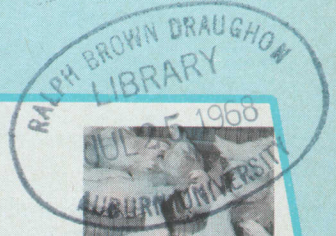




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FEED GRAIN SITUATION in Alabama

*1953-66 and
projections to 1975*



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FEED GRAIN SITUATION IN ALABAMA

1953-66 and projections to 1975*

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AMONG THE MOST SIGNIFICANT CHANGES in Alabama agriculture has been the increasing importance of livestock and poultry. Income from the sale of poultry and poultry products increased more than ten-fold between 1953 and 1966, and poultry is now the top farm income producing commodity.

Grain utilization by livestock and poultry has increased with expanded production, but this has not been accompanied by increased grain production in the State. In fact, decreasing proportions of the needed feed ingredients have been produced by the farmer-feeder. Thus, marketing, processing, and transporting facilities have been expanded to handle larger volumes of commercially mixed feeds. Significant changes in market structure have come about through contract feeding, vertical integration, custom mixing, and bulk handling. These changes have been most evident in the broiler industry.

The trend toward increasing livestock and poultry production without corresponding increases in grain production is expected to continue in Alabama. Larger volumes of grain coming from surplus producing areas will require additional adjustments in marketing and processing facilities. Estimates of volumes and types of feed required are needed for orderly and efficient adjustments in type, size, and location of facilities.

The objectives of this study were:

1. To determine the production-utilization balances for selected feed grains in Alabama.
2. To determine locations and capacities of various types of

* This study was supported by funds provided by the Research and Marketing Act of 1946 and by State Research funds. It was carried out as Alabama Research Project Hatch 607 and was a contributing project to Southern Regional Project SM-29, "Optimal Adjustments of Southern Grain Marketing Facilities to Future Conditions."

grain marketing and processing facilities currently operating in Alabama, and to obtain estimates of volumes of grains handled by each type of facility.

3. To project grain production and utilization in the next decade in Alabama.

METHOD OF STUDY

Secondary data on livestock and poultry production in Alabama were used to determine the number of animals to be fed during 1964. Animals were grouped into the following 12 classes as reported by Alabama Crop and Livestock Reporting Service:

1. Dairy cows 2 years and over, on farms January 1.
2. Other dairy animals, on farms January 1.
3. Beef cows 2 years and over, on farms January 1.
4. Beef cattle, grain fattened during year.
5. Other beef animals, on farms January 1.
6. Horses and mules, on farms January 1.
7. Sheep, on farms January 1.
8. Hogs raised.
9. Hens and pullets, on farms January 1.
10. Chickens raised.
11. Broilers raised.
12. Turkeys raised.

An average feed ration was developed for each class of animals, with specified amounts of individual feed grains and other ingredients based on an average U.S. ration. The rations were adjusted by animal scientists of the Agricultural Experiment Station to represent average Alabama feed rations.

Amount of each feed grain in the ration, multiplied by number of animals in the respective classes, was the estimate of feed grain requirements for that class. The total of feed grain requirements for the 12 classes of livestock plus "other livestock"¹ was the estimate of 1964 utilization in Alabama.

Feed grain utilization less production was used as an estimate of Alabama's feed grain deficit or production-utilization balance for 1964. Estimated net flow of grain into the State was used as a check against the estimate obtained by the production-utilization approach.

¹ "Other livestock" represents all livestock and poultry not on farms and other animals on farms not accounted for in the 12 classifications.

A listing of grain marketing and processing firms was developed in cooperation with the State Department of Agriculture, Federal-State Inspection Service, and trade directories. The firms were classified according to their most important activity by use of the following definitions.

1. Terminal elevators (receivers and merchandisers of raw grains of which more than 50 per cent originated from sources other than farmer-producers).

2. Country elevators (receivers and shippers of raw grains of which more than 50 per cent originated from farmer-producers).

3. Feed manufacturers (those firms where complete feed(s) was being produced as the primary product. Raw grain was mixed with oil meals and other individual grains and mineral products to build the rations).

4. Feed mixers (those firms with complete feed(s) being their primary product and which combined raw grains with concentrates manufactured and mixed by some other firm).

5. Custom feed mills (those firms that provided "custom" rations for customers and the customer provided some of the inputs, usually raw grains).

6. Soybean processors (crushers of soybeans).

7. Brewers and distillers.

8. Flour millers (including blenders).

9. Cereal product manufacturers (including corn products such as meal and grits, and all other grain cereals for foods).

Managers of a stratified random sample of grain marketing firms were interviewed to obtain information on storage and processing capacities and volumes. Information was also obtained on volumes of grain movements. Data obtained from the survey were expanded to provide an estimate of the total capacities and volume of movements for the State.

To project type, size, and location of facilities needed in 1975, an estimate of production and utilization was made by projecting 1953-64 trends. Trends of livestock production in the years 1953-64 for the 12 classes of livestock were estimated by regression analysis. These trends were extended to 1975 and the resulting estimates of production adjusted for known and anticipated limiting factors, such as available resources.

Average rations anticipated in 1975 were developed in cooperation with animal science personnel to estimate rate of grain utilization.

Production trends for corn, oats, wheat, soybeans, and grain sorghum were calculated and extended in the same manner as for livestock to estimate grain production in 1975.

The State was divided into two areas, with the division running roughly east-west through Birmingham, Figure 1. This division served to reflect general differences in livestock and poultry production and marketing of grain, and facilitated procurement of production data that is usually reported by crop reporting districts.

These areas were 2 of 36 designated as general market areas to aid in analysis of grain movements into the South, Figure 2. These two areas, designated as 7 and 8, are used in this publication to refer to southern Alabama and northern Alabama,

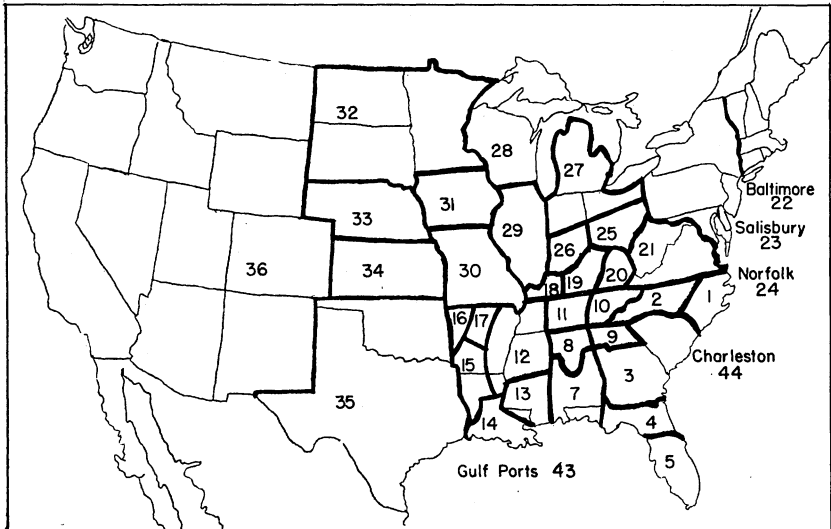
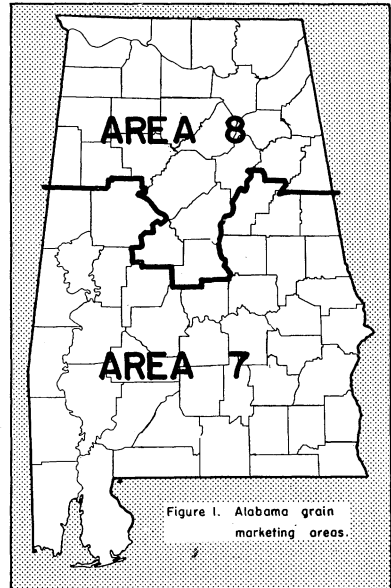


FIG. 2. Grain marketing areas of United States. (Source: SM-29 Southern Regional Grain Marketing Project.)

respectively. Area 7 includes crop reporting districts 4, 5, 6, 7, 8, and 9, and Area 8 districts 1, 2, 2a, and 3.

GRAIN PRODUCTION

General Trends

Since 1953, grain production in Alabama has shown a definite downward trend with significant year-to-year fluctuations. Increased yields have been more than offset by reduced acreages.

Production of corn, which accounts for more than 90 per cent of total grain production in the State, declined from 44,800,000 bushels in 1953 to 36,210,000 bushels in 1964. Production was estimated at slightly over 26 million bushels in 1966, Table 1.

Oats and grain sorghum, the only other grains grown primarily for feed grain in the State, have also declined in acreage and production.

Wheat production has been erratic since 1953. This may be partially explained by the fact that wheat is not grown in Alabama primarily for a feed grain. In addition, government programs designed to control wheat production were mainly responsible for significant reductions in total production in 1953, 1954, 1962, and 1963.

Production of soybeans — considered as a feed grain for this analysis because it was handled in the same facilities as grain — has increased consistently since 1953, Table 1.

Production Projections

Corn. Annual production of corn fluctuated from about 26 to 55 million bushels during 1953 to 1966, but showed a definite downward trend. The downward trend is expected to level off, with production estimated to be slightly over 27 million bushels in 1975, Figure 3. This will probably be produced on fewer acres as yields continue to increase.

Corn consistently accounted for approximately 90 per cent of total feed grain production during the past 14 years, and by 1975 is expected to account for over 95 per cent. Corn production has been about evenly divided between northern and southern Alabama, Appendix A Table 1, but there is an indication that production will shift southward.

TABLE I. FEED GRAIN ACREAGE AND PRODUCTION, ALABAMA, 1953-1966

Year	Corn		Oats		Wheat		Grain sorghum		Soybeans	
	Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production	Acreage	Production
	<i>1,000 acres</i>	<i>1,000 bushels</i>	<i>1,000 acres</i>	<i>1,000 bushels</i>	<i>1,000 acres</i>	<i>1,000 bushels</i>	<i>1,000 acres</i>	<i>1,000 bushels</i>	<i>1,000 acres</i>	<i>1,000 bushels</i>
1953.....	2,040	44,880	138	4,416	21	462	25	450	88	1,804
1954.....	2,121	27,573	185	5,458	24	528	16	294	95	1,140
1955.....	2,030	58,870	148	3,848	53	1,007	46	874	94	2,068
1956.....	1,989	47,736	136	4,896	80	1,840	34	612	110	2,255
1957.....	1,907	47,675	99	2,475	130	2,340	43	774	122	2,440
1958.....	1,794	55,614	79	2,528	100	2,300	38	912	127	2,794
1959.....	1,807	46,982	101	3,484	55	1,265	33	598	130	2,860
1960.....	1,705	44,330	85	2,975	48	1,200	28	480	135	3,240
1961.....	1,330	43,890	85	3,315	56	1,456	14	364	157	3,611
1962.....	1,144	31,460	72	2,448	35	840	10	240	176	3,608
1963.....	1,133	40,222	40	1,160	42	987	12	308	192	3,840
1964.....	1,020	36,210	42	1,701	64	1,600	11	189	207	4,554
1965.....	938	37,520	40	1,400	55	1,348	10	270	228	5,016
1966.....	869	26,070	34	1,292	58	1,624	7	210	280	6,860

Source: Statistical Bulletin 384, USDA Statistical Reporting Service, and Alabama Agricultural Statistics, Alabama Crop Reporting Service, Bulletin 11.

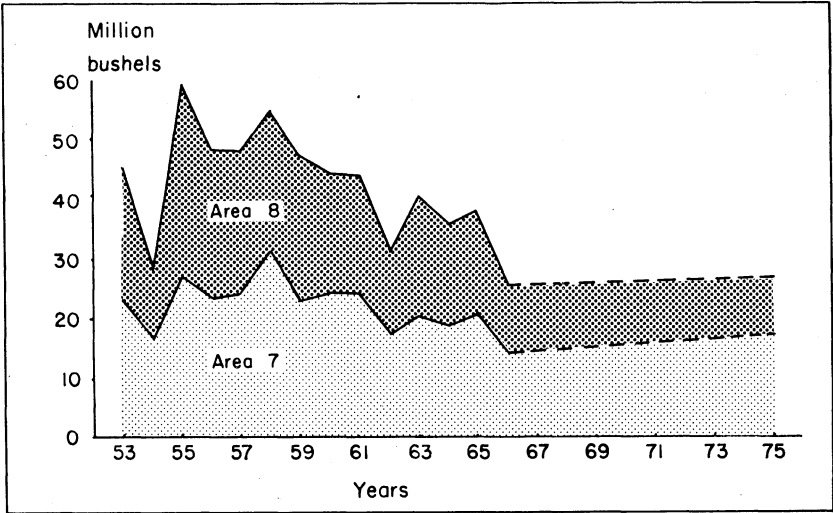


FIG. 3. Corn production, actual and projected, Alabama, 1953-1975.

