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Small- and Medium-Sized Feedlots: Management and Marketing Survey Results

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Small- and Medium-Sized Feedlots: Management and Marketing Survey Results

Executive Summary

Increasing sector specialization has led to a decline in the number of smaller feedlots in the U.S. However, some operations continue to finish or background cattle as part of diversified operations. After a set of focus group sessions a survey was conducted of feedlots in South Dakota to determine the competitive tradeoffs among size of operation and production and risk management practices. The mail survey was designed in collaboration with the National Agricultural Statistical Service (NASS). NASS designed a stratified random sampling methodology for survey instrument dissemination. A bi-variate sampling stratification procedure was used; South Dakota feedlots with less than 1,000 head capacity versus feedlots with a capacity over 1,000 head.

Key findings:

- Minimal distinct patterns were found among structural characteristics and finishing or backgrounding features. The size of a cow herd and placement activity in a feedlot were positively correlated, suggesting that a feeding enterprise may complement a cow-calf enterprise. The larger the placement activity, the larger the number of hired workers.
- At different feedlot sizes (less than 1,000 head and 1,000+ capacity), there are differences in the use of backgrounding. Smaller feedlots have a greater portion of cattle on feed that were raised on the operation. These cattle are placed at a lighter weights than would be typical of larger feedlots.
- Smaller feedlots have greater reliance on public information, such as local auction reports (not necessarily from the Agricultural Marketing Service), whereas larger feedlots are more likely use futures prices and packer bids to inform selling decisions. Smaller feedlots are more likely to use auctions, whereas larger feedlots are more likely to use direct sales to packers, and to use a variety of different pricing methods.
- Use of crop insurance and contracting non-feed inputs are common across feedlot sizes. Larger feedlots are more likely to use forward contracts, futures contracts and options contracts than are smaller feedlots. The use by larger lots is consistent with selective hedging.
- There was a high percent of feedlots that use a nutritionist, a veterinarian, a hospital pen, medical records and visual sorting of cattle. There was a low percent of feedlots that use Beta Agonists and ultrasound. The shares were more pronounced for larger versus smaller feedlots.
- Feedlots, especially larger feedlots, are not risk seeking, but have to bear a large amount of risk. In other words, larger feedlots have to take risks feeding cattle, but do not necessarily seek it out in the traditional sense.

Small- and Medium-Sized Feedlots: Management and Marketing Survey Results

This project was funded by a grant to the South Dakota Agricultural Experiment Station from the USDA-AFRI titled: "Feedlot Marketing Behavior and Packer Procurement Strategies in the Dakotas: A Seed Grant Proposal". The primary objective was to examine factors that characterize the management practices of smaller feedlots to inform a larger, more comprehensive research proposal to explain such changes at the national level. The grant, SD00G493-13, was active from Mach 1, 2014 to February 28, 2017.

The project involved active participation from feedlots. The project began with a set of focus groups in mid-2014 under the theme of "competitive pressures facing feedlot operators". Groups met in Brookings, SD, Mitchell, SD and Jamestown, ND. The focus groups informed the second component of the project, a survey instrument, titled "Economic Factors Influencing the Sustainability of Feedlots in South Dakota". The survey asked questions about feedlot capacity, farm characteristics, finishing, backgrounding, risk management, production practices and labor and operator characteristics. Some of the questions were only asked contingent on earlier answers, and those are identified when they are described.

The National Agricultural Statistics Service (NASS) designed a stratified random sampling methodology for survey instrument dissemination. A bi-variate sampling stratification procedure was used to select sample subjects. The two sub samples were South Dakota feedlots with less than 1,000 head capacity versus feedlots with a capacity over 1,000 head. NASS administered the survey, mailing it out in early 2016 to a potential sample of 2,157 subjects. NASS enumerated 400 responses to the initial inquiry of whether respondents had any cattle and calves on feed during 2015. There were three responses with inconsistent answers to feeding that were removed, leaving 397 usable observations.

The decision to use a stratified random sample selection procedure allows the findings of the study to be generalized, and thus to draw conclusions about the structure of the feedlot industry for the year 2015. In turn, states with feedlot industries with similar characteristics as South Dakota can use the findings of this study as a starting point for future research on feedlot industry issues at the state level.

Related Literature

At the time the project was proposed, there was general uncertainty about the use of different marketing and pricing methods by South Dakota feedlots selling fed or backgrounded cattle. Pricing methods include live or dressed weight priced transactions (average pricing) or individual animal priced transaction on a grid basis. Marketing options available to South Dakota feedlots include spot market (cash sales) or alternative marketing arrangements (AMAs). AMAs refer to contract sales. Contract sales in the fed cattle market are transactions where the seller commits to selling cattle to the buyer at future date. For additional information on AMAs see RTI International (2007).

Additional issues investigated to gain insight on the competitive position of South Dakota's feedlot industry found in the literature include: a) adoption of production technology and value-based

marketing strategies for long-run economic sustainability, and b) animal welfare and risk management issues.

The academic AMA literature on the slaughter cattle market has looked at the issues of how the growth in contract sales has affected fed cattle prices and the market share of slaughter volume across AMA alternatives. The two primary areas of research have dealt with how changes in the proportion of slaughter volume of a particular contract based AMA affects cash market price and how the market shares of slaughter volume across AMAs in the cash and contract markets have changed over time.

On the issue of changes in the market share of slaughter volume across AMAs, researchers have examined if the increased use of captive supply (forward contract, formula pricing, and packer ownership) by packers is depressing cash market prices. To date, empirical evidence has been inconclusive as documented by Ji and Chung (2012). Conceptual modeling of captive supplies, e.g., Zhang and Brorsen (2010) and Crespi and Xia (2015), lead to inconclusive reasons for and effects of captive supplies.

The adoption of value based marketing by feedlots (i.e., grid pricing) is an important factor explaining feedlot marketing behavior with respect to AMA selection. RTI International (2007) provides an excellent snapshot of the overall trends in the U.S. feedlot industry and discusses the significant differences in marketing behavior between large and small feedlots. They find that small feedlots tend to sell by the pen at an average price (primarily cash market transactions) and large feedlots tend to sell on a grid (in the contract market).

On feedlot management issues, the USDA (2013a and 2013b) provides results of a comprehensive national study on feedlot management and animal health issues. However, the study did not link feedlot management issues to feedlot marketing issues. Similarly, an earlier feedlot survey by Taylor and Fuez (1994) did not address marketing issues.

There was little additional work on the issue of the relationship between individual AMA slaughter volume market shares and market conditions, and how this relationship affects feedlot marketing behavior. To date, an economic study on how changing market conditions affect producer marketing behavior and how that may affect the long-run economic sustainability of smaller feedlots has not been undertaken.

In an article on fed cattle producer marketing behavior, Fausti et al. (2013) demonstrated that producers who are more risk averse and have less information on carcass quality will be more likely to sell by the pen at an average price than on a grid where each animal is priced individually based on carcass quality. On the other hand, producers who are less risk averse and have more information on carcass quality for their cattle are more likely to sell on a grid rather than by the pen at an average price. The implication is that smaller feedlots may be at a disadvantage relative to larger feedlots because the latter have a tendency to be less risk averse and have economies of scale to purchase the technology to monitor carcass quality. The disadvantage may grow because of expanding production capacity to capture economies of scale in costs and of increasing use of contract based transactions

between larger feedlots and packing firms as a way to increase efficiency in the supply chain. If the trend of vertical integration and of adoption of value based production technology continues, then economic pressure for smaller feedlots to either expand or exit will increase.

Diersen and Fausti (2012) find an inverse correlation across several of the AMAs with respect to slaughter volume market shares. Using seemingly unrelated regression (SUR) results for national slaughter volume market shares across AMAs, they provide across-equation correlation estimates that indicate feedlots view cash and contract AMAs as substitutes. This shifting of market share volume across AMAs indicates that producer AMA selection for marketing cattle changes over time. Important questions arise from this study: Does the marketing behavior of smaller feedlots differ from the marketing behavior of larger feedlots as market conditions change? What are the long-run implications for the structure of the feedlot industry, and for smaller feedlots in particular, associated with the short-run dynamics of current marketing patterns?

MacDonald and McBride (2009) discuss the long-run trends causing the decline in smaller operations. After achieving a minimum efficient size, a larger feedlot can grow by capturing economies of scale and operating at a lower cost than smaller feedlots. Commercial operations (generally larger feedlots) also fully utilize capacity – keeping the lots full throughout the year. General consolidation across farms, regardless of enterprises, has been prevalent in the long run in South Dakota (Brown et al., 2015).

Consolidation and specialization may have a limit when competing against operations with excess seasonal labor, feed supplies or facilities. Producers continue to explore different ways to retain ownership of cattle. For example, Hodur et al. (2007) find that backgrounding and retaining ownership remains common in South Dakota and neighboring states. Similarly, McBride and Mathews (2011) document that cow-calf operations are often not just that. Cow-calf/stocker and cow-calf/feedlot operations characterize 53 percent of U.S. cow-calf operations.

Acres Operated

The initial question posed in the survey was whether the operation had cattle and calves on feed during 2015. There could be operations in South Dakota that sat idle during 2015. Respondents were then asked for their one-time feedlot capacity on January 1, 2016. In the sample, the 397 feedlots had a total capacity of 182,533 head for an average of 460 head per lot. The common size delineation for feedlots is 1,000 head. Feedlots with capacity of 1,000 head or greater are surveyed by NASS as part of *Cattle on Feed* reporting. Feedlots with less than 1,000 head capacity would typically only be tallied during the *Census of Agriculture*. The sample contains 38 large feedlots with total capacity of 74,089 head or an average of 1,950 head per lot (Table 1). The sample contains 359 small feedlots with total and average capacity of 108,444 head and 302 head per lot, respectively.

A common practice in South Dakota is to place cattle on feed in a backgrounding program. This may entail a feeding regimen similar to that in a finishing program, one designed to grow the animal's frame to set it up for further feeding, one designed to prepare the animal for grazing, or something that utilizes available feedstuffs on the operation (such as silage). In the sample, 181

respondents had placements of cattle for finishing and 277 respondents had placements for backgrounding (Table 1).

Table 1. Distribution of Feedlots by Size and Practice

	Number of Lots	Average Capacity (Head per Lot)	Total Capacity (Head)
All	397	460	182,533
Large (1,000+ Head)	38	1,950	74,089
Small (< 1,000 Head)	359	302	108,444
Any Finished	181	521	94,262
Any Backgrounded	277	281	77,896

From the February 2016 *Cattle on Feed* report, on January 1, 2015 in South Dakota the inventory of cattle on feed in 1,000+ head feedlots was 230,000 head (from 245,000 head before adjustments and revisions). The total in all feedlots was 385,000 head, implying the total in smaller feedlots was 155,000 head. During 2015 the 1,000+ head feedlots had placements totaling 446,000 head, marketings totaling 395,000 head and other disappearance of 21,000 head. The January 1, 2016 inventory of cattle on feed for 1,000+ lots was 255,000 head. The inventory in all feedlots was 435,000 head, implying the total in smaller feedlots was 180,000 head.

In the February 2009 *Cattle on Feed* report, there was a breakdown of inventory and marketed cattle by feedlot capacity in 2007 for various states, including South Dakota. At the time there were 17 smaller feedlots for every large feedlot in South Dakota (Table 2).

Table 2. Distribution of South Dakota Feedlots by Capacity, 2007

Capacity	Lots	Inventory	Marketed
< 1,000 Head	3,000	170,000	290,000
1,000+ Head	176	230,000	469,000
1,000 – 3,999	148	110,000	202,000
4,000 – 15,999[1]	28	120,000	267,000

Source: USDA-NASS. Note: [1]The size groups included in this category were masked.

