

# ECONOMIC & POLICY UPDATE

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## Sacred Cows and Stocking Rates



*Author(s): Greg Halich*

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In May 2019, I was on a farm visit east of Lexington with a few county agents and NRCS specialists. Our goal was to help a cattle farmer who had about five years of experience come up with a long-run plan for improved infrastructure (water, fencing, etc.) as well as guide him in the short-run to improve the profitability of the farm.

It was quickly clear that the farm was significantly overstocked. It was mid-May and the pastures looked more like what you would expect in late July or August, not like what pastures should look like at their peak production. The pasture was one large unit without any subdivisions and was being continuously grazed by the cattle.

We found out later that he had about 95 acres of open pasture acres (after subtracting out woods and brush) and around 45 cows. This put his stocking rate at just over 2 acres of pasture per cow. Two

acres of pasture per cow is sometimes used as a rule-of-thumb as what is needed to support a beef cow in Kentucky. However, the soil quality of those acres, as well as management intensity are important factors that also need to be considered. Two acres of gently rolling Maury Silt loam in central Kentucky combined with well-managed rotational grazing will provide a lot more grazing than two acres of steep hillside Eden Shale clay combined with continuous grazing. Cow size will also have an impact. You can run a lot more moderate-framed 1200 lb cows on a given farm than you can 1800 lb behemoths.

Moreover, the two-acre per cow generalization does not define what “supporting” a cow means. Does it mean being able to graze through December on an average year, or does it mean the farmer will start having to feed hay by early October in an average year, and late summer if there is even a mild drought? I would contend that with more typical soils and management found in Kentucky, the two-acre stocking rate generalization would more likely than not result in the later hay feeding situation. The farm we were visiting was comprised mostly of steep Eden Shale clay, was being continuously grazed by the cattle, and was feeding over 150 days of hay per year.

We spent over two hours touring the farm and had a discussion in the shade before leaving. There were a lot of suggestions about ways to improve the farm, and most of these the farmer agreed with. However, when I mentioned that one of his fundamental issues on the farm was that he was overstocked and that by reducing the number of cows he could increase his profitability quicker than just anything else we suggested, he seemed perplexed. Paraphrasing what he said only slightly: “How could having fewer cows, and selling fewer calves possibly make you more money?” He was of course, focused on the revenue side of the profit equation.

What he was not considering is how much the cost side of the equation could go down by stocking at a lower rate. The biggest cost that decreases with a lower stocking rate is hay cost: not just overall hay cost (\$ for the entire farm), but also the hay cost per cow. By having fewer cows, you will be able to graze further into the fall or winter, as well as start grazing a little earlier in the spring. Thus, hay cost per cow would go down.

Having fewer cows (compared to an overstocked farm) also results in better quality forage, on average, going into the rumen of the cow, both during the grazing season and during those days where the overstocked farm is feeding hay while the farm with the lower stocking rate is still grazing. This improved forage quality has two positive effects on performance: 1) Increased conception/weaning rates, and 2) Increased weaning weights for the calves. Greg Brann, retired Tennessee NRCS grazing specialist (now doing consulting work related to grazing and soil health <https://gregbrann.com/>) noticed how drastically these performance measures improved on farms with lower stocking rates based on the thousands of cattle farms he visited in Tennessee and surrounding states. He also said most people never considered them as possible benefits of reduced stocking rates.

Getting back to the cattle farm east of Lexington, how many cows should this farmer reduce his cow herd by to be most profitable? It was clear that reducing his stocking rate from the current level would help with profitability, but at what point should he stop? Would he be most profitable at 2.5 acres per cow, 3 acres per cow, or 4 acres per cow?

I have been working on this question for the last few years. One thing that I learned is that you cannot answer the stocking rate question directly. As mentioned earlier, two acres of pasture is not always equivalent to another two acres of pasture. Management styles differ considerably, and two different farms on the same type of ground may need different stocking rates to achieve the same grazing goals. Thus, the question needs to be framed slightly differently: Instead of trying to determine what is the most profitable stocking rate for all farms, we need to instead determine the

most profitable number of hay feeding days for a given farm. If for example, the most profitable hay feeding days turned out to be three months, that might be equivalent to 2.5 acres of pasture per cow on one farm, and 3.5 acres of pasture per cow on another farm. You would have to estimate what actual stocking rate would get you to that hay-feeding rate based on the management and productivity of each farm.

The basic tradeoff in estimating the optimal hay feeding days is this: by reducing the stocking rate, we sell fewer calves, but at the same time we also reduce our costs/cow, as well as increasing the revenue per calf slightly (through the higher weaning rates and weaning weights). The other two major factors that impact the decision are hay cost per ton, as well as the overall cattle market. If the cost of hay is high, the optimal hay feeding days will shift downward (you will want a lower stocking rate). If the overall cattle market is high (like in 2014), the optimal hay feeding days will shift upward (you will want a higher stocking rate). In other words, if we knew we were going to be able to sell calves for \$2.50/lb, the reduced costs from lowering our stocking rate would not likely outweigh selling fewer calves and giving up \$1000-1200 per head.

