At the FEEDER with new-life mills

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Which Mineral Product is Right for My Cattle?

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Whether you are feeding cattle on pasture or in a dry lot, or you are feeding growing cattle versus mature cows, the use of a properly balanced ration is critical for optimal animal performance. Mineral supplementation plays a vital role in ensuring each animal's nutritional requirements are being met. However, when you consider the variety there is among the multitude of mineral products available, it can be a daunting market to navigate.

Below are a series of steps to take prior to your mineral purchase:

Step 1. Test forages. The nutritional content of on-farm forages needs to be understood, as the mineral you purchase must be balanced as a part of the total daily diet. Considering that forages make up a large portion of beef cattle diets, they will have a key impact on the selection of the appropriate mineral supplementation. There are also a number of mineral interactions that are antagonist and can lead to poor mineral utilization. For example, high molybdenum forages reduce the bioavailability of copper, leading to an increased supplemental copper requirement.

Step 2. Understand the group(s) of cattle that you are feeding and the nutritional requirements of each group. For example, if you are purchasing a mineral for breeding cows, ensure it has adequate phosphorus, whose nutrition is linked to conception rates and return to estrus.

Step 3. Evaluate the feeding rate of each mineral. You will notice that this varies among products as well as feed companies. Two different products can target the same daily intake of a specific mineral, but list different nutrient concentrations and feeding rates on the tag. Therefore, to accurately compare minerals, it is necessary to know the expected intakes.

Step 4. Determine if the level of macro minerals is adequate. These are reported on the tag as a percentage of the total weight. To calculate the amount of each nutrient being supplied, simply multiply the percentage by the feeding rate. For example, a premix that is formulated with 3% magnesium and fed at 85 grams is providing 2.55 grams of magnesium per head per day (0.03 x 85 grams). Compare this to the nutritional requirements of your cattle.

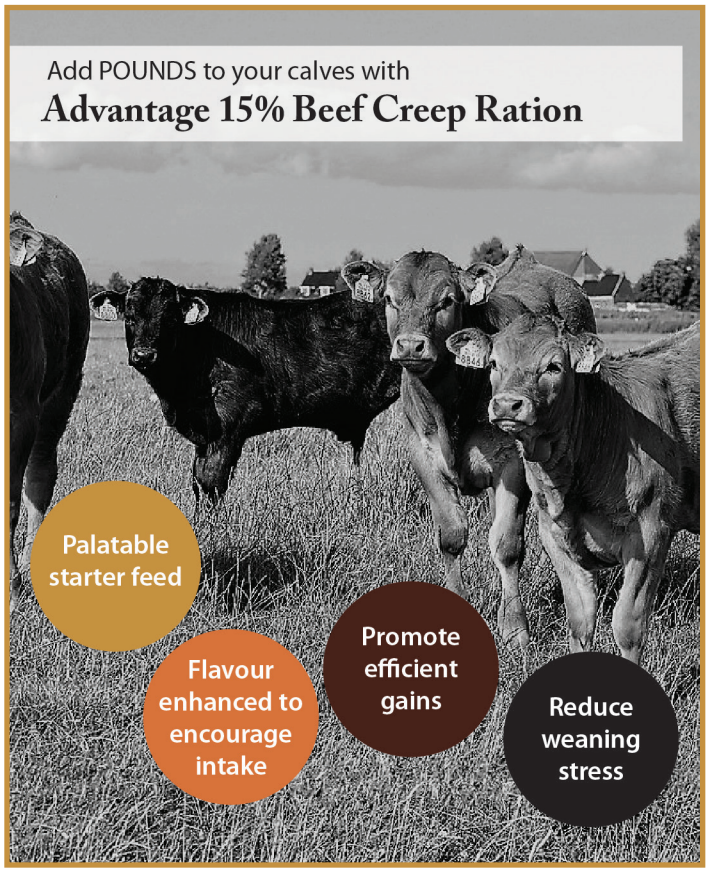
Step 5. Evaluate the trace mineral and vitamin levels, which are reported as mg/kg and IU/kg, respectively. In this case, the level of the nutrient is calculated by multiplying the mg/kg amount by the feeding rate in kg. For example, taking the feeding rate of

the mineral in the previous example (85g) and a copper concentration of 3000 mg/kg, this mineral is providing 255 mg per head per day of copper (0.085kg (feeding rate) x 3000 mg/kg). The same methodology is applied for vitamins. Once again, compare this value to the nutritional requirements of your cattle.

