10,240
Missouri, 1964	3,194	2,863	193[3]	1,004	200[4]	7,454
Missouri, 1970	1,354	299	207	4,401	556	6,817
Iowa, 1964	3,653	309	0	0	1,004	4,966
Iowa, 1970	4,556	0	0	0	20	4,556
Ohio, 1964	0	0	0	0	0	0
Ohio, 1970	1,045	0	0	0	0	1,045
Kansas, 1964	0	0	0	3,013	200	3,213
Kansas, 1970	0	0	0	90	1,167	1,257
Kentucky, 1964	980	1,335	0	0	0	2,315
Kentucky, 1970	2,158	0	0	151	0	2,309
Surrounding SE states[5], 1964	0	6,959	0	400	0	7,359
1970	698	918	1,485	511	83	3,695
Other[6], 1964	14,094	0	0	0	875	14,969

[1] See Literature Citation No. 3, pages 28-30.
[2] Includes hard wheat and soft wheat.
[3] Includes 143,000 bushels of oats received from Nebraska.
[4] Includes 175,000 bushels of grain sorghum received from Wisconsin.
[5] Includes receipts from Georgia, Tennessee, and Mississippi.
[6] Origins described by most respondents as Midwest or Corn Belt.

whole beans can be imported at the same cost, meal should be imported and crushing levels maintained near the 1969 level of capacity."

Illinois was the primary origin of corn received from out of state in both 1964 and 1970. Indiana claimed second place in 1970, growing from only 2,581,000 bushels shipped to Alabama in 1964 to 17,441,000 bushels in 1970, Table 34. Increased freight rates since 1964 apparently caused Alabama grain marketing firms to seek shipping points as near as possible to minimize transportation costs. This was largely responsible for the substantial increase in corn received from Indiana from 1964 to 1970. More than half the corn received from Illinois in 1970 was transported by barge from origins on the Illinois and Mississippi Rivers, while most from Indiana came by rail and truck, Table 24.

Although water transportation was the most important method of transporting grain to grain marketing firms in Alabama in 1964 and 1970, only 41.7 per cent was received by barge in 1970 compared with 56 per cent in 1964, Table 35. Receipts of total feed grains by rail increased substantially from approximately 18,775,000 bushels in 1964 (about 14 per cent) to approximately 44,909,000 bushels in 1970 (about 28.2 per cent of total receipts). Truck transportation remained relatively the same in both years.

Increased rail receipts of grain by Alabama firms from 1964 to 1970 were largely a result of increased shipments in hopper cars of about 100 tons capacity. These large hopper cars can transport large quantities of grain at lower cost than standard 50-ton hopper cars. These extra large hopper cars made rail rates competitive with truck and barge rates, apparently causing some shift from water to rail transportation for grain shipments to Alabama from 1964 to 1970. For 1970, Table 22 shows that approximately 73.2 per cent of total feed grains received by rail and about 81.6 per cent of corn received by rail moved in extra large hopper cars.

TABLE 35. FEED GRAIN RECEIPTS, BY METHOD OF TRANSPORTATION, ALABAMA, 1964[1] AND 1970

Method of transportation	Receipts, proportion	
	1964	1970
	Per cent	*Per cent*
Rail	14	28.2
Truck	30	30.1
Water	56	41.7

[1] See Literature Citation No. 3, pages 32-33.

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APPENDIX A—APPENDIX TABLES

APPENDIX TABLE 1. PRODUCTION OF FEED GRAINS IN ALABAMA, ACTUAL AND PROJECTED, 1958-1970

Year	Corn	Oats	Grain sorghum	Soft wheat	Soybeans
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
1958	55,614	2,528	912	2,300	2,794
1959	46,982	3,484	598	1,265	2,860
1960	44,330	2,975	480	1,200	3,240
1961	43,890	3,315	364	1,456	3,611
1962	31,460	2,448	240	840	3,608
1963	40,222	1,160	308	987	3,840
1964	36,210	1,701	189	1,600	4,554
1965	37,520	1,400	270	1,348	5,016
1966	26,070	1,292	210	1,624	6,860
1967[1]	37,840	1,050	280	2,688	13,068
1968[1]	22,016	980	280	2,775	12,254
1969[2]	17,332	1,102	561	2,465	14,743
1970[2]	12,535	1,064	748	2,324	14,312
1975[3]	10,000	775	1,570	3,300	18,750
1980[3]	9,500	700	1,780	3,750	20,700

Source: Ala. Crop and Livestock Rep. Ser., *Alabama Agricultural Statistics*, Bull. 12, pp. 15, 23, 34, 36, Aug. 1967.

