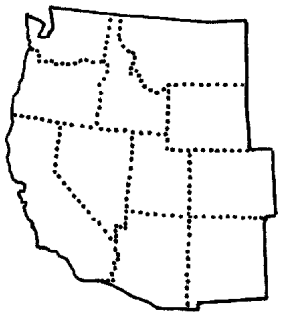

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# Drought Management Strategies for Beef Cattle

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Drought develops progressively over time. Management of the ranch during a drought depends on the balance between stocking density and the availability of feed and water.

In the long run, you can help protect your interests by sound planning to make your ranch decisions less sensitive to drought. Early decisions need to be based on what relief measures are potentially available on the ranch. Among the important factors are:

- Guessing the expected duration of the drought,
- The current water and feed inventories,
- The body condition of the cowherd, and
- Financial resources available.

During drought, decisions may often be made on emotion rather than logic. The main goal is to make objective decisions and get skilled help when necessary from your extension educator, beef specialist, range specialist, or agricultural consultant.

## Effect of Drought on Range Plants and Management

Drought is a serious obstacle to successful range livestock management. Producers must understand how drought affects plants, grazing animals, and livestock management, and what options exist. Forage production is decreased dramatically, but reductions are less on range in good and excellent ecological condition.

The ability of perennial plants to recover after drought is closely related to their vigor before and during the drought. Excessive grazing (more than 60 percent of current year's growth) decreases the ability of some plants to recover. Moderate use (25 to 55 percent) does not seem to affect the recovery rate.

A drought may require that livestock numbers be reduced according to forage supply. Retaining a rotational grazing system during drought is recommended over continuous grazing because periodic rest helps plants maintain vigor. Concentrating more animals into a single herd is recommended over having several smaller herds because by having more animals in a pasture, the entire pasture will be grazed more uniformly, and more use will be made of the less-preferred plants. Other options include grazing Crested wheat grass earlier and longer than normal, because it is one of the plants most tolerant of grazing.

Another option is keeping cattle on irrigated or subirrigated sites longer than usual. Fertilizer could be used to increase forage production on many of these sites. Fertilizer is a cash cost, however, and soils should be tested before fertilizer is applied. Fertilizer needs moisture to be available to the plant, and in times of extreme drought, this may not happen.

## Initial Questions

The producers who survive best during drought are those who adopt sound management and financial plans and review them regularly. They make firm decisions, and act quickly and early.

Keep alert for opportunities such as leasing land instead of buying feed. Four factors that affect risk management during a drought include:

1. The total population of cattle in relation to feed availability,
2. How widespread the drought-area is,
3. The time of year and the likelihood of rain and return to adequate feed supplies in your area, and
4. Evaluation of cash flow needs (borrowing your way through a drought to maintain traditional herd size may inhibit long term profitability).

## Questions to Answer When Facing a Drought

- Are my animals losing weight or not performing adequately?
- What is the body condition score (BCS) of my cows?
- Will I have to start to provide supplements?
- If the drought continues, should I cull the least productive or "at risk" animals?
- What feeds are available to the ranch?
- Assuming that I will have to purchase supplemental feeds, are they available and at what cost?
- Is one option to sell hay and buy back grain for limit feeding?
- Do I have the feed resources to allow for full feeding vs. supplementary feeding only vs. limit feeding of grain?

## Options to Consider During a Drought

- Do nothing.
- Selective reduction of the cow herd, especially the least productive cows.
- Early weaning of calves to reduce nutritional demands on cows.
- Leasing of additional grazing ground vs. purchasing of supplemental feeds.
- Purchase supplemental feedstuffs.
- Move the cowherd to a dry lot for full feeding.
- Limit feed grain to meet nutrient requirements.
- Sell all the livestock.

## Keep the Following in Mind with Regard to Cow Management

- Fertility of cows may decline when their body condition score drops below a 4, especially at time of calving and when they go into the breeding season in poor condition.

  In the absence of sufficient nutrients, particularly energy, cows lose considerable weight. When such weight losses occur, milk production decreases and reproductive activity may cease. The end result is lightweight calves and open cows. To prevent such undesirable effects, cows either must be provided sufficient nutrients to avoid weight losses and maintain production requirements, or they must be relieved totally or partially from body stresses.
- Early weaning of calves is one option that allows cows to rebuild body reserves and rebreed the next year.
- Money and diminishing feed reserves are too valuable to waste on cows that are unproductive, not pregnant, or are unsound. These animals are candidates for culling at any time, especially during drought conditions.

## Considerations for Water During a Drought

Water requirements of cattle may double during hot weather. If cattle do not have sufficient water, they may refuse to eat, experience lower production**,** and become sick. Table 1 shows estimates of water consumption for cattle.

