WASHINGTON STATE UNIVERSITY EXTENSION

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Washington Animal Agriculture Team
WSU Livestock Round-Up

WINTER HEALTH CONCERNS OF LIVESTOCK

In a previous newsletter we discussed livestock diseases of particular concern in the spring. In this issue we'll touch on a few that are more likely to occur in the winter.

Starvation

Starvation is probably the most important wintertime livestock health concern. Thick hair coats and infrequent close contact with animals during the winter can result in poor body condition going unnoticed until it is too late. The best way to prevent this unwelcome surprise is to make a point of touching each animal several times during the winter to assess its body condition. It would be best to touch every animal once a week, but this is impossible with large commercial herds. Commercial producers usually check their herd at least once a day and have trained their eye to detect animals in trouble. Refer to Figures 1 and 2 for illustrations of how body landmarks feel at the two extremes of body condition.

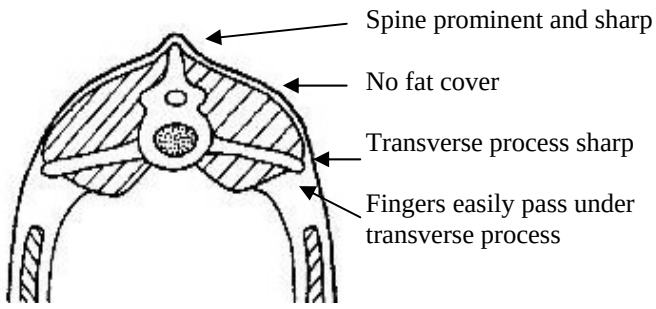


Figure 1. Body Condition Score 1 (emaciated).

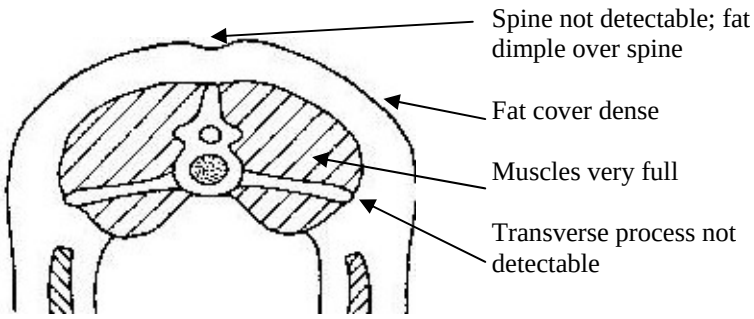


Figure 2. Body Condition Score 5 (obese).

Illustrations from Oregon State University Department of Animal Sciences publication EC 1433, "Body Condition Scoring of Sheep" by J. Thompson and H. Meyer. April 1994. Used with permission.

Animals most at risk of starvation are those that are elderly, parasitized and/or have an underlying health concern. Also, animals at the bottom of the pecking order may be run off by more aggressive animals before they are able to eat their share in a herd situation. Dental problems that prevent effective chewing can contribute to starvation. Animals with high nutritional requirements (i.e. doing hard work, in late pregnancy, lactating or growing) are also at higher risk. Livestock can starve to death on a full belly if they are fed only low-quality roughage. These animals' stomachs are full but they have not met their daily nutritional requirements—it is similar to a marathon runner trying to survive on meals of rice cakes.

Shelter can help animals expend less energy just to keep warm. Cold, wet and windy weather can increase an animal's energy

requirements tremendously. For every one degree drop in temperature below 20°F, an animal's energy demands increase by 1%. If this energy isn't provided through feed, animals will have to call on their body fat reserves and even their muscles as an energy source. That is why late winter and early spring are when most starvation deaths occur—these animals have been living off stored energy for months and in February and March, they have no energy stores left.

To prevent starvation, try to conduct hands-on body condition scoring of your animals regularly; sometimes a thick coat or fleece is covering up an animal that is skin and bones underneath. If you find a thin animal, you should investigate what the problem is, move it to another group and/or change its ration to one that includes more energy. Provide your animals with shelter from wind and precipitation. Allow adequate bunk space or group animals so that all can receive their fair share of feed. Some animals (elderly or hard-keeping horses, pet dairy cows, sick goats, etc.) may benefit from and tolerate a blanket, which helps keep in body heat, thus reducing the energy needed from feed to keep warm. Finally, supplemental energy in the form of more hay, higher quality hay or a high-energy concentrate (barley, corn, beet pulp, molasses, cottonseed meal, etc.) will be needed by many animals to help them maintain healthy body condition through the winter.