Across the 397 feedlots, respondents were asked about operated acres, land use, and the inventory of any beef cows. A total of 14 observations were deleted from the calculations because of missing and/or inconsistent responses. The summary statistics of the remaining 383 observations reveal a slight decrease in average feedlot capacity (Table 3). There was a wide range of owned and leased acres. The mix of operated acres showed a fairly even division between cropland and pastureland acres. The number of beef cows is only across the subsample that reported having beef cows, 331 respondents. A few observations reported having cows, but reported none in inventory. Removing those observations increased the mean to 194 cows. For comparison, the average farm size in South Dakota in the 2012 *Census of Agriculture* was 1,352 acres. Of operations with beef cows, the average number of cows was 239 head.

Table 3. Summary Statistics for Operated Acres

Variable	Minimum	Maximum	Average
Capacity (Head)	2	4,500	455
Owned Acres	0	17,900	1,378
Rented Acres	0	18,000	1,085
Landlord Acres	0	4,000	76
Operated Acres	7	21,000	2,374
Cropland Acres	0	11,000	914
Pastureland Acres	0	16,950	1,183
Hayland Acres	0	4,000	210
Beef Cows (Head)	0	1,520	191

Cattle for Finishing

Of the respondents, 181 had placements of cattle and calves for finishing during 2015, or 45.6 percent of the sample. The survey only contained questions about capacity, and not of inventory. Thus, the survey results are not directly comparable to the *Census of Agriculture*, which tallied inventory levels across farms. In 2012 there were 1,263 farms in South Dakota with a total of 418,374 cattle on feed. This compares to 1,793 farms with a total of 517,783 cattle on feed in 2007.

Respondents were asked for the total number of head placed and the number of cull cows and bulls placed. Until 2016, cows and bulls on feed were tallied in *Cattle on Feed* reports. A large absolute number of cows was common in large feedlots in South Dakota and Nebraska. For example, in South Dakota on January 1, 2015, there were an estimated 24,000 cows and bulls of 245,000 head on feed at large feedlots. Nationally, there were 84,000 cows and bulls of 10,690,000 head on feed at large feedlots.

Of the 181 respondents with placements for finishing, three had a total of 95 cull cows and bulls and no other finishing animals. There were 42 respondents with a total of 1,285 head of cull cows and bulls, with an average of 31 head per lot and a range from 1 to 200 head per lot.
Across all feedlots, the number placed for finishing exceeded the number placed for backgrounding (Table 4). However, when split by feedlot size (capacity), the number placed for backgrounding exceeded the number placed for finishing for small feedlots. When split by feeding practice, the proportion backgrounded was higher for smaller feedlots.

The number of head of cull cows and bulls were subtracted from placements for finishing. The distribution of steers and heifers can then be compared to feedlot sales in the *Census of Agriculture*. The distributions are similar across both sources (Table 5).

The majority of cattle placed for finishing were owned by the feedlot (Table 6). A total of 162 respondents were sole-ownership enterprises. There were 11 feedlots with some co-ownership, totaling 3,108 head. There were 175 feedlots with at least some sole-ownership totaling 79,484 head. Only 11 of the 181 feedlots, or 6.1%, had custom fed cattle. Across those there was a total of 11,670 head placed. Of the 11, 6 had capacity less than 1,000 head and 5 had capacity of 1,000+ head. Of the 11, only 3 were solely finishing custom cattle.

Table 4. Distribution of Placements by Size and Feeding Practice

Capacity and Practice	Number of Feedlots	Placements for Finishing	Placements for Backgrounding
All	397	94,262	77,896
< 1,000 Head	359	32,953	54,426
1,000+ Head	38	61,309	23,470
Any Finish	181	94,262	18,499
< 1,000 Head	155	32,953	12,399
1,000+ Head	26	61,309	6,100
Any Backgrounded	277	15,275	77,897
< 1,000 Head	261	7,606	54,426
1,000+ Head	16	7,669	23,470

Table 5. South Dakota Feedlot Sales and Placements for Finishing

Head Sold / Placed	Census of Agriculture		Placements for Finishing	
	Farms with Sales	Head Sold	Feedlots	Head Placed
Any	1,670	633,537	178	92,977
1 to 19	144	2,088	23	170
20 to 49	349	10,789	25	810
50 to 99	347	24,027	33	2,129
100 to 199	299	40,776	24	3,427
200 to 499	266	79,325	32	9,862
500 to 999	160	106,758	15	10,346
1,000 to 2,499	64	92,302	17	27,333
2,500 to 4,999	24	78,992	7	25,400
5,000 or More	17	198,480	2	13,500

Source: 2012 Census of Agriculture – State Data, South Dakota, Table 13.

For comparison, in the 2012 *Census of Agriculture*, 55 farms reported custom fed cattle (for slaughter) totaling 134,884 head in South Dakota. Only 3.3% of farms with feedlot sales had custom fed cattle, but they accounted for 21.3% of the head of cattle sold in 2012.

Table 6. The Implied (Weighted) Breakout of Placements for Finishing by Ownership

	Sole-ownership		Co-ownership		Custom Fed	
Capacity	Head	Share (%)	Head	Share (%)	Head	Share (%)
All	79,484	84.3	3,108	3.3	11,670	12.4
1,000+	51,911	84.7	968	1.6	8,431	13.8
<1,000	27,573	83.7	2,140	6.5	3,239	9.8

Note: N=94,262 head.

Sole ownership of cattle was prominent regardless of the size of the feedlot. For comparison, USDA (2013a) finds that for feedlots with 1,000-7,999 head capacity, the share of cattle owned by the

feedlot was 67.7 percent in 2011. They also report the share (combined) for jointly and custom fed was 30.9 percent of cattle.

Sources and Weights

The ownership of cattle was also reflected in the source of placements. The most frequent sources of cattle were an operation's own calf crop and auction barns (Table 7). Smaller feedlots had the largest share of cattle from the calf crop, while larger feedlots had the largest share from auction barns. In comparison, USDA (2013a) found that auctions were an even more prominent source for larger feedlots, followed by custom fed sources. A very small (aggregate) share of cattle comes from an operation's own calf crop. For smaller lots, USDA (2013b) found a higher share sourced from auctions and a lower share from the operation's calf crop.

Table 7. Sources of Placements for Finishing Across Feedlot Sizes

	All (n=181)		Large (n=26)		Small (n=155)	
	Counts	Share (%)	Counts	Share (%)	Count	Shares (%)
Own Calf Crop	134	30.9	13	24.3	121	41.5
Order Buyer	22	13.5	9	15.3	13	10.6
Auction Barn	61	31.7	11	34.1	50	27.9
Video Auction	5	2.9	4	4.4	1	0.3
Direct Purchase	16	5.1	3	4.3	13	6.4
Custom Fed	12	15.9	6	17.6	6	13.2
No Response / Inconsistent	5	2.8	3	11.5	2	1.3

Note: N=84,254 head after removing incomplete and inconsistent responses.

Respondents reported placement and sale weights of steers and heifers. However, placements were not gathered by gender. Often weights were given only for steers or heifers. The number of placements was used to weight the animal weights. When only steers (heifers) were reported, the placements were allocated 100% to steers (heifers). Otherwise, the placements were allocated at 67% steers and 33% heifers, reflecting the typical heifer mix on feed nationally.

Patterns in placement weights varied across feedlot sizes. For larger feedlots, the most common placements (40.9 percent) were among cattle weighing more than 800 pounds (Table 8). For comparison, in the *Cattle on Feed* statistics for large feedlots at the national level in 2015, over one-third of placements were in the 800+ pound category. The survey sample shows a distinct difference when considering only the small feedlots. The largest share (implied) is in placements weighing less than 600 pounds. The pattern is not unexpected because the source of the cattle is primarily from the operations' own calf crops. For comparison, USDA (2013a) has a breakdown of placements by small feedlots in categories of less than 700 pounds and equal to or more than 700 pounds. In 2011, across breeds and genders, 76 percent of cattle placed by small feedlots weighed less than 700 pounds.

Table 8. Implied Placement Weights of Cattle for Finishing

	Weight Category (Pounds per Head)			
	<600	600-699	700-799	800+
All (n=181)				
Steers	15,952	13,991	11,965	16,498
Heifers	7,441	6,048	1,055	9,833
Combined	23,393	20,039	13,020	26,331
Large (n=26)				
Steers	4,749	9,010	10,025	13,819
Heifers	2,861	4,260	757	8,087
Combined	7,610	13,270	10,772	21,906
Small (n=155)				
Steers	11,193	4,981	1,940	2,679
Heifers	4,580	1,788	298	1,746
Combined	15,773	6,769	2,238	4,425

Note: N=82,783 head.

Using the implied number of steers and heifers placed by respondents, a weighted average placement weight was computed across feedlot sizes (Table 9). For individual respondents there was commonly a 25 or 50 heavier in-weight reported for steers than for heifers. This pattern still holds in aggregate. For all feedlots, the average steer weighed 10 pounds more than the average heifer when placed. At finishing, the steers were substantially heavier, averaging 1,463 pounds, compared to 1,371 pounds for heifers. The sample range for large feedlots was 1,250-1,600 pounds for steers and 1,200-1,500 pounds for heifers. Small feedlots placed cattle at lighter weights and sold the cattle at lighter weights compared to large feedlots.

Table 9. Weighted-Average In- and Out-Weights of Cattle Placed for Finishing

	All (n=181)		Large (n=26)		Small (n=155)	
	In-Weight	Out-Weight	In-Weight	Out-Weight	In-Weight	Out-Weight
	(Pounds per Head)					
Steers	705	1,463	752	1,483	585	1,410
Heifers	679	1,371	717	1,395	599	1,321

The Agricultural Marketing Service (AMS) reports volume and weights of cattle sold at various South Dakota locations. The weighted average weight of cattle sold at AMS-reported South Dakota sale locations in 2015 was 717 pounds for steers, 692 pounds for heifers and 707 pounds across both. In Nebraska (LM_CT175), the 2015 yearly weighted average live steer weight for direct sales was 1,444 pounds per head with a range of 1,150-1,775 pounds. For heifers the average was 1,328 pounds per head with a range of 1,050-1,600 pounds.

Pricing and Selling

Respondents selling are a subset of respondents with cattle placed for finishing. Thus, 167 of the 181 respondents with placements also sold finished cattle in 2015. The respondents were asked for

the frequency of using different sources to determine the price of cattle sold. Thus, responses are not mutually exclusive as multiple sources may have been used. The differences by size, 24 large feedlots and 143 small feedlots, convey more information than the full sample (Table 10).

Larger feedlots seldom used AMS sources and smaller feedlots often used public sources. For finished cattle, the only sale location that AMS would specifically report is Sioux Falls Regional Livestock (SFRL) in Worthing, SD. The AMS would also be the source for direct sales. Using a fee service, video auction, or some other source was not common. Smaller feedlots tended to rely on local information. The final discrepancy is between the use of futures and order buyer [packer] bids. Larger feedlots were much more likely to sometimes or always use both the futures prices and buyer bids compared to smaller feedlots. A clear scale difference emerges, as smaller lots may face higher search or transactions costs to use buyer bids.

Chi-Square tests for independence in cross-classified tables were conducted to determine if there is a statistical difference between small and large feedlots for each information source listed in Table 10.[1] At the 5% level of statistical significance, we can conclude that large feedlots were more likely to never use public information sources when selling finished cattle relative to small feedlots. Large feedlots were more likely to always use futures and packer bids as information sources relative to small feedlots.

Respondents were asked about the type of pricing method used for finished cattle sold during 2015. As methods, they could be mutually exclusive categories. While one may consul[1]t multiple sources for information, a single sales method may exclude use of another. Thus, a number of respondents may have stopped answering (or being asked) once "Always" was chosen for a given price methods. Differences by size, 24 large feedlots and 143 small feedlots, again convey more information than the full sample (Table 11). Smaller feedlots predominantly used cash sales on a live [weight] by the pen method to sell finished cattle. Because small feedlots also used auctions, the method and location were consistent. Other methods were infrequently or never used. In contrast, the large feedlots would use the cash market sometimes, but forward markets also. The cascade effect is evident in the increasing number of non-responses down the list.

