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**Northern Great Plains Beef Production:
Production and Marketing Practices of Cow-Calf Producers**

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Abstract

Ruminant livestock production in North Dakota, South Dakota, Montana, and Wyoming is critical to the region's economy. Because of the economic significance of ruminant livestock production, producers in the four-state area are continually looking for opportunities to increase income and improve the viability of their farm and ranch operation. Accordingly, the Four-state Ruminant Consortium, an integrated research and extension program, was created to specifically address issues related to ruminant livestock production. One of the more widely applicable possibilities for adding value through the regions' ruminant livestock sector appears to be backgrounding feeder calves. However, while economic analysis has indicated that stockgrowers in the study area could typically increase their net returns by backgrounding feeder calves, anecdotal evidence suggests relatively few producers are presently backgrounding feeder calves. To identify the socioeconomic impediments inhibiting producers from backgrounding feeder cattle, this study sought to identify managerial, social, and institutional factors that influence and perhaps constrain producers' ability or willingness to background feeder cattle. Study objectives were to identify and document producers' current production and marketing practices as well as identify stock growers' perception of opportunities for and impediments to expansion of the ruminant livestock industry in the study area.

A mail questionnaire was delivered to 5,270 livestock producers in 37 counties in the 4-state study area of southwestern North Dakota, northwestern South Dakota, southwestern Montana and northwestern Wyoming. The questionnaire was designed to solicit a wide variety of information about operators' current production practices, including marketing, backgrounding, retained ownership, herd management, and feed and forage practices. The questionnaire also solicited operators attitudes on a wide variety of issues related to opportunities for and impediments to the expansion of the ruminant livestock industry in the study area as well asking respondents to identify what types of information would be of most interest to them and in what form they would prefer that information be delivered. The questionnaire also collected basic demographic data. Findings from the mail questionnaire are detailed in this report.

Key words: backgrounding, feeder calves, beef cattle producer characteristics, feeder cattle production practices, beef cattle marketing

Northern Great Plains Beef Production: Production and Marketing Practices of Cow-Calf Producers

Nancy M. Hodur, F. Larry Leistritz, Daniel J. Nudell,
Clint Clark, Duane Griffith, and Tammie Jensen¹

Introduction

Ruminant livestock production in North Dakota, South Dakota, Montana, and Wyoming is critical to the region's economy. In 2002, 59 percent of farms and ranches in the four-state study area raised beef cattle, while more than 8 percent raised sheep and lambs (USDA 2004). In 2004 in the four-state area cattle and calves accounted for one-third of farm and ranch receipts, ranging from 16 percent statewide in North Dakota to 75 percent statewide in Wyoming (USDA 2006).

The beef industry faces some unique challenges compared to the pork and poultry industries. Beef production is characterized by open market transactions between cow-calf producers and feedlots, as well as between feedlots and packers. Alternately, virtually all poultry and much pork production is organized into supply chains controlled through vertical integration and contracting. Because beef production is characterized by open market transactions, individual producers typically receive no information on their animals' performance in the feedlot or their carcass quality. This information would potentially be valuable in selecting animals with superior genetics, not only improving profitability of individual producers but also to better respond to consumer preferences.

Beef producers in the region have a number of production, marketing, and management options. Feeder calf production has long been the dominant livestock enterprise in the study region, with calves typically sold soon after weaning. However, some studies have indicated retaining calves on the ranch for some period after weaning and marketing at a somewhat heavier weight can often be profitable for producers (Watt et al. 1987). Further, when calves are retained on the ranch or elsewhere in the region for feeding, the regional economy is stimulated through stock growers' expenditures for feed and supplies (Leistritz and Sell 1993). Other options include retaining ownership of calves and sending them to a custom feedlot for finishing.

Because of the economic significance of ruminant livestock production, producers in the four-state area are continually looking for opportunities to increase income and improve the viability of their farm and ranch operation. Accordingly, the Four-state Ruminant Consortium,

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an integrated research and extension program, was created to specifically address issues related to ruminant livestock production. The purpose of the Four-State Ruminant Consortium is to enhance economic development in the target study area of southwestern North Dakota, northwestern South Dakota, southeastern Montana, and northeastern Wyoming by strengthening and capturing value from the ruminant livestock industry.

Literature Review

A number of authors have addressed alternative production, marketing, and management options for beef cattle producers. Little et al. (2000) reported findings of a survey of Mississippi beef cattle producers that detailed production and marketing practices and producer attitudes. Almost 47 percent retained ownership of calves through the stocker phase (similar to backgrounding), whereas only 7 percent retained ownership through finishing. Large volume producers (herds over 500 head) most often reported retaining ownership through finishing, likely due to economies of scale as most commercial feedlots require 125 - 150 calves per pen.

Popp and his colleagues (1999) surveyed producers in 1996 to examine factors affecting the decision to feed (background) or sell calves at weaning. Factors found to significantly affect the decision to background included acreage used for beef production; operator's attitude toward (1) price risk in backgrounding, (2) profitability of backgrounding, and (3) adequacy of/lack of facilities for backgrounding; and operator's attention to managing other aspects of beef production and marketing.

Watt and his colleagues (1987) analyzed eight retained ownership options for Northern Plains cow-calf producers. A backgrounding program consisted of feeding a high energy ration for 150 days for gains of 1.7 pounds per day (steers) and 1.5 pounds per day (heifers). A wintering program for calves was based on a high roughage diet with gains of 1.0 and 0.9 pounds per day for steers and heifers respectively. Wintered calves could be pastured or sold. If pastured for 120 days, gains were assumed to be 1.9 and 1.7 pounds per day for steers and heifers, respectively. Calves could go to a custom feedlot at weaning or after backgrounding, wintering, or pasturing. All retained ownership options were more profitable on average than selling the calves at weaning. Custom feeding of weaned calves was the most profitable alternative, profitable in 20 of 26 years studied, and returned an average net revenue of \$30.85 per cow. [Note: A more typical backgrounding program today would be to feed calves for a gain of 2.5 to 3 lbs. per day (Petty 2007).]

While backgrounding or stocker programs generally involve retaining animals for several months after weaning, shorter preconditioning programs are also used by some producers. According to Dhuyvetter (2004), preconditioning of feeder calves has been advocated for more than 40 years, but adoption has been slow. Preconditioning programs vary, but most include retaining the calves on the ranch for several weeks after weaning, administering appropriate vaccinations and booster shots, and other management practices as may be appropriate, with the aim of selling calves that will have a minimum of health problems in the feedlot. He estimates that preconditioned calves have been commanding a premium of about \$4.50 per cwt. in Kansas sales and that other studies have indicated that these calves provide a \$40 - \$60 advantage in the

feedlot. Ward and Lalman (2003) describe a preconditioning program sponsored by the Oklahoma Quality Beef Network (OQBN), which calls for a minimum 45 day post-weaning period, with castration, dehorning, clostridial and bacterial vaccinations with boosters, and feeding the calves a concentrate supplement for a minimum of 14 days after weaning. At a premium of \$5 per cwt., the OQBN calves provide \$5.79 per head in marginal returns to producers.

Feuz and Wagner (1996) examined risks and returns associated with retaining ownership of calves through finishing, using data from 291 pens of steers over a five-year period. Calves were placed on feed immediately after weaning with the aim of gaining 3 pounds per day, for slaughter at 12-14 months of age. Profit per head averaged \$16.05, but was quite variable, both year-to-year and among pens of cattle. Average returns ranged from \$113.67 per head in the best year (1992-93) to a loss of \$87.84 in the worst year (1993-94). The range between the most and least profitable pens averaged \$153 per head and was at least \$125 per head every year. Most of the difference in profitability arose from differences in the genetic potential of calves to gain rapidly and produce a high yielding, USDA Choice carcass. These differences were not easily predicted (based on measurable attributes) at the time cattle enter the feedlot but appeared to be consistent, year-to-year within a herd. In all but the most profitable feeding year, at least 1/3 of the pens had a negative net return; and in all but the worst year, at least 1/3 had a positive net return. Overall, the study demonstrated that producers with superior genetics are in the best position to profit from retained ownership.

More recently, White and Anderson (2005) examined potential returns from retained ownership through finishing, using data from 2,322 calves from 12 Mississippi farms over a 10-year period. Net returns from feeding averaged \$21.82 per head, but varied greatly. For 5 of the 12 farms, the net return from retaining ownership was more than \$30 per head while 2 farms had negative returns. This demonstrated that producers whose cattle perform well in the feedlot and consistently grade well have an incentive to retain ownership.

Fausti et al. (2003) examined returns from retained ownership for South Dakota producers. The average net return was \$14.15 per head or 5.6 percent, but if interest on the revenue from sale of the calves was considered, this fell to 2.5 percent. Many producers may not feel that the returns justify the risks associated with retained ownership.

Beef producers also have a number of alternative marketing channels. In a study of the top 15 feeder cattle producing states, Schmitz et al. (2003) estimated that local auctions account for about 61 percent of calves marketed, private sales (direct sales) for 23 percent, video auctions for 11 percent, and Internet sales for 5 percent. There were substantial inter-state variations. In North and South Dakota, 72.5 percent of all calves were estimated to be sold through local auctions whereas in Montana 67.5 percent were sold through direct sales and only 12.5 percent through sale barns. The authors speculate that sale barns were patronized by operators with smaller herds, whereas the video and Internet channels often require 100 calf (same sex) lots. They find that states with high percentages of calves coming from herds of 500+ cows tend to have more sales via video and Internet and less through sale barns. Fausti et al. (2006) recently surveyed beef producers in the West River region of the Dakotas. They found local auctions

were the marketing channel most often used by ranchers, although sales to private parties or via satellite auction increased with herd size.

The body of literature examines a wide variety of production and marketing practices, ranging from preconditioning programs to backgrounding to retaining ownership through finishing and slaughter. While most studies demonstrated the potential for higher returns, in many cases results were variable, and in other instances gains were small relative to risk. Clearly which production or marketing practice produces the most profitable results depends on individual producers' circumstances.

Study Objectives

One of the more widely applicable possibilities for adding value through the regions' ruminant livestock sector appears to be backgrounding feeder calves. However, while economic analysis has indicated that stockgrowers in the study area could typically increase their net returns by backgrounding feeder calves, anecdotal evidence suggests relatively few producers are backgrounding. To identify the socioeconomic impediments inhibiting producers from backgrounding feeder cattle, this study sought to identify managerial, social, and institutional factors that influence and perhaps constrain producers' ability or willingness to background feeder cattle. A more thorough understanding of current livestock production, management, and marketing practices would facilitate research and extension programs as well as serve as a baseline for future evaluation of the impact of the Four-State Ruminant Consortium program. Study objectives were to identify and document producers' current production and marketing practices as well as identify stock growers' perception of opportunities for and impediments to expansion of the ruminant livestock industry in the study area.

Methods

A mail questionnaire was delivered to 5,270 livestock producers in 38 counties in the four-state study area of southwestern North Dakota, northwestern South Dakota, southeastern Montana and northeastern Wyoming (Figure 1). Mailing lists of local producers maintained by county extension offices were deemed the best available source of producer names and addresses in the study area. In some instances, however, the county mailing lists contained more names than the number of livestock operations in the county as reported by the USDA Census of Agriculture. To "clean-up" the mailing lists and remove listings that could reasonably be assumed to not meet the study criteria (ruminant livestock production operations), the lists were sorted by zip code. Names with zip codes and addresses in urban areas, rural residential developments, and areas with many second homes and strong tourism sectors, were eliminated from the mailing list. Consultation with members of the research team personally familiar with the areas in question guided the clean-up process.

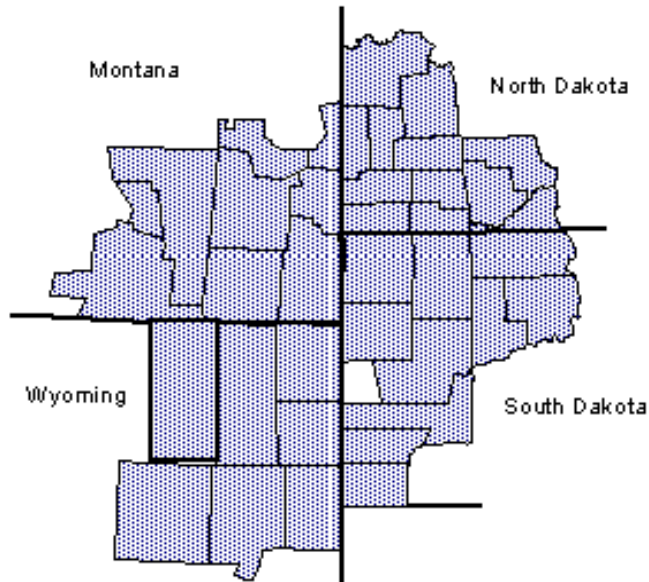


Figure 1. Study Area

Some ranch operators were also listed on more than one county extension mailing list or were listed multiple times. To eliminate multiple mailings to the same ranch operation, the mailing lists were merged and duplicates eliminated. While every effort was made to eliminate duplicate mailings, undoubtedly some multiple listings remained. In fact some respondents returned the questionnaire and indicated that they had received two questionnaires. The duplicate listings were removed from the mailing list and the sample size adjusted.

Because the mailing list most certainly also contained some individuals who did not raise ruminant livestock at all, no longer raised ruminant livestock, or raised ruminant livestock other than commercial beef cattle, the first question qualified study respondents. Individuals who did not raise ruminant livestock, or raised ruminant livestock other than commercial beef cattle were asked to stop and return the questionnaire. Respondents that returned the questionnaires because they did not raise commercial beef cattle and those who returned non-responses (i.e., those that for whatever reason choose not to complete the questionnaire) were removed from the mailing list and the sample size adjusted. Many indicated they no longer raised cattle or had retired. Based on the assumption that the returned “non-responses” were not part of the target population, only those respondents that raised commercial beef cows, commercial beef replacement heifers, or feeder calves were considered in the calculation of the response rate and the data analysis.

Overall response rate was just below 20 percent, with state response rates ranging from 17 percent in North Dakota to 22 percent in Wyoming. The actual response rate was likely higher. Considering that roughly 12 percent of the “cleaned up” mailing list was returned because they did not raise commercial beef livestock or otherwise choose not to participate, it is

reasonable to conclude that many that did not return the questionnaire, because they do not raise beef cattle, should not have been on the mailing list. While the mailing list likely contained individuals that did not meet the survey criteria, a sufficient number of questionnaires were mailed out to obtain an adequate sample of ruminant livestock producers. Overall sampling error with a 95 percent confidence interval was estimated to be ± 3 percent with individual sampling error for the study states ranging from ± 5 percent to ± 7 percent (Table 1) (Dillman 2000).

Table 1. Response Rate, by State, Rancher Survey, 2005

| Study Area | Population ¹ | Completed Questionnaires | Non-response/ Not Applicable ² | Mailing list/ Sample Size | Response Rate % | Sampling Error, 95 % Confidence Interval |
|----------------|-------------------------|--------------------------|---|---------------------------|-----------------|--|
| Overall | 8,929 | 1,045 | 701 | 5,270 | 20 | ± 3.0 |
| North Dakota | 3,024 | 259 | 267 | 1,505 | 17 | ± 5.8 |
| South Dakota | 2,787 | 330 | 175 | 1,542 | 21 | ± 5.0 |
| Montana | 1,756 | 286 | 172 | 1,456 | 20 | ± 5.3 |
| Wyoming | 1,480 | 170 | 87 | 691 | 22 | ± 7.0 |

¹ Source: US Department of Agriculture (2002).

² Non-response/not applicable included those no longer ranching, duplicate mailings, and those that do not raise commercial beef cows, beef replacement heifers, or feeder calves.

The questionnaire was designed to solicit a wide variety of information about operators' current production practices, including marketing, backgrounding, retained ownership, herd management, and feed and forage practices. The questionnaire also solicited operators' attitudes on a wide variety of issues related to opportunities for and impediments to the expansion of the ruminant livestock industry in the study area as well as asking respondents to identify what types of information would be of most interest to them and in what form they would prefer that information be delivered. The questionnaire also collected basic demographic data. Results were reported for the entire study area and by state. Reported averages are simple averages unless otherwise specified. Duncan's Multiple Range Test was used to test for significant differences between mean values by state at $\alpha \pm .05$ (SAS Institute 2004). The Pearson Chi-squared statistic was used to test for independence at $\alpha \pm .05$ (SAS Institute 2004). The chi-square test only concludes that the two variables compared in the contingency tables are related with one variable affecting the other. It does not make any other inferences about the relationship between the two variables.

Results

Current Production Practices

Producers in the four-state study area had on average 215 beef cows (cows), 36 replacement heifers, and 61 feeder calves on their ranch as of January 1, 2005 (Table 2). Respondents most frequently (34 percent) reported having from 1 to 100 head of cows. A large majority of producers, 79 percent overall, reported from 1 to 300 head of cows, ranging from 73 percent of respondents in Wyoming to 85 percent in North Dakota. Overall, 20 percent of respondents had more than 300 head of beef cows with state averages ranging from a low of 13 percent in North Dakota compared to 21, 22, and 25 in percent South Dakota, Montana, and Wyoming, respectively. Only 3 percent of producers in North Dakota reported over 500 head of cows, while 13 percent of producers in Wyoming reported over 500 head of cows (Table 2).

Average number of beef cows per respondent varied by state from a low of 173 cows in North Dakota to an average of 249 cows in Wyoming. No significant difference in the means for South Dakota, Montana and Wyoming respondents were found, but the mean for North Dakota was significantly different than the other study states. A second average was calculated eliminating the respondents that had no beef cows. The averages were nearly identical suggesting the survey had reached the targeted audience; producers with current beef cow operations. Average number of beef cows for all respondents was 215. The average when excluding respondents with no commercial beef cows was 218 per respondent (Table 2).

The number of replacement heifers per respondent on January 1, 2005 averaged from 22 in North Dakota to 43 head in Montana, with an overall average of 36 head. This translates into roughly a 17 percent replacement rate based on average herds of 215 cows (Table 2). Mean number of replacement heifers was significantly less in North Dakota than in the other states. There was no significant difference in mean number of replacement heifers between South Dakota, Montana and Wyoming respondents. Sixty-two percent of respondents indicated 1 to 100 replacement heifers on their ranch as of January 1, 2005 while 31 percent reported none. Five percent overall reported 101-200 replacement heifers. Only 2 percent of respondents in North Dakota reported 101-200 replacement heifers while 5 to 7 percent of respondents from South Dakota, Montana, and Wyoming reported 101-200 replacement heifers (Table 2).

The average number of feeder calves on the ranch as of January 1, 2005 was 61 head, ranging from 46 head in South Dakota to 74 head in Montana (Table 2). Because many producers sell part or all of their calves before January 1, an average, excluding respondents who reported no feeder calves on the ranch as of January 1, 2005, was also calculated. Averages increased considerably to 148 feeder calves overall, with per-state averages ranging from lows of 116 and 121 in South Dakota and North Dakota, respectively and higher averages of 158 and 223 in Wyoming and Montana, respectively (Table 2). There was no significant difference between means using either calculation.

