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BRASSICAS: BE AWARE OF ANIMAL HEALTH RISKS
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Brassicas (including turnips, rape, kale, and swedes) are highly productive, digestible forbs that contain relatively high levels of crude protein. Animals will readily consume the tops and will also grub the root bulbs out of the ground. Dry matter yield depends upon soil type, fertility, time of seeding, and precipitation.

Brassicas should not comprise more than about two-thirds of cattle diets because of their low dry matter and low fiber content. Therefore, it is important to provide adjacent pasture, corn stalks, or a palatable dry hay fed free choice to cattle when grazing these crops to decrease the incidence of diarrhea. It is also desirable to introduce cattle to brassicas slowly by limit grazing for a few hours per day until their digestive systems are accustomed to them.

Brassica crops can cause animal health disorders if not grazed properly. Most brassica related disorders in cattle tend to occur during the first two weeks of grazing. The main disorders are polioencephalomalcia, hemolytic anemia (mainly with kale), and pulmonary emphysema. Other possible clinical disorders include nitrate poisoning, bloat, and metabolic problems such as goiter and hypothyroidism. Glucosinates present in brassicas are also precursors of irritants that can cause colic and diarrhea. Large bulbs may also cause choke. Certain brassicas (rape) can cause sunburn (scald) on lightskinned animals, especially if it is grazed while the plants are immature. Other potential problems include oxalate poisoning, and also taint of meat and milk. The following is a brief description of the main disorders.

Polioencephalomalacia (PEM) is a brain disorder characterized by blindness, aimless wandering, lack of coordination, and twitching of ears, eyes, and skin which may develop in some cattle after a week or more of eating brassicas (usually turnip forages). Other clinical signs may include circling and convulsions. This disorder is thought to be related to the sulfur content of the plants, and can be exacerbated if the diet includes other high-sulfur feeds or high-sulfur water. However, brassicas can cause PEM by other as yet unknown mechanisms as well. Thiamine can be given as a treatment, but animals often do not respond.

A diet of pure brassicas can cause livestock to develop hemolytic anemia . The amino acid compound S-methyl –L-cysteine sulfoxide (SMCO) which accumulates in the plants is unique to this family of forage crops. In the rumen SMCO is converted to dimethyl disulfide that oxidizes hemoglobin. The defective hemoglobin is detected in the red blood cells that are then removed by the spleen. Hemolysis (rupture of the red blood cell) also occurs as a result of the oxidative damage to the red blood cell membrane that results in hemoglobinuria (red urine). The severity is greatest in cattle fed kale, rape and

UPCOMING EVENTS

- **AFGC Conference**
  January 12-24, 2014
  Memphis, TN
- **34th Kentucky Alfalfa Conference**
  February 20, 2014
  Bowling Green, KY
- **2014 KY Small Ruminant Grazing Conference**
  February 1, 2014
  Lexington, KY

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BRASSICAS (CONT)

turnips. Cattle become progressively weaker and may die from severe anemia unless removed from the plants. Hemolytic anemia is characterized by red urine, pale mucous membranes, and unthrifty appearance. Some animals may collapse and suddenly die.

Cattle given sudden access to turnip fields following relatively dry, high roughage diets may develop acute respiratory distress syndrome. Pulmonary emphysema causes rapid, difficult breathing accompanied by a grunt on expiration. Affected animals stand with extended heads, dilated nostrils, and open mouths with protruding tongues. Death may occur within two days. Surviving animals have a slow recovery over several weeks. Green turnip tops are a rich source of tryptophan that is converted in the rumen to 3-methyl indole which ultimately damages the lungs. The toxicity of the turnip tops is markedly reduced after they have been frozen.

Brassicas can cause a variety of other problems as well. Nitrate poisoning has been documented from excessive nitrogen fertilization. Accumulation of calcium and potassium can reduce the availability of magnesium to animals, resulting in hypomagnesemia or "grass tetany". Bloat can also occur when grazing rape or turnips. All brassicas but especially turnips contain glucosinolates which are chemicals that prevent the uptake of iodine by the thyroid gland resulting in hypothyroidism and goiter. Goiter can occur in all animals grazing brassicas, but is more of a concern with sheep and goats. Brassicas can contain large amounts of oxalate, causing oxalate poisoning and subsequent kidney failure.