Respondents could enter "other" selling methods which included using auction or sale barns, selling to individuals, selling by dressed weight of individual carcass, and forward-contracting in a niche market. It may make sense to exclude local/private sales (to say a neighbor), as various methods could be used to do so (generally short of a grid). It may also make sense to use another gradient level (e.g., more often, less often) for the pricing and buyer.

[1] For a discussion of the Chi-Square (χ^2) test see Fienberg (1980). The test p-values were evaluated at the 0.05 level.

Table 10. Market Information for Finished Cattle Sold

	Counts				Shares (%)			
	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
All (n=167)								
AMS Reports	95	50	17	5	56.9	29.9	10.2	3.0
Other Public Reports	30	65	68	4	18.0	38.9	40.7	2.4
Fee-Based Reports	110	30	23	4	65.9	18.0	13.8	2.4
Local Information	69	86	6	6	41.3	51.5	3.6	3.6
Futures Markets	64	62	37	4	38.3	37.1	22.2	2.4
Buyer Bids	87	43	33	4	52.1	25.7	19.8	2.4
Satellite (Video) Auctions	126	24	9	8	75.4	14.4	5.4	4.8
Other	137	16	7	7	82.0	9.6	4.2	4.2
Large (n=24)								
AMS Reports	18	4	1	1	75.0	16.7	4.2	4.2
Other Public Reports[1]	9	11	3	1	37.5	45.8	12.5	4.2
Fee-Based Reports	16	2	4	2	66.7	8.3	16.7	8.3
Local Information	11	9	1	3	45.8	37.5	4.2	12.5
Futures Markets[2]	5	8	10	1	20.8	33.3	41.7	4.2
Buyer Bids[2]	4	8	11	1	16.7	33.3	45.8	4.2
Satellite (Video) Auctions	18	3	0	3	75.0	12.5	0.0	12.5
Other	20	2	0	2	83.3	8.3	0.0	8.3
Small (n=143)								
AMS Reports	77	46	16	4	53.8	32.2	11.2	2.8
Other Public Reports	21	54	65	3	14.7	37.8	45.5	2.1
Fee-Based Reports	94	28	19	2	65.7	19.6	13.3	1.4
Local Information	58	77	5	3	40.6	53.8	3.5	2.1
Futures Markets	59	54	27	3	41.3	37.8	18.9	2.1
Buyer Bids	83	35	22	3	58.0	24.5	15.4	2.1
Satellite (Video) Auctions	108	21	9	5	75.5	14.7	6.3	3.5
Other	117	14	7	5	81.8	9.8	4.9	3.5

Note: [1]Larger feedlots were less likely to use a given source compared to smaller feedlots. [2]Larger feedlots were more likely to use a given source compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Table 11. Pricing Methods for Finished Cattle Sold

	Large (n=24)				Small (n=143)			
	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
Counts								
Cash Market								
Live Wt.	7	9	4	4	29	23	82	9
Dressed	7	9	3	5	89	25	19	10
Grid	11	6	2	5	117	11	5	10
Forward Contract								
Live Wt.	7	4	2	11	68	9	1	65
Dressed	5	4	4	11	71	8	0	64
Grid	8	3	1	12	74	2	1	66
Formula Priced								
Live Wt.	8	1	1	14	69	7	2	65
Dressed	8	1	0	15	70	8	0	65
Grid	6	1	2	15	74	4	1	64
Shares (%)								
Cash Market								
Live Wt.	29.2	37.5	16.7	16.7	20.3	16.1	57.3	6.3
Dressed	29.2	37.5	12.5	20.8	62.2	17.5	13.3	7.0
Grid	45.8	25.0	8.3	20.8	81.8	7.7	3.5	7.0
Forward Contract								
Live Wt.	29.2	16.7	8.3	45.8	47.6	6.3	0.7	45.5
Dressed	20.8	16.7	16.7	45.8	49.7	5.6	0.0	44.8
Grid	33.3	12.5	4.2	50.0	51.7	1.4	0.7	46.2
Formula Priced								
Live Wt.	33.3	4.2	4.2	58.3	48.3	4.9	1.4	45.5
Dressed	33.3	4.2	0.0	62.5	49.0	5.6	0.0	45.5
Grid	25.0	4.2	8.3	62.5	51.7	2.8	0.7	44.8

The buyer types used mirror the information sources and pricing methods. The differences by size, 24 larger feedlots and 143 smaller feedlots, convey more information than the full sample (Table 12). Larger feedlots predominantly used direct sales [to packers]. They used different methods, but to a lesser extent and none use any other buyer. Smaller feedlots often used both direct and auction types. A small percent used other methods, listing buyers that included friends, neighbors and other individuals. Use of an order buyer was not prevalent across feedlot sizes.

Table 12. Buyer Types for Finished Cattle Sold

	Large (n=24)				Small (n=143)			
	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
Counts								
Direct Sales	1	5	18	0	80	20	40	3
Order Buyer	17	3	0	4	113	22	5	3
Auction	13	6	2	3	32	32	78	1
Other	20	0	0	4	126	6	5	6
Shares (%)								
Direct Sales	4.2	20.8	75.0	0.0	55.9	14.0	28.0	2.1
Order Buyer	70.8	12.5	0.0	16.7	79.0	15.4	3.5	2.1
Auction	54.2	25.0	8.3	12.5	22.4	22.4	54.5	0.7
Other	83.3	0.0	0.0	16.7	88.1	4.2	3.5	4.2

Cattle for Backgrounding

Of the 397 respondents, 277 had placements of cattle and calves for backgrounding during 2015, or 70.0 percent of the sample. The share is likely only partially comparable to the survey results in Hodur et al. and McBride and Mathews, as they surveyed cow-calf and all cattle operations, respectively.

Sources and Weights

The distribution of the number of head placed for backgrounding is similar to that of the number of head placed for finishing (Table 13). Compared to feedlots with any finishing, larger capacity feedlots with any backgrounding had a tendency to have more custom fed cattle placed (Table 14).

Table 13. Placements of Cattle for Backgrounding and Finishing

Head	Backgrounding		Finishing	
Placed	Feedlots	Head	Feedlots	Head
Any	277	77,896	178	92,977
1 to 19	10	114	23	170
20 to 49	28	967	25	810
50 to 99	59	4,177	33	2,129
100 to 199	77	10,178	24	3,427
200 to 499	65	18,910	32	9,862
500 to 999	27	18,035	15	10,346
1,000 to 2,499	6	7,515	17	27,333
2,500 to 4,999	3	8,000	7	25,400
5,000 or More	2	10,000	2	13,500

Table 14. The Implied (Weighted) Breakout of Placements for Backgrounding

	Sole-ownership		Co-ownership		Custom Fed	
Capacity	Head	Share (%)	Head	Share (%)	Head	Share (%)
All	51,358	70.6	4,665	6.4	16,731	23.0
1,000+	6,350	34.4	1,070	5.8	11,050	59.8
<1,000	45,008	82.9	3,595	6.6	5,681	10.5

Of those backgrounding, 90% (249 of 276) of the feedlots were sourcing calves from their own calf crops (Table 15). Compared to those with any cattle for finishing, there was a smaller share of lots using an auction barn to source calves. The share of head from different sources is consistent with backgrounding lots feeding their own calf crops. The share of head, at 59.7% of placements, was greater for backgrounding lots than for finishing lots. The pattern was more pronounced across sizes, as small feedlots with backgrounding heavily concentrated the source of calves as their own calf crops.

Table 15. Sources of Placements for Backgrounding Across Feedlot Sizes

	All (n=276)		Large (n=15)		Small (n=261)	
	Counts	Share (%)	Counts	Share (%)	Count	Share (%)
Own Calf Crop	249	59.7	9	22.6	240	72.3
Order Buyer	16	5.5	3	1.6	13	6.8
Auction Barn	34	11.3	2	16.8	32	9.5
Video Auction	0	0.0	0	0.0	0	0.0
Direct Purchase	10	2.2	0	0.0	10	2.9
Custom Fed	18	21.3	5	59.0	13	8.5
No Response / Inconsistent	1	0.4	1	6.7	0	0.0

Note: N=72,896 head after removing incomplete and inconsistent responses.

Respondents reported placement and sale weights of steers and heifers of cattle placed for backgrounding. The observations were weighted by the implied placements mix. For steers the weights ranged from a minimum of 80 pounds to a maximum of 1,850 pounds. For heifers, the range was 80 to 1,500 pounds. The upper placement weights seem unrealistic, especially for a placement weight. The average weights were closer to expectations (Table 16). The average in- and out-weights for steers were 513 and 867 pounds, respectively. For heifers the average in- and out-weights were 498 and 846 pounds, respectively.

Table 16. Weighted-Average In- and Out-Weights of Placements by Practice

	Backgrounding		Finishing	
	In-Weight	Out-Weight	In-Weight	Out-Weight
	(Pounds per Head)			
Steers	513	867	705	1,463
Heifers	498	846	679	1,371

Pricing and Selling

Of those backgrounding any cattle, the respondents were asked if they sold any such cattle in 2015. If so, they were asked about their use of different information sources for pricing the backgrounded cattle sold. There were 214 respondents with sales (Table 17). Of those selling backgrounded cattle, there was a slightly higher percent that used public information sources compared to those selling finished cattle. The use of futures markets was less common, as was the use of bids from other feedlots.

Table 17. Market Information for Backgrounded Cattle Sold

	Counts				Shares (%)			
All (n=214)	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
AMS Reports	138	65	6	5	64.5	30.4	2.8	2.3
Other Public Reports	31	77	102	4	14.5	36.0	47.7	1.9
Fee-Based Reports	153	42	15	4	71.5	19.6	7.0	1.9
Local Information	77	121	11	5	36.0	56.5	5.1	2.3
Futures Markets	99	82	28	5	46.3	38.3	13.1	2.3
Order Buyer	160	35	13	6	74.8	16.4	6.1	2.8
Satellite (Video) Auctions	163	37	9	5	76.2	17.3	4.2	2.3
Feedlots	171	34	4	5	79.9	15.9	1.9	2.3

In contrast to sales of finished cattle, backgrounded cattle were predominantly sold using an auction (Table 18). Types such as direct sales and order buyers were sometimes used, in percentages similar to finishing. Several respondents listed "private treaty" for a buyer type, which we would have considered a direct sale.

Table 18. Buyer Types Used to Sell Backgrounded Cattle

All (n=214)	Never	Sometimes	Always	No Response
Counts				
Direct Sales	181	22	4	7
Order Buyer	180	22	6	6
Auction	11	28	173	2
Other	171	5	3	35
Shares (%)				
Direct Sales	84.6	10.3	1.9	3.3
Order Buyer	84.1	10.3	2.8	2.8
Auction	5.1	13.1	80.8	0.9
Other	79.9	2.3	1.4	16.4

Production Management

Starting with the full sample, the respondents were asked if they purchased any feeder cattle in 2015. Only 115 of the 397 responded that they purchased feeders (39.0%). Those respondents were then

asked how frequently they used different information sources to determine the price of purchased feeders (Table 19). The counts and shares are very similar to those that sold finished cattle with public sources being dominant.

Table 19. Market Information for Feeders Purchased

	Counts				Shares (%)			
All (n=115)	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
AMS Reports	71	29	11	4	61.7	25.2	9.6	3.5
Other Public Reports	21	46	45	3	18.3	40.0	39.1	2.6
Fee-Based Reports	72	31	10	2	62.6	27.0	8.7	1.7
Local Information	55	51	6	3	47.8	44.3	5.2	2.6
Futures Markets	45	46	21	3	39.1	40.0	18.3	2.6
Order Buyer	66	34	12	3	57.4	29.6	10.4	2.6
Satellite (Video) Auctions	85	23	4	3	73.9	20.0	3.5	2.6
Other	96	7	8	4	83.5	6.1	7.0	3.5

The general feedlot management practices questions were designed as a binary response question. So respondents either indicated yes or no (Table 20). There were some differences depending on the size of the operation. With respect to animal health issues, larger feedlots were more likely to consult a nutritionist or veterinarian and maintain a hospital pen relative to small feedlots. With respect to Beta Agonist, 26% of large feedlots and 6.1% of small feedlots indicated using this growth supplement. Both large and small feedlots maintained medical records and visually sorted cattle for market rather than relying on ultra-sound.

