Confined Animal Feeding Operations and Kansas Land Values

K-State Beef Cattle Research Center

Source: Department of Animal Sciences and Industry

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Introduction:

Confined animal feeding operations (CAFOs) consolidate livestock production, holding multiple animals in small areas. For neighboring residential areas, CAFOs can present several issues such as odor from animal waste and increased road traffic from livestock transportation. These challenges often raise concerns for residential land and home owners who want to avoid decreases in property value, forced changes in lifestyles or communities, and adverse impacts on their health (Thu and Durrenberger, 1998). Various studies have well explored and documented the negative impacts of CAFOs on rural-residential property values in the United States. The results of such studies have typically shown that residential property values suffer and decline in the presence of facilities that compromise the comfort of living in those areas. While plenty of research has explored the impact of CAFOs on residential land, few studies have explored their relationship to agricultural farmland values.

The USDA currently estimates that agricultural farmland and real estate accounts for over 80% of the total assets within the farm sector and is valued at roughly $3,800 per acre on average in 2022 (USDA ERS, 2020; USDA NASS, 2022). Agricultural land has a prominent impact on the agricultural economy, and thus, shifts in its value lead to consequential changes in the equity of the sector as a whole. Understanding the key factors that cause shifts in agricultural land prices can help stakeholders in the farm sector to make more informed fiscal management decisions. The current relationship between farmland values and CAFOs is unknown. However, the opportunity to sell crops as livestock feed and the availability of animal waste as a fertilizer source may present a mutually beneficial market opportunity that is reflected in the value of agricultural land.

There are several things to consider when attempting to understand the relationship between CAFOs and agricultural land values. Questions surrounding this topic include: Is the relationship positive or negative? At what proximity does the CAFO need to be to impact the land value? Does the presence of multiple CAFOs have an impact on land value? This study was developed to address these questions and provide insight into agricultural land in Kansas. The purpose of the research summarized

in this article is to evaluate the relationship between the location of CAFOs and the value of agricultural farmland in Kansas.[1]

Procedures:

To accomplish the objectives, an analysis of Kansas's land values from 2012 and 2013 was conducted using a hedonic modeling approach. The value of the agricultural land parcels was estimated using various physical characteristics of the land, economic indicators, and the distance between the parcel and a CAFO location. Multiple models using different distance specifications were used to evaluate both the impact of the closest CAFO to a parcel of agricultural land and multiple CAFOs within a given area adjusted for differences across regions and counties in Kansas. Figure 1 provides a map of the locations and types of CAFOs included in this study.

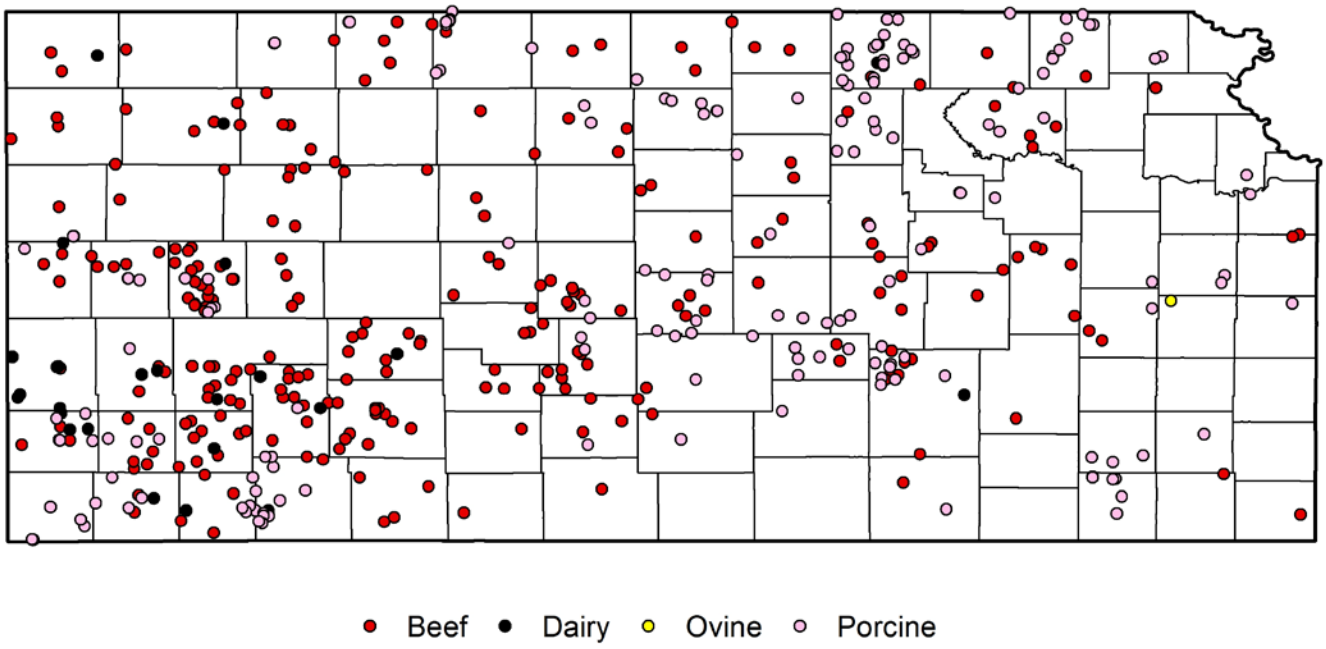

Figure 1. CAFO Location and Production Type, 2012 -2013

[1] For additional information, see Thomas et al. (2024).

