The Latest Across the Plains

Unused Feed

Fill your minds with those things that are good and deserve praise; things that are true, noble, right, pure, lovely, and honorable. Put into practice what you learned and received from me, both from my words and from my actions. And the God who gives us peace will be with you.

-- Philippians 4:8-9

Save Money $$$ Test Your Feeds

Tests are relatively inexpensive, usually costing less than $18, for the information derived. Contact our office to set up an appointment to have us pull feed samples if we have not done so yet.

We want to hear from you…

Do you have a question you would like one of the nutritionists to address in depth in our newsletter? Just submit your question through our website www.GPLC-Inc.com and we will get to work on it.

Timely Reminders

- Prepare adequate wind shelter and protection from winter elements. A dry, clean hair coat reduces maintenance energy requirements.
- Analyze winter feed supplies.
- Keep pens scraped and get manure hauled to fields.
- Make sure waterers are clean and in good working order.
- Keep an eye on breakeven projections for cattle placed on feed.
- Monitor BCS of cows monthly.
- Contact your nutritionist about running projections on growing or finishing cattle, beef or Holstein, to help plan feedstuff needs.
- Remember to provide bedding for mature bulls. Frozen testicles are a major reason for BSE failure.
- Use an internal parasite control product (white de-wormer) in both cows and calves after freeze up/ dormancy occurs.
- Its easier to put BCS on cows in the 2nd trimester, rather than the 3rd. Consider increasing BCS now if needed.

Securing Quality Corn Silage Throughout the Year

Even though this year's corn silage harvest is complete, it is important that the silage pile is properly managed to ensure a quality product is maintained throughout the year. If not managed properly, excessive exposure to oxygen is likely to reduce feeding value. Oxygen exposure can cause mold (Figures 1 and 2) and mycotoxin production which can result in decreased feed intake, poor performance and abortion.


Figure 1.


Figure 2.

Three molds commonly found in corn silage are *Monascus ruber, Aspergillus fumigatus,* and *Penicillium roqueforti.* These molds can be visibly identified by their color: *M. ruber* is red surrounded by white*, A. fumigatus* is yellow/green, and *P. roqueforti* is green/blue. Molds can reduce nutritional value, palatability, and bunk life. Additionally, some molds can produce toxic secondary metabolites known as mycotoxins. Primary mycotoxins found in corn silage are aflatoxin, deoxynivalenol (DON), zearalenone, T-2 toxin, fumonisin, and ochratoxin. The consumption of feed containing high levels of mycotoxins is rarely fatal but can have neg-

ative implications on important productivity measures such as feed intake, growth, performance and reproductive success.

Once harvested, a safe and cost-effective way to prevent molds and mycotoxins is to eliminate or reduce the presence of oxygen during storage. Steps that can help manage oxygen exposure of your corn silage are:

1. **Covering your silage pile**. You should always cover silage stored in bunkers with plastic. The cover should be applied immediately after the pile has been packed. Delayed sealing or coverage resulted in greater DM loss and lower aerobic stability when exposed to air during feed out (Bruning, et al., 2017). Shrink (loss of carbon/moisture) of an uncovered pile is 20-50%, while a covered pile only has 10-20% shrink. The addition of an oxygen barrier would add another 3-5% reduction in shrink, which has a significant economic impact. For example, if you reduce shrink from 25% to 15% with a cover/barrier and have $4.00 corn, you save $5.05/ton on 1200 tons, meaning you save $6060 per pile for a $1000 tarp.
2. **Prevent any tears and/or holes in the cover from sharp objects or wildlife**. Stored silage should be checked on a regular basis. Seal any tears/holes immediately after discovery. Bagged silage should be placed away from woods or water ways to reduce wildlife destruction, such as raccoons. Reintroduction of oxygen to stored silage leads to secondary fermentation, DM loss, molding and undesirable bacteria, such as *listeria*.
3. **Proper silage face management.** Silage that has been exposed to oxygen should be fed within 24 hours. The feed out face should have a smooth surface with no cracks and be perpendicular to the floor. A smooth perpendicular face reduces surface area being exposed to oxygen by up to 9%, risk for avalanches, and water being caught during rainy periods. When building a new pit, it is important to match the pit size to herd size to ensure silage exposed to oxygen is removed timely. It is recommended to remove 6-12 inches per day during the cold season and 18 inches per day during the warm season. Loose silage at the base of the face after feeding should be minimized daily. Exposure to the sun and oxygen causes secondary fermentation, which also causes heating.
4. **Only uncover the amount of silage that will be used in a short amount of time (no more than three day's feeding).** Use weights, such as sandbags, to secure the edge of cover to avoid aeration beneath the plastic cover.

