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The Cowboy Math of Mature Cow Size and Calf Revenue Generated

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I recently attended the 2024 Beef Improvement Federation meetings in Knoxville, TN. Interesting topics covered by an excellent panel of speakers from which I pull some information together for this week's topic. Did you know?

- The U.S. cow herd has been steadily increasing in mature weight for several decades. Excess mature weight of cows has several downsides. The focus of this article is its impact on profitability in commercial cow-calf operations.
- For each 100 head of 1,000 pound cows you could run in your cow-calf operation, the same forage base (and feed input cost) would sustain 71 head of 1,400 pound cows.
- For each 100 pound increase in mature weight, cows average approximately 10 more pounds of calf weaning weight produced.

The Cowboy Math

For the sake of this article, some assumptions are necessary, these are:

- the 1,000 pound cows will wean calves weighing 450 pounds
- a value of $3.00/pound for calf weaning weight
- a 90% calf crop weaned for both groups of cows

Therefore, the 100 head of 1,000 pound cows will wean 40,500 pounds of calf pay weight with a total value of $121,500. For example: (100 cows x 90% x 450 pounds x $3 per pound)

The 71 head of 1,400 pound cows will wean 64 calves weighing 490 pounds for a total of 31,360 pounds of calf pay weight with a total value of $94,080. (71 cows x 90% rounded up to 64 calves) x 490 (assuming an extra 10 pounds of weaning eight per 100 pounds of mature cow weight) x $3 per pound.

Bottomline

Yes, the Cowboy Math tells us the same forage base and feed cost could result in $27,420 more revenue generated annually. No, the 490 pound (heavier) weaned calves will not be worth as much per pound as the 450 pound calves. Taking that into account would exaggerate the difference in revenue generated to the advantage of the more moderate size cows.

This fall at weaning I encourage producers to weigh your cows and your calves. Those measurements can help to determine if excess mature cow weight is robbing profit potential from your operation.

References

Beef Improvement Federation Symposium. Cow Longevity: Economics & Genetic Solutions. Dr. Bob Weaber. June 11, 2024

Beef Improvement Federation Symposium. The Full Picture of Cow Efficiency. Dr. David Lalman. June 11, 2024

Nitrate Poisoning

Farmers and ranchers depend on the successful combination of livestock and crops. Forage crops, in particular, are important to the producer, but they should be monitored due to plant toxicants that can be a problem. One toxicosis of concern is Nitrate (NO_3) toxicity.

Nitrate toxicity of cattle was noted as early as 1895 with corn-stalk poisoning. However, at that time nitrate was not recognized as the principle toxicant. In the late 1930s, after an outbreak of oat-hay poisoning in the high plains region, an indictment of nitrate was finally made. The term "Nitrate Toxicity" should actually be "Nitrite Toxicity." When nitrate is ingested by a ruminant animal, it undergoes a chemical reduction action to nitrite. This reduction is accomplished by rumen microorganisms. Nitrite is readily absorbed into the bloodstream where it oxidizes the ferrous iron of the red blood pigment hemoglobin to ferric iron producing a modified red blood pigment called methemoglobin. Methemoglobin is incapable of transporting oxygen to various body tissues so the animal exhibits a characteristic chocolate brown blood color prior to and during death which is caused by asphyxiation. Ruminant animals affected in this manner by high nitrate feeds are said to be suffering from methemoglobinemia. Simple stomached animals such as swine and poultry do not have the microorganisms which can make this rapid conversion and are not as susceptible to nitrate toxicity.

The environmental scenarios that enhance accumulation of nitrates are similar to those of prussic acid, see OSU Fact Sheet PSS-2904, "Prussic Acid Poisoning in Livestock." However, the location of the toxicant within a plant is different. Therefore, it is necessary to be familiar with plant factors, livestock factors, and management practices to safely utilize forages that have the potential of this toxicosis.

Plant Factors in Nitrate Accumulation

Practically all plants contain detectable amounts of nitrates. Excessive nitrate accumulation occurs when the uptake of nitrate exceeds its utilization in plants for protein synthesis. The sorghum plant has been noted as having a high potential for accumulating nitrates. However, with proper management this crop offers a great potential as a feed source. The following factors are related to nitrate accumulation in plants:

1. **Plant species vary in their ability to accumulate nitrate. Even common barnyard weeds can cause problems.**

Management: If nitrate accumulation is of concern in your area, select sources of feed that have lower accumulation potential. Consider the environmental conditions for that year and manage inputs to accommodate lower accumulation potential.

2. **Stalks are highest in nitrate content, followed in order by leaves and grain in decreasing amounts**.