For More Information
http://oregonstate.edu/dept/animal-sciences/bcs.htm
http://www.ces.purdue.edu/extmedia/AS/AS_552_W.pdf

Foot Rot

Due to our seasonal rain cycle, the most common times to see foot rot are winter and spring, when high numbers of animals may concentrate in muddy areas. Hooves also seem to grow faster in wet conditions. Combine mud contaminated with foot rot organisms, overgrown hooves and a high concentration of animals with the likelihood of a carrier in the bunch and you have the makings of a foot rot outbreak. Good management can help mitigate some of these predisposing factors. Use gutters or other systems to control and direct water runoff. Add gravel to muddy areas or rotate feeding locations. Fence off muddy spots and paths. Decrease animal density. Trim feet regularly. Consider using a vaccine if there is a severe annual herd problem with foot rot.

Foot baths are often used to control foot rot, but a poorly maintained foot bath is worse than none at all. Instead of forcing all animals to walk through a herd foot bath on a daily basis, place the foot bath in a hospital area and only use it for affected animals. Remove as much mud, dirt and other debris from the foot as possible, and then have the affected individual stand in the foot bath for at least 10 minutes. Using this protocol, foot bath chemicals will last longer and the foot bath will not become a source of infection for other animals. Zinc sulfate is a widely recommended foot bath chemical.

For More Information
http://www.ext.vt.edu/news/periodicals/livestock/aps-99_01/aps-0005.html
http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-2157/CR-3901web.pdf

Lice

Lice can give your animals a lousy winter. The only good news is that lice are nearly 100% species specific, meaning that they like to stay on one species of host. The entire life cycle is completed on the host. After the sun comes out and the weather warms up past 60°F on a regular basis, lice are gone until the cold, damp, dark season rolls around again. Lice do the most damage to old, sick or young animals. A tremendous infestation of lice can cause anemia and even death, especially in young stock.

In some species, lice can be treated with over-the-counter powders, because these

products are cleared for use with certain species. If a species is not listed on the label, discuss the use of the product with your veterinarian and ask about dosage, number of applications and any milk or meat quality assurance issues. A few of the injectable or pour-on dewormers are effective against some types of lice, but again, discuss this issue with your veterinarian.

For More Information
http://www.uky.edu/Ag/Entomology/entfacts/livestc/ef512.htm
http://edis.ifas.ufl.edu/IG129

Congenital Hypothyroid Dysmaturity Syndrome

This syndrome with a whopper of a name applies only to foals. An affected mare may have an abnormally long pregnancy, abort or give birth to an abnormal foal. Affected foals often have an abnormal jaw, immature hair coat, fine skin, poorly-calcified hock and knee bones, abnormal curvatures of the front legs, congenitally-ruptured tendons and other abnormalities. Most effected foals die or need to be euthanized.

The cause of this disease is believed to be the ingestion of late winter/early spring weeds by mares during late pregnancy. Mustards and other members of the *Brassica* family are believed to be the main culprits. Chemical compounds in these plants seem to have goitrogenic (thyroid-stimulating) effects, even though the foals are not born with goiters. The risk factor is present in both fresh and dried plants, so weedy hay is also a concern. Nitrates may also be involved in this syndrome, but that is under investigation.

Horse owners should feed weed-free hay to pregnant horses and keep these animals out of weedy areas until after foaling. Mares that have foaled one affected foal are at higher risk to do so again, perhaps because of a behavioral component that involves preferential eating of the toxic weeds.

For More Information
http://www.vetmed.wsu.edu/depts-fdiu/MustardFoalsReport.pdf
- Dr. Susan Kerr, WSU Extension

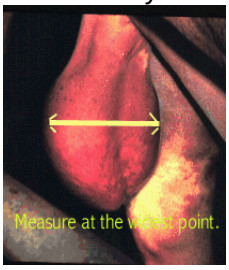
BREEDING EVALUATION OF BULLS

Evaluating bulls for breeding soundness is probably one of the most neglected management practices in cow-calf operations. Bull fertility is unquestionably one of the most important traits because a cow-calf producer derives their primary income from the number of calves born each year.

