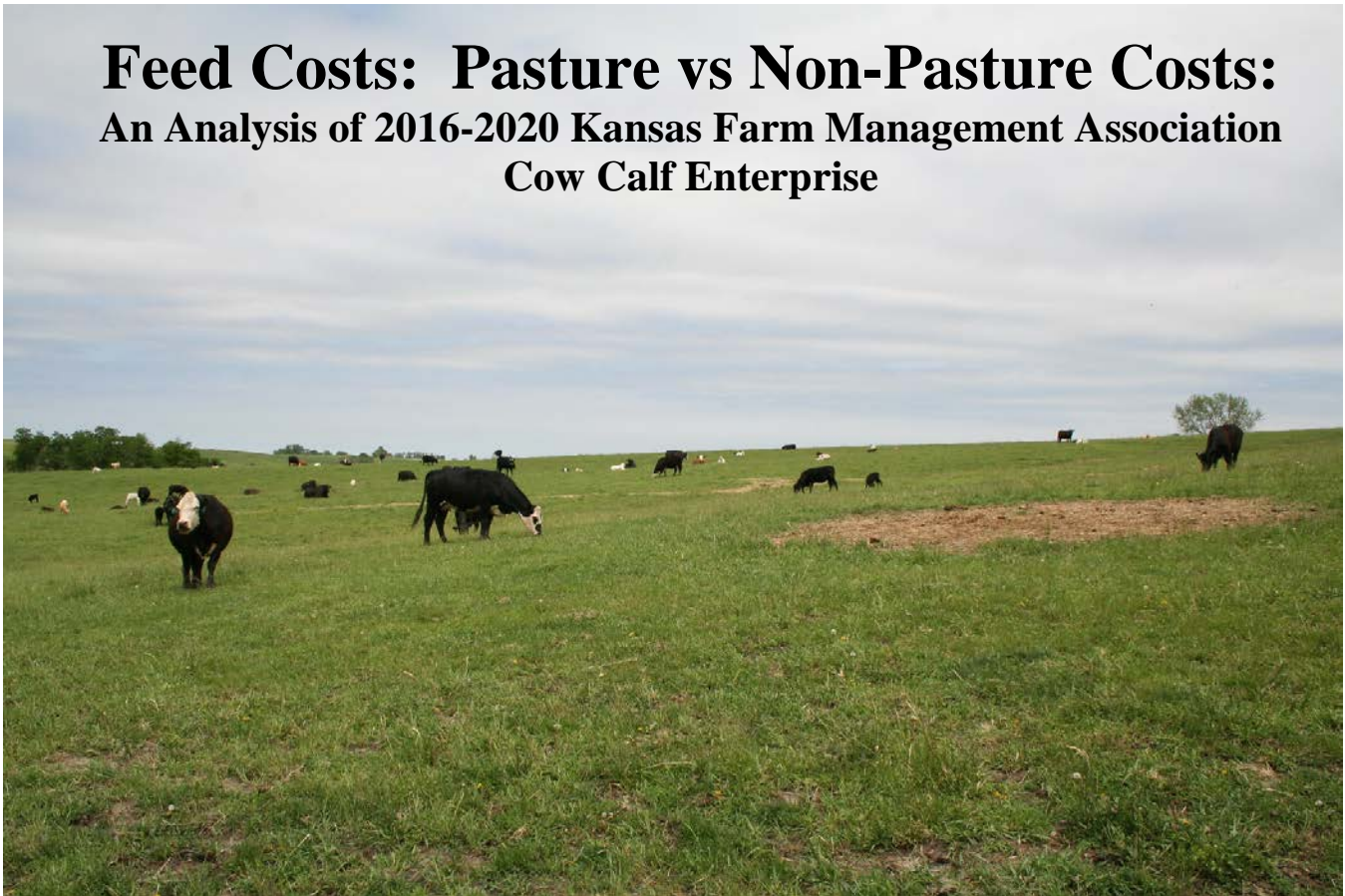


# **Feed Costs: Pasture vs Non-Pasture Costs: An Analysis of 2016-2020 Kansas Farm Management Association Cow Calf Enterprise**



