Virginia Cooperative Extension

PUBLICATION 448-124

A Characterization of Direct-Marketed Beef Production in Virginia

Denise Mainville, Extension specialist, Agricultural and Applied Economics, Virginia Tech
Gordon Groover, Extension specialist, Agricultural and Applied Economics, Virginia Tech
Bradley Webb, former graduate student, Agricultural and Applied Economics, Virginia Tech
Ashleigh Waddle, former graduate student, Agricultural and Applied Economics, Virginia Tech

Introduction

Beef is Virginia's second most important agricultural industry, with 20,000 beef farms generating nearly $400 million in cash receipts (USDA 2009). Despite the industry's importance, however, Virginia's beef producers face many challenges, including rising input costs, unstable selling prices, and expanding urban populations that put pressure on land prices and farming practices. Evolving consumer, industry, and regulatory demands that require new investments and increase costs further limit the profitability of the commonwealth's beef farms.

These issues make it challenging to operate a profitable beef-cattle operation in Virginia, particularly for smaller-scale commodity beef producers who sell calves or stockers out of state for finishing. Many producers are interested in knowing about marketing beef directly to consumers as an alternative to commodity beef production. Direct-marketing offers potential benefits, including price premiums and loyal customers, which in turn can increase farmers' incomes and improve the sustainability of their farm operations. Nevertheless, producers who direct-market beef to consumers must perform all of the logistical, marketing, and other value-added activities that are typically handled by other agents in the commodity beef market. Thus, they face additional costs, risks, and cash-flow considerations that should be weighed along with the potential benefits of entering the market.

As farmers contemplate direct-marketing their beef, they – and the professionals who serve them – need information about the different approaches and methods available so that they can consider their options and the tradeoffs among them. This publication describes the production practices employed by direct-marketers of beef in Virginia. It describes the characteristics of producers' farms and production techniques, including breeding and calving, pasture management, feeding and nutrition, finishing methods, and animal health care. The information presented in this publication comes from a telephone survey of 42 direct-marketers of beef in Virginia. Further information on the data and how it was analyzed is provided in box 1. A complementary publication – *A Characterization of Direct-Marketed Beef Processing and Marketing in Virginia*, Virginia Cooperative Extension publication 448-123, *www.pubs.ext.vt.edu/448/448-123/448-123.pdf* – draws from the same survey results and describes the processing and marketing practices used to direct-market beef in the state.

General Farm Characteristics

Producers responding to the survey were located in 30 different counties, as shown in figure 1. Sixty-five percent of the producers had a background in beef production, while 15 percent had a background in agriculture other than beef cattle, and 20 percent had no previous agriculture experience before beginning to direct-

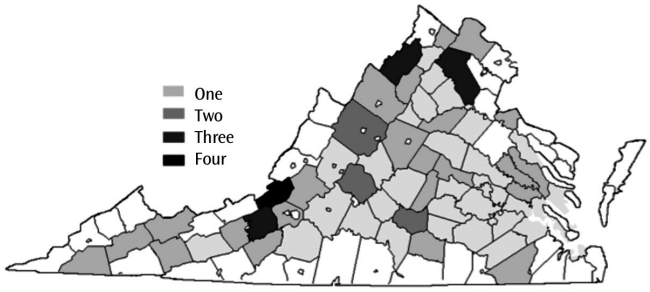

Figure 1. Geographic distribution of survey respondents
Note: Color variations represent the number of producers responding to the survey in each county.

www.ext.vt.edu

Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2009

VirginiaTech 1872 Invent the Future

VIRGINIA STATE UNIVERSITY

Box 1. Data sources and analysis

The information presented in this publication comes from a telephone survey of direct-marketers of beef that was conducted between November 2006 and March 2007. An attempt was made to contact all direct-marketers of beef in Virginia. A list of potential respondents was compiled from various sources, including the Virginia Department of Agriculture and Consumer Services, Virginia Cooperative Extension agents, and websites such as *www.EatWild.com*. In all, 95 potential respondents were contacted. Forty-four of them did not qualify for the survey because they did not direct-market beef. A further nine potential respondents declined to participate in the survey (these potential respondents did not necessarily direct-market beef), while 42 producers who direct-market beef completed the survey. The information in this publication comes from the results of the 42 completed surveys.