## Results:

Table 1 shows the results for the most profitable hay feeding days given an estimated net hay cost. This assumes a cattle market that is slightly above current levels, where a 525 lb steer/heifer average calf is selling for \$1.50/lb. Net hay cost is the cost or value of the hay minus the net fertilizer value. For example, a 5'x5' bale is typically around 1000 lbs or half a ton. If the cost per bale was \$35, the cost per ton would be \$70. The net nutrient value will vary substantially, from \$0-25 per ton. Most farms are probably in the \$5-10 per ton range. Thus if we valued the nutrient value at \$10 per ton, the net hay price for this farm (hay minus nutrient value) would be \$70 – \$10, or \$60 per ton. For more details on how to estimate the nutrient value of the hay fed on your farm go to the following article: <https://www.progressiveforage.com/forage-production/management/fertilizer-value-of-hay-feeding>

<b>Table 1: Most Profitable Hay Feeding Days</b>	
Net Hay Cost	Hay Feeding Days
\$40/ton	90-120
\$60/ton	60-90
\$80/ton	0-60
<i>Note: Net hay = hay cost less net nutrient value.</i>	

Depending on the estimated net hay cost, the most profitable hay feeding ranges from 0 – 120 days. The net hay cost for most farms in Kentucky will probably be at or slightly above the \$60/ton level. Given this likely net hay cost, the most profitable number of hay feeding days will be in the 60-90 day range, or two to three months of hay feeding for the average Kentucky farm. For further details of the analysis, see the following article in Progressive Forages: <https://www.progressiveforage.com/forage-production/management/picking-apples-off-the-grazing-tree-part-iii-the-stocking-rate-hay-feeding-trade-off>

How do these results conform to the majority of beef cattle farms in Kentucky? Acknowledging that we do not have official statistics on hay feeding days, I do regularly ask county agents what their guess is for their county. The usual response is around 120 days or four months of hay feeding, with the range somewhere between 100-150 days. If these estimates are accurate, we are feeding a lot more hay than we should be, and thus have a lot of room to improve profitability.

I have been criticized by hard-core grazing proponents for not providing a unified message promoting less hay feeding, even though for the average farm in Kentucky that is exactly what I have been advocating. While most farms are probably feeding too much hay, there is a smaller number that are not feeding enough and have pushed the “grazing is cheaper than hay feeding” envelope too far.

I presented on this topic at the Tennessee Grazing for Profit conference a few years ago and a young cattle farmer came up to me after the presentation. He seemed perplexed: he had read in a grazing magazine and heard at another conference that grazing is always cheaper than feeding hay. My results contradicted the message that you should strive for feeding no hay on your cattle farm. I asked him how he was going to get to the point of not feeding any hay on his farm. He said he was told to just keep grazing through the winter and to not feed hay! I tried to tell him in as kind words as I could find that this was wishful thinking, and that wishful thinking will not provide grass for the cows to eat on a cold, windy February day.

This young cattle farmer seemed just as perplexed as the farmer on those steep Eden Shale slopes. He did not understand the hay-feeding and stocking-rate tradeoff, and thought he could continually reduce his winter hay feeding without at some point reducing his stocking rate, and consequently (if successful in feeding no hay) would end up with a stocking rate that was too low. The farmer east of Lexington also did not understand the hay-feeding and stocking-rate tradeoff, but was on the other side of the proverbial misinformation fence. Consequently, he was stocked way too high.

The two-acre per cow rule of thumb may have had a purpose and may have been useful 1-2 generations ago. Possibly cattle prices were considerably higher relative to hay costs at that time, thus increasing the range of most profitable hay feeding days. Possibly the average cow size was a lot smaller. I do not know for sure. However, in our current era, there are few soil-management-cow size combinations in Kentucky that I believe two acres per cow will be anything close to the most profitable stocking rate, and will likely lead to a steady flow of losses.

I would rather not have a rule-of-thumb for anything that is as variable as stocking rates. If someone new to cattle is seeking guidance on how many cows their 100 acre farm can handle, I would rather not tell them a specific number without additional explanation. I think it is better to initially say something like: “whatever the number of cattle your farm can handle to keep your total hay feeding days in the 2-3 month range”. That might involve starting out with 3-4 acres per cow (25-33 cows on the 100 acre farm) and seeing what it results in, and slowly adjusting the stocking rate to reach and stay in that optimal hay feeding range. It will not necessarily be a static number. Improvements over time in grazing management and/or soil quality will allow an increase in stocking rates.

Given Kentucky’s unique forage base and climate, we have the potential to be one of the lowest-cost producers of calves in the country. That was a gift bestowed on us by a higher order. How we choose to take stewardship of that gift is up to each of us. Will we be lean and mean, or shiny and bloated? The quickest way for most farms in Kentucky to get back on the path of low-cost production is to base their stocking rate on profitability, not bragging rights based on maximum production. For most of our farms that will mean feeding less (but not zero) hay. Getting rid of the two-acre per cow rule-of-thumb and aiming for 60-90 days of hay feeding will get most farms pointed in the right direction.

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Author(s) Contact Information:

**[Greg Halich](#)** | Associate Extension Professor | **[greg.halich@uky.edu](mailto:greg.halich@uky.edu)**

*Profitable Stocking Rates was one of the topics covered at the [Cow-Calf Profitability Conferences](#) held this past winter. The focus of these conferences is to identify drains on profitability and provide options to remedy them. The conferences were postponed due to Covid-19. Contact your county ANR agent to find out when they will resume, hopefully by late fall, as well as the locations they will be offered. When available, dates and locations will also be announced on our [Extension Events](#) page and [Facebook](#) page.*