Source: Beef Cattle Institute

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As documented in Pendell and Herbel (2021)<sup>1</sup>, feed costs typically represent the single largest cost for beef cow-calf producers.<sup>2</sup> Based on Kansas Farm Management Association (KFMA) data for the beef cow-calf enterprise, feed costs (pasture and non-pasture) were 44.5% of total costs in 2020 and 46.5% of total costs for the 2016-2020 average (<http://www.agmanager.info/kfma/> - see 2020 Enterprise Summary for Beef Cows, Sell Calves). Thus, it is important that producers know what their feed costs are and how they compare to benchmark values for other producers such that they can manage this important cost for long-term business profitability. While the nutritional requirements of a beef cow are pretty well determined given her genetics, body size, and the environment she is in, the specific feedstuffs used to meet those requirements can vary considerably. Typically, spring-calving beef cows in Kansas are grazed on native grassland for about half of the year (e.g., May-Oct) and then rely on harvested feeds (e.g., hay, protein supplements) and crop residues for the remaining portion of the year. However, it is possible to use native range along with supplements as needed for more months out of the year (e.g., year-round grazing). In other words, there is a trade-off between the use of pasture and non-pasture costs in meeting the nutrient requirements of the cow and her calf. Thus, a producer with higher than average pasture costs might still be competitive with other producers if non-pasture feed costs are lower than average. Likewise, a producer having high non-pasture feed costs might be cost competitive if pasture costs are lower than average.

The KFMA has been completing an enterprise analysis for beef cow-calf operations in Kansas for over 46 years and part of that analysis has been to calculate and report total feed costs. Reported feed costs are disaggregated into two categories – “pasture” and “feed”, where “feed” basically represents all “non-pasture” feed costs (i.e., hay, supplements, crop residues, grain, etc.). It is important to note that raised feedstuffs are valued to reflect market opportunities and thus producers that feed hay that they produced on their own land are charged a cost for that hay based on market conditions (similar for producers that graze pasture land they own). While breaking total feed costs into pasture and non-pasture categories is still not sufficient to answer all questions about why some producers are more profitable than others, it does help understand some of the differences between producers.

To address some of these differences between producers, cow-calf enterprise total feed costs data included in the 2016-2020 Kansas Farm Management Association (KFMA) beef cow-calf enterprise analysis were used. As discussed in the companion paper, a potential problem with analyzing the returns

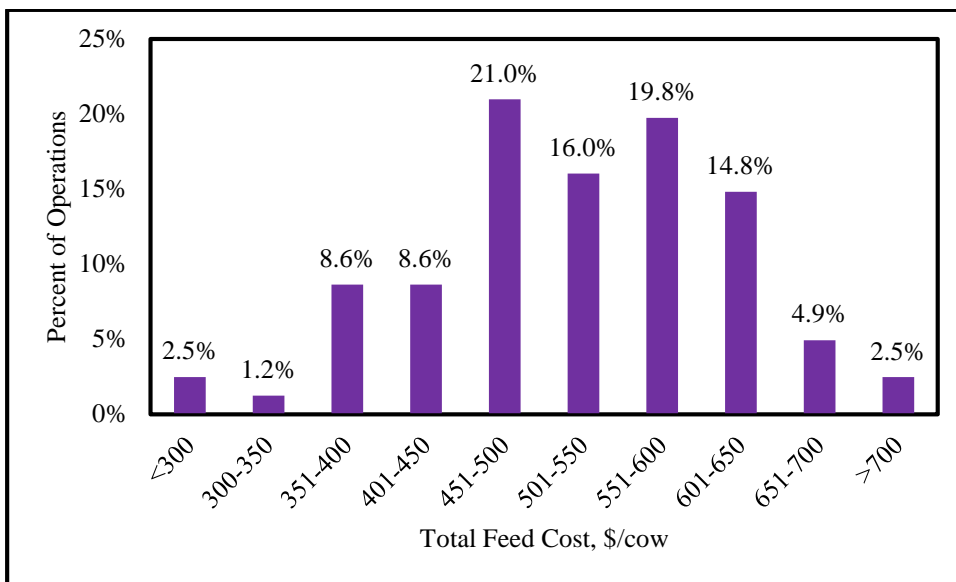
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<sup>1</sup> Pendell and Herbel (2021). “Differences Between High-, Medium-, and Low-Profit Cow-Calf Producers: An Analysis of 2016-2020 Kansas Farm Management Association Cow-Calf Enterprise.” Available at: [Differences Between High-, Medium-, and Low-Profit Cow-Calf Producers - 2016-2020 | AgManager.info](http://www.agmanager.info/kfma/2021-01-14-Differences-Between-High-Medium-and-Low-Profit-Cow-Calf-Producers-2016-2020)