Table 2. Number of Commercial Beef Cows, Commercial Beef Replacement Heifers, and Feeder Calves on Ranch as of January 1, 2005, by State and Overall, Rancher Survey, 2005.

| Item | Total | North | South | Montana | Wyoming |
|--|--------|------------------|------------------|------------------|------------------|
| | | Dakota | Dakota | | |
| ----- percent of respondents----- | | | | | |
| Commercial Beef Cows | | | | | |
| None | 1.6 | 1.9 | .6 | 2.1 | 2.4 |
| 1 to 100 | 34.4 | 37.6 | 31.1 | 33.5 | 37.4 |
| 101 to 200 | 27.7 | 33.7 | 27.7 | 26.1 | 21.1 |
| 201 to 300 | 16.5 | 14.0 | 19.5 | 16.6 | 14.5 |
| 301 to 400 | 8.4 | 6.6 | 9.1 | 9.9 | 7.2 |
| 401 to 500 | 3.5 | 3.1 | 3.1 | 3.9 | 4.2 |
| more than 500 | 7.9 | 3.1 | 8.8 | 8.1 | 13.2 |
| (n) | (1036) | (258) | (328) | (284) | (166) |
| Average ¹ | 215 | 173 ^b | 228 ^a | 218 ^a | 249 ^a |
| | (1038) | (258) | (328) | (284) | (166) |
| Average > zero ¹ | 218 | 176 ^b | 230 ^a | 222 ^a | 255 ^a |
| | (1021) | (253) | (328) | (278) | (162) |
| Commercial Beef Replacement Heifers | | | | | |
| None | 30.7 | 36.8 | 26.5 | 31.7 | 27.7 |
| 1 to 100 | 62.3 | 60.5 | 66.2 | 58.8 | 63.2 |
| 101 to 200 | 5.1 | 1.9 | 5.5 | 6.3 | 7.2 |
| 201 to 300 | 1.1 | 0.8 | 1.2 | 1.1 | 1.2 |
| 301 to 400 | 0.3 | 0.0 | 0.0 | 1.1 | 0.0 |
| 401 to 500 | 0.3 | 0.0 | 0.0 | 1.1 | 0.0 |
| more than 500 | 0.6 | 0.0 | 0.6 | 0.0 | 0.6 |
| (n) | (1036) | (258) | (328) | (284) | (166) |
| Average | 36 | 22 ^b | 38 ^a | 43 ^a | 40 ^a |
| | (1038) | (258) | (328) | (284) | (166) |
| Average > zero | 52 | 34 ^b | 52 ^a | 62 ^a | 56 ^a |
| | (719) | (163) | (241) | (194) | (120) |
| Feeder Calves on Ranch Jan. 1, 2005 | | | | | |
| None | 58.7 | 46.9 | 60.4 | 66.9 | 59.6 |
| 1 to 100 | 27.5 | 37.2 | 27.1 | 21.5 | 23.5 |
| 101 to 200 | 5.6 | 7.7 | 4.6 | 4.9 | 5.4 |
| 201 to 300 | 3.4 | 4.7 | 3.7 | 1.4 | 4.2 |
| 301 to 400 | 1.2 | 0.8 | 2.1 | 0.3 | 1.2 |
| 401 to 500 | 1.2 | 0.8 | 0.6 | 1.1 | 3.0 |
| more than 500 | 2.5 | 1.9 | 1.5 | 3.9 | 3.1 |
| (n) | (1036) | (258) | (328) | (284) | (166) |
| Average ¹ | 61 | 64 ^a | 46 ^a | 74 ^a | 64 ^a |
| | (1038) | (258) | (328) | (284) | (166) |
| Average > zero ¹ | 148 | 121 ^a | 116 ^a | 223 ^a | 158 ^a |
| | (428) | (137) | (130) | (94) | (67) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Respondents were also asked how many calves they typically raise annually from their own cows. Overall, respondents reported an average of 204 feeder calves raised from their own cows, ranging from an average of 163 in North Dakota to 245 in Wyoming (Table 3). Again, the average for North Dakota was significantly less than for South Dakota, Montana and Wyoming. Excluding those that indicated raising no calves annually from their own cows and recalculating the mean had little impact on the overall average or state averages. Respondents most frequently reported raising from 1 to 100 head of calves (36 percent) from their own cows, with similar per state averages ranging from 32 to 38 percent. Twenty five percent of respondents overall reported raising 101-200 calves with state averages varying from 20 percent in Wyoming to 33 percent in North Dakota. About three-fourths of all respondents reported 1 to 300 head of calves from their own cows, ranging from 83 percent in North Dakota to 70 percent in Montana. Only 13 percent of respondents in North Dakota raised more than 300 head of calves from their own cows compared to 21 percent in South Dakota, 23 percent in Wyoming, and 22 percent in Montana (Table 3).

Calving, Marketing, and Weaning

Half of the calving in the study area was done in April except in Wyoming. Wyoming respondents calved a slightly smaller percentage of their cows in April, 42 percent compared to 50 to 53 percent for the other states. Respondents in Wyoming and North Dakota calved slightly more in May, 14 and 13 percent, respectively than respondents in South Dakota, 10 percent and Montana, 9 percent. Across the study area, roughly one-third of calving occurred in March (Table 3).

Only 9 percent of respondents reported purchasing weaned feeder calves (Table 4). Respondents who purchased weaned feeder calves purchased, on average, 325 head with considerable variance between the states, but no significant differences. Average number of weaned feeder calves purchased varied from an average of 194 head in South Dakota to 497 head in Montana. A closer examination showed a wide range of response from a minimum of less than 10 purchased weaned feeder calves to a maximum of 2,500. Median number of purchased weaned feeder calves was 160 and ranged from 125 in South Dakota to 175 in North Dakota and 200 in Montana and Wyoming (Table 4).

Roughly two thirds (65 percent) of feeder calves in the study area were weaned in October with most of the remaining feeder calves weaned in November (27 percent) (Table 4). Only 8 percent of feeder calves were weaned in months other than October and November. Per-state results were consistent with overall results (Table 4). Weaning weights were most frequently in the 500 to 600 pound range (64 percent) with an average weaning weight of 562 pounds. There was no significant difference between weaning weights in North Dakota (567 pounds), South Dakota (568 pounds), and Montana (563 pounds). Weaning weight in Wyoming (539 pounds) was significantly different than the other three study states. Median weaning weights were similar to average weaning weights suggesting the distribution was not distorted by extreme observations. Seventeen percent of calves were weaned between 400 and 500 pounds and 16 percent were weaned between 600 and 700 pounds with very few weaned at over 700 pounds (less than 1 percent) or under 400 pounds (1.6 percent). Results in North Dakota, South Dakota, and Montana were consistent with overall results; however, Wyoming ranchers reported weaning slightly more feeder calves in the 400 to 500 pound range (26 percent compared to 17 percent overall) and slightly fewer calves in the 600 to 700 pound range (9 percent compared to 16 percent overall) (Table 4).

Table 3. Calves Raised from Own Cows and Calving Dates, Rancher Survey, 2005

| Item | All States | North Dakota | South Dakota | Montana | Wyoming |
|---|---------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | -----percent of respondent----- | | | | |
| Number of calves from own cows | | | | | |
| none | 4.5 | 3.8 | 2.1 | 8.0 | 4.2 |
| 1 to 100 | 35.8 | 38.6 | 32.3 | 35.7 | 38.0 |
| 101 to 200 | 25.6 | 32.6 | 25.8 | 22.1 | 19.7 |
| 201 to 300 | 14.7 | 12.3 | 18.9 | 12.1 | 14.8 |
| 301 to 400 | 7.6 | 7.2 | 8.6 | 8.4 | 4.9 |
| 401 to 500 | 4.4 | 2.5 | 4.8 | 4.8 | 5.6 |
| 501 to 1000 | 6.4 | 2.5 | 6.9 | 7.2 | 10.6 |
| more than 1000 | 1.0 | 0.4 | 0.3 | 1.6 | 2.1 |
| (n) | (918) | (236) | (291) | (249) | (142) |
| | -----number ¹ ----- | | | | |
| Average number of calves raised annually from own cows | | | | | |
| (n) | 204 (920) | 163 ^a (236) | 215 ^b (291) | 207 ^b (249) | 245 ^b (142) |
| Average number of calves of those > 0 | | | | | |
| (n) | 213 (879) | 169 ^a (227) | 219 ^b (285) | 225 ^b (229) | 255 ^b (136) |
| | -----percent----- | | | | |
| Percentage of calves born by month | | | | | |
| February | 3.7 | 3.0 | 4.1 | 3.2 | 5.1 |
| March | 33.3 | 28.5 | 35.6 | 35.4 | 32.6 |
| April | 49.6 | 52.6 | 49.7 | 51.7 | 41.6 |
| May | 11.2 | 13.4 | 9.9 | 8.8 | 14.3 |
| All other months | 1.8 | 2.2 | 0.8 | 0.5 | 5.6 |
| (n) | (1016) | (251) | (317) | (278) | (166) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Table 4. Purchase of Weaned Feeder Calves, Average Number Purchased, Month Calves were Typically Weaned and Average Weight at Weaning, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|---|----------------------------------|------------------|------------------|------------------|------------------|
| | | Dakota | Dakota | | |
| -----percent of respondents----- | | | | | |
| Percent that purchase weaned feeder calves | 9.4 | 13.0 | 8.5 | 8.4 | 7.5 |
| (n) | (998) | (246) | (317) | (275) | (160) |
| -----number ¹ ----- | | | | | |
| Of those that purchased weaned feeder calves, average number purchased | 325 | 325 ^a | 194 ^a | 497 ^a | 316 ^a |
| Median | 160 | 175 | 125 | 200 | 200 |
| | (95) | (32) | (27) | (23) | (12) |
| -----percent of calves----- | | | | | |
| Month Calves are Weaned | | | | | |
| September | 4.0 | 5.3 | 2.6 | 3.7 | 5.0 |
| October | 64.9 | 60.6 | 67.6 | 66.3 | 64.2 |
| November | 26.6 | 30.1 | 26.0 | 25.9 | 23.3 |
| December | 2.8 | 3.3 | 1.6 | 3.0 | 4.4 |
| Other | 1.7 | 0.8 | 2.2 | 1.1 | 3.1 |
| (n) | (979) | (242) | (314) | (269) | (154) |
| Weaning Weights | -----percent of respondents----- | | | | |
| 300 to 400 pounds | 1.6 | 2.1 | 1.6 | 0.0 | 3.9 |
| 401 to 500 pounds | 17.3 | 16.5 | 14.0 | 16.7 | 26.0 |
| 501 to 600 pounds | 64.3 | 63.2 | 64.3 | 67.3 | 61.0 |
| 601 to 700 pounds | 16.1 | 16.9 | 19.4 | 15.6 | 9.1 |
| 701 to 800 pounds | 0.6 | 1.2 | 0.6 | 0.4 | 0.0 |
| (n) | (979) | (242) | (314) | (269) | (154) |
| -----pounds ¹ ----- | | | | | |
| Average | 562 | 567 ^a | 568 ^a | 563 ^a | 539 ^b |
| Median | 560 | 570 | 575 | 560 | 550 |
| Minimum | 225 | 350 | 225 | 425 | 300 |
| Maximum | 800 | 800 | 800 | 772 | 690 |
| (n) | (981) | (242) | (314) | (269) | (154) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

About three-fourths of respondents reported marketing at least some of their calves at weaning, right off the cow (Table 5). For those that marketed at least some of their calves at weaning, statewide averages, ranged from 63 percent in North Dakota to 81 percent in Montana. Across the four states, few respondents (6 percent) indicated marketing at least some of their calves 15 to 45 days after weaning, while one-third indicated marketing at least some of their

calves 46 to 120 days after weaning. North Dakota producers more frequently (49 percent) and Wyoming producers less frequently (15 percent) marketed at least some of their calves 46 to 120 days after weaning than the four-state average of 33 percent. The percentage of South Dakota and Montana respondents who marketed calves 46 to 120 days after weaning were similar (31 percent) to the overall average. Ten percent of respondents marketed after backgrounding, and 9 percent retained ownership or a percentage ownership through finishing and slaughter. Per state averages were consistent with overall averages (Table 5) .

The percentage of calves marketed at each interval were compared by state. On average 61 percent of calves in the study area were marketed at weaning, right off the cow (Table 5). North Dakota respondents marketed a significantly smaller percentage of calves at weaning, 51 percent compared to 63 to 67 percent in the other study states. There was no difference between the other three study states. Alternately, North Dakota respondents marketed a greater percentage of calves 46 to 120 days after weaning than did respondents in South Dakota, Montana, and Wyoming, 29 percent compared to 15 percent in South Dakota, 13 percent in Montana, and 9 percent in Wyoming. Again, there was no significant difference between South Dakota, Montana, and Wyoming. While representing only a small percentage of calves marketed overall, respondents in South Dakota and Wyoming differed in the percentage of calves marketed 15 to 45 days after weaning, 1 percent in South Dakota compared to 6 percent in Wyoming. There were no significant differences between states in the percentage of calves marketed after backgrounding and/or finishing (Table 5).

The average weight of steer calves marketed at weaning was slightly higher than the average weight of heifer calves marketed, 587 pounds compared to 543 pounds. Average weight of steer calves marketed at weaning was significantly higher in North and South Dakota (598 and 596 pounds, respectively) than in Montana and Wyoming (580 and 568 pounds, respectively). Average weight of heifer calves marketed at weaning was significantly lower in Wyoming (524 pounds) than in South Dakota and Montana (552 and 546 pounds, respectively). There was no difference in average weight of weaned heifers between Wyoming and North Dakota (Table 5). Average weight of all calves at weaning was 562 pounds (data not shown).

Table 5. Marketing Feeder Calves, Timing of Marketing, and Weight at Weaning, Rancher Survey, 2005

| Activity | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|-------|--------------------|-------------------|--------------------|-------------------|
| -----percent of respondents----- | | | | | |
| Respondents that: | | | | | |
| Market at least some calves at weaning, right off the cow | 73.8 | 63.3 | 76.9 | 80.7 | 71.9 |
| Market at least some calves 15 to 45 days after weaning | 6.2 | 6.9 | 2.8 | 8.2 | 8.8 |
| Market at least some calves 46 to 120 days after weaning | 33.1 | 48.8 | 31.3 | 31.5 | 15.1 |
| Retain ownership or percentage ownership through backgrounding | 10.5 | 10.1 | 12.7 | 7.4 | 12.0 |
| Retain ownership or percentage ownership through finishing and slaughter | 9.3 | 9.7 | 9.5 | 8.5 | 9.4 |
| Other ² | 31.1 | 24.6 | 35.1 | 31.7 | 32.1 |
| (n) | (993) | (248) | (316) | (270) | (159) |
| -----percent of calves ¹ ----- | | | | | |
| Calves marketed at each of the following: | | | | | |
| At weaning, right off the cow | 61.2 | 51.3 ^b | 63.3 ^a | 67.0 ^a | 62.6 ^a |
| 15 to 45 days after weaning | 3.4 | 3.8 ^{a,b} | 1.4 ^b | 3.5 ^{a,b} | 6.4 ^a |
| 46 to 120 days after weaning | 17.2 | 29.2 ^a | 15.1 ^b | 13.4 ^b | 9.4 ^b |
| Retain ownership or percentage ownership through backgrounding | 5.2 | 5.3 ^a | 6.1 ^a | 3.6 ^a | 5.9 ^a |
| Retain ownership or percentage ownership through finishing and slaughter | 4.2 | 4.6 ^a | 3.8 ^a | 3.5 ^a | 5.7 ^a |
| Other ² | 8.7 | 5.8 | 10.3 | 9.0 | 9.6 |
| (n) | (730) | (248) | (316) | (270) | (159) |
| -----pounds ¹ ----- | | | | | |
| Weight at Weaning | | | | | |
| Steer calves marketed at weaning | 587 | 598 ^a | 596 ^a | 580 ^b | 568 ^b |
| (n) | (742) | (164) | (238) | (224) | (114) |
| Heifer calves marketed at weaning | 543 | 539 ^{a,b} | 552 ^a | 546 ^a | 524 ^b |
| (n) | (693) | (154) | (224) | (207) | (106) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Replacement heifers, sold for breeding stock, production sales, market grassfed, sell as yearlings, summer heifers culled, bull sales, over 120 days

Respondents were also asked about strategies used to increase the value of calves marketed at weaning. Overall, 93 percent of respondents indicated they vaccinated between birth and weaning, with statewide averages ranging from 90 percent in North Dakota to 97 percent in South Dakota (Table 6). Other value-added strategies were used less frequently; however, about half of the respondents indicated vaccinating calves at weaning. More respondents in North Dakota and South Dakota indicated vaccinating calves at weaning (62 and 57 percent, respectively) than the overall average, and Montana and Wyoming vaccinated at weaning less frequently than the overall average (51 and 47 percent, respectively). About one-third of respondents overall fed creep feed/supplements prior to weaning and implemented beef quality assurance practices¹, but for both the responses varied considerably by state. Only 8 percent of respondents in Wyoming fed creep feed/supplements while 42 percent of respondents in North Dakota fed creep feed/supplements; a significant difference. Similarly, only 19 percent of respondents in Montana responded positively when queried about ‘beef quality assurance’ compared to 43 percent of respondents in North Dakota; also a significant difference. There was no statistical difference between South Dakota and Wyoming regarding beef quality assurance (Table 6).

Table 6. Value-added Strategies for Calves Marketed at Weaning, Rancher Survey, 2005

| Activity | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|--|-------------------|---------------------|---------------------|---------------------|
| | -----percent of respondents ¹ ----- | | | | |
| Vaccinations between birth and weaning | 93.4 | 90.3 ^b | 97.1 ^a | 90.6 ^b | 94.8 ^{a,b} |
| Vaccinations at weaning | 54.7 | 61.7 ^a | 57.1 ^{a,b} | 50.9 ^{a,b} | 47.4 ^b |
| Creep feed/supplements prior to weaning | 26.7 | 41.6 ^a | 32.4 ^a | 20.1 ^b | 7.8 ^b |
| Beef quality assurance | 29.2 | 43.5 ^a | 29.4 ^b | 18.7 ^c | 29.3 ^b |
| (n) | (722) | (154) | (238) | (214) | (116) |

¹Means with the same letter are not significantly different. Duncan’s multiple stage test at $\alpha \pm .05$.

Respondents most frequently marketed at least some of their calves at local or regional auctions (Table 7). On average, 81 percent of respondents marketed at least some of their calves at local or regional auctions, with state averages ranging from 66 percent in South Dakota and Montana to 91 percent in North Dakota. The next most frequently reported marketing outlet was order buyers, 19 percent overall. Respondents in Montana more frequently used order buyers than respondents in the other states. Thirty-one percent of respondents in Montana reported using an order buyer compared to only 10 percent in South Dakota, 16 percent in Wyoming, and 20 percent in North Dakota. Respondents in Montana also more frequently used contract sales to market at least some of their calves. Twenty-four percent of respondents in Montana reported marketing at least some of their calves using contract sales compared to 9 percent in South

¹A voluntary producer program designed to promote and strengthen consumer confidence through the use of best managements practices to produce high quality beef.

Dakota and 12 percent in North Dakota and Wyoming. Respondents in Montana and Wyoming more frequently used video sales than their counterparts in North and South Dakota. Twenty percent of respondents in Montana and Wyoming used video sales to market at least some of their calves compared to 10 percent in North and South Dakota (Table 7).

Table 7. Use of Various Marketing Outlets, Rancher Survey, 2005

| Activity | Total | North Dakota | South Dakota | Montana | Wyoming |
|---|---|--------------------|-------------------|-------------------|--------------------|
| Respondents that market at least some of their calves using the following: | | | | | |
| | -----percent of respondents----- | | | | |
| local or regional auction | 81.3 | 91.0 | 65.8 | 65.8 | 78.4 |
| order buyer | 18.9 | 19.7 | 9.6 | 30.5 | 16.5 |
| video sales | 14.4 | 10.2 | 10.5 | 19.3 | 20.4 |
| contract sales | 14.2 | 11.9 | 8.6 | 24.2 | 11.8 |
| other ¹ | 15.3 | 12.3 | 14.1 | 16.7 | 20.4 |
| internet | 2.6 | 4.9 | 0.6 | 2.6 | 2.6 |
| (n) | (977) | (244) | (312) | (269) | (152) |
| Calves marketed at each of the following: | | | | | |
| | -----percent of calves ² ----- | | | | |
| local or regional auction | 59.3 | 63.4 ^b | 76.9 ^a | 37.4 ^d | 55.7 ^c |
| order buyer | 13.7 | 13.7 ^b | 5.5 ^c | 23.5 ^a | 12.4 ^b |
| contract sales | 10.4 | 8.8 ^b | 5.3 ^b | 19.1 ^a | 7.9 ^b |
| video sales | 9.8 | 6.9 ^b | 6.4 ^b | 13.2 ^a | 15.5 ^a |
| other ¹ | 3.7 | 4.6 | 5.6 | 5.9 | 7.3 |
| internet | 1.2 | 2.6 ^a | .2 ^b | .9 ^{a,b} | 1.4 ^{a,b} |
| (n) | (980) | (244) | (312) | (269) | (152) |
| Calves marketed at each of the following: | | | | | |
| | <u>herd size (calves from own cows)</u> | | | | |
| | less than 100 | 100 to 299 | 300 or more | | |
| | -----percent ² ----- | | | | |
| local or regional auction | 76.5 ^a | 55.9 ^b | 38.4 ^c | | |
| order buyer | 8.2 ^b | 16.2 ^a | 17.2 ^a | | |
| contract sales | 7.0 ^a | 10.7 ^a | 11.8 ^a | | |
| video sales | 4.8 ^c | 10.3 ^b | 18.6 ^a | | |
| other ¹ | 3.0 ^b | 5.2 ^b | 11.5 ^a | | |
| internet | 0.3 ^b | 1.5 ^{a,b} | 2.6 ^a | | |
| (n) | | (835) | | | |

¹Other: Packer/buyer, sell bulls, production sales, wholesale/retail, on-grid packing plant, private treaty, feed lot, organic market, word of mouth.

²Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Overall, respondents reported marketing 59 percent of their calves at local or regional auctions; however, there was considerable variation between states. Respondents in South Dakota reported marketing 77 percent of their calves at local or regional auction markets compared to 56 percent in Wyoming, 63 percent in North Dakota, and 37 percent in Montana, all significant differences. A significantly larger percentage of calves were sold using order buyers in Montana (23 percent) than the other states, 12 percent in Wyoming, 13 percent in North Dakota, and only 5 percent in South Dakota. The use of contract sales was also more prevalent in Montana than the other study states -- 19 percent of calves in Montana were marketed via contract sales compared to 5 to 9 percent in the other study states. The difference between Montana and the other states was significant. Video sales were also used to market a significantly greater percentage of calves in Montana and Wyoming (13 and 16 percent, respectively) than in North Dakota and South Dakota (7 and 6 percent, respectively) (Table 7). Reasons for using various marketing outlets were not explored.

Use of the different marketing channels was also examined by herd size (number of calves marketed)(Appendix Table 1). As expected, auction markets were the primary marketing channel for ranchers marketing 100 head of calves or less per year -- 78 percent of this group sold the majority of their calves through auctions. Conversely, only 36 percent of ranchers who marketed 300 head or more annually marketed a majority of their calves through auction markets. Order buyers, contract sales, and video sales were also substantially more popular with larger volume producers than with smaller ones. Twenty-three percent of large ranches (more than 300 calves), marketed 50 percent or more of their calves via video sales compared to only 5.5 percent of those with less than 100 head of calves. Similarly, about 21 percent of large ranches (more than 300 calves) sold the majority of their calves to order buyers and 14 percent sold a majority through contract sales. The differences were all statistically significant by herd size (Appendix Table 1).

Backgrounding and Retained Ownership

Roughly half of the respondents overall backgrounded calves on their own ranch. A somewhat larger percentage of respondents backgrounded calves in North Dakota and South Dakota, 61 and 57 percent compared to 43 and 42 percent in Montana and Wyoming (Table 8). The differences between North and South Dakota were not significant nor were the differences between Montana and Wyoming, but North and South Dakota were significantly different than Montana and Wyoming. Respondents on average retained calves 4.8 months with respondents in Wyoming retaining calves significantly longer than respondents in the other study states, 6.1 months compared to 4 to 5 months in North Dakota, South Dakota, and Montana. Respondents in North Dakota and Montana most frequently retained calves on their own ranch 1 to 3 months, 58 and 48 percent respectively, while respondents in South Dakota and Wyoming most frequently retained calves on their own ranch 4 to 6 months, 44 and 38 percent respectively. Average market weight was 759 pounds with no significant difference between the study states. Respondents in North Dakota, South Dakota, and Montana most frequently marketed calves backgrounded on their own ranch in the 600 to 799 pound range (56-66 percent) while Wyoming respondents most frequently marketed them in the 800 to 999 pound range (47 percent) (Table 8).

Table 8. Backgrounding Calves on Own Ranch, Length of Retention, and Market Weight of Calves Backgrounded on Own Ranch, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|--------------------------------|--|-------------------|-------------------|-------------------|-------------------|
| Background on Own Ranch | -----percent of respondents ¹ ----- | | | | |
| Yes | 51.4 | 61.1 ^a | 56.6 ^a | 42.9 ^b | 41.9 ^b |
| (n) | (180) | (240) | (311) | (268) | (160) |
| Time retain on ranch | | | | | |
| 1-3 months | 44.0 | 58.2 | 36.8 | 47.6 | 25.0 |
| 4-6 months | 36.7 | 32.1 | 44.1 | 30.1 | 38.3 |
| 7-9 months | 11.6 | 7.5 | 13.2 | 10.7 | 18.3 |
| 10-12 months | 6.0 | 1.5 | 3.3 | 9.7 | 16.7 |
| 12 months or more | 1.8 | 0.8 | 2.6 | 1.9 | 1.7 |
| Average months retained | -----number ¹ ----- | | | | |
| (n) | 4.8 | 3.9 ^b | 4.8 ^b | 4.9 ^b | 6.1 ^a |
| | (449) | (134) | (152) | (103) | (60) |
| Market weight | -----percentage of calves----- | | | | |
| 400 - 599 pounds | 6.1 | 5.4 | 3.8 | 7.0 | 13.3 |
| 600 - 799 pounds | 59.9 | 66.1 | 65.4 | 55.8 | 33.3 |
| 800 - 999 pounds | 26.9 | 23.8 | 23.3 | 26.7 | 46.7 |
| 1000 pounds or more | 7.1 | 4.6 | 7.5 | 10.5 | 6.7 |
| Average market weight | -----pounds ¹ ----- | | | | |
| (n) | 759 | 746 ^a | 760 ^a | 766 ^a | 780 ^a |
| | (394) | (130) | (133) | (86) | (45) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Respondents were asked to rank the three most important criteria when selecting feeder calves to retain on their own ranch. The number one consideration was to retain replacement heifers. One hundred and seventy seven of 432 respondents indicated 'retain replacement heifers only' was the number one criteria, and 254 of 432 respondents rated 'retain replacement heifers only' one of the top three criteria for selecting calves to retain (Table 9). Respondents next most frequently indicated the number one criteria was they retained all calves regardless, 101 of 432 respondents. Retention based on current conditions and retention of the lightest calves were the next most frequently cited criteria with 178 and 157 of 432 respondent's respectively indicated they were one of the top three considerations for retention (Table 9).

Table 9. Three Most Important Criteria for Selecting Feeder Calves to Retain, Ranchers that Retain Calves on Own Ranch, Rancher Survey, 2005

| Item | First | Second | Third | Total |
|---------------------------------------|-------------------------------|--------|-------|-------|
| | -----number of responses----- | | | |
| Retain replacement heifers only | 177 | 41 | 36 | 254 |
| Retain based on current conditions | 54 | 65 | 59 | 178 |
| Retain lightest | 56 | 71 | 30 | 157 |
| Retain all calves regardless | 101 | 16 | 15 | 132 |
| Retain based on potential performance | 16 | 47 | 23 | 86 |
| Retain set percentage | 12 | 11 | 27 | 50 |
| Retain heaviest | 1 | 9 | 16 | 26 |
| Other ¹ | 19 | 2 | 13 | 34 |
| | (n) | | | (432) |

¹Other: Bobtail/shortears, buyer's culls, calves turned back from buyer, disaster, feed all or none, lack of facility, unsalable calves, keep middle so like set of calves, feed on hand, cutbacks, all other heifers.

One of the primary goals of the survey was to identify impediments to backgrounding. Accordingly, respondents were asked why they do not retain (background) feeder calves. The two most prevalent reasons were 'drought conditions have created feed shortage' (67 percent) and 'do not have adequate feedlots or capacity' (56 percent) (Table 10). There was no significant difference between the states regarding drought but there were some significant differences between the states regarding feedlot capacity. Significantly more respondents in Wyoming (65 percent) indicated lack of adequate feedlots or capacity than did respondents in North and South Dakota. There was no significant difference between Wyoming and Montana. Just over one- third of respondents overall cited they 'did not want to invest additional resources to develop feedlot space' with a significant difference between South Dakota (32 percent) and Montana (47 percent). Just over a third of respondents also indicated they 'prefer to take profit' with no significant differences between the states. Less than 10 percent overall said they 'lack expertise in nutrition and feed regime' with some differences between the study states. More respondents in Montana and Wyoming (12 and 9 percent, respectively) indicated they lack expertise in nutrition and feed regimes than in North and South Dakota, 4 and 3 percent, respectively. Less than 5 percent of respondents indicated 'they were unable to secure capital' or they 'do not background on their own ranch, but retain a percentage ownership' with no significant differences between the study states (Table 10).

Table 10. Reason For Not Retaining (Background) Calves on Own Ranch or Feedlot After Weaning, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|--|-------|---------------------|---------------------|---------------------|---------------------|
| | | Dakota | Dakota | | |
| -----percent of respondents ^{1, 3} ----- | | | | | |
| Drought conditions have created feed shortages that currently prohibit backgrounding | 66.6 | 62.2 ^a | 69.6 ^a | 63.4 ^a | 72.3 ^a |
| Do not have adequate feedlots or capacity | 55.9 | 47.8 ^b | 50.4 ^b | 60.6 ^{a,b} | 65.1 ^a |
| Do not want to invest additional resource to develop feedlot space | 38.6 | 35.6 ^{a,b} | 31.2 ^b | 47.2 ^a | 38.6 ^{a,b} |
| Prefer to take profit | 35.9 | 31.1 ^a | 32.0 ^a | 41.5 ^a | 37.4 ^a |
| Do not want to expand current farm/ranch enterprise | 28.2 | 22.2 ^b | 24.0 ^{a,b} | 36.6 ^a | 26.5 ^{a,b} |
| Cash flow. Repayment requirement prevent expansion/ranch budget prohibit expansion | 27.3 | 27.8 ^{a,b} | 23.2 ^{a,b} | 34.5 ^a | 20.5 ^b |
| Feed is prohibitively expensive | 26.4 | 18.9 ^b | 24.8 ^{a,b} | 28.2 ^{a,b} | 33.7 ^a |
| Markets too unstable, too much risk | 21.4 | 22.2 ^a | 24.8 ^a | 19.7 ^a | 18.1 ^a |
| Insufficient labor | 21.1 | 22.2 ^a | 20.0 ^a | 24.6 ^a | 15.7 ^a |
| Lack expertise in nutrition and feed regimes | | | | | |
| to feed calves | 7.5 | 4.4 ^b | 3.2 ^b | 12.0 ^a | 9.6 ^{a,b} |
| Do not background on own ranch, but retain a share of ownership | 3.6 | 3.3 ^a | 1.6 ^a | 4.2 ^a | 6.0 ^a |
| Unable to secure capital | 3.6 | 3.3 ^a | 2.4 ^a | 4.9 ^a | 3.6 ^a |
| Other ² | 3.6 | 6.7 | 4.8 | 2.1 | 1.2 |
| (n) | (440) | (90) | (125) | (142) | (83) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Other: Lack of modern equipment, feed storage, fall off-farm job, pending retirement, lose control of overhead, replacements.

³Does not sum to total because of multiple responses.

Larger ranches more often retain some of their calves (Appendix Table 2). More than two-thirds of the ranches with 300 head or more retained some of their calves, compared to 42 percent of those with 100 head or less. There was no relationship between operator age and retaining calves, but operators with post secondary education retained calves more often (55 percent) than their counterparts with high school education or less (47 percent). Also, households that derived 50 percent or more of their household income from livestock sales more often retained calves (55 percent) than their counterparts who were less dependent on livestock for their income (47 percent). The difference was significant (Appendix Table 2).

Relatively few producers indicated that they retain ownership or partial ownership of feeder calves post weaning at a location other than their own farm or ranch, only 4 percent overall. Those who retained ownership through backgrounding generally retained an interest of 90 percent or more (Table 11). Half of the backgrounded calves were sold at a weight of 600 to

799 pounds with 25 percent sold at weights of 800 to 999 pounds. The average number of calves retained was 153 per respondent while the median was 100 suggesting that a few large observation affected the mean value somewhat.

Table 11. Retained Ownership or Partial Ownership of Feeder Calves Through Backgrounding at Other Location, Rancher Survey, 2005¹

| Item | Total |
|---|--|
| | ----percent of respondents ² ---- |
| Retain Ownership Elsewhere¹ | 4.1 |
| North Dakota | 5.7 ^a |
| South Dakota | 2.2 ^a |
| Montana | 4.0 ^a |
| Wyoming | 5.7 ^a |
| (n) | (880) |
| | |
| Retained ownership | ----percentage ownership---- |
| Less than 30 percent | 5.4 |
| 30 - 49 percent | 5.4 |
| 50 - 69 percent | 8.1 |
| 70- 89 percent | 2.7 |
| 90 percent or more | 78.4 |
| Average | 81.3 |
| (n) | (37) |
| | |
| Market weight | -----percent of calves----- |
| 400 - 599 pounds | 9.4 |
| 600 - 799 pounds | 50.0 |
| 800 - 999 pounds | 25.0 |
| 1000 pounds or more | 15.6 |
| Average market weight | 776 |
| (n) | (32) |
| | |
| Number retained | ----percent of respondents---- |
| 1 - 100 | 57.1 |
| 201-300 | 14.3 |
| 301-400 | 9.0 |
| more than 400 | 3.6 |
| Average number retained | 153 |
| Median number retained | 100 |
| (n) | (28) |

¹Calculations include respondents that background only. Does not take into consideration those that retain through finishing and slaughter.

²Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Respondents most frequently indicated the reason they do not retain ownership or partial ownership through backgrounding at another location was they ‘prefer to take profit by marketing rather than retaining’ (60 percent) with no significant difference between study states (Table 12). Between one-third and one-fourth said they ‘lacked experience with retained ownership’, ‘backgrounding calves elsewhere is too risky’, and ‘do not want an addition enterprise’ again with no significant differences in responses between the study states. There were significant differences between the study states on only two statements, ‘cash flow and repayment requirements prevent ...ranch budget does not permit retained/shared ownership’ and ‘no backgrounding lot(s) in my area’. Significantly more respondents in North Dakota and South Dakota indicated cash flow/budget constraints prevented backgrounding at other locations than did respondents in Wyoming. There was also a significant difference between respondents in Wyoming and North Dakota regarding the availability of backgrounding lots, significantly fewer respondents in North Dakota (18 percent) sited availability of backgrounding lots than did respondents in the other study states. Less than 10 percent of respondents indicated that ‘backgrounding calves on shares is prohibitively expensive’ with no significant difference between the states (Table 12).

Table 12. Reasons For Not Retaining All or Partial Ownership of Feeder Calves Backgrounded at Location Other than Farm or Ranch, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|---|-------|---------------------|---------------------|---------------------|-------------------|
| | | Dakota | Dakota | | |
| -----percent of respondents ¹ ----- | | | | | |
| Prefer to take profit by marketing calves rather than retaining them | 59.9 | 56.1 ^a | 58.4 ^a | 63.1 ^a | 63.7 ^a |
| Lack experience with retained ownership | 30.2 | 34.3 ^a | 26.3 ^a | 32.2 ^a | 28.3 ^a |
| Backgrounding calves elsewhere is too risky | 29.5 | 34.3 ^a | 29.4 ^a | 27.6 ^a | 25.2 ^a |
| Do not want an additional enterprise | 27.7 | 25.7 ^a | 25.1 ^a | 32.9 ^a | 27.6 ^a |
| Cash flow and repayment requirements prevent expansion/ranch budget does not permit retained/shared ownership | 26.4 | 33.8 ^a | 27.8 ^{a,b} | 24.3 ^{b,c} | 15.7 ^c |
| No backgrounding lot(s) in my area | 18.5 | 9.1 ^c | 18.8 ^b | 20.1 ^b | 29.9 ^a |
| Backgrounding calves elsewhere is not profitable | 17.0 | 17.7 ^{a,b} | 17.6 ^{a,b} | 11.7 ^b | 23.6 ^a |
| Backgrounding calves on shares is prohibitively expensive | 6.9 | 7.6 ^a | 6.7 ^a | 6.5 ^a | 7.1 ^a |
| Other ² | 9.1 | 11.6 | 9.8 | 8.4 | 4.7 |
| | (n) | | (440) | | |

¹Means with the same letter are not significantly different. Duncan’s multiple stage test at $\alpha \pm .05$.

²Other: Background ourselves, no feed, only keep replacements, labor and time, income deferred, not “family” practical, use own lot

Eleven percent of the respondents indicated that they retain ownership in calves through finishing at an off-ranch location (Table 13). This is in addition to the 4.1 percent that indicated they retain ownership through backgrounding only (Table 11). The percentage of respondents that indicated they retain ownership through backgrounding or backgrounding and finishing is relatively consistent with an earlier question regarding the percentage of calves marketed at various times. Nine percent indicated they market at least some of their calves at finishing and 11 percent indicated they market at least some of their calves after backgrounding (Table 5). State rates varied from 8 percent in Montana to 14 percent in North Dakota, a significant difference. Those who retain through finishing and slaughter retain a majority ownership; 67 percent indicated retaining 91 to 100 percent ownership. Numbers retained through slaughter were larger than numbers retained through backgrounding, averaging 287 head. Sixty-seven percent retain 200 or fewer head, while 13 percent retain ownership of more than 500 head. The median number of head retained was 150, again indicating a few large observation pulled the mean upward (Table 13).

Table 13. Retained Ownership or Partial Ownership of Feeder Calves Through Backgrounding and Finishing to Slaughter, Rancher Survey, 2005

| Item | Total |
|--|--|
| | ----percent of respondents ¹ ---- |
| Respondents that retain ownership through backgrounding and slaughter | |
| | 10.7 |
| North Dakota | 14.2 ^a |
| South Dakota | 9.7 ^{a,b} |
| Montana | 7.7 ^b |
| Wyoming | 12.8 ^{a,b} |
| (n) | (996) |
| Percent retained ownership | -----percent of ownership----- |
| Less than 30 percent | 17.9 |
| 30 - 49 percent | 8.5 |
| 50 - 69 percent | 4.7 |
| 70- 89 percent | 1.9 |
| 90 percent or more | 67.0 |
| Average | 76.1 |
| (n) | (106) |
| Number of calves retained | -----percent of respondents----- |
| 100 or fewer | 41.5 |
| 101-200 | 26.7 |
| 201-300 | 8.9 |
| 301-400 | 3.7 |
| 401-500 | 5.9 |
| more than 500 | 12.9 |
| Average number retained | 287 |
| Median number retained | 150 |
| (n) | (101) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Respondents most frequently indicated the reason they did not retain ownership or partial ownership through slaughter was 'lack of experience with retained ownership' (Table 14); 43 percent of respondents, overall, with no significant differences between the states. Thirty-eight percent indicated they 'did not want an additional enterprise' with significantly more respondents in Montana and Wyoming responding affirmatively (44 percent) to the statement than respondents in North and South Dakota (36 and 31 percent). There were some differences between the states regarding the availability of finishing lots. Overall, one third of respondents

sited availability of finishing lots, but significantly more Wyoming respondents responded positively to the statement (43 percent) than the other study states. There were also some difference between the states regarding cash flow and repayment requirements. Again, about one third of respondents overall cited cash flow and repayment requirements, but significantly fewer respondents in Wyoming responded positively to the statement (23 percent) than the other study states. Less than 10 percent of respondents indicated ‘finishing calves is not profitable’ or ‘finishing on shares is prohibitively expensive’ with no significant differences between the states (Table 14).

Table 14. Reason for Not Retaining All or Partial Ownership of Feeder Calves Through Backgrounding and Finishing to Slaughter, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|---|-------|---------------------|-------------------|-------------------|-------------------|
| | | Dakota | Dakota | | |
| -----percent of respondents ¹ ----- | | | | | |
| Lack experience with retained ownership through finishing | 42.7 | 49.7 ^a | 40.2 ^a | 40.9 ^a | 40.0 ^a |
| Do not want an additional enterprise | 37.9 | 36.1 ^{a,b} | 31.1 ^b | 43.8 ^a | 44.3 ^a |
| Cash flow and repayment requirements prevent expansion | 34.2 | 39.9 ^a | 38.2 ^a | 30.5 ^a | 23.5 ^b |
| No finishing lot(s) in my area | 31.1 | 26.2 ^b | 30.3 ^b | 29.6 ^b | 43.5 ^a |
| Markets are too unstable, too much risk | 31.0 | 28.4 ^a | 33.2 ^a | 31.0 ^a | 30.4 ^a |
| Finishing calves is too risky | 23.7 | 27.3 ^a | 24.1 ^a | 22.2 ^a | 20.0 ^a |
| Finishing calves is not profitable | 7.5 | 8.7 ^a | 8.3 ^a | 3.9 ^a | 10.4 ^a |
| Finishing on share is prohibitively expensive | 7.7 | 10.4 ^a | 6.2 ^a | 6.9 ^a | 7.8 ^a |
| Other ² | 5.7 | 5.5 | 5.4 | 6.4 | 5.2 |
| | (n) | | (744) | | |

¹Means with the same letter are not significantly different. Duncan’s multiple stage test at $\alpha \pm .05$.