In some areas you may be able to develop a spring or seep (a flow of 1/2 gallon per minute amounts to 720 gallons per day). Consider the possibility of installing a larger storage tank and piping water to troughs. You may need to install high-pressure plastic pipe to carry water from a central source.

Although expensive initially, pipelines will prove useful for many years. Hauling stock water is expensive. However, it may be a viable strategy in some situations.

One concern about cattle drinking stagnant pond water during hot, dry weather is that animals can die if the water contains certain species of blue-green algae. Toxic blue green algae blooms occur because of favorable conditions including hot, sunny days and warm, nutrient-rich water.

Toxic blooms of algae are unpredictable. Also, not all blue green algae are poisonous, and the blue green algae that can generate poisonous toxins do not always do so. Blue green algae congregate on or near the water surface.

Convulsions, bloody diarrhea, and sudden death characterize intoxication with blue-green algae. Affected animals rarely range far from the water source. Clinical signs in blue green algae poisoning include nervous

**Table 1. Estimated water consumption by different classes of beef cattle (North Dakota Extension Service).**

| Class of beef cattle | Estimated water consumption at 88°F |
|---|---|
| | (gallons/day) |
| Cows | |
| Dry | 14 |
| Lactating | 17 |
| Bulls | 18 |
| Growing cattle | |
| 400 lb | 9 |
| 600 lb | 12 |
| 800 lb | 14 |
| Finishing cattle | |
| 600 lb | 14 |
| 800 lb | 17 |
| 1,000 lb | 20 |
| 1,200 lb | 23 |

derangement, staggering, tremors, and severe abdominal pain. Presence of potentially poisonous blue green algae may be determined by microscopic examination, but the presence of algae does not mean the water is toxic. If you suspect blue green algae, contact your veterinarian or county educator to determine which samples would be appropriate for your situation. If concentrations of blue green algae are suspected, walk around to the windy side of the water body. If any dead animals such as mice, muskrats, birds, snakes, or fish are present, assume a poisonous condition exists.

## Supplementing Cattle on Drought-Affected Pastures and Ranges

Producers generally have two options for meeting the nutrient requirements of cattle on drought-affected pastures and ranges: (1) provide supplemental feed to ensure the cow herd has adequate energy, protein, vitamins, and minerals, or (2) reduce the nutrient requirements of the cow to a point where they can be met with available forage.

Drought-affected pastures and native range generally do not produce adequate forage to maintain "normal" stocking rates, so producers must provide supplemental energy to meet the needs of the cow herd. If forage is plentiful, protein often is the choice of a supplement.

If you do supplement hay on rangeland, try not to buy, or harvest, weed-infested hay. The future cost of feeding weed-infested hay far out-weighs its feed value in the short run. If weedy hay must be fed, feed in an area or holding pasture that is removed from streams, riparian areas, and wooded areas. Be sure to keep cattle confined for several days after feeding the weedy hay to prevent them from spreading viable seed from their digestive tract.

Observe holding pastures and feeding areas closely, and treat weed infestations. Try to take advantage of areas dominated with annual species. They should be grazed early in the season when their nutrient value is high. This will allow grazing deferment on the higher-condition range dominated with perennial plants.

Available crop residues such as small grain straws, and other byproducts of crop production represent important methods of stretching tight feed supplies during drought conditions.

Pastures and native range that are dormant due to drought conditions may be low in vitamin A, phosphorus, and protein. Meeting the need for these nutrients is important if cow herd productivity is to be maintained.

Reductions in stocking rate will benefit range plants by reducing stress and will also provide more forage for remaining cattle. When stocking rates are reduced in accordance with production, smaller effects on weaning weight may occur. If stocking rate is not reduced, supplemental feeding is necessary to maintain herd productivity and alleviate grazing pressure.

### Two Options

**1. When pasture is lacking in amount as well as quality:**

If only slightly limited, the feeding of range cubes (minimum 20 percent crude protein) or mixtures of grain and cottonseed or soybean meal at rates of 3 to 5 pounds per cow daily may work for awhile. Cubes with a large amount of natural protein and a low crude fiber level (less than 10 percent) would be preferred.

**2. When pasture becomes extremely short**:

Purchase of hay or a replacement feed for the pasture must be considered as well as selling of stock. Remember that most grass hay has only 50 to 65 percent the energy content of grain so that 1.0 pound of grain can replace 1.5 to 2.0 pounds of hay. A pound of grain will only replace 1.2 to 1.4 pounds of alfalfa hay.

It doesn't make sense to pay $105 per ton for poor quality grass hay when grain would cost very little more. It is necessary to start cows on grain slowly and feed so that all cows have opportunity for their share of the feed.

It is possible to feed up to 80 percent grain in a maintenance diet for British bred cows. Grain-based supplements should be fed daily to reduce the risk of acidosis. All cattle need some forage in the diet to minimize digestive problems.