Management: Research with piper sudangrass, sorghum sudangrass, and pearl millet has shown that the lower six inches of the stem contains 3 times more nitrate than does the top part of the plant. Elevating the cutter bar above this six inch point can potentially lower nitrate levels.

3. **Immature or young plants have a greater potential for nitrate accumulation than older plants (such as those with seed in the hard dough stage).**

Management: Be cautious when turning livestock in on a field that is still immature in growth. Hungry livestock are not as likely to selectively graze leaves over stems so allow them to feed before releasing them on a field. Always test fields of concern prior to releasing livestock on them.

4. **Any weather condition which reduces plant growth may increase nitrate accumulation. This includes drought and sometimes cool, cloudy weather.**

Management: This condition is obviously out of your control. However, it is important to be aware of the weather conditions for that year and how they have affected your crop. The quantity of nitrate in a plant which is dangerous to ruminants is sufficient for only 2 to 4 days of active plant growth. Thus, problems created by weather usually disappear after a few days of sunshine, adequate moisture, and proper temperatures (70°F for small grains and 85°-90°F for sorghums). The exception to this would be late-planted material or regrowth that has been hit by a frost and immediately after a drought-ending rain. Research with millets has shown that 7 to 14 days are required for nitrate to return to safe levels after a drought-ending rain.

5. **Forages high in nitrate will exhibit lower nitrate levels after being ensiled due to the microbial activity in the fermentation process.**

Management: Ensiling is one option when dealing with higher nitrate forage sources. However, caution should still be taken as ensiling corn has been reported to reduce nitrates by a range of only 20-50%. Therefore, if silage was put up with nitrate concentrations of 10,000 – 20,000 ppm, then the potential for high nitrate levels would still exist. If the silage has less than 10,000 ppm nitrate concentration levels, the range of use may be improved. If high nitrates are a concern prior to the ensiling process, silage should be tested before feeding.

6. **Excessive use of nitrogen fertilizer may contribute to the problem**.

Management: Apply 50 pounds of actual nitrogen per acre as a preplant application and then the same amount after each cutting (refer to OSU Fact Sheets PSS-2225 and PSS-2568) for sudangrass being cut for hay. If grazing, a second application should only be made if adequate moisture and growing conditions exist and subsequent secondary growth is allowed. Research has shown no significant differences between this application and a one time 100-pound application in terms of nitrate accumulation. However, research has shown the trend for greater nitrate accumulation with higher application rates (Table 3). Therefore, this is a conservative approach in managing for low nitrates.

7. **Acid soils and phosphorus deficient soils will increase plant nitrate accumulation**.

Management: Soil testing is a necessity for any successful farming operation. Apply phosphorus fertilizer and ag-lime as determined by a soil test. The OSU soil testing laboratory recommends maintaining a soil pH greater than 5.5. Phosphorus fertilizer requirements vary depending on the soil test value of the field.

Brown Patch Disease of Cool-Season Grasses

David Hillock

Brown patch is a disease that commonly shows up on cool-season turfgrasses, especially tall fescue, but can occasionally appear on hybrid bermudagrass and zoysiagrass. Brown patch disease appears as brown patches up to three feet in diameter. Leaves first take on a dark color, then wilt and turn brown.

Brown patch usually occurs in hot, humid weather when night temperatures are above 60°F and foliage remains wet for prolonged periods. Poor soil drainage, lack of air movement, cloudy weather, heavy dew, overwatering and watering in late afternoon favor prolonged leaf wetness and increased disease severity. The application of high rates of nitrogen and or deficiencies of phosphorus and potassium, especially when weather conditions are favorable for brown patch, can increase disease severity. Excessive thatch, mowing when wet and leaf fraying by dull mower blades can also enhance the severity of brown patch.

Control starts with good management practices. Though there are varieties of turf-type tall fescue that are considered resistant to brown patch, even resistant varieties succumb when growing conditions are less than ideal for growth of strong plants (as described above) and environmental conditions are highly favorable for disease development.

When environmental conditions favor disease, avoid application of excessive rates of nitrogen. Fertilizer should be applied judiciously, and adequate amounts of phosphorus and potassium are essential to ensure the highest possible levels of plant resistance. In general, cool-season turfgrasses should not receive more than one pound of actual nitrogen per 1,000 square feet at any one time. Use very low rates or avoid applying nitrogen in late spring or summer to cool-season turfgrasses. In a typical home lawn situation, the last application of fertilizer in the spring should be applied no later than early May. Ensure adequate amounts of phosphorus and potassium by applying these nutrients based on soil test results.

