Factors Influencing Sale Price of North Dakota Calves

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Data were collected from three auction markets in North Dakota in late autumn and in midwinter to determine the destination and factors influencing sale price of feeder calves from these auction markets. Marketing calves in larger lot sizes and with vaccinations, announced by the auctioneer, receive premiums, compared with calves sold in smaller lot sizes or with no vaccination history. The most frequent state destinations for North Dakota feeder cattle, in order based on number of cattle received, were North Dakota, South Dakota and Nebraska.

Introduction

Calves in value-added calf programs sell at higher prices, compared with unweaned, unvaccinated calves (King et al., 1996; King and Seeger, 2004; Corah et al., 2006). The price advantage for calves in value-added calf programs has been increasing in recent years (King and Seeger, 2004). Additional factors influencing sale price in these studies were region of the country, sex, breed description, horns, weight variation, lot size, flesh and frame score.

Little quantitative information exists on factors influencing price of North Dakota calves. Furthermore, the destination of calves sold in North Dakota auction markets have not been described, and the effect of destination on sale price also has not been measured.

The objectives of this study were to determine the first destination of calves from North Dakota auction markets and factors influencing sale price of calves.

Methods

Data were collected from three auction markets: Napoleon Livestock, Napoleon; Kist Livestock, Mandan; and Stockmen's Livestock, Dickinson, during three consecutive weeks in late October and November 2005, when most calves sold were freshly weaned. Data again were collected from the same auction markets for three consecutive weeks in January 2006. North Dakota State University representatives were present at the sales and collected the following for each lot of calves sold: 1) lot number, 2) lot size, 3) sex, 4) weight, 5) hair color, and 6) vaccinations and deworming products. ZIP codes of destinations of calves were determined from market clearance records from each auction market.

Results

Destinations of feeder calves sold during late autumn (October and November) 2005 are shown in Figure 1. Data collected on 31,312 feeder calves sold in the fall indicated they were shipped to 11 states, including various locations in North Dakota. The majority of these feeder calves remained in North Dakota (46%). South Dakota destinations accounted for 18% of the cattle, while Nebraska destinations accounted for 14% of the total. Iowa and Minnesota rounded out the top five with 8% and 5%, respectively. The remainder of the feeder calves was shipped to Illinois, Oklahoma, Kansas, Colorado, Wyoming and Montana.

Figure 1.

First destination following sale of North Dakota feeder calves sold at three auction markets in fall, 2005.