A small proportion of the corn produced in southern Alabama entered the commercial grain marketing channel. A major proportion produced in that area was utilized in hog production on farms where it was produced. In Area 8 corn was more important as a cash crop.

Wheat. Production of wheat ranged from a high of 2.3 million

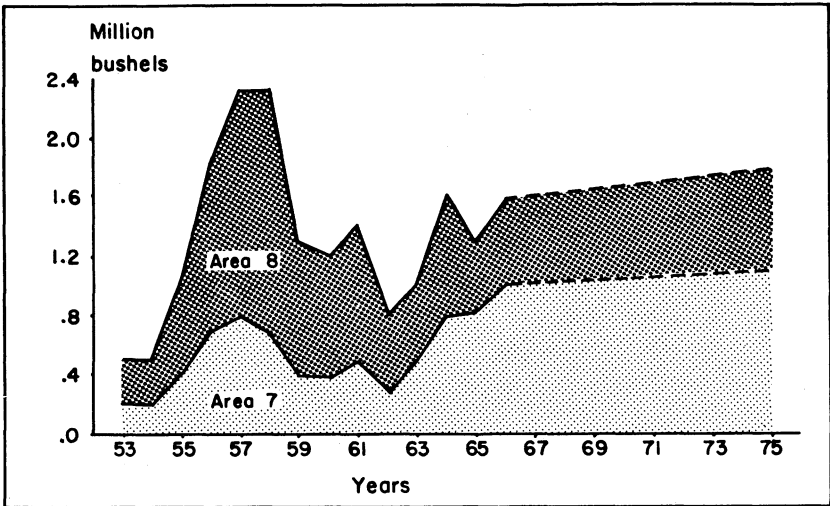


FIG. 4. Wheat production, actual and projected, Alabama, 1953-1975.

bushels in 1957 to a low of 462,000 bushels in 1953. The trend projection indicated production of 1.8 million bushels in 1975, Figure 4.

Wheat has not traditionally been considered a feed grain in Alabama and it is expected that future production will mainly be utilized in flour. Wheat production appeared to be increasing in Area 7 and decreasing in Area 8, Appendix A Table 2, primarily because: (1) wheat fits well in a double cropping system with soybeans and potatoes in the Gulf Coast area of Alabama; and (2) a strong export market for wheat is located at the nearby Port of Mobile. These two factors can cause wheat production to exceed the projected estimate in 1975, especially if soybean production increases as anticipated.

Oats. Oats have become a relatively minor feed grain crop in Alabama. Production declined from 5.5 million bushels in 1954 to 1.3 million bushels in 1966. Projected production for 1975 was only 898,000 bushels, Figure 5.

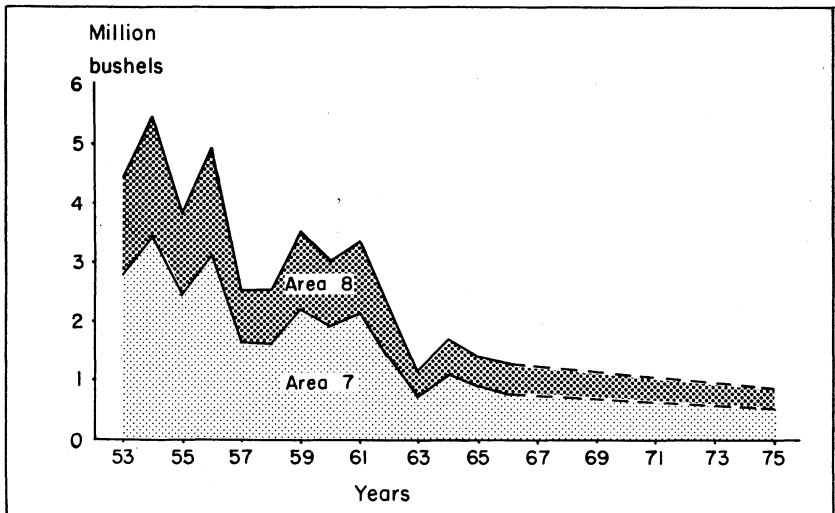


FIG. 5. Oat production, actual and projected, Alabama, 1953-1975.

Grain Sorghum. After reaching a peak of almost 1 million bushels in 1958, grain sorghum production declined to 210,000 bushels in 1966, Figure 6. Production was projected to be 108,000 bushels in 1975, and will be of no significance in the consideration of need for marketing facilities.

Soybeans. Although not normally considered a feed grain,

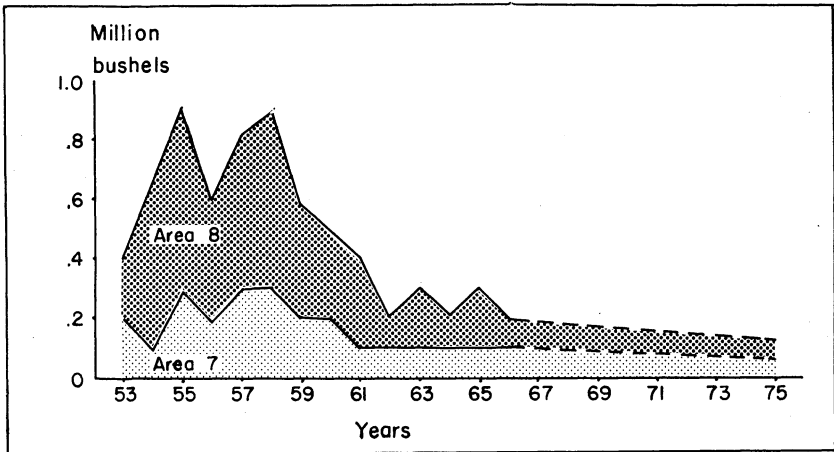


FIG. 6. Grain sorghum production, actual and projected, Alabama, 1953-1975.

soybeans are a major source of protein in livestock and poultry feeds. Soybeans were treated as a feed grain in this study because they are handled in the same types of facilities as grains and will influence the needs for adjustment in facilities.

Increased production of soybeans during the past few years has created more interest in the development of marketing facilities than have major feed grains.

Production went from 1.8 million bushels in 1953 to 6.9 million bushels in 1966, an increase of almost 300 per cent, Figure 7. Almost three-fourths of this increase has occurred since 1963. Projected production for 1975 was 23 million bushels. There is widespread optimism that soybeans will become the State's major field crop within the next few years and will exceed the projected production of 23 million bushels.

Soybean production was started in Alabama on the basis of a double cropping system with potatoes in extreme southern Alabama. In the 1950's approximately 90 per cent of the crop was produced in Area 7, Appendix A Table 5. By 1966 approximately 73 per cent of production was in southern Alabama, and the present geographic distribution of production is expected to continue through 1975.

Expansion of soybean production in the U.S. over the past 10 years has created the possibility of production-limiting programs being imposed or a significant reduction in soybean prices because of larger supplies. A continued expansion of ex-

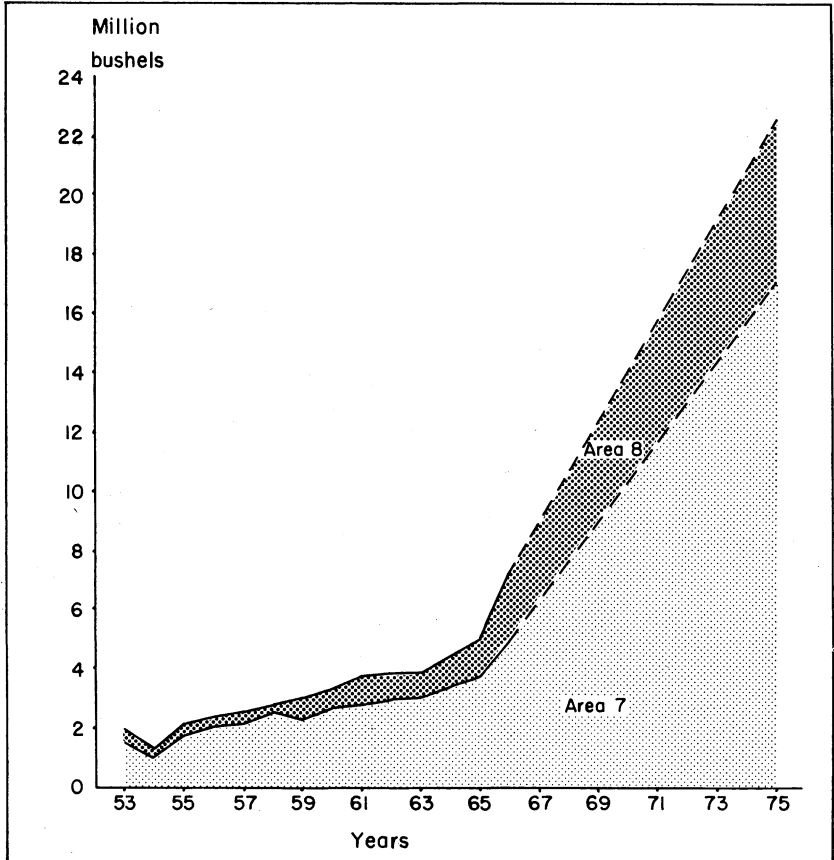


FIG. 7. Soybean production, actual and projected, Alabama, 1953-1975.

port markets can accommodate a moderate annual increase in soybean supplies and maintain prices near the present levels. The supply-demand situation in domestic and world markets indicates that prices will probably decrease and slow the expansion of the past decade.

LIVESTOCK AND POULTRY PRODUCTION

General Trends

Certain classes of livestock and poultry increased while others declined, but the net result was a significant increase in the number of grain consuming animal units between 1953 and 1966, Table 2. (Grain consuming animal unit is a common de-

TABLE 2. NUMBER OF GRAIN CONSUMING ANIMAL UNITS, ALABAMA, 1953 AND 1966

Class of livestock	Number of GCAU per head	Number of head		Number of GCAU	
		1953	1966	1953	1966
		1,000	1,000	1,000	1,000
Milk cows.....	0.9	423	186	381	167
Other dairy animals..	0.2	302	110	60	22
Beef cows.....	0.2	503	856	101	171
Beef cattle fed.....	2.0	1	54	-----	108
Other beef animals...	0.1	509	783	51	78
Hogs.....	0.6	1,284	1,250	770	750
Horses and mules.....	2.1	210	100	441	210
Sheep.....	0.015	33	10	2	2
Hens and pullets.....	0.05	5,961	15,198	298	760
Chickens raised.....	0.015	9,070	11,835	136	178
Broilers.....	0.008	28,416	324,124	227	2,593
Turkeys.....	0.07	290	1,278	20	90
Other ³	---	---	---	124	256
TOTAL.....	---	---	---	2,609	5,383

¹ None reported.

² Less than 1.

³ Includes pets and other animals not on farms.

nominator intended to show the relative importance of various classes of livestock in grain utilization.²⁾

The number of grain consuming animal units more than doubled from 1953 to 1966. Over 90 per cent of the increase resulted from expansion of the broiler industry, which accounted for almost half of the State's grain consuming animal units in 1966. Other classes of poultry also increased.

Beef cattle was the only other class of livestock that increased significantly during the period observed. Beef cattle production in the State was primarily composed of brood cow herds that produced stocker and feeder calves. This system was dependent on forage crops and on cottonseed meal as a protein supplement. Therefore, expansion in numbers had little effect on demand for feed grains.

Classes of livestock produced in the State that utilized relatively large volumes of grain were dairy cattle, hogs, and horses and mules. The number of each in the State was less in 1966 than was reported in 1953. The proportional decrease was 56 per cent for dairy cows, 3 per cent for hogs, and 52 per cent for horses and mules.

² Each kind of livestock and poultry was converted into an animal unit or fraction thereof, by dividing the quantity of grain consumed per head by the amount consumed by one milk cow.

Production Projections

Dairy Cattle. Developments in both production and marketing have influenced adjustments in Alabama's dairy industry. Bulk handling of fluid milk has required investments in bulk tanks and other equipment that were not economically feasible for small or inefficient herds. This and other factors requiring more efficiency have led to fewer and larger herds with higher producing cows. Herds maintained for production of milk for manufacturing have declined, as have numbers of "family milk cows."

The increase in production per cow is evidenced by comparing a 30 per cent decrease in milk production to the 56 per cent decrease in milk cow numbers from 1953 to 1966.

The distribution of cows within the State has been about 60 per cent in southern Alabama and 40 per cent in northern Alabama, and this distribution should be almost constant until 1975, Figure 8. Total number of milk cows will continue to decrease, reaching about 63,000 head in 1975. Milk production will also continue downward, but at a rate less than cow numbers.

Other dairy cattle was composed of dairy heifers, dairy bulls, and dairy calves. The majority of this class was heifers being saved for replacements and these were distributed proportionate to dairy cows, Figure 9. The ratio of replacement heifers to cows declined and is likely to continue to drop as cow numbers are reduced.