Bull fertility can be a major limiting factor in a breeding program. Fertility problems that reduce a bull's ability to sire calves affect an estimated 10 to 25 percent of the bulls in the United States and Canada. In most cases, bulls that have been in the herd for a year or more are assumed to be of sound breeding value, however, this is not necessarily true.

There are a number of factors that can impact fertility of any bull such as age, health, and injury. Even if a bull has proven satisfactory at the time of purchase, it is important to consider a breeding soundness evaluation (BSE) about 60 to 90 days prior to each breeding season. A basic BSE consists of: physical examination of the bull, examination of the reproductive organs, measurement of the scrotal size and semen evaluation.

The criteria used to assess fertility in a breeding soundness evaluation are testicular capacity, as measured by scrotal circumference (40%), sperm cell morphology (40%), and sperm cell motility (20%). Bulls which score higher than 60% and do not have any limiting physical or genital disorders are considered to be satisfactory breeding animals. Bulls scoring between 30 and 60% should be considered questionable breeders. Those bulls scoring less than 30% are classified as unsatisfactory breeders.



Breeding soundness evaluations provide a cost-effective, immediate and objective evaluation of the breeding potential of bulls.

It can be a very effective tool when done prior to either the breeding season or at the time bulls are purchased or sold. It provides an accurate method of evaluating bulls for fertility so the infertile and sub-fertile bulls can be eliminated from your breeding herd.

Remember that a bull may have the genetic characteristics you want and produce high-quality semen, but be of little value as a herd sire if he is not capable of breeding. Observing the bull service a cow often enables you to identify any back, leg, feet or other reproductive problems that prevent him from completing the act successfully.

Bull dominance is a factor that is also often overlooked in a multi-sire breeding program. The most dominant bull in the herd is usually the oldest and heaviest, and has been in the herd the longest. Therefore, the way bulls are grouped in breeding pastures is very important. Keeping young and old bulls in the same breeding pasture may contribute to lower reproductive efficiency in your herd. As bulls reach four or five years-of-age, their reproductive ability declines, but their dominance remains high. Since older bulls often prevent younger, more potent bulls from mating, the highest percent calf crop may not be achieved.

The more you know about your bulls, the better you will be able to strike that combination of breeding capacity, age, aggressiveness and breeding efficiency to help ensure a productive, profitable calf crop next year.

- Jean Smith, WSU Extension

TUBE FEEDING NEONATAL SMALL RUMINANTS

It is essential that sheep and goat producers learn how to tube feed young animals. This simple procedure can often save a young animal's life, thereby increasing lambing and kidding crop rates and enhancing profitability.

Steps to Tube Feeding

1. Determine that tube feeding is necessary. If an animal is too weak or otherwise unable to nurse from its dam or take a bottle, it needs to be tube fed. Any newborn lamb or kid that has not nursed within 12 hours of birth should be tube fed.

2. If the animal is cold, warm it before administering colostrum.

3. Warm the fluid to be administered to about 104ºF. There is no need to feed colostrum if the animal is older than 24 hours - milk will do. Electrolytes should be administered if the animal is weak due to dehydration from diarrhea. Frozen colostrum should be thawed in a warm water bath, not a microwave; microwaving will destroy the antibodies in the colostrum.

4. Assemble sanitized equipment, including a feeding tube and a 60-cc dose syringe. Tube feeding kits are available through livestock catalogs and farm supply stores.

5. Place the tube alongside the neonate's body, with the mouth of the tube at the animal's mouth and the end at its last rib, where the stomach is located. Note how far the tube will have to be inserted to reach the last rib.

6. Sit down and gently hold the animal by its shoulders between your knees, facing away from you.

7. Hold the animal so its head is in a normal position. Dip the tip of the tube in clean water and slowly insert the tube in the animal's mouth, gently advancing the tube toward the back of the animal's mouth. The animal should swallow the tube readily. THE GOAL IS TO INSERT THE TUBE INTO THE ESOPHAGUS, NOT THE TRACHEA. If the tube enters the trachea (windpipe), the animal should cough, gag and react violently, but a moribund animal may not react.

