

Dry Weather Management for Cattle

It is not uncommon for Arkansas summers to be very hot and dry. As summer begins, cattle usually are in good body condition, but the pastures can dry up very quickly. Hot weather stress is particularly hazardous to closely confined cattle such as show cattle. High relative humidity when the temperature is at or above 80°F adds to the likelihood of profit-stealing losses. Temperatures above 100°F are always dangerous and if the humidity is above 25 percent, the situation is “Emergency.” When conditions are at the emergency level, all handling of cattle should be kept at a minimum. Provide shade if possible and plenty of fresh water.

Listed below are some beef cattle management suggestions for dry weather conditions.

1. **Provide a Good Water Supply.** Cattle require greater amounts of water during hot weather.
2. **Check the Herd Routinely.** Check for good health, body condition and soundness – eyes, feet, teeth, udder, etc.
3. **Inventory Feed Resources.** Estimate as accurately as possible the amount of hay available. Include crop residues or other sources of roughage. Check on the cost and availability of crop byproduct feeds such as soybean hulls, corn gluten feed, whole cottonseed, rice bran, cottonseed hulls, etc. If feed supplies are inadequate, consider alternative feeding and management options to most efficiently maintain the herd.
4. **Cull the Herd.** Sell open cows, old cows, unsound cows (injured, diseased, pendulous udder, short or missing teeth, etc.), cows which produce lightweight calves and late calving cows. Keep young, productive cows and the best replacement heifers and bulls.
5. **Wean Calves Early.** Cows nursing calves have about double the energy and protein needs of dry cows. Calves can be weaned as young as six to eight weeks of age and started on a complete ration. Young calves require a good quality feed with adequate levels of protein, TDN, minerals and vitamins. After calves are weaned, cows can be maintained on a minimum amount of forage. Cows should be maintained in a moderate body condition. It’s generally cheaper to feed the cow and calf separately than it is to feed the cow, which feeds the calf.
6. **Creep Feeding or Creep Grazing.** If milk production declines, nursing calves receive inadequate nutrition to grow properly. Creep feeding or preferably creep grazing (which probably won’t be available during droughts) may be used to maintain adequate calf gains. Calves usually prefer milk to grass so they will first take whatever milk is available and, therefore, creep feeding or creep grazing doesn’t reduce nutrient needs of the cow.
7. **Provide Cattle on Pasture Supplemental Feedstuffs.** Hay is often the least expensive supplement to feed cattle on pasture. However, during periods of drought, other feeds (grains, protein supplements, range cubes, etc.) may provide a cheaper source of nutrients.
8. **Have Forage Tested and Feed Balanced Rations.** Efficiently use available forage by having it tested and balance rations to avoid overfeeding or underfeeding mistakes.
9. **Use Appropriate Feed Additives.** Monensin (Rumensin®) fed to beef cows, replacement heifers or stockers at the recommended levels will reduce hay or pasture requirements by about 10 percent. Lasalocid (Bovatec®) will improve feed efficiency in calves, replacement heifers and stockers.
10. **Supply Adequate Minerals and Vitamins.** Nutrient needs for phosphorus and other minerals and vitamins should be met, especially during periods of drought.

Provide a good free-choice mineral-vitamin supplement year-round.

11. **Consider Poultry Litter and Other Alternative Feeds.** Identify the cheapest sources of protein, energy and roughage for a given situation and then use those feeds to balance a ration for the cattle that must be fed. Broiler litter is usually preferred to turkey litter but either may be used as a cheap source of protein and minerals for beef cattle if they are good quality and adequately processed.
12. **Group Cattle for Feeding.** Don't feed all cattle together in one group. Separate the herd into groups based on nutrient needs. Dry cows need less than cows nursing calves. Replacement heifers and first-calf heifers have higher requirements than mature cows. Distinct management groups of cattle in most beef herds are (1) dry cows, (2) cows nursing calves, (3) first-calf heifers, (4) weanling replacement heifers, (5) bred yearling heifers and (6) bulls.
13. **Avoid Nitrate and Prussic Acid Poisoning.** Environmental conditions which retard plant growth often cause excessive accumulation of nitrate and prussic acid in plants. If forage is suspect, have it tested for these poisons. Most common accumulators of nitrates ranked from highest to lowest are weeds, corn, sorghums, sudangrass, cereal grains, tame forage grasses and legumes. Nitrate accumulates primarily in lower stems. Prussic acid accumulates primarily in the leaves.
14. **Maintain Herd Health.** Continue to follow recommended guidelines for vaccinating cattle and controlling flies and other external and internal parasites.
15. **Avoid Feed Waste.** Plan feeding to avoid waste. Unroll large round bales or use ring feeders to prevent wastage of hay. May limit-feed hay to make cattle eat all of it, especially if grain or other feeds will be supplied.