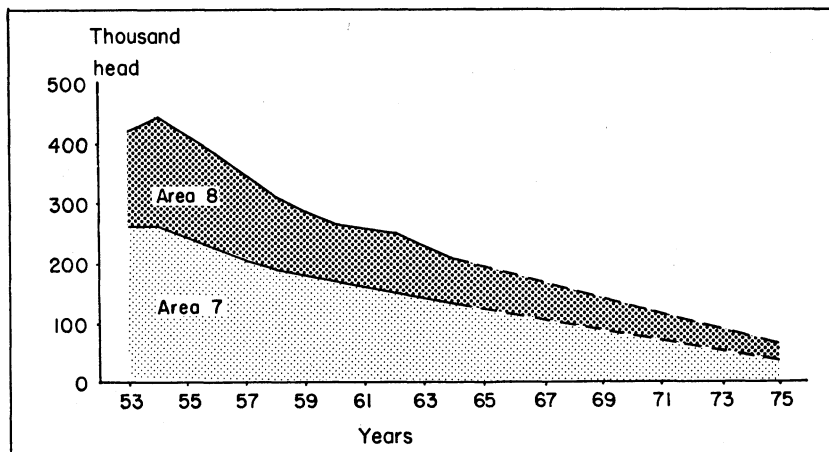


FIG. 8. Milk cows 2 years old and older on farms January 1, actual and projected, Alabama, 1953-1975.

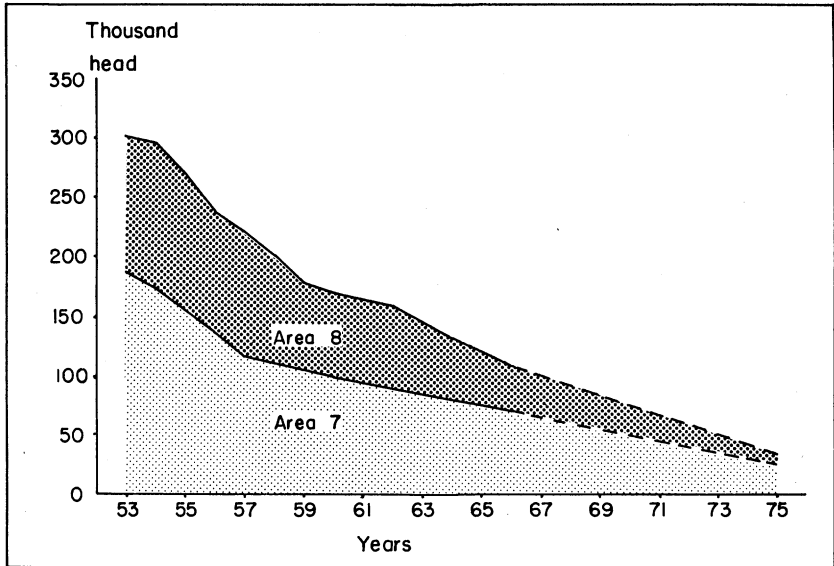


FIG. 9. Other dairy animals on farms January 1, actual and projected, Alabama, 1953-1975.

Beef Cows. Beef cow numbers in Alabama increased steadily during 1953-1966, Figure 10. The increase of 69 per cent brought beef cow numbers to 856,000 in 1966. The rate of increase is expected to level off and beef cows will number about 878,000 in 1975. The distribution of 80 per cent in Area 7 and 20 per cent in Area 8 is expected to hold through 1975.

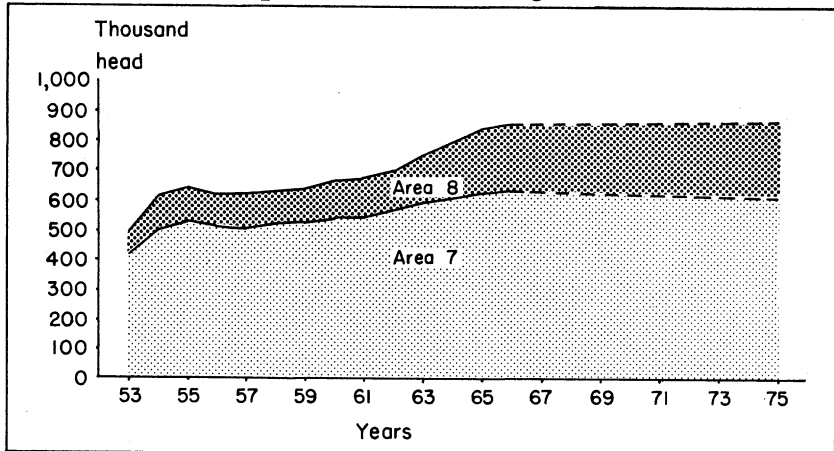


FIG. 10. Beef cows 2 years old and older on farms January 1, actual and projected, Alabama, 1953-1975.

Beef cows require a relatively large acreage per unit and the increasing demand for land will probably be a major factor limiting expansion of beef cow numbers.

Since beef production in Alabama is primarily from cow-calf operations, which are dependent on forage, increasing cow numbers for this type of operation will call for little additional feed grain.

Beef Cattle Grain Fattened. The number of beef cattle finished on grain in Alabama was small and has been recorded only since 1960. There was an increase between 1960 and 1965,

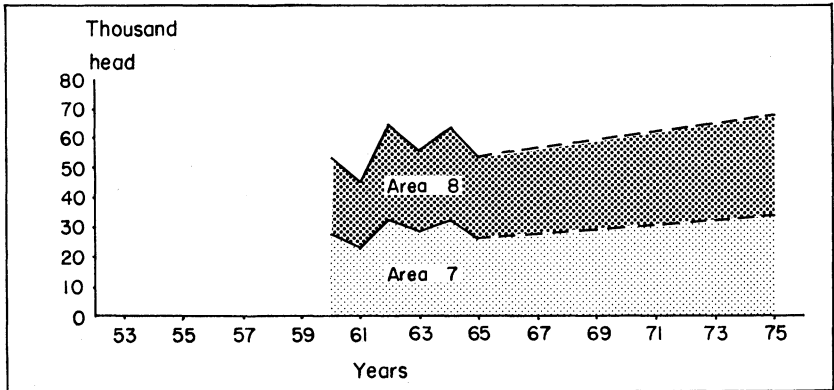


FIG. 11. Beef cattle grain fattened, actual and projected, Alabama, 1953-1975.

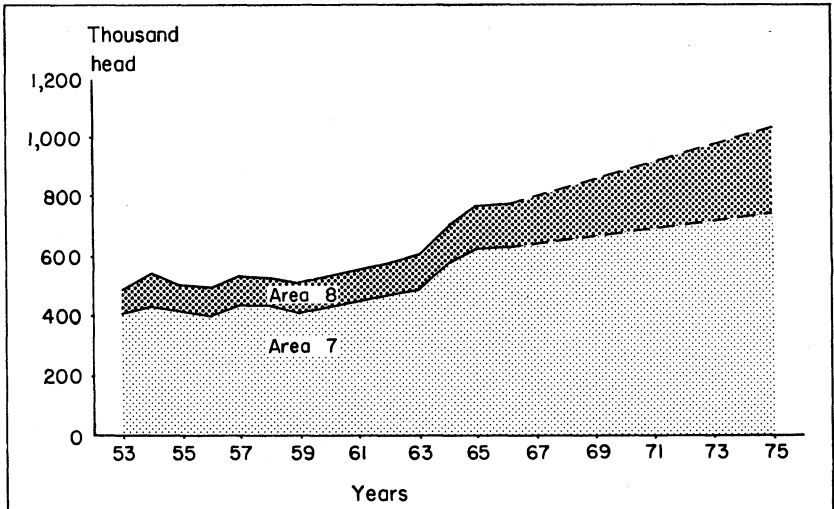


FIG. 12. All other beef animals on farms January 1, actual and projected, Alabama, 1953-1975.

Figure 11, and this trend indicates that Alabama will finish about 67,000 head in 1975. Because cattle feeding is a relatively new enterprise in Alabama and of minor importance, a trend is not as reliable for finished beef as for other classes of livestock. Several private and public groups are interested in promoting cattle feeding in Alabama. If their efforts are successful, trend estimate could be well below the actual number in 1975.

Other Beef. This class of animals was composed of beef calves, bulls, and replacement heifers, but primarily heifers. Distribution and growth patterns of this class of livestock followed closely those for beef cows, Figure 12. As rate of growth in beef cow numbers decreases, the ratio of other beef to beef cows should decrease because of less need for heifers to build cow herds.

Hogs. Reports for this class of animals comprised both spring and fall pig crops and represented the number of hogs to be fed during the year. Hog production in Alabama went through production cycles similar to those for the United States, but the number produced in 1966 was only 3 per cent different from

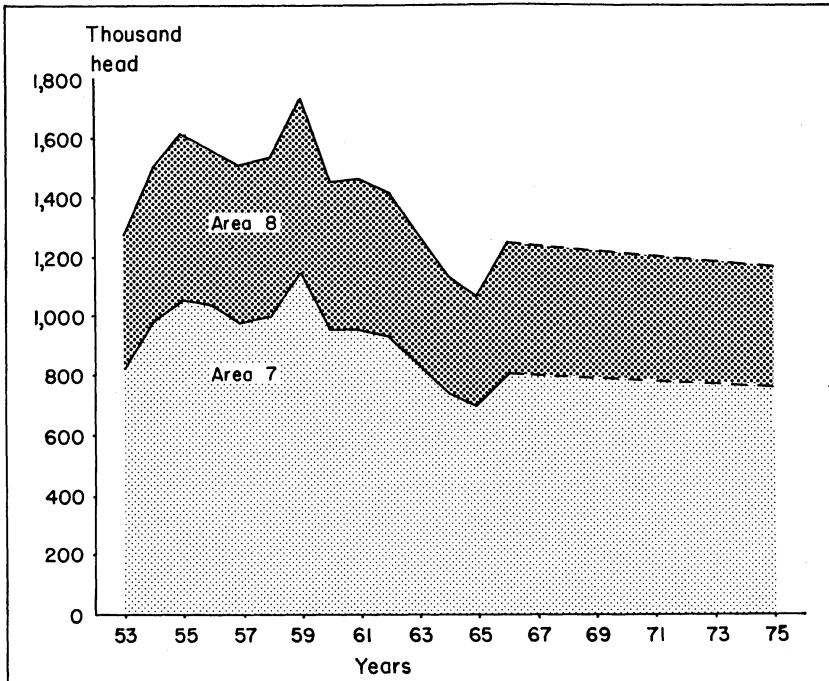


FIG. 13. Hogs produced, actual and projected, Alabama, 1953-1975.

the figure for 1953. If the trend continues until 1975, as expected, growers in Alabama will be producing about 1,171,000 head, Figure 13.

Hog production was concentrated in southern Alabama where hogs were finished primarily with locally produced grain. This area produced about 80 per cent of Alabama's hogs from 1953 to 1966 and should produce about that proportion in 1975.

Hog production can be profitable for many Alabama farmers, and thus has potential to exceed the production estimated for 1975. With high grain utilization per unit, a moderate increase in hog production could increase significantly the amount of grain fed.

Sheep. Never a large factor in feed grain demand, sheep production is expected to be almost nil in 1975. There was some interest in sheep in Alabama during the fifties but disease and parasite problems made this class of livestock undesirable in Alabama's climate. Sheep numbered 33,000 in 1953, but are expected to be 5,000 or less in 1975, Figure 14.

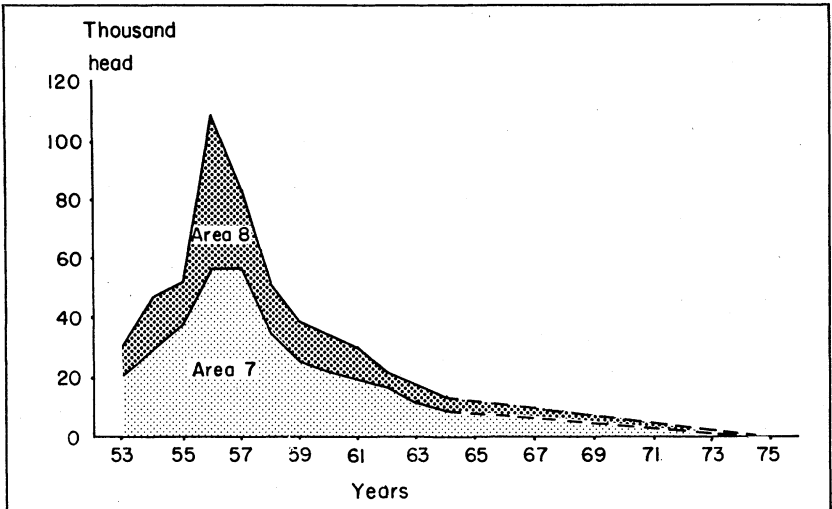


FIG. 14. Sheep on farms January 1, actual and projected, 1953-1975.