Respondents were asked how frequently they used various feeds in 2015. Typically, the respondents used farm-raised crops (Table 21). Other feeds were sometimes or always used by 30-50 percent of respondents. A greater share of larger feedlots used wet distillers grain with solubles (WDGS) and feed from other local producers compared to smaller feedlots.

Respondents were asked their participation in Beef Quality Assurance (BQA) and in the South Dakota Certified Enrolled (SDCE) program. For the full sample, 43.1% of respondents completed BQA certification, while only 8.3% were in the SDCE program (Table 22). The share of those with BQA was sharply higher among larger feedlots compared to smaller feedlots and statistically different at the 5% level based on a Chi-Square test. There was not a statistical difference in the rate of participation in SDCE across feedlot size.

Table 20. Select Management Practices across Feedlot Sizes

	Counts			Shares (%)		
	Yes	No	No Resp.	Yes	No	No Resp.
All (n=397)						
Nutritionist	299	87	11	75.3	21.9	2.8
Veterinarian	352	36	9	88.7	9.1	2.3
Hospital Pen	247	135	15	62.2	34.0	3.8
Medical Records	311	74	12	78.3	18.6	3.0
Beta Agonist	31	351	15	7.8	88.4	3.8
Ultra-Sound	26	360	11	6.5	90.7	2.8
Visual Sort	340	48	9	85.6	12.1	2.3
Large (n=38)						
Nutritionist[1]	36	1	1	94.7	2.6	2.6
Veterinarian[1]	37	0	1	97.4	0.0	2.6
Hospital Pen[1]	37	0	1	97.4	0.0	2.6
Medical Records	33	3	2	86.8	7.9	5.3
Beta Agonist[1]	10	27	1	26.3	71.1	2.6
Ultra-Sound	3	34	1	7.9	89.5	2.6
Visual Sort	34	3	1	89.5	7.9	2.6
Small (n=359)						
Nutritionist	264	86	9	73.5	24.0	2.5
Veterinarian	316	36	7	88.0	10.0	1.9
Hospital Pen	211	135	13	58.8	37.6	3.6
Medical Records	279	71	9	77.7	19.8	2.5
Beta Agonist	22	324	13	6.1	90.3	3.6
Ultra-Sound	23	327	9	6.4	91.1	2.5
Visual Sort	306	46	7	85.2	12.8	1.9

Note: [1]Larger feedlots were more likely to use a given practice compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Respondents were also asked about their basic feedlot infrastructure. Out of the full sample, 300 respondents reported an open lot with windbreak, 67 an open lot with shed, 17 a deep-bedded confinement unit, and 3 a slatted floor confinement unit, while 10 did not respond.

Table 21. Select Feeding Practices

	Counts				Shares (%)			
	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
All (n=397)								
Syrup (Distillers)	280	54	50	13	70.5	13.6	12.6	3.3
Wet Distillers	251	50	86	10	63.2	12.6	21.7	2.5
Dry Distillers	279	60	46	12	70.3	15.1	11.6	3.0
Own Crop	12	22	357	6	3.0	5.5	89.9	1.5
Local Farm	196	139	51	11	49.4	35.0	12.8	2.8
Local Firm	224	120	41	12	56.4	30.2	10.3	3.0
Large (n=38)								
Syrup (Distillers)	22	4	6	6	57.9	10.5	15.8	15.8
Wet Distillers[1]	10	7	18	3	26.3	18.4	47.4	7.9
Dry Distillers	22	7	5	4	57.9	18.4	13.2	10.5
Own Crop	1	4	32	1	2.6	10.5	84.2	2.6
Local Farm[1]	11	11	15	1	28.9	28.9	39.5	2.6
Local Firm	17	14	6	1	44.7	36.8	15.8	2.6
Small (n=359)								
Syrup (Distillers)	259	50	44	6	72.1	13.9	12.3	1.7
Wet Distillers	241	43	69	6	67.1	12.0	19.2	1.7
Dry Distillers	258	53	41	7	71.9	14.8	11.4	1.9
Own Crop	11	18	326	4	3.1	5.0	90.8	1.1
Local Farm	186	128	36	9	51.8	35.7	10.0	2.5
Local Firm	208	106	35	10	57.9	29.5	9.7	2.8

Note: [1]Larger feedlots were more likely to respond as sometimes or always using a given practice compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Table 22. Participation in Quality Control Programs

	Counts			Shares (%)		
	Yes	No	No Resp.	Yes	No	No Resp.
All (n=397)						
Beef Quality Assurance (BQA)	171	210	16	43.1	52.9	4.0
South Dakota Certified Enrolled (SDCE)	33	351	13	8.3	88.4	3.3
Large (n=38)						
Beef Quality Assurance (BQA)[1]	25	12	1	65.8	31.6	2.6
South Dakota Certified Enrolled (SDCE)	2	35	1	5.3	92.1	2.6
Small (n=359)						
Beef Quality Assurance (BQA)	146	198	15	40.7	55.2	4.2
South Dakota Certified Enrolled (SDCE)	31	316	12	8.6	88.0	3.3

Note: [1]Larger feedlots were more likely to respond yes compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Risk Management

Respondents were asked if they owned any cattle on feed in 2015. A total of 343 of the 397 responded that they owned cattle at that time (86.4%). Those that owned cattle were then asked to rank their primary risks among production, output prices and input prices. For all feedlots, output price ranked as the greatest risk by 65.3% of respondents (Table 23). Input price was the most common moderate risk category (42.3%) and production was the most common category with the least risk (44.3%).

Table 23. Relative Risk Rankings of Those Owning Cattle

	Counts				Shares (%)			
	Prod.	Output	Input	No R.	Prod.	Output	Input	No R.
All (n=343)								
Greatest	72	224	62	1	21.0	65.3	18.1	0.3
Moderate	118	85	145	1	34.4	24.8	42.3	0.3
Least	152	33	135	1	44.3	9.6	39.4	0.3
Large (n=33)								
Greatest	5	26	5	0	15.2	78.8	15.2	0.0
Moderate	6	6	19	0	18.2	18.2	57.6	0.0
Least[1]	22	1	9	0	66.7	3.0	27.3	0.0
Small (n=310)								
Greatest	67	198	57	1	21.6	63.9	18.4	0.3
Moderate	112	79	126	1	36.1	25.5	40.6	0.3
Least	130	32	126	1	41.9	10.3	40.6	0.3

Note: [1]Larger feedlots were more likely to rank production as the risk that least concerned them compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Respondents were asked about how much risk they take on (avoid versus seek) in the feedlot enterprise. The choices were not ranked, but a single characterization was given. Across the 343 with owned cattle on feed, 42.6% of feedlots responded that they avoid risk when possible, while 16.3% took on substantial levels of risk (Table 24). An additional 39.9% reported neither seeking nor avoiding risk. A subtle difference in the wording is brought out when considering larger feedlots, where 36.4% reported taking on risk. The contingency table residuals show a higher share of larger feedlots take on risk and a lower share neither take on nor avoid risk compared to smaller feedlots.

A follow-up question elicited the relative amount of risk taken in the feedlot enterprise compared to other aspects of the overall operation. The most common response across all feedlots (65.9%) was that there was no difference in the risk treatment of the feedlot enterprise versus the overall operation (Table 24). The share taking on less risk (18.4%) was much lower than the share that sought to avoid risk. When testing across size categories, the large feedlots more often selected taking on less risk and less often selected no difference compared to small feedlots. Thus, even though larger feedlots take on risk, they are not automatically risk-seeking.

Table 24. Risk Aversion and Risk Bearing by Those Owning Cattle

	All (n=343)		Large (n=33)		Small (n=310)	
	Counts	Shares (%)	Counts	Shares (%)	Counts	Shares (%)
Avoid	146	42.6	15	45.5	131	42.3
Take on[1]	56	16.3	12	36.4	44	14.2
Neither[2]	137	39.9	5	15.2	132	42.6
No Resp.	4	1.2	1	3.0	3	1.0
Greater	42	12.2	5	15.2	37	11.9
Less[1]	63	18.4	12	36.4	51	16.5
No Diff.[2]	226	65.9	13	39.4	213	68.7
No Resp.	12	3.5	3	9.1	9	2.9

Note: [1]Larger feedlots were more likely to select the category compared to smaller feedlots. [2]Larger feedlots were less likely to select the category compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Use of Risk Management Tools

Respondents were asked how frequently they used various input- and output-related risk management tools. The sample was restricted to those that owned cattle on feed during 2015. With output price risk being a major concern and a desire to avoid risk by a large share of respondents, the use of tools may reflect where it is feasible to transfer risk to other parties and where it may need to be borne by the feedlot. Crop insurance, for example, was always used by 86.0% of respondents (Table 25). Forward contracting other inputs (e.g., fuel) was the only tool besides crop insurance with more that sometimes or always used it than never used it. Perhaps the prevalent use of crop insurance explains why input prices were perceived as having the least risk.

In contrast, tools to manage output price risk were frequently never used. For example, there was limited use of Livestock Gross Margin (LGM) and Livestock Risk Protection (LRP) that protect against downside price risk for finished cattle and for backgrounded and finished cattle, respectively. Shares of those using forward contracts for fed and feeder cattle lagged behind the shares of those using forward contracts for feed and other inputs. Use of futures contracts for output risk was never used by 65.3% of respondents. The prevalence of "sometimes" using tools, especially futures and forward contracts, is consistent with selective hedging behavior by livestock producers.

Table 25. Use of Risk Management Tools by Those Owning Cattle

	Counts				Shares (%)			
All (n=343)	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
Insurances								
Livestock Gross Margin	318	16	3	6	92.7	4.7	0.9	1.7
Livestock Risk Protection	299	27	11	6	87.2	7.9	3.2	1.7
Crop insurance	32	14	295	2	9.3	4.1	86.0	0.6
Noninsured Disaster Assistance Program	216	74	47	6	63.0	21.6	13.7	1.7
Pasture, Rangeland Forage	239	52	48	4	69.7	15.2	14.0	1.2
Forward Contract								
Fed Cattle	279	49	9	6	81.3	14.3	2.6	1.7
Feeder Cattle	289	44	6	4	84.3	12.8	1.7	1.2
Feed	240	80	18	5	70.0	23.3	5.2	1.5
Other Inputs	116	146	76	5	33.8	42.6	22.2	1.5
Hedging								
Futures on Inputs	238	78	22	5	69.4	22.7	6.4	1.5
Options on Inputs	253	75	11	4	73.8	21.9	3.2	1.2
Futures on Outputs	224	91	23	5	65.3	26.5	6.7	1.5
Options on Outputs	238	88	12	5	69.4	25.7	3.5	1.5
Multi-period (Packer)	310	22	7	4	90.4	6.4	2.0	1.2
Multi-period (Cow/Calf)	320	16	3	4	93.3	4.7	0.9	1.2

Those owning cattle were divided by capacity. There were no differences in responses by size for LGM, LRP, crop insurance, Noninsured Disaster Assistance Program (NAP), or the use of forward contracts for non-cattle/non-input uses (Table 26). For all of the other tools, larger feedlots were consistently more likely to select always or sometimes compared to smaller feedlots. The reason behind the difference may be that the larger size reduces the transactions cost of using the tools or that size may necessitate managing the risk.

