

# Factors Influencing Price of North Dakota, South Dakota and Montana Feeder Calves

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## Abstract

Our objective was to determine factors influencing the sale price of feeder calves from North Dakota, South Dakota and Montana auction markets. Data were collected at three auction markets in North Dakota and two auction markets in both South Dakota and Montana in fall 2006 (68,475 calves; 520 ± 26 lbs. of average weight; three sales per market) and winter 2007 (30,106 calves; 646 ± 35 lbs. of average weight; three sales per market). Data were collected during the same weeks in each state to reduce confounding effects of fluctuations in market patterns. The following data were collected for each lot of calves sold: lot size, sex, weight, breed description, vaccination history, implant status and natural program-qualified. In the fall, lot sizes ≥ 21 head received greater ( $P = 0.04$ ) prices when compared with lots of ≤ 20 head. Lot sizes of 11 to 20 and six to 10 head were priced similarly ( $P = 0.92$ ) but were greater than ( $P < 0.001$ ) lots of ≤ five head. The price for steers was \$9.78/hundredweight (cwt) greater ( $P < 0.001$ ) than for heifers. The price for black cattle was greater ( $P = 0.002$ ) than prices received for mixed, red and white cattle that were priced similarly ( $P ≥ 0.28$ ). Vaccinations (seven-way clostridial, four-way viral and Pasteurella) increased ( $P ≤ 0.04$ ) sale price in the fall, compared with calves with no vaccination history. In winter, the price for lot sizes of ≥ 21 head was greater ( $P < 0.03$ ) than lots of ≤ 20 head. Lot sizes of 11 to 20 and six to 10 head were priced similarly ( $P = 0.38$ ) but were greater than ( $P < 0.001$ ) lots of ≤ five head. The price for steers was \$8.40/cwt greater ( $P < 0.001$ ) than heifers. The price for both black and white cattle was greater ( $P ≤ 0.04$ ) than mixed and red cattle. Vaccination history did not affect ( $P = 0.71$ ) the sale price in winter. Data suggest feeder calf price is dependent on multiple factors. Selling calves in larger lot sizes is economically advantageous, whereas the value of vaccinating varied depending on marketing time.

## Introduction

Feeder calf prices are dependent on multiple factors. Many of these factors are affected by environmental conditions, such as feed prices, slaughter cattle prices and weather conditions (Schroeder et al., 1988). Other factors, such as lot sizes, calf weight, vaccination programs and season of the year, can be controlled by the producer when calves are marketed (Schroeder et al., 1988; King and Seeger, 2004a,b).

Calves marketed in larger lot sizes receive premiums, compared with calves sold in smaller lot sizes (Barham and Troxel, 2007). Premiums may be paid for larger lot sizes because they facilitate filling truckloads and cattle originate from fewer sources.

Calves in value-added programs sell for greater prices, compared with unweaned, unvaccinated calves (King and Seeger, 2004a,b; Corah et al., 2006). The price advantage for calves in value-added programs has been increasing in recent years (King and Seeger, 2004b).

Little quantitative information exists on factors influencing price of North Dakota, South Dakota and Montana feeder calves. Because prior management may affect calf prices received in the marketplace, informing producers of these factors is important for them to make informed decisions. Therefore, the objectives of this study were to determine factors influencing the sale price of feeder calves from North Dakota, South Dakota and Montana auction markets.

## **Materials and Methods**

Data were collected from three sale barns in North Dakota and two sale barns in both South Dakota and Montana (seven sale barns total) during the weeks of Oct. 23, Oct. 30 and Nov. 6, 2006 (fall), when most calves sold were freshly weaned. The three auction markets in North Dakota were Napoleon Livestock, Napoleon; Kist Livestock, Mandan; and Stockmen's Livestock, Dickinson. The two auction markets in South Dakota were Faith Livestock, Faith; and Philip Livestock Auction, Philip. The two auction markets in Montana were PAYS Auction Yard, Billings; and Miles City Livestock Commission Co., Miles City. Data were collected at the same auction markets during the weeks of Jan. 15, Jan. 29, and Feb. 12, 2007 (winter). University representatives were present at each sale and collected the following for each lot of calves sold: lot size, sex, weight, hide color, health programs, vaccination history, use of deworming products, implant status, natural program-qualified, source and age verification status, and beef quality assurance (BQA) status.