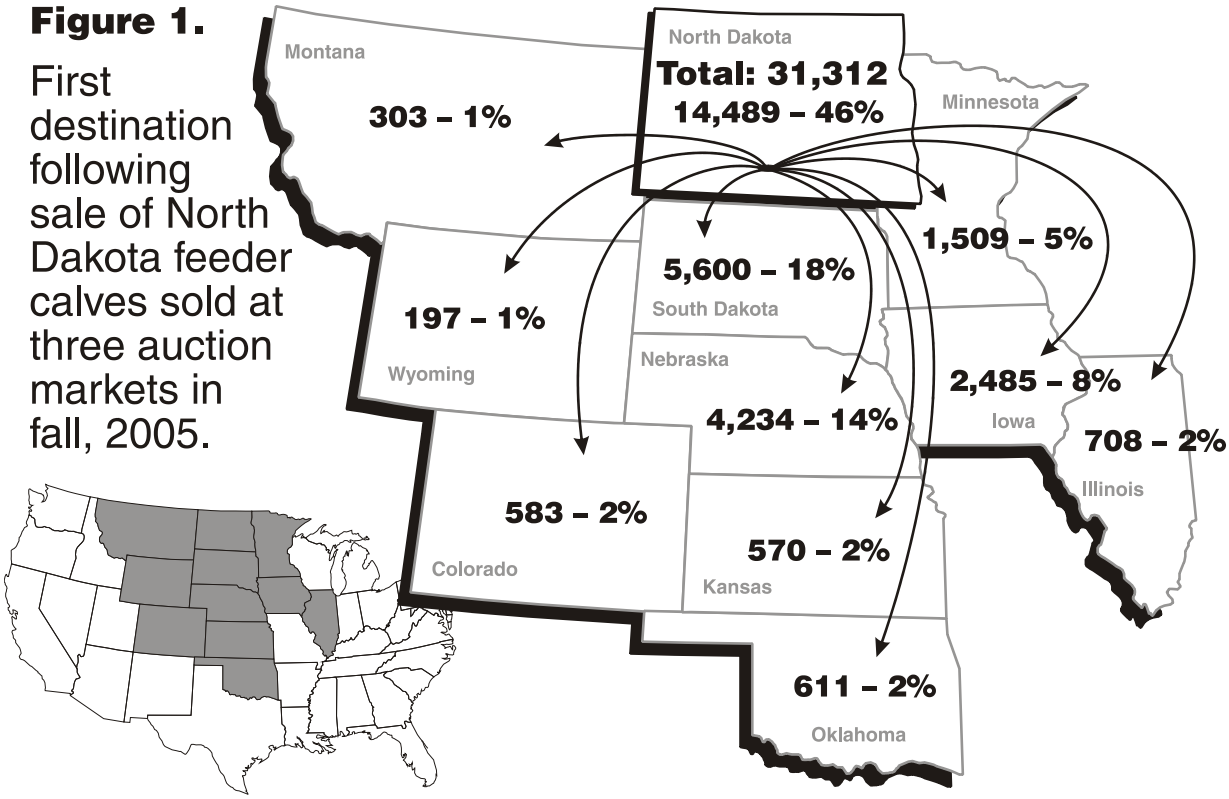
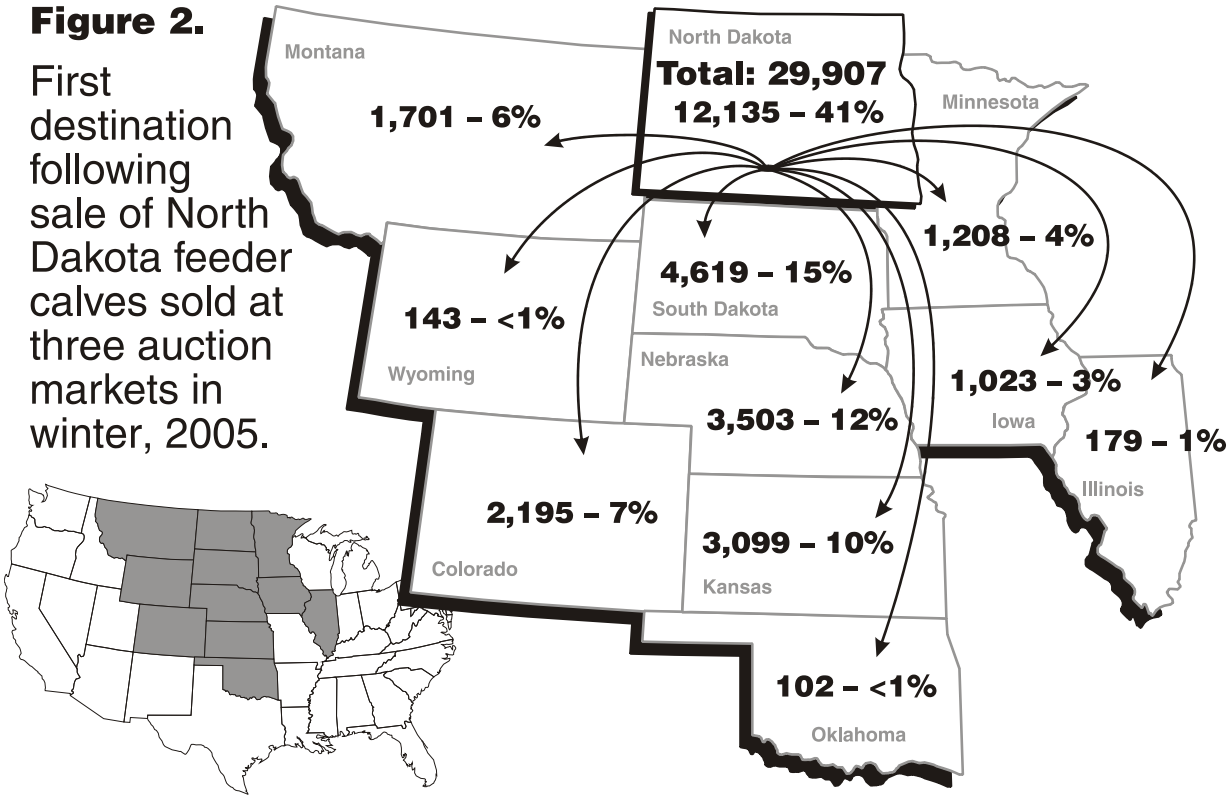