Table 26. Use of Risk Management Tools by Large Feedlots

	Counts				Shares (%)			
Large (n=33)	Never	Some-times	Always	No Resp.	Never	Some-times	Always	No Resp.
Insurances								
Livestock Gross Margin	30	3	0	0	90.9	9.1	0.0	0.0
Livestock Risk Protection	29	3	1	0	87.9	9.1	3.0	0.0
Crop insurance	5	0	28	0	15.2	0.0	84.8	0.0
Noninsured Disaster Assistance Program	20	9	4	0	60.6	27.3	12.1	0.0
Pasture, Rangeland Forage[1]	25	0	8	0	75.8	0.0	24.2	0.0
Forward Contract								
Fed Cattle[1]	18	12	2	1	54.5	36.4	6.1	3.0
Feeder Cattle[1]	23	9	1	0	69.7	27.3	3.0	0.0
Feed[1]	14	13	6	0	42.4	39.4	18.2	0.0
Other Inputs	7	14	12	0	21.2	42.4	36.4	0.0
Hedging								
Futures on Inputs[1]	12	16	5	0	36.4	48.5	15.2	0.0
Options on Inputs[1]	14	18	1	0	42.4	54.5	3.0	0.0
Futures on Outputs[1]	12	19	2	0	36.4	57.6	6.1	0.0
Options on Outputs[1]	14	18	1	0	42.4	54.5	3.0	0.0
Multi-period (Packer)[1]	22	6	5	0	66.7	18.2	15.2	0.0
Multi-period (Cow/Calf)[1]	28	5	0	0	84.8	15.2	0.0	0.0

Note: [1]Larger feedlots were more likely to select sometimes or always for a given tool compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

Feedlot Economic Sustainability

Respondents were asked their capacity expansion plans in the next five years. A majority, 246 respondents, were not planning on changing capacity. Those expecting to increase capacity, 93 respondents, exceeded those expecting to decrease capacity, 45 respondents. In addition, there were 13 without a response to this question.

A Likert scale was used to assess the relative importance of various factors influencing the given capacity expectation. Across all respondents, market access for selling cattle, improve production efficiency and economic opportunity were the only factors where the combined shares of moderate and very important exceeded 60% (Table 27).

In addition, subsamples were constructed for all feedlot respondents who indicated to increase, to decrease, or hold constant their capacity intentions. In the case of the capacity subsets, a statistical difference was found based on feedlot size for these subgroups with respect to the factors hypothesized to effect capacity decisions.

Table 27. Production Capacity Factors for All Feedlots

	Counts					Shares (%)				
All (n=397)	Not	Slight	Mod.	Very	No Resp.	Not	Slight	Mod.	Very	No Resp.
Near Retirement	141	78	92	78	8	35.5	19.6	23.2	19.6	2.0
Family Labor	94	60	95	139	9	23.7	15.1	23.9	35.0	2.3
Capital Access	81	77	111	117	11	20.4	19.4	28.0	29.5	2.8
Regulations	94	67	102	124	10	23.7	16.9	25.7	31.2	2.5
Competitive Position	86	88	106	106	11	21.7	22.2	26.7	26.7	2.8
Market Access	64	47	117	158	11	16.1	11.8	29.5	39.8	2.8
Labor Availability	104	74	110	99	10	26.2	18.6	27.7	24.9	2.5
Production Efficiency	60	68	115	143	11	15.1	17.1	29.0	36.0	2.8
Access to Inputs	99	108	102	78	10	24.9	27.2	25.7	19.6	2.5
Economic Opportunity	52	80	114	141	10	13.1	20.2	28.7	35.5	2.5
Cropland Conversion	108	61	75	143	10	27.2	15.4	18.9	36.0	2.5

Most of the factors increased in the shares of higher importance when the sample was restricted to those expecting to increase capacity (Table 28). Efficiency was selected as moderately or very important by over 80.7% of respondents. The exception was being near retirement, which was selected as not important by 51.6% of respondents. In contrast, being near retirement was selected as being very important by 51.1% of respondents that were expecting to decrease capacity (Table 29).

Table 28. Production Capacity Factors for Those Increasing Capacity

	Counts					Shares (%)				
Increase (n=93)	Not	Slight	Mod.	Very	No Resp.	Not	Slight	Mod.	Very	No Resp.
Near Retirement	48	17	18	10	0	51.6	18.3	19.4	10.8	0.0
Family Labor	11	17	23	41	1	11.8	18.3	24.7	44.1	1.1
Capital Access	8	12	29	43	1	8.6	12.9	31.2	46.2	1.1
Regulations	15	19	28	30	1	16.1	20.4	30.1	32.3	1.1
Competitive Position	12	14	26	40	1	12.9	15.1	28.0	43.0	1.1
Market Access	12	10	25	44	2	12.9	10.8	26.9	47.3	2.2
Labor Availability	20	17	23	32	1	21.5	18.3	24.7	34.4	1.1
Production Efficiency	8	9	26	49	1	8.6	9.7	28.0	52.7	1.1
Access to Inputs	20	23	27	22	1	21.5	24.7	29.0	23.7	1.1
Economic Opportunity	6	18	26	42	1	6.5	19.4	28.0	45.2	1.1
Cropland Conversion	25	11	17	40	0	26.9	11.8	18.3	43.0	0.0

Table 29. Production Capacity Factors for Those Decreasing Capacity

	Counts					Shares (%)				
(n=45)	Not	Slight	Mod.	Very	No Resp.	Not	Slight	Mod.	Very	No Resp.
Near Retirement	11	4	7	23	0	24.4	8.9	15.6	51.1	0.0
Family Labor	19	6	9	11	0	42.2	13.3	20.0	24.4	0.0
Capital Access	16	13	6	10	0	35.6	28.9	13.3	22.2	0.0
Regulations	18	8	9	10	0	40.0	17.8	20.0	22.2	0.0
Competitive Position	18	13	7	7	0	40.0	28.9	15.6	15.6	0.0
Market Access	12	5	17	11	0	26.7	11.1	37.8	24.4	0.0
Labor Availability	12	7	17	9	0	26.7	15.6	37.8	20.0	0.0
Production Efficiency	13	9	12	11	0	28.9	20.0	26.7	24.4	0.0
Access to Inputs	19	11	11	4	0	42.2	24.4	24.4	8.9	0.0
Economic Opportunity	12	9	15	9	0	26.7	20.0	33.3	20.0	0.0
Cropland Conversion	15	9	9	12	0	33.3	20.0	20.0	26.7	0.0

Table 31 decomposes the data in Table 27 to investigate the relative importance of each factor with respect to subject response of increasing, decreasing, or no change in capacity. Non-Parametric Wilcoxon Rank Sums Two-Sample tests for location were conducted to determine if there is a statistical difference between small and large feedlots with respect to factors influencing changes in feedlot capacity over the next five years for the three subsamples.[2]

For each subsample, factors hypothesized to effect capacity decisions were ranked based on each factor's mean score for each subgroup. The relative rankings in Table 31 indicate that a subject's future capacity response had an effect on the rankings of the relative importance of a particular factor on the capacity decision. The rankings for subjects who indicated either no change or an increase in capacity were consistent across factor categories except for "access to capital", which ranked #2 for the increasing category and #6 for the holding capacity constant group. The greatest divergence between the decreasing capacity category and the other two was retirement and labor shortage.

[2] For a discussion of the Wilcoxon Two Sample test see Daniel (1990). P-values for hypotheses tests were evaluated as two-sided test. P-values were generated using "Exact Wilcoxon Two-Sample Test" SAS(2009).

Table 30. Rankings by Capacity Decision: Rank 1 Highest to 10 Lowest

	Decreasing (n=45)	Constant (n=243)	Increasing (n=92)
Near Retirement	1###	10	10
Family Labor	6##	4***	5
Capital Access	8	6	2*
Regulations	7	4**	6
Competitive Position	9	7**	5
Market Access	2	1***	4
Labor Availability	3	8***	8**
Production Efficiency	4	3	1
Access to Inputs	10	9***	9
Economic Opportunity	4	2**	3
Cropland Conversion	5	5*	7##

Notes: The level of statistical significance differences between large and small feedlots for each factor is denoted by * if large feedlots indicate a higher level of importance than small feedlots. If small feedlots indicate a higher level of importance than large feedlots then statistical significance is denoted by #. Significance levels are *=10%, **=5%, and ***=1%. Hypothesis tests are two-tailed.

Table 31 suggests that factors effecting producer capacity decisions are not uniform with respect to the decision or the size of feedlot. It appears that capacity decisions are a factor in determining the competitive position of small feedlots. If one parses the data further by separating each capacity subgroup by size of feedlot, then capacity decisions diverge. For reducing capacity, large feedlots rank labor availability as the number one reason; small feedlots rank near retirement as the number one reason. For constant capacity, large and small feedlots rank market access as the number one reason. For increasing capacity, large feedlots rank capital access and economic opportunity as the number one reason; small feedlots rank production efficiency as the number one reason.

Regulatory Concerns

Respondents were also asked their impression of the general impact that regulations have on the operation (not specifically tied to expansion). Two sets of Likert style questions were asked. The first set focused on the feedlot respondent's opinion on which level of government regulation has the greatest impact on current feedlot operations. The second set asked respondents which area of government regulation has had the greatest impact on their feedlot operations. Responses for the entire sample are provided in Table 32. Federal regulations and waste concerns were rated relatively high across the sample. Animal welfare was consistently rated as of at least some concern.

Restricting responses to larger feedlots, the different regulators were selected as having moderate or high impacts, especially at the federal and state levels (Table 33). Federal and State regulators were more likely classified as having moderate or high impacts compared to smaller feedlots. Waste management was also more commonly selected as having a moderate or high impact by larger feedlots compared to smaller feedlots.

Table 31. Regulatory Entities and Topic Areas

	Counts					Shares (%)				
All (n=397)	No	Slight	Mod.	High	No Resp.	No	Slight	Mod.	High	No Resp.
Source										
Federal	131	103	93	61	9	33.0	25.9	23.4	15.4	2.3
State	144	108	91	46	8	36.3	27.2	22.9	11.6	2.0
County	184	91	64	50	8	46.3	22.9	16.1	12.6	2.0
Local	200	97	56	36	8	50.4	24.4	14.1	9.1	2.0
Type										
Animal	105	123	103	57	9	26.4	31.0	25.9	14.4	2.3
Waste	128	90	96	74	9	32.2	22.7	24.2	18.6	2.3
Zoning	184	75	73	57	8	46.3	18.9	18.4	14.4	2.0
Taxation	134	96	99	59	9	33.8	24.2	24.9	14.9	2.3

Table 32. Regulatory Entities and Topic Areas of Large Feedlots

	Counts					Shares (%)				
Large (n=38)	No	Slight	Mod.	High	No Resp.	No	Slight	Mod.	High	No Resp.
Source										
Federal[1]	4	6	17	10	1	10.5	15.8	44.7	26.3	2.6
State[1]	5	7	15	10	1	13.2	18.4	39.5	26.3	2.6
County	12	10	9	6	1	31.6	26.3	23.7	15.8	2.6
Local	15	13	6	3	1	39.5	34.2	15.8	7.9	2.6
Type										
Animal	9	11	11	6	1	23.7	28.9	28.9	15.8	2.6
Waste[1]	2	6	11	18	1	5.3	15.8	28.9	47.4	2.6
Zoning	14	7	8	8	1	36.8	18.4	21.1	21.1	2.6
Taxation	10	10	11	6	1	26.3	26.3	28.9	15.8	2.6

Note: [1]Larger feedlots were more likely to select moderate or high impact for a given regulation type or area compared to smaller feedlots. These χ^2 tests across sizes had p-values less than 0.05.

The importance of responses are ranked based on mean scores for small versus large feedlots (Table 34). Both small and large feedlots ranked federal regulations as having the greatest impact and local regulations as having the least impact on operations. There is a statistical difference in the mean level of importance for the federal and state regulators, with large feedlots having higher means – consistent with the contingency table results.

