



# Comparison of Alternative Cattle Management Strategies Under Long-Term Drought

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Drought is a major challenge for cattle producers in the West. Drought can cause reductions in forage production, forcing producers to choose between smaller herd sizes, increasing costs through supplemental feeding activities, and/or increasing short-term debt loads. Research at the University of Wyoming suggests Wyoming cattle producers have tried a number of strategies to cope with drought (see Nagler et al., 2007, for example). Researchers at the university conducted analyses to evaluate long-term profitability of alternative management strategies for livestock operations when faced with droughts and fluctuating cattle prices. Potential strategies to cope with drought include late calving, early weaning, and retaining steers as well as the more frequently used strategies of partial liquidation and/or purchasing additional feed (hay) to address forage shortages, specifically in response to variable precipitation and cattle prices. Table 1 describes the differences in the alternative strategies.

In the *Base* scenario, producers are only able to reduce herd sizes in response to drought. The *Summer feeding* option allows producers to feed additional forage (hay) in summer to overcome forage deficits and reduce herd size. We model *Late calving* in two ways. The first alters the calving dates and subsequent weaning and sale weights and corresponding prices for the base scenario. The second option, *Late calving – Additional benefits*, models additional benefits based on other research that may or may not be realized by individual producers trying this strategy, which include increased breed back, reduction in calf death loss by 50 percent, a reduction in yearly cow costs (due to fewer calving difficulties and labor costs), less supplementation needs, and a reduction

in yearly fixed costs representing cost savings associated with less required buildings for calving, given most calving would take place out-of-doors. While not all of these additional benefits may be experienced by all producers (for example, it is unlikely an operation would eliminate existing barn space due to reduced calving inside), our analysis included all benefits to determine the potential impact of a best-case scenario associated with a conversion to late calving.

The option to *Early wean* allows the producer to wean as many calves as necessary to bring herd forage demand into alignment with available forage on August 1. This strategy is more reactive than proactive in response to drought. The final scenario, *Retain Steers*, models a ranch operating as a cow/calf/yearling operation with all steer calves held over winter. Optimally, the ranch sells steers as yearlings the following fall but has the option to sell some short May 1 if forage appears scarce for the summer. It should be noted that, for all scenarios, the model assumes the transition from the base scenario has already occurred, and none of the conversion costs (transition breeding stock, updating grazing strategies, etc.) have been included. Producers deciding to change their operations would want to consider these conversion costs and discuss potential cash flow needs and changes with their bankers.

Results from the analysis are shown below. For a description of the model, see Ritten et al., 2010a and b. Table 2 shows how these strategies performed over an 86-year horizon across various precipitation and price scenarios. Tables 3 and 4 show how these strategies ranked over a 5- and 11-year drought, respectively.

As seen in Table 2, allowing for summer feeding did improve overall average profitability over the long run when compared to just partial liquidation. However, this alternative was the least profitable when compared to the remaining management options.

If all of the additional benefits are included with the late-calving option, this scenario outperformed all others over the planning horizon on average from a profitability standpoint. However, if the only change is lighter calves at sales date, and all other potential benefits are not realized, the scenario that retained all steer calves over the winter with the option to sell in early summer or fall outperformed the late-calving strategy.

The option to wean calves early and send them to market when forage resources became scarce in mid-summer performed worse than either late calving or retaining steers but outperformed both summer feeding and only partial liquidation as management strategies. These rankings of results are generally the same across extended periods of drought as well (Table 3 and Table 4). Variability in profits (as seen in the minimum, maximum, and standard deviation figures) is higher for the late calving with additional benefits compared to retaining steers. Generally, retaining ownership of steer calves over the winter, with the option to sell if forage supplies become scarce, outperforms both partial liquidation and summer feeding, and it results in lower profit variability than late calving or early weaning with only slightly lower profit compared to late calving with additional benefits across most of the scenarios analyzed.

Our results indicate late calving may be a promising strategy but some caution must be exercised when considering this alternative as producers will need to realize all potential benefits with this strategy. There are some potential disadvantages of this option that were not incorporated into our analysis. One drawback is the potential for conflicting labor demands when calving is delayed into irrigating schedules. Another potential drawback is that many producers in this region rely on public grazing during summer months and moving newborn calves to these grazing lands can be stressful to both calves and dams. Additionally, producers utilizing common grazing allotments can lead to problems if others turn out bulls when grazing these public lands. Late calving would require isolation of cows from other herds in the area to eliminate the potential for early conception. While our analysis did not account for

these potential drawbacks, they should be evaluated before adopting this strategy.

If producers are willing to consider a change in their operations to better withstand drought events but are concerned with the late-calving option, our results suggest transitioning to a cow/calf/yearling shows promise as well. Our analysis indicates this provided profits that were slightly lower overall than the late-calving option with additional benefits. Moreover, reduced variability in profits suggests this alternative may be less risky than the late-calving alternative. The steers can easily be sold if forage is short with less disruption to the genetic base of the herd as compared to a straight cow/calf operation. Again, producers will need to consider transition costs and cash flow changes when considering changes in their operations.