Maintaining Herd Productivity During Drought

Drought always presents unique and difficult management situations. Most farmers are caught somewhat by surprise by the size, scope and severity of drought. Getting off to a late start in managing through any drought would completely alter the normal approach to forage and nutritional management.

- Feeding through drought usually is not an economically viable option. For hay feeding to make economic sense, cattle prices would have to be high. In most situations, the most economical option is to reduce herd size so supplemental forage will not have to be purchased or fed.
- Reduce your herd size to what your resources will support. Critically evaluate the physical attributes of the individual cows. Consider culling those cows with bad physical attributes – udders, legs, eyes, etc. Cull the cows on their reproduction efficiency. Palpate the herd and cull the open cows. Look at your records and cull those cows who have not calved every 12 months or are extremes (too early or too late) in your breeding and calving season.
- Critically evaluate replacement heifers. Decide what is the minimum number of heifers needed next year and sell the rest.
- Evaluate the bulls. If they are getting old and need to be replaced, sell them now and plan on purchasing a better bull before next breeding season.

Environmental/Stress Management

Managing through a drought requires implementing practices that help reduce stress. This includes nutritional and environmental factors, which lead to increased energy requirements of cows and calves.

- Fencing off watering areas that become boggy will reduce energy required to maintain production. This only works when there are other sources of water available.
- Hauling water is an expense that cannot be supported for long. There is also the risk of

having weaker cows bog down and die before they are discovered. When water supplies are depleted it is time to liquidate. Minimize exposure to increased health risks by reducing access to stagnant watering areas.

- Allow cattle access to shade, normally a problem only on operations with a high percentage of “improved” pastures.
- Heifers and calves are not able to compete with mature cattle for pasture or supplemental feed. Drought feed is costly and it is important to feed only those animals that really need it. Segregating animals gives each group a better chance of getting needed feed supplies.
- Manage cows to maintain a body condition score (BCS) of 4 or above on mature cows and 5 on two- and three-year-old cows. Cull early and allow cows to maintain condition on standing forage. Thin cows are more susceptible to parasites.

Health Management

- Continue to protect cows and calves against clostridial diseases (blackleg). As cattle graze on shorter and shorter forage the chance of picking up soil-borne pathogens increases. Blackleg, leptospirosis and anthrax are just a few of the diseases that occur with greater frequency during drought.
- Check with veterinarians in the local area to get a history on diseases of concern.
- Chances of leptospirosis increases as watering areas dry up. Cattle and wildlife are forced into more concentrated areas and the chance of spread between species increases.
- Protect against the reproductive diseases – campylobacter fetus (vibrio), brucellosis, haemophilus somnus, trichomoniasis, IBR and BVD to name a few.

- Cattle at all ages are affected by a diversity of internal and external parasites. Parasites, both internal and external, need to be monitored and controlled as needed.

Nutritional Management Strategies

- The key to successful forage management during drought is to cull and reduce the number of animals early enough and go deep enough to provide adequate forage for the remaining cow herd.
- Keep cows that are least susceptible to nutritional stress caused by poor forage conditions. This will be mid-aged cows between 4 and 10 years of age. At lower body condition scores (BCS 3 and 4) cows of this age will average 35 percent and 20 percent higher conception rates than first and second calf cows, respectively, as shown in Table 1.
- Decreased milking ability and lighter calves at weaning are reasons older cows have higher conception rates at any given BCS. If condition can be maintained on second-calf cows they can also be kept in the herd.

- Sell replacement heifers and any other cow that will not wean a calf in this production year. If a place can be found to hold these cattle economically there may be justification for retaining ownership.

- Cull first-calf heifers next. There are two primary reasons. These two groups of cattle are normally the most expensive to develop and maintain and have the lowest production potential. When feed is expensive and cattle are cheap, cost can be reduced dramatically by moving these cattle.
- Always manage the forage base to allow adequate consumption and efficient use of marginal precipitation. Cows need to consume forage at the rate of 2 to 3 percent of their body weight to have a chance of maintaining acceptable production and reproductive performance. This will be a constant battle until the drought breaks, requiring constant monitoring and periodic adjusting to prevent decline in range condition and cow performance.
- Minerals will need to be provided to cattle during periods of drought. Do not stop supplementing phosphorus! Phosphorus has a major impact on reproductive performance.