<sup>2</sup> This paper is an update to Pendell and Herbel (2020). “Feed Costs: Pasture vs Non-Pasture Costs: An Analysis of 2015-2019 Kansas Farm Management Association Cow-Calf Enterprise.” Available at: [Feed Costs: Pasture Versus Non-Pasture Cost | AgManager.info](http://www.agmanager.info/kfma/2020-01-14-Feed-Costs-Pasture-Versus-Non-Pasture-Cost)

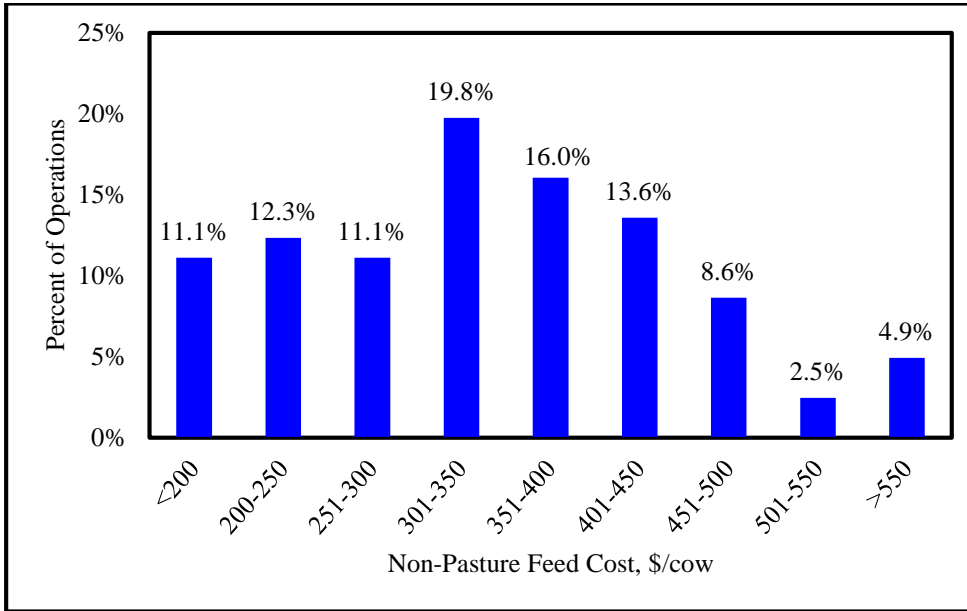
from a group of producers in a given year is that differences could be due more to chance than management.<sup>1</sup> For example, if producers in one part of the state received little or no summer rain, they might have lower weaning weights or higher feed costs, and hence, have below average returns due to weather conditions as opposed to poor management. To reduce the problem of random differences in costs across producers in a given year, a multi-year average is used for each producer. Specifically, the costs for producers that had a minimum of three years of data over the 2016-2020 five-year time period were included in the analysis.<sup>3</sup>