²Other: Not enough calves, labor/time, don’t want to change operation, too far from slaughter plant, finish own calves, sell calves in the fall

One potential benefit of retaining an ownership interest in animals is the ability to receive information on their feedlot performance and/or carcass quality. More than two-thirds of the ranchers who retained ownership did receive performance or carcass data. In addition, about 16 percent of the producers who did not retain ownership reported that they received performance and/or carcass data. One potential means for receiving performance or carcass data without retaining ownership at a commercial background or finishing lot would be participation in performance trial programs through University Extension services or similar programs. Of the ranchers who received performance or carcass data (21 percent of respondents), 84 percent reported using this information in making management or marketing decisions (data not shown).

Changes in Cow/Calf Pairs and Changes in Calves Backgrounded, Fed, or Finished

Across the four state area, nearly 50 percent of respondents indicated the number of cow/calf pairs in their herd had declined, on average by one-third (Table 15). There was some variability between states as 64 percent of respondents in Wyoming indicated the number of cow/calf pairs in their herd had declined in the last five years, while only 35 percent of respondents in North Dakota indicated the number of cow/calf pairs in their herd had declined. The average percentage decline was smallest in Montana with an average reduction in cow/calf pairs of 28 percent and largest in Wyoming with an average reduction of 38 percent. The average decline in Wyoming was significantly greater than the average decline in North Dakota and Montana. There was no difference in average decline between Wyoming (38 percent) and South Dakota (35 percent) (Table 15).

Table 15. Changes and Percentage Change in the Number of Cow/Calf Pairs and the Number of Calves Backgrounded, Fed, or Finished Either Partially or Totally on Own Ranch or Elsewhere in the Last Five Years, Rancher Survey, 2005

| Change | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|--------|---------------------|---------------------|-------------------|-------------------|
| -----percent of respondents ¹ ----- | | | | | |
| Cow Calf Pairs | | | | | |
| Decreased | 47.7 | 35.5 | 48.9 | 47.3 | 64.1 |
| Stayed the Same | 28.1 | 32.3 | 28.8 | 28.0 | 20.4 |
| Increased | 23.8 | 31.8 | 21.6 | 24.7 | 15.0 |
| (n) | (1011) | (248) | (319) | (275) | (167) |
| -----percent ¹ ----- | | | | | |
| Average Decrease | 33.0 | 30.6 ^{b,c} | 35.1 ^{a,b} | 28.3 ^c | 38.0 ^a |
| (n) | (468) | (87) | (151) | (129) | (101) |
| Average Increase | 39.2 | 30.8 ^a | 40.1 ^a | 50.0 ^a | 35.2 ^a |
| (n) | (229) | (77) | (65) | (62) | (24) |
| Calves Backgrounded, Fed, or Finished | | | | | |
| -----percent of respondents----- | | | | | |
| Stayed the Same | 46.1 | 47.3 | 42.0 | 55.3 | 36.4 |
| Decreased | 38.2 | 30.5 | 44.1 | 29.9 | 52.7 |
| Increased | 15.7 | 22.3 | 13.9 | 14.7 | 10.9 |
| (n) | (796) | (203) | (245) | (217) | (129) |
| -----percent ¹ ----- | | | | | |
| Average Decrease | 45.5 | 0.6 ^a | 43.9 ^a | 40.6 ^a | 48.5 ^a |
| (n) | (247) | (51) | (88) | (55) | (53) |
| Average Increase | 58.9 | 61.4 ^a | 53.5 ^a | 68.5 ^a | 40.4 ^a |
| (n) | (108) | (41) | (27) | (28) | (12) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Alternately, on average, 24 percent of respondents indicated the number of cow/calf pairs in their herd had increased in the last five years by an average of 39 percent (Table 15). Thirty-two percent of respondents in North Dakota reported an increase in cow/calf pairs in the past five years compared to only 15 percent of Wyoming respondents. While the number of producers that indicated the number of cow/calf pairs had increased varied somewhat between the study states, the average size of increase was consistent across the study states. The average increase was 39 percent with no significant difference between the study states (Table 15).

Roughly half of all respondents indicated the number of calves backgrounded, fed, or finished either partially or totally on their own ranch or elsewhere had not changed in the last five years (46 percent) (Table 15). Thirty-eight percent of respondents indicated the number of calves backgrounded, fed or finished had decreased in the last five years by an average of 45 percent. Variability between states ranged from 53 percent of respondents in Wyoming to 30 percent of respondents in North Dakota that indicated a decline. The overall reduction in the number of calves backgrounded, fed or finished either on their own ranch or elsewhere was 45 percent with no significant differences between the study states. Only 16 percent of respondents indicated the number of calves backgrounded, fed, or finished had increased in the past five years. While the number of respondents reporting increases were moderate, average increases were quite substantial. While average increases ranged from 40 percent in Wyoming to 68 percent in Montana, the differences were not significant (Table 15).

Respondents most frequently indicated drought conditions and an inadequate feed supply as the reason why the number of calves they backgrounded, fed, or finished had declined in the past five years (Table 16). Ninety-one percent of respondents indicated drought conditions forced herd reductions while 54 percent indicated an inadequate feed supply contributed to the decline. While there were some significant differences between states regarding drought conditions, the differences do not diminish the fact that drought conditions influenced a large majority of producers to reduce their herd in the last five years. Inadequate feed was cited as an influence by half the respondents overall, but was cited significantly more often by respondents in South Dakota and Montana (65 and 61 percent) than respondents in North Dakota and Wyoming (42 and 39 percent). Other factors that influenced a decline, such as cash flow restrictions, inadequate labor, stock liquidations, or retirement were cited by respondents far less frequently (12 percent or less).

Table 16. Reasons that Influenced Decision to Increase or Decrease the Number of Calves Backgrounded, Fed, or Finished Either Partially or Totally on Own Ranch or Elsewhere in the Last Five Years, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|--|---------------------|--------------------|--------------------|---------------------|
| | -----percent of respondents ¹ ----- | | | | |
| Influences to Decrease | | | | | |
| Drought conditions forced herd reduction | 91.5 | 83.0 ^b | 95.2 ^a | 93.8 ^a | 91.0 ^{a,b} |
| Inadequate feed supply | 53.7 | 42.4 ^b | 65.1 ^a | 61.5 ^a | 38.8 ^b |
| Cash flow restrictions | 11.9 | 18.6 ^a | 9.7 ^a | 10.8 ^a | 10.4 ^a |
| Loss of leased or rented land | 10.5 | 20.3 ^a | 9.7 ^b | 7.7 ^b | 6.0 ^b |
| Retired, retiring, or semi-retired | 5.8 | 11.9 ^a | 2.9 ^b | 9.2 ^{a,b} | 1.5 ^b |
| Inadequate labor/labor restrictions | 5.8 | 11.9 ^a | 4.8 ^{a,b} | 6.1 ^{a,b} | 1.5 ^b |
| Sold ranch and/or liquidated stock | 2.7 | 3.4 ^a | 1.9 ^a | 3.1 ^a | 3.0 ^a |
| Inadequate or loss of local markets | 0.7 | 0.0 ^a | 1.0 ^a | 1.5 ^a | 0.0 ^a |
| Transferring the operation to a family member or relative | 1.0 | 1.7 ^a | 1.0 ^a | 0.0 ^a | 1.5 ^a |
| Other ² | 6.5 | 8.5 | 2.9 | 12.3 | 4.5 |
| (n) | (294) | (59) | (103) | (65) | (67) |
| Influences to Increase | | | | | |
| Increase in cattle price | 33.9 | 45.4 ^a | 30.3 ^a | 25.8 ^a | 23.1 ^a |
| Increased access to pasture land | 33.9 | 40.9 ^a | 21.2 ^a | 38.7 ^a | 30.8 ^a |
| Expanded feedlot capacity | 23.1 | 36.4 ^a | 27.3 ^a | 25.6 ^a | 10.7 ^a |
| Now have adequate winter feed | 23.1 | 25.0 ^a | 18.2 ^a | 19.3 ^a | 38.5 ^a |
| Developed better marketing and risk management skills | 25.6 | 34.1 ^a | 18.2 ^a | 29.0 ^a | 7.7 ^a |
| Family member or other relative(s) joined farm/ranch operation | 16.5 | 18.2 ^{a,b} | 24.2 ^a | 12.9 ^a | 0.0 ^a |
| Other ² | 19.8 | 13.6 | 30.3 | 12.9 | 30.8 |
| (n) | (121) | (44) | (33) | (31) | (13) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Other: Increase herd, sell bred heifers, quit cows, weather, alliances, saving replacement heifers, government policy on trade, dissatisfied with background lot, lost money in feed lot, diversification, quality of cattle to purchase, grasshoppers.

A number of factors had about equal influence on respondents' decisions to increase the number of calves backgrounded, fed, or finished, with no one or two factors dominant. 'Increased cattle prices' and 'increased access to pasture land' were cited by one-third of respondents as a consideration that influenced their decision to increase the number of calves

backgrounded, fed, or finished, either totally or partially in the last five years (Table 16). Roughly 25 percent indicated ‘better marketing and risk management skills’, ‘expanded feedlot capacity’, and ‘adequate winter feed’ were issues that influenced their decision to increase the number of feeder calves backgrounded, fed, or finished. Sixteen percent indicated the addition of a family member or relative influenced their decision and 19 percent indicated some other reason influenced their decision (Table 16). There were no significant differences between the study states except for the addition of a family member or relative. Significantly more respondents in South Dakota (24 percent) responded positively to the statement than respondents in Wyoming (0 percent) (Table 16).

Respondents were asked about what changes they were considering in the next five years. Respondents most frequently indicated they were considering increasing their cow/calf herd with no significant differences between the study states (Table 17). Overall, 57 percent of respondents indicated they were considering increasing their cow/calf herd. Few respondents (16 percent) indicated decreasing their cow/calf herd was under consideration, again with no significant differences between the study states. Nineteen percent of all respondents indicated they were considering increasing the number of feeder calves backgrounded while 14 percent indicated they were considering increasing the number of feeder calves retained through backgrounding and/or finishing. Respondents in North Dakota and South Dakota more frequently indicated they were considering increasing the number of calves backgrounded than respondents in Montana and Wyoming, 27 and 22 percent in North Dakota and South Dakota, respectively compared to 13 percent in Montana and Wyoming. The differences between North and South Dakota and Montana and Wyoming were statistically significant. Fourteen percent overall indicated considering increasing the number of calves retained through backgrounding and finishing with no significant difference between the states. Twelve percent of respondents overall indicated they were considering liquidating their herd in the next 5 years. Statewide responses regarding herd liquidation ranged from 9 percent in South Dakota to 17 percent in North Dakota, a significant difference (Table 17). Differences between the states are detailed in Table 17.

Table 17. Changes Under Consideration in the Next 5 Years, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|---|--|--------------------|--------------------|---------------------|---------------------|
| Change: | -----percent of respondents ¹ ----- | | | | |
| Increasing my cow/calf herd | 57.3 | 54.5 ^a | 59.5 ^a | 59.5 ^a | 51.3 ^a |
| Increasing the number of feeder calves that I background | 19.5 | 27.3 ^a | 22.4 ^a | 13.8 ^b | 13.2 ^b |
| Decreasing my cow/calf herd | 16.4 | 16.7 ^a | 13.4 ^a | 16.6 ^a | 21.0 ^a |
| Increasing the number of feeder calves that I retain ownership in through backgrounding and /or finishing | 14.5 | 15.8 ^a | 14.1 ^a | 15.4 ^a | 11.8 ^a |
| Liquidating my herd | 12.4 | 16.7 ^a | 9.4 ^b | 11.0 ^{a,b} | 14.6 ^{a,b} |
| Expanding my feedlot capacity | 7.3 | 15.3 ^a | 6.1 ^b | 5.7 ^b | 1.3 ^a |
| Decreasing the number of feeder calves that I background | 3.6 | 4.8 ^{a,b} | 2.2 ^b | 2.4 ^b | 6.6 ^a |
| Switching to or adding other ruminant livestock production | 1.9 | 1.9 ^{a,b} | 1.8 ^{a,b} | 0.8 ^b | 4.0 ^a |
| Decreasing the number of feeder calves that I retain ownership in through backgrounding and /or finishing | 1.8 | 2.9 ^a | 1.8 ^a | 1.2 ^a | 1.3 ^a |
| Other ² | 0.8 | 0.0 | 2.6 | 0.0 | 0.0 |
| (n) | (885) | (209) | (277) | (247) | (152) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Other: Increase number of calves going into seed stock enterprise, depends on weather, taking in pasture cattle, liquidation, transfer ownership, improve genetics, stay the same, retire, use more data for marketing, sheep.

Changes under consideration were also examined by herd size and by producer age and education level (Appendix Table 3). Producers with large herds (300 head of calves or more) more frequently expressed interest in increasing both the number of animals backgrounded on the ranch and the number in retained ownership at an off-ranch location. Producers with 300 head of calves or more were also more frequently considering expansion of feedlot capacity and less frequently considering liquidating the cow herd. However, the differences were statistically significant only for retained ownership at an off-ranch location and liquidation. Fewer older producers (50 and above) were considering increasing their cow herd, more were considering decreasing or liquidation the herd. More operators with some post-secondary education were considering increasing the number of calves backgrounded on the ranch, increasing the number of calves in retained ownership at another location, and expanding feedlot capacity (Appendix Table 3). The differences were significant.

Feed, Forage, and Land Use

Winter forage across the study area was predominantly from hay (grass or alfalfa). Respondents indicated about 60 percent of winter forage for their cow herd and for backgrounding calves was from hay (grass or alfalfa) with virtually no differences between states (Table 18). Winter grazing native ranges or non-native pastures was the next most frequently cited source of winter forage (20 percent) with substantial variation between states. Respondents in Wyoming indicated 30 percent of winter forage was from winter grazing compared to only 8 percent in North Dakota with South Dakota and Montana reporting about 20 percent of winter grazing from native range or non-native pastures. The differences were significant except between South Dakota and Montana. Small grain hay (oats, barley, wheat) was more frequently used as a source of winter forage in North Dakota, 20 percent compared to only 10 percent in South Dakota and Montana and 4 percent in Wyoming. Differences were significant except between South Dakota and Montana. Remaining sources of winter forage (silage or haylage, post harvest grazing of corn stalks or stubble fields, aka crop aftermath) combined to provide 10 percent or less of winter forage (Table 18).

Table 18. Source of Winter Forage for Cow Herd and Backgrounding Calves, Rancher Survey, 2005

| Forage | Total | North | South | Montana | Wyoming |
|--|-------|-------------------|-------------------|-------------------|-------------------|
| | | Dakota | Dakota | | |
| percent ¹ | | | | | |
| Hay, grass or alfalfa | 59.9 | 60.1 ^a | 58.9 ^a | 60.3 ^a | 60.9 ^a |
| Winter grazing native range or non-native pastures | 19.9 | 8.1 ^c | 22.7 ^b | 20.9 ^b | 30.2 ^a |
| Small grain hay (oats, barley, wheat) | 11.2 | 19.5 ^a | 9.8 ^b | 9.8 ^b | 4.2 ^c |
| Silage or haylage | 5.9 | 7.6 ^a | 4.1 ^b | 5.0 ^b | 2.7 ^b |
| Post harvest grazing of cornstocks, stubble fields | 2.4 | 3.1 ^a | 2.7 ^a | 2.3 ^a | 0.9 ^b |
| Other ² | 1.5 | 1.6 | 1.7 | 1.6 | 1.0 |
| (n) | (986) | (241) | (308) | (272) | (163) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Other: Cowcake, sudan grass hay, corn, by-products, range cubes, straw, CRP, peas, millet, protein pellets

Use of salt and trace mineral mix supplements was consistent throughout the study area. Roughly 90 percent of respondents indicated using salt with no significant differences between states (Table 19). Eighty-four percent of respondents indicated using trace mineral mix. Responses were similar in North Dakota, South Dakota, and Montana with significantly fewer respondents in Wyoming (73 percent) using trace mineral mix than the other study states. About two-thirds of respondents indicated using protein supplement (e.g., cake), but there was some variability between states. Significantly fewer respondents in North Dakota (58 percent) used protein supplements than respondents in South Dakota (73 percent) and Montana (70 percent). Corn was used more frequently as a feed supplement by North Dakota (39 percent) and South Dakota respondents (45 percent) than in Montana (23 percent) and Wyoming (18 percent). The differences were significant. Barley was also used by significantly more respondents in North Dakota than the other study states, 30 percent compared to 3 percent in Wyoming, 7 percent in

South Dakota and 15 percent in Montana (Table 19). Use of liquid feed supplements was similar across the study area, roughly 24 percent of respondents, with no significant difference between study states (Table 19).

Table 19. Use of Various Types of Feed Supplements, Rancher Survey, 2005

| Supplement | Total | North | South | Montana | Wyoming |
|--|--------|-------------------|-------------------|-------------------|---------------------|
| | | Dakota | Dakota | | |
| -----percent of respondents ¹ ----- | | | | | |
| Salt | 92.0 | 92.7 ^a | 93.5 ^a | 89.0 ^a | 92.2 ^a |
| Trace mineral mix | 83.8 | 85.1 ^a | 83.8 ^a | 89.3 ^a | 72.5 ^b |
| Protein supplement (e.g. cake) | 67.2 | 58.5 ^b | 72.6 ^a | 70.1 ^a | 64.7 ^{a,b} |
| Corn | 33.2 | 38.7 ^a | 45.3 ^a | 23.5 ^b | 18.0 ^b |
| Liquid feed supplements | 23.5 | 23.8 ^a | 23.9 ^a | 22.8 ^a | 23.9 ^a |
| Barley | 14.2 | 29.8 ^a | 7.4 ^c | 15.0 ^b | 3.0 ^c |
| Other ² | 15.0 | 21.4 | 13.0 | 13.5 | 11.4 |
| (n) | (1020) | (248) | (322) | (281) | (167) |

¹Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

²Other: Oats, by-products, corn gluten, distillers grain, flax, screenings, sunflower pellets, crystelyx, cattle-prep mineral, peas, rolled grain, soybean hulls, molasses, milo, lick tub, wheat midds, DDG

Native rangeland was the predominate type of land used by respondents in their farm and ranch operation. On average, respondents used about 7,400 acres of native rangeland, either owned or leased with quite a bit of variability between the states. Respondents in North Dakota used on average 2,900 acres of rangeland compared to over 13,000 in Wyoming, 9,600 in Montana and 5,600 in South Dakota (Table 20). The means were all significantly different between study states. While Wyoming ranchers' acreage of native rangeland was substantially higher than the other states, they used less of all of the other land types than their counterparts in the other study states.

Alfalfa or alfalfa-grass hayland acres were a distant second to native rangeland in all study states with respondents using on average 330 acres of alfalfa or alfalfa-grass hayland. South Dakota ranchers used a significantly greater number of acres of alfalfa or alfalfa-grass hayland with on average 418 acres compared to approximately 300 acres in North Dakota and 275 in Montana and Wyoming. North Dakota ranchers used significantly more cropland for cash crops in their farm/ranch operation than the other study area states, on average 488 acres compared to 25 acres in Wyoming, 228 in South Dakota and 336 in Montana. Further, significantly more acres were devoted to cropland for feed/forage production in South and North Dakota (roughly 200 acres each), compared to 121 in Montana and only 60 acres in Wyoming. Use of seeded pasture also varied considerably. Wyoming used significantly less than Montana and North Dakota, 100 acres compared to 250 acres in North Dakota and 315 acres in Montana.

Total acres used in farm and ranch operations was on average 8,740 acres across the study area with variation in per-state totals roughly proportionate to the variation in native rangeland by state. Average total acres for North Dakota was about 4,400 acres, compared to about 7,400 acres in South Dakota, 10,600 acres in Montana, and over 14,000 acres in Wyoming (Table 20).