Table 1. Body Condition Score at Palpation by Age Group (Parity)

Parity	BCS 3	BCS 4	BCS 5	BCS 6	BCS 7	All
1	40%	50%	70%	82%	83%	63%
2	43%	79%	89%	100%	100%	77%
3-10	71%	86%	92%	97%	95%	91%
> 10	100%	92%	97%	100%	100%	97%
All	54%	76%	89%	94%	94%	84%

(Wiske, Herd, 1995)

This information was adapted from a fact sheet written by Diego M. Gimenez, Jr., Extension Animal Scientist.

To Keep or to Sell Calves in the Drought?

During drought there is very little grass in pastures either for animals to eat or to cut as hay. Many are already feeding surplus hay from last winter and some of you are already buying hay and other feeds for your livestock. The question many of you are trying to answer is, "Do I keep feeding or do I sell my calves now?" It's a tough question to answer generally because each operation is different.

- If you have adequate feedstuffs to hold onto your calves until fall, you need to do so. Prices are expected to go up because of a smaller calf crop this year and secondly, improved demand for beef may also help market prices.
- Look for alternative feeds that are readily available and low-cost. Producers have got to consider using other feedstuffs than just hay. Options could include broiler litter, whole cotton seed, peanut hay and soybean hulls among many other possibilities. The key is to locate a nutritious alternative feed that you can buy at a reasonable cost. Bulky feedstuffs are not a good choice if they have to be transported long distances (due to handling and freight charges).
- Consider getting together with other producers to buy feeds in large bulk quantities. You may not need or have storage space for a trailer load of cottonseed, but it could be more affordable if two or three producers bought a truckload together. Also, buying in bulk will allow you to avoid the cost of bagging the feed.
- Make sure you have the storage facilities for bulk alternative feeds. Open front sheds give protection to the feeds while still giving you easy access to the feeds. Storing some bulk feedstuffs on thick grass sod with a tarp or plastic cover is possible, but you must consider the cost and waste of the feedstuff.
- Summer creep feeding offers another option. The decision to creep feed calves hinges on whether the cost of the creep feeding is less than the value added to the calf at sale time. You can feed a variety of rations to calves. Grain and a combination of byproducts can be fed in most cases.
- Early weaning of calves is another option. By four months, a calf is only getting between 20 and 40 percent of its energy requirement from its mother. Early weaned calves fed in a dry lot or supplemented on pasture may gain a half-pound to a pound faster than nursing calves. Early weaning reduces the nutritional needs for the nursing cows by one-third to one-half. You can now move these animals to low quality forages. You can also cull and sell older or open cows.
- A final option you may want to consider is retained ownership. Retained ownership through the stocker and feedlot phase offers you some flexibility.

This information was adapted from a fact sheet written by Dr. Walt Prevatt, Extension Agricultural Economist.

Drought Stricken Forages Often Present Nitrate Toxicity

Under normal weather conditions, nitrogen application to soils is taken up as nitrate by plants and metabolized into plant protein. Under drought conditions, this metabolism is decreased and nitrate content of the plant is increased. Forages such as corn, sorghums, pearl millet, soybeans, sudangrass and sorghum-sudan hybrids may accumulate toxic levels of nitrates. Several weeds (e.g., pigweeds, Canadian thistle, ragweed's goldenrod, nightshades) may also accumulate nitrates, so weedy hay may create a problem. Whenever nitrate accumulations are suspected, take extreme precautions in feeding the forage.