If you have followed the recommendations above and are still getting spoiled silage, discard the spoilage from your feed. Dilution is **NOT** the solution to spoilage contamination. A study by Whitlock et al. (2000) evaluated the effects of feeding corn silage with increased amounts of surface spoilage to cattle. Researchers observed that as the proportion of spoiled silage increased from 0 to 75% of the silage fed, dry matter intake decreased linearly (Table 1).

Table 1. Effect of the Level of Spoiled Silage on Nutrient Digestibility for Steers Fed the Four Whole-Plant Corn Rations

Item	Rations [1]			
	0	25	50	75
DM intake, lb/day	17.5[a]	16.2[b]	15.3[bc]	14.7[c]
DM intake, % of BW	2.36[a]	2.22a[b]	2.10[bc]	2.04[c]

[1]The four rations contained 90% silage and 10% supplement (DM basis). The silages in the rations were: 0) 100% normal; 25) 75% normal: 25% spoiled; 50) 50% normal: 50% spoiled; and 75) 25% normal: 75% spoiled.

If you are concerned about molds and/or mycotoxins in corn silage, we suggest getting it tested to make sure it is safe to feed. A representative sample should be taken and sent to the lab as soon as possible. If you have questions about your silage management or would like to have a sample submitted for analysis, please contact one of our consultants, we would be happy to assist you.

The Importance of Mineral Supplementation in Your Herd

Annual cost for a mineral supplementation program for a cow nursing a calf for 200 days is approximately $30/head/year. This cost can be influenced by geographical location of cattle and the feeds they are consuming. Most feeds naturally contain minerals; however, the amount and availability of the minerals in the feed will impact the amount of supplemental mineral that needs to be provided. Mineral supplementation strategies that supply both macro and micro minerals help ensure you maintain the desired production level of your cattle.

Forty years ago, it was far less common to provide supplemental trace minerals, yet cattle survived. True, they "got by", but is getting by good enough? Forty years ago, we demanded far less from cows and feedlot cattle. However, as we expect more from our livestock, nutrient requirements increase, and trace mineral nutrition becomes more important to success. The Meat Animal Research Center's data show weaning weight has increased by an average of 55 lb between 1970 and 2000; furthermore the mature body weight of a cow has increased almost 40% since 1975 (1000 to 1400 lbs.). This would indicate milk production has increased, along with nutritional demands on the cow. This is most evident in first-calf heifers that require a nutrient rich diet in order to rebreed efficiently. The interval from calving to first estrus (heat) has shortened from 86 days to fewer than 60 days on average in the past 40 years. In the past, skimping on minerals in developing heifers may not have reduced conception rates, but prior to 1970, heifers were normally bred for the first time at 2 years of age or older. The effect of poor mineral nutrition was masked by breeding them later. The modern heifer is bred for the first time between 13-15 months of age and heifers reach puberty at least 30 days earlier than they did in 1970. Additionally, growing feedlot cattle has changed as well. Steer weight at slaughter has increased by nearly 300 lb since 1970 and they are reaching that weight by 12 to 18 months of age instead of 24 to 36 months. Meanwhile, average dressed weight of slaughtered steers increased from about 670 lb in 1960s to 870 lb in recent years according to USDA-LMIC (Figure 1). The increase in slaughter weight is a result of 1 lb/day improvement in ADG, which dramatically increases nutrient requirements.