While the rankings of the sources of regulation are uniform across feedlot sizes, the ranking of types or area of regulations differ. With respect to regulation area, large feedlots ranked waste, animal welfare, taxation and zoning in order of declining importance. Small feedlots ranked animal welfare, waste, taxation and zoning in order of declining importance. It is interesting that animal welfare regulation is the one that small feedlots point to as the regulatory area having the greatest effect on

their operations. Across sizes, the importance of waste regulations was the only type where the mean response was different.

Table 33. Regulatory Rankings by Source and Area: Rank 1 Highest to 4 Lowest

	Large (n=37) Likert Scale Means	Small (n=352) Likert Scale Means	Ranks Large, Small
Source			
Federal	2.892***	2.145	1, 1
State	2.811***	2.025	2, 2
County	2.243*	1.917	3, 3
Local	1.912	1.801	4, 4
Type			
Animal	2.378	2.279	2, 1
Waste	3.216***	2.202	1, 2
Zoning	2.270	1.980	4, 4
Taxation	2.351	2.199	3, 3

Notes: Likert Scale ranked from 1: not important to 4: very important. Mean values of Likert responses are provided in first two columns. The level of statistical significance of differences between large and small feedlots for each factor is denoted by *. Placement of * indicates which group places a higher level of importance on regulatory issue. Significance levels are *=10%, **=5%, and ***=1%. Hypothesis tests are two-tailed. Wilcoxon Two Sample test were employed.

Paid Feedlot Workers

Hired labor was common as 36% of respondents had feedlot workers (Table 35). The share of larger feedlots with workers, 76.3%, was much higher than for smaller feedlots. The shares of relatively full time and part time workers was similar across feedlot capacity sizes.

Table 34. Paid Feedlot Workers Across Feedlot Sizes

	All (n=397)	Large (n=38)	Small (n=359)
Total Lots	397	38	359
Lots with Payroll	143	29	114
Percent of Total	36.0	76.3	31.8
Number of Workers	293	82	211
150 Days or More	220	67	153
149 Days or Less	76	19	57

The most common number of hired workers was 2, regardless of feedlot capacity (Table 36). A few respondents of different size feedlots had 4 to 7 hired workers. Respondents were asked if they will hire workers in the future. The question did not specify additional workers, so it may cover new or replacement workers. Only 96 respondents intended to hire workers, while 219 did not intend to hire workers. A total of 73 respondents did not know and 9 did not provide a response. Those that

did not intend to hire workers were asked if various factors affected the decision. A lack of need for hired help was a common factor (Table 37). The cost of labor was also cited as a factor to not hire workers. Several respondents gave an additional reason for not hiring – generally summarized as having adequate available family labor.

Table 35. Number of Hired Workers Across Feedlot Sizes

Employees	All (n=397)	Large (n=38)	Small (n=359)
One	46	4	42
Two	62	12	50
Three	17	3	14
Four	7	3	4
Five	5	4	1
Six	2	1	1
Seven	1	1	0

Table 36. Factors to Not Hire Paid Workers

Not Hiring	Counts			Shares (%)		
(n=219)	Yes	No	No Resp.	Yes	No	No Resp.
Labor Pool	26	175	18	11.9	79.9	8.2
Lack of Need	180	28	11	82.2	12.8	5.0
Cost	80	124	15	36.5	56.6	6.8
Turnover	14	187	18	6.4	85.4	8.2
Other	20	176	23	9.1	80.4	10.5

Operator Characteristics

Respondents were asked the year in which they began making day-to-day decisions for the feedlot operation. The years ranged from 1950 to 2015 with an average start year of 1986. Respondents were then asked their age. The most common age was 50 to 59 years old, with 36.2% of respondents in that range (Table 38). The distributions across feedlot sizes are similar.

Table 37. Age of Operator on December 31, 2015

	All (n=397)		Large (n=38)		Small (n=359)	
	Count	Share (%)	Count	Share (%)	Count	Share (%)
Less than 35	15	3.8	3	7.8	12	3.3
35 to 49 Years Old	78	19.6	8	21.1	70	19.5
50 to 59 Years Old	144	36.2	12	31.6	131	36.5
60 to 69 Years Old	111	28.0	8	21.1	103	28.7
70 Years or Older	36	9.1	5	13.2	32	8.9
No Response	13	3.3	2	5.2	11	3.1

The highest education level obtained by the operator was split evenly among high school degree, some college and bachelor's degree or higher levels (Table 39). The mix was similar across feedlot sizes.

Table 38. Highest Formal Education of Operator

	All (n=397)		Large (n=38)		Small (n=359)	
	Count	Share (%)	Count	Share (%)	Count	Share (%)
Less than H.S.	8	2.0	0	0.0	8	2.2
High School	124	31.2	15	39.5	109	30.4
Some College	131	33.0	9	23.7	122	34.0
Bachelor's Degree	111	28.0	12	31.6	99	27.6
Advanced Degree	10	2.5	0	0.0	10	2.8
No Response	13	3.3	2	5.2	11	3.0

There were 384 male operators and 5 female operators among the respondents. Across operators, 331 respondents had a spouse in 2015, while 58 did not. The operators were primarily male, with 96.7% of respondents. The primary occupation of the operator (and if applicable, the spouse) was then asked. For operators, farm or ranch work was the most common primary occupation (Table 40). For spouses, other work was the most common occupation. For comparison, in the 2012 *Census of Agriculture* only 92.7 percent of operators were male. Across operators (regardless of gender), only 58.9 percent had farming as their primary occupation.

Table 39. Primary Occupation of Operator (and Spouse)

	Operator (n=397)		Spouse (n=331)	
	Count	Share (%)	Count	Share (%)
Farm or Ranch Work	350	88.2	99	29.9
Other Work	34	8.6	174	52.6
Not in Workforce	5	1.2	56	16.9
No Response	8	2.0	2	0.6

To further assess the demand for feedlot labor, respondents were asked to quantify their (and applicable spouse's) off-farm work (in days). While a large share of operators gave farm or ranch work as the primary occupation, there was a small share that had no off-farm work (Table 41). For operators with some employment, 83 respondents, off-farm hours worked ranged from 1 to 80 hours per week with a mode (most common response) of 40 hours and an average of 30.7 hours. Responses of more than 168 hours were removed from the comparison. For comparison, a smaller share had no off-farm work compared to the share of operators in the 2012 *Census of Agriculture*. In the survey sample, a lower share of spouses had no off-farm work and a higher share of spouse had 200 or more days of off-farm work. For spouses with some employment, 186 respondents, off-farm hours worked ranged from 1 to 160 per week with a mode (most common response) of 40 hours and an average of 35.5 hours. Of the respondents, there were 12 operators and 23 spouses that identified themselves as being retired.

Operators were then asked if off farm employment was important during the recent five-year span from 2011 to 2015. Of the total, 149 respondents agreed that is was important, 235 did not agree and 13 did not respond. Of those in agreement, they were asked to rank the relative importance of income, health and retirement benefits. There were many respondents that did not agree and

answered the ranking. There were also many respondents that agreed, but did not given an ordinal ranking. Screening out such respondents left 119 with a clear ordinal ranking. The greatest reason was most often added income, chosen by 63 respondents (Table 42). Health benefits was the greatest or moderate reason by a similar share of respondents. Retirement benefits, while sometimes greatest or moderate, was most often the least ranked reason for off-farm employment.

Table 40. Days with Off-farm Employment of Operator (and Spouse)

	Operator (n=397)		Spouse (n=331)	
	Count	Share (%)	Count	Share (%)
None	283	71.3	124	37.5
1 – 49 days	15	3.8	22	6.6
50 – 99 days	8	2.0	13	3.9
100 – 199 days	10	2.5	34	10.3
200 days or more	70	17.6	136	41.1
No Response	11	2.8	2	0.6

Table 41. Ranking of Reasons for Off-farm Employment

	Count			Share (%)		
All (n=119)	Added Income	Health Benefits	Retirement Benefits	Added Income	Health Benefits	Retirement Benefits
Greatest	63	50	6	52.9	42.0	5.0
Moderate	43	51	25	36.1	42.9	21.0
Least	13	18	88	10.9	15.1	73.9

Discussion and Implications

Several characteristics differentiate larger and smaller feedlots who responded to the survey. The 38 large feedlots had an average capacity of 1,950 head, while the 359 small feedlots had an average capacity of 302 head. The smaller feedlots fed a larger proportion of cattle from the owner's calf crop. The larger feedlots tend to use more sources for cattle to feed. How prevalent these structural aspects are in other states remains an empirical question.

In the sample, 45.6 percent of feedlots had some cattle on feed for finishing. Presumably because of using multiple sources for cattle, larger feedlots placed cattle on feed at heavier weights and sold cattle at heavier weights. Smaller feedlots more often use auction markets when selling, while larger feedlots more often sell direct to packer. In the future, the selling questions could be reworded or enumerated differently as the response choices used can be mutually exclusive, e.g., if a respondent always using a practice they would technically not use another practice.

The feedlots with cattle for backgrounding had a relatively high proportion of cattle being custom fed relative to the feedlots with cattle for finishing. This may be an artifact of the sample, e.g., something specific to South Dakota, or a characteristic of backgrounding feedlots in general. The sample feedlots with backgrounding is distinct in terms of the in- and out-weights of the cattle. For selling, the sample feedlots extensively used auction markets, which are prevalent in South Dakota.

The combined or full sample was then analyzed based on responses to questions about production practices. Larger feedlots are more likely to buy feed, source it from nearby farms, use WDGS and use nutritionists. With more cattle to feed, more feed would be necessary for large feedlots However, the size at which it becomes necessary or feasible to use specific feeds and/or a nutritionist is not clear.

Output risk was commonly identified as the greatest risk faced by feedlots. The larger feedlots responded that they take on risk specific to the feedlot enterprise, but were not risk-seeking. The use of tools differs across feedlot size. Larger feedlots were more likely to use many of the tools, suggesting that size makes use either feasible or necessary.

Issue of economic sustainability of small and medium feedlots was addressed in two areas: future capacity decisions and government regulation. The capacity issue was address by first asking producers their expectations on how the capacity of their feedlot will change in the future. A follow up question provided eleven factors affecting their capacity decision. Analysis indicates the importance of factors that effect capacity decisions is influenced by firm size and the producer's expected capacity decision. This issue needs to be explored further. The second area of sustainability investigated is regulation, both the source of regulation and the area of regulation. Survey results indicate uniform rankings on sources of regulation, however, area of regulation has large feedlots ranking waste management regulations as most important followed by animal welfare. Small feedlots reverse that order. Large feedlots indicate a more significant effect of regulations on feedlot operations than small feedlots.

These feedlot respondents consider farming as the primary occupation. The operator and/or spouse cited additional income as a key reason for off-farm employment. Large feedlots were more likely to have hired labor than small feedlots. Those not looking to expand cited a lack of need for help as a factor.

Overall, there were several areas where responses differ by size of feedlot. Future research would further clarify if size differences explain these effects or if differences arise because feedlots reach a certain scale where practices and behavior change to effectively manage a larger enterprise.

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Appendix: Survey Instrument

ECONOMIC FACTORS INFLUENCING THE SUSTAINABILITY OF FEEDLOTS IN SOUTH DAKOTA

Project Code: 199 QID: 153808
SMetaKey: 3808

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Please make corrections to name, address and ZIP Code, if necessary.

SECTION A - ACRES OPERATED

1. In 2015, were there any **cattle and calves on feed**, regardless of ownership, on this operation? **Include** cattle being fed by you for others. **Exclude** any of your cattle being custom fed in feedlots operated by others.