#### **For more drought related work, see the other fact sheets in this series:**

- *Two Common Drought Management Strategies and some Considerations for Wyoming Cattle Producers.* [Bulletin B-1218](#)
- *Considerations for Preparing a Drought Management Plan for Livestock Producers.* [Bulletin B-1220](#)
- *Price or Weather – Which Signal Should Livestock Producers Follow?* [Bulletin B-1221](#)

#### **For more detailed information regarding this analysis, see:**

Ritten, John, Christopher T. Bastian, W. Marshall Frasier, Michael A. Smith, and Steven I. Paisley. 2010a. *Managing Your Ranch During Drought: Implications from Long and Short Run Analyses.* University of Wyoming, Cooperative Extension Service, [Bulletin B-1205](#). May 2010.

#### **References**

Nagler, A., C. T. Bastian, J. P. Hewlett, S. Mooney, S. I. Paisley, M. A. Smith, M. Frasier, W. Umberger, and P. Ponnameneni. Multiple Impacts – *Multiple Strategies: How Wyoming Cattle Producers Are Surviving in Prolonged Drought.* University of Wyoming Cooperative Extension Service, College of Agriculture, University of Wyoming, Laramie. [Bulletin B-1178](#). April 2007.

Ritten, John, Christopher T. Bastian, Steven I. Paisley, and Michael Smith. 2010b. "Long-Term Comparison of Alternative Range Livestock Management Strategies Across Extended Droughts and Cyclical Prices." *Journal of the American Society of Farm Managers and Rural Appraisers* 73(1): 243-252.

**Table 1.** Comparison of Alternative Herd Management Strategies

	<b>Base</b>	<b>Summer feeding</b>	<b>Late calving</b>	<b>Late calving - Additional benefits</b>	<b>Early wean<sup>1</sup></b>	<b>Retain steers<sup>2</sup></b>
<b>Calving date</b>	April 15	April 15	June 1	June 1	April 15	April 15
<b>Weaning date</b>	October 1	October 1	October 1	October 1	August 1 / October 1	October 1
<b>Allowed to feed hay in summer months</b>	No	Yes	No	No	No	No
<b>Yearling sale date</b>	N/A	N/A	N/A	N/A	N/A	May 1 / November 1
<b>Reduction in calving costs compared to Base</b>	No	No	No	Yes	No	No

<sup>1</sup> Standard weaning date is October 1; however, calves can be weaned or sold August 1 if forage resources are lacking due to drought. <sup>2</sup> Standard yearling sales date is November 1; however, yearlings can be sold May 1 if forage resources are lacking due to drought.

**Table 2.** Range and Distribution of Total Net Discounted Returns over Entire 86-Year Horizon

	<b>Late calving</b>	<b>Late calving - Additional benefits</b>	<b>Early wean</b>	<b>Retain steers</b>	<b>Summer feeding</b>	<b>Base</b>
<b>Minimum</b>	\$1,382,708	\$1,556,828	\$1,241,704	\$1,440,733	\$977,329	\$885,562
<b>Average</b>	\$1,532,248	\$1,712,451	\$1,415,089	\$1,591,260	\$1,105,798	\$1,034,335
<b>Maximum</b>	\$1,640,996	\$1,826,303	\$1,542,872	\$1,683,501	\$1,189,350	\$1,121,476
<b>Standard deviation</b>	\$80,402	\$83,309	\$81,951	\$65,694	\$62,143	\$66,743

**Table 3.** Range and Distribution of Total Net Discounted Returns over 5-Year Drought

	Late calving	Late calving - Additional benefits	Early wean	Retain steers	Summer feeding	Base
<b>Minimum</b>	\$48,911	\$68,465	\$31,713	\$90,100	\$24,580	\$18,248
<b>Average</b>	\$167,625	\$190,960	\$153,680	\$187,490	\$106,344	\$106,764
<b>Maximum</b>	\$275,338	\$302,349	\$301,088	\$287,245	\$184,798	\$192,630
<b>Standard deviation</b>	\$68,032	\$71,640	\$71,592	\$51,200	\$48,130	\$51,247

**Table 4.** Range and Distribution of Total Net Discounted Returns over 11-Year Drought

	Late calving	Late calving - Additional benefits	Early wean	Retain steers	Summer feeding	Base
Minimum	\$65,198	\$75,889	\$53,682	\$63,759	\$36,892	\$38,331
Average	\$74,378	\$84,035	\$68,218	\$73,536	\$46,010	\$47,717
Maximum	\$85,757	\$93,347	\$79,838	\$79,115	\$52,351	\$54,760
Standard deviation	\$5,386	\$5,184	\$6,347	\$4,077	\$4,421	\$4,345

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