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COW SENSE CHRONICLE

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Megan Van Emon, Extension Beef Cattle Specialist in Miles City, writes about forage sampling in this month's guest post. Megan can be reached at 406-874-8286 or megan.vanemon@montana.edu.

COLLECTING FORAGE SAMPLES

—MEGAN VAN EMON—

Knowing what is in your livestock's forage is an integral part of knowing what your livestock is eating, and whether its nutritional needs are being met. Forage should make up the basis of most beef rations, in exception to those animals that are being fed in a feed-lot situation. The ability to develop a ration catered to your animals' needs revolves around the ability to know what is in the feedstuffs that your animals are consuming.

Forage Sampling

Proper forage sampling is essential in obtaining an accurate representative for forage analysis. Forages may be sampled in the pasture, after harvest and baling, or pre- and post-ensiling and need to be a representative sample of the entire "lot." Having a representative sample can help in estimating the nutrient distribution and variation across the field/pasture and during harvesting.

A "lot" of hay (or silage) should be fairly uniform, and is usually taken from a single pasture or hay stack. The forages in the lot are usually at the same stage of maturity, have had similar management, and we would expect to have similar amounts of anti-quality factors, such as mold, weeds, or rain damage. If there is a large variation in a single lot in terrain (i.e. sloping hills or river bottoms), management, or anti-quality components, it is recommended that multiple samples be taken to best represent that particular allotment of forage.

Sampling Baled Hay

Large Round Bales

When sampling large round or square bales, at least 10% of the bales should be selected and collected 2 core samples from each bale. Forage samples should be collected from the circumference of the large round bales to receive the most representative sample. Core forage samples of square bales should be collected perpendicular to the bale surface on the end of the bale.

Sampling Standing Forage

Sampling standing forage will determine if the field is adequate to cut for hay or to determine if any supplemental feed is required during grazing. Clipping sites should be cut randomly throughout the field to provide a representative sample. The easiest way to achieve this is to walk in an “M” pattern throughout the field, harvesting samples at regular intervals.

The forage should be clipped from a one square foot area at harvesting or grazing height at each site. After clipping each site, cut the samples into three inch pieces and place them in your sampling bucket. Mix all of the samples together in the sampling bucket to create a representative sample. Samples can then be spread out on paper to air dry for two days or can be frozen prior to shipment for analysis. These will minimize any molding that may occur during shipment to the laboratory.

Sampling Silage

Fresh Cut

Sampling chopped silage prior to being placed in a bag, bunker, or silo provides ample time for analysis prior to feeding. If packed and stored properly, silage crude protein and fiber remain stable during fermentation. Therefore, having the analysis information early will allow for adequate timing to plan for any additional feeds required. Studies have shown that higher quality forage prior to ensiling resulted in higher quality silage, compared to lower or more mature forage that has gone through the same fermentation process. To ensure proper sampling prior to ensiling, multiple samples should be taken from each chopper wagon or truck load. Distribution of stems, leaves, or grain is not uniform throughout the load. Leaves tend to gather on the sides and at the back of the chopper wagon and stems tend to bunch at the center of the wagon. Four to five handfuls of silage should be collected from each chopper wagon or truck. The samples should be collected from the middle of the load as it is unloading, this will provide a representative sample of stems, leaves, and grain. Samples should be immediately placed in the refrigerator or freezer. Once an entire field is harvested, mix all of the samples together and place it in a sample bag and freeze.

Upright Silo

Sampling should take place after fermentation is complete if the silage was not sampled prior to being placed in the silo. To collect a representative silage sample from an upright silo, do not sample from the top or bottom 2 to 3 feet of silage. Removing the spoilage from the top and bottom of the silo will provide a better sample for analysis. When using a silage unloader, grab 10-12 handfuls or 1 to 2 pounds of silage from the unloader while it is running. Samples should be sealed tightly in a sample bag and stored in the freezer for shipping.

Silage Bunker

It is not recommended to take samples from the face of the bunker, this will not yield a representative sample and creates safety concerns, such as the collapse of the silage wall. Samples obtained from the face of the bunker can result in highly variable estimates of crude protein and fiber content. The best way to obtain a sample from a bunk is to use a face shaver or loader bucket to scrape across the face similar to removing silage for feeding. Then create a pile of silage on the bunker floor. Collect six to eight hand grab samples from the pile on the floor. Mix well in the sample bucket and take a hand grab sample for analysis. Store the sample in the freezer until shipment.

Silo Bag

Hand grab samples can safely be obtained from the silage face when stored in a silo bag. After silage is removed from the bag, creating a fresh silage face, collect 5 to 8 hand grab samples across the entire silage face. Mix the samples together in the sample bucket and place a representative sample in the sample bag. Immediately freeze after collection.

Core samples can also be taken from silo bags. Approximately 8 to 10 core samples should be collected from a silo bag along the entire length and both sides of the bag. Tape the core holes securely closed after collecting the sample to prevent oxygen infiltration and spoilage. Similar to the hand grab samples, mix samples in the sample bucket and collect a representative sample in a sample bag for analysis. Freeze immediately upon collection.

Sampling Total Mixed Rations (TMR)

Collecting a representative sample of a TMR is a fairly straightforward process. Mix the TMR using normal procedures and distribute in the bunk as normal. Collect hand grab samples along the entire bunk line from the top, middle, and bottom of the TMR and place in the sample bucket. The sample bucket should be about 2/3 full when all of the samples have been collected. On a smooth, clean surface dump the bucket of the TMR samples out and leave the coned sample intact. Using a yard stick or thin piece of wood, cut the sample in half, and then half again, which creates a representative sample. Keep this quarter of the sample for analysis.

All forage and feed samples should be stored in the freezer until shipping for analysis. To minimize the chances for mold formation or spoilage during shipping, ensure your samples arrive at the laboratory as quickly as possible.