Reduce prolonged leaf wetness by watering infrequently to a depth of 6 to 8 inches and at a time when the foliage is likely to dry quickly. Avoid watering in late afternoon and evening and allow for better air movement by removing unwanted vegetation and selectively pruning trees and shrubs. Removal of morning dew reduces prolonged leaf wetness and exudates that favor disease development. This can be accomplished by dragging a hose across the turfgrass or by running the irrigation system for a short time. Good surface and soil drainage must be present to reduce disease incidence.

Make sure mower blades are sharp to reduce the amount of wounded turfgrass in which the fungus can enter the plant. Collect and promptly dispose of clippings on infected areas or when conditions favor disease development. Avoid mowing turfgrass when wet, and do not mow too low so that the turfgrass will be better able to resist the disease.

Applications of effective fungicides, when the first disease symptoms appear, will give good control of brown patch on highly maintained turfgrass. A preventative fungicide program should be considered in areas where the above conditions are difficult to control or change and when conditions are favorable for disease development.

For more information on managing cool-season grasses see leaflet **L-442 Cool-Season Lawn Management Calendar** and fact sheet **HLA-6420 Lawn Management in Oklahoma**

Fleas and Ticks in the Yard

We are in flea and tick season. Successful flea and tick management relies on Integrated Pest Management (IPM). Pets, pet areas, the yard, and home must all be treated and may need repeat applications. Non-chemical methods should be used with chemical treatments. There are many good products on the market. Insect growth regulators (IGRs) are available for the pet, yard, and inside the home. Here are a few more tips.

Flea adults feed on blood and females require a blood meal to lay eggs. All stages of ticks except eggs feed on blood. Male and female adult ticks need a blood meal before they mate and before females can lay eggs. Both fleas and ticks prefer shady, moist areas outdoors.

There are over 2,000 species of fleas in the world; the cat flea is the most common flea found in urban areas and is an intermediate host of the tapeworm. Cat fleas lay eggs on the host, and some fall off and develop in pet bedding, carpet, soil, etc. Eggs hatch in about 1 to 12 days. The larvae are tiny, whitish, legless, covered with hairs, and feed on organic debris, their own caste (skins), and adult feces. Larvae develop over 7 to 26 days and may last over several months if conditions are not favorable. Favorable conditions include 50% or greater humidity and 55 to 90 degrees Fahrenheit. Flea larvae do not survive in direct sunlight or standing water. After the larvae reach the last growth stage, they spin a cocoon. This is called the pupating stage and may last 1 week to several months depending on the direct pressure and area disturbance, increased temperature and humidity, and body warmth of host. When an adult cat flea emerges from a cocoon, it will normally only live 7 to 10 days if it doesn't get a blood meal. The average life span of females on a host is about 11 days and males about 7 days. Egg to adult may last 16 days to 20 months.

There are four species of ticks in Oklahoma. These can transmit diseases to humans including Rocky Mountain spotted fever and Lyme disease. The normal life cycle of a tick from the larval stage until adult lays effs is usually a year or more.

The American dog tick is found throughout Oklahoma but is very abundant in wooded or partially wooded recreational areas. The lone star tick and black legged tick are most abundant in wooded areas in eastern Oklahoma, although the black legged tick does occur in wooded areas of some western counties. The brown dog tick is common throughout Oklahoma and almost always is associated with dogs and areas where dogs are kept (kennels, dog houses, porches or in the house). The black legged tick and brown dog tick commonly prefer other hosts other than humans.

The pet, home and yard should be treated at the same time to prevent infestation from a treated area. There are many methods that should be used in addition to chemical treatments.

Because dogs may carry fleas and ticks into urban areas, they should be checked when returning from a suspected infested area to reduce tick establishment in their yard.

Lawns must be mowed frequently and the prevention of build up of tall grass, weeds or brush in fence lines or around shrubbery is important. Remember these pests prefer shady areas.

There are many insecticides available for fleas and ticks. There are growth regulators available for yards that prevent fleas from reproducing. Insecticides should be used according to the label. It is recommended chemical families be alternated every other treatment to avoid insecticide resistance. These chemicals should not be mixed and applied in yards at the same time.

Mix outdoors away from drains and use only the recommended amount on the label directions.

Cover all exposed skin when mixing and applying insecticides. Use a dust mask when mixing or applying dusts, powders or granules.

OSU EXTENSION
4-H YOUTH DEVELOPMENT

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CALENDAR

Aug 21-24..... Beaver Co. & 4-H Fair

If you are interested in being included in a

WATER ISSUE Research Group for our area,

please contact Loren at the

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580-625-3464 or by email loren.sizelove@okstate.edu

WE WILL BE OFFERING

ARTIFICIAL INSIMINATION

COURSES

COMING IN

FEBRUARY 2025

Course size will be limited