Lot sizes were categorized into groups of  $\geq 21$  calves, 11 to 20 calves, six to 10 calves and  $\leq$  five calves. Lots of calves sold were split into four color categories. Categories used for color were black, red, white and mixed-color pens. Lots were categorized based on 75 percent of one lot having a predominant color. For example, a lot having four black calves and one red calf would be categorized as a black lot. A lot having two black calves and three red calves would be categorized as a mixed-color lot. Three categories for vaccination status were used: 1) calves receiving a seven-way clostridial vaccination plus four-way viral vaccination plus *Pasteurella* vaccination (741 vaccination program), 2) four-way viral vaccination only, or 3) calves with no vaccination history or having only a seven-way clostridial vaccination.

## **Results**

Data are presented as fall sales (October and November, 2006; Table 1) and winter sales (January and February, 2007; Table 2).

**Table 1. Factors influencing price of North Dakota, Montana and South Dakota calves during fall 2006.**

Factor	Number of Lots	Lot Price	Price Premium <sup>a</sup>	P-value
Lot size				<0.001
≥ 21	911	114.74 <sup>a</sup>	6.20	
11–20	885	112.85 <sup>b</sup>	4.31	
6–10	1,113	112.76 <sup>b</sup>	4.22	
≤ 5	3,342	108.54 <sup>c</sup>	0.00	
Calf sex				<0.001
Steers	3,440	117.11 <sup>a</sup>	9.78	
Heifers	2,805	107.33 <sup>b</sup>	0.00	
Color				<0.001
Black, BWF <sup>b</sup>	3,831	114.40 <sup>a</sup>	3.48	
Mixed	968	112.15 <sup>b</sup>	1.23	
Red, RWF <sup>c</sup>	983	111.42 <sup>b</sup>	0.50	
White	450	110.92 <sup>b</sup>	0.00	
Vaccinations				<0.001
4-way viral	1,191	113.46 <sup>a</sup>	2.50	
741 <sup>d</sup>	1,559	112.24 <sup>a</sup>	1.28	
No vaccinations <sup>e</sup>	3,502	110.96 <sup>b</sup>	0.00	
Natural				0.04
Yes	898	113.00 <sup>a</sup>	1.55	
No	5,354	111.45 <sup>b</sup>	0.00	
Implants				0.18
Yes	286	113.05	1.66	
No	5,966	111.39	0.00	
Base weight <sup>f</sup>	6,251		-0.09	<0.001
Base weight (quadratic)	6,251		0.00	<0.001

<sup>a</sup>Price in \$/cwt

<sup>b</sup>BWF = black white face

<sup>c</sup>RWF = red white face

<sup>d</sup>741 = 7-way clostridial plus 4-way viral plus Pasteurella

<sup>e</sup>No vaccination history, but may have 7-way clostridial

<sup>f</sup>Mean base weight of all lots (520 lbs.) – base weight of each lot

**Table 2. Factors influencing price of North Dakota, Montana and South Dakota calves during winter**

Factor	Number of Lots	Lot Price	Price Premium <sup>a</sup>	P-value
Lot size				<0.001
≥ 21	406.00	99.42 <sup>a</sup>	4.95	
11–20	442.00	98.47 <sup>b</sup>	4.00	
6–10	494.00	98.11 <sup>b</sup>	3.64	
≤ 5	1356.00	94.47 <sup>c</sup>	0.00	
Calf sex				<0.001
Steers	1416.00	101.82 <sup>a</sup>	8.40	
Heifers	1282.00	93.42 <sup>b</sup>	0.00	
Color				<0.001
Black, BWF <sup>b</sup>	1594.00	98.84 <sup>a</sup>	2.08	
White	162.00	98.02 <sup>a</sup>	1.26	
Mixed	545.00	96.87 <sup>b</sup>	0.11	
Red, RWF <sup>c</sup>	396.00	96.76 <sup>b</sup>	0.00	
Vaccinations				0.71
4-way viral	622.00	97.78	0.29	
741 <sup>d</sup>	1332.00	97.59	0.10	
No vaccinations <sup>e</sup>	744.00	97.49	0.00	
Base weight <sup>f</sup>	2698.00		-0.06	<0.001
Base weight (quadratic)	2698.00		0.00	<0.001

