Contribution of Agriculture to the Arkansas Economy

by Wayne P. Miller and Yoko Soto

ARKANSAS AGRICULTURAL EXPERIMENT STATION
Division of Agriculture University of Arkansas
November 1999 Special Report 196

Cover design and technical editing by Karen Eskew

Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Fayetteville. Milo J. Shult, Vice President for Agriculture and Director; Charles J. Scifres, Associate Vice President for Agriculture. 1M 11/99 PM65.The Arkansas Agricultural Experiment Station follows a nondiscriminatory policy in programs and employment.

ISSN:0571-0189 CODEN:AUARAN

CONTRIBUTION OF AGRICULTURE TO THE ARKANSAS ECONOMY

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SUMMARY

Arkansas' agricultural sector is a vital and growing component of the state's economy. Including direct, indirect, and induced effects, agricultural production and the first-stage processing of agricultural products account for approximately one-fourth of all jobs and value in the Arkansas economy.

The agricultural sector is relatively more important to Arkansas' economy than the economies of neighboring states, the southeast region, or the United States as a whole. Production and processing of agricultural products, including crops, livestock, forest products, and fisheries, accounted for 15% of Arkansas' gross state product in 1996, the most recent year available, up from 13% in 1977.

• There were a total of 337,868 Arkansas workers employed as a result of agricultural production and processing in the state. This is equal to 24% of the jobs in Arkansas in 1995.

• These workers received $8.1 billion in wages and salaries, which was about one-fourth of total employee income in 1995.

• The total value added as a result of agricultural production and processing in the state was approximately $13 billion. This was 25% of all value added in the state in 1995.

Key Words: Arkansas agriculture, Arkansas economy, economic impact, gross state product (GSP).

CONTENTS

CONTRIBUTION OF AGRICULTURE TO THE ARKANSAS ECONOMY

Historically, agriculture has been the primary engine that generated economic growth in Arkansas. Wealth generated by agriculture is invested in other sectors of the economy, which results in a more diversified and growing economy. Although the agricultural sector has evolved over time, the sector will continue to be a critically important component of Arkansas' economy into the foreseeable future.

The purpose of this report is to:

- compare the size of Arkansas' agricultural sector to the southeast region of the United States and the United States as a whole;
- describe the agricultural sector in relation to the Arkansas economy as a whole;
- describe the broad components that make up Arkansas' agricultural sector (crops, horticulture, livestock, forestry, and fisheries); and
- estimate the number of jobs and value contributed by agriculture to the state's economy.

For the purposes of this study, the agricultural sector is defined as production and processing of agricultural products, including crops, livestock, forestry, and fisheries. Secondary data are used to estimate the economic impact of:

- direct production activities,
- industries that supply agricultural firms,
- spending by employees of agricultural industries at local businesses.

Data for this report are obtained from three sources: the Bureau of Economic Analysis; Arkansas Agricultural Statistics; and the Minnesota IMPLAN Group, Inc. We used the most current data that were available at the time of conducting this research. This means that data from Arkansas Agricultural Statistics and the Bureau of Economic Analysis are for 1996 and data obtained from the Minnesota IMPLAN Group, Inc. are for 1995. Gross state product (GSP) and crop and livestock sales data are for 1996, whereas, employment and value added data are for 1995. The base year for calculating constant dollars is 1992.

Three indicators – gross state product, value added, and employment – are used in this report to measure and compare the size of different sectors of the Arkansas economy. Gross state product and value added are often used interchangeably. The only difference between these two terms is in the method of calculation. Gross state product is

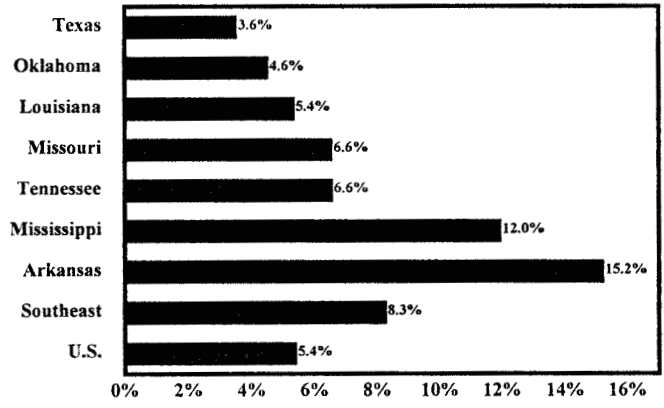
equal to gross output minus the cost of intermediate inputs, whereas, value added is the sum of employee compensation, proprietary and other property income, and indirect business taxes. They both measure the dollar value of the economy and the contribution of an industry or sector to the economy. The sum of all industry value added (gross state product) equals the size of the economy in terms of dollars. Employment (number of full- and part-time jobs) is another measure of the size of an economy.

Sales figures represent the dollar value received from the sale of a product or service. Sales figures do not measure the contribution of a business or industry to the economy. Summing sales figures from all industries would overstate the size of an economy because many products and services would be counted more than once.

The contribution of agriculture to the state economy is computed using IMPLAN, an economic input-output model that generates multipliers to calculate the indirect and induced effects of agricultural production and processing on the state economy.

