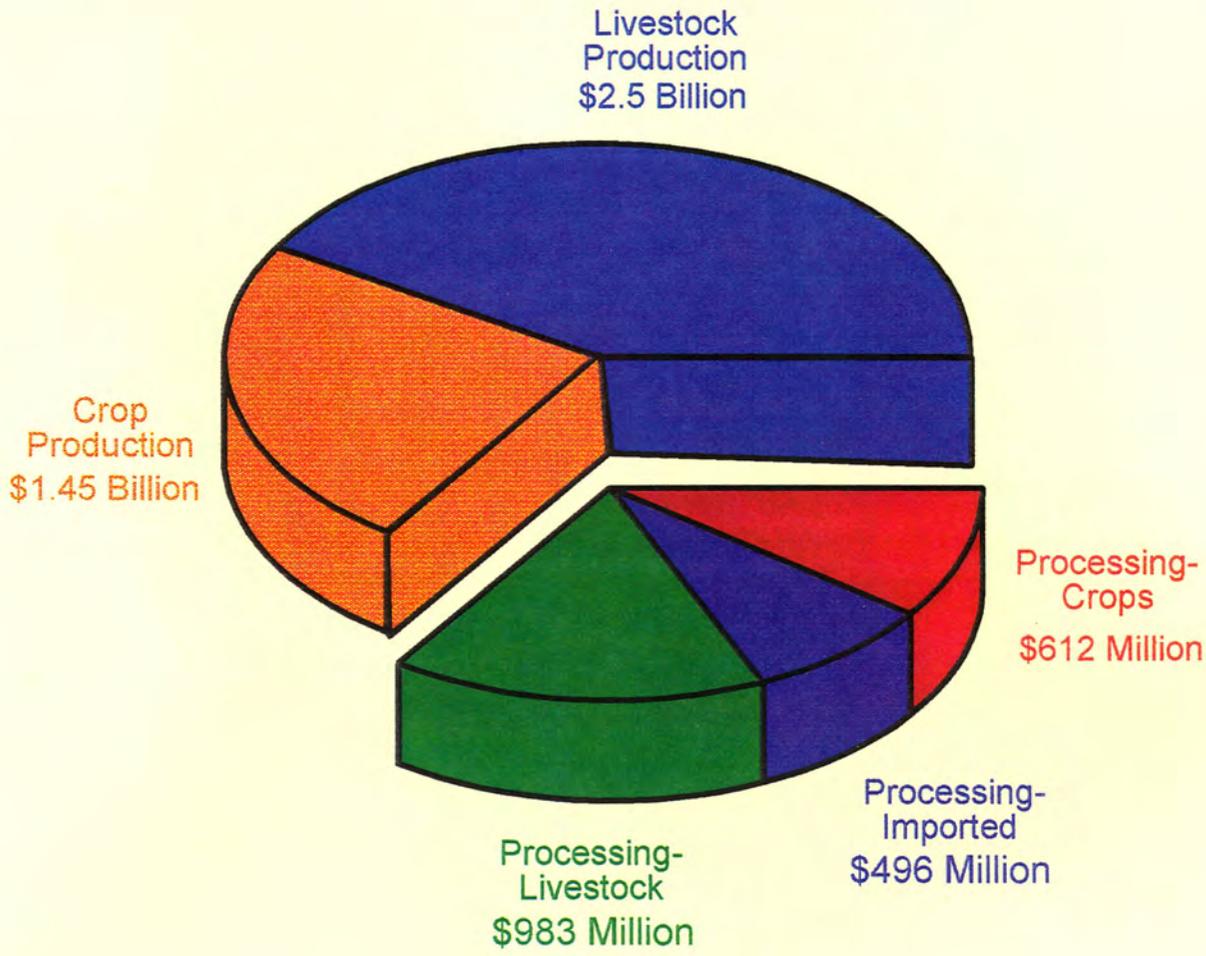


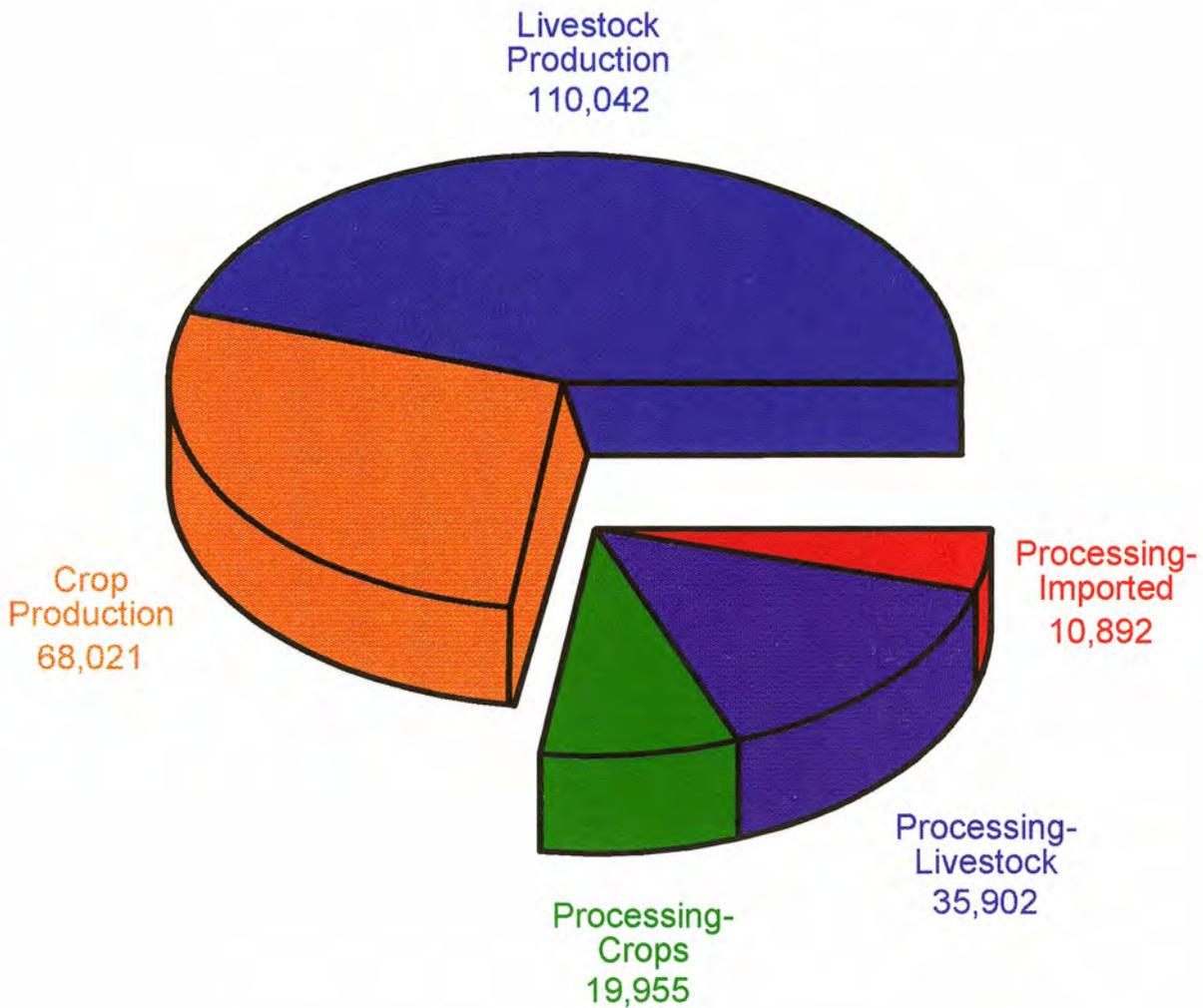


Economic Impact of Agriculture on Oklahoma's Economy



Total Impact \$6.1 Billion

Economic Impact of Agriculture on Oklahoma's Employment



Total Employment 244,812

Project Funded by: Division of Agricultural Sciences and Natural Resources, Oklahoma State University, Oklahoma Department of Agriculture, Beef Industry Council, Cattlemen's Association, Grain and Stocker Producers Association, Greenhouse Growers Association, Peanut Commission, Pecan Growers, Vegetable Association, Wheat Commission

Economic Impact of Agriculture on Oklahoma's Economy

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Economic Impact of Agriculture on Oklahoma's Economy

Executive Summary

The value of production agriculture to the economy includes the purchases of production inputs, the goods and services required to move the agriculture commodities from the farm to the retail outlet, and the goods and services required by the employees in the agriculture input, production and processing industries, in addition to the final value of agriculture products.

In 1993, the total value of final goods and services produced in Oklahoma (Gross State Product) exceeded \$63 billion and provided 1.5 million jobs. The agriculture sector (all production and processing) accounted for roughly 10 percent of the Gross State Product (GSP) and 17 percent of all jobs. The percent of GSP generated by agriculture varies by as much as 2 percent, higher or lower, depending on the economic health of the overall economy and the relative economic health of agriculture and the other sectors of the economy.

In 1993, nearly \$4 billion (6.3 percent) of GSP and more than 178 thousand jobs (11.9 percent) were generated as a result of production agriculture. Actual production of agriculture commodities accounted for \$1.15 billion (1.8 percent) of GSP and contributed to more than 76 thousand jobs (5.1 percent of the states total employment). The economic activity generated by production of the goods and services required to produce the agricultural commodities and meet the demands of the workers employed in production agriculture accounted for an additional \$2.8 billion (4.4 percent) and nearly 102 thousand jobs (6.83 percent).

