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Figure 1. Culling cattle is one of the primary methods for managing drought. *Photo*: J. S. Davy

DROUGHT TIP

Drought Strategies for Beef Cattle Culling

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Managing livestock during drought usually combines supplemental feeding and culling. Removing animals from the herd is the most direct method of reducing forage consumption on drought-stricken rangeland. Strategic culling requires the ability to navigate the current year's challenges while considering the necessity to rebuild cattle numbers in the future. Culling and selling cattle will reduce forage consumption to better match range production.

Culling cattle is a primary method of dealing with drought because it reduces the consumption of limited forage (fig. 1). When making culling decisions, it is important to analyze all the production phases of a cow-calf operation. It is likely that a culling strategy will incorporate calves, replacement heifers, cows, and bulls.

The primary objective in culling cattle is to preserve body condition score (>4) in the herd with the lowest input costs possible. Overstocking rangeland during drought years can result in rangeland degradation, potentially lengthening the recovery period after the drought breaks. Timely reduction of herd numbers should reduce the amount of supplemental feeding necessary to maintain the body condition of the remaining animals in the herd.

Importance of Body Condition Score

Body condition score is one of the most important factors in cow reproductive performance (fig. 2). Cows that have low body condition scores at calving have lower overall subsequent pregnancy rates, first service conception rates, and calf performance (Selk et al. 1988; Lake et al. 2005). In addition, the postpartum interval is lengthened (Lalman et al. 1997), resulting in a longer calving season. Thinner cows are also more prone to ingest toxic plants (Pfister et al. 2008), which is amplified during drought because alternative nontoxic forages become less available (Pfister et al. 2002).

Body condition scoring assigns a numeric reference to how much flesh an animal is carrying. Lower body condition scores are assigned to thinner animals, and higher scores are assigned to fleshier animals. To apply body condition scoring as a culling tool, it is essential to have accurate calibration and knowledge of this system. The UC Davis School of Veterinary Medicine's Cattle Care Standards (Stull et al. 2012) provides detailed information on body condition score. The manual also provides an explanation and photo references for body condition scoring cattle.

Figure 2. Cow body condition score is the most important factor to consider for conception rate. Cow age, however, is important to consider in calf weaning weight. *Photo*: J. S. Davy

Considerations for Culling

Thin cows should be culled in preparation for drought. Cows that are thin in non-drought situations likely have a higher nutritional requirement than their cohorts in better condition. Culling these cows preserves feed, improves herd reproductive performance, and reduces the passing of this trait to replacement heifers. As the drought worsens, further culling will be likely. considerations for culling in different classes of beef cattle include the following.

Early Weaning

The first consideration in culling should be weaning calves. Lactation significantly increases a cow's protein and energy demands. Dry cows have a much lower energy requirement, which can reduce supplementation costs. Weaning calves early can improve cow body condition (Story et al. 2000), increase subsequent pregnancy rate, reduce postpartum interval (Lusby et al. 1981), and reduce feed consumption (NRC 2000). All of these have long term economic impacts.

Calves are typically weaned 30 to 90 days early. Once calves are removed from the cows, the decision sell or keep and feed the calves must be made. Selling the weaned calves immediately is usually the most economically sound option, but if low-cost feed is available it may make sense to feed them. A ration balancing program such as the Taurus software program (see the UC Davis Department of Animal Science website, http://animalscience.ucdavis.edu/extension/Software/Taurus/index.htm) can help estimate gain. This program allows the user to consider various rations and calculates the cost per pound of gain. Keep in mind that while lower-quality feeds typically are cheaper and are a less-expensive daily cost ration, they result in a longer feeding period and can drive up the total cost of gain.

To determine whether it is cost effective to wean calves early and feed them to market weight, estimate the value of the cattle once they reach the desired weight. This can be done by multiplying the target weight of the calves by the expected market price by class, matching the extra weight of the calf with the market price. The cost of feeding over the entire feed period, plus labor, must be lower than this value to obtain more profit than selling calves directly after weaning.

It is important to remember that prices differ by class and weight. Generally, heifers are worth less per pound than steers, and lighter calves are generally worth more per pound than heavier animals.

Table 1 provides a generic example of cost calculations. Using estimated prices, a 500-pound calf was valued at $70 more than a 400-pound calf. A concentrate ration developed to gain 2.15 pounds per day was fed for 46 days. The resulting return over feed cost was just over $5 per head. However, this does not include labor. With labor included in the example, it would be unlikely that additional profit could be recovered by feeding calves rather than selling at weaning.

Table 1. Sample feed cost calculation for weaned calves on a per head basis

Cattle class		Weight, each (cwt)	Price or cost per unit	Total value/head
Steer calves		4	$235.00	$940.00
Steer calves		5	$202.00	$1,010.00
Change in value				$70.00
Feed cost	ADG	Days fed	Ration cost/day	
	2.15	46	$1.41	$64.86
	Return over feed cost			$5.14

Replacement Heifers

There is value in the genetic improvement of the herd obtained by keeping at least some replacement heifers (Mathews and Short 2001). Other benefits include their disease resistance (foothill abortion and anaplasmosis) and familiarity with the range they graze (fig. 3).