Figure 2 indicates the destination of cattle sold during midwinter (January) 2006. A total of 29,907 feeder calves were included in the data set during this time. North Dakota destinations accounted for a majority of the cattle sold, with 41% of the total. South Dakota accounted for 15% of the total, while Nebraska and Kansas were destinations for 12% and 10%, respectively. In January, 7% of North Dakota feeder calves were shipped to Colorado, while 6% were shipped to Montana. Kansas and Colorado received heavier, weaned calves, while the majority of calves shipped to Montana were replacement heifers.

Figure 2.

First destination following sale of North Dakota feeder calves sold at three auction markets in winter, 2005.



Factors influencing price of calves sold in late autumn (October, November) 2005 are shown in Table 1. Calves sold during this period averaged 537 pounds.

Table 1. Factors influencing price of North Dakota calves during late autumn 2005.

Factor	Number of lots	Lot price[1]	Price premium over baseline[1]	*P*-value
Lot size				<0.001
≥ 21	355	129.93[a]	5.98	
11–20	548	128.92[b]	4.97	
6–10	677	128.59[b]	4.64	
≤ 5	2033	123.95[c]	0	
Calf sex				<0.001
Steers	1977	131.84[a]	7.98	
Heifers	1636	123.86[b]	0	
Color				<0.001
Black, BWF[2]	1993	129.28[a]	2.84	
White	341	128.37[b]	1.94	
Red, RWF[3]	482	127.31[c]	0.88	
Mixed	797	126.43[d]	0	
Vaccinations				<0.001
7-4-1[4]	1222	128.68[a]	1.65	
4-way viral	580	127.83[b]	0.8	
No vaccinations[5]	1811	127.03[c]	0	
Base weight[6]	3613		-10.2	
Base weight (quadratic)	3613		0.01	

[1]$/hundred pounds.

[2]BWF = black white face.

[3]RWF = red white face.

[4]7-4-1 = 7-way clostridial plus 4-way viral plus *Pasteurella.*

[5]No vaccination history, but may have 7-way clostridial.

[6]Mean base weight of all lots (537 lb.) minus base weight of each lot; indicates price slide

[abcd]Within a column, means for specific factors without a common superscript letter differ ($P \leq 0.05$).

Lot size effected ($P < 0.001$) calf price. Calves sold in large lot sizes (≥ 21 calves) received greater premiums ($P = 0.05$) than lot sizes of six to 10 and 11 to 20. Calves sold in lot sizes of 11 to 20 and six to 10 were priced similarly ($P = 0.45$) and sold for $128.92/hundred weight (cwt) and $128.59/cwt, respectively. Calves sold in lot sizes of ≤ five sold for less than the other lot sizes ($123.95/cwt).

As expected, calf sex influenced ($P < 0.001$) sale price. Steer calves sold for $7.98/cwt more ($P < 0.001$) than heifer calves. Steers sold for $131.84/cwt, while heifers sold for $123.86/cwt.

An effect ($P < 0.001$) of color was observed. Black cattle sold for $0.90/cwt more than ($P = 0.04$) white cattle. White cattle sold for $128.37/cwt, which was greater ($P = 0.05$) than the price received for red

cattle ($127.31). Despite this, red cattle received a premium (*P* = 0.05) of $0.88/cwt when compared with pens of mixed-color cattle.

An effect (*P* < 0.001) of vaccinations was observed for calves sold in the fall. Calves vaccinated with a seven-way clostridial plus four-way viral plus *Pasteurella* vaccine (commonly referred to as the 7-4-1 vaccination program) sold for $128.68/cwt, which was greater (*P* = 0.03) than calves receiving only a four-way viral vaccination. Calves receiving only a four-way viral vaccination received $0.80/cwt more (*P* = 0.03; $127.83) than calves with no vaccination history or receiving only a seven-way clostridial vaccination ($127.03).