Some people are genetic "tasters" and can easily taste the bitter phenylthiocarbamide (PTC) chemical in brassicas while to others it is virtually tasteless. The ability to taste PTC is a dominant genetic trait in humans. Producers should take this into consideration if using on dairy animals or fattening grass fed feeder animals. It is important to graze brassicas after milking to avoid milk taint.

MINIMIZING HAY WASTE WHILE FEEDING

If hay is stored and fed properly, hay loss can be minimized. Total losses from hay storage and feeding are estimated to exceed three billion dollars annually nationwide. This does not include additional economic losses associated with labor used to store and feed hay. While it is normal to expect some hay loss during feeding, minimizing hay feeding losses should be a primary producer goal.

Hay loss from feeding can range from less than 2% to as much as 60%. Feeding losses can occur from trampling, chemical and physical deterioration, fecal contamination, and livestock refusal. The amount of loss will be affected by feeding method, interval between feedings, amount fed, weather conditions, number of animals being fed, method of storage, and overall hay quality.

Feeding Methods

Continued feeding in the same area the entire winter can result in excessive sod destruction, muddy conditions, heavy spring weed germination, increased pathogen transmission, and soil compaction. If you do choose to feed in one area, it is advised to feed on a "high traffic area pad" which is a solid surface created by concrete or gravel. The publication Using Geotextiles for Feeding and Traffic Surfaces has more information on constructing high traffic area pads. If you choose not to feed on a high traffic area pad, moving the feeding area around will help spread manure more uniformly over the field, improve soil fertility of thin spots, and reduce sod damage. Well-drained, upland sites are more optimal feeding areas. Avoid placing hay near streams or lowland areas.

To reduce waste, it is advised to provide only enough hay to last for one day. If large amounts of hay must be put out at one time, it is helpful to place a barrier between the hay

The metal sheeting on the cone feeder (top photo) reduces hay loss significantly compared to the ring feeder with no sheeting (bottom photo).

Photo Credit: Jeff Lehmkuhler

and animals to reduce waste. Feeding racks or rings can be effective barriers. Large round bales should especially have a feeding ring around it to reduce waste.

Types of Feeders

In a study performed by Dr. Buskirk at Michigan State University, the four most commonly used round-bale feeders were evaluated: the cone feeder, the ring feeder, the trailer feeder, and the cradle feeder. The trailer and cradle feeder generated the most waste. In these feeders, cows commonly pull their heads out to push another cow out of the way, dropping hay on the ground and trampling it. With the ring and cone feeders, cows were more content to stay where they were and didn't push other cows around as much, resulting in less hay on the ground. The cone feeder (reduced hay waste by 43% compared to a ring feeder with metal skirting) generated the least waste of the four. The metal sheeting on the bottom of feeders reduces waste significantly by preventing hay from falling out the bottom of the feeder to be trampled. In a Missouri study, hay loss was reduced by 30% with metal sheeting on the bottom of a ring round bale feeder.

Feed Based on Hay Quality

To efficiently use your hay, hay must be sampled in separate lots or cuttings, tested for its nutrient content and fed based on your cattle's nutrient needs. Using this method, the quality of hay can be matched to the nutrient demands of the animal. For example, your highest quality hay should be fed to the animals with the highest nutritional requirements, such as young calves, growing heifers, or when your cows are nursing calves.

In summary, the following key management tools will help to reduce hay losses during feeding:

- Match hay quality to animals' nutritional requirements.
- Select well-drained sites for outside feeding.
- Use a hay feeder to reduce trampling and hay losses.
- Minimize the amount of hay that animals will have access to at one time.