Data was analyzed in two ways, depending on the type of question that was asked. For questions that asked "how many" (for example, "How many acres do you farm?"), the mean, median, and coefficient of variation were calculated. While the mean shows the arithmetic average of a value, it can be increased or decreased by the presence of only a few particularly large or small observations. The median, in contrast, shows the mid-point of the observations and thus is more representative of the "typical" farm. The coefficient of variation is the ratio between the standard deviation and the mean of the observations; it helps show the variation in responses – a higher coefficient of variation means that individual responses varied more widely around the mean than a lower coefficient of variation. Questions that were not appropriate to analyze with such statistics (such as, "What county do you live in?") are reported as percentage distributions.

market beef. Only five producers were either certified organic or seeking organic certification.

The mean area farmed (excluding forest and timber land) by producers was 509 acres, though the median area farmed of 230 acres reflects that there is a relatively small number of large farms that skew the mean upwards, while most farms are much smaller (table 1). Approximately three-quarters of producers' mean acreage is devoted to pasture, while about two-thirds of the total farm acreage is devoted strictly to the production of direct-marketed beef. Table 1 shows that while the mean farm is larger, the share of acreage devoted to pasture is smaller than that of the median farms. Approximately one-third of the farms surveyed also produced row crops (a mean of 75 acres among them), while approximately one-third also produced fruits and vegetables. Forty percent of the farmers interviewed focus exclusively on livestock production.

Producers were asked how direct-marketed beef and other animal products contribute to their total farm income (table 2). On average, 61 percent of the producers' total farm income comes from direct-marketed

Table 1. Farm characteristics

	Mean	Median	Coefficient of variation
Total farm acres	509	230	133%
Acres of pasture	302	164	140%
Acres devoted to direct-marketed beef only	228	125	121%
Pasture acreage as a share of total farm acreage	74%	78%	35%
Direct-marketed beef acreage as a share of total farm acreage	67%	70%	49%
Direct-marketed beef acreage as a share of pasture acreage	95%	100%	45%

Table 2. Description of direct-marketed activities and income

	Mean	Median	Coefficient of variation
Direct-marketed animal products as share of total farm income	61%	66%	64%
Direct-marketed beef as share of total farm income	42%	32%	79%

livestock product sales, with 42 percent of that income from the sale of direct-marketed beef only. Compared to the mean, the median (typical) farmer is more reliant on direct-marketed livestock products, with a smaller share of those sales coming specifically from beef.

Figure 2 shows producers' approximate business debt as a percentage of their total farm assets. Fifty percent of the producers have a debt-to-asset ratio of less than 10 percent, while 40 percent either did not know their level of debt to assets or preferred not to divulge the information. Figure 3 shows that producers tend to have a heavy reliance on off-farm income, with 62 percent earning more than $20,000 of off-farm income per year. At the other extreme, 26 percent reported having no off-farm income.