Results & Discussion:

The results of this research identify a clear positive relationship between CAFO locations in Kansas and the value of agricultural land in the state. We estimate that the nearest CAFO to a parcel increases the value of the land by 5% with the average minimum distance between a parcel and the CAFO location being about 15 kilometers (roughly 10 miles). Furthermore, each additional CAFO present within a 25-kilometer radius (roughly 15 miles) of a parcel of agricultural land was estimated to increase the value of a parcel by up to 1.5%. Figure 2 shows the average number of CAFOs found in each band.

As shown in Figure 2, the average parcel of land in this analysis had approximately 20 CAFO facilities present within a 25-kilometer radius. This suggests that a parcel of agricultural land in Kansas could see a higher average sale price when surrounded by additional animal facilities. Other factors that significantly contribute to the value of agricultural land in Kansas include physical characteristics such as the parcel size, amount of irrigated land, amount of homestead land, and level of soil productivity.

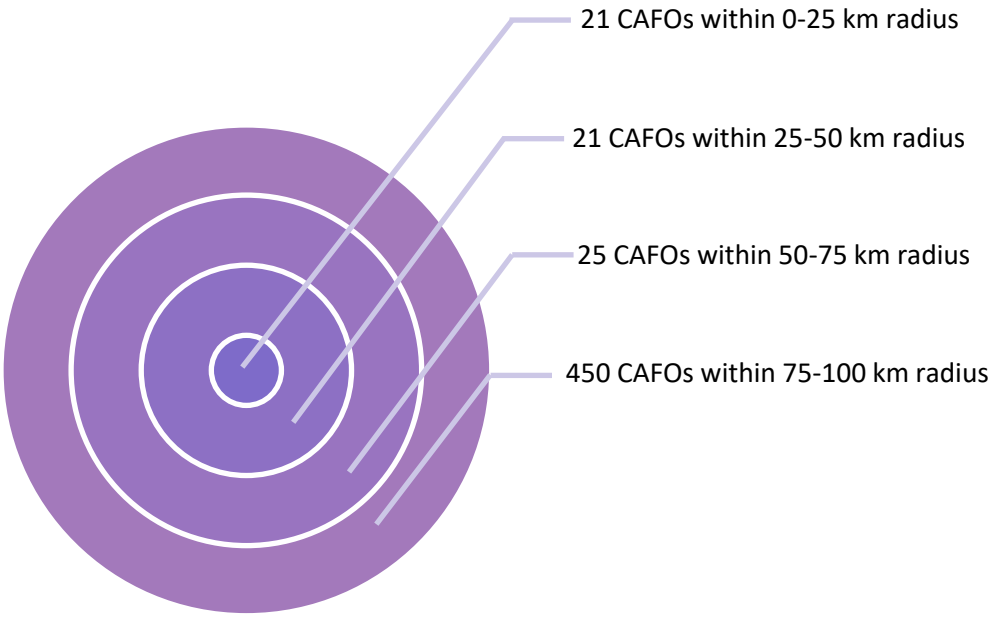

Figure 2. Average Number of CAFOs by Radius

Table 1 summarizes the results for the significant parcel characteristics identified in this study. Not only is the distance to CAFOs having a significant impact on land values, but also the size of the parcel, type of land, and soil productivity have a positive contribution to land values.

Table 1. Significant Parcel Characteristics Percentage Impact on Price

Parcel Characteristic	Impact on Land Value	Percent Impact
Distance to Nearest CAFO	+	5%
CAFOs in a 0-25 km Radius	+	1.5% per facility
Size	+	< 0.1%
Percent of Irrigated Acres	+	0.5% per acre
Percent of Homestead Acres	+	3.6% per acre
Crop Index (Productivity)	+	0.8%

This study shows that the market opportunities for cropland such as livestock feed markets and access to fertilizer inputs in the form of animal waste are reflected in the value of agricultural land. This relationship should be taken into consideration by landowners when seeking an accurate appraisal of the value of their assets along with other environmental and economic factors.

References:

Thu, K.M., & Durrenberger, E.P., eds. 1998. Pigs, Profits, and Rural Communities. *SUNY Press*. USDA ERS. 2020. Farmland Value. United States Department of Agriculture. https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-value/#:~:text=U.S.%20farmland%20values%20remained%20high,and%20Wealth%20Statistics%20for%20details

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Thomas, R., Myers, M., Pendell, D. L., Taylor, M., Yu, J., & Tian, A. 2024. Impact of Confined Animal Feeding Operations on Agricultural Land Values., *Journal for the American Society of Farm Managers and Rural Appraisers. (Full article forthcoming)*