## General Recommendations

### Minerals

Provide the same salt and mineral mixture during drought as you would during normal conditions. During drought, however, phosphorus supplementation is even more critical. A complete mineral supplement containing 12 percent calcium, 12 percent phosphorus, 5 percent magnesium, 0.4 percent zinc (4,000 ppm), and 0.2 percent copper (2,000 ppm) has worked well in many areas.

### Vitamin A

Lack of vitamin A may become a problem during the fall and winter for cows that grazed drought-affected pastures during the summer. Vitamin A is lacking in forages growing under drought conditions and hay produced from drought-affected forages. Cows should receive vitamin A and D booster shots approximately 30 days before calving if they have not been previously supplemented with vitamins.

### Protein

Pastures dormant due to drought conditions are usually deficient in protein. If these conditions occur during the breeding season, reductions in pregnancy rate can occur. Provide dry cows with approximately 0.5 to 0.75

pound of supplemental crude protein and lactating cows with 0.9 to 1.2 pounds of supplemental crude protein per day. This can be fed as approximately 1.0 to 1.5 pounds of soybean meal for dry cows and 2.0 to 2.5 pounds of soybean meal for lactating cows. Feed 1.0 to 2.0 pounds per day of a high protein supplement to dry cows and possibly as much as 2.0 to 3.0 pounds to lactating cows to maintain forage intake and efficient use of the forage.

Protein supplementation may be necessary for optimum breeding rates during drought conditions. Protein based supplements (cottonseed meal, soybean meal, and canola meal), commercial protein blocks, liquids, and tubs would also be appropriate. Alfalfa hay, sunflower meal, safflower meal, as well as other protein meals may also be used as protein supplements.

### Energy

During drought conditions, energy may be the most limiting nutrient for grazing cattle. Several options are available for supplying energy to cattle on drought-stressed pasture. Hay, grain, and crop processing byproducts can all be used to supply energy to grazing cattle. Low-quality forages can also be ammoniated to increase digestibility and protein content.

Grain supplementation on pasture can result in a "catch 22" problem. Excess supplemental grain can reduce forage intake and digestibility, resulting in less energy available to the animal from available forage. The reduction in forage intake may not be undesirable during a drought.

As a general rule, up to 0.2 percent of body weight of supplemental grain per head per day will not result in large decreases in forage intake and digestion. For example, a 1,200-pound cow could receive 2.4 pounds of grain per day without drastically reducing forage utilization.

For some grains, processing may be necessary for optimum use by cattle. Corn and oats can be fed whole but may be used better if coarsely rolled before feeding. Barley and wheat, however, should be coarsely rolled. Avoid fine grinding and rolling, which results in excess fines and dust. These can result in increased incidence of acidosis and founder. In addition, extremely dusty supplements are unpalatable. However, the producer must weigh the additional costs of processing vs. the value of the grain.

Grain processing co-products such as wheat midds, soybean hulls, and corn gluten feed that contain highly digestible fiber provide energy while alleviating much of the negative impact that grain supplementation has on fiber digestibility. In addition, these byproducts provide protein that may also be limiting in drought stressed forages.

When using byproduct feedstuffs, make sure that the mineral program is balanced. These feeds are typically high in phosphorus and potentially high in sulfur, which may lead to some mineral imbalances. The trace mineral levels may be somewhat low as well.

### Drylot Feeding

If pasture conditions are extremely poor, producers may consider feeding cows in drylot. This may be more cost effective than supplementation on range if large amounts of supplement must be transported and fed to cows daily. In addition, it may allow pastures a much needed rest period to begin recovering from the drought.

## Reducing Nutrient Requirements of the Cowherd

Lactation represents the greatest nutrient demand for cows during a year-long production cycle. Lactation increases demand for energy, protein, water, and other nutrients. One of the simplest ways to reduce nutrient requirements is to wean the calf. This practice can cut nutrient requirements by one-third to one-half depending on milk production of the cow.

Early weaned calves can achieve adequate rates of growth if given access to a high quality ration. Dry cows will eat less forage and usually travel further distances for forages than lactating cows, which further reduces demand placed on the pasture. By removing the demands of lactation, acceptable pregnancy rates and calving season length can usually be maintained.

Producers may consider early weaning only a portion of the herd. In this case, logical candidates for early weaning are cows nursing their first and second calves. These animals have nutrient requirements for growth in addition to maintenance and lactation. The nutrient requirements for lactation and growth are given higher priority than the need to reproduce. By removing the demands of lactation on nutrient requirements, growth and reproduction will receive a greater proportion of the nutrients available.