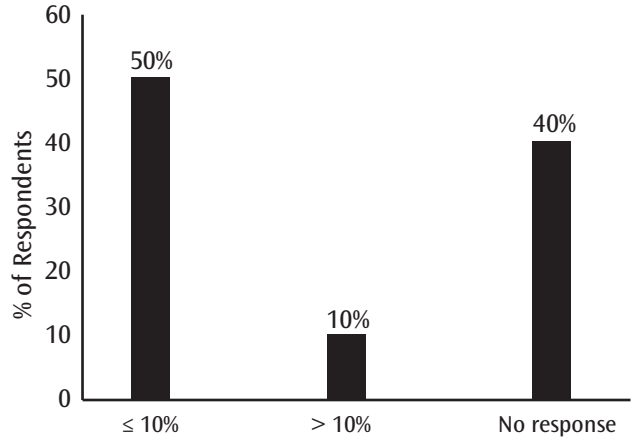

Figure 2. Level of farm debt to assets

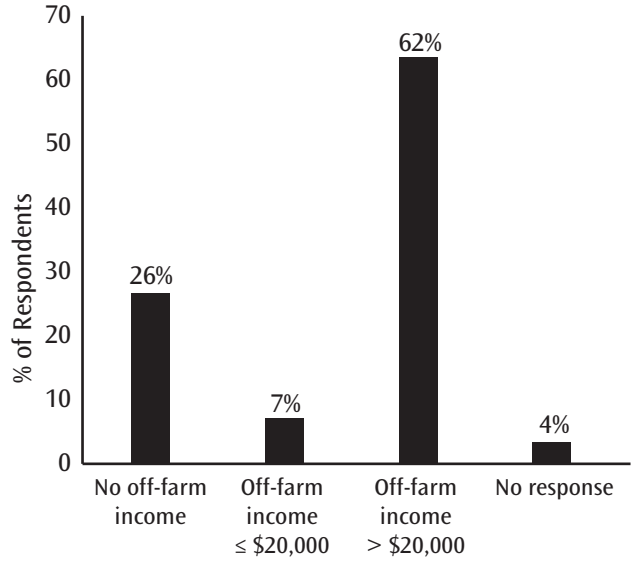

Figure 3. Reliance on off-farm income

Direct-Marketed Livestock Activities

Figure 4 illustrates that beef is the only animal product direct-marketed by about one-third of the respondents, while 27 percent direct-market beef along with one other animal product. Approximately one producer in five direct-markets two animal products in addition to beef. Figure 5 shows that pork and poultry are the most common products direct-marketed in combination with beef, followed by eggs and lamb. "Other" livestock products produced include goats, dairy, bison, and rabbits.

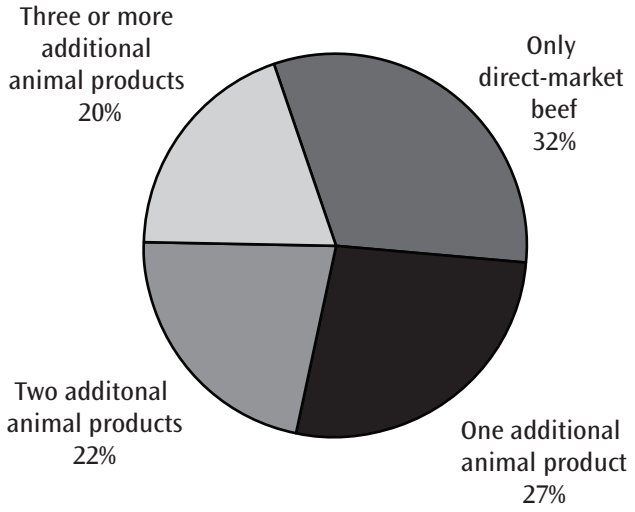

Figure 4. Direct-marketed animal product diversity

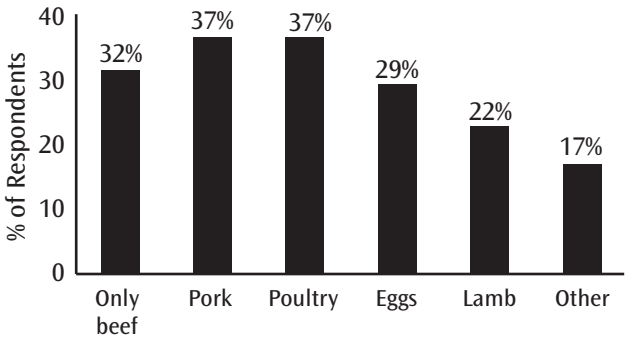

Figure 5. Other direct-marketed animal products

Production Systems

Figure 6 characterizes the scope of beef-production activities undertaken by direct-marketers of beef, including those involving conventionally marketed herds. The clear majority, 81 percent, raise cattle from birth to slaughter, yet one-quarter buy stockers to add to their finishing programs. Cow-calf operations reported are generally a part of the producer's commodity beef operation but also the source of cattle that will be drawn from the herd to be finished out and direct-marketed to consumers.