THE REGIONAL CONTEXT

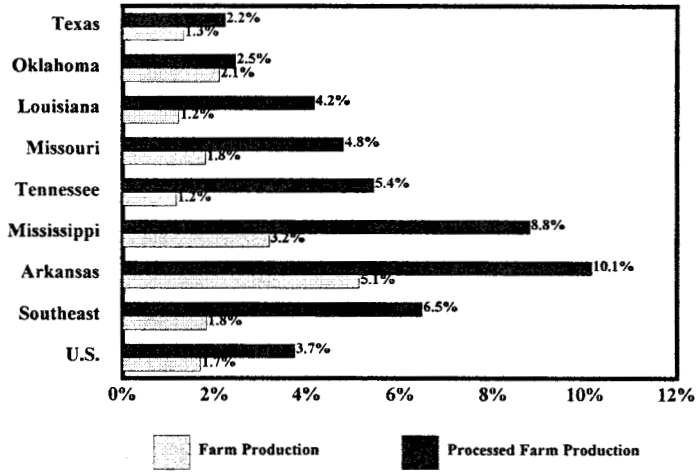
Agriculture is a vital component of Arkansas' economy. Contributing 15% of GSP, Arkansas' agricultural sector accounts for a substantially larger share of GSP than in the United States and the six surrounding states (Fig. 1). Production and processing of agricultural products account for 15.2% of Arkansas' gross state product as compared to 5.4% for the United States and 8.3% for the southeast region. The agricultural sector accounts for from about 4% of GSP in Texas to 12% of GSP in Mississippi.



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 1. Farm production and processing's share of gross state product (GSP), 1996

Both agricultural production and processing are more important to Arkansas' economy than to the United States as a whole or the southeast region (Fig. 2). Arkansas' farm production accounts for more than twice the share of gross state product of the United States or the southeast region. Processing of farm products also accounts for a larger share of gross state product in Arkansas than in the United States or the southeast region.



Source: U.S. Department of Commerce, Bureau of EconomicAnalysis, Regional Economic Analysis Division.

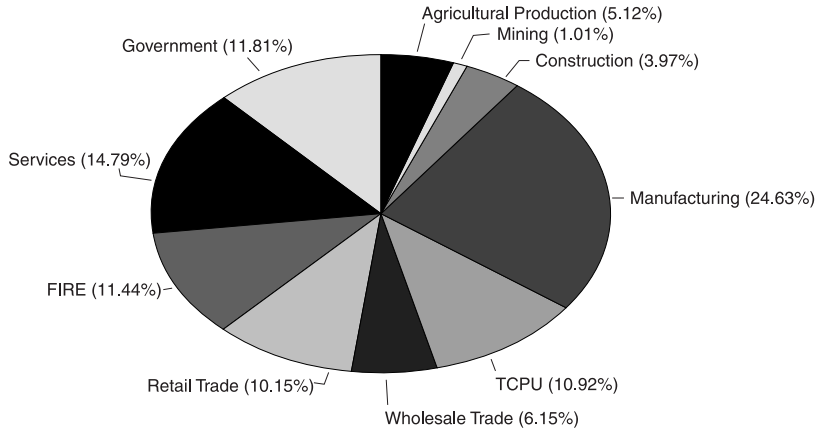
Fig. 2. Share of gross state product by agriculture industry, 1996.

Farm production, which includes crop, livestock, forestry, and fisheries, accounted for 5% of Arkansas' gross state product in 1996. Processing of agricultural products accounted for another 10% of Arkansas gross state product that year.

Compared separately, both production and processing contribute more to Arkansas' gross state product than they do in the six surrounding states, and the southeast region (Fig. 2).

THE ARKANSAS ECONOMY

In 1996, the most recent year for which data are available, Arkansas' total gross state product was $56.4 billion with approximately 1.4 million full- and part-time jobs. Manufacturing is the single largest sector of Arkansas' economy, accounting for 25% of gross state product (Fig. 3). In comparison, manufacturing accounts for just 18% of the U.S. economy.



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 3. Arkansas gross state product, 1996 (sector percentages).

Arkansas' manufacturing sector includes the processing of food and forest products.