Unavailability of feeds or unusually high cost often prohibits feeding lactating cows the nutrients necessary for lactation and rebreeding. Production requirements of the mature cow for which nutrients are needed include body maintenance, lactation, and rebreeding. First-calf heifers and young cows must have additional nutrients for growth.

To reduce stress and lessen the total feed necessary, the only production requirement that can be removed is lactation. Lactation stress may be removed from cows or heifers by weaning calves after 60 to 80 days of age, or partially removed by creep feeding.

## Feeding Management Options

- Design your feeding program to get the most mileage from the available feeds on your ranch or in your area.
- Supplement low-quality feeds correctly. Your Ex-

tension educator or nutrition consultant can help you determine if you are meeting the cow and calf nutrient requirements.

- Underfeeding nutrients lowers production. Overfeeding nutrients increases feed expense and reduces the net return over feed expense.
- Make every effort to reduce feed wastage.
- Feed the highest quality feeds to animals that have the highest nutrient requirements (replacement heifers, growing calves, lactating cows).
- Feed the lowest quality feeds to cows in the middle-stage of pregnancy.
- Save the better quality feeds for those periods just before and after calving.
- Consider substituting grains for hay when these substitutions can balance the ration more adequately at a lower price (see section on substituting grain for hay).
- Consider ammoniating crop residues such as wheat and barley straw to improve digestibility and intake.

## Ammoniated Straw May Be an Option

Ammoniation of straw with 60 pounds of anhydrous ammonia per ton of straw will increase cattle performance and make possible the use of wheat straw as the only roughage in the diet, which is not recommended for untreated straw. A summary of four trials is presented in Table 2 indicating that actual daily gain was improved by ammoniation by .31 to .82 pound daily.

The improvement in gain resulted because of increases in digestibility and intake. Supplement in the amount of 2.0 to 3.0 pounds or alfalfa hay were fed along with free choice ammoniated wheat straw. Ammoniation alone does not make wheat straw a complete feed. A good mineral/vitamin supplement will be essential and supplementation with 1 or 2 pounds of natural protein is needed along with the non-protein nitrogen added by ammoniation.

Toxicity problems, involving calf losses and wild irrational cattle behavior, have been reported when ammoniating high-quality forages. Toxicity problems have not been observed with ammoniation of wheat straw or similar products.

**Table 2. Summary of results using ammoniated wheat straw.**

| | | Daily gain, lb | | |
|---|---|---|---|---|
| **Source** | **Cattle type** | **Untreated** | **Treated** | **Response** |
| Oklahoma | Yearlings | .60 | 1.25 | +.65 |
| Oklahoma | Open cows | .09 | .40 | +.31 |
| Nebraska | Preg. cows | .26 | .88 | +.62 |
| Purdue | Preg. cows | -1.00 | -.18 | +.82 |

## Stay Alert for Potential Problems

- The use of **salt** to limit supplement intake may increase water intake 50 to 75 percent. Water must not be limited in any way, or salt toxicity may result.
- Over-consumption of **urea**-containing supplements by cattle on forage scarce ranges may result in ammonia toxicity. Generally, cattle performance on urea-type supplements can be lower than expected when energy or forage is in short supply.
- Hay cut under moisture stress conditions, especially grain type hays, may contain high levels of **nitrate**. It is recommended to test for nitrate before feeding such hays, especially before feeding large amounts. Be sure to take a good representative sample for analysis.
- **Prussic acid** or cyanide poisoning can also be a problem in grazing drought-stunted plants such as sorghum, sorghum hybrids, and sudangrass. If forage for hay is allowed to sun cure thoroughly for three to five days, bleaching out any bright green color, prussic acid problems should be lessened.
- Cattle grazing short pasture are more likely to consume poisonous plants.
- Infrequent feeding (from alternate day to once per week feeding) of protein supplements (less than 30 percent crude protein), such as oilseed meal cubes, has been recommended to save labor. The practice is still good for high protein supplements but is not to be used for grain type supplements.

  High energy supplements (grain, breeder cubes, etc.) should be fed daily especially where ≥0.5 percent of body weight may be fed daily. High-energy acid-producing feeds tend to decrease rumen pH and fiber digestion, and alternate day feeding of large amounts simply magnifies the decrease in rumen pH. Furthermore, unadapted cows should be started on grain feeding slowly, or the problems of acidosis, founder, and even death may result.
- **Rumen impaction** may result where cattle receive inadequate protein (less than 7 to 8 percent CP in total diet) and too much of a low quality/high fiber forage such as drought affected pasture or wheat straw only. Lack of adequate water will aggravate the impaction problem.
- **Hardware disease**—Hay harvested from vacant city lots, roadsides, etc., may contain nails, wire, or foreign objects that can pierce the rumen wall resulting in death of the animal. Close observation of feeds and the use of magnets in grinder/mixers can help to reduce the potential consumption of problem materials by animals.

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