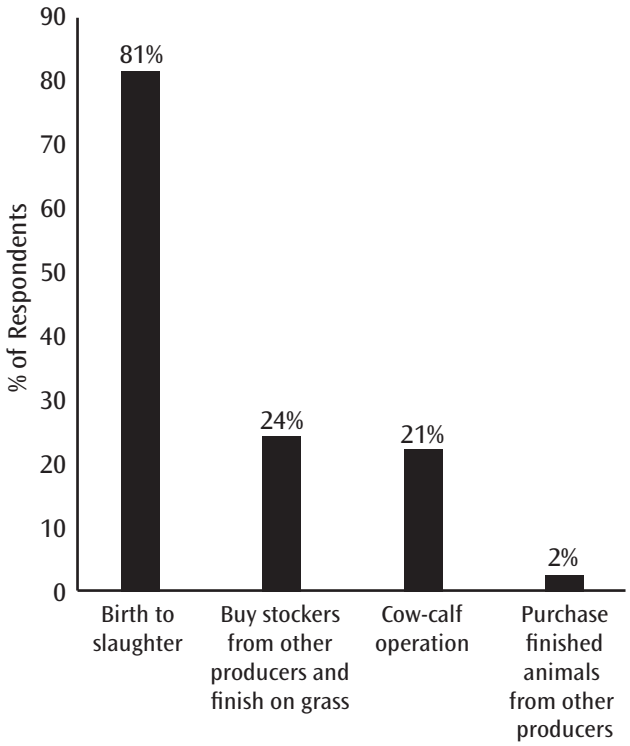

Figure 6. Stages of beef-cattle production practiced by farmers

Table 3. Direct-marketed beef herd composition and animals slaughtered

	Mean	Median	Coefficient of variation
Total herd size	127	60	120%
Cows	63	30	122%
Bred heifers	7	6	80%
Stocker steers	20	15	87%
Finishing steers	14	7	138%
Calves	54	30	118%
Number of animals slaughtered	16	11	76%

Figure 7 compares state-level data from the 2002 Census of Agriculture (USDA 2004) on the distribution of farms with different size herds to survey data on those farms that direct-market beef specifically. As shown in figure 7, Virginia farms that direct-market beef tend to have larger herds than Virginia's beef-cattle farms in general, with about two-thirds of Virginia's direct-marketers having herds of between 20 head and 200 head, while the vast majority of Virginia's beef-cattle farms have less than 50 head.

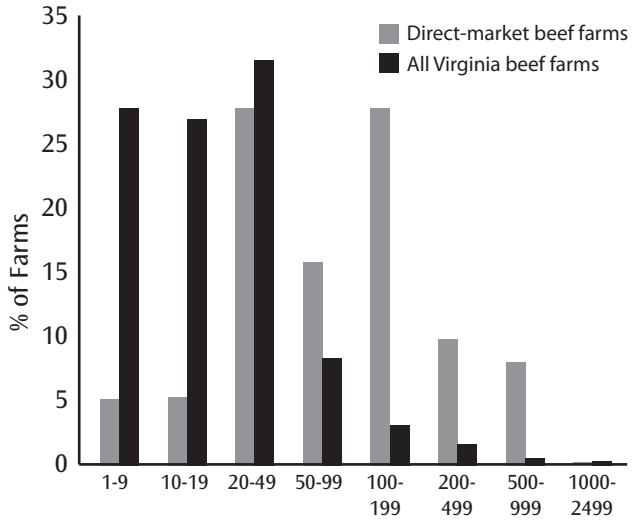

Figure 7. Comparison of direct-market and all beef-cattle herd sizes in Virginia

Breeding and Calving

Seventy percent of producers surveyed rely on natural service for breeding, with the rest using a combination of artificial insemination and natural service. Figure 8 shows producers' target calving seasons. The largest share of producers (38 percent) calves in spring, while 36 percent calve in both spring and fall, and 18 percent calve year-round. Average weaning weights are 518 pounds for steers and 475 pounds for heifers.

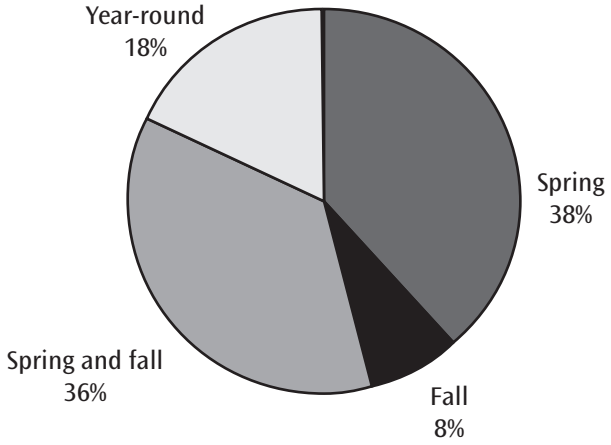

Figure 8. Target calving season

Though a broad range of breeds are used, 44 percent of the producers report that 75 percent or more of their bull herd is Angus. After Angus, Hereford, Simmental, and Highland were most commonly represented in bull genetics, while Ancient Whitepark, Murray Grey, Galloway, Holstein, and Jersey genetics are also used. Angus also dominated cow genetics, with 43 percent of the producers reporting that 75 percent or more of their

cow genetics were Angus. Other breeds present among cows included Devon, Hereford, Simmental, Ancient Whitepark, Highland, and Red Poll.

Pasture Management

Producers were asked to rank their first-, second-, and third-most important forages for finishing their cattle (figure 9). Orchard grass is the most important forage for 41 percent of the respondents. Clover is the second-most important forage for 47 percent of the respondents, and fescue is the third-most important forage for 39 percent of the respondents. Fescue is named as one of the three most important forages for 73 percent of the producers.