100
1 ☐ Yes - Continue 3 ☐ No - Go to Section I on Back Page

	Head
a. What was the total capacity of this feedlot on January 1, 2016?.	101

2. On January 1, 2016, how many acres did this operation:	None	Acres
a. Own?. . . . . +	☐	102
b. Rent or lease from others or use Rent Free? (**Exclude** land used on an animal unit month [AUM] basis, BLM, and Forest Service land.). . . . . +	☐	103
c. Rent to others?. . . . . -	☐	104
3. Calculate Item **1a + 1b - 1c**. Then the **total acres operated** on January 1 were:. . . . . =		105

4. For the (Item 3) total acres operated, how many acres were:	None	Acres
a. Cropland (**Exclude** hay acres, land in government programs. **Exclude** cropland pasture	☐	106
b. Pastureland (**Include** cropland pasture, woodland pasture, other pasture and rangeland, and land in government programs).	☐	107
c. Hayland.	☐	108

5. In 2015, were there any beef cows on the total acres operated that will be used in a cow/calf operation?

109
1 ☐ Yes - Continue 3 ☐ No - Go to Section B

	Head
a. How many beef cows were on this cow/calf operation?.	110

SECTION B - CATTLE FOR FINISHING

1. During 2015, were there any cattle and calves placed in this feedlot for **finishing**? **Exclude** cattle and calves placed in this feedlot for backgrounding only (report in Section C - Cattle for Backgrounding).

111
1 ☐ Yes - Continue 3 ☐ No - Go to Section C - Cattle for Backgrounding

	Head
a. How many cattle and calves were placed in this feedlot for **finishing**?	112
b. Of the (Item 1a) total cattle and calves placed in this feedlot for **finishing**, how many were cull cows and bulls?	113

2. Of the (Item 1a) total cattle and calves placed in this feedlot for **finishing** in 2015, what percent of cattle and calves were under sole-ownership by this operation, co-ownership by this operation with another operation, or being custom fed by this operation?

	None	Percent
a. Sole-ownership?	☐	114
b. Co-ownership?	☐	115
c. Custom fed?	☐	116
		100%

3. Of the (Item 1a) total cattle and calves placed in this feedlot for **finishing** in 2015, what percent of cattle and calves were from the following sources:

	None	Percent
a. Own calf crop?	☐	117
b. Order buyer?	☐	118
c. Auction barn?	☐	119
d. Video auction?	☐	120
e. Direct purchase from cow/calf producer?	☐	121
f. Custom Fed?	☐	122
		100%

4. In 2015, what was the average placement in-weight and out-weight for **finishing** steers and heifers under sole- ownership by this operation, co-ownership by this operation with another operation, or being custom fed by this operation?

Cattle Ownership	None	What was the average placement in-weight and out-weight for finishing steers?		What was the average placement in-weight and out-weight for finishing heifers?	
		In-weight	Out-weight	In-weight	Out-weight
a. Sole-ownership	☐	123	124	125	126
b. Co-ownership	☐	127	128	129	130
c. Custom fed	☐	131	132	133	134

5. In 2015, did this operation **sell** any **finished** cattle? **Exclude** cattle and calves placed in this feedlot for backgrounding only (report in Section C - Cattle for Backgrounding).

135 1 ☐ Yes - Continue 3 ☐ No - Go to Section C - Cattle for Backgrounding

a. Please indicate the frequency each of the following market information sources were used to determine the price of **finished** cattle sold in 2015. (Check one box per row.)

Market Information Source		Never	Sometimes	Always
b. USDA public price reports published by the Agricultural Marketing News Service.	136	1 ☐	2 ☐	3 ☐
c. Price reporting by local auction managers or other reporters in a public medium (newspapers, radio, etc.)	137	1 ☐	2 ☐	3 ☐
d. Price reporting by fee-based electronic data services (DTN, Cattle Fax, etc.)	138	1 ☐	2 ☐	3 ☐
e. Information from neighbors and friends	139	1 ☐	2 ☐	3 ☐
f. Futures markets	140	1 ☐	2 ☐	3 ☐
g. Bids from order buyers (independent or packer employee)	141	1 ☐	2 ☐	3 ☐
h. Satellite (video) auction markets	142	1 ☐	2 ☐	3 ☐
i. Other	143	1 ☐	2 ☐	3 ☐

6. Please indicate the frequency each of the following markets were used to determine the price of **finished** cattle sold in 2015. (Check one box per row.)

Price Method		Never	Sometimes	Always
a. Cash Market				
(i) Live weight by pen	144	1 ☐	2 ☐	3 ☐
(ii) Dressed weight by the pen	145	1 ☐	2 ☐	3 ☐
(iii) On a grid	146	1 ☐	2 ☐	3 ☐
b. Forward Contract (for delivery, excludes futures contracts)				
(i) Live weight by pen	147	1 ☐	2 ☐	3 ☐
(ii) Dressed weight by the pen	148	1 ☐	2 ☐	3 ☐
(iii) On a grid	149	1 ☐	2 ☐	3 ☐
c. Formula Priced				
(i) Live weight by pen	150	1 ☐	2 ☐	3 ☐
(ii) Dressed weight by the pen	151	1 ☐	2 ☐	3 ☐
(iii) On a grid	152	1 ☐	2 ☐	3 ☐
d. Other (Specify: 153_____)	154	1 ☐	2 ☐	3 ☐

7. Please indicate the frequency each of the following cattle buyers were used to sell **finished** cattle in 2015. (Check one box per row.)

Cattle Buyer	Never	Sometimes	Always
a. Directly to packer ---	1 ☐	2 ☐	3 ☐
b. Order buyer ---	1 ☐	2 ☐	3 ☐
c. Auction Barn ---	1 ☐	2 ☐	3 ☐
d. Other ---	1 ☐	2 ☐	3 ☐

SECTION C - CATTLE FOR BACKGROUNDING

1. During 2015, were any cattle and calves placed in this feedlot for **backgrounding**? Exclude cattle and calves placed in this feedlot for finishing only (report in Section B - Cattle for Finishing).

159 1 ☐ Yes - Continue 3 ☐ No - Go to Section D

	Head
a. How many cattle and calves were placed in this feedlot for **backgrounding**?.	160

2. Of the (Item 1a) total cattle and calves placed in this feedlot for **backgrounding** in 2015, what percent of cattle and calves were under sole-ownership by this operation, co-ownership by this operation with another operation, or being custom fed by this operation?:

	None	Percent
a. Sole-ownership?.	☐	161
b. Co-ownership?.	☐	162
c. Custom fed?.	☐	163
		100%

3. Of the (Item 1a) total cattle and calves placed in this feedlot for **backgrounding** in 2015, what percent of cattle and calves were from the following sources:

	None	Percent
a. Own calf crop?.	☐	164
b. Order buyer?.	☐	165
c. Auction barn?.	☐	166
d. Video auction?.	☐	167
e. Direct purchase from cow/calf producer?.	☐	168
f. Custom Fed?.	☐	169
		100%

4. In 2015, what was the average placement in-weight and out-weight for **backgrounding** steers and heifers under sole- ownership by this operation, co-ownership by this operation with another operation, or being custom fed by this operation?

Cattle Ownership	None	What was the average placement in-weight and out-weight for backgrounded steers?		What was the average placement in-weight and out-weight for backgrounded heifers?	
		In-weight	Out-weight	In-weight	Out-weight
a. Sole-ownership	☐	170	171	172	173
b. Co-ownership	☐	174	175	176	177
c. Custom fed	☐	178	179	180	181

5. In 2015, did this operation **sell** any **backgrounded** cattle? **Exclude** cattle and calves placed in this feedlot for finishing only (report in Section B – Cattle for Finishing).

182
1 ☐ Yes - Continue 3 ☐ No - Go to Section D

a. Please indicate the frequency each of the following market information sources were used to determine the priceof **backgrounded** cattle sold in 2015. (Check one box per row.)

Market Information Source		Never	Sometimes	Always
b. USDA public price reports published by the Agricultural Marketing News Service	183	1 ☐	2 ☐	3 ☐
c. Price reporting by local auction managers or other reporters in a public medium (newspapers, radio, etc.)	184	1 ☐	2 ☐	3 ☐
d. Price reporting by fee-based electronic data services (DTN, Cattle, Fax, etc.)	185	1 ☐	2 ☐	3 ☐
e. Information from neighbors and friends	186	1 ☐	2 ☐	3 ☐
f. Futures markets	187	1 ☐	2 ☐	3 ☐
g. Bids from order buyers (independent or packer employee)	188	1 ☐	2 ☐	3 ☐
h. Satellite (video) auction markets	189	1 ☐	2 ☐	3 ☐
i. Quotes from feedlot operators	190	1 ☐	2 ☐	3 ☐

6. Please indicate the frequency each of the following cattle buyers were used to sell backgrounded cattle in 2015.(Check one box per row.)

Cattle Buyer		Never	Sometimes	Always
a. Directly to another feedlot	---	1 ☐	2 ☐	3 ☐
b. Order buyer	---	1 ☐	2 ☐	3 ☐
c. Auction barn	---	1 ☐	2 ☐	3 ☐
d. Video auction	---	1 ☐	2 ☐	3 ☐
e. Other (Specify: 195_____)	---	1 ☐	2 ☐	3 ☐

SECTION D - PRODUCTION MANAGEMENT

1. In 2015, did this operation **purchase** any feeder cattle for backgrounding or finishing?

197
1 ☐ Yes - Continue 3 ☐ No - Go to Item 2

a. Please indicate the frequency each of the following market information sources were used to determine the priceof **feeder cattle** purchased by this operation in 2015. (Check one per row.)

Market Information Source	Never	Sometimes	Always
b. USDA public price reports published by the Agricultural Marketing News Service 198	1 ☐	2 ☐	3 ☐
c. Price reporting by local auction managers or other reporters in a public medium (newspapers, radio, etc.) 199	1 ☐	2 ☐	3 ☐
d. Price reporting by fee-based electronic data services (DTN, Cattle, Fax, etc.) 200	1 ☐	2 ☐	3 ☐
e. Information from neighbors and friends 201	1 ☐	2 ☐	3 ☐
f. Futures markets 202	1 ☐	2 ☐	3 ☐
g. Bids from order buyers (independent or packer employee) 203	1 ☐	2 ☐	3 ☐
h. Satellite (video) auction markets 204	1 ☐	2 ☐	3 ☐
i. Other 205	1 ☐	2 ☐	3 ☐

2. Please indicate which of the following **feedlot management practices** were used by this operation in 2015. (Check one box per row.)

Feedlot Management Practices	Yes	No
a. Consulted with Animal Nutritionist 206	1 ☐	3 ☐
b. Consulted with Veterinarian for sick or injured animals 207	1 ☐	3 ☐
c. Maintained hospital pen 208	1 ☐	3 ☐
d. Kept hormone, vaccination, and medical records for animals in your lot 209	1 ☐	3 ☐
e. Added Beta Agonist: such as Zilmax or Optaflexx to rations as part of the finishing process 211	1 ☐	3 ☐
f. Used Ultra-Sound to sort cattle for marketing purposes 212	1 ☐	3 ☐
g. Visually sorted of cattle for marketing purposes 213	1 ☐	3 ☐

3. Please indicate the frequency each of the following **feedlot feeding practices** were used by this operation in 2015. (Check one box per row.)