Horses and Mules. Farm work stock were replaced with tractors rapidly during the fifties. Numbers were reduced from 210,000 to 100,000 between 1953 and 1960, Figure 15. Numbers of horses and mules have not been estimated in Alabama since 1960, but it was assumed that numbers leveled off at around

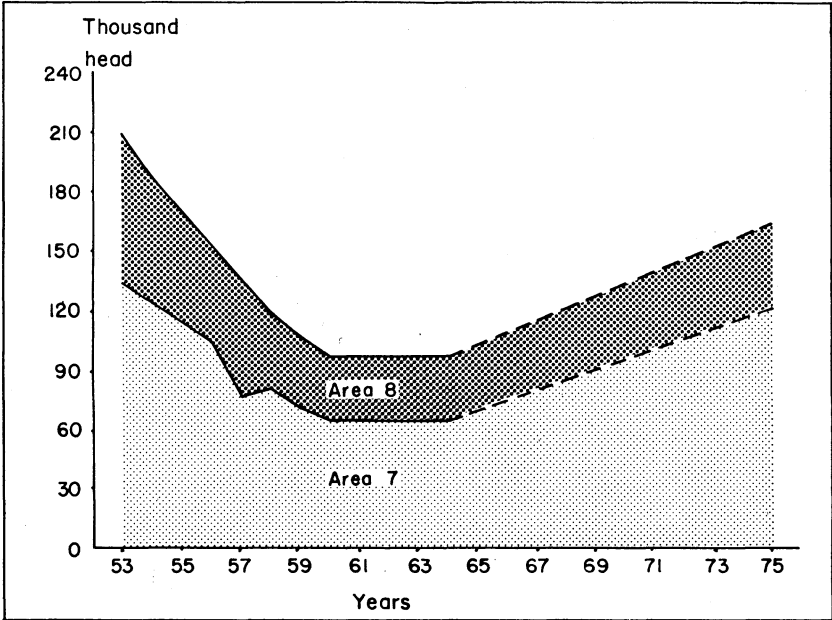


FIG. 15. Horses and mules on farms January 1, actual and projected, Alabama, 1953-1975.

100,000 because of an increase in the number of pleasure horses. Horses and mules are expected to total about 164,000 by 1975.

Hens and Pullets. Hens and pullets increased from approximately 6 million in 1953 to over 15 million in 1966, with the majority of the increase in Area 8, Figure 16. A large part of the increase was for production of hatching eggs used by the expanding broiler industry. These trends are expected to continue until 1975 when Alabama will have over 33 million hens and pullets. More than 80 per cent will be in northern Alabama.

Chickens Raised. These chickens are for replacements of laying flocks. Distribution and rate of increase from 9 million in 1953 to about 12 million in 1964 were similar to that for hens and pullets, Figure 17. A continuation of this trend is expected to bring the total to 31.6 million in 1975, with about 26.2 million in Area 8 and 5.4 million in Area 7.

Broilers. Most of the additional demand for feed grains in Alabama after 1953 was for expanded broiler production. Production increased from 28.4 million in 1953 to 324.1 million in 1966, Figure 18. This trend projected to 1975 indicates that Alabama will produce over 424 million broilers.

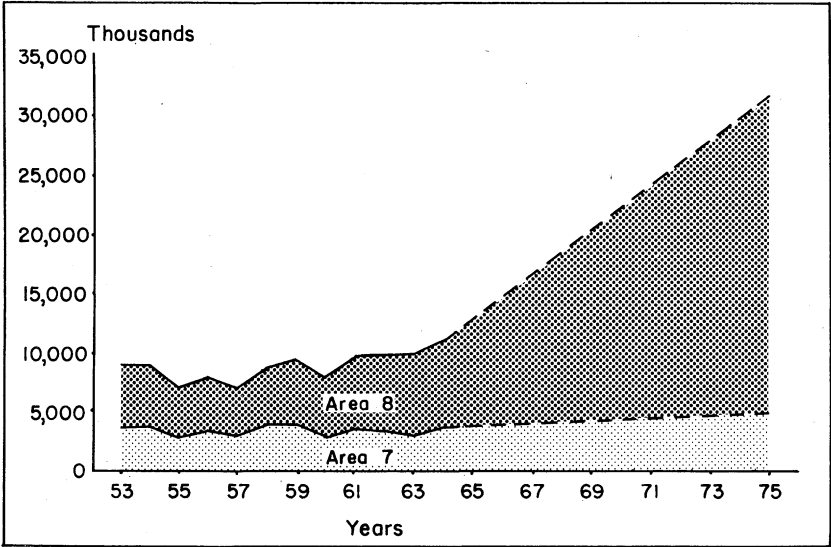


FIG. 16. Hens and pullets on farms January 1, actual and projected, Alabama, 1953-1975.

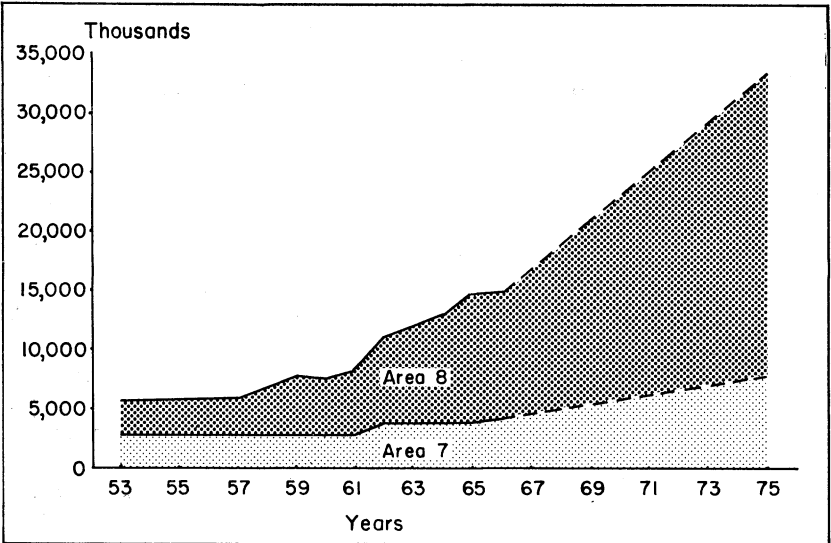


FIG. 17. Chickens raised, actual and projected, Alabama, 1953-1975.

Northern Alabama produced 91 per cent of the State's broilers in 1953 and 75 per cent in 1966, and is expected to produce 74 per cent in 1975. The predominance of this area in

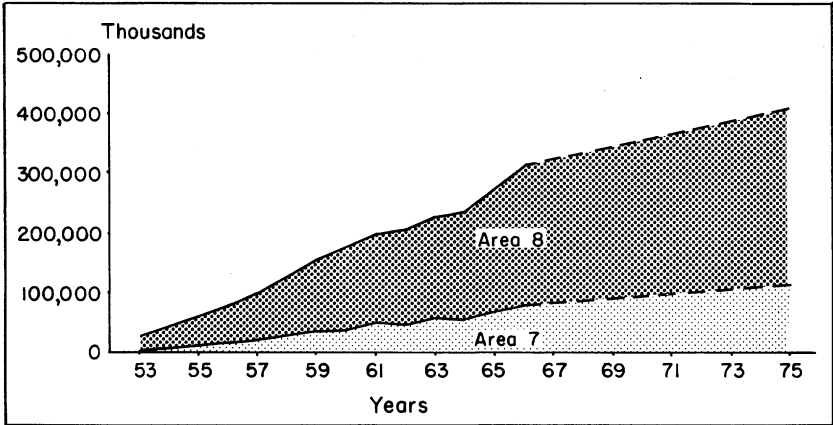


FIG. 18. Broilers produced, actual and projected, Alabama, 1953-1975.

broiler production can be largely attributed to its proximity to the Tennessee River and low cost water transportation of grain. The advantage of water over rail transportation was decreased with adjustment of rail rates in 1963, thereby reducing the competitive advantage of northern over southern Alabama.

Because concentration of broiler production in Area 8 will

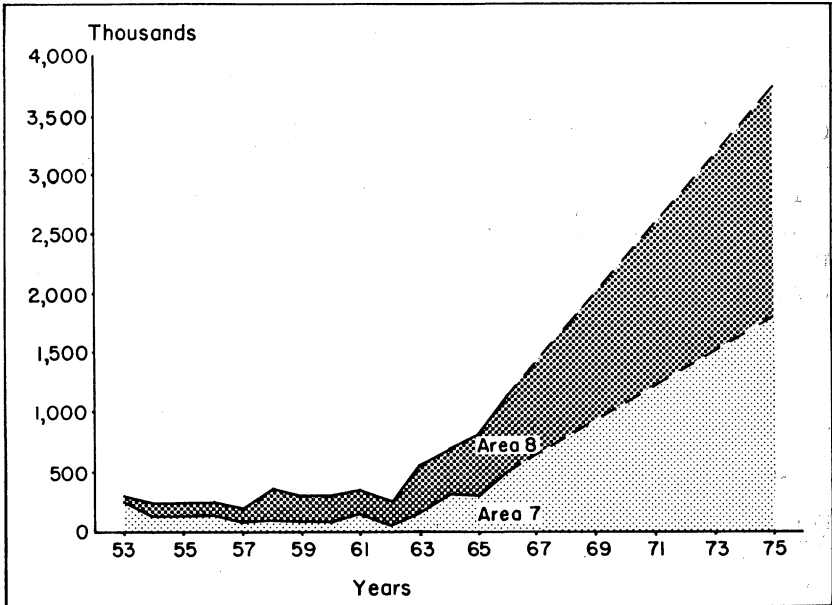


FIG. 19. Turkeys raised, actual and projected, Alabama, 1953-1975.

continue to increase the demand for factors of production, Area 7 will have a comparative advantage in factors other than transportation rates. The distribution of broiler production between northern and southern Alabama will be dependent to a large extent on relative rates of the various means of transporting grain.

Turkeys. Turkey production was erratic during the period studied, decreasing the dependency of trend projection as a method of estimating 1975 production. Production was 290,000 in 1953 and over 1,278,000 in 1966, Figure 19. The trend projection indicates about 3,833,000 in 1975, but this estimate is less dependable than for most other classes of livestock. Distribution within the State is even less applicable to estimation by trends.

GRAIN MARKETING AND PROCESSING FIRMS

Type of Firms

The grain industry in Alabama is made up of a large number of firms varying in size and services performed, Table 3. Division of firms by type of service performed was difficult because most firms performed more than one function in the process of merchandising and processing feed grains.

To prevent disclosing information of individual firms, data from soybean processors and flour mills were combined with data from all feed mills. Terminal and country elevator data were also combined.

No attempt was made to determine the extent of integrated operations, but a few large firms produced a significant proportion of all poultry feeds. Producing poultry feeds for their own operations, these firms accounted for a significant proportion

TABLE 3. GRAIN MARKETING AND PROCESSING FIRMS, BY TYPE AND AREA, ALABAMA, 1964

Type firm	State	South (Area 7)	North (Area 8)
	No.	No.	No.
Terminal elevators.....	6	2	4
Country elevators.....	10	7	3
Feed mills ¹	180	116	64
Soybean processors.....	4	3	1
Flour mills.....	1	0	1
TOTAL.....	202	129	73

¹ Feed mills include feed manufacturers, feed mixers, and custom feed mills.