All agricultural related processing contributed \$2.1 billion to the GSP and employed nearly 67 thousand. However, agricultural processing which rely's on Oklahoma agricultural products for part or all of the inputs accounted for \$1.6 billion, and provided jobs for nearly 56 thousand workers. The percent of total processing relative to production was very small compared with the nation as a whole. Nationally, approximately 2 percent of Gross Domestic Product (GDP) was generated by production agriculture and an additional 13-14 percent of GDP was generated by agricultural processing. In Oklahoma, agricultural production generates 1.8 percent to GSP and only 3.5 percent of GSP is from processing agricultural commodities.

Production and processing in the cattle industry, the largest single agricultural industry in Oklahoma, accounted for more than \$2.4 billion of GSP and provided about 105 thousand jobs. Wheat is the second largest industry in Oklahoma, accounting for nearly \$822 million of GSP and providing nearly 32 thousand jobs.

Economic Impact of Agriculture on Oklahoma's Economy¹

Kim Anderson, Michael R. Dicks, Roger Sahs, Wendy Caid and Jani Brackett²

Introduction

U.S. agriculture accounts for nearly 18 percent of the U.S. Gross Domestic Product (GDP) and over 20 million jobs. Production agriculture produces 2 percent of GDP and 2.5 million jobs. The industries supplying inputs to agriculture contribute about 2 percent of the GDP and another 2 million jobs. The remaining 14 percent of GDP and more than 15 million jobs are generated by transportation, storage, processing, manufacturing, and distribution industries which contribute to the transformation of raw agricultural products into consumer food, fiber, and industrial goods and the service industries which provide goods and services to these industries. In regions where agriculture is a dominant industry, the total economic activity stemming from agriculture may be considerably larger.

Oklahoma contains roughly 44 million acres and has one of the most diverse landscapes in North America with a range of environments from pine forests and deciduous woodlands to semi-arid plains and plateaus. Oklahoma is one of ten states which contain the Great Plains, a vast area occupying nearly one-third of the U.S. land mass, most of which is semi-arid rolling plains.

The Great Plains is predominantly rural with relatively small business centers. Agriculture is a predominant industry in this region as well as in the state of Oklahoma.

¹Project funded by the Oklahoma Department of Agriculture, Beef Industry Council, Cattlemen's Association, Grain and Stocker Producers Association, Greenhouse Growers Association, Peanut Commission, Pecan Growers, Vegetable Association, Wheat Commission.

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This paper provides a measure of the relative importance of Oklahoma agriculture to the Great Plains and the total U.S. agriculture industry and its importance to the economy of Oklahoma.