ANIMAL TIP OF THE MONTH

STRIPGRAZING STOCKPILED FORAGE

Photo Credit: Garry Lacefield

Stockpiling forage is one way to extend the grazing season and minimize winter hay feeding. Tall Fescue is renowned for stockpiling because of its inherent ability to maintain high levels of nutrients during the winter months. Stockpiling fescue in the fall is fairly simple. First, the designated area is mowed or grazed down to three to four inches in late July to early August. If the stand is relatively uniform, some choose to apply 40 to 100 lbs of nitrogen to improve forage growth. Then, grazing is deferred to allow the forage to accumulate until late fall/early winter when other available forage becomes limiting. It is strip grazed until the target residual is achieved when forage is 2 to 3 inches tall. It is not grazed again until new growth occurs next spring. Properly fertilized stockpiled tall fescue will usually maintain 10 to 14% crude protein and 55 to 65% TDN, with quality declining from November through February. As fescue leaves turn from green to brown, nutrition from the plant decreases thus grazing earlier in the winter is recommended.

Grazing management will be the determining factor for efficient use of stockpiled forages. If strip grazed, the amount of forage lost to trampling and defecation will be minimal and you will be able to graze longer into the winter without feeding hay. Animals will often consume up to 70% of available forage by strip grazing.

Strip grazing is achieved by allocating just enough standing forage to meet the intake of the animals for a short period of time, usually less than three days. Using temporary fencing, a small strip of pasture is fenced off resulting in less selectivity and more uniform grazing. The fence is then moved forward providing access to new standing forage as well as the previous strip.

Being that the only tool needed for strip grazing is a temporary fence, strip grazing is cost effective. A temporary fencing system is comprised of an electric fence charger, a reel of electric fence, tape, or wire, and a few step-in posts. Also, cattle should have access to a water source and mineral feeder.

In order to determine the amount of forage to include in a strip, one must know how

STRIPGRAZING STOCKPILED FORAGE (CONT)

much forage is available. The amount of accumulated stockpiled forage varies with location, rainfall, and the amount of nitrogen applied. Tools, such as a grazing stick or falling plate meter, can be used to determine forage quantity. Refer to the publications listed at the end of this article for more information on determining the amount of forage available for grazing. The quantity of stockpiled fescue may average around 3000 lb of dry matter per acre. A 1,400 lb cow may consume 30 to 35 lbs of forage dry matter/day. Accounting for a 70% utilization rate with strip grazing, 3,000 lbs of dry matter per acre would last 40 cows about one and a half days and giving two acres would provide enough forage for approximately three days. If the forage appears limiting by day two, provide a new strip and adjust your assessment of available forage and utilization to ensure cows are offered enough forage.

As long as stockpiled forage is available, hay will not need to be fed unless there is deep snow cover. Snow depth of six inches or more would be considered a deep cover. Cattle will pick through a few inches of snow for access to pasture. However, keep in mind that even ¼ inch of ice on forage may prevent grazing and forage supplementation will be needed.

In summary, stockpiled fescue is an effective way to extend the grazing season and reduce winter hay feeding. Strip grazing stockpiled fescue reduces waste from trampling and defecation and will extend the length of time grazing a particular field. It is cost effective and simple to use. The amount of forage available and number of days of grazing will vary from year to year due to weather conditions, and should be considered when planning and implementing stockpiled fescue into a grazing system.

AGR 191: Using a Grazing Stick for Pasture Management

A Falling Plate Meter for Estimating Pasture Mass

IMPORTANT WINTER REMINDERS

- Inventory standing forage and develop a plan to utilize remaining forage. Alfalfa can be grazed again after November 1st or the first killing frost.
- Sample hay and obtain forage analysis prior to feeding or sale. Develop a plan for when and to which livestock hay will be fed.
- Evaluate grazing program for the past grazing season. Start planning for changes in forages or management that will be implemented in the spring or late winter.
- Inspect and prepare water systems for freezing temperatures. Be sure that livestock have access to water at all times.
- Reduce damage to pastures by removing animals or reducing traffic during extremely wet conditions. Consider using a sacrifice area. If a sacrifice area is not used, rotating feeding areas frequently will help reduce soil erosion, compaction, and distribute manure nutrients more evenly.
- Set up temporary fencing to utilize stockpiled forage by strip grazing.

Photo credit: Sheryl Wingard

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