

Economic Impact of Cow-Calf Sector Income Losses in Arkansas due to the 2012 Drought

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1. Introduction

The cow-calf sector in Arkansas has been especially hard hit by the 2012 drought. Poor pasture conditions, increased cost of inputs, reduced revenues from low hay production, and lower cattle marketing weights are all factors that have negatively impacted cattle farmers' bottom line. To measure the economic losses that have already taken place over the past 12 months (August 2011 to July 2012) an online survey was distributed to cow-calf producers in Arkansas. A total of 545 responses from 58 counties were received and the results were used to estimate the economic loss to cow-calf operations from increased hay purchases, reduced hay sales, and decreased calf sales revenue. The drought has resulted in an estimated loss of \$141 per bred cow for cow-calf producers or \$128 million for the cow-calf sector (Smith et al., 2012). The purpose of this report is to estimate the broader economy-wide effects of these income losses in the Arkansas cattle production sector resulting from the 2012 drought.

The focus here is on the income losses experienced on Arkansas cow-calf farms over the past 12 months and how these reductions in income impact the broader state economy. There are a variety of different impacts in agriculture during a drought that go well beyond the losses of income in the current year. In the mid-term, the effects of a reduced herd size will impact the backward-linked sectors that rely on cattle farms to purchase inputs such as feed, machinery, and agricultural chemicals. There are long-term issues associated with pasture recovery and increased breeding failures due to reduced herd condition and cow weight. These impacts will require additional time to unfold and are not considered here.

2. Methods

The regional economic impact model IMPLAN was used to examine the effects of the lost income in the cow-calf sector due to the 2012 drought in Arkansas (MIG, 2012). IMPLAN accounts for the direct losses of income in the cow-calf sector and how those losses lead to induced effects from the decrease of expenditures in the local economy. These effects are called multiplier effects. For example, the loss of farmer income means that the farmer has less disposable income to pay bills and purchase consumer goods and services, such as groceries or dental work. This type of effect is called an induced effect. Indirect effects result from the farmers' purchases of inputs for the farm, such as feed and fertilizer. Indirect effects are not considered here because it is assumed that in the past 12 months, cattle farms have made input purchases and these input suppliers will not see negative impact (due to reduced beef sector output) until further down the road. "Total economic impact" in this report will refer to the sum of direct and induced effects and will be calculated in terms of labor income and total value added. Value added is similar to Gross Domestic Product, or GDP, and is a measure of wealth. It is generally the preferred measure of economic impact.

Only a portion of the direct income loss of \$128 million is used in building the impact scenario. In the Arkansas agricultural production sectors, labor income (wages and farm owner income) makes up only 14% of the gross income or cash receipts (output). Therefore, only 14% of the total income lost (\$18.4 million) is used to build the impact scenario for the induced impacts resulting from reduced farm proprietor spending. Because the majority of income generated by

the cattle farm gets "spent" back into the farm through input purchases, breeding stock/calf purchases, etc. rather than spent on goods and services at retail and food service businesses, we assume that only a portion of the income lost during the drought will also be lost via induced impacts. A brief summary of the results follows.

3. Results

The direct impact of the 2012 drought on the Arkansas cow-calf sector is estimated to be \$128 million. Most of this loss is absorbed by the cow-calf sector by pulling additional income out of savings or other investments or more drastic means such as herd liquidations. However, a portion of the direct loss spurs decreases in other industries through induced impacts. The induced impacts of the lost income in the Arkansas cattle sector are losses of \$4.4 million in labor income and \$8.1 million in total value added over the past 12 months. The total impacts are losses of \$133 million in labor income and \$136 million in value added (Table 1). The real estate and rental industry experienced the most income and value added losses due to induced impacts, followed by health and social services, retail trade, finance and insurance and wholesale trade (Table 2). As discussed earlier and reflected in the results, the brunt of the economic losses are experienced directly by the cow-calf sector although the impacts of reduced spending by farmers and employees are felt across a broad range of industries. Comparing the current losses to the value of production from 2011 generated by marketings of cattle and calves in Arkansas of \$484.8 million (Table 3) demonstrates how dramatically the drought has impacted the cow-calf sector in Arkansas.

Table 1. The total economic impacts of the drought on the Arkansas cow-calf sector

	Labor Income (Dollars)	Value Added (Dollars)
	-	-
Direct Effect	128,000,000	128,000,000
Induced Effect	-4,398,237	-8,141,716
	-	-
Total Effect	132,398,237	136,141,716

Table 2. Top five industries (outside of agriculture) impacted by losses in the cow-calf sector

NAICS Industry ¹	Labor Income (Dollars)	Value Added (Dollars)
53 Real estate & rental	-85,837	-2,261,788
62 Health & social services	-1,304,024	-1,402,263
44-45 Retail trade	-727,358	-1,035,231
52 Finance & insurance	-431,323	-739,663
42 Wholesale Trade	-235,056	-418,234
Other Industries Total	-1,614,639	-2,284,537
Induced Effect, All		
Industries	-4,398,237	-8,141,716

Table 3. Cattle and calves marketings and value of production, 2007-2011

Year	Marketings (millions pounds)	JƯi YcZDfcXi W¶cb¹ (millions dollars)
2011	641.0	\$484.8
2010	696.6	\$433.2
2009	551.7	\$416.3
2008	589.5	\$423.4
2007	578.1	\$483.3
5-yr avg.	611.4	\$448.2

Source: NASS, 2012

4. References

Minnesota IMPLAN Group (MIG), Inc., IMPLAN System (2012). Data and software. 1725 Tower Drive west, Suite 140, Stillwater, MN 55082, http://www.implan.com.

National Agricultural Statistics Service (NASS) United States Department of Agriculture (2012). Meat Animals Production, Disposition, and Income Annual Summary. Available Online: http://usda.mannlib.cornell.edu

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¹ North American Industry Classification System