Background

Oklahoma produced nearly \$60 billion of final goods and services in 1992 compared with more than \$710 billion produced by the Great Plains States and \$5.8 trillion for the U.S. economy. Production agriculture accounted for just less than 2 percent of the U.S. Gross Domestic Product (GDP) but contributed about 3.5 percent to the economy of the Great Plains and 1.9 percent for the economy of Oklahoma. Texas' economy is more than 56 percent of the total Great Plains' economy but accounts for less than 25 percent of the Great Plains' final goods and services (GDP) attributable to agriculture production. Agriculture productions' importance is greatest in the Northern Plains states, comprising about 12 percent of the Gross State Product (GSP) of South Dakota, 10 percent of Nebraska's GSP and nearly 9.5 percent of North Dakota's GSP. Production agriculture is least important in Texas (1.3% of GSP), Colorado (1.9% of GSP), and New Mexico (2.1% of GSP)³.

Oklahoma has diverse agricultural production activities including numerous commercial crop and livestock enterprises, horticulture and ornamental enterprises, aquaculture, and specialty and industrial commodities. The size and value of major crop and livestock commodities for Oklahoma is compared to the Great Plains and the United States for the years 1988-1992⁴ to provide a measure of the relative importance of Oklahoma agriculture.

³Statistics from the August 1994, Survey of Current Business, Vol. 74, No. 8. U.S. Department of Commerce.

⁴ This period was selected because it is the most recent five year period for which a complete set of data on production and value was available at the time of the analysis.

Oklahoma's largest agricultural industry is beef production. With an average 1.5 billion dollars of farm gate sales over the period, the production of cattle and calves accounts for nearly half of the value generated from Oklahoma agriculture. Oklahoma ranks fourth in the United States for production of cattle and calves, producing over 5 million head annually. The Great Plains produces nearly half of the approximate 100 million head total annual U.S. production. In broiler production, Oklahoma produces 175 million broilers, compared with 520 million broilers produced in the Great Plains and 6 billion produced in the United States. The pork industry was nearly 120 thousand head in 1992 compared to 9 million head in the Great Plains and 60 million head in the United States.

Oklahoma's cattle and calf inventory was valued at over \$3 billion in 1992, while the value of the Great Plains cow\calf inventory was \$27 billion compared to \$63 billion for the United States. Total value of broilers in Oklahoma was \$203 million, the Great Plains was \$763 million and United States was \$9 billion. Pigs and hogs were valued at \$15 million in Oklahoma, \$691 million in the Great Plains and total national value in 1992 was \$4.3 billion.

Swine production is rapidly expanding in Oklahoma. New pork processing and production facilities are being developed or are in the initial stages of production in McCurtain county and Holdenville (Tyson Foods), Poteau (Cargill), Crescent (Cimarron Pork), Hennessey (Pig Improvement Company), Beaver and Texas counties (Dekalb), Guymon (Seaboard) and Eakley (Farmland Industries). USDA's December 1, 1994 estimate of Oklahoma's hog and pig inventory reflects a 58 percent increase in numbers between 1991 and 1993. December 1, 1991 and 1993 inventories were 190,000 and 300,000 head respectively. Oklahoma's hog breeding herd inventory increased from 35,000 to 60,000 from December 1, 1992 to December 1, 1993. The breeding herd expanded to 110,000 head of sows in 1994. An estimated 100 million dollars has been recently

invested in new hog facilities in the state.⁵ The hog and pig inventories increased to 590,000 head valued at \$32.5 million for 1994. Oklahoma increased in national rank from 24th in 1993 to 17th in 1994. The growth in this sector is not captured in the current estimates of the Gross State Product.

Total value of all livestock in Oklahoma was \$3.5 billion and total value of the top eight crops was \$811 million. Great Plains total livestock and crop production were \$31.5 billion and \$13.7 billion respectively. National livestock and crop production was \$149 billion, with \$101 billion coming from livestock and \$48 billion coming from the eight common crops.

Winter wheat is Oklahoma's number one crop, ranks second in total value of crop and livestock, and was valued at \$545 million in 1992. Oklahoma ranked third in the nation for all wheat and second in the production of winter wheat. All wheat in the Great Plains and the United States was valued at \$4.9 billion and \$7.9 billion respectively. In 1992, Oklahoma produced 171 million bushels of winter wheat compared to total wheat production in the Great Plains of 1.5 billion bushels, and 2.5 billion bushels of total U.S. production. In recent years, as few as 69 percent of the acres planted for wheat were harvested in Oklahoma. The year-to-year variation in the percent of planted area which is harvested is a result of weather and the relative prices of beef and wheat. Because winter wheat is often used for grazing stocker cattle, the value of wheat under-estimates the value of the crop. Nearly 1.5 million head of stocker cattle are brought into Oklahoma each year to be wintered on wheat pasture, with an estimated 2.3 million stockers grazing winter wheat annually.

Closely following wheat is all hay with production valued at \$287 million for 1992. Oklahoma is the seventh largest producer of grain sorghum with 17.5 million bushels compared to total U.S.

⁵Excerpt from "Status of the Oklahoma Swine Industry", William G. Luce and Joseph E. Williams, Oklahoma State University, January, 1995.

production of 884 million bushels and the Great Plains production of 452 million bushels. Oklahoma also ranked seventh in the production of peanuts, producing 236 million pounds. National peanut production for 1992 was 4.3 billion pounds, while Great Plains production was 974 million bushels. Other crops of importance include nut and fruit production, valued at \$10 million, \$6 million for watermelons, and \$5 million for peaches. Mushroom production was \$13 million.

Measuring Economy-wide Impacts

The farm gate value of agricultural products represents only the value of inputs used to produce these products and the net income generated from their sale. Thus, the farm gate value of the commodities is only a partial measure of the value that these commodities create in the economy. Additional economic activity is generated as the farm commodities undergo transformation into consumer goods. Farm products are moved, processed, and marketed. These services require employees that earn income and create additional economic activity through their purchases of goods and services. The value of economic activity generated through the farm production, purchasing or processing activities is defined as the **direct impacts** of agriculture on the economy. That is, agricultural production and processing activities contribute a final product to the economy. For the production and processing industry to produce a final product requires the purchase of goods and services from other sectors of the economy. The value of economic activity generated by the industries supplying inputs to the production and processing industries is defined as the **indirect impacts** of agriculture on the economy. Finally, the industries supplying goods and services to the agricultural production and processing industries pay wages to employees. The value of goods and services purchased by these employees are defined as the **induced impacts** of agriculture on the

economy. Thus, the total impacts of agriculture on the economy includes the direct, indirect and induced impacts.