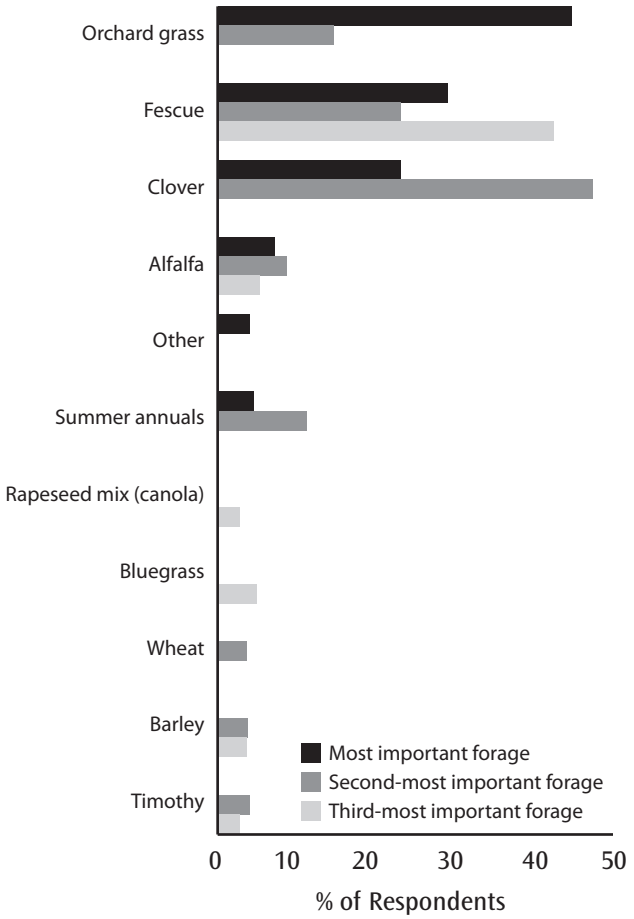

Figure 9. Producers' most important finishing forages

Table 3 offers a summary of the composition of producers' herd inventory during 2006. While the mean total herd size was 127, the median size was 60, indicating a large number of relatively small farms direct-market beef. Relative to total herd size, there is little difference between the mean and median numbers of animals slaughtered, showing that producers with smaller herds finish out more of their animals on a yearly basis than those with larger herds.

Producers were asked if they used pasture land as part of a crop rotation and how often they took a pasture out of grazing and put it into other uses, such as fallow, hay, or crops. A majority of the respondents (93 percent) do not use their pastures as part of a crop rotation sequence. Producers were also asked how often they rotated animals between pastures during periods of good forage growth. The results, shown in figure 10, suggest intense pasture management, as 44 percent of the producers rotate every three days or fewer during the grazing season.

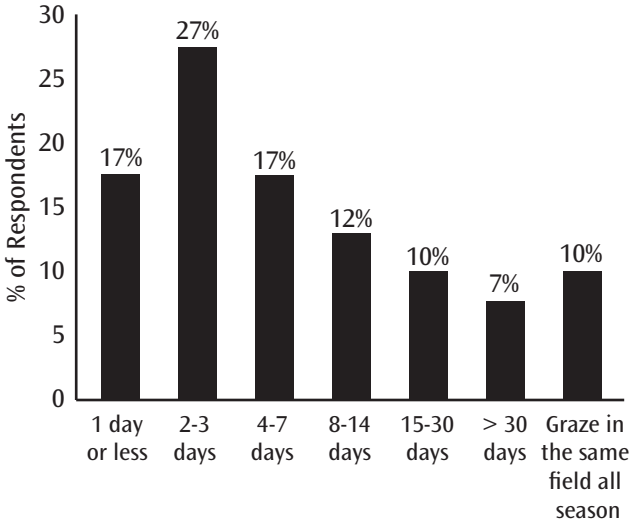

Figure 10. Frequency of pasture rotation during grazing season

Producers use various drought-management strategies (figure 11), with 40 percent feeding hay as the primary strategy. Interestingly, 36 percent of the producers reported either not having a drought-management strategy in place or not having needed one at the time of the survey.