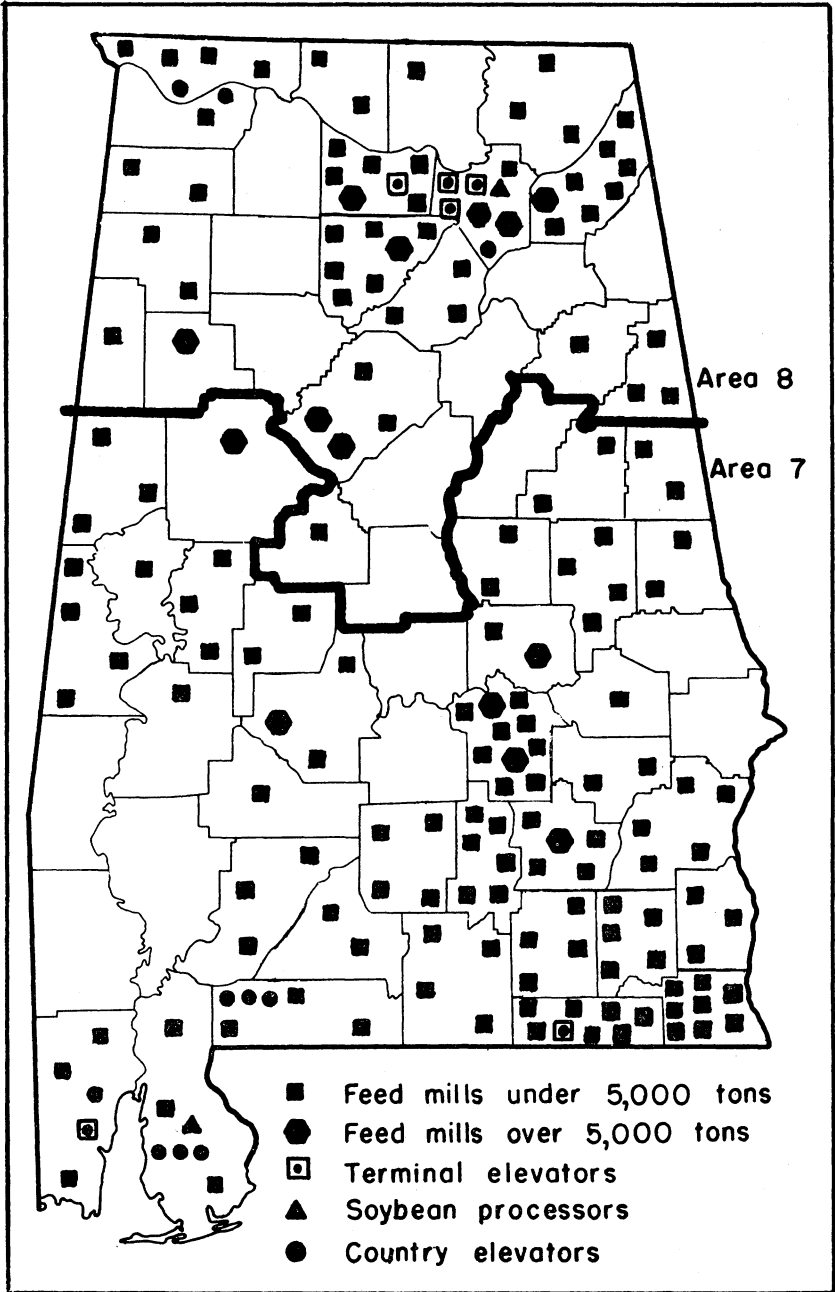


FIG. 20. Grain marketing and processing firms in Alabama in 1964.

of total feed grain utilization. The development of integrated firms in the poultry industry resulted in less mixed feed entering the market channel to be distributed to feeders. These integrated firms are considered to be ultimate consumers at the feed mill or elevator level.

Location of Firms

Firms are not distributed uniformly within the State by type and size, Figure 20. Northern Alabama had more of the large firms, terminal elevators, and integrated firms, and southern Alabama more small firms and custom grinders. This is explained in part by the type animal production in the areas. Area 8 primarily produced poultry and had facilities for receiving and storing large volumes of grain barged in on the Tennessee River. Area 7 produced mostly cattle and hogs, utilizing more forage and locally produced grain. A large proportion of grain shipped into Area 7 was received in small lots backhauled from the Midwest by trucks. An exception in this area was the grain elevator at the Alabama State Docks in Mobile, which had a large storage capacity to facilitate assembling grains for export.

Business Volume of Firms

Feed Mills. Feed mills with annual processing capacity of over 2,000,000 tons produced 916,902 tons of mixed feeds in 1964. A majority of the output was poultry feed produced by large firms in Area 8.

To facilitate analysis of changes in size distribution of firms in the feed industry, the number in each size group in 1959 and 1964 was determined. The number of feed mills increased from 156 in 1959 to 180 in 1964, Table 4, with entry of small firms

TABLE 4. NUMBER OF FEED MILLS AND PERCENTAGE CHANGE, BY SIZE, ALABAMA, 1959 AND 1964

Annual production, tons	Number of firms		Change <i>Per cent</i>
	1959	1964	
	<i>No.</i>	<i>No.</i>	
500 or less.....	49	77	+57
501-1,000.....	28	31	+11
1,001-2,000.....	32	24	+ 9
2,001-5,000.....	24	22	- 8
5,001-30,000.....	26	16	-38
Over 30,000.....	9	10	+11
TOTAL.....	156	180	+15

TABLE 5. FEED MILLS, BY SIZE CLASSIFICATION, ALABAMA, 1960 AND 1964

Volume, tons annually	No. of firms 1960	Number of firms in 1964, by tons annual volume								Drop-outs ¹
		500 or less	501-1,000	1,001-2,000	2,001-5,000	5,001-10,000	10,001-20,000	20,001-30,000	Over 30,000	
		No.	No.	No.	No.	No.	No.	No.	No.	No.
500 tons or less.....	49	32	3	1	---	---	---	---	---	13
501-1,000.....	28	7	11	4	2	---	---	---	---	4
1,001-2,000.....	22	4	2	10	4	1	---	---	---	1
2,001-5,000.....	24	2	1	5	10	2	---	---	---	4
5,001-10,000.....	15	1	1	---	4	3	3	---	---	3
10,001-20,000.....	9	1	---	---	---	2	4	1	---	1
20,001-30,000.....	2	---	---	---	---	---	---	---	2	---
Over 30,000.....	9	---	---	---	---	---	---	---	8	1
New firms ²	---	30	13	4	2	---	---	---	---	---
TOTAL, 1964.....	---	77	31	24	22	8	7	1	10	27

¹ Number of firms going out of business from 1960 to 1964.

² Number of firms started between 1960 and 1964.

(500 tons or less) into the industry accounting for most of the increase. The number of medium size firms decreased more than one-third in the same period. Given in Table 5 are number of firms in business in January of each respective year; however, there was exit and entry of many firms during this period. Number and percentage of new firms and dropouts from 1960 to 1964 are shown by Table 5 data.

When classed by dollar value of business, the percentage of total production accounted for by large feed mills (more than \$800,000 annual sales) decreased from 91.8 per cent in 1961 to 78.5 per cent in 1963.³ Actual production of large firms increased from 704,000 tons in 1961 to 850,000 tons in 1963. Average production increased more for large firms than for small firms.

Elevators. Elevators were classified as (1) terminal elevators if the majority of grain handled was received from sources other than grain producers, and (2) country elevators if the majority of grain was received from producers. Most terminal and country elevators handled both shipped in grain and locally produced grain. There were 6 terminal elevators and 10 country elevators in Alabama in 1964.

Contrast between numbers of elevators in 1964 (16) and 1959 (30) may not provide a meaningful comparison because of a difference in definition of type firms.⁴ A large number of feed

³ Current Industrial Reports, U.S. Department of Commerce.

⁴ Curtis, W. C., and M. White, 1964. Grain Movements in Alabama, Auburn University, Agricultural Experiment Station Bull. 355.

mills and other agribusiness firms that handled raw grain may have been classified as elevators in 1959 and not in 1964.

All elevators handled about 62 million bushels of grain in 1964. Approximately 15 million bushels of raw grain were handled by feed mills in addition to that processed into feeds.

Other Firms. Only two firms were classified as soybean processors and one firm as a flour mill in the State in 1964. Their volume of business was combined with feed mills to prevent possible disclosure of confidential information.

Storage Capacity of Firms

Total grain storage capacity of all firms was 16,723,000 bushels on January 1, 1965; approximately 13,637,000 bushels was bulk upright storage, Table 6. The remainder was sack storage, most often used by small feed mills.

TABLE 6. GRAIN STORAGE CAPACITY, BY TYPE FIRM, ALABAMA, 1965

Type firm	Storage capacity		
	Bulk	Sack	Total
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
Elevators.....	3,714	956	4,670
Feed mills.....	4,198	2,130	6,328
Other ¹	5,725	0	5,725
TOTAL.....	13,637	3,086	16,723

¹ Includes soybean processing plants, flour mills, and other grain handling and processing firms not classified as livestock and poultry feed mills or grain elevators.

GRAIN MOVEMENTS

Previous sections of this publication reported that Alabama's livestock and poultry industries utilized more grain than was produced in the State each year. Movement of grain from surplus producing states to Alabama was a large and complex industry. The efficiency of these movements is a primary factor affecting livestock and poultry production.

Estimates of 1964 grain movements, by origin, destination, and mode of transportation, were obtained by interview of a representative sample of firms, and information obtained was expanded by the appropriate factor.

Movement estimates were made for: (1) comparison with utilization estimates based on average rations and numbers of live-

stock and poultry, and (2) evaluation of the efficiency of grain movements.

Receipts

Alabama's grain marketing firms received over 134 million bushels of grain in 1964, Table 7. Corn was the most important grain, accounting for two-thirds of the total amount received. Soybeans was second in volume handled, with 17.5 per cent of the total. Over two-thirds of the grain was received in Area 8 where poultry production was concentrated.

TABLE 7. FEED GRAIN RECEIPTS, BY TYPE OF GRAINS AND AREA OF THE STATE, ALABAMA, 1964

Area of receipt	Corn	Oats	Wheat	Grain sorghum	Soybeans	Total	Per cent
	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	
South (Area 7)...	18,228	416	6,331	2,269	16,603	43,847	32.7
North (Area 8)...	71,070	6,941	3,813	1,534	6,901	90,257	67.3
State.....	89,298	7,357	10,144	3,803	23,504	134,106	100.0
<i>Per cent</i>	66.6	5.5	7.6	2.8	17.5	100.0	-----

TABLE 8. FEED GRAIN RECEIPTS, BY TYPE OF GRAIN AND SOURCE, ALABAMA, 1964

Source	Corn	Oats	Wheat	Grain sorghum	Soybeans	Total	Per cent
	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	
Local.....	16,719	490	2,577	-----	3,289	23,075	17.2
Intrastate.....	9,097	1,313	-----	109	3,044	13,563	10.1
Intrastate.....	63,482	5,554	7,567	3,694	17,171	97,468	72.7
TOTAL.....	89,298	7,357	10,144	3,803	23,504	134,106	100.0

Approximately 97.5 million bushels, 73 per cent of all grain receipts, were received from sources outside the State, Table 8. Seventeen per cent came from local producers and 10 per cent from other firms within the State.

Corn. Alabama grain marketing firms received 89,298,000 bushels of corn in 1964, Table 9. Approximately 71 per cent was imported from Midwestern States, with Illinois supplying over 42 per cent.

Northern Alabama received over 80 per cent of all corn — local, intrastate, and imported. Approximately two-thirds received in this area came from Illinois. Southern Alabama

TABLE 9. RECEIPT OF CORN, BY AREA OF ORIGIN, ALABAMA, 1964

Origin	Southern (Area 7)	Northern (Area 8)	State	Per cent
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	
Local ¹	5,139	11,580	16,719	18.7
Intrastate ²	1,403	7,694	9,097	10.2
Illinois.....	3,371	34,254	37,625	42.2
Iowa.....	1,753	1,900	3,653	4.1
Missouri.....	1,769	1,425	3,194	3.6
Indiana.....	1,001	1,580	2,581	2.9
Minnesota.....	-----	1,355	1,355	1.5
Kentucky.....	-----	980	980	1.1
Other ³	3,792	10,302	14,094	15.7
TOTAL.....	18,228	71,070	89,298	100.0
Net imports.....	11,686	51,736	63,482	-----

¹ Received from producers.

² Received from other firms within the State.

³ Origins described by most respondents as Midwest or Corn Belt.

received 64 per cent of its total corn from outside the State and this came from several states.

Wheat. Receipts of wheat by Alabama firms in 1964 was about 25 per cent local and 75 per cent imported, Table 10. Kansas was the leading state, supplying 65 per cent of all wheat imported. Missouri furnished 13 per cent of imports.

TABLE 10. RECEIPT OF WHEAT, BY AREA OF ORIGIN, ALABAMA, 1964

Origin	Southern (Area 7)	Northern (Area 8)	State	Per cent
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	
Local ¹	2,314	263	2,577	25.4
Intrastate ²	-----	-----	-----	-----
Missouri.....	1,004	-----	1,004	9.9
Kansas.....	3,013	1,800	4,813	47.4
Georgia.....	-----	200	200	2.0
Mississippi.....	-----	200	200	2.0
Indiana.....	-----	200	200	2.0
Illinois.....	-----	400	400	3.9
Minnesota.....	-----	750	750	7.4
TOTAL.....	6,331	3,813	10,144	100.0
Net imports.....	4,017	3,550	7,567	-----

¹ Received from producers.

² Received from other firms within the State.

Area 7 received about 62 per cent of all wheat, primarily at the Port of Mobile for export. The 3,813,000 bushels received in Area 8 were for use in the State.

Oats. Oats was a relatively minor feed grain, accounting for only 5.5 per cent of total grain receipts in 1964. About 75 per

TABLE 11. RECEIPT OF OATS, BY AREA OF ORIGIN, ALABAMA, 1964

Origin	Southern (Area 7)	Northern (Area 8)	State	Per cent
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	
Local ¹	162	328	490	6.7
Intrastate ²	-----	1,313	1,313	17.9
Missouri.....	50	-----	50	0.7
Nebraska.....	143	-----	143	1.9
Indiana.....	61	-----	61	0.8
Illinois.....	-----	625	625	8.5
Minnesota.....	-----	4,675	4,675	63.5
TOTAL.....	416	6,941	7,357	100.0
Net imports.....	254	5,300	5,554	-----

¹ Received from producers.

