

Animal Feeding Operations and Residential Value: Summary of Literature

This literature review evaluates and summarizes the impacts of animal feeding operations (AFOs) on surrounding residential and nonresidential land prices. It is based on 14 studies on the impact of AFOs on rural residence and property values. The following points provide a general summary of the results of these studies.

- All studies indicated that the impact of AFOs on property value was localized or limited to properties near the AFO.
- Seven of the 14 studies indicated that AFOs reduced nearby residential property values,^{1, 5, 8, 9, 10, 11, 13} and five indicated that AFOs have the potential to either increase or decrease housing values depending on AFO size, concentration or species.^{3, 6, 7, 12, 14}
- One study indicated AFOs can potentially increase or decrease prices of county farmland without residences, depending on density and scale of the operation.⁶
- One study indicated no impact of AFOs on agricultural land value.⁴
- A single study compared the local effect of an AFO on land prices with the impact of the AFO on the local economy and found local economic benefits exceeded negative impact on residential real estate values.¹

This review summarizes the factors found to affect the size of the impact of AFOs on rural property values. These factors are distance, size and concentration, animal species, housing value, management factors and economic benefits.

Distance

Distance is commonly used to explain the impact of AFOs on property value. The studies focused on sales of residences within 10 miles of AFOs. The conclusions indicate that the negative impact of AFOs on residential value diminishes quickly as the distance between the AFO and the residence increases.

- An Iowa study found that homes downwind of a livestock facility during the summer season were negatively impacted. As the distance between the livestock facility and home increased, the impact decreased.⁵

- Another Iowa study found that houses located within 2, 2.5 and 3 miles of a CAFO (concentrated animal feeding operation) resulted in losses of 17 percent, 15 percent and 6 percent, respectively.⁸
- A Pennsylvania study indicated that an AFO located within 0.3, 0.5 and 0.75 miles of a residence decreased the residential value by 6.4 percent, 4.1 percent and 1.6 percent, respectively.¹³
- A Colorado study was less clear on the impact of distance on residential values. It generally concluded an additional beef cattle or dairy operation near a residence correlated positively with sale prices but an additional hog or sheep operation was negatively related to sale prices of nearby residences.¹²
- A study conducted by the Indiana Business Research Center found that nearness to livestock operations yielded different results depending on the classification of the residence. General results indicated that AFOs decreased the value of town and nontown residential properties and increased the value of farm properties. Results also indicated all property values decreased if the residence was located downwind of an AFO.⁷
- The results of a Minnesota analysis indicated that nearby feedlots are associated with higher property values. This finding was contrary to what was initially expected. The explanatory variable “nearby” indicates that the location of a new feedlot within 3 miles of a home that has no feedlot would increase median home values by \$1,750, or 6.6 percent. The authors of the study concluded that this result could be due to an employment effect, wherein feedlot owners buy nearby residences to provide housing for their workers or to avoid complaints from homeowners.¹⁴

Because of poor sales data in Missouri, a traditional economic analysis of AFOs on residential values, as in all other studies mentioned, could not be performed. The Missouri study attributed all economic impact to the land containing a residence rather than to the actual residence. This data problem yielded confusing results. The study found that if no house was on the land, the value of the land did not decrease due to nearness to an AFO. If land within 3 miles of an AFO contained a residence, however, the land decreased in value an average of \$112 an acre. Recognizing that the land without a home did not decrease in value due to the AFO, any observed land value decrease when a house

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was present is due to an unmeasured decrease in residential value. Because the size of the land associated with individual homes is not a factor in the study, no quantitative impact on residential values could be determined.⁴

Size and concentration

Several studies sought to evaluate the effects of facility size and animal concentration on residential property values. Two studies indicated that the higher concentration of animals increased the negative impact on residential values.^{1,10} A Michigan study estimated that residential property values decreased 1.71 percent for every additional 1,000 hogs nearby.¹ This study may be biased, however, because it focused only on sales of houses near AFOs that had received odor complaints. A North Carolina study also showed that increased density of livestock increased the negative impact of an AFO on residential values.¹⁰

The Iowa study that found that nearness to an AFO decreased residential values also found that increasing size diminished the negative impact of the AFO. This counterintuitive outcome was conjectured to result from the awareness that larger AFOs are newer and have better manure management facilities.⁵

That same Iowa study also mentioned the impact of a new hog facility where none other existed within 3 miles of a home. The authors hypothesized that a new small facility located within ¼ mile upwind would be expected to diminish home values 14 to 16 percent. This hypothesis fails to account for the previous conjecture that small facilities are old and not as well managed.⁵

Another Iowa study indicated that larger concentrations of animals negatively impacted houses more than 3 miles from the livestock facility.⁸