Due to limited numbers of calves that received implants during late autumn, data could not be analyzed statistically.

Factors influencing price of calves sold in midwinter (January) 2006 are shown in Table 2. Calves sold during this period had an average weight of 627 pounds.

Finished steers loaded for market.

Table 2. Factors influencing price of North Dakota calves during midwinter 2006.

Factor	Number of lots	Lot price[1]	Price premium over baseline[1]	*P*-value
Lot size				<0.001
11–20	496	122.94[a]	3.2	
6–10	597	122.32[a]	2.57	
≥ 21	392	122.13[a]	2.38	
≤ 5	2027	119.75[b]	0	
Calf sex				<0.001
Steers	1878	123.16[a]	2.74	
Heifers	1636	120.42[b]	0	
Color				<0.001
Black, BWF[2]	1699	122.36[a]	1.21	
White	331	122.34[a]	1.19	
Mixed	789	121.29[b]	0.14	
Red, RWF[3]	696	121.15[b]	0	
Vaccinations				0.05
4-way viral	849	122.02[a]	0.6	
7-4-1[4]	1160	121.91[ab]	0.49	
No vaccinations[5]	1506	121.43[b]	0	
Implants				<0.001
No	2912	122.55[a]	1.52	
Yes	603	121.02[b]	0	
Base weight[6]	3514		-10.1	<0.001
Base weight (quadractic)	3514		0.01	<0.001

[1]$/hundred pounds.

[2]BWF = black white face.

[3]RWF = red white face.

[4]741 = 7-way clostridial plus 4-way viral plus *Pasteurella.*

[5]No vaccination history, but may have 7-way clostridial.

[6]Mean base weight of all lots (627 lb.) minus base weight of each lot; indicates price slide for increased

[ab]Within a column, means for a specific factor without a common superscript letter differ ($P < 0.05$).

Lot size had an effect ($P < 0.001$) on calf price. No differences ($P \geq 0.13$) were observed for lot sizes of ≥ 21, 11 to 20 or six to 10, which sold for $122.13, $122.94 and $122.32/cwt, respectively. Calves sold in lot sizes of less than or equal to five received lower ($P < 0.0001$; $119.75/cwt) prices, compared with the other lot sizes.

Calf sex had an effect ($P < 0.001$) on price. Steer calves sold for $123.16/cwt, while heifer calves sold for $120.42/cwt. Thus, steers received $2.74/cwt more than heifers. The low price spread is due to more replacement heifers being sold.

Color influenced ($P = 0.003$) calf sale price. No differences ($P = 0.97$) were observed between black and white cattle ($122.36/cwt and $122.34/cwt, respectively). Mixed-color and red cattle received

similar (P = 0.74; $121.29/cwt and $121.15/cwt, respectively) prices when compared with each other. However, black and white cattle received more ($P \leq 0.01$) per hundredweight when compared with mixed-color and red cattle.

An effect (P = 0.05) of vaccinations was observed. Calves sold with a four-way viral or 7-4-1 vaccination program were similarly priced (P = 0.73; $122.02/cwt and $121.91/cwt, respectively). Calves without a vaccination history or only a seven-way clostridial vaccination sold for $121.43/cwt. Calves with a 7-4-1 vaccination program tended (P = 0.06) to receive a greater price when compared with nonvaccinated calves.

Implant status had an effect ($P < 0.001$) on sale price of calves sold in midwinter. Calves without an implant sold for $122.55/cwt, compared with calves that received an implant, which sold for $121.02/cwt.

North Dakota ZIP codes were the most frequent destinations during late autumn. Calves sold in larger lot sizes received premiums when compared with smaller lot sizes. As expected, calf sex and color had an effect on the price producers received. Vaccinated calves sold for more than calves without a vaccination history.

During midwinter, calves were shipped to 11 states, with the majority remaining in North Dakota. Calves sold in lot sizes of greater than equal to six were priced similarly, but received a premium, compared with small lot sizes. Black and white calves were similar in price but did receive premiums when compared with mixed-color and red calves. Calves that received a viral vaccination sold for more than calves with no vaccination history and calves not receiving an implant received higher prices than those calves that were implanted.

Implications

These data suggest that the price received is dependent on multiple factors. Selling vaccinated calves in larger lot sizes seems to be economically advantageous.

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