The indirect and induced impacts for each agricultural industry are summed to provide a combined measure of the economy-wide impact of the associated **Supporting Industries**. In the results we provide one measure, **Direct Impact**, to illustrate the impact on the economy of agricultural production or processing activities. A second measure, the impact of the supporting industries, is used to illustrate the value of economic activity generated by all the industries and employees which rely on agricultural production or processing.

The direct, indirect and induced economy-wide impacts of agriculture and its various components are measured using input-output analysis. While this modeling technique has certain limitations, it provides an effective means for making a complete measurement of the value a specific industry or set of industries generates throughout the economy. The USDA Forest Service has developed a computer-based system, IMPLAN, which utilizes input-output analysis procedures capable of estimating enter-industry economic impacts. IMPLAN is a nationally recognized modeling system based on county-level data and is of sufficient depth and breadth of detail to be valuable in the analysis of a specific industry's importance in an economy. A major limitation of the model is the length of time required to collect and insert the data needed by the model. The current model uses data which provides a "snapshot" of the industrial relationships which existed in 1991.

The description of direct, indirect, induced, and total impacts of agriculture and its various components on the economy is provided by the level of final demand, gross state product (total income), and employment. The value of **final demand** is the value of the goods and services demanded from each industry in the economy. Final demand is the sum of all commodities (goods

and services) for final use purchased by a processor, consumer, or exported out of the state. Final demand includes both the domestic (within state) and export (out of state) demands.

Total (P & W) Income is the sum of property income and employee compensation. Employee compensation is defined as wages and salaries paid to employees plus the value of benefits, and any contribution to social security and pension funds by the employee and employer. Property income is thought of as income of sole proprietorships, plus dividend, interest, and rental income from a property. **Total Income** provides a measure of the income generated as a result of the total industrial output. Total Income may be used as an estimate of **Gross State Product (GSP)**, the value-added of final goods and services produced in the economy. In agriculture, Total (P & W) Income (GSP) is calculated by reducing the value of production or final demand by the costs of the goods and services not produced in Oklahoma. Thus, gross state product represents the net value (profit) of goods and services produced within the state.

Economic values were calculated for all Oklahoma agriculture and for all agricultural commodities. Economic impacts were calculated for the level of output produced in 1993 (the most recent year for which complete data on output was available for the state of Oklahoma).

To determine the economic impact of agriculture, specific commodities, or classes of commodities, the value of the goods and services were determined. Care was taken not to "double count" the value. For example with cattle, a cow/calf enterprise produces a \$400 stocker, which is sold for placement on wheat pasture and then sold for \$600 to a feedlot which produces an \$800 slaughter animal. The economic activity is \$1,800 (total industry output) but the value of final sale is only \$800. Eight hundred dollars was used as the "value of production" and to estimate the

addition to Gross State Product. However, if the \$400 stocker was imported from another state, then the "value of production" would only be \$400 (final sale value less import value).

With hay, the value of production is much higher than the economy-wide activity. Much of Oklahoma's hay, corn, and grain sorghum is fed without going through the marketing system. Thus, the value shows up as livestock rather than crops. To avoid double counting, "cash market receipts" were used for most crops.

Results

In 1993, Oklahoma's Gross State Product (GSP) was \$63.3 billion, the civilian labor force was 1.6 million people, and the total number employed was about 1.5 million people (Oklahoma Department of Commerce).

Production Agriculture

The 1993 value of Oklahoma agricultural production was \$3.37 billion (Table 1). After adjustments were made for production inputs, production agriculture added \$1.15 billion to the state's GSP and provided 76,418 jobs. Production agriculture produced 1.8 percent of Oklahoma's GSP and provided 5.1 percent of Oklahoma's 1993 employment.

All livestock production contributed \$771 million to the GSP and crops added \$380 million (Table 1). Of the 1.5 million jobs in Oklahoma, 46,318 jobs were attributed to livestock production and 30,100 jobs were attributed to crop production.

Support Industries

Indirect and induced economic impacts of agricultural production is a measure of the economic activities that support production agriculture and economic activities that occur to support the delivery of raw commodities to the end user or for export. Supporting industries were aggregated into nine industries: (1) services; (2) financial, insurance, and real estate; (3) wholesale and retail; (4) transportation, communication, and utilities; (5) manufacturing; (6) government; (7) construction; (8) mining; and (9) special industries. A description of each industry is presented in the Glossary of Terms included in the back of this report.

In 1993, the value of goods and services produced to support production agriculture was \$2.82 billion (Table 2). Producing these goods and providing the services added \$2.8 billion to Oklahoma's GSP and created 101,645 jobs.

Services (mechanics, veterinarians, child care, hotels, etc.) was the largest industry providing a final demand of \$888 million and adding \$687 million to the state's GSP. Financial services (lending institutions, banks, insurance, real estate, etc.) added \$587 million to GSP and had a final demand of \$715 million. Other major industries (Transportation, Communication, etc.) contributed \$310 million to the GSP and manufacturing added \$229 million. The remaining industries (Government, Construction, Mining, and other special industries) added a total of \$178 million to GSP.

Additional agriculture production is required because of increased employment in the support industries and is included in the indirect and induced effects. Thus, the employment required by these industries supporting production will create additional demand for agricultural commodities. An additional \$341 million was contributed to GSP and an additional 22,166 jobs were created.

To support agriculture, the services industry created 34,878 jobs, the wholesale and retail industry provided 21,896 jobs, and the financial industry consisted of 9,154 jobs. Transportation, communication, and utilities involved 4,588 jobs and the manufacturing industry created 4,395 jobs. Government support of agriculture required 1,864 jobs and an additional 2,158 jobs were associated with construction. Mining and special industries had 198 and 348 jobs, respectively.

Total Economic Activity

Total economic activity is a summation of the direct economic impacts from agriculture production and the indirect and induced economic impacts from the supporting industries. Production agriculture contributed \$1.15 billion to GSP and created 76,418 jobs (Table 1). The supporting industries contributed an additional \$2.8 billion to the GSP and created 101,645 jobs (Table 2). Agricultural's total economic-wide addition to the GSP was \$3.96 billion (6.3%) (Table 3). All livestock production and associated value-added activities added \$2.5 billion to GSP. All crop production and associated value-added activities added \$1.45 billion to the state's GSP.