8. Check correct placement of the tube by several methods:

- Seeing the animal swallow as the tube is introduced and advanced.
- Watching the tip of the tube advance in the esophagus on the left side of the animal's neck.
- Being able to insert tube to 100% of previously-noted length.
- Feeling the tube in the esophagus on the left side of the animal's neck.
- No gagging or coughing.

BEST METHOD: Attach a 60-cc dose syringe to the mouth of the feeding tube after it has been fully inserted into the animal; pull the plunger back. If the tube is placed properly, it should be very difficult to get the plunger to move past a few cc marks. If the tube is improperly placed and is in the trachea, it will be very easy to pull the syringe's plunger back with the air in the trachea. *If you understand, master and perform this check every time you pass a feeding tube, you will never accidentally drown an animal while tube feeding.*

9. Detach the syringe from the feeding tube and remove its plunger. Firmly re-attach the empty syringe to the mouth of the feeding tube. Pour warmed fluid in. Let fluid trickle in via gravity, do not force it in. Try to keep air from entering the tube and stomach.

10. After the required amount of fluid has been administered, detach the syringe and crimp off or plug the end of the tube as it is withdrawn from the animal; this prevents the animal from inhaling any fluid as the tube is withdrawn across the pharynx.

An animal should receive at least 10% of its body weight in colostrum in the first 12-24 hours of life. For example, a 10-pound lamb should receive one pound (16 ounces) of colostrum during its first day. Frequent small meals of two or three ounces are better than one or two huge meals. If all goes well, the animal will only need to be tubed once, and then can be returned to its dam to nurse free choice.

Diseases can spread to your herd through infected colostrum so it is best to only feed pasteurized colostrum. However, it is a challenge to pasteurize colostrum without destroying its beneficial antibodies. The key is to keep the colostrum between 132.8ºF and 134.6ºF for 60 minutes.

To disinfect tube feeding equipment, rinse well immediately after use. Wash thoroughly with warm, soapy water to remove all debris. Dilute one ounce of bleach with 21 ounces of water and submerge all equipment in this solution for two minutes. Remove, rinse well, air dry and store in a clean place. Wash your hands well before and after tube feeding.

It is easy to learn how to tube feed neonatal small ruminants with confidence. Every sheep and goat producer should master this skill and have sanitized equipment and frozen colostrum ready during lambing and kidding season.

For More Information
http://cru.cahe.wsu.edu/CEPublications/eb1998/eb1998.pdf
http://www.ext.vt.edu/news/periodicals/livestock/aps-01_01/aps-0309.html
http://www.sheepandgoat.com/news/feb2005.html#tubing
- Dr. Susan Kerr, WSU Extension

WINTER RANGELAND GRAZING

Why

Intermountain bunchgrass rangeland is characterized by plants with a high proportion of reproductive tillers to vegetative tillers (stems) as well as elevated growing points. Grasses with elevated growing points are more susceptible to grazing damage than those with low growing points (like Sandberg bluegrass). Grasses with fewer vegetative tillers, more reproductive stems and that are mostly dependent on seed production to

replicate themselves are also more susceptible to grazing damage, as a population. With these grasses, there is greater likelihood of a reproductive tiller getting eaten before it has had a chance to produce seed, or potential new plants.

These same grasses also have their highest nutritional value in the spring when animals want to be out, ranchers are anxious to stop feeding hay, and riparian areas are not as enticing as in August. It is for these reasons that much of the Intermountain West bunchgrass range experienced declining health in the last century.

Ironically, tradition holds that Eastern Washington was "discovered" by cattlemen from California who abandoned their stock in the face of a particularly harsh winter and returned in the early summer to find them fat. Winter grazing can be an important management component of a cattle or sheep operation toward a couple key objectives: improved profitability and increased rangeland health.

Economics

The cost of feeding hay in the winter has been estimated at 50-80% of the average cattle operation's annual operating costs. Consequently, management actions that reduce this massive cost in an already marginally profitable enterprise (on average) have the potential to increase profit for operations in the black and perhaps make those in the red pencil out for a change.

