BEEF CATTLE RESEARCH UPDATE

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Effects of Alternative Weaning Methods on Behavior and Performance of Beef Calves

Beef calves are traditionally weaned by abrupt remote separation from their dams. Weaning is one of the most stressful events in a calf's life.[1] Minimizing weaning stress should improve calf health and weight gain. Recent Virginia research evaluated the effect of alternative weaning methods on behavior, blood metabolites and performance of beef calves.[2] The weaning methods evaluated were traditional abrupt remote separation (control group, CTRL), fence-line weaning (FL, calves physically separated from their mothers and placed in adjacent pastures so that visual and auditory contact was maintained while suckling was prevented), and the use of antisuckling nose-clips (NC, allows the calf to maintain physical contact with its mother while suckling is prevented).

Two experiments (108 and 54 calves in experiment 1and 2, respectively) evaluated the effect of weaning method on calf performance and behavior during the seven day period prior to weaning or remote separation (day -7 to 0). In both experiments, seven days prior to weaning FL calves were placed in pastures adjacent to their mothers separated by a single fence and NC calves were fitted with plastic antisuckling nose-clips (Calf Weaner C183149N, Nasco, Fort Atkinson, WI). The NC and CTRL calves remained in the same pastures with their mothers. The nose-clips were removed at weaning. A third experiment evaluated performance and behavior during a seven day period after weaning (day 1 to 7) over two consecutive years (48 steer calves in year 1, Exp. 1 and 54 steer calves in year 2, Exp. 2). In both years, steer calves were weaned and transported 107 miles away from their mothers and placed on pasture (weaning method groups were maintained).

The effects of weaning method on calf behavior before remote separation (weaning) are shown in Table 1. The NC calves spent less time eating, more time idling, more time close to dams and walked less than FL and CTRL calves before weaning. In experiment 1, during the seven days prior to weaning Fl calves gained more weight (0.13 lb/day) and CTRL calves lost less weight (-0.60 lb/day) than NC calves (-2.14 lb/day). In experiment 2, FL and CTRL calves each gained more weight (1.94 and 2.95 lb/day, respectively) than NC calves (0.62 lb/day). The observed behavior of the NC calves before weaning suggests that the nose-clip treatment decreased time grazing which ultimately reduced gains. These researchers also reported that blood metabolite concentrations from the seven days prior to weaning suggested that the NC calves were in a negative energy balance.

Table 1. Time spent (% of the observation period) by calves in different behaviors before weaning in experiments 1 and 2 (observed on days -7 to -4).

	Weaning Method		
Item	Control	Fence-Line	Nose-Clip
Eating	70[a]	67[a]	44[b]
Ruminating	8[b]	8[b]	14
Idling (no jaw movements)	17[b]	22[b]	38[a]
Standing	85[ab]	88[a]	78[b]
Lying	14	12	20
Within 11 yards of dam	32[ab]	18[b]	55[a]

[a,b] Means within a row with different superscripts are different (P<0.05).
Adapted from Boland et al., 2008.

The effects of weaning method on calf behavior after remote separation (weaning) are shown in Table 2. The CTRL calves spent less time eating, more time idling, and walked more than FL or NC

calves. During the seven day period after weaning, gains of FL calves (4.65 lb/day) were greater than that of NC calves (3.18 lb/day) with the gains of CTRL calves being intermediate (3.75 lb/day). It is interesting to note that the gains of NC calves after weaning were decreased as compared with FL and CTRL calves in spite of increased grazing time.

Table 2. Time spent (% of the observation period) by calves in different behaviors after weaning in experiment 3 (observed on days 1 to 4).

	Weaning Method		
Item	Control	Fence-Line	Nose-Clip
Eating	33[c]	45[b]	50[a]
Ruminating	14	13	12
Idling (no jaw movements)	47[a]	34[ab]	31[b]
Standing	72	67	70
Lying	28	33	29

[a,b,c] Means within a row with different superscripts are different (P<0.05).
Adapted from Boland et al., 2008.