The total jobs created by all economy-wide agriculture activities were 178,063 (11.9%) (Table 3). There were 110,042 jobs attributed to the livestock industry and 68,021 jobs attributed to the crop industry. Supporting activities for agriculture production required an additional 101,645 (178,063 - 76,418) jobs. This indicates that 7.3 percent of Oklahoma's labor force is not involved in agriculture production but is employed because of Oklahoma agriculture production.

Processing

Oklahoma agricultural processing industries, which require state agriculture production as inputs, contributed \$1.6 billion to Oklahoma's GSP (Table 4). Processing generated a direct total income of \$465 million dollars. Supporting economic activities generated an additional \$1.13 billion.

The highest level of processing income was generated in the cattle industry. Direct income generated by cattle processing was \$127 million. Including the goods and services required to support cattle processing activities, cattle processing contributes about \$432 million to GSP. Poultry, dairy, wheat and fruits and vegetables contributed between \$203 and \$257 million each to GSP. Peanut processing, which is now about three times larger than in 1993, produced \$168,000 in direct income and an economy-wide GSP of \$594,000.

Agriculture processing accounted for 55,857 jobs (Table 5). The economy-wide employment impact of both production and processing provided 233,920 jobs, about 16 percent of Oklahoma's employment in 1993. Cattle processing, poultry processing, and fruits and vegetables provided the largest number of jobs in agricultural processing. Cattle processing created 15,638 jobs, poultry processing 10,440, and fruits and vegetable processing accounted for 5,779 jobs.

Livestock processing accounted for roughly \$253 million of GSP (Table 4) and 7,197 jobs (Table 5). Supporting industries generated an additional \$730 million in GSP and 29 thousand jobs, for a total \$983 million of total income and nearly 36 thousand jobs.

Following the pattern of the cattle production industry, the cattle processing industry which includes slaughter and packing, sausage and cured products, tanning and rendering, produced the largest total income (\$127 million) and employed the largest work force (2,732 employees). Industries supporting cattle processing generated an additional \$306 million and employed an

additional 12,906 employees by providing inputs for processing and services to the employees working in the industry. However, the processing portion of the cattle industry is relatively small in comparison to the size of the production portion of the industry. For the United States, the income generated as a result of the cattle processing industry is 4-5 times the size of the production portion of the industry. This is a result of the aggregation of transportation, slaughter, processing, canning, tanning, packing, wholesale and retail activities into a single livestock processing industry. Thus, considerable activity is required to move the animals from the feedlot or farm to the table. The relatively small number in Oklahoma is an indication of the absence of a vigorous processing industry and the shipment of cattle outside the state for finishing and processing.

By comparison, dairy production accounted for nearly \$33 million of GSP (Table 6) while dairy processing contributed \$75 million to GSP (Table 4). In total, dairy processing generated \$258 million of total income and employed 8,200 workers. While nearly a 7.8 to 1 ratio of processing to production occurs with the Oklahoma dairy industry, a 0.7 to 1 ratio exists in the cattle industry. This implies that for every \$1 dairy production added to GSP, dairy processing added \$7.80 to GSP. With beef, for every \$1 added to GSP from production only 70 cents was generated from processing. The reason beef processing GSP is low relative to production is most beef is exported for processing in Texas or Kansas.

The crop processing industry accounted for over \$211 million of GSP and 5,113 jobs. The industry generated an additional \$400 million in GSP and 14,842 jobs throughout the Oklahoma economy. In total, the crop processing industry generated roughly \$612 million of GSP and 19,955 jobs.

The economic activity in the crop industry follows the pattern identified in the livestock industry. Large production industries such as wheat have relatively small processing components while smaller crop production industries such as fruits and vegetables have relatively large processing components.

Individual Agriculture Commodities

Agriculture production is divided into two groups, livestock and crops. Of agriculture production's \$1.15 billion contribution to GSP, livestock production contributed about 68 percent and crop production contributed about 32 percent (Table 1). Livestock production also provided 68 percent of production agriculture's jobs.

When livestock's indirect and induced economic impacts are added to the direct impacts from livestock production, about 63 percent of the agriculture's contribution to the state's GSP and about 62 percent of agriculture's labor force is accounted for. Crops contributed the remaining 37 percent of agriculture's contribution to GSP and 38 percent of agriculture's labor.

Beef Cattle

Total cash receipts for all cattle and calves, in 1993, was \$2.12 billion (Oklahoma Agricultural Statistics, 1993). Consumption at home added another \$17 million. After subtracting the value of in-shipments and farm slaughter, the value of beef production (cow/calf + stockers + feedlot) was about \$1.49 billion (Table 6). Beef production (direct economic impacts) contributed \$636 million to Oklahoma's GSP and created 38,246 jobs. Industries supporting the beef industry (indirect and induced economic impacts) generated an additional \$1.4 billion, for a total economy-wide impact of

nearly \$2 billion (Table 7). Total economy-wide employment in the beef industry was 88,886, 5.9 percent of Oklahoma's 1993 employment.

The beef industry was divided into three groups: cow/calf, stockers, and feeders. Just over 50 percent of the value was attributed to cow/calf, about 40 percent was attributed to stockers, and slightly less than 10 percent was produced by feeders. Of the \$1.49 billion in beef production, cow/calf contributed \$743 million, stockers added \$594 million, and Oklahoma feedlots added \$148 million in value of production.

Cow/calf production contributed \$317 million to Oklahoma's GSP and created 19,161 jobs (Table 6). The total economy-wide economic impact cow/calf production contributed just over \$1 billion to Oklahoma's GSP and created a total of 44,910 jobs (Table 7). Thus, industries supporting cow/calf production generated an additional \$690 million in GSP and 25,749 jobs (Tables 8 and 9).

Stocker production's contributed \$253 million to Oklahoma's GSP and provided 15,329 jobs (Table 6). The total economy-wide contribution from stocker production on Oklahoma's GSP was \$791 million and the number of jobs created was 35,286 (Table 7). Thus, industries supporting stocker cattle production added \$537,485 to Oklahoma's GSP and 19,957 jobs.

Feedlots producing fed cattle created 3,756 jobs and contributed almost \$66 million to GSP (Table 6). Industries supporting fed cattle production created another 4,934 jobs and contributed an additional \$133 million to the GSP. Total economy-wide contribution to the GSP by the fed cattle industry was \$198 million with a requirement of 8,690 jobs (Table 7).

