



Drought Consequences for Cow-Calf Production in Wyoming: 2011–2014

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On the Ground

- Drought reduces forage quantity and carrying capacity, but reductions in cow-calf performance measured by calf average daily gain (ADG) and weaning weight (WW) are less understood.
- From 2011 to 2014, a period with very dry and very wet years, we assessed an adjusted 210 day WW and ADG for a total of 869 calves on two University of Wyoming ranches.
- We found WW was up to 99 pounds (lb) lower, and ADG was up to 0.47 lb lower between the driest and wettest years.
- For each one inch reduction in precipitation, WW are predicted to be 7 lb to 14 lb lower, ADG is expected to be 0.03 lb to 0.07 lb lower, and dollar per head values \$12 to \$27 lower, depending on calf sex and ranch location.
- If drought occurs, or continues to escalate in frequency and severity, WW reductions, ADG reductions, and value per head reductions should be expected and documented for strategic planning and/or compensation programs.

Keywords: beef, climate, precipitation, weaning weights, weather.

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Drought is a constant challenge to livestock production on western rangelands. The early twenty-first century resembled the extreme droughts of the 1930s “dust bowl” and the 1950s drought in the southwestern United States¹ and caused many ranches to reduce herds or go out of business completely. Drought has been defined as a period when precipitation is consistently less than what is climat-

ically expected. The magnitude or severity of drought can be characterized three ways, including (1) persistence, (2) intensity or deficit severity, and (3) the interval between events.² The most common way that drought impacts livestock production is the reduction of forage quantity and carrying capacity relative to animal demand; an effect that typically leads to herd reduction or complete liquidation. Although the problematic reduction of forage quantity leading to reduced animal numbers is well understood, what may be less understood is its negative effect on forage quality and subsequent livestock performance. Even when ranches are stocked to absorb the variation in precipitation and reduction in forage quantity, ranchers may not fully recognize and quantify the potential negative effects of the low-quality forage as it influences cow nutrient requirements and optimal calf growth.

The Situation

The drought of 2011 and 2012 was noted as one of the worst droughts in North America in recorded history.³ Droughts such as these often result in losses from the liquidation of cows from the herd due to reduced forage quantity.⁴ However, severe drought also reduces the nutritive value of grasses, causing deleterious effects on forage quality through reduced crude protein and higher acid detergent fiber.⁵ Thus, the reduced nutritive value of drought-stricken forage on rangelands is reflected in lower protein and energy and, consequently, lower cow and calf performance.

Cattle and Rangeland Management Description

This study was conducted on two University of Wyoming Agricultural Experiment Station (AES) ranches in the northern mixed prairie of southeastern Wyoming, an area with a semi-arid climate. The Sustainable Agriculture Research and Extension Center (SAREC) ranch is located