Multi-year averages were calculated for total feed costs for each of the 81 operations that had a minimum of three years of data. Figure 1 shows the distribution of total feed costs across these 81 producers. Total feed costs averaged \$520 per cow, but considerable variability existed as costs ranged from less than \$264 per cow to \$781 per cow. The most common value (approximately 20% of producers) was in the range of \$451-\$500 and \$551-\$600 per cow. Figures 2 and 3 shows the distribution of non-pasture feed costs and pasture costs per cow, respectively, across the same 81 producers. Non-pasture costs had tremendous variability as the values ranged from \$135 to \$614 per cow, with an average of \$344 per cow. Pasture costs averaged \$177 per cow, but also had a large range from \$31 to greater than \$327 per cow for the multi-year average.

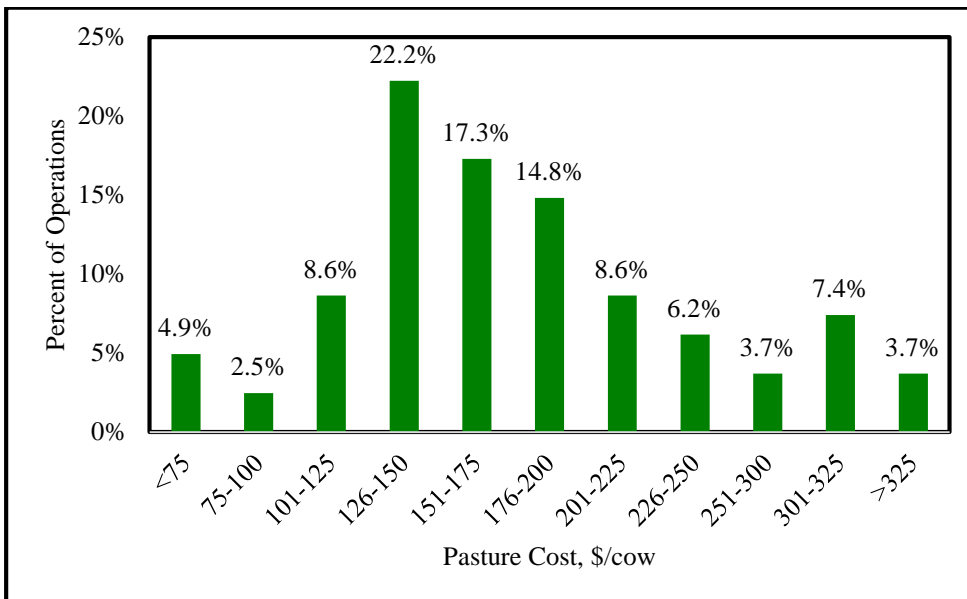


**Figure 1. Distribution of Total Feed Costs, 2016-2020 (average=\$520)**

<sup>3</sup> It would be preferred to have examined the costs for all producers having three or five years of continuous data; however, when that stipulation was used the sample size dropped significantly because not all cow-calf producers conduct an enterprise analysis every year. See Pendell and Herbel (2021) in footnote 1 for more discussion on these data used in the analysis.