Step 6. It is possible to purchase a mineral premix that includes a medication. In this case, it is very important to feed these products at a specified feeding rate, which will be outlined on the tag, to ensure the appropriate medication level is being supplied to the animals.

Step 7. Prior to mineral purchase, it is necessary to determine if you require the inclusion of any additives, such as chelated trace minerals, flavoring ingredients or fly control products. These will have an impact on the overall price, so it is important to consider prior to purchase.

Do not base mineral purchase decisions solely on price. Animal health and performance strongly rely on your evaluation of animal requirements compared to available mineral options. Discuss your options with your New-Life Mills Representative or Nutritionist.



Meet: Kristin Thompson!

Ruminant Nutritionist

I grew up in rural Saskatchewan on a mixed farm operation, where we raised an assortment of livestock and poultry species. Growing up on a farm and through the 4-H program instilled a deep love for agriculture and drove me to pursue the tremendous opportunities that this industry has to offer.

I attended the University of Saskatchewan where I obtained my Bachelor of Science in Agriculture, specializing in Animal Science and later a Masters Degree in Ruminant Nutrition and Genetics. I had the opportunity to work with a livestock genetics company in Saskatchewan prior to starting with New-Life Mills in 2015.

When not working, I can be found on the farm where I live with my husband, two children, dogs, cats and horses. We are currently cultivating our own farm vision and look forward to having our children grow up in this industry.

One of the main reasons I love working in agriculture is the people. I can't think of any other industry where I would rather spend my career. People in agriculture are some of the most hard-working, innovative and entrepreneurial individuals in the world, and I appreciate learning from everyone that I meet.

Know Before You Feed – The Value of Testing Forages

Written by: Kristin Thompson, Ruminant Nutritionist, MSc., PAg

Forage quality has a direct impact on a producers' profitability through influencing growth, production performance, milk yields and reproductive efficiency. The quality of a forage is determined by the amount and availability of the nutrients that it contains. Since forages are the main component in cattle rations, the evaluation of forage quality is key to developing an effective feeding strategy. This is where analytical testing comes into play, which provides the nutritional composition of forages and allows us to formulate rations to meet the animals' nutrient requirements and offer a prediction on animal performance.

Analytical laboratories will offer a number of different analysis packages that can be grouped by sample type or livestock category. At a minimum, the forage should be tested for moisture or dry matter (DM), crude protein (CP) acid detergent fiber (ADF), neutral detergent fiber (NDF), an estimation of energy such as total digestible nutrients (TDN), net energy of maintenance (NEm) or Net energy of gain (NEg) and, when dealing with silages such as corn and barley, the starch levels. Forages should also be tested for macro-mineral content which includes Calcium, Phosphorus, Magnesium, Potassium and Sulfur. Other nutritional parameters might be required depending on specific farm requirements. Table 1 provides an example certificate of analysis for corn silage.

Dry Matter

Dry Matter (DM) refers to the portion of feed that remains following removal of all water. The majority of feed analysis results will be reported in both "as fed" and "dry matter" basis. Always ensure you are balancing rations based on dry matter, as it represents the true value of nutrients. Furthermore, water content (as fed basis) will vary from day to day and any water that is present in the feed dilutes nutrients.