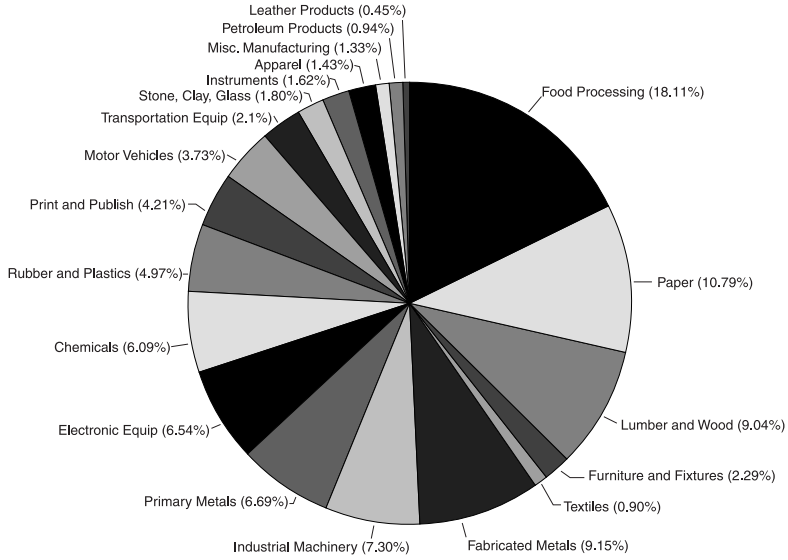
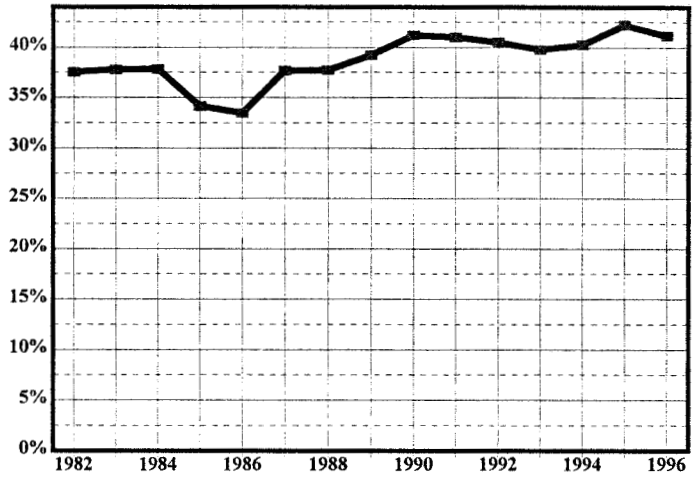


Fig. 4. Components of Arkansas' manufacturing sector (gross state product, 1996).

Processing of agricultural products accounted for 41% of manufacturing gross state product in 1996 (Fig. 5). Agriculture's share of manufacturing has risen from about 38% in the early 1980s.

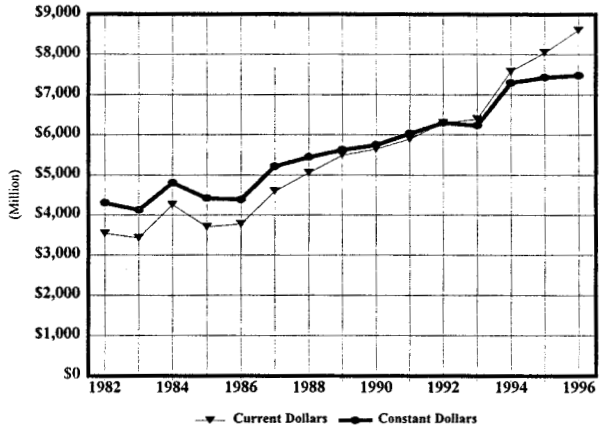


Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 5. Agricultural processing share of manufacturing.

THE AGRICULTURAL SECTOR'S COMPONENTS

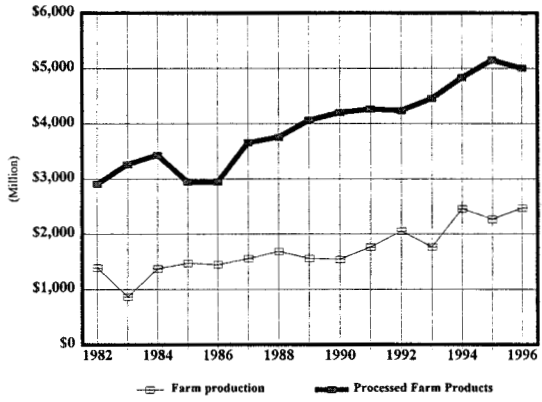
Since 1982, the state's economy has experienced steady growth. Agricultural production and processing remained at about the same level during the early and mid-1980s, saw significant growth in 1987, and slower, but constant growth from 1987 to 1996. The gross state product of agricultural production and processing increased from about $3.5 billion in 1982 to $8.6 billion in 1996 (Fig. 6). In constant dollars, the gross state product of agricultural production and processing increased from about $4.3 billion in 1982 to $7.5 billion in 1996, a 74% increase over this period.



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 6. Arkansas farm production and processing (gross state product).

In constant dollars, both production and processing have increased (Fig. 7). Farm production's gross state product increased 77% from 1982 to 1996. Similarly, processing's gross state product increased 72% during this same period. Combined, production and processing increased 74% from 1982 to 1996.



Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

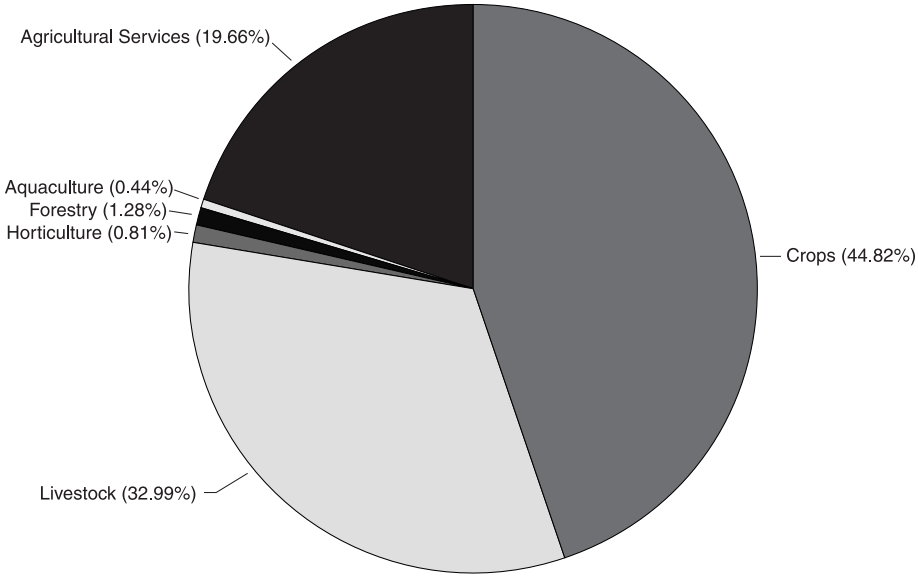
Fig. 7. Arkansas farm production and processing (GSP in constant dollars).