**Figure 2. Distribution of Non-Pasture Feed Costs, 2016-2020 (average=\$344)**

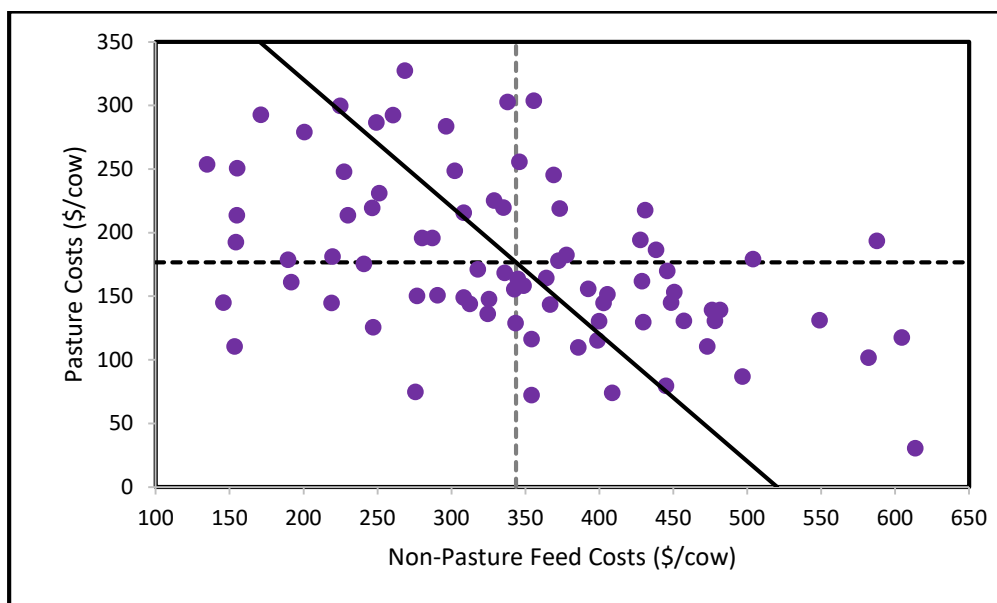


**Figure 3. Distribution of Pasture Costs, 2016-2020 (average=\$177)**

As might be expected, there is a strong, positive correlation ( $r=0.83$ ) between producers’ non-pasture feed costs and their total feed costs. This suggests that having high non-pasture costs is indicative of having high total feed costs. There is also a positive correlation between producers’ pasture costs and their total feed costs. However, the correlation is not as strong ( $r=0.12$ ). There is a negative relationship between pasture costs and non-pasture feed costs ( $r=-0.47$ ). In other words, as the pasture costs increase (decrease), the non-pasture feed costs decrease (increase). This suggests producers are possibly “trading

off” between pasture and non-pasture feed. That is, it might be that producers with high pasture costs have low non-pasture feed costs and vice versa. The grazing systems and strategies producers use (e.g., year-round grazing, early intensive grazing, rotational grazing, etc.) will impact their total costs and this might help explain the relatively weak relationship between pasture and total feed costs.

Figure 4 shows the multi-year average pasture and non-pasture feed costs plotted against each other. There are several points that can be made from this figure. First, the black line represents combinations of pasture and non-pasture feed costs that are equal to the average of total feed cost (i.e., \$520 per cow). Values to the right of the black line (52% of the points) represent producers that have total feed costs that are above average. Likewise, values to the left of the line (48% of points) represent producers that have total feed costs that are below average. Second, the two dashed lines represent the average pasture costs of \$177 per cow (horizontal dashed line) and average non-pasture costs of \$343 per cow (vertical dashed line).



**Figure 4. Pasture and Non-Pasture Feed Costs, 2016-2020**

Values in the upper right quadrant of figure 4 (14% of points) represent producers with both pasture *and* non-pasture feed costs that are above average, which likely will make it difficult for them to be competitive in the long run. Points in the upper left quadrant reflect producers that have above average pasture costs, but below average non-pasture costs. Thus, these producers might be using a longer grazing season and relying less on harvested feedstuffs. The lower right quadrant reflects the opposite scenario where producers have higher non-pasture costs than average, but lower pasture costs (i.e., somebody with a shorter grazing season and relying upon more harvested forages). The points in these two quadrants (i.e., upper left and lower right) reflect producers that are trading off one type of feedstuff for another<sup>4</sup>. Finally, points in the lower left quadrant reflect producers that likely have a competitive

<sup>4</sup> If looked at closely, it can be seen that there are more points to the left of the diagonal line in the upper left quadrant and more points to the right of the diagonal line in the lower right quadrant. This seems to indicate that producers relying more

advantage as they have both pasture and non-pasture feed costs that are below average (i.e., 21% of operations).