A North Carolina study used a manure index (as a proxy for concentration of livestock) rather than individual AFOs to estimate the effect on property values. The manure index was calculated by converting animal-head capacities into tons of manure produced annually to determine the cumulative effect from all farms in each distance ring on housing values. The results indicated that if a new 2,400-head facility with an initial manure index of 33.107 was built within ½ mile, 1 mile or 2 miles of a house, the house's values would decline 4.75 percent, 0.57 percent or 0.56 percent, respectively.¹¹

An Illinois study indicated that a 1 percent increase in swine farm density would result in a 0.129 percent reduction in county farmland prices, meaning more hogs equals lower farmland prices. However, results indicated that a 1 percent increase in average swine operation scale would result in a 0.069 percent increase in county farmland prices, meaning larger operations increase county farmland prices. This study also examined the effect of the transformation of the Illinois swine industry from 1980 to 1999 and found that in most years the transformation had a positive effect on farmland values.⁶

An Indiana study summarized the concentration effect, the number of AFOs within ½ mile to 10 miles of a home.

The hypothesis was that the nearness of an AFO may not be as influential on housing prices as the concentration of AFOs in a particular area. The results indicate positive effects on property values where multiple AFOs are located between ½ and 3 miles from a property.⁷

Lastly, an Ohio study's results indicated that a new 1,000-animal unit livestock facility within 500 feet would slightly increase the value of a residential property previously surrounded by other facilities. But if the house was not surrounded by other facilities within 3 miles, a new animal facility would slightly depreciate its value. The results of this analysis indicate that the appreciation or depreciation of property value is tied to the density of the animal production inventories surrounding the property.³

The Colorado study again had confusing results. Increasing the size of beef and dairy operations decreased the value of residences, although the operations' presence generally increased the value of residences. In contrast, increasing the size of swine operations increased the value of residences, although the operations' presence generally decreased the value of residences. The peculiar results of the Colorado study may be due in part to the specific location of the study, which was the northern front range of the Colorado Rockies and included the commuter towns northwest of Denver and the entire greater metropolitan area of Greeley.¹²

Animal species

The Colorado study indicated that an additional beef or dairy operation near a residence will have a positive effect on housing sales prices, but an additional hog or sheep operation would have a negative effect on housing values. Interestingly, poultry operations were found to positively affect housing values within 2 miles and negatively affect values within 2 to 3 miles.¹²

Research conducted by the Indiana Business Research Center found that the type of animal confinement also has an effect on property values. General results found swine and beef operations to be positively related to town, nontown and farm residence values, and dairy operations to be negatively related to all three. However, depending on the pricing categories of these homes (low, medium, high), results could exhibit an opposite effect.⁷

Housing value

The Colorado study indicated that the less expensive housing market (under \$150,000) has an overall less negative impact than the expensive housing market (over \$200,000). Results showed that hog operations have a more negative impact on less expensive houses than beef and dairy operations. In the more expensive housing market, sheep operations had the largest negative effect of 0.45 percent (\$1,215.38) and poultry operations had the lowest negative effect of 0.008 percent (\$21.42).¹²

A Minnesota study concluded that older, lower-priced homes were more affected by feedlot proximity, and newer, higher-priced homes were not affected at all.¹⁴

The Indiana study showed that mid-priced (\$100,000 to \$150,000) and higher-priced (over \$150,000) nontown residential properties are positively affected by the number of AFOs within 1 mile. However, mid-priced properties are negatively affected by the number of pig animal units within 1 mile. Sale prices of mid-priced town residential properties were most likely to be influenced by surrounding AFOs, particularly by the type of operation.⁷

Management practices

Only two studies considered the impact of management practices on residential real estate values. A Pennsylvania study found that AFOs without conservation plans negatively impacted residential values more than AFOs with conservation plans.¹³ An Iowa study hypothesized that the lesser effect of large AFOs on land prices compared to smaller AFOs may have been due to better management of manure storages, land application of manure and site selection for the operation.⁵

Economic benefits

The Michigan study concluded that the economic benefits from local hog operations exceeded the economic costs on property value.¹ Similarly, the Indiana study concluded that housing markets benefit from having large-scale feeding operations nearby based on the results that AFOs positively affect values of houses located ½ to 3 miles away.⁷

In an interesting lawsuit in Nebraska, a man successfully argued that the presence of his AFO negatively impacted the assessed value of his expensive home. Reducing his assessed value allowed him to pay less property tax on his home.²

Summary

The studies summarized in this guide are inconclusive. The impact of animal feeding operations on residential values is not answered simply. Distance between an AFO and a home, concentration of AFOs and livestock, animal species, housing values and AFO management will affect the impact of AFOs on the value of nearby residences. Livestock production generally increases economic activity in rural areas and may reduce residential values, particularly of residences located near and downwind of an operation.

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