Table 20. Land Types Used in Farm/Ranch Operation, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|--|-------|--------------------|--------------------|--------------------|---------------------|
| | | Dakota | Dakota | | |
| -----acres per respondent ¹ ----- | | | | | |
| Land Type | | | | | |
| Native rangeland (owned or leased) | 7,396 | 2,859 ^d | 5,575 ^c | 9,590 ^b | 13,679 ^a |
| Alfalfa or alfalfa-grass hayland | 330 | 314 ^b | 418 ^a | 278 ^b | 276 ^b |
| Cropland for cash crops | 285 | 488 ^a | 228 ^b | 336 ^b | 25 ^c |
| Seeded pasture | 215 | 250 ^{a,b} | 164 ^{b,c} | 315 ^a | 100 ^c |
| Cropland for feed/forage production | 159 | 229 ^a | 193 ^a | 121 ^b | 60 ^c |
| Native hayland | 86 | 50 ^b | 126 ^a | 76 ^{a,b} | 83 ^{a,b} |
| Other ² | 53 | 43 | 82 | 55 | 10 |
| Total Acres | 8,740 | 4,368 | 7,415 | 10,628 | 14,435 |
| (n) | | | (953) | | |
| -----percent of acres----- | | | | | |
| Ownership | | | | | |
| Deeded land | 60.3 | 53.5 | 64.7 | 60.2 | 62.7 |
| Leased from private parties | 21.4 | 30.2 | 20.8 | 16.7 | 17.4 |
| Leased State land | 4.3 | 3.3 | 2.9 | 5.0 | 6.7 |
| Leased Federal land | 8.4 | 7.0 | 4.3 | 13.0 | 10.6 |
| Leased tribal, trust or other | | | | | |
| Reservation land | 4.0 | 3.9 | 6.4 | 3.2 | 0.7 |
| Other ¹ | 0.4 | 0.3 | 0.3 | 0.6 | 0.6 |
| (n) | (954) | (230) | (300) | (261) | (161) |

¹Means with the same letter are not significantly different.

²Other: barnyard, CRP, millet, full grazing, native rangeland, old crested wheat grass, Forest Service, summer fallow, wasteland.

Deeded land made up the greatest proportion of land used across the study area (60 percent) ranging from 54 percent in North Dakota to 63 percent in Wyoming (Table 20). Leases from private parties made up most of the rest of land used in farm and ranch operations by land ownership type. Overall 21 percent of land was leased from private parties with private land leases slightly more prevalent in South and North Dakota than in Wyoming and Montana and ranged from 30 percent in North Dakota to 21 percent in South Dakota and 17 percent in Montana and Wyoming. Alternately, State and Federal land leases were more prevalent in Wyoming and Montana, 18 percent, compared to North and South Dakota, 10 percent and 7 percent, respectively (Table 20).

Respondents were also asked if they have ever considered converting cropland from cash grain to forage production. While just over a third (38 percent) indicated they had considered converting cropland to forage production, there was considerable variation between the states (Table 21). Fifty-five percent of respondents in North Dakota indicated they had considered

converting cropland to forage production compared to only 14 percent in Wyoming, and 35 and 39 percent respectively in Montana and South Dakota, a significant difference. Considering the differences between North Dakota and Wyoming in terms of cash crops acreages, 488 acres in North Dakota compared to 25 acres in Wyoming, divergent responses regarding conversion of cropland to forage production are consistent with land types used in ranch operations in North Dakota and Wyoming. Respondents in South Dakota and Montana were both split about 60-40, 60 percent indicated they had not considered converting cropland from cash grain to forage production or some combination and 40 percent that had. Respondents most frequently indicated they had not considered converting cropland to forage because they had no need for additional feed as they did not background calves (39 percent). Twelve percent of respondents overall indicated ‘support programs are better for grains than for livestock’ and ‘cash grain is more profitable than forage production’ with some variation between states. Less than 10 percent of respondents indicated they had ‘no way to store forage or feed grain’ or that ‘storing forage or feed grain is prohibitively expensive’ (Table 21). Differences between states are detailed in Table 21.

Table 21. Conversion of Cropland to Forage Production, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|---|--|-------------------|---------------------|--------------------|-------------------|
| Considered converting cropland from cash grain to forage production or some combination of cash grain and forage production? | -----percent of respondents ¹ ----- | | | | |
| NO | 62.5 | 45.1 | 60.7 | 65.4 | 86.3 |
| YES | 37.5 | 54.9 ^a | 39.3 ^b | 34.6 ^b | 13.7 ^c |
| (n) | (877) | (213) | (272) | (246) | (146) |
| If NO why not: | | | | | |
| No need for additional feed, I do not background calves | 39.1 | 43.6 ^a | 40.0 ^{a,b} | 44.1 ^a | 28.1 ^b |
| Support programs are better for grains than for livestock | 11.7 | 28.2 ^a | 10.4 ^b | 8.7 ^b | 4.2 ^b |
| Cash grain is more profitable than forage production | 11.4 | 21.8 ^a | 14.1 ^{a,b} | 8.7 ^{b,c} | 3.1 ^c |
| No way to store forage or feed grain | 9.8 | 1.3 ^a | 9.6 ^b | 11.8 ^b | 14.6 ^b |
| Storing forage or feed grain is prohibitively expensive, not cost-effective | 3.7 | 3.8 ^a | 3.0 ^a | 4.7 ^a | 3.1 ^a |
| Other ² | 46.0 | 32.1 | 42.2 | 44.9 | 64.2 |
| (n) | (435) | (78) | (135) | (127) | (96) |

¹Means with the same letter are not significantly different. Duncan’s multiple stage test at $\alpha \pm .05$.

²Other: Cheaper to buy own feed, not cropland or grain crops, ground is not suitable, full-time off farm job, dryland, cost of leasing too high, currently in forage, time/money.

Issues and Attitudes

Respondents were asked a series of questions related to raising, backgrounding, and finishing feeder calves (Table 22). Respondents were asked to indicate their level of agreement with various statements using a 1 to 5 scale where 1 is strongly disagree and 5 is strongly agree.

Respondents most frequently agreed with the statements that ‘the availability of feed and forage is the biggest impediment to retaining feeder calves’ (62 percent) and ‘I would be willing to background feeder calves if it would increase my net revenue’ (60 percent). On two issues, ‘weather conditions ...drought...prohibit retaining feeder calves at my location’, and ‘I would prefer to use available feed and forage to expand my cow herd rather than background feeder calves’, more than 50 percent of respondents overall agreed. There was also general disagreement among respondents on several issues. Only 10 percent of respondents overall agreed with the statement ‘I do not background calves because there is no specialty finishing lot to market a larger calf in my area’. Only 5 percent of respondents in North Dakota agreed with the statement compared to 18 percent of respondents in Wyoming. Responses to issues and attitude questions per state are detailed in Table 22.

An average score was calculated to allow for a comparison of responses in issues and attitudes questions by state (Table 23). Respondents generally agreed with the statements: ‘availability of forage and feed is the biggest impediment I have to retaining feeder calves’, ‘weather conditionsprohibit retaining feeder calves at my location’, ‘I prefer to use available feed and forage resources to expand my cow herd rather than background feeder calves’, and ‘I would be willing to background feeder calves if it would increase my net revenue’ with average scores of 3.6, 3.6, 3.6, and 3.5 respectively. While respondents in each state generally agreed with the statements, respondents in Wyoming more strongly agreed with statements related to the availability of feed and forage and weather conditions (average score 4.0) than did respondents in Montana and North Dakota (3.5 and 3.6). The differences were significant. Respondents in North Dakota more strongly agreed with the statement related to willingness to background if it would increase net income than Montana and Wyoming with an average score of 3.8 compared to scores ranging from 3.3 to 3.5. The differences were significant. Respondents in Wyoming and South Dakota (average score 3.7) more strongly agreed with the statement related to using any available feed to expand their cow herd than did respondents in North Dakota (average score 3.4) and Montana (average score 3.6). Again the differences were significant.

Table 22. Respondents Opinions on Various Issues Related to Backgrounding Feeder Calves, Rancher Survey, 2005

| Statement or Issue | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|---|-----------------|-----------------|---------|---------|
| | -----percent of respondents that agree or strongly agree----- | | | | |
| The availability of forage and feed is the biggest impediment I have to retaining feeder calves. | 61.7 | 54.5 | 63.6 | 61.3 | 70.0 |
| I would be willing to background feeder calves if it would increase my net revenue. | 60.1 | 68.2 | 61.3 | 53.0 | 57.0 |
| Weather conditions, such as drought, winter weather, lack of water, etc. prohibit retaining feeder calves at my location. | 57.8 | 45.1 | 60.8 | 58.8 | 69.9 |
| I prefer to use available feed and forage resources to expand my cow herd rather than background feeder calves. | 57.3 | 47.0 | 61.2 | 57.8 | 65.5 |
| I do not have enough labor to expand my current operation to include backgrounding feeder cattle. | 45.0 | 40.4 | 42.1 | 49.8 | 49.3 |
| The cost of expanding my operation to background cattle is prohibitively high and not cost effective. | 40.7 | 37.5 | 41.1 | 42.4 | 49.7 |
| Market volatility makes retaining and backgrounding feeder calves too risky. | 39.5 | 34.9 | 41.5 | 41.1 | 40.0 |
| Regardless of net returns, I am not interested in retaining ownership in feeder calves. | 32.1 | 31.1 | 28.0 | 36.4 | 34.7 |
| Regardless of net returns, I am not interested in backgrounding feeder calves. | 29.6 | 23.6 | 26.3 | 36.2 | 33.8 |
| I would be willing to build or expand feedlot capacities for backgrounding feeder calves if cost share funds were available. | 22.7 | 34.5 | 24.1 | 19.0 | 13.6 |
| I do not have enough expertise in appropriate feed and forage regimes to retain and background feeder calves. | 27.2 | 17.8 | 24.9 | 33.6 | 35.5 |
| I am interested in retaining full or partial ownership of calves through finishing at a feedlot elsewhere. | 21.5 | 21.6 | 19.4 | 21.5 | 25.3 |
| I am interested in retaining full or partial ownership of calves through backgrounding at a feedlot elsewhere. | 18.4 | 15.9 | 15.1 | 19.6 | 28.7 |
| I cannot secure adequate financing/ranch budget prohibits backgrounding feeder calves. | 16.4 | 19.4 | 16.6 | 29.0 | 14.0 |
| I do not background calves because there is no specialty finishing lot to market a larger calf in my area. | 9.5 | 4.7 | 7.5 | 11.1 | 18.0 |
| (n) | (953) | (238) | (298) | (268) | (154) |

Table 23. Respondent Perceptions on Various Issues Related to Backgrounding Feeder Calves and other Related Issues, Rancher Survey, 2005

| Item | Total | North | South | Montana | Wyoming |
|--|-------|------------------|-------------------|-------------------|-------------------|
| | | Dakota | Dakota | | |
| -----average score ^{1,2} ----- | | | | | |
| The availability of forage and feed is the biggest impediment I have to retaining feeder calves. | 3.6 | 3.5 ^b | 3.7 ^{ab} | 3.6 ^b | 4.0 ^a |
| Weather conditions, such as drought, winter weather, lack of water, etc. prohibit retaining feeder calves at my location. | 3.6 | 3.3 ^c | 3.6 ^{ab} | 3.5 ^{bc} | 3.9 ^a |
| I prefer to use available feed and forage resources to expand my cow herd rather than background feeder calves. | 3.6 | 3.4 ^b | 3.7 ^a | 3.6 ^{ab} | 3.7 ^a |
| I would be willing to background feeder calves if it would increase my net revenue. | 3.5 | 3.8 ^a | 3.5 ^{ab} | 3.3 ^b | 3.4 ^b |
| I do not have enough labor to expand my current operation to include backgrounding feeder cattle. | 3.2 | 3.0 ^a | 3.1 ^a | 3.3 ^a | 3.3 ^a |
| Market volatility makes retaining and backgrounding feeder calves too risky. | 3.2 | 3.1 ^a | 3.3 ^a | 3.2 ^a | 3.2 ^a |
| The cost of expanding my operation to background cattle is prohibitively high and not cost effective. | 3.2 | 3.0 ^b | 3.2 ^b | 3.2 ^{ab} | 3.5 ^a |
| Regardless of net returns, I am not interested in retaining ownership in feeder calves. | 2.9 | 2.7 ^a | 2.8 ^a | 3.0 ^a | 2.9 ^a |
| I do not background calves because there is no specialty finishing lot to market a larger calf in my area. | 2.8 | 2.5 ^b | 2.9 ^{ab} | 2.9 ^{ab} | 3.1 ^a |
| Regardless of net returns, I am not interested in backgrounding feeder calves. | 2.8 | 2.6 ^c | 2.7 ^{bc} | 3.1 ^a | 2.9 ^{ab} |
| I do not have enough expertise in appropriate feed and forage regimes to retain and background feeder calves. | 2.7 | 2.5 ^c | 2.7 ^{bc} | 2.9 ^{ab} | 2.9 ^a |
| I would be willing to build or expand feedlot capacities for backgrounding feeder calves if cost share funds were available. | 2.6 | 3.0 ^a | 2.6 ^b | 2.4 ^{bc} | 2.2 ^c |
| I cannot secure adequate financing/ranch budget prohibits backgrounding feeder calves. | 2.5 | 2.6 ^a | 2.6 ^a | 2.4 ^a | 2.4 ^a |
| I am interested in retaining full or partial ownership of calves through backgrounding at a feedlot elsewhere. | 2.5 | 2.4 ^b | 2.5 ^{ba} | 2.4 ^b | 2.8 ^a |
| I am interested in retaining full or partial ownership of calves through finishing at a feedlot elsewhere. | 2.6 | 2.5 ^a | 2.6 ^a | 2.5 ^a | 2.6 ^a |
| (n) | (946) | (236) | (297) | (263) | (151) |

¹Average score based on a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree.

²Means with the same letter are not significantly different. Duncan's multiple stage test at $\alpha \pm .05$.

Respondents were generally neutral on statements related to the availability of labor to expand operations, market volatility making retaining feeder calves too risky, and lack of interest in backgrounding regardless of net returns, with no significant difference between study states. On several other issues respondents overall were generally neutral but there were some differences between the states. For example respondents were generally neutral on the statement ‘cost of expanding.....is prohibitively expensive’, but the average score of respondents in Wyoming (3.5) was significantly higher than the average score of respondents in North and South Dakota (3.0 and 3.2, respectively). Respondents generally disagreed with the statements ‘inadequate financing/ranch budget prohibits backgrounding’ and ‘they were interested in retaining full or partial ownership of calves through finishing’ with no significant difference between the study states. While respondents overall also generally disagreed with the statement ‘I am interested in retaining full or partial ownership of calves at a feedlot elsewhere’ there were some differences between the study states. The average score was slightly lower for respondents in North Dakota and Montana 2.4 than for respondents in South Dakota and Wyoming, 2.5 and 2.8 respectively. There was no difference in scores between North Dakota and Montana or South Dakota and Wyoming, but North Dakota and Montana scores were significantly different than South Dakota and Wyoming. Average scores and difference in average scores are detailed in Table 23.

Responses to issues questions also were examined by herd size, by operator age, and by operator education. Larger operators (300 head of calves or more) were more likely to agree with the statement, ‘they would background if it increased net revenue, ‘that they were interested in backgrounding at an off-ranch location’, and ‘that they were interested in finishing animals elsewhere’ (Appendix Table 4). Larger operators (300 head of calves or more) were less likely to see weather conditions as an obstacle to backgrounding, to feel they lacked expertise in feeding, or to see financing as a constraint. They were much less likely to agree that they were not interested in backgrounding or retained ownership, compared to ranchers with smaller herds (Appendix Table 3). Differences were statistically significant.

Younger ranchers more frequently agreed or strongly agreed with the statement ‘likely to be more interested in backgrounding if it increased net revenue’ and ‘would build a feedlot if cost share funds were available’ than older producers. They were less likely to agree that they lack labor to background or that they are not interested in backgrounding, regardless of returns. Ranchers with post secondary education were more likely to be interested in building a feedlot, if cost share funds were available. They were less likely to agree that they lack expertise in feed and forage regimes that they cannot secure financing, or that they are not interested in backgrounding or retaining ownership regardless of return. They more frequently agreed that they are interested in finishing elsewhere (Appendix Table 4).

Outreach

Because of the outreach component of the Four-State Ruminant consortium, respondents were asked to prioritize information needs and indicate in what form they would prefer to receive information. Responses will help outreach and extension personnel design and deliver

programs that best address the information needs of ranchers in the study area. Respondents most frequently (63 percent) expressed an interest (either responded ‘interested’ or ‘very interested’) in information on ‘balancing feed rations’ (Table 24). Roughly half of the respondents indicated an interest in ‘alternate forage production options’, ‘economics of alternate forage production options’, ‘marketing strategies...’ and ‘economics of alternate weaning dates’. Respondents were least interested (either disinterested or very disinterested) in information on ‘retaining ownership of calves at alternate locations other than own ranch’ (43 percent) and ‘“ag-bags” and other feed storage systems’ (42 percent) (Table 24).

Table 24. Participants Preference for Information on Various Issues Related to Beef Cattle Production, Backgrounding Feeder Calves and other Related Issues, Rancher Survey, 2005

| Item | Average Score ¹ | Interested/ | | Disinterested/ |
|---|----------------------------|-----------------|---------|--------------------|
| | | Very Interested | Neutral | Very Disinterested |
| -----percent of respondents ¹ ----- | | | | |
| Balancing feed rations | 3.6 | 62.6 | 23.4 | 13.9 |
| Marketing strategies, futures, options, forward contracting, etc. | 3.4 | 54.4 | 21.7 | 23.9 |
| Economics of alternative forage production options | 3.4 | 54.4 | 24.9 | 20.6 |
| Alternative forage production options (e.g., haylage) and methods | 3.2 | 51.3 | 25.2 | 23.5 |
| Economics of alternative weaning dates (e.g., early weaning) | 3.3 | 49.7 | 29.2 | 21.1 |
| Economics of alternative calving dates | 3.2 | 43.5 | 29.2 | 27.3 |
| Production practices and economics of feeder calf backgrounding | 3.2 | 46.5 | 30.7 | 22.8 |
| Buying replacement heifers vs. raising replacement heifers | 3.1 | 43.7 | 21.3 | 35.0 |
| Ultra sounding for backfat | 2.9 | 31.0 | 37.1 | 31.9 |
| “Ag-bags” and other feed storage systems | 2.7 | 24.1 | 33.5 | 42.4 |
| Retaining percentage ownership of calves at a location other than my ranch or feedlot | 2.7 | 30.2 | 26.7 | 43.1 |
| Other ² | 4.6 | 86.3 | 9.0 | 4.5 |
| | (n) | (978) | | |

¹Average score based on a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree.

²Other: Equipment costs, ultra sound, low cost production methods, production software, nutritional information, marketing, record keeping, managing during drought, finishing at own location, animal health.

The topics of interest were also examined by herd size and management approach. Producers with larger herds generally expressed significantly higher levels of interest in virtually all of the topics listed (Appendix Table 5). The only exceptions were ‘“Ag-bags” and other feed storage alternatives’ and ‘buying vs. raising replacement heifers’. Another grouping of ranchers

examined were those who receive performance and carcass data for their animals versus those who do not. As mentioned previously, about 21 percent of producers receive this data for some or all of their animals. This group expressed significantly higher levels of interest in almost every topic area. The only exceptions were 'economics of alternative calving dates' and 'buying replacement heifers' (Appendix Table 5).

Two other groupings of ranchers were examined: (1) those who sell some or all of their calves at weaning and (2) those who retain some of their calves on the ranch. Those who market some of their calves at weaning were less interested in information on all topic areas listed, and the differences were significant in most cases. Those who retain some or all of their calves on the ranch expressed significantly higher levels of interest in all topic areas 'except economics of alternative calving dates' and 'buying replacement heifers' (Appendix Table 5).