FARM PRODUCTION

Except for a decline in 1983, farm production as measured by gross state product remained relatively constant during the 1980s at about $1.5 billion. Since 1990, production has experienced strong growth from $1.5 billion in 1990 to nearly $ 2.5 billion in 1996, in constant dollars a 66% increase in production.

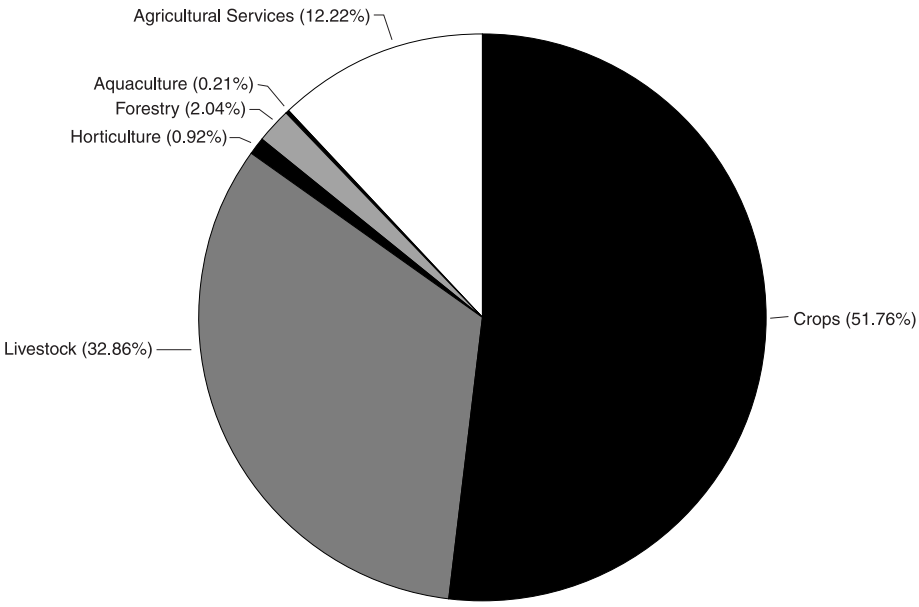
Although employment in farm production has been declining, the sector remains a significant employer, providing jobs for 77,264 workers in 1996 and earnings of $2.1 billion for workers and owners.

Crop Production - Crop production is a vital part of Arkansas' agricultural sector. Crops account for 45% of employment (Fig. 8) and more than half (52%) of the value added (Fig. 9) by all farm production in 1995.



Source: Computed using the 1995 Arkansas database from the Minnesota IMPLAN Group, Inc.

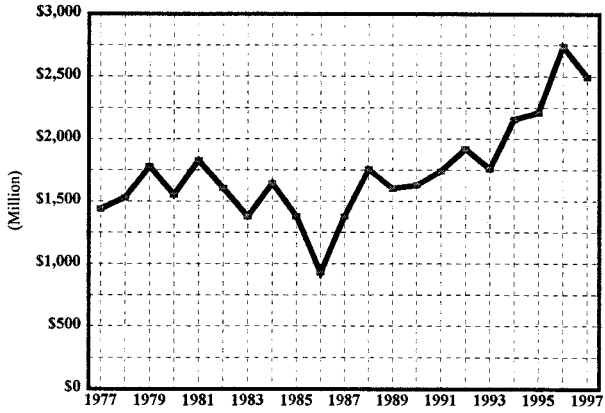
Fig. 8. Employment in farm production, 1995.



Source: Computed using the 1995 Arkansas database from the Minnesota IMPLAN Group, Inc.

Fig. 9. Value added by farm production, 1995.

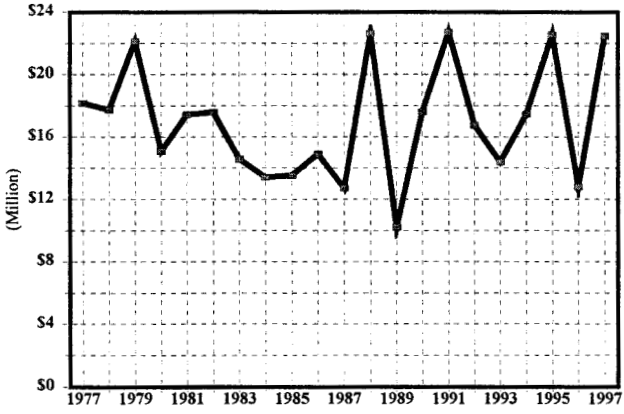
Crop sales reached a record level of $2.7 billion in 1996 (Fig. 10). The dollar value of sales has increased steadily since 1986 fueled by yield improvements, technological advancements, and better management practices. Nonetheless, weather, prices, and other factors continue to contribute to year-to-year variability in the total value of crop production.