<sup>a</sup>Price in \$/cwt  
<sup>b</sup>BWF = black white face  
<sup>c</sup>RWF = red white face  
<sup>d</sup>741 = 7-way clostridial plus 4-way viral plus Pasteurella  
<sup>e</sup>No vaccination history, but may have 7-way clostridial  
<sup>f</sup>Mean base weight of all lots (646 lbs.) – base weight of each lot

### Fall Sales

During fall 2006, there were 68,475 beef calves sold in 6,251 lots (Table 1). The average weight was 520 lbs., with a price slide of \$8.60/cwt.

Lot size affected ( $P < 0.001$ ) calf price. Calves sold in lot sizes  $\geq 21$  calves were worth \$114.74/cwt, which was greater ( $P = 0.04$ ) than lot sizes of  $\leq 11$  head. Calves sold in lot sizes of 11 to 20 and six to 20 were priced similarly ( $P = 0.92$ ; \$112.81/cwt). Calves sold in lot sizes of  $\leq$  five sold for less ( $P < 0.001$ ; \$108.54/cwt) than larger lot sizes.

As expected, calf sex influenced ( $P < 0.001$ ) sale price. Prices for steer calves were greater ( $P < 0.001$ ) than prices for heifer calves (\$117.11/cwt vs. \$107.33/cwt for steers and heifers, respectively).

An effect ( $P \leq 0.001$ ) of color was observed in the fall. Black cattle sold for \$114.40/cwt, which was more than ( $P < 0.002$ ) for the other colors of cattle. Pens of mixed-color, red and white cattle were priced similarly ( $P \geq 0.28$ ) and averaged \$111.50/cwt.

An effect ( $P < 0.001$ ) of vaccinations was observed for calves sold in the fall. Calves vaccinated with a four-way viral vaccine only or 741 vaccination program were priced similarly ( $P = 0.11$ ; \$112.85/cwt) and were priced greater ( $P = 0.04$ ) than calves sold with no vaccination history (\$110.96/cwt).

In the fall, there was a small premium for calves that qualified for a natural program ( $P = 0.04$ ). Producers received a \$1.55/cwt premium when calves were marketed as natural qualified. Implant status did not have an effect ( $P = 0.18$ ) on sale price of calves. Insufficient lots sold as source- and age- verified and BQA certified in the fall prevented determination of the value of those attributes.

### *Winter Sales*

In winter 2007, there were 30,106 calves sold in 2,698 lots (Table 2). The average weight was 646 lbs., with a price slide of \$5.50/cwt.

Lot size had an effect ( $P < 0.001$ ) on calf price during the winter. Calves sold in large lot sizes ( $\geq 21$  calves) received a premium ( $P = 0.03$ ), compared with calves sold in lot sizes of  $\leq 11$  head. Calves sold in lot sizes of 11 to 20 and six to 10 were priced similarly ( $P = 0.38$ ) and sold for \$98.29/cwt. Calves sold in small lot sizes of  $\leq$  five sold for less ( $P < 0.001$ ) than all other lots of calves (\$94.47/cwt).

Calf sex had an effect ( $P < 0.001$ ) on price. Steer calves sold for \$8.40/cwt more ( $P < 0.001$ ) than heifer calves (\$101.82/cwt vs. \$93.42/cwt for steers and heifers, respectively).

Color influenced ( $P < 0.001$ ) calf sale price in the winter months. Black cattle were priced similarly ( $P = 0.12$ ) to white cattle and sold for \$98.43/cwt. Black and white cattle received greater ( $P \leq 0.04$ ) prices, compared with mixed-color and red calves. Mixed-color and red cattle were priced similarly ( $P = 0.80$ ) and sold for \$96.82/cwt, respectively.

These data suggest that the price received for feeder calves in North Dakota, South Dakota and Montana is dependent on multiple factors. Selling vaccinated calves in larger lot sizes seems to be economically advantageous and the value of vaccination history varied, depending on marketing time.

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