Ranchers in the study area most frequently indicated they were interested in receiving information by 'pamphlet or bulletin...through local Extension office...' (56 percent either interested or very interested) (Table 25). Just under half indicated they were interested in 'on-site demonstrations and tours' (48 percent), 'half-day conferences or seminars' (46 percent), or 'testimonials from other producers' (44 percent). Thirty-eight percent indicated they were interested in 'personal visits and one-on-one site visits...'. Respondents were nearly evenly split regarding their interest in receiving information using 'decision support software..', 'internet or website/online information', or 'e-mail notifications...' with roughly one third each interested, neutral, and disinterested. Less than 30 percent of respondents were interested in 'full-day conferences or seminars' or 'multi-media...on CD-ROM or the internet' (Table 25).

Preferences for the different forms of information were examined by herd size and by operator age and education (Appendix Table 6). Ranchers with larger herds (300 head or more) generally expressed higher levels of interest in each of the communication media listed. These differences were statistically significant, except for 'pamphlet or bulletin' and 'decision support software'. When preferences were compared by age, the only significant differences were for 'multi-media presentations' and 'decision support software'. Ranchers over 50 years old were less frequently interested in multi-media presentations and decision support software. When compared by educational level, operators with post secondary education had a higher level of preference for 'multi-media presentations', 'full-day conferences', 'Internet or website', and 'decision support software' (Appendix Table 6).

Table 25. Preferred Method of Receiving Information on Various Issues Related to Beef Cattle Production, Backgrounding Feeder Calves and other Related Issues, Rancher Survey, 2005

| Item | Average | Interested/ | Dis-interested/ | |
|---|---------|-----------------|-----------------|---------------------|
| | Score | Very Interested | Neutral | Very Dis-interested |
| -----percent of respondents----- | | | | |
| Pamphlet or bulletin available through the local Extension office or county agent | 3.4 | 56.0 | 28.1 | 15.9 |
| On-site demonstrations and tours | 3.2 | 47.7 | 30.6 | 21.7 |
| Half-day conferences or seminars | 3.2 | 46.4 | 30.6 | 22.9 |
| Testimonials from other producers | 3.2 | 44.2 | 36.2 | 19.6 |
| Personal visits and one-on-one on-site visits by local Extension personnel and other livestock production experts | 3.1 | 38.4 | 34.5 | 27.0 |
| Decision support software, such as spread sheets, worksheets, decision models | 2.9 | 35.8 | 28.1 | 36.0 |
| Internet or website/online information | 2.9 | 35.0 | 27.2 | 37.7 |
| E-mail notifications of field days, demonstration projects, new research, and other relevant information | 2.8 | 30.6 | 29.5 | 39.9 |
| Full-day conferences or seminars | 2.8 | 28.1 | 37.1 | 34.7 |
| Multi-media demonstrations/presentation on CD-ROM or the internet | 2.9 | 28.0 | 35.6 | 36.5 |
| (n) | | | (978) | |

Demographics

Respondents' average age was 54 years with little variation between the study states (Table 26). Wyoming ranchers were just slightly older on average at 57 years. Respondents were generally long time ranchers, ranching on average 29 years. Again there was little variation between states. Respondents had most frequently been ranching for 21 to 30 years (33 percent) ranging from 26 percent in Wyoming to 35 percent in North Dakota. Only 10 percent of respondents overall had been ranching for less than 10 years with some variation between the states. Seven percent of respondents in North Dakota had been ranching for less than 10 years compared to 9 percent in South Dakota, 12 percent in Montana, and 13 percent in Wyoming (Table 26). Most respondents ranch only in their home county (70 percent) while 30 percent indicated they have ranch operations in counties other than their home county (data not shown). Sixty-three percent of respondents operate their ranch with a family member or relative and just over half (53 percent) indicated they plan to transfer their farm/ranch operation to their children or other family member (data not shown).

Table 26. Age, Years Operating Ranch, Net Farm/Ranch and Total Net Household Income, by State, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|----------------------------------|-----------------|-----------------|---------|---------|
| | -----number----- | | | | |
| Years operating ranch | 28.6 | 28.1 | 28.9 | 27.8 | 30.3 |
| Average Age of rancher | 54.3 | 52.6 | 53.8 | 54.3 | 57.4 |
| (n) | (1,010) | (250) | (314) | (278) | (168) |
| Number of years operating ranch | -----percent of respondents----- | | | | |
| 1 to 10 | 9.8 | 6.8 | 8.6 | 11.9 | 13.1 |
| 11 to 20 | 19.1 | 22.0 | 19.1 | 19.4 | 13.7 |
| 21 to 30 | 33.2 | 35.2 | 34.7 | 34.7 | 26.2 |
| 31 to 40 | 21.1 | 25.2 | 20.4 | 16.9 | 23.2 |
| 41 to 50 | 12.3 | 7.6 | 13.1 | 12.6 | 17.9 |
| more than 50 | 4.5 | 3.2 | 4.1 | 5.0 | 5.9 |
| (n) | (1012) | (250) | (314) | (278) | (168) |
| Net farm/ranch income | | | | | |
| net loss | 6.3 | 7.6 | 5.4 | 6.5 | 5.7 |
| 0 to 25,000 | 34.7 | 34.7 | 36.4 | 32.6 | 34.2 |
| 25,001 to 50,000 | 25.4 | 30.1 | 22.1 | 25.3 | 25.3 |
| 50,001 to 75,000 | 11.8 | 11.0 | 14.0 | 11.5 | 9.5 |
| 75,001 to 100,000 | 6.8 | 3.8 | 11.4 | 5.0 | 5.7 |
| 100,001 to 125,000 | 4.0 | 3.0 | 3.3 | 4.6 | 5.7 |
| 125,001 to 150,000 | 2.4 | 1.3 | 2.0 | 2.7 | 4.4 |
| more than 150,000 | 8.6 | 8.5 | 5.4 | 11.9 | 9.5 |
| (n) | (956) | (236) | (299) | (261) | (158) |
| Total net household income | | | | | |
| net loss | 4.4 | 5.5 | 5.4 | 3.8 | 1.9 |
| 0 to 25,000 | 18.9 | 19.2 | 21.1 | 17.6 | 15.4 |
| 25,001 to 50,000 | 27.1 | 29.4 | 23.8 | 28.7 | 27.6 |
| 50,001 to 75,000 | 17.2 | 18.7 | 17.1 | 17.2 | 15.4 |
| 75,001 to 100,000 | 12.3 | 11.5 | 13.4 | 10.3 | 14.1 |
| 100,001 to 125,000 | 6.4 | 3.0 | 8.0 | 7.7 | 6.4 |
| 125,001 to 150,000 | 3.3 | 3.4 | 3.4 | 1.9 | 5.1 |
| more than 150,000 | 10.5 | 9.4 | 7.7 | 12.6 | 14.1 |
| (n) | (952) | (235) | (298) | (261) | (156) |

Roughly two-thirds of respondents in South Dakota, Montana, and Wyoming reported net farm income of \$50,000 or less with little variation between study states (Table 26). Forty-six percent of respondents reported total net household income between zero and \$50,000.

Responses were similar across the study states varying from 49 percent of respondents in North Dakota to 43 percent of respondents in Wyoming reporting net household income of between zero and \$50,000. Fifteen percent of respondents reported net farm/ranch income of more than \$100,000, ranging from 11 percent in South Dakota to 19 percent in Montana and Wyoming. Twenty percent of respondents' reported net household income of over \$100,000. Six percent of respondents reported farm/ranch income was a net loss, and 4 percent indicated total net household income was a net loss (Table 26).

Livestock sales made up the majority of gross farm income. Across the study area, respondents reported 82 percent of gross farm income from livestock sales (Table 27). There was some variation between the states with respondents in North Dakota reporting a slightly smaller percentage of gross farm income from livestock sales (72 percent) and respondents in Wyoming reporting a slightly higher percentage of gross farm income from livestock sales (92 percent). Crop sales represented a higher percentage of gross farm sales in North Dakota and a lower percentage of crop sales in Wyoming (20 percent and 3 percent respectively). Percentage of gross farm sales from crop sales were similar for Montana and South Dakota (12 percent and 10 percent, respectively). Net farm/ranch income was 66 percent of household income with 25 percent of household income from off farm employment. The percentage of net farm/ranch income from off-farm employment income ranged from 21 percent in South Dakota to 30 percent in North Dakota (Table 27).

Farm/ranch business structure was most frequently that of a sole proprietorship (71 percent) with more sole proprietorships in North Dakota (83 percent) and fewer in Wyoming (56 percent). Alternately, there were more corporations in Montana and Wyoming, 21 percent and 15 percent respectively, than in South or North Dakota, 8 percent and 1 percent, respectively. Differences in state laws likely explain the variation. Nearly half of the respondents were high school graduates with 21 percent with vocation/technical or 2-year college degree, and 23 percent with a bachelor's degree (Table 27).

Table 27. Composition of Gross Farm Income, Net Household Income, Farm/Ranch Structure, and Education by State, Rancher Survey, 2005

| Item | Total | North Dakota | South Dakota | Montana | Wyoming |
|--|------------------------------------|-----------------|-----------------|---------|---------|
| Gross Farm Income from each of the Following: | | | | | |
| | -----percent----- | | | | |
| livestock sales | 82.1 | 71.8 | 85.3 | 81.8 | 91.7 |
| crop sales | 11.9 | 20.4 | 9.7 | 11.9 | 3.2 |
| custom hire | 2.0 | 2.5 | 2.1 | 2.0 | 1.3 |
| Other ¹ | 2.6 | 3.6 | 2.0 | 1.9 | 3.2 |
| (n) | (996) | (244) | (313) | (275) | (164) |
| Net Household Income from each of the Following: | | | | | |
| net farm/ranch income | 66.1 | 61.4 | 72.3 | 67.5 | 58.7 |
| off-farm employment income (spouse's off-farm job, non-farm business) | 25.5 | 30.4 | 21.4 | 24.2 | 28.1 |
| other farm/ranch related business (leased hunting rights, guided hunting, agri-tourism, bed and breakfast, etc.) | 2.3 | 1.7 | 1.6 | 2.5 | 4.3 |
| energy leases, mineral rights | 1.6 | 2.4 | 0.1 | 0.6 | 4.8 |
| Other | 2.3 | 3.4 | 2.6 | 2.9 | 2.9 |
| (n) | (969) | (242) | (300) | (269) | (157) |
| Farm/Ranch Business Structure | | | | | |
| | ----- percent of respondents ----- | | | | |
| sole proprietor | 71.0 | 82.9 | 76.8 | 62.7 | 56.4 |
| partnership | 13.8 | 14.2 | 12.9 | 12.3 | 17.8 |
| corporation | 11.0 | 1.2 | 8.1 | 20.6 | 15.3 |
| LLC | 2.7 | 0.8 | 1.6 | 2.2 | 8.0 |
| other | 1.4 | 0.8 | 0.6 | 2.2 | 2.4 |
| (n) | (997) | (246) | (310) | (276) | (163) |
| Education | | | | | |
| Some high school | 4.4 | 4.5 | 4.5 | 4.7 | 3.6 |
| High school graduate | 47.1 | 43.7 | 47.9 | 49.6 | 46.7 |
| Vocational/Technical or 2year college degree | 21.7 | 28.6 | 22.7 | 18.3 | 21.7 |
| Bachelor's degree | 23.0 | 20.0 | 22.4 | 24.5 | 22.8 |
| Graduate degree | 3.9 | 3.3 | 2.6 | 2.9 | 3.9 |
| (n) | (1005) | (245) | (313) | (278) | (167) |

¹Does not total to 100 percent.

Summary of Key Findings

A key objective of this study was to document beef producers' production and marketing practices, as well as identifying stock growers' perceptions of opportunities for and impediments to expanding their livestock enterprises. The key data source was a region-wide survey designed to target commercial beef producers. More than 1,000 usable questionnaires were received, providing an extensive database for analysis. The respondents reported an average herd of 215 beef cows. They also reported that livestock sales accounted for 82 percent of their net farm/ranch income and that farm/ranch income accounted for 66 percent of their total household income. Beef cattle production in this region differs from the situation in many other areas of the country, where cow-calf production is often dominated by small herds and the beef enterprise typically is supplemental to crop production or non-farm employment (Colette and Almas 2003, Little et al. 2000). The average age of respondents was 54, with 29 years experience in ranch operation.

Calving occurs predominately during March and April (83 percent), and most calves are weaned in October (64 percent) or November (27 percent). Most ranchers (74 percent) market at least some of their calves at weaning, ranging from 63 percent in North Dakota to 81 percent in Montana. Region wide, 61 percent of the calf crop was marketed at weaning, ranging from 51 percent in North Dakota to 67 percent in Montana. Calves marketed at weaning had average weights of 587 pounds for steers and 543 pounds for heifers. Most producers took measures to increase the value of their calves, including calfhod vaccinations (93 percent), vaccinations at weaning (55 percent), participation in the Beef Quality Assurance (BQA) program (29 percent), and providing creep feed and supplements (27 percent). Approximately 59 percent of the region's calf crop was marketed through local auctions, about 14 percent are purchased by order buyers. Contract sales and video marketing accounted for about 10 percent each.

About 51 percent of ranchers reported backgrounding some calves, ranging from 61 percent in North Dakota to 42 percent in Wyoming. These animals were marketed at an average weight of 759 pounds. For ranchers who did not background calves, the most important reasons cited were feed shortages resulting from drought conditions (67 percent), lack of adequate feedlot capacity (56 percent), not wishing to invest resources in developing feedlot space (39 percent), and preference for taking the profit available by selling calves (36 percent). The impact of drought conditions on the region has been substantial. Region wide, 48 percent of ranchers reported that they had reduced the number of cow-calf pairs on their ranch over the past five years and 38 percent had decreased the number of calves backgrounded.

While retaining ownership in animals that are backgrounded or finished at another location is a value-added option for producers, relatively few producers in the study area used this option. Overall, about 15 percent of producers retained ownership in calves that were backgrounded or finished at an off-ranch location. Among those who chose not to retain ownership, the most common reason cited was that they (producers) preferred to take the profit available by marketing the calves, and this was consistent across all four states. [It should be noted that the period preceding the survey was one of record high feeder cattle prices, in nominal terms.]

When asked about their plans for the next five years, the majority of producers (57 percent) were considering expanding their cow herd. About 20 percent of respondents indicated a desire to increase the number of calves they background, and 15 percent were considering increasing the number in which they retain ownership while feeding at an off-ranch location. This would indicate continuing interest in these value-added alternatives, if recent constraints posed by drought and feed shortages ease.

Winter feed has always been a concern for ranchers in the Northern Plains. Grass or alfalfa hay continues to be the predominate winter forage, accounting for at least 59 percent of forage needs in each state. Other forms of winter feed differ substantially by state. Winter grazing accounts for 30 percent of winter forage in Wyoming, compared to 8 percent in North Dakota. Conversely, forage derived from cropland (e.g., small grain hay, silage, grazing crop residues) accounted for 30 percent of forage needs in North Dakota and only 8 percent in Wyoming. Lack of available forage was cited by two-thirds of respondents as a reason why they do not background feeder calves on their own ranch.

The land base of ranches in the four states also reflects the diversity of the region's land resources. Native range accounts for the largest acreage in each state, ranging from 2,859 acres (65 percent of ranch acreage) in North Dakota to 13,679 acres (95 percent of ranch acres) in Wyoming. Conversely, cropland used for cash crops ranged from 488 acres in North Dakota to 25 acres in Wyoming. Cropland used for feed production ranged from 229 acres in North Dakota to 60 acres in Wyoming. Although some public and tribal lands are utilized, private lands account for the bulk of ranchland in this region. In each state, more than half of the ranchland was deeded. When deeded land and private land operated under a lease or rental agreement were taken together, they accounted for more than 75 percent of ranchland in each state.

When the ranchers were asked about their level of interest in information about selected topics, it is perhaps not surprising that they were most interested in information on balancing feed rations (63 percent interested or very interested). However, it is also noteworthy that several of the topics receiving high ratings were economic in nature. Fifty percent or more of respondents were interested or very interested in marketing strategies, economics of alternative forage production systems, and economics of alternative calving dates. When asked about the form in which they would prefer to receive information, a pamphlet or bulletin available through the local Extension office was the most preferred form – 56 percent were interested or very interested compared to 48 percent for the next alternative (demonstrations and tours). Internet website was of interest to only 35 percent. There were however some differences based on age and education.

Finally, producers' agreement with a series of "issues and attitudes" statements may shed light on opportunities for backgrounding and similar value-added alternatives. More than 60 percent of producers (and more than half in each state) agreed that they would be willing to background cattle if it would increase their net revenue. However, 62 percent (more than half in each state) indicated that availability of forage and feed was the biggest impediment to backgrounding. They also agreed (58 percent) that weather conditions were an impediment and that they would prefer to use feed and forage resources to expand their cow herd (57 percent). Labor availability (45 percent), cost of facilities (41 percent), and market volatility (40 percent) also were concerns for a number of producers.

Research Implications

One of the main objectives of this study was to provide research and extension programs and programs like the Four-state Ruminant Consortium with a more thorough understanding of current livestock production, management, and marketing practices to facilitate further research and outreach efforts. The survey findings reported here provide a snapshot of production practices, operator perceptions, and operator characteristics in the study area. This overview should provide valuable information for the Four-State Ruminant Consortium and the study states' land grant universities, experiment stations, and extension services as they develop research and outreach programs to facilitate industry growth and expansion, and improve viability of individual operations. This data may also be used as a baseline for future evaluation of programs like the Four-state Ruminant Consortium. Following are a few areas that may warrant additional research and consideration.

Overall 57 percent of respondents indicated they were considering expanding their cow herd in the next 5 years. Only 20 percent indicated they were considering increasing the number of calves they background, and only 14 percent were considering increasing the number of calves retained through backgrounding. Fifty-seven percent of respondents also agree or strongly agreed with the statement 'I would prefer to use available feed and forage to expand my cow/calf herd'. Alternately 62 percent of respondents indicated the availability of feed and forage was the biggest impediment to retaining feeder calves. This would suggest that exploring avenues for expanding cow herds may be more in line with many producer's plans and available resources than expanding backgrounding opportunities. The economics of cow-calf expansion may be preferable to backgrounding for many producers.

On the other hand, 40 percent of respondents were either neutral or disagreed with the statement that the availability of feed and forage was the biggest impediment to retaining feeder calves. This would seem to suggest that feed may not be a constraint to backgrounding for many producers in the study area or feed may be less of an issue in certain sub-regions in the study area. Further examination the characteristics of producers that indicated feed was not an impediment to backgrounding could determine if some other constraint or constraints were limiting backgrounding or whether a potential opportunity exists.

Obviously available feed and forage is a critical limiting factor for either cow/calf herd expansion or for backgrounding calves. However this research did not quantify or qualify feed limitations. Further study to define the type and severity of feed shortages in the study area may be appropriate. Are feed stocks slightly short every year or generally good with only occasional shortages? Could shortages be addressed with subtle changes in land management or land use? Are there options for increasing the feed base or is forage availability contingent on factors beyond the producer's control, namely the weather? How do feed stocks vary across the study area? Depending on the nature, duration, severity, and frequency of feed shortages, alternative strategies for addressing the limitation could be developed.

Another stated goal of this research effort was to support outreach and extension personnel efforts to identify topics for program development. This objective was addressed directly with a specific question asking producers about their level of interest in various topics. Nearly two-thirds of respondents were either interested or very interested in balancing feed rations. Considering feed availability and feed costs are critical factors to production, it certainly makes sense that producers would be interested in raising their level of expertise on the matter. Fifty percent or more of respondents were interested in information on marketing strategies, the economics of alternative forage production, economics of alternative weaning dates, as well as information on alternative forage production, options and methods. Economics of alternative calving dates, production practices economics of feeder calf backgrounding, and the economics of buying versus replacing heifers were also of interest by roughly 45 percent of respondents. These responses would seem to directly respond to extension and outreach professionals needs assessment for program development.

How producers prefer to receive information was noteworthy. Producers' preferred medium for receiving information was a pamphlet or bulletin. Respondents also showed high levels of interest in half-day seminars, testimonials from other producers, and on-site visits. Decision soft-ware, internet or web-based information, e-mail, and multi-media applications were preferred less frequently. Approximately one-quarter to one-third of respondents were interested or very interested in those media, compared to 56 percent that indicated they were either interested or very interested in a brochure or pamphlet. Preferences varied slightly based on age and education. Younger producers with higher levels of formal education were somewhat more likely to indicate they were interested or very interested in multi-media, web or internet delivered content, or decision support software than their counterparts. However, a brochure or pamphlet was still cited more frequently as the preferred delivery media by over half of the respondents. This would suggest targeting information to the audience is critical to outreach programming.