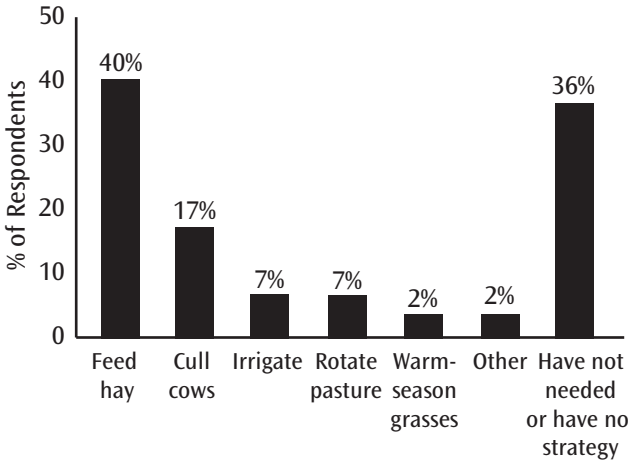

Figure 11. Drought-management strategies

The majority of producers (90 percent) fertilize their pastures with various forms of nitrogen, potassium, and phosphorus. Of the producers who supplement their pastures, 90 percent add nitrogen, 74 percent add phosphorus, and 72 percent add potassium. Table 4 shows the sources of the pasture fertilization used.

Table 4. Sources of pasture fertilization

Nitrogen	%	Phosphorus	%	Potassium	%
Organic	52	Poultry litter	41	Commercial	52
Legumes	43	Commercial	39	Organic	11
Commercial	36	Rock phosphate	4	Do not apply	36
Do not apply	10	Organic	2		
		Do not apply	27		

On average, producers turn their cattle out to pasture on April 1, and start feeding hay on November 15, resulting in an average of 240 days on pasture and 125 days on hay each year.

Feed Supplementation

Producers were asked whether they supplement breeding cattle as well as cattle for finishing, and if so, what supplements they gave. Figure 12 shows that 45 percent of producers supplement their cows and bred heifers. Among these, 69 percent supplement their bred heifers, while 50 percent supplement their mature pregnant cows, and 25 percent supplement their cows during lactation.

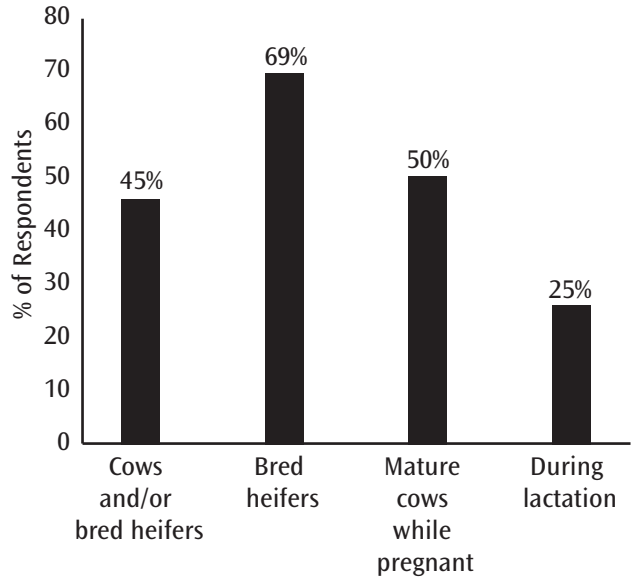

Figure 12. Producers supplementing cows and bred heifers

The choices of supplement for cows and bred heifers can be seen in figure 13, with hay and an energy-protein mix being the most prevalent. "Other" supplements include a kelp-salt mixture, minerals, and organic feed.

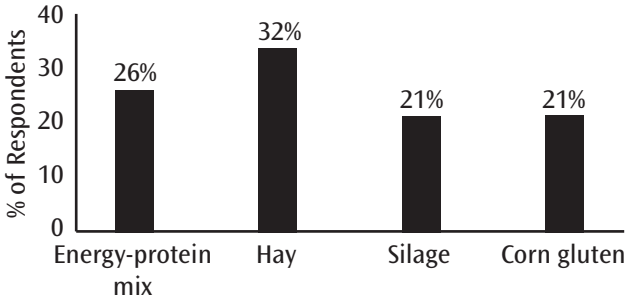

Figure 13. Cow and bred heifer supplements

Figure 14 shows that 45 percent of the respondents supplement their beef calves after weaning, with 72 percent of those who do so supplementing their calves specifically, while 50 percent supplement their finishing steers, and 39 percent supplement their stockers. Of those that supplement, 29 percent supplement with an energy-protein feed, 24 percent with silage, 18 percent with hay, and 35 percent with a corn-gluten feed (figure 15). The average percentage of crude protein for both breeding and finishing animals was 16 percent.