Wheat

In 1993, all crop production contributed \$369 million to Oklahoma's GSP and agriculture production's total contribution to GSP was \$1.15 billion. Cash receipts from wheat in 1993 was \$449 million. Since 1989's cash receipts of \$520 million, 1993's cash receipts were the second lowest to 1991's \$430 million. Wheat production's \$214 million contributed to GSP made up 19 percent of the total agriculture contribution and 58 percent of the contribution from all crop production (Table 6). There were 13,728 jobs directly related to wheat production.

An additional \$381 million was contributed to GSP by industries supporting wheat production (Table 8). Wheat's economy-wide (direct, indirect, and induced) economic impacts contributed \$596 million to the GSP and created 26,453 jobs (Table 9). Thus, 15 percent of agriculture's contribution to the GSP was from wheat production and its related activities.

Greenhouse and Nursery

In 1993, greenhouse and nursery production had the third highest value of production of \$275 million (Oklahoma Agricultural Statistics, 1993). Wheat, with a value of production of \$478 million, and All Hay, with a value of production of \$333 million, were the only two crops with a higher value than greenhouse and nursery production. Direct greenhouse and nursery production contributed \$57 million to Oklahoma's GSP and 9,114 jobs. Industries supporting the greenhouse and nursery production created a final demand of \$596 million and contributed an additional \$308 million in GSP (Table 8). Total GSP contributed by greenhouse and nursery production and its supporting industries was \$365 million. Industries supplying inputs and services required an additional 11,016 jobs. Total employment by the greenhouse and nursery industry was 20,130 jobs.

Vegetables

Vegetable production is a growing industry in Oklahoma. In 1993, the value of vegetable production was about \$72 million and the contribution to GSP was \$6.3 million. Employment created due to the production of vegetables was 660 jobs (Table 6). The economy-wide impact of the industries supporting vegetable production created a final demand for all goods and services of \$111 million. Economy-wide vegetable economic activity contributed \$55 million to Oklahoma's GSP and created 2,451 jobs. Thus, the economic activity required to support vegetable production contributed an additional \$49 million to GSP and required 1,791 more jobs (Tables 8 and 9).

Peanuts

The value of peanut production is highly variable. During the five year period between 1989 and 1993, the value of peanut production varied between \$61 million in 1993 and \$99 million in 1990 (Oklahoma Agricultural Statistics, 1993). The five year average value of peanut production was nearly \$74 million. Thus, 1993's value of production will underestimate peanut's normal impact on Oklahoma's economy. In 1993, producing \$61 million worth of peanuts contributed about \$6 million to Oklahoma's GSP and generated 455 jobs (Table 6).

Peanut's big impact was the income and jobs required to support peanut production. The value of final demand for all goods and services to produce and support the peanut industry was \$87 million (Table 7). The economy-wide economic impact contributed \$43 million to the GSP and created 1,657 jobs. Thus, economic activity required to support peanut production contributed an additional \$37 million to Oklahoma's GSP and an additional 1,202 jobs (Tables 8 and 9).

Pecans

During the five-year period between 1989 and 1993, the value of Oklahoma pecan production varied between \$4.6 million and \$13.5 million (Oklahoma Agricultural Statistics, 1993). In 1993, the value of Oklahoma pecan production was \$6.9 million (Table 6). The addition to GSP was \$922,000 and 168 jobs were required in pecan production.

Economic activity required to support pecan production contributed an additional \$6.4 million to GSP and the total GSP contribution by the pecan industry was \$7.3 million (Table 7). Economic activity supporting pecan production created an additional 228 jobs and 396 jobs were created by all pecan economic activities (Tables 7 and 9).

Summary

Economic activity associated with Oklahoma livestock production contributed \$2.5 billion to GSP and provided 110 thousand jobs. The processing of the livestock products contributed an additional \$983 million to GSP and 36 thousand jobs, for a total impact on the Oklahoma economy of \$3.5 billion and 146 thousand jobs.

Economic activity associated with the major Oklahoma crop production industries contributed \$1.45 billion to GSP and provided 68 thousand jobs. Processing activities associated with these crops added \$612 million to GSP and 20 thousand jobs for a total impact of the crop industry in the Oklahoma economy of over \$2.1 billion and 88 thousand jobs.

All processing of agricultural commodities, including both Oklahoma produced and imported agricultural commodities from other states, contributed \$2,091 million to the GSP and created 66,749

jobs. Thus, economic activity associated with all processing plus production represents 9.8 percent of the GSP and 16.3 percent of the labor force.

For 1993, agricultural production and processing (processing which requires raw commodities produced in Oklahoma) in Oklahoma contributed \$5.6 billion to the state economy and employed roughly 244 thousand. The economic activity associated with these agricultural commodities represents 8.8 percent of the Gross State Product. The value of these industries to Oklahoma's economy has varied over the last decade from a low in 1987 of seven percent to a high in 1990 of 11 percent. The variation in contribution to the economy is a result of changes in prices of agricultural commodities, business cycles and the health of other industries in the state.

This study identified the loss in economic activity to the state of the export of raw products and the absence of processing. The processing of crop and livestock products could add \$3-5 billion to the Oklahoma economy and provide an additional 150 to 250 thousand jobs.

Tables

Table 1. Direct Agricultural Production Impacts on Oklahoma's Economy: 1993

Industry	Value of Production \$1,000	Gross ¹ State Product \$1,000	Employment ² Number of Jobs
All Livestock	2,110,351	770,669 (1.2%)	46,318 (3.1%)
All Crops	1,261,503	380,354 (0.6%)	30,100 (2.0%)
Total	3,371,854	1,151,023 (1.8%)	76,418 (5.1%)

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP. Oklahoma's 1993 GSP was \$63.3 billion.

² Total 1993 Oklahoma employment was about 1.5 million.

Table 2. Total Agricultural Production Indirect and Induced Effects: 1993

Industry	Final Demand (\$1,000)	Gross State ¹ Product (\$1,000)	Employment Number of Jobs Added
Agriculture ²	26,970	340,629	22,166
Services	888,182	686,901	34,878
Finance, Insur, Real Estate	715,026	586,837	9,154
Wholesale, Retail	567,707	472,521	21,896
Transportation, Comm, Util.	245,773	310,288	4,588
Manufacturing	278,257	229,408	4,395
Government	67,410	77,541	1,864
Construction ³	0	56,523	2,158
Mining	20,374	35,102	198
Special Industries	8,722	8,691	348
Total Indirect and Induced	2,818,421	2,804,441 (4.4%)	101,645 (6.8%)

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP.