Alternate marketing channels may also be worthy of further examination. Local auctions were the dominant marketing outlet with 81 percent of producers marketing on average 59 percent of their calves at local auctions. Order buyers, contract sales, and video sales were more frequently used by larger producers, but local actions were still the most prevalent channel among all producers. While order buyers and contract sales generally require larger, homogenous lots and may not be appropriate for a smaller producer, there may be some real advantages for producers in newer marketing outlets like video sales. Alternate marketing strategies could provide a means to increase individual operator's profitability with no change in production practices. This was consistent with respondents information needs. Fifty-four percent of respondents were either interested or very interested in information on marketing strategies.

Expanded use of carcass data and other performance data may also provide producers opportunities to improve viability without increasing their herd size or changing production practices. Most of the respondents that retained ownership received carcass data. While only 20 percent of producers overall received carcass data, a majority of those producers indicated they use that information in the management and marketing of their herd. Expanded use of carcass, other performance data, test lots, and other programs that enable producers to receive

performance data on a sample of their calves may improve herd characteristics and performance and offer opportunities for increased profitability without a change in herd size, number of calves backgrounded, or production practices.

It should also be noted that market conditions have been quite unique the last few years. Feeder calf prices have been at record levels, and often the price differential between a 550 pound calf and a 700 or 750 pound steer has been considerable. A wide spread drought has exacerbated conditions in some years making feed short and expensive. A narrow price differential combined with high feed prices made for less than ideal conditions for backgrounding.

While this section has identified a few potential areas for additional research, it surely is not an exhaustive list. Researchers with expertise in production, marketing, forage production, feed rations, risk management, and other aspects of livestock productions will likely identify other opportunities for industry expansion and improved profitability that warrant additional research based on the data collected for this report. Outreach personnel can use this information to develop programs to meet the information needs of producers in the study area. This effort was not intended to be an end-point, but rather a starting point for further research and outreach efforts.

Regardless of what opportunities are explored by researchers and outreach professionals, a one-size fits all approach is not appropriate. Production practices, opportunities, and constraints varied considerably across the four-state area. Multiple comparisons of responses by state clearly illustrated that what may be appropriate in southwestern North Dakota may not be appropriate in northeastern Wyoming. An awareness of the variability of available resources and production practices will be critical to all future research and outreach efforts aimed at enhancing or expanding the region's beef cattle industry.

References

- Colette, W.A., and L.K. Almas. 2003. Utilizing Conditional Probabilities in Developing Price Expectations for Selecting Optimal Marketing Alternatives for Fixed Resource Cow-Calf Operators in the Texas Panhandle. WAEA Selected Paper. Canyon, TX: West Texas A&M University, Division of Agriculture, 25 pp. <http://agecon.lib.umn.edu>.
- Dhuyvetter, K.C. 2004. Preconditioning Beef Calves: Are Expected Premiums Sufficient to Justify the Practice? WAEA Selected paper. Manhattan, KS: Kansas State University, Dept. of Agricultural Economics, 26 pp. <http://agecon.lib.umn.edu>.
- Dillman, D.A. 2000. *Mail and Internet Surveys: the tailored design method*. New York: Wiley.
- Fausti, S.W., B. Johnson, W. Epperson, and N. Grathwohl. 2003. *Risk and Economic Incentive to Retain Ownership of Steer Calves*. Economics Staff Paper 2003-6. Brookings, SD: South Dakota State University, Dept. of Economics, 29 pp. <http://agecon.lib.umn.edu>.
- Fausti, S.W., B.A. Qasmi, D.G. Landblom, M. Beutler, P. Johnson, R. Gates, H. Patterson, and R. Salverson. 2006. *Public Price Reporting, Market Channel Selection, and Price Discovery: The Perspective of Cow/Calf Producers in the Dakotas*. Economics Staff Paper 2001-1. Brookings, SD: South Dakota State University, Department of Economics. <http://agecon.lib.umn.edu>.
- Feuz, D.M., and J.J. Wagner. 1996. Retained Ownership: Understanding Performance Risk and Evaluating Marketing Alternatives. *Journal of the American Society of Farm Managers & Rural Appraisers* 60: 65-71.
- Leistriz, F.L., and R. Sell. 1993. *Economic Impact of Expanding Backgrounding in North Dakota*. AE93003. Fargo, ND: NDSU Department of Agricultural Economics.
- Little, R.D., C.S. Forrest, and R.C. Lacy. 2000. *Cattle Producer Attitudes Towards Alternative Production and Marketing Practices*. Dept. Res. Rpt. 2000-006. Mississippi State, MS: Mississippi State University, Dept. of Agricultural Economics, 52 pp. <http://agecon.lib.umn.edu>.
- Petry, T. 2007. Cattle Situation and Outlook, July, 2007. <http://www.ag.ndsu.nodak.edu/aginfo/lsmkt/livestock.htm>.
- Popp, M.P., M.D. Faminow, and L.D. Parsch. 1999. Factors Affecting the Adoption of Value-added Production on Cow-Calf Farms. *Journal of Agricultural and Applied Economics* 31 (1): 97-108.
- SAS Institute Inc. 2004. *SAS Online Doc 9.1.3*. Cary, NC: SAS Institute Inc.

- Schmitz, T.G., C.B. Moss, and A. Schmitz. 2003. Marketing Channels Compete for U. S. Stocker Cattle. *Journal of Agribusiness* 21 (2): 131-148.
- Ward, C.E., and D.L. Lalman. 2003. Price Premiums from a Certified Feeder Calf Preconditioning Program. Stillwater, OK: Oklahoma State University, Dept. of Agricultural Economics, 20 pp. (Accessed from website: <http://agecon.lib.umn.edu>).
- Watt, D.L., R.D. Little, and T.A. Petry. 1987. Retained Ownership is an Option for Cow-Calf Operations. *Journal of the American Society of Farm Managers & Rural Appraisers* 51: 80-87.
- White, B.J., and J.D. Anderson. 2005. Factor Price Disparity in the Feeder Cattle Market and Retained Ownership Decision Making: An Application of Farm-level Feed-out Data. AAEA Selected paper. Mississippi State, MS: Mississippi State University, Dept. of Agricultural Economics, 22 pp. <http://agecon.lib.umn.edu>.
- USDA, National Agricultural Statistics Service. 2006. Agricultural Statistics database. Washington, DC: U. S. Department of Agriculture. <http://www.nass.usda.gov/>.
- U. S. Department of Agriculture. 2004. *2002 Census of Agriculture, Vol. 1, Ch. 2, County Level Data*. <http://www.nass.usda.gov/census/census02/volume1>.

Appendix I

Appendix Table 1. Percent of Sales Using Various Marketing Channels by Herd Size, Rancher Survey, 2005

| Marketing Channel | herd size (calves from own cows) | | |
|----------------------------------|----------------------------------|------------|-------------|
| | less than 100 | 100 to 299 | 300 or more |
| | -----percent ¹ ----- | | |
| local or regional auction | | | |
| zero | 13.8 | 16.1 | 28.5 |
| 1 to 49 percent | 8.6 | 28.1 | 36.0 |
| 50 percent of more | 77.5 | 55.8 | 35.0 |
| (n) | | (835) | |
| order buyer | | | |
| zero | 90.0 | 79.2 | 71.0 |
| 1 to 49 percent | 1.0 | 3.3 | 8.1 |
| 50 percent of more | 9.0 | 17.5 | 20.9 |
| (n) | | (835) | |
| contract sales | | | |
| zero | 91.7 | 85.0 | 81.7 |
| 1 to 49 percent | 0.3 | 3.3 | 4.3 |
| 50 percent of more | 8.0 | 11.7 | 14.0 |
| (n) | | (835) | |
| video sales | | | |
| zero | 93.1 | 83.9 | 73.1 |
| 1 to 49 percent | 1.4 | 3.9 | 3.2 |
| 50 percent of more | 5.5 | 12.2 | 23.1 |
| (n) | | (836) | |
| internet | | | |
| zero | 99.0 | 96.9 | 95.2 |
| 1 to 49 percent | 0.7 | 1.4 | 2.7 |
| 50 percent of more | 0.3 | 1.7 | 2.1 |
| (n) | | (835) | |

¹Chi-squared statistic significant at $\alpha \pm .01$

Appendix Table 2. Retention of Feeder Calves on Ranch after Weaning, by Ranch Size, Age, Education, and Percentage of Household Income from Livestock, Rancher Survey, 2005

| Characteristic | Retain Calves after Weaning | |
|---|----------------------------------|-------|
| | No | Yes |
| | -----percent of respondents----- | |
| Number of calves¹: | | |
| less than 100 | 58.0 | 42.0 |
| 100 to 299 | 45.6 | 54.4 |
| 300 or more | 33.2 | 66.8 |
| Total | 47.1 | 52.9 |
| | (n) | (833) |
| Age: | | |
| 50 or less | 47.9 | 52.1 |
| over 50 | 49.0 | 51.0 |
| | | (968) |
| Education²: | | |
| High school or less | 52.7 | 47.3 |
| Post secondary | 44.6 | 55.4 |
| | | (959) |
| Percent of Household Income from Livestock: ² | | |
| less than 50 percent | 53.1 | 46.9 |
| 50 percent or more | 45.5 | 54.5 |
| | | (922) |

¹Chi-squared statistic significant at $\alpha \pm .01$

²Chi-squared statistic significant at $\alpha \pm .05$

Appendix Table 3. Changes under Consideration in Next Five Years, by Herd Size, Age, and Education, Rancher Survey, 2005

| Item | Herd Size (calves) | | | Age | | Education | |
|---|----------------------------------|---------|-------------------|------------|-------------------|----------------|-------------------|
| | less than 100 | 100-299 | 300 or more | 50 or less | over 50 | High School | Post Secondary |
| | -----percent of respondents----- | | | | | | |
| Increasing cow/calf herd | 60.9 | 58.1 | 50.3 | 70.7 | 48.0 ¹ | 56.2 | 57.6 |
| Decreasing cow/calf herd | 15.2 | 17.7 | 17.0 | 12.1 | 19.3 ¹ | 16.8 | 16.2 |
| Increasing number of calves backgrounded | 16.4 | 21.3 | 24.9 | 21.6 | 18.2 | 15.4 | 23.5 ¹ |
| Decreasing number of calves backgrounded | 3.5 | 3.9 | 4.2 | 3.5 | 3.8 | 3.4 | 4.0 |
| Increasing number of calves retain ownership offsite | 9.0 ¹ | 16.5 | 24.2 ¹ | 17 | 12.9 | 8.6 | 19.8 ¹ |
| Decreasing number of calves retain ownership offsite | 0.4 | 2.4 | 3.0 | 1.7 | 1.9 | 0.7 | 3.1 ¹ |
| Expanding feedlot capacity | 5.1 | 9.0 | 10.9 | 9.5 | 6.1 | 5.2 | 9.7 ² |
| Liquidating cow herd ¹ | 17.6 | 13.2 | 6.7 ¹ | 7.5 | 15.9 ¹ | 12.9 | 12.2 |
| Switching to or adding another ruminant livestock enterprise | 2.7 | 1.2 | 3.0 | 3.5 | 1.0 | 2.0 | 1.9 |
| | (n) | | | (755) | | | |

¹Chi-squared statistic significant at $\alpha \pm .01$.

²Chi-squared statistic significant at $\alpha \pm .05$.

Appendix Table 4. Respondents Opinions on Various Issues Related to Backgrounding Feeder Calves, by Herd Size, Age, and Education, Rancher Survey, 2005

| Item | Herd Size (calves) | | | Age | | Education | |
|--|--|---------|-------------------|------------|-------------------|----------------|-------------------|
| | less than 100 | 100-299 | 300 or more | 50 or less | over 50 | High School | Post Secondary |
| | -----percent that agree or strongly agree----- | | | | | | |
| Would build backgrounding feedlot with cost share | 18.0 | 25.7 | 25.5 | 25.5 | 20.7 ¹ | 20.0 | 25.8 ² |
| Would background if it increased net revenue | 54.0 | 64.1 | 65.8 ² | 66.8 | 56.0 ¹ | 57.5 | 63.3 |
| Feed/forage availability is main impediment | 56.6 | 65.9 | 64.8 | 60.2 | 63.0 | 61.4 | 62.2 |
| Weather conditions prohibit backgrounding | 62.8 | 58.6 | 52.1 ¹ | 56.1 | 59.2 | 60.0 | 54.7 |
| No specialty finishing lot in my area | 23.8 | 32.6 | 23.0 | 22.8 | 29.8 | 28.3 | 25.6 |
| Cost of expanding facilities prohibitive | 43.6 | 41.2 | 32.5 | 41.7 | 40.7 | 46.1 | 35.0 |
| Market volatility/backgrounding too risky | 43.6 | 36.2 | 37.4 | 36.7 | 41.7 | 41.9 | 36.6 |
| Lack expertise in feed and forage regimes | 37.6 | 27.3 | 15.3 ¹ | 25.5 | 28.6 | 29.7 | 24.3 ² |
| Lack labor to background | 49.0 | 43.3 | 45.8 | 40.9 | 48.0 ² | 48.3 | 41.2 |
| Not interested in backgrounding, regardless of net returns | 37.4 | 25.2 | 22.9 ¹ | 24.9 | 32.9 ¹ | 33.9 | 25.4 ¹ |
| Not interested in retaining ownership, regardless of net returns | 40.8 | 29.1 | 23.6 ¹ | 28.6 | 34.7 | 37.5 | 26.6 ¹ |
| Cannot secure adequate financing | 25.1 | 12.5 | 8.4 ¹ | 16.0 | 16.5 | 20.6 | 11.7 ¹ |
| Interested in backgrounding elsewhere | 11.2 | 20.3 | 29.6 ¹ | 18.0 | 19.0 | 15.8 | 21.0 |
| Interested in finishing elsewhere | 9.2 | 23.9 | 40.3 ¹ | 23.7 | 20.4 | 18.1 | 24.7 ² |
| Prefer to use feed for cow herd | 63.5 | 53.4 | 53.2 | 59.7 | 55.8 | 57.7 | 57.0 |
| | (n) ³ | (809) | | (935) | | (927) | |

¹Chi-squared statistic significant at $\alpha \pm .01$.

²Chi-squared statistic significant at $\alpha \pm .05$.

³Number of observations is the average number of observation for each item.

Appendix Table 5. Ranchers Interest in Information on Selected Topics, by Herd Size, Carcass August 30, 2007 Data, Marketing at Weaning, and Retaining Calves on Ranch, Rancher Survey, 2005

| Topic | Herd Size (calves) | | | Carcass data | | Market at Weaning | | Retain Calves | |
|--|------------------------------------|---------|-------------------|-------------------------------|-------------------|-------------------|-------------------|---------------|-------------------|
| | less than 100 | 100-299 | 300 or more | No | Yes | No | Yes | No | Yes |
| | ----- percent of respondents ----- | | | interested or very interested | | | | ----- | |
| Alternative forage production options | 47.1 | 50.7 | 59.8 ² | 47.8 | 63.9 ¹ | 65 | 48.0 ¹ | 41.6 | 60.1 ¹ |
| Economics of alternative forage production | 50.4 | 55.9 | 64.1 ¹ | 50.1 | 69.8 ¹ | 66.7 | 50.9 ¹ | 44.8 | 62.7 ¹ |
| Economics of alternative calving dates | 41.9 | 44.9 | 52.3 ¹ | 42.1 | 48.6 | 51.3 | 41.6 ¹ | 39.8 | 45.3 |
| Economics of alternative weaning dates | 43.0 | 53.4 | 62.4 ¹ | 47.1 | 59.1 ¹ | 55.7 | 48.5 | 45 | 53.2 ¹ |
| "Ag-bags" and other feed storage | 21.3 | 26.7 | 26.3 | 22.0 | 31.3 ² | 29.5 | 22.5 | 21.5 | 26.0 ² |
| Economics of backgrounding | 38.2 | 46.4 | 60.6 ¹ | 42.7 | 59.8 ¹ | 62.8 | 41.9 ¹ | 32.7 | 58.3 ¹ |
| Ultra sounding for backfat | 25.9 | 33.6 | 39.0 ¹ | 26.0 | 48.8 ¹ | 34.9 | 29.2 | 25.2 | 35.1 ¹ |
| Balancing feed rations | 54.3 | 68.2 | 72.1 ¹ | 59.2 | 74.6 ¹ | 74.1 | 60.0 ¹ | 52.9 | 71.5 ¹ |
| Retaining ownership at other location | 17.9 | 36.6 | 42.1 ¹ | 25.3 | 47.9 ² | 40.8 | 27.1 ¹ | 25.3 | 34.1 ¹ |
| Buying replacement heifers | 41.7 | 46.4 | 43.6 | 43.5 | 44.4 | 47.7 | 43.7 | 46.9 | 41.2 |
| Marketing strategies | 47.7 | 59.1 | 62.1 ¹ | 50.9 | 66.7 ² | 62.7 | 52.1 ² | 47.4 | 60.0 ¹ |
| (n) | (838) | | | (978) | | (917) | | (935) | |

¹ Chi-squared statistic significant at $\alpha \pm .01$.

² Chi-squared statistic significant at $\alpha \pm .05$.

Appendix Table 6. Preferred Method of Receiving Information, by Herd Size, Age, and Education, Rancher Survey, 2005

| | Herd Size | | | Age | | Education | |
|---|-------------------|---------|-------------------|------------|-------------------|----------------|-------------------|
| | less than 100 | 100-299 | 300 or more | 50 or less | over 50 | High School | Post Secondary |
| | -----percent----- | | | | | | |
| Pamphlet or bulletin | 52.5 | 58.4 | 60.0 | 56.7 | 56.3 | 55.4 | 56.7 |
| Multi-media presentations on CD-ROM or the Internet | 23.9 | 27.9 | 36.2 ¹ | 30.6 | 26.4 ² | 22.5 | 32.9 ¹ |
| On-site demonstrations and tours | 36.5 | 52.5 | 57.8 ¹ | 48.2 | 47.7 | 45.1 | 50.9 |
| Testimonials from other producers | 35.3 | 48.0 | 50.8 ¹ | 42.5 | 45.4 | 42.3 | 46.4 |
| Personal visits | 26.4 | 42.6 | 49.2 ¹ | 40.6 | 37.5 | 35.6 | 41.8 |
| Full-day conferences or seminars | 21.9 | 28.9 | 40.7 ¹ | 26.4 | 29.8 | 22.1 | 34.1 ¹ |
| Half-day conferences or seminars | 39.6 | 47.8 | 61.1 ¹ | 46.6 | 46.5 | 43.0 | 49.5 |
| E-mail notification of field days, etc. | 22.1 | 31.5 | 40.8 ¹ | 32.7 | 29.5 | 24.0 | 37.4 |
| Internet or website online information | 26.0 | 38.8 | 41.0 ¹ | 40.3 | 31.7 | 28.7 | 41.9 ¹ |
| Decision support software (spread sheets, decision models) | 29.0 | 37.9 | 42.8 | 43.4 | 30.8 ² | 28.7 | 43.7 ¹ |
| (n) | | (821) | | (951) | | (940) | |

¹Chi-squared statistic significant at $\alpha \pm .01$.

²Chi-squared statistic significant at $\alpha \pm .05$.

Appendix II

Please answer the following questions about expanding ruminant livestock production in the Northern Great Plains.

CURRENT PRODUCTION PRACTICES

1. Do you raise commercial or purebred ruminant livestock (*e.g., cattle, sheep, buffalo, etc*)?

| Yes | No |
|--|----|
| If no, please stop and return the questionnaire in the enclosed self-addressed stamped envelope | |

2. How many of each of the following do you have on your ranch as of January 1, 2005?

| | |
|---|------------|
| Commercial beef cows (2 years or older) | _____ head |
| Commercial beef replacement heifers | _____ head |
| Feeder calves (450 to 900 pounds) | _____ head |
| Purebred beef cows (2 years or older) | _____ head |
| Purebred replacement heifers | _____ head |
| Purebred bulls (2 years or older) | _____ head |
| Other bulls, not purebred | _____ head |
| Sheep (feeder &/or breeding stock) | _____ head |
| Dairy cattle | _____ head |
| Buffalo | _____ head |
| Elk | _____ head |
| Other (<i>Please specify.</i>)_____ | _____ head |

If you raise only purebred beef cattle, sheep, buffalo, elk, dairy cattle, or other ruminant animals, please stop and return the questionnaire in the enclosed self-addressed stamped envelope.