² Received from other firms within the State.

cent of the oats was imported, primarily from Minnesota, Table 11. Almost 95 per cent of all oats went to firms in Area 8 to be used in poultry feeds.

Grain Sorghum. Receipts of grain sorghum accounted for only 2.8 per cent of all feed grains handled in Alabama in 1964. No grain sorghum was reported to have been received from local producers, Table 12. Illinois and Iowa were the most important sources, supplying over 63 per cent of the total. Almost 60 per cent of the grain sorghum was received at Mobile for export.

TABLE 12. RECEIPT OF GRAIN SORGHUM,¹ BY AREA OF ORIGIN, ALABAMA, 1964

Origin	Southern (Area 7)	Northern (Area 8)	State	Per cent
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	
Local ²	-----	-----	-----	-----
Intrastate ³	-----	109	109	2.9
Illinois.....	1,240	175	1,415	37.2
Missouri.....	25	-----	25	0.6
Iowa.....	1,004	-----	1,004	26.4
Wisconsin.....	-----	175	175	4.6
Kansas.....	-----	200	200	5.3
Other ⁴	-----	875	875	23.0
TOTAL.....	2,269	1,534	3,803	100.0
Net imports.....	2,269	1,425	3,694	-----

¹ Includes small amounts of other grains of minor importance.

² Received from producers.

³ Received from other firms within the State.

⁴ Origins described by most respondents as Midwest or Corn Belt.

Soybeans. Information was obtained for soybeans to determine need for handling and storage facilities. Volume of raw beans reported does not reflect the importance of soybeans as

TABLE 13. RECEIPT OF SOYBEANS, BY AREA OF ORIGIN, ALABAMA, 1964

Origin	Southern (Area 7)	Northern (Area 8)	State	Per cent
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	
Local ¹	2,989	300	3,289	13.9
Intrastate ²	2,719	325	3,044	13.0
Florida.....	550	-----	550	2.3
Mississippi.....	6,100	124	6,224	26.5
Illinois.....	2,000	-----	2,000	8.5
Missouri.....	2,245	618	2,863	12.2
Tennessee.....	-----	185	185	.8
Kentucky.....	-----	1,335	1,335	5.7
Indiana.....	-----	1,235	1,235	5.3
Illinois.....	-----	2,470	2,470	10.5
Iowa.....	-----	309	309	1.3
TOTAL.....	16,603	6,901	23,504	100.0
Net imports.....	10,895	6,276	17,171	-----

¹ Received from producers.

² Received from other firms within the State.

a livestock and poultry feed in Alabama. Although soybeans accounted for 17.5 per cent of all grain handled by Alabama firms in 1964, over half of the beans were received at Mobile for export. Most of Alabama's soybean needs was supplied in the form of meal, which had been processed in other states.

Soybean receipts totaled 23.5 million bushels, with about 73 per cent from other states and 27 per cent received from producers and other firms within the State, Table 13. As indicated, a majority of raw beans was received in Area 7 at the Port of Mobile.

Shipments

Alabama grain marketing firms, including processors, distributed over 73 million bushels of raw grain in 1964, Table 14. Corn, the most important grain shipped, accounted for almost 60 per cent of the total, followed by soybeans with 22 per cent,

TABLE 14. GRAIN SHIPMENTS, BY AREA OF ORIGIN, ALABAMA, 1964

Origin of shipment	Corn	Oats	Wheat	Grain sorghum	Soybeans	Total	Per cent
	<i>1,000 bu.</i>	<i>1,000 bu.</i>	<i>1,000 bu.</i>	<i>1,000 bu.</i>	<i>1,000 bu.</i>	<i>1,000 bu.</i>	
South (Area 7)...	7,845	329	6,220	1,007	15,889	31,290	42.8
North (Area 8)...	35,904	5,212	370	19	347	41,852	57.2
State.....	43,749	5,541	6,590	1,026	16,236	73,142	100.0
Per cent.....	59.8	7.6	9.0	1.4	22.2	100.0	-----

TABLE 15. GRAIN SHIPMENTS, BY DESTINATION, ALABAMA, 1964

Destination	Corn	Oats	Wheat	Grain sorghum	Soybeans	Total	Per cent
	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	
Local.....	11,455	-----	-----	-----	-----	11,455	15.7
Intrastate.....	1,670	2,722	1,282	19	3,291	8,984	12.3
Export.....	5,419	119	-----	982	12,745	19,265	26.3
Interstate.....	25,205	2,700	5,308	25	200	33,438	45.7
TOTAL.....	43,749	5,541	6,590	1,026	16,236	73,142	100.0
<i>Per cent</i>	59.8	7.6	9.0	1.4	22.2	100.0	-----

wheat 9 per cent, oats 7.6 per cent, and grain sorghum 1.4 per cent.

Area 8 shipped 57.2 per cent of total grain and was the most important in corn shipments, with almost 36 of the 43.7 million bushels shipped. Area 7 shipped almost 98 per cent of the 16.2 million bushels of soybeans, but only 42.8 per cent of all grains.

Over 45 per cent of the grain shipped was to firms outside the State, all in the Southeastern United States, Table 15. Out-of-state shipments were primarily corn going to the poultry producing section of North Georgia to be used in feeds.

Exports made up 26 per cent of all grain shipments and were composed mostly of soybeans and corn shipped through the Port of Mobile. Almost a million bushels of grain sorghum and other minor grains were also exported from Mobile.

Net Imports

Net imports of grain into Alabama totaled almost 45 million bushels in 1964, Table 16. Corn accounted for over 73 per cent and soybeans almost 10 per cent of all imports. The remainder was divided almost equally between oats, wheat, and grain sorghum.

TABLE 16. NET GRAIN IMPORTS, BY GRAIN TYPE, ALABAMA, 1964

Item	Corn	Oats	Wheat	Grain sorghum	Soybeans	Total
	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>	1,000 <i>bu.</i>
Net receipts.....	63,482	5,554	7,567	3,694	17,171	97,468
Net shipments.....	30,624	2,819	5,308	1,007	12,945	52,703
Net imports.....	32,858	2,735	2,259	2,687	4,226	44,765
<i>Per cent</i>	73.4	6.1	5.1	6.0	9.4	100.0

Transportation of Grain

Water transportation was the most important means of moving grain to Alabama firms in 1964. Approximately 56 per cent of all grain receipts was moved by barge. Trucks moved 30 per cent and rail shipments 14 per cent. Figure 21 shows source, transportation, and area of grain receipts.

Increases in rail shipments of grain to Alabama were anticipated after the reduction in rail rates and innovation of "Big John" railroad cars, but large elevators and feed mills on the Tennessee River continued to receive the vast majority of grain and relied on the established barge system. Truck was an important means of transporting grain to firms in southern Alabama, with rail most important in extreme southern Alabama.

Shipment of grain by Alabama firms in 1964 was 37, 36, and 27 per cent by truck, water, and rail, respectively. Figure 22 shows origin, transportation, and destination of feed grain shipments.

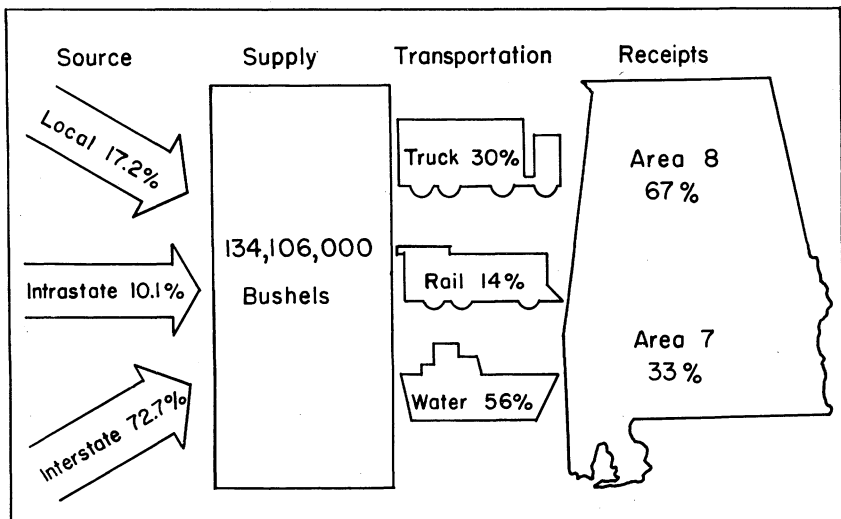


FIG. 21. Receipts of feed grains in Alabama during 1964 shown here may total more than actual receipts because figures used are for total amount handled.

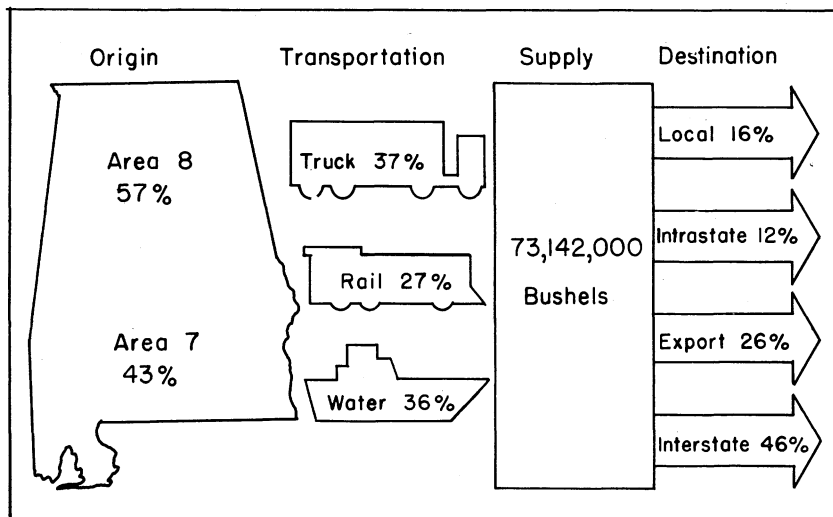


FIG. 22. Shipment of feed grains in Alabama during 1964 shown here may total more than actual shipments because figures used are for total amount handled.

FEED GRAIN UTILIZATION

Expanding livestock numbers are expected to result in greater feed grain deficits by 1975. Trends show that livestock production is increasing in Alabama at a much higher rate than grain production. An attempt was made to determine the amount of feed utilized in 1964 and to estimate the quantity that would be needed in 1975. Anticipated rations included feed grains plus other ingredients (Appendix B).

Utilization in 1964

Rations for 1964 were based on known conditions. Based on these ration requirements, feed grain utilization was estimated at 80,995,000 bushels (2,180,118 tons), Table 17. Corn comprised approximately 83 per cent of the total, followed by oats, grain sorghum, wheat, and barley in that order.

Soybeans was not considered as a raw grain in computing utilization estimates, but use of an estimated 356 thousand tons of soybean meal would have required almost 15 million bushels of beans.⁵

⁵ Assuming 1 bushel (60 pounds) would yield 48 pounds of meal.

TABLE 17. FEED GRAIN UTILIZATION, BY CLASS OF LIVESTOCK, ALABAMA, 1964

Class of livestock	Corn	Oats	Barley	Grain sorghum	Wheat ¹
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
Milk cows.....	5,576	577	44	56	---
Other dairy.....	1,060	98	---	---	---
Beef cows.....	144	---	---	---	---
Fed beef.....	2,012	18	197	16	4
Other beef.....	64	---	---	---	---
Hogs.....	17,502	753	---	---	---
Sheep.....	8	1	---	---	---
Horses and mules.....	2,246	900	---	---	---
Hens and pullets.....	12,151	2,570	0	1,421	553
Chickens raised.....	2,536	1,147	---	528	197
Broilers.....	19,074	---	---	2,167	404
Turkeys.....	1,186	44	---	61	35
Other livestock.....	3,525	1,089	731	238	62
TOTAL.....	67,084	7,197	972	4,487	1,255

¹ Includes a small amount of rye.

Broilers, hogs, and hens and pullets were the major users of grain. Broilers consumed approximately 28 per cent, hogs 23 per cent, and hens and pullets 20 per cent. Poultry (all classes) utilized approximately 54 per cent of the total.

Volumes of feed grains reported available exceeded estimated utilization by about 5 per cent, Table 18. Production plus net imports and inventory changes, as reported in the survey of grain handlers and feed manufacturers, amounted to approximately 85.2 million bushels; estimated utilization was 81 million bushels. Nonfeed uses of grain for such products as cereals, corn meal, and flour could have accounted for much of the difference in volume available and that utilized by livestock.