[1] See Literature Citation No. 1, page 11.

[2] See Literature Citation No. 8, pages 50, 52, 55, 57, 62.

[3] Estimated and projected.

APPENDIX TABLE 2. FEED GRAIN PRODUCTION, UTILIZATION, AND DEFICIT IN ALABAMA, ACTUAL AND PROJECTED, 1964 TO 1980[1]

Year	Feed grains produced	Feed grains fed	Deficit
	1,000 tons	*1,000 tons*	*1,000 tons*
1964[2]	1,046	3,082	2,036
1965[3]	1,081	3,760	2,679
1966[3]	757	3,701	2,944
1967[4]	1,085	3,282	2,197
1968[4]	640	3,545	2,905
1969[4]	515	3,905	3,390
1970[5]	425	4,100	3,675
1975[5]	350	4,600	4,250
1980[5]	300	4,900	4,600

[1] Excluding soybeans.

[2] See Literature Citation No. 5, page 37.

[3] See Literature Citation No. 6, page 37.

[4] See Literature Citation No. 7, page 111.

[5] Estimated and projected.

APPENDIX B—GLOSSARY OF TERMS

Classification of Firms

1. **Country elevator.** A firm whose primary activity is collecting and merchandising raw grain. It is classed as a country elevator if it receives more than 50 per cent of the raw grain directly from farmers and if more than 50 per cent of the raw grain received leaves the facility as raw grain. The definition is not affected by where the grain goes or whether some manufacturing of feed or ingredients takes place.

2. **Terminal elevator.** A firm whose primary activity is collecting and merchandising raw grain. It is classed as a terminal elevator if it receives more than 50 per cent of its grain from firms other than farmers. The definition is not affected by where the grain goes. Although terminal elevators typically sell to firms other than farmers, some types of firms may be classed as terminal elevators that receive grain from other firms and sell directly to farmers. More than 50 per cent of the raw grain received must go out of the facility as raw grain to be classified as a terminal elevator.

3. **Feed manufacturer or feed mill.** A firm whose primary activity is any kind of feed manufacturing, including such activities as production of complete feed, production of feed ingredients and premixes, feed grinding (including custom grinding), or feed mixing. More than 50 per cent of its revenue must come from sale of feed or feed ingredients.

4. **Integrated poultry.** A firm, which could otherwise be classified as a feed manufacturer or feed mill, whose operation involves production of broilers, eggs, or other poultry as part of a total operation, and which receives more than 50 per cent of its dollar revenue from the sale of poultry or poultry products. To qualify under this category, such a firm must receive at least some raw grain as part of the total operation.

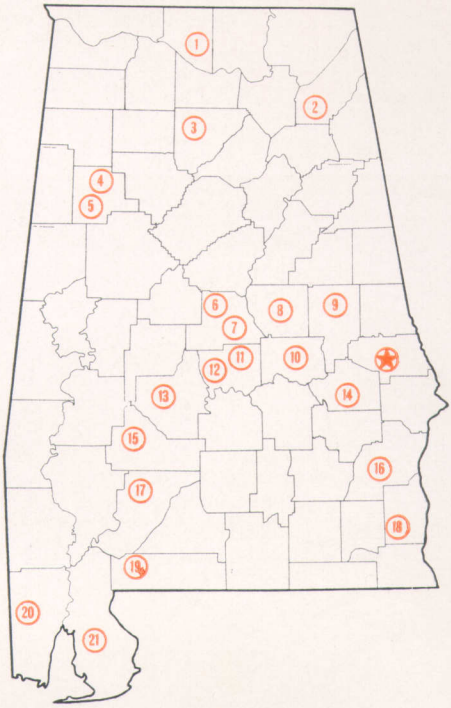
5. **Integrated livestock.** Same as integrated poultry except that it involves all other livestock except poultry.

6. **Soybean processor.** A firm whose primary activity is extracting oil from soybeans, with soybean oil meal a product of the operation. It is not important, for the purpose of definition, what is done with the products as long as its primary activity is processing of soybeans and it receives more than 50 per cent of its revenue from processed products of soybeans.

7. **Flour mill.** A firm whose primary activity is the milling of wheat flour(s) that result from complete milling of at least 50 per cent of the wheat flour(s) produced.

AGRICULTURAL EXPERIMENT STATION SYSTEM OF ALABAMA'S LAND-GRANT UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill.
21. Gulf Coast Substation, Fairhope.

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