

NUTRITIONAL ASSESSMENT



BASICS

OVERVIEW

Determination of the health status of an individual or herd is based on nutritional demand and feed consumption. Nutritional assessment of ruminants is a process using observation, discussion, and testing. Veterinarians rely on this assessment as part of a basic herd health program. It enables identification of sources of disease and promotes optimal production for an operation.

GEOGRAPHIC DISTRIBUTION

Nutrition is a consideration on every herd operation. Local/regional variations in environmental and weather conditions create a need for continuous vigilance over local feedstuffs.

SYSTEMS AFFECTED

Digestive, Immune, Metabolic, Musculoskeletal, Neurologic, Reproductive, Respiratory

PHYSICAL EXAMINATION FINDINGS

Body Condition Scoring (BCS) should be performed at least twice a year, and during any individual animal examination. The score is based on muscle and fat coverage of the dorsal and transverse processes at the level of the loin area. Flesh coverage on the ribs, chest, paralumbar fossa, and inguinal area may also contribute useful data depending on the body type of the animal. The amount of fat around the tailhead can be integrated into an assessment of the body condition. Dairy cattle, small ruminants, and camelids use a scale of 1 to 5. A score of 1 is emaciated whereas a score of 5 is obese. Beef cattle are ordered 1 to 9, with the same gradations. Adjustments to herd rations or sorting of individual animals by score can be done if the herd is evaluated at pregnancy testing or weaning. Sorting of this nature allows for more efficient feeding strategies.



DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

Veterinarians must determine whether a disease process on the operation has a nutritional component.

CBC/BIOCHEMISTRY/URINALYSIS

Basic bloodwork is useful in times of disease and may aid in determining underlying nutritional imbalances. CBC rules out infectious causes, while chemistries can be used to identify electrolytes that are out of balance. Sequestration and storage of certain minerals (i.e., copper) may not show up accurately on bloodwork.

OTHER LABORATORY TESTS

Fecal Egg Counts aid in determining the presence of heavy parasite burdens in ruminants that do not appear in good physical condition.

Forage/feedstuff and water sampling should be used to investigate the whole nutritional status of the herd.

OTHER DIAGNOSTIC PROCEDURES

Liver biopsies may be used to evaluate a diseased animal or an entire herd if nutritional issues are suspected. The procedure is more invasive and costly than bloodwork, but may contain more overall value in its results.



FOLLOW-UP

PREVENTION

- Feedstuffs should be assessed for adequate energy and protein values. Low protein in the feed will cause a die off of important rumen microbes and thus decrease overall dry matter intake as well as feed efficiency and nutrient production. Poor feed value not only impacts dams, but also the offspring. Low energy and protein can produce weak neonates that are susceptible to disease and poor growth. Fat supplementation may be beneficial in some areas of production, but feeding it in inappropriate quantities can lead to negative effects on ruminant health.
- Good forage programs supply the majority of minerals necessary, but in some areas and operations, a balanced mineral mix may be necessary to make up for deficiencies. Some commercial mineral mixes are formulated for the most stressful periods of production. These include weaning, late pregnancy, and early spring growth. Managers should monitor the consumption of mineral according to the label. Overconsumption of mineral may occur due to a specific deficiency and can be extremely cost-ineffective. Underconsumption may indicate a poor palatability mineral or that the ruminant is receiving adequate amounts from the feed. Salt is used commonly as a limiter in mineral and a high percentage may prevent animals from adequate consumption of other necessary minerals. Sheep are extremely sensitive to copper and should not be fed minerals made for other ruminants. If minerals are used on the farm or ranch, a tag should be taken, evaluated and made part of the medical record. In some instances, inappropriately made mineral can cause major disturbances in animals under heavy production.
- Water sources should be checked daily for adequacy, cleanliness, obstructive debris, electric current, ice in the winter and algae in the summer. Avenues leading to the water source should be cleared for easy access. The height of the tank and the level of the water within it should be matched to the size of the animal using it (i.e. ensure calves are able to reach supply). The mineral composition of the water should be analyzed. Some water sources are high in minerals and may lead to toxicities when paired with certain feed products.
- As important as an appropriate ration is for a group, it is also important that individual animals in the group can feed equally. It is crucial to ensure that the young, small, sick, thin or old animals have an adequate opportunity to eat rather than be crowded out from the feed. The other important period of segregation is that of the far-off, close-up, and lactating cows. The energy and feed demands are vastly different for these three phases of production and it is nearly impossible to have one ration for those groups.

POSSIBLE COMPLICATIONS

- Weather conditions can impact both the quality of the feed and the ruminant's consumption of feed. Nutrient demands can change based on wind, temperature, humidity, forage growth and rate, temperature swings, and the condition of the animal's hair coat as well as many other factors. If the animal's hair coat is thick, such as in the spring, or damp, such as can happen in the fall and winter, the nutritional demands on that animal can increase rapidly. Adjusting daily is not a prudent option but creating a strategy for when extreme weather arises is advisable.
- Pest control should be monitored to avoid their negative impact on herds. Parasites are detrimental to performance by increasing energy demands and decreasing feed intake. Internal parasites may have a significant presence on farms that have used dewormers inappropriately over time and/or have poor pasture management strategies and overcrowding. Storage facilities on the operation should be inspected for wildlife and their excrement. Diseases may be transmitted through contaminated feed and palatability may also be affected.
- As labor availability for operations diminishes, provision of all the animals with adequate nutrition becomes more of a challenge. If nutritional issues can be reduced, the immune, metabolic, and digestive systems can be optimized and the potential for disease can be diminished. Different equipment on farms should be evaluated as they are limiting factors on delivery of feed on an operation. Feedstuffs that can be used are dictated by the means by which they may be delivered. Each farm or ranch must have a nutrition plan developed to fit their capabilities. Commercial nutrition companies have developed different compositions of feed to make them available to both small and larger operations. Cubes/cake, pellets, tubs, and liquids are just a few of the different means by which nutrients can be delivered. These products are often more expensive than direct-fed nutrients, but may be the most reliable way of providing animals with necessary needs. Part of every nutritional assessment requires establishing a delivery system that works within the operation in the most efficient and economical way possible.



MISCELLANEOUS

AGE-RELATED FACTORS

Nutritional demands vary dependent on the age and production phase.

PREGNANCY

Nutritional deficiencies are often the root cause of poor conception and pregnancy rates.

PRODUCTION MANAGEMENT

Veterinarians should use a wide range of resources when they are assessing nutrition on any operation. The use of extension agents, qualified nutritionists, and research is necessary to provide clients with a qualified opinion of potential issues. Herd records and accurate history from the

ABBREVIATIONS

BCS: Body Condition Score

Suggested Reading

Funston, Rick, "Nutrition and reproduction interactions." AABP Proceedings. 47: 18-27, 2014.

Hilton, W. Mark, "Achieving Reproductive Efficiency in Beef Cows Herds." AABP Proceedings. 44: 34-40, 2011.

Rasby, R. and Funston, R., "Invited Review: Nutrition and management of cows: Supplementation and feed additives." The Professional Animal Scientist. 32: 135-144, 2016.

Van Saun, Robert J., "Basic Small Ruminant Nutrition." AABP Proceedings. 48: 136-143, 2014.

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