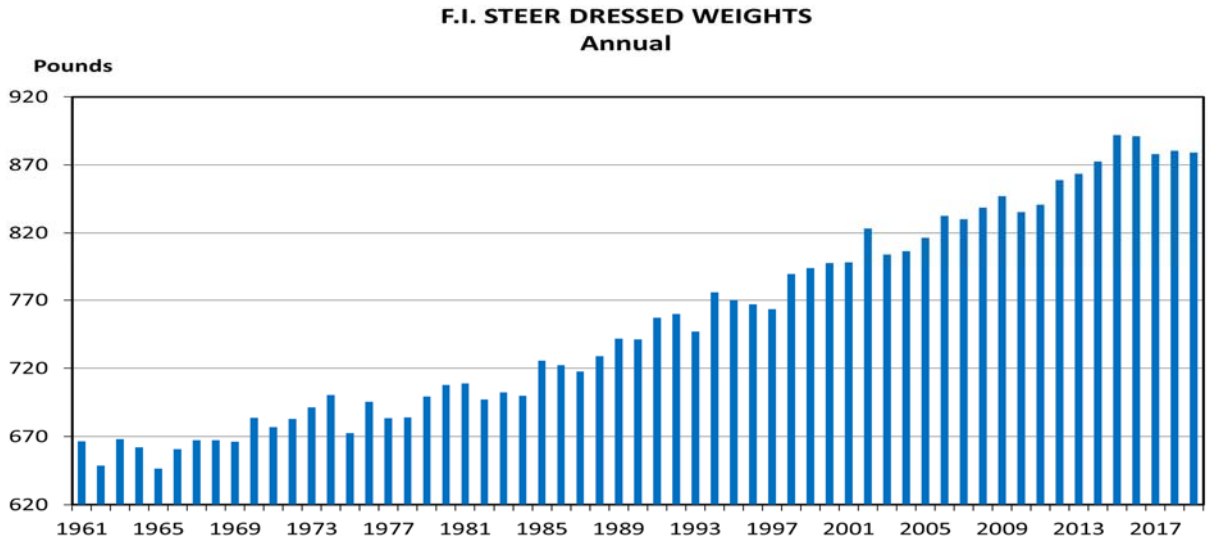

Figure 1. Average dressed weight of slaughtered steers. Source: USDA-NASS. Livestock Marketing Information Center

In order to accommodate these improvements, a well-designed nutritional program is important. Below is a partial list of macro and micro minerals, as well as a description of their function for reproducing and growing cattle.

Macrominerals

This class of minerals is required in larger amounts than trace minerals, and usually is expressed as a percentage of the diet or grams per day, rather than parts per million (ppm).

Salt (NaCl) – Sodium (Na) and chloride (Cl) work together to maintain cellular volume, pH and osmolarity (water balance) of body fluids, such as blood. Sodium chloride (NaCl) promotes water intake, which will help

maintain or improve milk production and overall herd health. Individually, Cl is involved primarily in hydrochloric acid production in the abomasum (stomach) to aid in digestion. Sodium works in conjunction with potassium (K) for nutrient transport into and out of cells. On average, cattle should consume 11 to 15 grams of salt per day to meet nutritional requirements. The one mineral that should always be supplied to cows free choice is salt.

Calcium (Ca) – Roughly 98% of calcium plays an essential, structural role in bones and teeth. Proper absorption of calcium is dependent on Vitamin D, as well as the source and form of calcium being supplied to the animal. Older animals can be fed a calcium deficient diet for an extended period without any negative side effects due to the large calcium stores in the skeletal system. However, young, growing animals fed calcium deficient diets will have developmental issues, such as slowed growth and rickets.

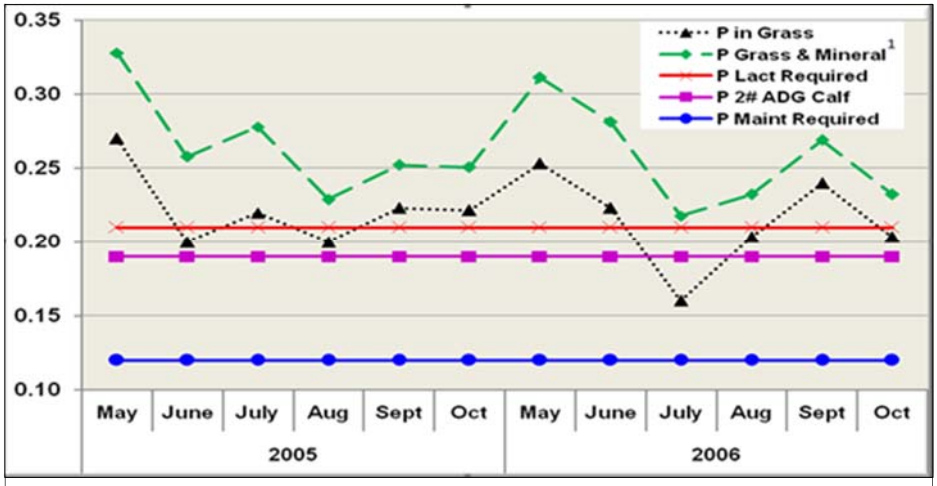

Figure 1. Phosphorus (P) levels of grass compared to lactating / gestating cows and calf requirements. [1]Phosphorus of the grass plus a 6% P mineral fed at 4 oz/day from May to July and a 3% P mineral fed at 4 oz/day from August to October.
Dr. Jim Russell and Mathew Haan; Iowa State University

Phosphorus (P) – Roughly 80% of Phosphorus is found in the bones and teeth. Calcium and phosphorus work simultaneously to develop the skeletal system. It also plays an important role in energy utilization within the body. Phosphorus deficiency is one of the most common mineral deficiencies in the world but is commonly over supplemented in the US. Researchers at Iowa State University reported P content of grass from May through October met requirements of lactating cows in many cases, and minimal supplemental P is needed. Calves gaining 2.0 pounds per day did not need any supplemental P (Figure 1). If cattle are grazing forages low in Phosphorus, it can cause a decrease in conception rates. Additionally, it can result in decreased growth rates and feed efficiency, fragile skeletal system and decreased milk production.