Feedlot Feeding Practices	Never	Sometimes	Always
a. Dried distillers grain (DDG) liquid syrup mixed with low quality roughage 214	1 ☐	2 ☐	3 ☐
b. Wet distillers grain with solubles (WDGS) 215	1 ☐	2 ☐	3 ☐
c. Dried distillers grain with solubles (DDGS) 216	1 ☐	2 ☐	3 ☐
d. Own crop production (corn, hay, etc.) 217	1 ☐	2 ☐	3 ☐
e. Purchase locally from other producers (corn, hay, etc.) 218	1 ☐	2 ☐	3 ☐
f. Purchase locally from commercial firm (corn, hay, etc.) 219	1 ☐	2 ☐	3 ☐

4. Has this operation completed the requirements of the Beef Quality Assurance program?.... 220 1 ☐ Yes 3 ☐ No

5. Has this operation enrolled in the South Dakota Certified Enrolled Cattle™ program?. . .. . . . 221 1 ☐ Yes 3 ☐ No

6. How would you best describe your feedlot facility infrastructure? (Check one.)
222
1 ☐ Open lot with windbreak
2 ☐ Open lot with shed
3 ☐ Deep-bedded confinement
4 ☐ Slatted floor confinement

SECTION E - RISK MANAGEMENT

1. In 2015, did this operation **own** any **cattle and calves on feed**? **Exclude** cattle being custom fed by you for others.
223
1 ☐ Yes - Continue 3 ☐ No - Go to Section F

2. Feedlot operators face a financial risk from three primary sources: production, output price, and input price risk. For cattle fed in 2015, please rank these risks **1, 2, or 3**, with **1** being the area of risk you consider the **greatest risk** to earning a profit from your feedlot operation, **2** being moderate risk, and **3** being **the least risk**

	Rank
a. Production Risk (e.g. drought, disease, etc.).	224
b. Output Price Risk (e.g. declining fed cattle prices).	225
c. Input Price Risk (e.g. rising feed costs, rising calf prices).	226

3. Which of the following statements about feedlot financial decisions would characterize the level of risk taken by this operation? (Check one.)
227
1 ☐ Avoid risk when possible in feedlot financial decisions
2 ☐ Take on substantial levels of risk in feedlot financial decisions
3 ☐ Neither seek nor avoid risk in feedlot financial decisions

4. Based on the (Item 3) level of risk about feedlot financial decisions, do you take greater financial risk, less financial risk, or is the level of risk no different for **major** financial decisions outside of the feedlot? **(e.g. land purchases, financial investments, new business ventures)"**. (Check one.)

228 1 ☐ Take greater financial risk
2 ☐ Take less financial risk
3 ☐ No difference

5. During the three-year period 2013 through 2015, indicate the frequency each of the following risk management tools were used by this operation. (Check one box per row.)

Risk Management Tools	Never	Sometimes	Always
a. Livestock Gross Margin Insurance (LGM) 229	1 ☐	2 ☐	3 ☐
b. Livestock Risk Protection Insurance (LPR) 230	1 ☐	2 ☐	3 ☐
c. Crop Insurance 231	1 ☐	2 ☐	3 ☐
d. Noninsured Disaster Assistance Program (NAP) 232	1 ☐	2 ☐	3 ☐
e. Pasture, Rangeland, Forage Insurance 233	1 ☐	2 ☐	3 ☐
f. Forward contract for fed cattle 234	1 ☐	2 ☐	3 ☐
g. Forward contract for feeder cattle 235	1 ☐	2 ☐	3 ☐
h. Forward contract for feed (corn, hay, DDGS,etc.) 236	1 ☐	2 ☐	3 ☐
i. Forward contract for other inputs (fuel, fertilizer, etc.) 237	1 ☐	2 ☐	3 ☐
j. Hedging using futures to manage input price risk 238	1 ☐	2 ☐	3 ☐
k. Hedging using options to manage input price risk 239	1 ☐	2 ☐	3 ☐
l. Hedging using futures to manage output price risk 240	1 ☐	2 ☐	3 ☐
m. Hedging using options to manage output price risk 241	1 ☐	2 ☐	3 ☐
n. Multi-period relationship with packer for fed cattle delivery 242	1 ☐	2 ☐	3 ☐
o. Multi-period contracts with cow/calf producer for feeder cattle delivery 291	1 ☐	2 ☐	3 ☐

SECTION F - FEEDLOT ECONOMIC SUSTAINABILITY

1. In the next five years, do you intend for feedlot production capacity to increase, decrease, or stay at current production capacity on this operation? (Check one.)

243 1 ☐ Increase
2 ☐ Decrease
3 ☐ Stay at current production capacity

2. Based on the (Item 1) feedlot production capacity intentions for the five years, indicate the importance eachof the following factors were in forming capacity intentions. (Check one box per row.)

Production Capacity Factors	Not Important	Slightly Important	Moderately Important	Very Important
244 a. Near retirement	1 ☐	2 ☐	3 ☐	4 ☐
245 b. Interest of family members in running feedlot operation	1 ☐	2 ☐	3 ☐	4 ☐
246 c. Access to financial capital	1 ☐	2 ☐	3 ☐	4 ☐
247 d. Government regulations	1 ☐	2 ☐	3 ☐	4 ☐
248 e. Improve competitive position of my farming operation	1 ☐	2 ☐	3 ☐	4 ☐
249 f. Market access for selling cattle	1 ☐	2 ☐	3 ☐	4 ☐
250 g. Farm labor availability	1 ☐	2 ☐	3 ☐	4 ☐
251 h. Improve production efficiency (lower cost structure)	1 ☐	2 ☐	3 ☐	4 ☐
252 i. Market access for purchasing inputs	1 ☐	2 ☐	3 ☐	4 ☐
253 j. Economic opportunity	1 ☐	2 ☐	3 ☐	4 ☐
254 k. Loss of pasture/hayland to corn/soybean production	1 ☐	2 ☐	3 ☐	4 ☐

3. Government regulation has been an ongoing concern for feedlot operators. Please indicate the impact each of the following levels of government regulation have on this feedlot operation. (Check one box per row.)

Government Regulation	No Impact	Slight Impact	Moderate Impact	High Impact
--- a. Federal regulations	1 ☐	2 ☐	3 ☐	4 ☐
--- b. State regulations	1 ☐	2 ☐	3 ☐	4 ☐
--- c. County regulations	1 ☐	2 ☐	3 ☐	4 ☐
--- d. Local regulations	1 ☐	2 ☐	3 ☐	4 ☐

4. Please indicate the impact of government regulation on each of the following areas of this feedlot operation.(Check one box per row.)

Regulation Area	No Impact	Slight Impact	Moderate Impact	High Impact
--- a. Animal health and welfare	1 ☐	2 ☐	3 ☐	4 ☐
--- b. Feedlot waste management	1 ☐	2 ☐	3 ☐	4 ☐
--- c. Zoning restrictions	1 ☐	2 ☐	3 ☐	4 ☐
--- d. Taxation	1 ☐	2 ☐	3 ☐	4 ☐

SECTION G - PAID FEEDLOT WORKERS

1. In 2015, did this operation have anyone on the payroll to do feedlot work? [**Only report** workers directly hired and paid by the farm operation. **Include** part-time workers, paid family members, and hired managers. **Include** all hired workers regardless of method of pay. **Exclude** contract and custom workers, retail workers and "value-added" workers (exclude retail sales workers, for example)]

263
1 ☐ Yes - Continue 3 ☐ No - Go to Item 4

	Total Paid Feedlot Workers
2. How many workers did this operation have on payroll to do feedlot work in 2015?.	264

3. In 2015, of the (Item 2) total paid feedlot workers, how many will be paid by this operation:

	None	Number of Workers
a. for 150 days or more of work?.	☐	265
b. for 149 days or less of work?.	☐	266

4. Will this operation hire anyone on the payroll to do feedlot work in the future? [**Only report** workers to be directly hired and paid by the farm operation. **Include** part-time workers, paid family members, and hired managers. **Include** all hired workers regardless of method of pay. **Exclude** contract and custom workers, retail workers and "value-added" workers (exclude retail sales workers, for example)]

267
1 ☐ Yes - Go to Section H 3 ☐ No - Go to Item 5 2 ☐ Don't Know - Go to Section H

5. Please indicate which of the following factors affected the decision to **not** hire paid workers on this operation.

Factor to Not Hire Paid Workers	Affected hiring decision?
a. No one looking for work in geographic area	1 ☐ Yes 3 ☐ No
b. Not enough work on this operation to justify additional paid workers	1 ☐ Yes 3 ☐ No
c. Cost to hire additional paid workers	1 ☐ Yes 3 ☐ No
d. High turnover of paid workers on this operation	1 ☐ Yes 3 ☐ No
e. Other (specify:272_____)	1 ☐ Yes 3 ☐ No

SECTION H - OPERATOR CHARACTERISTICS

1. In what year did you begin to make day-to-day decisions for this feedlot operation?. . . . . | 274 | **Year (YYYY)**

2. What was your age on December 31, 2015? (Check one.)

275
- 1 ☐ Less than 35 years old
- 2 ☐ 35 – 49 years old
- 3 ☐ 50 – 59 years old
- 4 ☐ 60 - 69 years old
- 5 ☐ 70 years or older

3. What was the highest level of formal education you have achieved? (Check one.)

276
- 1 ☐ Less than high school diploma
- 2 ☐ High school
- 3 ☐ Some college (Include Associate's Degree)
- 4 ☐ Four-year college degree (Bachelor's Degree)
- 5 ☐ Advanced Degree (Master's, MBA, Ph.D., etc.)

4. What is your gender? (Check one.)

277
- 1 ☐ Male
- 2 ☐ Female

5. Did you (the principle operator) have a spouse at any point during 2015?. . . . . 278 1 ☐ Yes 3 ☐ No

6. Answer the following questions for you (the Principle Operator) and the spouse (if applicable) as of December 31, 2015.

	Principal Operator	Spouse
a. At which occupation did each person spend the majority (50 percent or more) of their worktime in 2015?	**Mark one answer only** 279 1 ☐ Farm or ranch work 2 ☐ Work other than farming/ranching 3 ☐ Currently not in the paid workforce	**Mark one answer only** 280 1 ☐ Farm or ranch work 2 ☐ Work other than farming/ranching 3 ☐ Currently not in the paid workforce
b. How many days did each person work at least four hours per day in an off-farm job in 2015? **Exclude** work on someone else's farm for pay.	**Mark one answer only** 281 1 ☐ None 2 ☐ 1 - 49 days 3 ☐ 50 - 99 days 4 ☐ 100 - 199 5 ☐ 200 days or more	**Mark one answer only** 282 1 ☐ None 2 ☐ 1 - 49 days 3 ☐ 50 - 99 days 4 ☐ 100 - 199 5 ☐ 200 days or more
c. Is this person retired from farming?	283 1 ☐ Yes 3 ☐ No	284 1 ☐ Yes 3 ☐ No

7. How many hours per week did each of the following people spend working outside this operation? **Include** time spent working for a wage or salary, or for a non-farm business. **Exclude** time spent working at another farm/ranch operation and time spent commuting.

	None	Hours
a. You (the principle operator).	☐	285
b. Your spouse (the principle operator's spouse).	☐	286

8. During the five-year period 2011 through 2015, was off-farm employment an important financial component to maintain the financial stability of this operation?

287
1 ☐ Yes - Continue 3 ☐ No - Go to Section I

9. Some reasons for off-farm employment include additional income, health insurance benefits, and retirement benefits. Please rank these reasons **1, 2, or 3**, with **1** being the reason you consider the **greatest** for off-farm employment, **2** being **moderate**, and **3** being **the least.**

	Rank
a. Additional Income.	288
b. Health Insurance Benefits.	289
c. Retirement Benefits.	290

SECTION I - CONCLUSION

1. Please provide any comments about your operation, cattle feeding, or changes in ownership:

This completes the survey. Thank you for your help.

OFFICE USE ONLY

Response		Respondent		Mode		Enum.	Eval.	Change	Office Use for POID			
1-Comp 2-R 3-Inac 4-Office Hold 5-R – Est 6-Inac – Est 7-Off Hold – Est	9901	1-Op/Mgr 2-Sp 3-Acct/Bkpr 4-Partner 9-Oth	9902	1-Mail 2-Tel 3-Face-to-Face 4-CATI 5-Web 6-e-mail 7-Fax 8-CAPI 19-Other	9903	9998	9900 **R. Unit** 9921	9985	9989 __ __ __ - - **Optional Use**			
									9907	9908	9906	9916
S/E Name												