



EXTENSION

BEEF CATTLE RESEARCH UPDATE

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Influence of Weaning Strategy on Behavior, Humoral Indicators of Stress, Growth, and Carcass Characteristics

Weaning is one of the most stressful events in a calf's life. A 2007-08 USDA survey of U.S. beef cow operations from 24 states with the largest beef cow populations showed that 49.8% of calves are removed from the presence of their dams abruptly and sold immediately.¹ Weaning is rarely an isolated source of stress since weaning is also often used as a convenient time to vaccinate, deworm, dehorn, and/ or castrate.

Strategies that are reported to reduce stress at weaning include using nose flaps designed to prevent suckling while allowing physical contact with the dam and delaying weaning to adhere to a natural weaning time more closely. North Carolina State University researchers conducted a study evaluating these weaning strategies with the following goals: 1) characterize calf behavior in the weeks surrounding weaning; 2) assess calf activity levels with the use of accelerometers during the same time period; 3) monitor changes in haptoglobin and cortisol levels during weaning; 4) quantify growth efficiency during preconditioning; and 5) document any impacts of weaning strategy on feedlot performance and carcass merit.²

This study was a 4-year trial (2013-2016) that utilized Angus and Angus X Senepol steer calves that were randomly assigned to one of three weaning strategy groups. Strategies were traditional, abrupt weaning (39 calves) at 237 days of age, weaning after placement of a nose flap for 7 days (40 calves) at 237 days of age, or weaning delayed by 49 days from the date that the abrupt and nose flap groups were weaned (39 calves, 286 days of age). Behavioral observations were made on five steers per strategy group per year over the weeks surrounding weaning. Activity levels were determined by accelerometers worn on neck collars. Blood samples were obtained from the observed cattle during the last 2 years of the study to determine haptoglobin and cortisol concentration. Plasma cortisol and haptoglobin are low in healthy, unstressed cattle. But increase in stressed cattle. After weaning, the steers were followed through finishing and carcass characteristics obtained at harvest.

These researchers reported that 12 steers in the nose-flap group had sores in their nostrils from the nose flaps when the flaps were removed at weaning. The abruptly and delayed weaned calves were more active than nose-flap calves in the first 2 to 3 days after weaning but settled down to similar activity levels to the nose-flap groups by day 4. In addition, the abruptly and delayed weaned groups were more vocal than the nose-flap group during the same time frame. They also reported that cortisol and haptoglobin remained within normal reference ranges. Average daily gain (ADG) was greater for delayed weaned calves than abruptly weaned calves, who in turn had greater ADG than the nose-flap calves during the first 42 days after the abruptly and nose-flap calves were weaned (1.52, 1.19, and 0.82 lb/d, respectively; $P < 0.01$). However, weaning strategy did not impact gain or efficiency during the growing/finishing period ($P > 0.2$) and had minimal impact on carcass characteristics.

In conclusion, the results of this study suggest that when steers are followed to harvest, weaning strategy has little impact on the efficiency of production or on end product quality.

The presence of nasal lesions in 12 of 38 steers which received nose flaps suggests that further research into the animal welfare implications of this strategy may be warranted. These authors recommended delaying weaning when available pasture and cow body condition support this strategy since this strategy would enhance ADG and allow the sale of heavier calves, increasing profitability. However, when conditions do not permit delayed weaning, abrupt weaning may be the next viable option based on animal welfare concerns and increased handling to place and remove the flaps. Nose flaps reduced vocalization at weaning but resulted in less postweaning ADG. These researchers also suggested that based on this data that “abrupt weaning under the conditions of this study, is less stressful than we perceive it to be, based on calf behavior”.

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- ¹ USDA-APHIS. 2010. Beef 2007-08, Part IV: Reference of Beef Cow-calf Management Practices in the United States, 2007–08. USDA–APHIS–VS–CEAH, Fort Collins, CO. Available: https://www.aphis.usda.gov/animal_health/nahms/beefcowcalf/downloads/beef0708/Beef0708_dr_PartIV_1.pdf
- ² Freeman, S., M. Poore, C. Pickworth and M. Alley. 2021. Influence of weaning strategy on behavior, humoral indicators of stress, growth, and carcass characteristics. *Transl. Anim. Sci.* 5: Translational Animal Science, Volume 5, Issue 1, January 2021, txaa231, <https://doi.org/10.1093/tas/txaa231>

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