² There is an amount of output (indirect effect) produced from backward-linked agricultural industries created due to the input needs of production agriculture in Oklahoma. These interdependent industries generate income (proprietary and employee) from jobs created. Household spending patterns (induced effect on final demand) within the agricultural sector are generated from regional employment as well.

³ Construction Final demand is zero because the structures are not sold for final use but are used for intermediate use.

Table 3. Economy-Wide Impact of Agricultural Production on Oklahoma's Economy: 1993

Industry	Final Demand \$1,000	Gross ¹ State Product \$1,000	Employment ² Number of Jobs
All Livestock	3,843,789	2,503,443 (4.0%)	110,042 (7.3%)
All Crops	2,346,486	1,452,021 (2.3%)	68,021 (4.5%)
Total Economic Impact	6,190,275	3,955,464 (6.3%)	178,063 (11.9%)

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP. Oklahoma's 1993 GSP was \$63.3 billion.

² Total 1993 Oklahoma employment was about 1.5 million.

Table 4. Summary Economy-Wide Impact by Agriculture Processing Industries and Economic Activities: 1993

Industry	Direct Processing ¹ \$1,000	Indirect & Induced Processing ² \$1,000	Total Processing Related ³ \$1,000
Cattle	126,917	305,532	432,449
Dairy	74,607	183,255	257,862
Poultry	50,268	199,825	250,093
Hogs	1,282	41,796	43,078
Total Livestock	253,074	730,408	983,482
Wheat	110,072	116,503	226,575
Fruit and Vegetables	82,898	119,706	202,604
Feed Grains	8,865	128,975	137,840
Soybeans	5,353	27,453	32,806
Cotton	4,095	7,065	11,160
Peanuts	168	426	594
Total Crops	211,451	400,128	611,579
Total	464,525	1,130,536	1,595,061

¹ Direct processing is a measure of income generated directly by Oklahoma's processing industry. Only income generated to process Oklahoma produced raw commodities is included in this table.

² Indirect & Induced Processing is an estimate of income generated by industries supplying goods and services to the processing industry and the demand generated by these industries.

³ Total Processing Related income is the sum of Direct, Indirect, and Induced Employment.

Table 5. Summary Employment-Wide Impact by Agriculture Processing Industry: 1993

Industry	Direct Processing Employment ¹	Indirect & Induced Processing Employment ²	Total Processing Related Employment ³
Cattle	2,732	12,906	15,638
Poultry	2,609	7,831	10,440
Dairy	1,828	6,383	8,211
Hogs	28	1,585	1,613
Total Livestock	7,197	28,705	35,902
Fruit and Vegetables	1,960	3,819	5,779
Wheat	1,840	3,806	5,646
Feed Grains	1,047	4,134	5,181
Peanuts	17	1,659	1,676
Soybeans	107	1,139	1,246
Cotton	142	285	427
Total Crops	5,113	14,842	19,955
Total	12,310	43,547	55,857

¹ Direct Processing Employment is an estimate of the jobs required to process agricultural commodities.

² Indirect and Induced Processing Employment is an estimate of the jobs required to supply inputs and support processing.

³ Total Processing Related Employment is the sum of Direct, Indirect, and Induced Employment.

Table 6. Direct Agricultural Production Impacts on Oklahoma's Economy: 1993.

Industry	Value of Production \$1,000	Gross ¹ State Product \$1,000	Employment Number of Jobs
Cows & Calves	743,047	316,706	19,161
Stockers	594,438	253,365	15,329
Cattle Feedlots	148,062	65,871	3,756
Poultry & Eggs	313,000	52,073	3,476
Dairy Farm Products	166,987	33,071	2,003
Hogs, Pigs & Swine	76,951	39,522	1,815
Other Livestock ²	60,958	6,926	603
Sheep & Wool	4,935	2,239	125
Goats & Mohair	1,974	896	50
Total Livestock	2,110,351	770,669	46,318
Wheat	449,000	214,104	13,728
Greenhouse & Nursery	275,000	56,950	9,114
Hay & Pasture	63,000	27,295	2,090
Cotton	78,613	16,314	1,093
Soybeans	36,722	16,544	464
Corn	32,000	14,417	404
Grain Sorghum	30,000	13,516	379
Vegetables	71,986	6,286	660
Peanuts	60,730	5,946	455
Forest Products	141,418	5,153	1,217
Fruit & Nuts	13,690	1,810	297
Pecans	6,910	922	168
Other Feed Grains ³	2,434	1,097	31
Total Crops	1,261,503	368,535	30,100
Total	3,371,854	1,151,023	76,418

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP.

² Other Livestock include turkeys, ratite, and other livestock not included in listed enterprises.

³ Includes Rye, Barley, and Oats.

Table 7. Economy-Wide Impact of Agricultural on Oklahoma's Economy: 1993.

Industry	Final Demand \$1,000	Gross ¹ State Product \$1,000	Employment Number of Jobs
Cows & Calves	1,456,448	1,006,537	44,910
Stockers	1,144,353	790,850	35,286
Feedlot Cattle	284,943	198,433	8,690
Poultry	470,268	231,169	9,985
Dairy	248,563	132,643	5,179
Hogs, Pigs & Swine	141,533	101,121	4,100
Other Livestock ²	84,417	33,404	1,489
Sheep & Wool	9,470	6,633	288
Goats & Mohair	3,794	2,653	115
Total Livestock	3,843,789	2,503,443	110,042
Wheat	866,356	595,532	26,453
Greenhouse/Nursery	592,097	365,171	20,130
Forestry	251,466	120,534	6,168
Cotton	126,476	69,317	3,039
Hay & Pasture	125,199	82,878	3,949
Vegetables	110,588	55,005	2,451
Peanuts	86,826	43,122	1,657
Soybeans	54,322	36,318	1,117
Corn	47,337	31,648	974
Grain Sorghum	44,379	29,670	913
Fruit & Misc Nuts	24,706	13,139	700
Pecans	13,141	7,285	396
Other Feed grains ³	3,593	2,402	74
Total Crops	2,346,486	1,452,021	68,021
Total Economic Impact	6,190,275	3,955,464	178,063

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP.