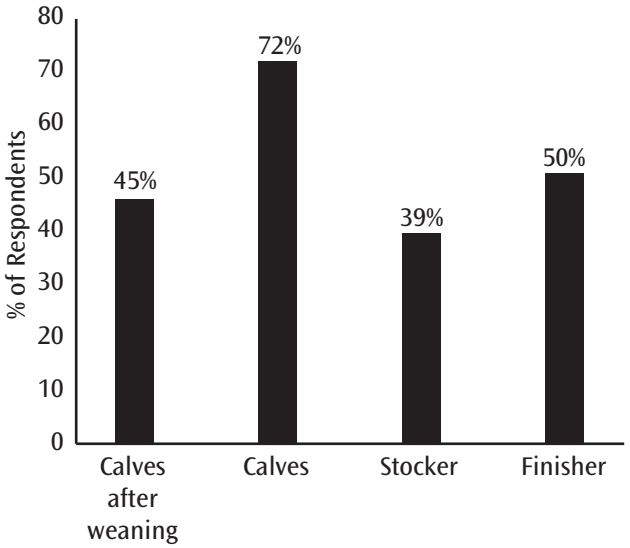

Figure 14. Stage of life for beef-cattle supplementation

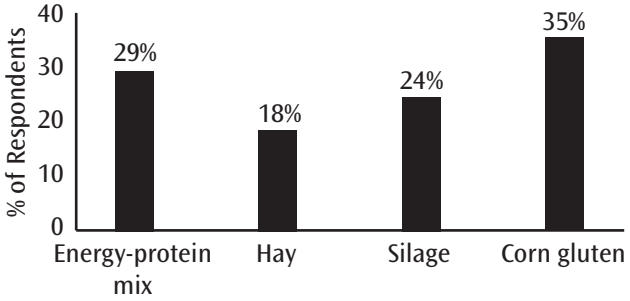

Figure 15. Supplements for finishing cattle

Finishing

Most farmers spread their finishing over several seasons, with 42 percent finishing year-round. Figure 16 shows that 83 percent of the producers finish in fall, though finishing in summer, spring, and winter is also common.

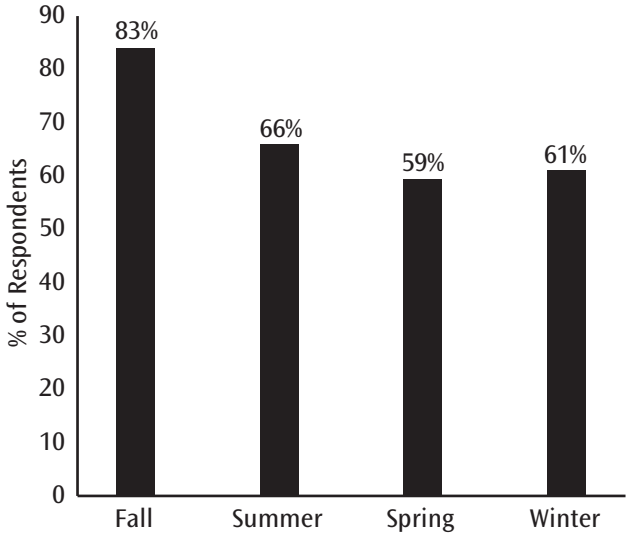

Figure 16. Finishing seasons

Producers' finishing systems can be characterized as pasture feeding only, pasture feeding with supplement, pasture feeding then feedlot, and feedlot only (figure 17). The majority of the producers surveyed (61 percent) finish their cattle on pasture only. Of those producers who finish on pasture (either alone, with supplement, or followed by feedlot), 55 percent do not have separate pastures for finishing. Table 5 shows that finishing periods last nearly a year, with both mean and median finishing weights of approximately 1,100 pounds for steers and 1,000 pounds for heifers.

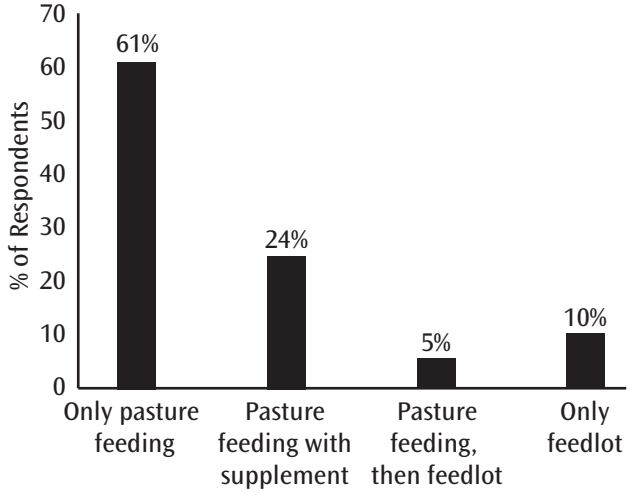

Figure 17. Finishing phase description

Animal Health and Welfare

An overwhelming majority (98 percent) of the producers do not feed ionophores[1], sub-therapeutic antibiotics, or MGA. Most producers (93 percent) castrate their bull calves.