Being in the lower left quadrant of figure 4 might be something to strive for; however, a word of caution needs to be added about what this might represent. Given that a beef cow requires a certain amount of nutrients (i.e., either pasture or non-pasture feed), having costs below average for both of these suggests one of two things – either the cow is not receiving adequate nutrition, or the feed is valued at below average price/cost. The first statement may be true in any given year, but cannot happen consistently over time as production would suffer and cows might not rebreed. Likely, pasture and/or non-pasture feed costs are valued significantly below average for producers in this quadrant. For example, in figure 3 it can be seen that approximately 7% of the producers paid less than \$100 per cow for pasture costs in the multi-year average. If these producers had a similar grazing season as other producers, then this lower cost would be due to a low rental rate. It is important that producers recognize this because if this is what allows them to be profitable this may, or may not, be sustainable in the future. That is, producers should always strive to have a competitive advantage, but it is also important to recognize what might be the driving force behind this and whether it is sustainable in the long run.

There are a number of factors that might help explain differences between producers' feed costs (both pasture and non-pasture) as displayed in figure 4. Cow size will impact feed costs and thus an operation having smaller than average cows would be expected to have lower than average feed costs. Likewise, producers with larger cows, or creep feeding calves, will have higher total feed costs. Additionally, drought or other weather conditions might have significantly impacted individual producer's costs, and more specifically, the relationship between pasture and non-pasture costs for their operation in a given year.

When analyzing pasture costs and non-pasture feed costs over time for the same producers, there is a fairly strong relationship between costs compared to the previous year. For example, comparing the same producers pasture costs in 2019 and 2020, the correlation is 0.92. The correlation is 0.76 when comparing the non-pasture feed costs in 2019 and 2020 for those same producers. This suggests that feed costs for individual producers tend to be fairly consistent (i.e., high-cost producers have high costs across years and low-cost producers have low costs across years). This relationship indicates there is an opportunity for management. However, it can also be seen that variability around year-to-year costs does exist, which likely reflects less manageable factors (e.g., impact of drought, blizzard, localized hay production, etc.).

## Summary

Feed costs represent the single largest cost for cow-calf producers, and thus, represent an important determinant of cow-calf profitability. More specifically, the difference in feed costs across producers is a major factor explaining profitability differences across producers. Because feed costs are so important to profitability both in the short- and long-run, it is important that producers not only know what their costs are, but also how they compare with other cow-calf producers. This paper examined pasture and non-

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upon pasture, and less upon non-pasture feed, tend to have lower than average total feed costs (consistent with a common thought that costs will be lower if a cow harvests as much of her own feed as possible).

pasture feed costs for 81 producers participating in the KFMA 2016-2020 beef cow-calf enterprise analysis summary. Annual total feed costs (pasture + non-pasture feed) averaged \$520 per cow, but ranged from less than \$264 to over \$781. Across all producers, there is a moderately strong negative relationship between pasture and non-pasture feed costs indicating that producers might be trading off one feedstuff (pasture) for another (non-pasture). For example, the 2016-2020 average feed costs for 81 producers show that just below 36% had below average pasture costs and above average non-pasture feed costs and just below 30% of the producers had below average non-pasture feed costs and above average pasture costs; while almost 14% of producers had above average pasture and non-pasture feed costs and 21% of producers had below average costs for both pasture and non-pasture feed costs. Additionally, these data indicate persistence in feed costs across producers from year to year (i.e., those producers with high (low) costs in one year likely will have high (low) costs in the next year as well). This consistency reflects the management style and environment of an individual producer. Thus, it is imperative that they recognize if this is a comparative disadvantage that needs to be addressed or if it is a comparative advantage that can be capitalized on.

This paper focused solely on feed costs and thus only reported feed costs differences across producers. For those individuals that are interested in learning more about profitability differences of these same cow-calf producers, please see *Differences Between High, Medium, and Low Profit Cow-Calf Producers: An Analysis of 2016-2020 Kansas Farm Management Association Cow-Calf Enterprise*, which is available at [www.AgManager.info](http://www.AgManager.info).

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