Deferring spring grazing on some rangeland pasture to "stockpile" for fall or winter use can extend the grazing season, shortening the hay feeding season. This may necessitate reduction in cow numbers, but the increase in per cow net returns may offset the slight decrease in total pounds weaned, depending on individual circumstances. For example, 300 cows at $75/hd net return will be worth $2500 less per year than 250 cows at $100/hd net return.

Plant health

Perhaps the single most important change toward improving rangeland condition (and total production) is avoiding, at least in some years, grazing bunchgrasses heavily during the critical growth period of internode elongation, often referred to as bolting. Bunchgrasses will sustain mostly vegetative basal growth for a period in the spring, then rapidly elongate between the growing points to their characteristic stature, then mature the seed, then stop above-ground growth. *Repeated defoliation below the stem's growing points during the bolting stage will eventually kill the plant.*

Fall or winter grazing a given location, such as in a regular rotation system that allows unimpeded growth during the critical stage when plants are building photosynthetic leaf area to generate a full seedhead, will maintain rangeland productivity. This will promote the increase of perennial bunchgrasses as animal movement and hoof action pushes seeds into the soil. Seed-to-soil contact is one of the primary limiting factors for native bunchgrass reproduction.

There are challenges associated with grazing during the fall and winter.

Timing

Most producers in eastern Washington calve in the early spring, which means cows are in the second and third trimesters with their next calf during the fall and winter. Fall presents the best opportunity to most closely match nutrient availability to animal nutrient demand, because dry cows post-weaning have the lowest nutritional need of any time in the annual cycle. At this time, rangeland forage has lost some of the crude protein value, but retains much of the digestible energy.

Riparian use

The primary reason more rangeland is not used in the fall is that this is the season when uplands are driest and forage moisture is little more than hay. Meanwhile, riparian areas may still be growing grass. They often have live water and shade and are actively sought out by livestock. Late-season riparian use has caused much of the public outcry against Western livestock grazing. However, in some areas seasonal water sources may have dried

up and the producer with off-site water can get good distribution and be less concerned about streambanks, because they are dry and firm.

The combination of well-placed water tanks and electric fencing to control riparian use can make even rangeland parcels with perennial streams usable. More producers should consider herding as a tool for placing cattle (as opposed to "hazing" or chasing). *(There is an excellent new Interagency Technical Reference on riparian grazing (TR 1737-20) available for download at http://www.blm.gov/nstc/library/techref.htm)*

Nutrition

Rangeland species composition can vary widely from one site to another. Since the nutritive value of the forage is largely dependent on the plant species comprising the stand, forage values may vary significantly across even relatively small areas. In addition, the nutritive components of a plant decline as the plant matures, some faster than others.

At low stock densities, animals will select those plants that most closely meet their nutritional needs, tending to select a higher value diet than what is represented on average on the landscape. On the other hand, more efficient forage use can be had with higher stock densities for shorter periods of time.

In addition, rumen bacteria are not as choosy as the cow's tongue - palatability is not always an accurate indicator of nutrient value. Rumen microbes digest the food first and are able to synthesize all of the necessary amino acids from protein found in low quality forage. As microbes die, they are absorbed by the ruminant and have nutritional value.

Supplementation is simply making up the difference between what the forage provides and what the animal needs. Under low nutrient value conditions, animals will likely require protein supplement, and they will require adequate energy to properly digest the protein. In early fall, protein will be most limiting for dry cows. Later in winter, plant protein and energy levels will be insufficient for proper nutrition. Molasses-based supplements work well because they can provide a liquid protein source in an energy-rich base.

References

T.E. Bedell. 2003. Range Nutrition in Relation to Management. Cow-Calf Management Guide & Cattle Producer's Library. *(Available at www.csubeef.com; order at hard copy at http://www.avs.uidaho.edu/wbrc/).*
– Tip Hudson, WSU Extension

SPRING PASTURE FERTILIZATION

Irrigated and dryland pastures respond to fertilization when soil nutrient levels are below plant needs. Even though much of the dry matter grazing livestock consume is re-deposited to the pasture, additional plant nutrients must be replenished to maintain healthy and highly productive pastures as shown in Table 1.