Seventy percent of the producers use conventional veterinary practices to treat sick animals, while 26 percent use practices in accordance with certified-organic guidelines or holistic practices. The remainder reported not needing to treat sick animals.

About half of the respondents (56 percent) deworm their animals on a regular basis, while 19 percent deworm when needed. Of those that deworm, 72 percent use a commercial dewormer, while 21 percent use organic methods such as diatomaceous earth, turpentine, and flaxseed oil. Seven percent report using "other" methods to deworm, such as dried apple-cider vinegar and garlic, and Shakley's Basic H soap.

Of the 59 percent of producers that treat for flies and lice, 70 percent use commercial treatments, 26 percent use organic methods, and 4 percent use other products, such as dusters and flytraps.

Table 5. Finishing phase characteristics

	Mean	Median	Coefficient of variation
Length of finishing period	355	374	73%
Crude protein of finishing supplement	16	13	30%
Pounds of supplement per animal, per day, during finishing period	18	18	77%
Average finishing weight for steers (lbs.)	1,104	1,100	11%
Average finishing weight for heifers (lbs.)	1,011	1,000	16%

[1]Ionophores are a group of feed additives that increases weight gain and improves feed efficiency.

Summary and Conclusion

Beef-cattle production is a critical part of Virginia's agricultural landscape, yet Virginia's beef producers are facing many issues as they move forward. Direct-marketing beef is an alternative that may help increase farmers' incomes.

The primary objective of this study was to characterize and classify Virginia's direct-marketing beef producers. Most direct-marketers of beef entered this activity with prior experience in beef-cattle production. The typical value-added beef farm in Virginia has 230 acres with 164 acres devoted to pasture. The typical producer devotes 70 percent of his or her farm acreage specifically to the production of direct-marketed beef. The typical farm produces at least one other direct-marketed animal product in addition to beef – usually pork or chicken. Approximately one-third of producers' net farm income comes from direct-marketed beef and two-thirds comes from direct-marketed livestock, including beef.

The majority of the producers raise cattle from birth to slaughter, with the typical herd having 60 head. Calving is done in both the spring and fall. The average weaning weight is 518 pounds for steers and 475 pounds for heifers. Angus is the most prevalent breed for both bull and cow breeding stock.

Most producers feed and finish cattle on pasture. Less than half of the operations supplement their cows or weaned calves, and the average farmer starts feeding hay on Nov. 15. Orchard grass, fescue, and clover are the most common forages used. The typical producer does not use feed additives or sub-therapeutic antibiotics and calls on a veterinarian to treat sick animals.

Two broad conclusions can be drawn from this characterization of the producers and production methods used by Virginia's direct-marketers of beef. First, production methods are extremely diverse, which results in beef with highly variable animal and carcass characteristics from farm to farm. This limits the market alternatives available to Virginia's direct-marketers of beef – in particular the potential for farmers to market their product in association with one another – as the product characteristics will not be consistent between farms.

Second, the farm business characteristics – such as the fact that beef direct-marketers' businesses are not highly leveraged and the high diversity of animal products sold – lead to the conclusion that many producers are direct-marketing beef as a sideline or exploratory activity rather than being fully vested in the endeavor. Both of these general observations point to the conclusion that the market is in a very early stage of development with production, marketing, and business methods being highly diverse, and no general models for these having yet emerged.

References

[USDA] U.S. Department of Agriculture, National Agriculture Statistics Service. 2009. 2007 Census of Agriculture. *www.agcensus.usda.gov/*

Acknowledgements

The authors gratefully acknowledge the contributions of Guillermo Scaglia and Ed Rayburn in developing the survey on whose results this publication is based. Thanks to Ed Rayburn, Scott Greiner, Jon Repair, and Scott Baker for their thoughtful reviews of the article prior to publication. The research was funded through a Southern Sustainable Agriculture Research and Education grant.