Differences in the estimated amounts of oats and barley available and utilized were probably made up by substitution of

TABLE 18. FEED GRAIN AVAILABILITY AND UTILIZATION, ALABAMA, 1964

Grain	Production	Net receipts	Change in inventory	Amount available	Estimated utilization
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
Corn.....	38,886	32,858	+2,095	73,839	67,084
Oats.....	1,338	2,735	+ 564	4,637	7,197
Wheat.....	1,189	2,259	+ 314	3,762	972
Barley.....	---	---	---	---	4,487
Grain sorghum.....	268	2,687	+ 45	3,000	1,255
TOTAL.....	41,681	40,539	3,018	85,238	80,995

corn and grain sorghum for which an excess was reported as being available.

Feed Grain Situation in 1975

Projected feed grains balances for 1975 indicate a need for expanded grain handling facilities.

Feed grain utilization by all classes of livestock and poultry was estimated to be 143.5 million bushels, Table 19, approximately a 77 per cent increase. Projection of trends shows that 29 million bushels will be produced within the State. This leaves 115 million bushels to be shipped in, which is about three times the volume imported in 1964.

Increased volumes of feed grains will be needed mainly to support expected expansion in poultry production. Compared with 1964, less will be fed to dairy animals and more to hogs and horses. On a tonnage basis, projected estimates show that about 71 per cent of the feed grains will be utilized by poultry, 14 per cent by hogs, 11 per cent by cattle, and 4 per cent by horses and mules.

The majority of grain will probably continue to be corn shipped from the Midwest or Corn Belt. Water will continue to be important for transporting grain to the dense poultry producing areas adjacent to the Tennessee River. Further development of other rivers, and possible construction of the Tom-

TABLE 19. ESTIMATED FEED GRAIN UTILIZATION, BY CLASS OF LIVESTOCK, ALABAMA, 1975

Class of livestock	Corn	Oats	Barley	Grain sorghum	Wheat
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
Milk cows.....	2,253	492	19	24	---
Other dairy.....	409	79	---	---	---
Beef cows.....	157	---	---	---	---
Fed beef.....	3,031	57	297	24	8
Other beef.....	83	---	---	---	---
Hogs.....	17,795	1,574	---	---	---
Horses and mules.....	3,391	3,536	---	---	---
Hens and pullets.....	26,555	12,907	---	3,540	1,377
Chickens raised.....	4,629	5,630	---	1,299	475
Broilers.....	34,857	---	---	4,546	707
Turkeys.....	3,032	479	---	329	185
Other livestock.....	6,086	1,880	1,263	411	107
TOTAL.....	102,278	26,634	1,579	10,173	2,859

bigbee Waterway, will increase the feasibility of barge shipments of Midwestern grain to other State regions.

More competitive rates on rail transportation and more efficient rail systems will increase the feasibility of locating economic size grain handling and processing facilities at inland points. Development and use of such facilities would have a cumulative effect and permit economies of scale to accrue to facilities and transportation systems, and thus lower costs to inland producing areas.

Truck transportation should become more efficient and competitive with completion of more interstate highway systems.

An increase in Alabama's feed grain deficit should not seriously restrict growth or efficiency of the livestock and poultry industries. The favorable outlook for improving efficiency and competitiveness of transportation indicates only a need for expansion of handling and processing facilities.

Many questions will require answers before decisions are made to locate grain handling or processing facilities at any given place. However, general conclusions of this study indicate that facilities will need to be expanded significantly within the decade. Much of the expansion can be accomplished through modification and expansion of existing facilities, but new ones will also be needed. Central and southern Alabama, where soybean production is rapidly increasing, appear to have the greatest need for new facilities.

New facilities are indicated to handle locally produced soybeans as a basic function. If dairying continues at near present levels and grain feeding of beef cattle and hogs increases, more facilities will be needed in central and southern Alabama to receive grain for use in feeds. Dual use of facilities would increase the feasibility by assuring more utilization through the year.

Since risks are normally assumed by individual firms as a result of choosing a specific location, the economic feasibility of any facility should be specifically determined.

SUMMARY

The purpose of this study was to estimate feed grain production and utilization for the present and to project these amounts to 1975. This information was to be used as a basis for determining adjustments that may be needed in grain marketing facilities in the next decade.

Grain production estimates were obtained from Alabama Co-operative Crop Reporting Service and U.S. Department of Agriculture reports. A net import-export balance was determined from a survey of grain marketing firms in the State. This balance was combined with the quantity produced to arrive at the quantity available for use in Alabama. Utilization of feed grains was determined for all types of livestock and poultry by multiplying the amount of grain in an average ration for each type by the number of head fed during the year.

Trends in grain and animal production for 1953-66 were extended to 1975. An average ration for animals to be fed was used to estimate utilization in 1975.

Total utilization of feed grains in 1964 exceeded 80 million bushels while total production was 41 million bushels. Corn utilization was 67 million bushels and production 39 million bushels. Estimates for 1975 showed that more than 100 million bushels of corn and 43 million bushels of other feed grain will be consumed by livestock and poultry. Poultry will utilize over three-fourths the total in 1975.

Grain marketing facilities in 1975 will be required to handle approximately 75 per cent more feed grain than in 1964. Projected grain production in 1975 will be approximately 30 million bushels, indicating a need for over 113 million bushels to be imported from other states. In addition, 23 million bushels of Alabama-produced soybeans will be marketed. A total of 166 million bushels of grains will be handled by grain marketing and processing facilities in 1975.

APPENDIX A

APPENDIX A TABLE 1. CORN PRODUCTION, BY SM-29 MARKET AREA,
ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
1953.....	44,800	21,952	22,848
1954.....	27,573	15,524	12,049
1955.....	58,736	26,960	31,776
1956.....	47,736	23,021	24,715
1957.....	47,675	23,885	23,790
1958.....	55,614	31,282	24,332
1959.....	46,982	23,190	23,792
1960.....	44,330	23,625	20,705
1961.....	43,890	23,832	20,058
1962.....	31,460	17,083	14,377
1963.....	40,222	20,473	19,749
1964.....	36,210	18,865	17,345
1965.....	37,520	20,415	17,105
1966.....	26,070	14,436	11,634

APPENDIX A TABLE 2. WHEAT PRODUCTION, BY SM-29 MARKET AREA,
ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
1953.....	462	170	292
1954.....	523	194	334
1955.....	1,007	370	637
1956.....	1,840	718	1,122
1957.....	2,340	763	1,577
1958.....	2,300	726	1,574
1959.....	1,265	388	877
1960.....	1,200	410	790
1961.....	1,456	517	939
1962.....	840	262	578
1963.....	987	504	483
1964.....	1,600	770	830
1965.....	1,348	807	541
1966.....	1,624	1,023	601

APPENDIX A TABLE 3. OAT PRODUCTION, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
1953.....	4,416	2,789	1,627
1954.....	5,458	3,447	2,011
1955.....	3,848	2,430	1,418
1956.....	4,896	3,092	1,804
1957.....	2,475	1,563	912
1958.....	2,528	1,597	931
1959.....	3,484	2,201	1,283
1960.....	2,975	1,879	1,096
1961.....	3,315	2,095	1,220
1962.....	2,448	1,547	901
1963.....	1,160	733	427
1964.....	1,701	1,075	626
1965.....	1,400	885	515
1966.....	1,292	816	476

APPENDIX A TABLE 4. GRAIN SORGHUM PRODUCTION, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
1953.....	450	168	282
1954.....	294	110	184
1955.....	874	326	548
1956.....	612	228	384
1957.....	774	289	485
1958.....	912	340	572
1959.....	598	223	375
1960.....	480	179	301
1961.....	364	136	228
1962.....	240	90	150
1963.....	308	115	193
1964.....	189	70	119
1965.....	270	101	169
1966.....	210	78	132

APPENDIX A TABLE 5. SOYBEAN PRODUCTION, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 bushels</i>	<i>1,000 bushels</i>	<i>1,000 bushels</i>
1953.....	1,804	1,551	253
1954.....	1,140	1,035	105
1955.....	2,068	1,856	212
1956.....	2,255	2,030	225
1957.....	2,440	2,170	270
1958.....	2,794	2,452	342
1959.....	2,860	2,331	529
1960.....	3,240	2,637	603
1961.....	3,611	2,820	791
1962.....	3,608	2,814	794
1963.....	3,840	2,930	910
1964.....	4,554	3,370	1,184
1965.....	5,016	3,616	1,400
1966.....	6,860	4,993	1,867

APPENDIX A TABLE 6. MILK COWS 2 YEARS AND OLDER, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	423	258	165
1954.....	440	264	176
1955.....	409	241	168
1956.....	380	224	158
1957.....	346	204	142
1958.....	318	188	130
1959.....	293	175	118
1960.....	270	166	104
1961.....	256	156	100
1962.....	246	150	96
1963.....	231	139	92
1964.....	210	124	86
1965.....	200	117	83
1966.....	186	110	76

APPENDIX A TABLE 7. OTHER DAIRY ANIMALS, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	302	187	115
1954.....	294	176	118
1955.....	269	159	110
1956.....	237	140	97
1957.....	214	126	88
1958.....	195	115	80
1959.....	182	109	73
1960.....	170	105	65
1961.....	163	98	65
1962.....	156	95	61
1963.....	144	88	56
1964.....	131	81	50
1965.....	124	76	48
1966.....	110	67	43

APPENDIX A TABLE 8. BEEF COWS, 2 YEARS AND OLDER, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	503	417	86
1954.....	624	518	106
1955.....	642	526	116
1956.....	622	510	112
1957.....	625	512	113
1958.....	634	520	114
1959.....	641	525	116
1960.....	669	546	123
1961.....	675	541	134
1962.....	705	560	145
1963.....	759	590	169
1964.....	806	613	193
1965.....	848	633	215
1966.....	856	636	220

APPENDIX A TABLE 9. BEEF CATTLE GRAIN FATTENED, BY SM-29 MARKET AREA, ALABAMA, 1960-1965

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1960.....	54	27	27
1961.....	46	23	23
1962.....	64	32	32
1963.....	57	29	28
1964.....	64	32	32
1965.....	54	27	27

APPENDIX A TABLE 10. OTHER BEEF CATTLE, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	509	412	97
1954.....	553	448	105
1955.....	515	417	98
1956.....	504	408	96
1957.....	541	438	103
1958.....	544	441	103
1959.....	524	424	100
1960.....	547	443	104
1961.....	562	455	107
1962.....	582	471	111
1963.....	623	505	118
1964.....	715	579	136
1965.....	783	634	149
1966.....	783	634	149

APPENDIX A TABLE 11. HOGS PRODUCED, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	1,284	835	449
1954.....	1,493	985	508
1955.....	1,628	1,058	570
1956.....	1,584	1,030	554
1957.....	1,521	989	532
1958.....	1,541	1,002	539
1959.....	1,745	1,152	593
1960.....	1,465	952	513
1961.....	1,468	954	514
1962.....	1,434	932	502
1963.....	1,286	849	437
1964.....	1,149	758	391
1965.....	1,079	701	378
1966.....	1,250	812	438

APPENDIX A TABLE 12. SHEEP, BY SM-29 MARKET AREA, ALABAMA 1953-1966

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	33	22	11
1954.....	47	31	16
1955.....	55	37	18
1956.....	110	57	53
1957.....	85	58	27
1958.....	53	35	18
1959.....	39	26	13
1960.....	36	24	12
1961.....	31	21	10
1962.....	22	15	7
1963.....	18	12	6
1964.....	14	10	4
1965.....	12	8	4
1966.....	10	7	3

APPENDIX A TABLE 13. HORSES AND MULES, BY SM-29 MARKET AREA, ALABAMA, 1953-1964

Year	State	Area 7	Area 8
	<i>1,000 head</i>	<i>1,000 head</i>	<i>1,000 head</i>
1953.....	210	136	74
1954.....	189	125	64
1955.....	174	115	59
1956.....	157	104	53
1957.....	137	78	59
1958.....	122	80	42
1959.....	110	72	38
1960.....	100	65	35
1961.....	100	65	35
1962.....	100	65	35
1963.....	100	65	35
1964.....	100	65	35

APPENDIX A TABLE 14. HENS AND PULLETS, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
1953.....	5,961	2,623	3,338
1954.....	5,703	2,680	3,023
1955.....	5,899	2,714	3,185
1956.....	5,917	2,722	3,195
1957.....	6,279	2,825	3,454
1958.....	7,084	3,046	4,038
1959.....	8,091	3,155	4,936
1960.....	7,962	3,025	4,937
1961.....	8,564	3,169	5,395
1962.....	11,199	4,032	7,167
1963.....	12,160	3,770	8,390
1964.....	13,264	3,979	9,285
1965.....	14,614	4,384	10,230
1966.....	15,198	4,559	10,639