Source: Arkansas Agricultural Statistics, various years. For selected crops: rice, soybeans, wheat, cotton (lint & seed), corn, grain sorghum, oats, and hay.

Fig. 10. Arkansas crop sales (current dollars).

Horticulture - Horticultural crops account for 1% of the value and jobs in the farm sector. The value of horticultural crop sales varies greatly from year to year, reaching highs of $22.7 million in 1988, 1991, and 1995 (Fig. 11).

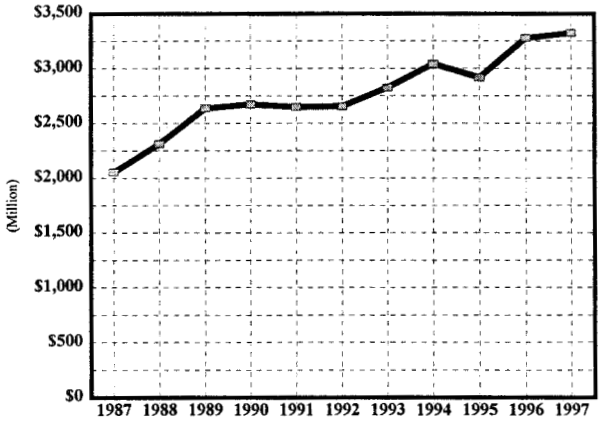


Source: Arkansas Agricultural Statistics, various years. For selected crops: tomatoes, strawberries, grapes, apples, peaches, and pecans.

Fig. 11. Arkansas horticultural sales (current dollars).

Arkansas' major horticultural crops include tomatoes, grapes, peaches, watermelons, pecans, blueberries, apples, and strawberries. The gross sales of all these crops, except watermelons, increased over the period 1980 to 1995, but were quite variable from year to year. The gross sales of all these crops except grapes dropped sharply in 1996.

Livestock Production - Livestock gross sales increased 59% from 1987 to 1996 (Fig. 12) with poultry accounting for most of the growth. From 1991 to 1996, the value of poultry and egg production increased 41%, from $1.7 to $2.4 billion.



Source: Arkansas Agricultural Statistics.

Fig. 12. Arkansas livestock sales (current dollars).

Poultry and egg production is increasing its share of the value of livestock production. In 1991, poultry and egg production accounted for 62% of total livestock sales. In 1996, its share had grown to 74%.

Arkansas ranks second among the states in poultry production. In 1996, Arkansas produced 15% of all broilers in the United States.

Livestock production also accounts for a substantial part of total farm production in the state. Livestock accounted for 33% of employment (Fig. 8) and 33% of value added in 1995 (Fig. 9).

Forestry – Forestry production contributes a small part of all farm production. Forestry production accounted about 1% of employment and 2% of value added in 1996. However, forestry is important to the Arkansas economy because of the timber it provides to the Arkansas wood products manufacturing industry.

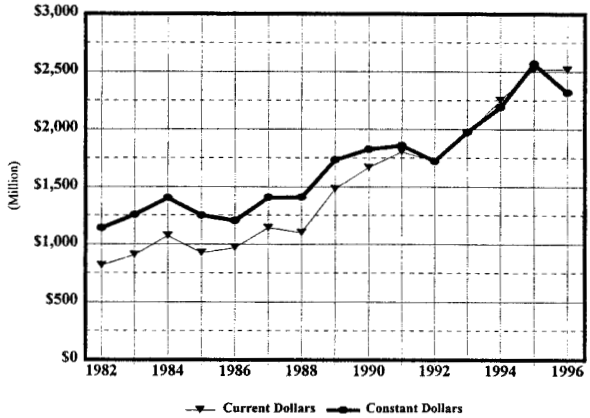
Aquaculture - Commercial fish farming is a small but growing component of agricultural production in Arkansas. In 1995, commercial fish farming contributed about 1% of the value added by agricultural production. From 1991 to 1994, the value of aquaculture sales doubled from $51 million to $103 million. Catfish farming is a large and growing component of the commercial fish farming in Arkansas. It's sales increased from $19 million in 1991 to $44 million in 1996.

Agricultural Services – Agricultural services are the third largest component of Arkansas' agricultural production. In 1995, agricultural services accounted for nearly 20% of employment and 12% of value added by farm production.

PROCESSED AGRICULTURAL PRODUCTS

Processing of farm products is a critical part of Arkansas' agricultural sector. Processing facilities exist in Arkansas because the raw materials (forests, crops, and livestock) are nearby, and vice versa. Processing of agricultural products includes food and kindred products, textile mill products, lumber and wood products, paper and allied products, and furniture and fixtures products.