- When cattle or other ruminants consume forages with nitrates, the rumen bacteria convert the nitrates to nitrite. Bacteria may utilize nitrite, but the bacteria are overloaded when nitrate concentrations are too high. In this case, nitrite is readily absorbed into the blood system and changes the blood into a form (methemoglobin) that cannot transport oxygen in the body.
 - When acute toxicity occurs, cattle have difficulty breathing, have paralysis, go down and may die within an hour unless treated. Accurate diagnosis and prompt treatment of acute cases are essential in the prevention of deaths and abortions.
 - The prime diagnostic criterion for nitrate toxicity is chocolate-brown blood. Another symptom is the darkening of normally white membrane (e.g., eyes) to a bluish color.
 - Animals are often drowsy, develop a chronic cough, are unthrifty with a reduced appetite and have a drop in production. Abortions and decreased conception may occur.
- Nitrate in forages CANNOT be estimated.**
- It is absolutely essential that forages be analyzed. Taking a representative sample prior to grazing the suspected forage is important. Sampling prior to harvest can help determine whether it is worthwhile to harvest the crop.
 - Nitrate content of forage MAY decrease by 15 to 20 percent if ensiled, but this cannot be counted upon.
 - Nitrate content normally does not decrease in hay. If the nitrate in the forage is excessive, the cost of harvesting and storage should be avoided.
 - If preliminary analysis indicates that harvesting is feasible, nitrates may change by the time of harvest, so a second analysis should be made on the forage prior to feeding.
 - Nitrate content of drought-stricken forage often increases for two to four days following a rain, so harvesting or grazing should be postponed if rain occurs. Leaf and grain portions of forages are normally lower in nitrate content than lower stalks, so get a representative sample of what will be harvested or grazed.
 - The minimum toxic level of nitrates is difficult to define even though there are guidelines. Labs normally list either nitrate (NO₂) or nitrate nitrogen (NO₂-N) values (other values occasionally reported) and the numbers are very different.
 - Nitrate values can be converted to nitrate nitrogen by multiplying the nitrate value by 0.23; nitrate nitrogen can be converted to nitrate by multiplying the nitrate nitrogen by 4.40.
 - The following guidelines for nitrate nitrogen were compiled from several sources and the categories may differ slightly from those you obtain from your laboratory reports.
 - 0-575 PPM: Generally considered safe.
 - 575-1150 PPM: Use caution when feeding young or pregnant animals. Prevent over consumption.
 - 1150-3450 PPM: Potentially fatal.
 - Susceptibility of animals to toxicity will depend not only on the concentration of nitrate in the forage but also on the total amount of nitrate consumed, the speed of intake of the toxic forage and the adaptation to the feed.

- If the nitrate content is not excessively high, the danger can be reduced by hand-feeding or mixing the forage with other nitrate-free feeds. For lactating dairy cattle on total mix rations, varying the ingredients can alter the final concentration of nitrates in the total feed mix.
- For beef cattle, dry dairy cattle or heifers, blending nitrate containing forages is difficult. Feeding the animals with nitrate-free forages before grazing may be adequate, but any such grazing management must be done with care.
- Adapting the cows to the feed over time allows the bacteria to adjust to the forage. Introduce such forages into the ration gradually over a period of 7 to 10 days.
- Don't allow hungry animals access to the suspected forages. Under practical conditions, injury is much greater when an animal consumes the forage rapidly than when it is consumed slowly.
- Thus, providing small amounts over a long period of time, even when the cows are accustomed to the feed, is less apt to create problems than if the cows have free access to nitrate-containing hay.
- The inability to control total intake creates problems when cows are allowed free-choice access to grazing (e.g., drought-stricken corn) or hay in large round bale feeders. Providing other nitrate-free feeds before or with grazing or large round bales helps limit "slugging" the cow's system with nitrates.
- Addition of vitamin A (~22,000IU/head/day) is considered beneficial. Access to iodized salt is also considered of value as the iodine metabolism may be compromised with nitrates.
- Animals exhibiting symptoms of nitrate toxicity maybe saved if immediate action is taken. Animals should be removed from the nitrate containing forages and placed on nitrate-free forages.
- Animals should be handled and moved slowly and with a minimum of stress. The oxygen-carrying capacity of the blood is quite low, so stressing the cows or running them with dogs, horses or pickups enhances the problem.
- Methylene blue is the specific treatment for animals exhibiting systems of nitrate toxicity, and survival of affected animals may be improved if a veterinarian administers methylene blue immediately.

In summary, drought-stricken forages may contain toxic amounts of nitrates for cattle, and prevention of problems is essentially the only valid approach to avoiding economic loss. Suspected forages should be tested and results used in the feed management of cattle. Nitrate-containing forages may be used with proper precautions. Limiting forage intake, adapting cows to forages, mixing problem forages and nitrate-free feeds and preventing animals from eating nitrate-containing forages free choice, especially when hungry, are important in avoiding cattle losses.

This information was adapted from a fact sheet written by B. R. (Pete) Moss, Professor in Dairy Science, Don Ball, Alumni Professor in Agronomy, Darrell Rankins, Associate Professor in Animal Nutrition and Gatz Riddell, Professor, Large Animal Surgery and Medicine.