The results of this study suggest that the use of nose-clips decreases calf performance both prior to and after weaning. In contrast, fence-line weaning appears to be a viable alternative to weaning calves by remote separation. The results of this research concur with 2003 California research.[3] These California researchers conducted a three-year study to compare weaning calves while allowing fence-line contact with their dams to non-weaned calves or calves weaned and completely separated from their dams. Results of this study (Table 3) indicate that FL weaned calves show less behavioral stress (time spent eating, walking, and resting) than calves abruptly separated from their dams. During the first three days after weaning, calves weaned on pasture away from their dams were observed walking almost 3-fold more frequently and bawled twice as often compared to FL weaned calves. Additionally, FL weaned calves spent more time eating and resting. Aside from bawling, FL weaned calves exhibited similar behavior to non-weaned control calves. Seven days after weaning, all weaned calves in the study were managed together. Fence-line weaned calves gained 57% more during the first two weeks after weaning than calves totally separated from their dams (47 vs. 30 lb gain, respectively), and retained the weight advantage through 10 weeks post-weaning.

Table 3. Average percentage of observations in which calves exhibited various behaviors on days 1 through 3 post-weaning (yr 1, 2, 3) and average cumulative weight gain at 2 and 10 weeks post weaning (yr 1 and 3).

	Control	Pasture Weaned	
Item	Not Weaned	Fence-Line	Separation
Behavior	----------% of observations----------		
Eating	41.1[a]	37.3[a]	23.7[b]
Walking	8.6[a]	10.1[a]	28.1[b]
Lying down	22.9[a]	23.3[a]	16.0[b]
	----------# vocalizations/hour----------		
Bawling	0.1[a]	216.7[b]	434.6[c]
Performance	----------weight gain (lb)----------		
Weaning – 2 wks	44[a]	47[a]	30[b]
Weaning – 10 weeks	143[a]	110[b]	91[c]

[a,b,c] Means within a row with different superscripts are different (P<0.05).
Adapted from Price et al., 2003.

In summary, both the Virginia and California research show that fence-line contact between mother and calf for seven days after weaning results in less stress on calves than that associated with the traditional abrupt separation of the calves from their mothers. This minimizes reductions in weight

gain often associated with weaning. Even though fence-line weaning is not always possible or feasible, minimizing stress is still important. A recent review listed the following tips to minimize stress from weaning to shipping.[1]

- Provide calves access to the weaning area (pen, trap, or pasture) a few weeks prior to weaning so calves do not undergo the stress of an environment change at weaning.
- Allow fence-line contact between calf and dam for four to seven days following weaning. Fences should be sturdy and allow nose to nose contact while preventing nursing.
- If fence-line contact is not practical, move cows far enough away that they cannot hear the calves bawling.
- Move the cows to a new location when cows and calves are separated at weaning. Do not move the calves.
- If weaning in a drylot or corral, place feed bunks, hay, or water troughs along the fence to minimize perimeter walking.
- Do not castrate, dehorn, or brand calves at weaning. These practices should be completed at least three weeks before weaning and preferably prior to three months of age.

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[1] Mathis, C. P. 2008. Calf management: Weaning to shipping. Pages 35-40 in 2008 Southwest Beef Symposium, Roswell, NM. Available: http://cahe.nmsu.edu/ces/swbeef/documents/2008-sw-beef-symposium-proceedings.pdf.

[2] Boland, H. T., G. Scaglia, W. S. Swecker Jr., and N. C. Burke. 2008. Effects of alternate weaning methods on behavior, blood metabolites, and performance of beef calves. Prof. Anim. Sci. 24: 539-551.

[3] Price, E. O., J. E. Harris, R. E. Borgwardt, M. L. Sween, and J. M. Connor. 2003. Fenceline contact of beef calves with their dams at weaning reduces the negative effects of separation on behavior and growth rate. J. Anim. Sci. 2003: 116-121.