Table 1. Pounds of nutrients removed per ton of orchardgrass hay.

Nutrient	Removed in 1 ton	Removed in 5 tons	Removed in 7 tons
Nitrogen	30-37	150-185	210-259
Phosphorus	4-5	20–25	28-35
Potassium	35-39	175-195	245-273
Sulfur	3-4	15–20	21 - 28

Healthy pastures make healthy livestock. Liming may be necessary for healthy legume/grass pastures grown in acid soils (some mountain meadows in Washington with high organic matter are low in pH). Plants low in magnesium may not provide sufficient levels for the prevention of grass tetany in the spring grazing period. When soil pH drops below 6.5, nodulation of legumes with nitrogen fixing bacteria is diminished. Lime can be top-dressed to a pasture at any time.

In mixed grass/legume pastures the relative concentrations of grass versus legume can be influenced by the level of certain plant nutrients. High levels of soil nitrogen favor the growth and competitiveness of grasses, whereas high levels of phosphorus favor the

competitiveness of legumes. In mixed pastures, a 30% to 50% concentration of legumes is considered optimum. In these pastures, nitrogen fertilization may be maintained at a minimum as much of the nitrogen requirement for both the legume and grass is supplied through nitrogen fixation.

Fertilizer recommendations will only be accurate if soil samples are properly taken and are representative of the field to be fertilized. In general, 20 to 30 soil probes taken in a zigzag pattern over the entire pasture and combined into one sample which is then sub-sampled for the soil test will constitute a properly taken sample.

Nitrogen (N)

Grass pastures respond to nitrogen fertilization. It is not uncommon to apply up to 150 lbs of N to grass pastures each year. It would be wise to spread this amount over the growing season in 30 to 50 lb/ac increments early in the spring (March) and then after each grazing cycle. Applying the entire N in the spring could increase the potential of nitrate poisoning especially when ruminants are let out on lush pastures after wintering on hay or when a late spring frost shocks rapidly growing grass. It is also associated with increased cases of grass tetany.

Phosphorus (P)

Soils with a soil test P level less than 12 ppm (Sodium bicarbonate extractable P) may respond to phosphorus fertilization. Legumes have a high P requirement. Grasses tend to have a low P requirement. A general rule of thumb is to add 25 lbs of phosphate for every ppm unit of P below 12 ppm indicated in the soil test.

Potassium (K)

Legumes have a high K requirement, whereas grasses have a moderate K requirement. Central Washington soils were once naturally sufficient in K, but with continual removal with crops such as hay combined with ample irrigation, K levels in many areas of the region are becoming deficient. The exception is in soils that have been pastured or have had manure applied as soil K can actually increase under continual grazing or manured systems. A general rule of thumb is to add 2-3 lb of K_2O for every ppm unit of K below 150 ppm indicated in the soil test. Too much K however, leads to luxury consumption of K and can lead to nutritional disorders in livestock, such as hypomagnesaemia (grass tetany).

Sulfur (S)

Like P and K, sulfur requirements are greater for legumes than for grasses. Sulfur is most often needed in mountain valleys, foothills or rain-fed pastures as irrigation water from river systems often contain sulfur. The rule of thumb for sulfur is to add 3 lbs of S for every ppm unit of S below 14 ppm. Fertilization with sulfur may reduce the selenium concentration of forage, thus it is important to maintain adequate selenium supplements for grazing livestock.

Boron (B)

Boron is required by legumes and is most often found in acid soils or very sandy soils in Central Washington. Soils low in B may give grasses a competitive advantage. Fertilize with B if soil tests indicate a level below 0.5 ppm. Add no more than 3 lbs B/ac as excesses of B are toxic to plants.

Timing

An early spring application of the seasonally predicted needs of P, K and S should be adequate until fall when P and K needs are assessed. Fall is the best time to apply P and K for root growth and winter survival.

The addition of liquid formulations of nitrogen fertilizer through sprinkler irrigation may be an efficient method of distributing N over the growing season. Liquid N sources are more costly than dry formulations, but the ease and efficiency of application may offset the added cost.

- John Kugler, WSU Extension

Editor: John Fouts

Central Washington Animal Agriculture Team members' contact information and publications can be found at http://animalag.wsu.edu.