Food and Kindred Products - The food processing industry has grown rapidly from 1982 to 1996. Gross state product in the industry tripled over the period, growing from $817 million in 1982 to $2.5 billion in 1996 (Fig. 13). In constant dollars, gross state product doubled from $1.1 billion to $2.3 billion during this period.

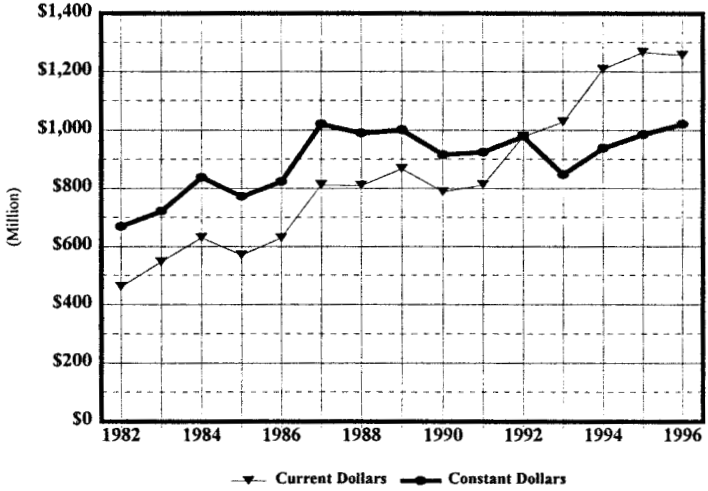


U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 13. Food processing (gross state product).

Employment in the food processing industry also continued to grow. From 1990 to 1995, employment increased by 19%. Food processing employment as a share of manufacturing grew from 20% in 1990 to 21.5% in 1995.

Lumber and Wood Products - The lumber and wood products industry grew from $463 million to $1,257 million between 1982 and 1996 (Fig. 14). However, most of the real growth occurred between 1982 and 1987 when the gross state product, as measured in constant dollars, grew by 50%. Since 1987, gross state product of the lumber and wood products industry, as measured by constant dollars, declined slightly in the early 1990s but rebounded to 1987 levels by 1996.



U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division.

Fig. 14. Lumber and wood products (gross state product).

This industry contributes 7% of the gross state product of Arkansas' manufacturing industry and 18% of agricultural manufacturing. In 1995, the industry employed 27,233 workers.

Paper and Allied Products - The paper and allied products industry is a relatively small but growing component of the agricultural sector. The paper and allied products sector accounted for 11% of manufacturing gross state product in 1996.

The industry grew from $594 million in gross state product in 1982 to nearly $1.5 billion in 1996 (Fig. 15). In constant dollars, the industry grew 58% during the period from $789 million to $1,244 million. In 1995, this industry employed over 15,400 workers with earnings of $679 million.

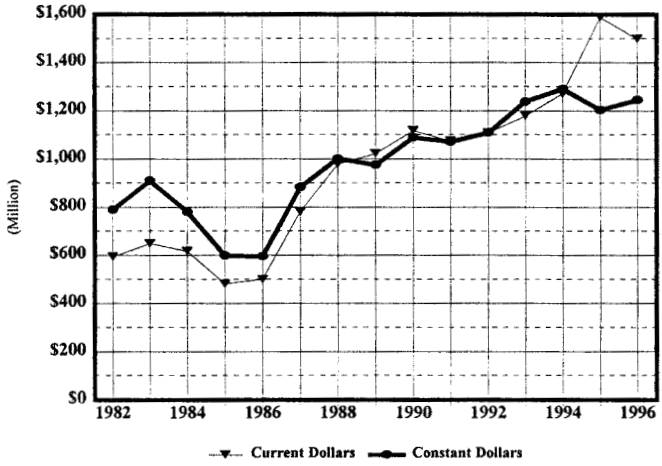


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Fig. 15. Paper and allied product (gross state product).

Textile Mill Products - Textile mill industries accounted for only about 1% of manufacturing gross state product in 1996. The industry increased its gross state product, measured in constant dollars, from $95 million in 1982 to $130 million in 1996, a 37% increase in constant dollars (Fig. 16).

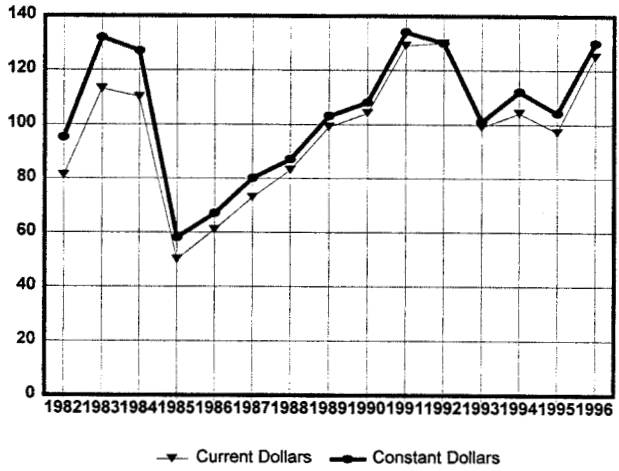


Fig. 16. Textile processing (gross state product).

This modest growth came in spite of a sharp decline in the textile industry from 1984 to 1985 and a recent decline from 1991 to 1993.