3. Typically, how many calves **from your own cows** do you raise each year? _____

4. What percentage of your calves (from your cows) are born in each of the following months:

| | |
|----------|--|
| February | _____ % |
| March | _____ % |
| April | _____ % |
| May | _____ % |
| Other | _____ % (<i>Please specify the month</i>)_____ |

5. Typically, how many weaned feeder calves do you purchase and feed each year?
(If none, please enter zero.) _____
6. In what month do you typically wean a majority your calves? _____
7. What is the average weight of your calves at weaning? _____ pounds

MARKETING, BACKGROUNDING, AND RETAINED OWNERSHIP

| | |
|--|---------------------------------------|
| 8. Do you market some or all of your calves at weaning? | |
| YES | NO |
| IF YES , what do you do to improve/increase the value of the calves you market at weaning? <i>(Please check all that apply.)</i> | IF NO, Please go to Question 9 |
| _____ vaccinations from time of birth to weaning _____ vaccinations at weaning _____ creep feeding/supplements prior to weaning _____ beef quality assurance (BQA) _____ other <i>(Please specify)</i> _____ | |
| IF YES , of calves that are marketed at weaning, what is their typical weight? steers _____ pounds heifers _____ pounds | |

| |
|--|
| 9. What percentage of your calves do you typically market (deliver) at each of the following times? |
| _____ % within two weeks of weaning, right off the cow _____ % 15 to 45 days after weaning _____ % 46 to 120 days after weaning _____ % retain ownership or a percentage ownership through backgrounding _____ % retain ownership or a percentage ownership through finishing and slaughter _____ % Other <i>(Please specify)</i> _____ |

10. What percentage of your calves do you currently market using each of the following outlets?

| | | |
|-------|---|---------------------------------------|
| _____ | % | local or regional auction barn |
| _____ | % | video sales |
| _____ | % | internet |
| _____ | % | order buyer |
| _____ | % | contract sales |
| _____ | % | other (<i>Please specify</i>) _____ |

11. Do you retain (background) any of your own calves on your ranch or in your feedlot after weaning?

| YES | NO |
|---|--|
| <p>IF YES, on average, how long do you background calves on your ranch or feedlot? _____ months</p> <hr style="border-top: 1px dotted black;"/> <p>IF YES, at approximately what weight do you generally market calves that you have backgrounded on your ranch or feedlot? _____ pounds</p> <hr style="border-top: 1px dotted black;"/> <p>IF YES, please rank 1, 2, and 3, <i>with 1 the most important</i>, the three most important criteria you use to select which feeder calves to retain?</p> <p>_____ Retain a set percentage of calves</p> <p>_____ Retain a selected set of calves based on potential performance</p> <p>_____ Retain heaviest</p> <p>_____ Retain lightest</p> <p>_____ Retain based on current market conditions and market potential</p> <p>_____ Retain replacement heifers only</p> <p>_____ Retain all calves regardless of markets or other considerations</p> <p>_____ Other (<i>Please specify</i>) _____</p> <p>_____</p> | <p>IF NO, why not? (Please check all that apply)</p> <p>_____ Markets are too unstable, too much risk</p> <p>_____ I do not want to expand my current farm/ranch enterprise</p> <p>_____ I do not have adequate feedlots or capacity</p> <p>_____ I do not wish to invest additional resources (money, time, etc.) to develop feedlot space</p> <p>_____ Feed for calves is prohibitively expensive</p> <p>_____ Drought conditions have created feed shortages that currently prohibit backgrounding</p> <p>_____ Cash flow and repayment requirements prevent expansion/ranch budget prohibits backgrounding</p> <p>_____ Unable to secure capital</p> <p>_____ Lack expertise in nutrition and feed regimes to feed calves</p> <p>_____ Prefer to take profit</p> <p>_____ Do not background calves on my own ranch or feedlot but retain a share of ownership</p> <p>_____ Insufficient labor</p> <p>_____ Other (<i>Please specify</i>) _____</p> <p>_____</p> |

12. Do you retain ownership or partial ownership of feeder calves post-weaning that are backgrounded at a location other than your ranch or feedlot?

| YES | NO |
|---|--|
| <p>IF YES, what percentage ownership do you retain? _____ percent</p> | <p>IF NO, why not? <i>(Please check all that apply.)</i></p> <p>_____ No backgrounding lot(s) in my area</p> <p>_____ I do not want an additional enterprise</p> <p>_____ Backgrounding calves elsewhere is not profitable</p> <p>_____ Backgrounding calves elsewhere is too risky</p> <p>_____ Cash flow and repayment requirements prevent expansion/ranch budget does not permit retained/shared ownership</p> <p>_____ Lack experience with retained ownership</p> <p>_____ Backgrounding calves on shares is prohibitively expensive</p> <p>_____ Prefer to take profit by marketing calves rather than retaining them</p> <p>_____ Other <i>(Please specify)</i> _____</p> |
| <p>IF YES, how many feeder calves do you retain ownership or partial ownership through backgrounding and finishing? _____ calves</p> | |
| <p>IF YES, for approximately how long do you retain ownership? _____ months</p> | |
| <p>IF YES, at approximately what weight do you market your retained ownership calves? _____ pounds</p> | |
| <p>IF YES, do you receive feedlot performance data on retained livestock? <i>(Please circle one.)</i></p> | |
| <p style="text-align: center;">YES NO</p> | <p>IF NO, do you receive performance data regardless of retained ownership? <i>(Please circle one.)</i></p> <p style="text-align: center;">YES NO</p> |

| | |
|--|---|
| 13. Do you retain ownership or partial ownership of feeder calves through backgrounding and finishing to slaughter? | |
| YES | NO |
| <p>IF YES, what percentage ownership do you retain?</p> <p>_____ percent</p> <p>.....</p> <p>IF YES, how many feeder calves do you retain ownership or partial ownership through backgrounding and finishing to slaughter?</p> <p>_____ calves</p> <p>.....</p> <p>IF YES, for approximately how long do you retain ownership?</p> <p>_____ months</p> <p>.....</p> <p>IF YES, do you receive carcass data on retained livestock?</p> <p>YES NO</p> | <p>IF NO, why not? <i>(Please check all that apply).</i></p> <p>_____ No finishing lot(s) in my area</p> <p>_____ Markets are too unstable, too much risk</p> <p>_____ I do not want an additional enterprise</p> <p>_____ Finishing calves is not profitable</p> <p>_____ Finishing calves is too risky</p> <p>_____ Cash flow and repayment requirements prevent expansion</p> <p>_____ Finishing on share is prohibitively expensive</p> <p>_____ Lack experience with retained ownership through finishing</p> <p>_____ Other <i>(Please specify)</i> _____</p> <p>_____</p> <p>_____</p> <p>.....</p> <p>IF NO, do you receive carcass data regardless of retained ownership?</p> <p>YES NO</p> |

| | |
|--|-----------|
| 14. Do performance data and/or carcass data impact your management and/or marketing decisions? <i>(Please circle one.)</i> | |
| YES | NO |

| | |
|---|-----------|
| 15. Do you use performance data and/or carcass data when marketing your calves? <i>(Please circle one.)</i> | |
| YES | NO |

HERD MANAGEMENT

16. How has the number of cow/calf pairs you own changed in the last five years? (*Please select one.*) By what percentage has it changed?

increased If increased, by what %
 decreased If decreased, by what %
 stayed the same

17. How has the number of calves you background, feed, finish, or retain either partially or totally at your ranch or feedlot **or** at some other location changed in the last 5 years?

| Increased by <input type="text"/> % | Decreased by <input type="text"/> % | Neither, stayed the same |
|---|---|--|
| <p><i>(Please check all that apply.)</i></p> <p>IF INCREASED, what influenced your decision to increase the number of calves retained.</p> <p><input type="checkbox"/> Increase in cattle price</p> <p><input type="checkbox"/> Increased access to pasture land</p> <p><input type="checkbox"/> Expanded my feedlot capacity</p> <p><input type="checkbox"/> Developed better marketing and risk management skills</p> <p><input type="checkbox"/> Family member or other relative(s) joined the farm/ranch operation</p> <p><input type="checkbox"/> Now have adequate winter feed</p> <p><input type="checkbox"/> Other (<i>Please specify</i>)</p> <p>_____</p> <p>_____</p> | <p><i>(Please check all that apply.)</i></p> <p>IF DECREASED, what influenced your decision to reduce the number of calves retained?</p> <p><input type="checkbox"/> Cash flow restrictions</p> <p><input type="checkbox"/> Inadequate labor/labor restrictions</p> <p><input type="checkbox"/> Loss of leased or rented land</p> <p><input type="checkbox"/> Inadequate or loss of local markets</p> <p><input type="checkbox"/> Drought conditions forced a reduction in my herd</p> <p><input type="checkbox"/> Inadequate feed supply</p> <p><input type="checkbox"/> Retired, retiring, or semi-retired</p> <p><input type="checkbox"/> Transferring the operation to a family member or other relative</p> <p><input type="checkbox"/> Sold ranch and/or liquidated stock</p> <p><input type="checkbox"/> Other (<i>Please specify</i>)</p> <p>_____</p> | <p>IF NEITHER, please go to Question 18</p> |

18. What types of changes are you considering in the next 5 years? (*Check all that apply.*)

- Increasing my cow/calf herd
- Decreasing my cow/calf herd
- Increasing the number of feeder calves I background
- Decreasing the number of feeder calves I background
- Increasing the number of feeder calves that I retain ownership in through backgrounding and/or finishing
- Decreasing the number of feeder calves that I retain ownership in through backgrounding and/or finishing
- Expanding my feedlot capacity
- Liquidating my herd
- Switching to or adding other ruminant livestock production
- Other, (*Please specify*) _____

FEED AND FORAGE

19. What percentage of your winter forage for both your cow herd and backgrounding calves (the period from November through April) comes from each of the following sources:

- _____ % hay, grass or alfalfa
- _____ % silage or haylage
- _____ % small grain hay (oats, barley, wheat)
- _____ % post harvest grazing of cornstocks, stubble fields
- _____ % winter grazing native range or non-native pastures
- _____ % other (*Please specify*) _____

20. What types of feed supplements do you use? (*Please check all that apply*)

- salt
- trace mineral mix
- protein supplement (e.g., cake)
- liquid feed supplements
- corn
- barley
- other (*Please specify*) _____

21. How many acres of each type of land do you use in your ranching/farming operation?

_____ acres native rangeland (owned or leased)
 _____ acres seeded pastures
 _____ acres native hayland
 _____ acres alfalfa or alfalfa-grass hayland
 _____ acres of cropland for feed/forage production
 _____ acres of cropland for cash crops
 _____ other (*Please specify*) _____
 _____ Total acres

22. What percentage of the land used in your operation is

_____ % deeded land
 _____ % leased from private parties
 _____ % leased State Land
 _____ % leased Federal Land
 _____ % leased tribal, trust, or other Reservation land
 _____ % Other (*Please specify*) _____

23. Have you considered converting cropland from cash grain to forage production or some combination of cash grain and forage production?

| YES | NO |
|---|---|
| IF YES, please go to Question 24 | IF NO, why not? (<i>Please check all that apply.</i>) |
| | <p>_____ cash grain is more profitable than forage production</p> <p>_____ support programs are better for grains than for livestock</p> <p>_____ no way to store forage or feed grain</p> <p>_____ storing forage or feed grain is prohibitively expensive, not cost-effective</p> <p>_____ no need for additional feed, I do not background calves.</p> <p>_____ other (<i>Please specify</i>) _____</p> <p>_____</p> |

ISSUES AND ATTITUDES

24. Please indicate how strongly you agree or disagree with each of the following statements where 1 is strongly disagree and 5 is strongly agree.

| | Strongly Disagree | Dis- Agree | Neutral | Agree | Strongly Agree |
|--|----------------------|---------------|---------|-------|-------------------|
| I would be willing to build or expand feedlot capacities for backgrounding feeder calves if cost share funds were available. | 1 | 2 | 3 | 4 | 5 |
| I would be willing to background feeder calves if it would increase my net revenue. | 1 | 2 | 3 | 4 | 5 |
| The availability of forage and feed is the biggest impediment I have to retaining feeder calves. | 1 | 2 | 3 | 4 | 5 |
| Weather conditions, such as drought, winter weather, lack of water, etc. prohibit retaining feeder calves at my location. | 1 | 2 | 3 | 4 | 5 |
| I do not background calves because there is no specialty finishing lot to market a larger calf in my area. | 1 | 2 | 3 | 4 | 5 |
| The cost of expanding my operation to background cattle is prohibitively high and not cost effective. | 1 | 2 | 3 | 4 | 5 |
| Market volatility makes retaining and backgrounding feeder calves too risky. | 1 | 2 | 3 | 4 | 5 |
| I do not have enough expertise in appropriate feed and forage regimes to retain and background feeder calves. | 1 | 2 | 3 | 4 | 5 |
| I do not have enough labor to expand my current operation to include backgrounding feeder cattle. | 1 | 2 | 3 | 4 | 5 |
| Regardless of net returns, I am not interested in backgrounding feeder calves. | 1 | 2 | 3 | 4 | 5 |
| Regardless of net returns, I am not interested in retaining ownership in feeder calves. | 1 | 2 | 3 | 4 | 5 |
| I cannot secure adequate financing/ ranch budget prohibits backgrounding feeder calves. | 1 | 2 | 3 | 4 | 5 |
| I am interested in retaining full or partial ownership of calves through <i>backgrounding</i> at a feedlot elsewhere. | 1 | 2 | 3 | 4 | 5 |
| I am interested in retaining full or partial ownership of calves through <i>finishing</i> at a feedlot elsewhere. | 1 | 2 | 3 | 4 | 5 |
| I prefer to use available feed and forage resources to expand my cow herd rather than background feeder calves. | 1 | 2 | 3 | 4 | 5 |

INFORMATION NEEDS AND DISSEMINATION

| 25. Please indicate your level of interest in receiving information on each of the following topics where 1 is very disinterested and 5 is very interested. | Very Disinterested | Dis- interested | Neutral | Interested | Very Interested |
|---|-----------------------|--------------------|---------|------------|--------------------|
| Alternative forage production options (e.g., haylage) and methods | 1 | 2 | 3 | 4 | 5 |
| Economics of alternative forage production options | 1 | 2 | 3 | 4 | 5 |
| Economics of alternative calving dates | 1 | 2 | 3 | 4 | 5 |
| Economics of alternative weaning dates(e.g., early weaning) | 1 | 2 | 3 | 4 | 5 |
| “Ag-bags” and other feed storage systems | 1 | 2 | 3 | 4 | 5 |
| Production practices and economics of feeder calf backgrounding | 1 | 2 | 3 | 4 | 5 |
| Ultra sounding for backfat | 1 | 2 | 3 | 4 | 5 |
| Balancing feed rations | 1 | 2 | 3 | 4 | 5 |
| Retaining percentage ownership of calves at a location other than my ranch or feedlot | 1 | 2 | 3 | 4 | 5 |
| Buying replacement heifers vs. raising replacement heifers | 1 | 2 | 3 | 4 | 5 |
| Marketing strategies, futures, options, forward contracting, etc. | 1 | 2 | 3 | 4 | 5 |
| Other (<i>Please specify</i>) _____ | 1 | 2 | 3 | 4 | 5 |
| _____ | | | | | |

26. Please indicate in what form you would prefer to receive information on feeder cattle production and management. Please indicate your level of interest in each where 1 is very disinterested and 5 is very interested.

| | Very Disinterested | Dis-interested | Neutral | Interested | Very Interested |
|---|--------------------|----------------|---------|------------|-----------------|
| Pamphlet or bulletin available through the local Extension office or county agent | 1 | 2 | 3 | 4 | 5 |
| Multi-media demonstrations/presentations on CD-ROM or the internet | 1 | 2 | 3 | 4 | 5 |
| On-site demonstrations and tours | 1 | 2 | 3 | 4 | 5 |
| Testimonials from other producers | 1 | 2 | 3 | 4 | 5 |
| Personal visits and one-on-one on-site visits by local Extension personnel and other livestock production experts | 1 | 2 | 3 | 4 | 5 |
| Full-day conferences or seminars | 1 | 2 | 3 | 4 | 5 |
| Half-day conferences or seminars | 1 | 2 | 3 | 4 | 5 |
| E-mail notifications of field days, demonstration projects, new research, and other relevant information | 1 | 2 | 3 | 4 | 5 |
| Internet or website/online information | 1 | 2 | 3 | 4 | 5 |
| Decision support software, such as spread sheets, worksheets, decision models | 1 | 2 | 3 | 4 | 5 |
| Other (<i>Please specify</i>) _____ | 1 | 2 | 3 | 4 | 5 |

RESPONDENT CHARACTERISTICS

Following are a few general questions about you and your livestock operation. Responses to these questions help compare attitudes and perceptions based on respondent characteristics.

Please be assured that your responses will be kept strictly confidential.

27. In what county and state do you live? County_____ State_____

28. How many years have you been operating your farm and/or ranch? _____

29. What is your age? _____ years

30. Do you ranch/farm in any counties in addition to your county of residence. (*Please circle one.*)

YES

NO

IF YES, in what other counties do you ranch? _____

31. Do you operate your farm/ranch with a family member or relative? (*Please circle one.*)

YES

NO

32. Do you plan to transfer your farm/ranch operation to your children or other family member? (*Please circle one.*)

YES

NO

DO NOT KNOW

33. Which of the following best describes your net farm/ranch income in 2003 (gross cash farm income less gross cash farm expenses)?

- _____ net loss
- _____ \$0 to \$25,000
- _____ \$25,001 to \$50,000
- _____ \$50,001 to \$75,000
- _____ \$75,001 to \$100,000
- _____ \$100,001 to \$125,000
- _____ \$125,001 to \$150,000
- _____ \$150,001 or more

34. Which of the following best describes your total net household income in 2003 (net cash farm income, plus net income from other non-ranch enterprises, plus net off-farm income)?

- _____ \$0 to 10,000
- _____ \$10,001 to \$25,000
- _____ \$25,001 to \$50,000
- _____ \$50,001 to \$75,000
- _____ \$75,001 to \$100,000
- _____ \$100,001 to \$125,000
- _____ \$125,001 to \$150,000
- _____ \$150,001 or more

35. What percentage of your gross farm income comes from each of the following:

- % livestock sales
- % crop sales
- % custom hire
- % other (*Please specify*) _____

36. What percentage of your household income comes from each of the following sources?

- % net farm/ranch income
- % other farm/ranch-related business (such as leased hunting rights, guided hunting, agri-tourism activities, bed & breakfast, etc.)
- % energy leases, mineral rights
- % off-farm employment income/earnings (e.g., spouse's off-farm job, non-farm business)
- % other (*Please specify*) _____

37. How is your farm/ranch business structured? (If your farm/ranch enterprise uses more than one organizational structure, please select the structure used for the largest share of your business.)

- sole proprietorship
- partnership
- limited liability company (LLC)
- corporation
- Other (*Please specify*) _____

38. Which of the following categories best describes the highest level of education you have completed?

- Some high school
- High school graduate
- Vocational/Technical or 2-year college degree
- Bachelor's degree (4-year college program)
- Graduate school (Master and/or Doctorate Degree)

39. What is the single most critical factor in determining the size and characteristics of potential livestock enterprises for your ranch operation?

Please feel free to offer any additional thoughts or comments you may have regarding feeder cattle, backgrounding, and ranching operations in general. This is your opportunity to address any issues not covered in this questionnaire. Your response is critical to this research effort and your responses will be kept strictly confidential. Thank you for completing this questionnaire.

Thank you for completing this questionnaire. Your cooperation is greatly appreciated.

Please return the questionnaire in the enclosed post-paid envelope.

We anticipate a final report will be available to the public in the last half of 2005. For a copy of study results, please provide your name and mailing address below or you may contact the Department of Agribusiness and Applied Economics at North Dakota State University in Fargo, ND, Phone 701-231-7441, Fax 701-231-7400 or e-mail: cjenson@ndsuxext.nodak.edu or visit our departmental listing of research reports on the world wide web at <http://agecon.lib.umn.edu/ndsu.html>