APPENDIX A TABLE 15. CHICKENS RAISED, BY SM-29 MARKET AREA, ALABAMA, 1953-1964

Year	State	Area 7	Area 8
	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
1953.....	9,070	3,991	5,079
1954.....	9,251	4,348	4,903
1955.....	7,216	3,319	3,897
1956.....	7,793	3,585	4,208
1957.....	7,403	3,331	4,072
1958.....	8,958	3,852	5,106
1959.....	9,585	3,738	5,847
1960.....	7,956	3,023	4,933
1961.....	9,627	3,562	6,065
1962.....	9,820	3,535	6,285
1963.....	10,115	3,135	6,980
1964.....	11,835	3,550	8,285

APPENDIX A TABLE 16. BROILERS PRODUCED, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
1953.....	28,416	2,557	25,859
1954.....	47,739	7,161	40,578
1955.....	57,764	11,552	46,212
1956.....	82,473	17,319	65,154
1957.....	103,875	23,891	79,984
1958.....	131,640	32,910	98,730
1959.....	158,248	41,144	117,104
1960.....	176,654	44,164	132,490
1961.....	198,036	47,529	150,507
1962.....	214,933	49,434	165,499
1963.....	227,989	56,977	171,012
1964.....	242,764	60,691	182,073
1965.....	285,077	71,269	213,808
1966.....	324,124	81,031	243,093

APPENDIX A TABLE 17. TURKEYS RAISED, BY SM-29 MARKET AREA, ALABAMA, 1953-1966

Year	State	Area 7	Area 8
	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
1953.....	290	238	52
1954.....	259	157	102
1955.....	273	166	107
1956.....	262	160	102
1957.....	223	80	43
1958.....	348	125	223
1959.....	313	115	198
1960.....	300	123	177
1961.....	330	142	188
1962.....	238	38	200
1963.....	536	134	402
1964.....	708	304	404
1965.....	783	313	470
1966.....	1,278	511	767

APPENDIX B

APPENDIX B TABLE 1. CURRENT AND PROJECTED RATIOS FOR MILK COWS 2 YEARS OLD OR OLDER (PRODUCTION PER HEAD—1964, 4,200 POUNDS; 1975, 6,000 POUNDS) AND OTHER DAIRY CATTLE

Ingredient	Feed used in rations, per head			
	Milk cows		Other dairy cattle	
	1964	1975	1964	1975
	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Feed grain				
Corn (excluding silage).....	1,487.0	1,002.0	475.0	675.0
Oats.....	88.0	250.0	25.0	75.0
Barley.....	10.0	14.0	-----	-----
Sorghum grain.....	15.0	21.0	-----	-----
Wheat and rye.....	-----	-----	-----	-----
Total feed grains.....	1,600.0	2,287.0	500.0	750.0
By-product feeds				
Oil seed meals				
Cottonseed meal.....	161.0	230.0	75.0	112.0
Soybean meal.....	90.0	128.0	25.0	38.0
Other oil seed meals ¹	-----	-----	-----	-----
Animal proteins ²				
Grain proteins ³	20.0	29.0	-----	-----
Mill feeds ⁴	20.0	29.0	-----	-----
Other ⁵	109.0	154.0	-----	-----
Total by-product feeds.....	400.0	570.0	100.0	150.0
Seeds ⁶				
Milk ⁷	-----	-----	66.0	66.0
Total concentrates.....	2,000.0	2,857.0	666.0	966.0
Hay.....	1,800.0	1,320.0	2,000.0	2,000.0
Silage and wet beet pulp ⁸	2,200.0	4,400.0	500.0	2,000.0
Corn stover and sorghum forage	-----	-----	-----	-----
Straw.....	-----	-----	-----	-----
TOTAL	6,000.0	8,577.0	3,166.0	4,966.0

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.

APPENDIX B TABLE 2. CURRENT AND PROJECTED RATIONS FOR BEEF COWS 2 YEARS OLD OR OLDER AND OTHER BEEF CATTLE

Ingredient	Feed used in rations, per head			
	Beef cows		Other beef cattle	
	1964	1975	1964	1975
	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Feed grain				
Corn (excluding silage).....	10.0	10.0	5.0	5.0
Oats.....	-----	-----	-----	-----
Barley.....	-----	-----	-----	-----
Sorghum grain.....	-----	-----	-----	-----
Wheat and rye.....	-----	-----	-----	-----
Total feed grains.....	10.0	10.0	5.0	5.0
By-product feeds				
Oil seed meals				
Cottonseed meal.....	100.0	100.0	50.0	50.0
Soybean meal.....	-----	-----	-----	-----
Other oil seed meals ¹	-----	-----	-----	-----
Animal proteins ²	-----	-----	-----	-----
Grain proteins ³	-----	-----	-----	-----
Mill feeds ⁴	-----	-----	-----	-----
Other ⁵	-----	-----	-----	-----
Total by-product feeds.....	100.0	100.0	50.0	50.0
Seeds ⁶				
Milk ⁷	-----	-----	-----	-----
Total concentrates.....	110.0	110.0	55.0	55.0
Hay.....	1,500.0	1,500.0	400.0	400.0
Silage and wet beet pulp ⁸	-----	-----	-----	-----
Corn stover and sorghum forage.....	-----	-----	-----	-----
Straw.....	-----	-----	-----	-----
TOTAL.....	1,610.0	1,610.0	455.0	455.0

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.

APPENDIX B TABLE 3. CURRENT AND PROJECTED RATIONS FOR BEEF CATTLE GRAIN FATTENED (PRODUCTION PER HEAD—1964, 800 POUNDS; 1975, 900 POUNDS) AND HOGS (PRODUCTION PER HEAD—1964, 210 POUNDS; 1975, 215 POUNDS)

Ingredients	Feed used in rations, per head			
	Beef cattle		Hogs	
	1964	1975	1964	1975
	Lb.	Lb.	Lb.	Lb.
Feed grain				
Corn (excluding silage).....	1,910.0	2,533.0	853.0	851.0
Oats.....	10.0	27.0	21.0	43.0
Barley.....	160.0	213.0	-----	-----
Sorghum grain.....	15.0	20.0	-----	-----
Wheat and rye.....	5.0	7.0	-----	-----
Total feed grains.....	2,100.0	2,800.0	874.0	894.0
By-product feeds				
Oil seed meals				
Cottonseed meal.....	160.0	213.0	8.0	16.0
Soybean meal.....	20.0	27.0	46.0	40.0
Other oil seed meals ¹	15.0	20.0	2.0	2.0
Animal proteins ²	-----	-----	40.0	41.0
Grain proteins ³	10.0	13.0	6.0	6.0
Mill feeds ⁴	25.0	33.0	25.0	26.0
Other ⁵	150.0	200.0	23.0	24.0
Total by-product feeds.....	380.0	506.0	150.0	155.0
Seeds ⁶	-----	-----	2.0	2.0
Milk ⁷	-----	-----	2.0	2.0
Total concentrates.....	2,480.0	3,306.0	1,028.0	1,053.0
Hay.....	370.0	370.0	-----	-----
Silage and wet beet pulp ⁸	650.0	987.0	-----	-----
Corn stover and sorghum forage	-----	-----	-----	-----
Straw.....	-----	-----	-----	-----
TOTAL	3,500.0	4,663.0	1,028.0	1,053.0

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.

APPENDIX B TABLE 4. CURRENT AND PROJECTED RATIONS FOR HENS AND PULLETS (PRODUCTION PER HEAD—1964, 206 EGGS; 1975, 215 EGGS) AND CHICKENS RAISED (PRODUCTION PER HEAD—1964, 4.4 POUNDS; 1975, 4.2 POUNDS)

Ingredients	Feed used in rations, per head			
	Hens and pullets		Chickens	
	1964	1975	1964	1975
	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Feed grain				
Corn (excluding silage).....	51.3	45.0	12.0	8.2
Oats.....	6.2	12.5	3.1	5.7
Barley.....	.....	.....	.....	.....
Sorghum grain.....	6.0	6.0	2.5	2.3
Wheat and rye.....	22.5	2.5	1.0	.9
Total feed grains.....	66.0	66.0	18.6	17.1
By-product feeds				
Oil seed meals				
Cottonseed meal.....	1.5	1.8	.1	.1
Soybean meal.....	8.8	9.5	3.0	2.7
Other oil seed meals ¹.....	.5	.5	.2	.2
Animal proteins ²	3.0	3.4	.7	.7
Grain proteins ³.....	.5	.8	.6	.6
Mill feeds ⁴	4.7	5.0	1.0	.9
Other ⁵	3.0	3.0	.5	.4
Total by-product feeds.....	22.0	24.0	6.1	5.6
Seeds ⁶.....	.....	.....	.....	.....
Milk ⁷.....	.....	.....	.....	.....
Total concentrates.....	88.0	90.0	24.7	22.7
Hay.....	.....	.....	.....	.....
Silage and wet beet pulp ⁸.....	.....	.....	.....	.....
Corn stover and sorghum forage.....	.....	.....	.....	.....
Straw.....	.....	.....	.....	.....
TOTAL.....	88.0	90.0	24.7	22.7

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.

APPENDIX B TABLE 5. CURRENT AND PROJECTED RATIOnS FOR BROILERS (PRODUCTION PER HEAD—1964, 3.3 POUNDS; 1975, 3.6 POUNDS) AND TURKEYS (PRODUCTION PER HEAD—1964, 18 POUNDS; 1975, 18 POUNDS)

Ingredient	Feed used in rations, per head			
	Broilers		Turkeys	
	1964	1975	1964	1975
	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Feed grain				
Corn (excluding silage).....	4.4	4.6	46.3	44.3
Oats.....	-----	-----	2.0	4.0
Barley.....	-----	-----	-----	-----
Sorghum grain.....	.5	.6	4.8	4.8
Wheat and rye.....	2.9	2.9	.1	.1
Total feed grains.....	5.0	5.3	56.0	56.0
By-product feeds				
Oil seed meals				
Cottonseed meal.....	.1	.1	.8	.8
Soybean meal.....	1.9	2.0	12.0	12.0
Other oil seed meals ¹.....	.1	.1	.8	.8
Animal proteins ².....	.3	.3	4.8	4.8
Grain proteins ³.....	.2	.2	2.4	2.4
Mill feeds ⁴	-----	-----	-----	-----
Other ⁵.....	.7	.7	3.2	3.2
Total by-product feeds.....	3.3	3.3	24.0	24.0
Seeds ⁶	-----	-----	-----	-----
Milk ⁷	-----	-----	-----	-----
Total concentrates.....	8.3	8.7	80.0	80.0
Hay.....	-----	-----	-----	-----
Silage and wet beet pulp ⁸	-----	-----	-----	-----
Corn stover and sorghum forage.....	-----	-----	-----	-----
Straw.....	-----	-----	-----	-----
TOTAL	8.3	8.7	80.0	80.0

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.

APPENDIX B TABLE 6. CURRENT AND PROJECTED RATIONS FOR HORSES AND MULES AND SHEEP (PRODUCTION PER HEAD—1964, 38 POUNDS; 1975, 55 POUNDS)

Ingredients	Feed used in rations, per head			
	Horses and mules		Sheep	
	1964	1975	1964	1975
	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Feed grain				
Corn (excluding silage).....	1,258.0	1,158.0	35.0	46.0
Oats.....	288.0	690.0	3.0	9.0
Barley.....	-----	-----	-----	-----
Sorghum grain.....	-----	-----	-----	-----
Wheat and rye.....	-----	-----	-----	-----
Total feed grains.....	1,546.0	1,848.0	38.0	55.0
By-product feeds				
Oil seed meals				
Cottonseed meal.....	-----	-----	15.0	22.0
Soybean meal.....	-----	-----	2.0	2.0
Other oil seed meals ¹	-----	-----	-----	-----
Animal proteins ²	-----	-----	-----	-----
Grain proteins ³	-----	-----	-----	-----
Mill feeds ⁴	58.0	69.0	-----	-----
Other ⁵	68.0	81.0	-----	-----
Total by-product feeds.....	126.0	150.0	17.0	24.0
Seeds ⁶	-----	-----	-----	-----
Milk ⁷	-----	-----	-----	-----
Total concentrates.....	1,672.0	1,998.0	55.0	79.0
Hay.....	2,437.0	2,437.0	180.0	180.0
Silage and wet beet pulp ⁸	-----	-----	-----	-----
Corn stover and sorghum forage.....	-----	-----	-----	-----
Straw.....	-----	-----	-----	-----
TOTAL	4,109.0	4,435.0	235.0	259.0

¹ Includes linseed meal, peanut meal, and copra meal.

² Includes tankage, meat scraps, fish meal, and dried milk products.

³ Includes gluten feed and meal and brewers' dried grains.

⁴ Includes wheat and rice millfeeds.

⁵ Includes dried and molasses beet pulp, alfalfa meal, molasses, hominy, oat mill-feed, screenings, and added fats.

⁶ Includes cottonseed, soybeans, cowpeas, velvet beans, and peanuts.

⁷ Dry equivalent of noncommercial milk products feed as liquids.

⁸ Corn, sorghum, and grass silage, and wet beet and citrus pulp.