Furniture and Fixtures Products - The furniture and fixtures industry is a growing industry. Gross state product in the industry increased from $157 million in 1982 to $318 million in 1996 (Fig. 17). In constant dollars, the industry grew 34% during the time period. The industry employed 7,796 workers with wages and salaries of $185 million in 1995. The industry accounted for 2.3% of manufacturing gross state product.

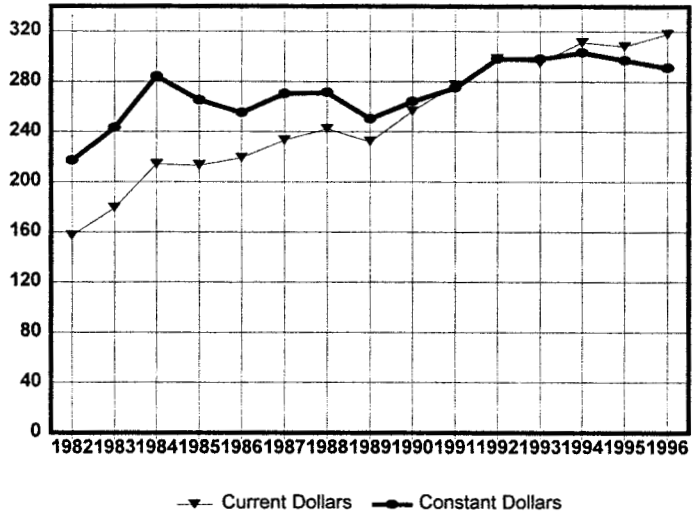


Fig. 17. Furniture and fixtures (gross state product).

AGRICULTURAL PROCESSING SUMMARY

The industries that process farm products have grown considerably since 1982. These processing industries have grown from a gross state product of $2.1 billion in 1982 to $5.7 billion in 1996. In constant dollars, this is a growth of 72%.

The agricultural processing industries also grew in their share of manufacturing gross state product. These industries grew from 37% of manufacturing in 1982 to 41% in 1996. Agricultural processing's share of the total Arkansas gross state product grew slightly from 9% in 1982 to 10% in 1996.

AGRICULTURE - A GROWING SECTOR

The gross state product of combined agricultural sector (production and processing) grew from $3.5 billion to $8.6 billion from 1982 to 1996. This represents growth of 74% in constant dollars. A large share of this increase comes from food and kindred products, which grew from 14.5% to 18.1% of total manufacturing from 1982 to 1996. The agricultural sector's share of gross state product remains at the 1982 level of 15.3% (Fig. 18).

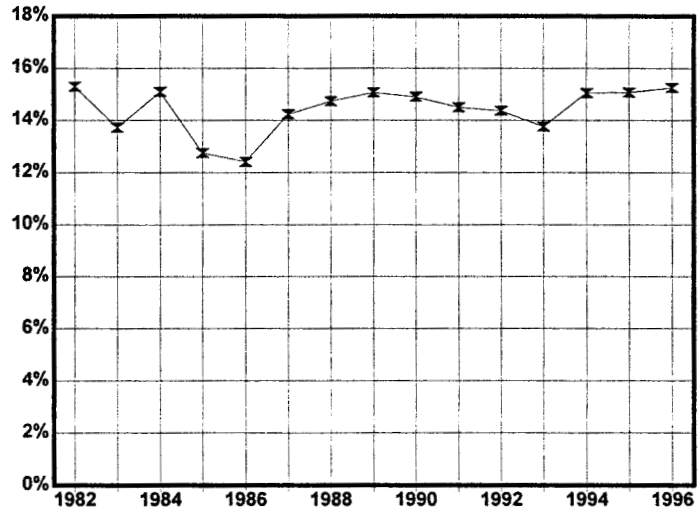


Fig. 18. Farm production and processing share of GSP.

ECONOMIC IMPACT OF AGRICULTURE

The impact of agriculture on the state economy is larger than the direct effect of agricultural production and processing described above. The contribution of agriculture to the state economy includes indirect and induced effects.

- **Direct effects** result from producing agricultural commodities and processed products. The agricultural production and processing firms hire workers and use raw materials to produce their product.
- **Indirect effects** result when agricultural firms purchase raw materials and services from other Arkansas businesses to produce their products. These sup-

plying firms will hire additional employees and purchase additional goods and services from other Arkansas firms. The additional production required to supply the agricultural production and processing firms is called the indirect effect. The indirect effects are computed using the direct expenditures adjusted for employment and income multipliers generated by IMPLAN, an economic input-output model.

- **Induced effects** result from local purchases of goods and services by employees of the agricultural firms and employees of the supplying industries that produce goods and provide services for agricultural firms.

The contribution of agriculture to the state economy includes the sum of the direct, indirect, and induced economic activity.

THE SECTOR'S DIRECT IMPACTS

The agricultural sector's direct impact on the state's economy is measured by the sum of impacts of farm production and the processing of farm products.The direct impacts are measured by total production, employment, income, and value added.There were 187,096 workers employed by the farm production and processing sectors (Table 1). These workers and the owners of these farms and businesses received nearly $4.6 billion in wages and salaries and these industries added value of nearly $7 billion to the Arkansas economy.

Table 1. Summary of Agricultural Sector Impacts on Arkansas' economy, 1995.