² Other Livestock include turkeys, ratite, and other livestock not included in listed enterprises.

³ Includes Rye, Barley, and Oats.

Table 8. Direct, Indirect and Induced, and Total Economy Gross State Product: 1993

Industry	Direct ¹ Gross State Product \$1,000	Indirect & Induced Gross State Product \$1,000	Total Economy Gross State Product \$1,000
Cows & Calves	316,706	689,831	1,006,537
Stockers	253,365	537,485	790,850
Cattle Feedlots	65,871	132,562	198,433
Poultry & Eggs	52,073	179,096	231,169
Dairy Farm Products	33,071	99,572	132,643
Hogs, Pigs & Swine	39,522	61,599	101,121
Other Livestock ²	6,926	26,478	33,404
Sheep & Wool	2,239	4,394	6,633
Goats & Mohair	896	1,757	2,653
Total Livestock	770,669	1,732,774	2,503,443
Wheat	214,104	381,428	595,532
Greenhouse/Nursery	56,950	308,221	365,171
Forestry	5,153	115,381	120,534
Hay & Pasture	27,295	55,583	82,878
Cotton	16,314	53,003	69,317
Vegetables	6,286	48,719	55,005
Peanuts	5,946	37,176	43,122
Soybeans	16,544	19,774	36,318
Corn	14,417	17,231	31,648
Grain Sorghum	13,516	16,154	29,670
Fruit & Misc Nuts	1,810	11,329	13,139
Pecans	922	6,363	7,285
Other Feed Grains ³	1,097	1,305	2,402
Total Crops	380,354	1,071,667	1,452,021
Total Agriculture	1,151,023	2,804,441	3,955,464

¹ Total (Property, Wage, & Proprietor) Income is used as an estimate of GSP.

² Other Livestock include turkeys, ratite, and other livestock not included in listed enterprises.

³ Includes Rye, Barley, and Oats.

Table 9. Direct, Indirect and Induced, and Total Economy Employment: 1993

Industry	Direct Employment Number of Jobs	Indirect & Induced Employment Jobs	Total Economy Employment Number of Jobs
Cows & Calves	19,161	25,749	44,910
Stockers	15,329	19,957	35,286
Cattle Feedlots	3,756	4,934	8,690
Poultry & Eggs	3,476	6,509	9,985
Dairy Farm Products	2,003	3,176	5,179
Hogs, Pigs & Swine	1,815	2,285	4,100
Other Livestock ¹	603	886	1,489
Sheep & Wool	125	163	288
Goats & Mohair	50	65	115
Total Livestock	46,318	63,724	110,042
Wheat	13,728	12,725	26,453
Greenhouse/Nursery	9,114	11,016	20,130
Forestry	1,217	4,951	6,168
Hay & Pasture	2,090	1,859	3,949
Cotton	1,093	1,946	3,039
Vegetables	660	1,791	2,451
Peanuts	455	1,202	1,657
Soybeans	464	653	1,117
Corn	404	570	974
Grain Sorghum	379	534	913
Fruit & Misc Nuts	297	403	700
Pecans	168	228	396
Other Feed Grain ²	31	43	74
Total Crops	30,100	37,921	68,021
Total Agriculture	76,418	101,645	178,063

¹ Other Livestock include turkeys, ratite, and other livestock not included in listed enterprises.

² Includes Rye, Barley, and Oats.

GLOSSARY OF TERMS

Construction:	Industries which build farm and ranch facilities, i.e. grain storage bins, barns, residential, industrial, commercial, utility and farm structures, highways and streets, and maintenance and repair of such structures. Number of commodities - 9.
Direct Impacts:	Value of economic activity generated through farm production, purchasing or processing activities that contribute to the final product.
Employment:	The number of employees based on a full year equivalent.
Final Demand:	Final demand is the sum of all commodities (goods and services) for final use purchased by a processor, consumer, or exported out of the state. Final demand includes both the domestic (within state) and export (out of state) demands. These are purchases from producing industries by institutions such as households (personal consumption expenditures), local, state, and federal government purchases, excess goods purchased by the CCC, inventory purchases, gross private capital formation, and commodity exports to foreign countries.
Finance, Insurance, and Real Estate:	Financial services like lending, banking, insurance brokers and carriers, real estate, etc. Number of commodities - 7.
Government:	Postal service, any federal expenditure (military and non-mil), state and local govt utilities, CCC, state and local expenditures on education, etc. Number of commodities - 11.
Gross State Product:	This is a measure of income that is generated as the result of production.
Induced Impacts:	Value of goods and services purchased by employees of agricultural production and processing industries which supply inputs for agricultural production.
Manufacturing:	Industries involved in processing raw products into marketable finished products, either for sale to other

	producing industries or to the ultimate consumer. Number of commodities - 371.
Mining Sector:	Industries which mine and process raw materials obtained for the earth, i.e. petroleum products, tin, salt, minerals, ore(s) extraction, fossil fuels (unrefined), sand and gravel, chemical and fertilizer mining, and so on. Number of commodities - 20.
Processing:	Acts to change raw agriculture products into marketable commodities.
Services:	Hotels, advertising, car rental, motion pictures, auto repair, health professions, higher education, child care, etc. Number of commodities - 47.
Special Industries:	Home based businesses, rest of the world industry, etc. Number of commodities - 3.
Transportation, Communication, Utilities:	Industries responsible for moving commodities, communication for marketing, transporting, and processing, and electricity, water, gas, etc. used in the production and marketing of agriculture production.
Total (P & W) Income:	Sum of two main components, employee compensation and property income. Employees compensation is defined as wages and salaries paid to employees by industries plus the value of benefits, and any contribution to social security and pension funds by the employee and employer. Property income is thought of as income of sole proprietorships, plus dividend, interest, and rental income from a property.
Total Impacts:	The sum of direct, indirect, and induced economic activity.
Value of Production:	Includes total value of marketings minus value of in-shipments, and any increase or decrease of inventory.
Wholesale & Retail:	The process of assembling, storing, and selling at the wholesale and retail market levels. Number of commodities - 9.