Magnesium (Mg) – Approximately 65% of Magnesium is found in bones, 15% muscle and the remaining 20% in other soft tissues. It is estimated that Magnesium activates more than 300 enzymes in the body. Enzymes play an important role in energy metabolism and transport, without them cattle could not utilize feed properly. Magnesium also aides in the function of nerves and muscles. Cattle deficient in magnesium will have convulsions, calcification of soft tissues and excitability.

Potassium (K) – Potassium is the 3rd most abundant mineral in body, functions in acid-base balance, osmotic pressure, water retention, muscle and nerve function and enzyme systems. Grasses, particularly early lush spring growth, contains more than adequate amounts of potassium for grazing cattle and supplementation is rarely needed. Grass tetany is a potassium toxicity. However, potassium may occasionally be low in stockpiled forages or hay that was rained on prior to baling because potassium is soluble and will leach from the forage. Deficiency can lead to reduced intake and gain, rough hair coat and weak muscles.

Microminerals

This class of minerals is required in very small amounts. Requirements typically are expressed in parts per million (ppm). Although these minerals are required in small amounts, they are vital in maintaining normal body function.

Cobalt (Co) – Cobalt is used as a substrate for the rumen microbes to synthesize vitamin B12 (cyanocobalamin). Vitamin B12 is necessary for the rumen microbes to produce propionate, a volatile fatty acid and an important energy source. Vitamin B12 is also essential for the production of red blood cells. The signs of cobalt deficiency include poor growth and appetite, rough hair coat, anemia, and a general lack of reproductive activity.

Copper (Cu) – Copper is implicated in red blood cell health, reproduction, and immunity. Copper interacts with molybdenum and sulfur in vitamin metabolism. If cattle are exposed to high levels of zinc, iron, or phosphorus, Cu absorption can be reduced. Signs of Cu deficiency include faded hair coats, delayed estrus (heat), severe

diarrhea, and reduced immune response. Secondary Cu deficiencies occur when dietary Cu is made unavailable by interactions with antagonists such as Fe, Mo, S, Se or Zn present in the diet or water. Therefore, Cu requirements vary with antagonist trace mineral concentration.

Iodine (I) – Iodine is key in maintaining a normal metabolic rate through its role in thyroid hormones. When I is deficient, thyroid function is disrupted, resulting in lower metabolic rates. Signs of I deficiency include reduced milk production, weaning weights, an increased incidence of abortions, and poor hoof health. Cows deficient in I may have calves that are born blind, weak, hairless, or are stillborn. A hallmark of long-term iodine deficiency is a goiter, which is an enlargement of the thyroid gland as a compensation for reduced iodine concentration.

Manganese (Mn) - Manganese is important for growth and essential for reproduction. Concentrations of Mn increase in reproductive tissues with greater supplementation. Both Ca and P can inhibit Mn absorption when fed in excess. Signs of Mn deficiency include reduced conception rates, poor growth rates, low birth weights, and increased abortions. Cows deficient in Mn may have calves with skeletal abnormalities such as knuckled over pasterns. Requirements may vary depending on the stage of production.

Selenium (Se) - Selenium interacts with vitamin E in immune function, growth, and reproduction. In the north-central United States, soil Se is relatively high (> 2 ppm). In some areas, toxicity can develop, resulting in blind staggers, sloughing of hooves and hair, anorexia, and a wide range of birth defects. Deficiencies of Se more commonly are found in the Pacific Northwest, Great Lakes, and Atlantic Coastal Range and are associated with disorders such as white muscle disease, retained placentas and reduced reproductive efficiency.

Zinc (Zn) - Zinc is essential in the immune response, enzyme systems, and hoof health. Copper and Zn compete for a similar absorption site, therefore the Zn:Cu ratio should be 3:1 to a 6:1. Signs of deficiency include reduced feed intake and weight gain, excessive salivation, rough hair coat, and sensitive, soft hooves. Critical Zn deficiencies result in hair loss, thickening of skin, and lesions around the nose and mouth. Zinc is also essential for sperm quality and male reproductive performance. Due to its essential nature to health, Zn is often supplemented at a greater rate in stressed cattle.

It is difficult to evaluate the economic loss associated with mineral deficiencies. Typically, you don't know you have a mineral deficiency until you do. If your herd has a mineral deficiency, it can cause:

1. Reduced conception rates, which results in less calves being sold. It also means you carried the cost of the cow throughout the year without them producing a calf.
2. Reduced weight gain in calves.
3. Decreased colostrum quality and milk production in cows, resulting in decreased growth and health of calves.

Investing in a well-balanced mineral program now can help insure you do not run into any deficiencies in the future that will impact your profitability. Please contact us if you would like to discuss your mineral program with one of our consultants.

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