Protein

The crude protein value on a forage analysis report represents the total nitrogen (true protein and non-protein nitrogen (NPN)) in the feed sample. Typical protein values for corn silage and haylage range from 6.5-9% and 18-25%, respectively. However, to further understand the value of this protein, the report typically fractionates the CP based on the rate of ruminal breakdown into soluble protein (rapidly available in the rumen), neutral detergent insoluble protein (NDICP) and acid detergent insoluble protein (ADICP). Soluble protein values, for example, should be in the range of 42-62% for corn silage and 48-65% for haylage.

Table 1: Example Certificate of Analysis

Certificate of Analysis		**Lab ID: 123456**
Sample ID: 405		**Date Received: 10/14/2020**
Sample Type: Corn Silage		**Date Reported: 10/20/2020**
Parameter	Reported Value	Unit
Dry Matter		
Dry Matter	62.2	%
Moisture	37.8	%
Protein		
Crude Protein	7.1	% DM
Soluble Protein	47	%CP
ADICP	10.1	% CP
NDICP	14.2	% CP
Fiber		
ADF	22.8	% DM
NDF	38.2	% DM
Energy and Index Calculations		
TDN	73.7	% DM
NEm	0.86	Mcal/lb
NEg	0.57	Mcal/lb
Carbohydrates		
Starch	39.4	% DM
Crude Fat	2.84	% DM
Minerals		
Ash	2.86	% DM
Calcium	0.19	% DM
Phosphorus	0.21	% DM
Potassium	0.14	% DM
Magnesium	0.68	% DM
Sulfur	0.11	% DM

The NDICP value represents the portion of protein that is slowly degraded in the rumen and consists of a large portion of the ruminally undegraded protein. The portion of protein that is undigested and thus unavailable to the animal, is reported as ADICP. A high ADICP value can be an indication that the forage has heat damage.

Fiber

When it comes to fiber, the majority of forage analysis reports will provide a crude fiber value for the feed tested. However, it is recommended that the report also include ADF and NDF measured separately. Neutral detergent fiber is an estimation of the total fiber constituents of the forage as it contains the cell wall components of the plant. These components make up the fibrous bulk of the plant and are negatively correlated to dry matter intake (DMI). Acid detergent fiber is a measurement of the indigestible components of the plant cell wall and is negatively correlated to forage digestibility. Generally, a high ADF value is associated with a more mature forage. Table 2 provides average ADF and NDF values for haylage and corn silage.

Table 2: Average fiber values for common ensiled forages.

Forage Type	ADF	NDF
Corn Silage	20-30%	35-50%
Haylage	30-40%	35-50%

Energy

Typically, the energy value of a forage is reported as TDN, which is a calculated value. However, TDN underpredicts the energy value of concentrates (grains). Therefore, TDN can be a useful tool when formulating a ration that is primarily forage based but it may be more advantageous to formulate based on net energy values when concentrates are included in the ration.

Both NEm and NEg are an estimation of the forages ability to meet the animals' energy requirements, expressed as megacalories (Mcal) per unit of forage (lb or kg). Net energy for maintenance is the energy available to meet maintenance requirements, while NEg is the energy available for growth. The energy in forages is more efficiently utilized for maintenance rather than growth, therefore, the NEm value will always be higher when compared to NEg. The NEg value should be used when estimating the forages' ability to put weight on growing cattle.

Other Nutrient Considerations

Mineral Evaluation: Calcium and phosphorus levels are typically the main concern for beef producers and should be maintained at a 2:1 ratio. Depending on the type of forage harvested or specific soil and environmental conditions, the mineral content of forages can have a significant impact on the overall ration balance.

Ash: The ash content of forages can give an indication of soil contamination. Haylage, which is cut lower in the field, normally has a higher ash content when compared to corn silage. However, an ash content higher than 8% in any forage usually indicates soil contamination.

Starch: When evaluating grain crops and summer crops such as corn silage, starch levels should be determined and will provide an idea of the energy value of the forage.

Conclusion

Forages are the main feed source in beef cattle rations. Protein, fibre and energy are three parameters than can be used to determine the basic nutrient availability of a forage. It is important to discuss with your New-Life Mills Representative to evaluate forage quality and develop an effective feeding strategy.