	Jobs	Personal income	Value added
		Million $	Million $
Ag production	75,285	1,386	2,072
Ag processing	111,811	3,185	4,883
Total Ag - Direct	**187,096**	**4,571**	**6,955**
Ag inputs - indirect	65,128	1,766	2,980
Total Agriculture	**252,224**	**6,337**	**9,935**
Ag - Induced	85,644	1,795	3,081
Total Ag Related	**337,868**	**8,132**	**13,016**

INDIRECT EFFECTS OF SUPPLYING INDUSTRIES

There were 65,128 workers employed by industries supplying goods and services to the farm production and processing industries. These workers and the owners of these establishments received nearly $1.8 billion in wages and salaries and these industries added value of nearly $3 billion to the Arkansas economy.

Most of the indirect jobs created (70%) are in the service, trade, and transportation industries. However, many jobs were also created in the construction, finance, and manufacturing industries.

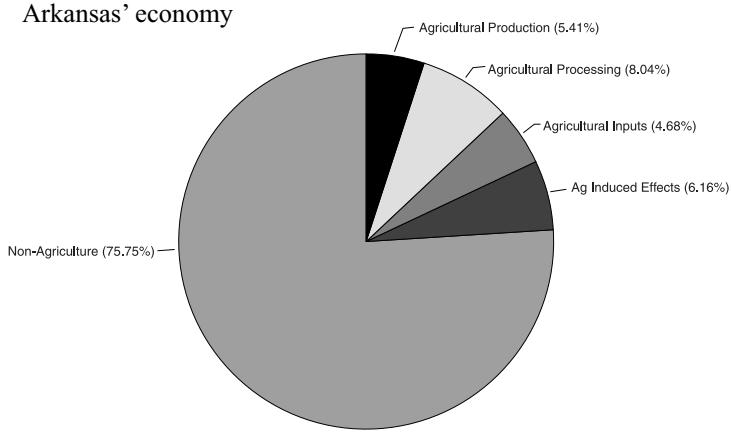
INDUCED EFFECTS OF EMPLOYEE PURCHASING

There were 85,644 workers employed by businesses providing goods and services to the employees in agriculture and its supplying industries. These employees and the proprietors of these businesses received $1.8 billion in wages and salaries and added value of $3 billion to the Arkansas economy.

AGRICULTURE'S CONTRIBUTION TO THE STATE ECONOMY

The agricultural sector has a considerable impact on the Arkansas economy. In 1995, economic activity generated by the agricultural sector, including direct, indirect, and induced effects:

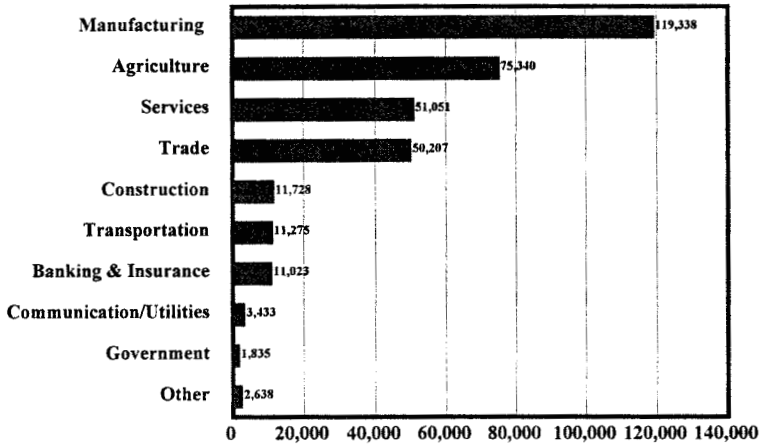
- accounted for 337,868 jobs, 24% of all jobs in the state (Fig. 19)
- a total of $8.1 billion in personal income
- added approximately $13 billion of value to the economy, nearly 25% of Arkansas' economy



Source: Computed using IMPLAN Pro and the 1995 Arkansas IMPLAN database, Minnesota IMPLAN Group, Inc.

Fig. 19. Agricultural employment in Arkansas' economy, 1995.

Most of the jobs and value added generated by the agricultural sector are in the manufacturing, agriculture, service, and trade sectors (Fig. 20). However, over 11,000 jobs are also generated in the transportation, construction, and banking/insurance sectors of the Arkansas economy.



Source: Computed using IMPLAN Pro and data from the Minnesota IMPLAN Group, Inc.

Fig. 20. Agriculture generated employment by sector.

SUMMARY

Agriculture, which includes crop and livestock production, forestry, and the processing of agricultural commodities, accounts for approximately one-fourth of all employment, personal income, and value added in the Arkansas economy. Agriculture is a larger component of the state economy than it is for the southeast region or for the United States.

The agricultural sector continues to grow – primarily as a result of the growth in the food-processing sector. The processing of agricultural products accounts for over 40% of total manufacturing value added in the state.

Crop production is a major component of the farm sector, accounting for approximately 50% of value added. Livestock, the second largest component accounts for about one-third of the value added.

The viability of Arkansas' agricultural sector is critical to the functioning of Arkansas' economy. The Arkansas economy remains heavily dependent on the abundant natural resources of the state.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