Keeping extra heifers when the forage supply is short is challenging. In a drought situation, pregnancy-checking heifers early is recommended as early as 90 days after bulls are turned out. This allows the quick culling of late-bred heifers, which helps narrow the breeding season the subsequent year. Early marketing can also contribute to a smooth transition of second-calf heifers into the cow herd and preserve forage for heifers that will be retained.

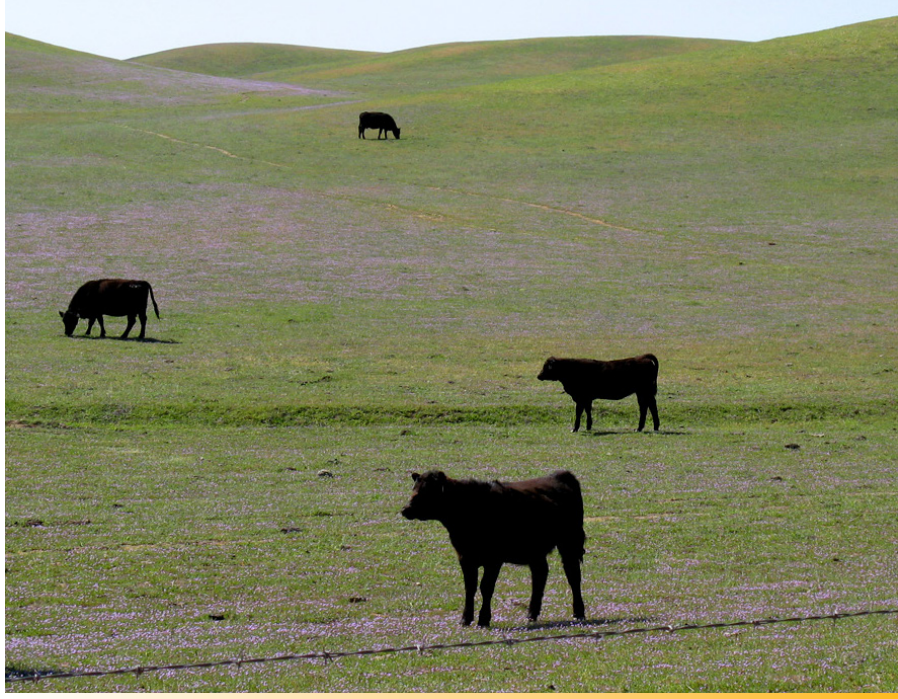

Figure 3. Replacement heifer management is crucial during drought.
Photo: J. S. Davy

Cows

Open Cows

All open cows should also be culled as a first priority, since they will not contribute income to the ranch. A cow that misses weaning even one calf will likely never recover the decrease in her net present value (Mathews and Short 2001).

Age

When body condition score is kept high, age may not affect reproductive performance, but age can reduce the ability of a cow to hold a high body condition score. One study (Bourdon and Brinks 1987) showed that a cow's feed intake begins to decline at age 8. The study also found that milk production in range cattle begins to decline at the same time. This suggests that when a cow reaches 8 years of age, she should be considered for culling. Adding to this, research in California found that 10-year-old cows weaned calves 77 pounds lighter than 5-year-old cows (Renquist et al. 2006a).

Teeth

Cows should be mouthed during pregnancy testing. Cows with missing teeth, called "broken mouths," can be easily identified and culled. Broken-mouth cattle have more difficulty consuming forage, particularly in short feed years. Since cattle's teeth wear down with age, mouthing can be used as a method to cull older cows if birth year branding or tagging is not used (Taylor and Field 1999). Environmental factors (e.g., cattle consuming forage with high levels of silica) may cause excessive wear or tooth losses that are not attributed to age.

Dystocia

Cows that experience calving problems have a lower conception rate than those that have not had problems (Laster et al. 1973). These cows should be culled as soon as possible.

Soundness

Any cows with structural issues such as lameness, bad eyes, or poor udders should be immediately culled.

Bulls

During drought, the management of bulls is worth extra consideration. Bulls can consume up to 25% more forage than cows (NRC 2000). Semen-checking within a month of the end of the breeding season can help to determine which bulls should be culled, subsequently saving feed (fig. 4). This is especially important when cattle prices are high because the salvage value of the cull bull can be half or more of the cost of a purchased replacement the next year.

Taxes

Sections in the federal tax code—IRS Code Section 451(e) and 1033(e)—allow for the deferral of capital gains during a drought if cattle are replaced upon drought completion. The decision of which section to use depends on whether a drought designation has been declared in the affected area. In most cases, if beyond-normal culling is necessary, it is likely that a drought disaster has been

Figure 4. Bulls can consume 25% more forage than a cow. Semen-checking and culling bulls can save needed forage for cows. *Photo*: J. S. Davy

declared in that area. The National Cattlemen's Beef Association has a fact sheet that describes the requirements and tax deferrals available. Copies of these fact sheets are posted at http://www.calcattlemen.org/pdf/Drought%20Tax%20Deferment%20Factsheet.pdf. A copy of this fact sheet can be very handy when used in conjunction with an accountant.

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