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Small-scale U.S. Cow-calf Operations



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ITEMS OF NOTE

For this report, small-scale cow-calf operations were defined as operations with fewer than 100 beef cows. Farms with fewer than 100 beef cows are important contributors to U.S. agriculture, accounting for 90.4 percent of all farms with beef cows and 45.9 percent of all U.S. beef cows (NASS 2007 Census of Agriculture).

The majority of small-scale cow-calf operations relied at least partially on off-farm income to support the household. When considering all the hours worked on and off farm, producers on operations with fewer than 50 beef cows devoted an average of 28.9 percent of their total work time to the cow-calf operation, and operations with 50 to 99 beef cows devoted an average of 47.3 percent of their work time to the operation.

Almost 8 of 10 operations with fewer than 50 beef cows (78.0 percent) operated their cow-calf operation as a supplemental source of household income; 5.3 percent operated as the primary source of household income; and 16.7 percent operated for some other reason, such as pleasure. Among operations with 50 to 99 beef cows, 68.3 percent operated their cow-calf operation as a supplemental source of household income; 24.1 percent operated as the primary source of household income; and 7.6 percent operated for some other reason, such as pleasure.

Over 60 percent of small-scale cow-calf operations used production practices to target conventional marketing channels for calves produced (60.5 and 68.7 percent of operations with 1-49 and 50-99 beef cows, respectively). About 7 of 10 of the operations that functioned as the primary source of household income (72.7 percent) targeted conventional marketing channels compared with about 5 of 10 of the operations that functioned for reasons other than income (55.8 percent). A very small percentage of operations used specific production practices to target certified organic marketing channels (1.2 and 0.2 percent of operations with 1-49 and 50-99 beef cows, respectively). The percentage of operations that targeted conventional and certified organic marketing channels did not differ substantially by herd size.

Use of some marketing practices for calves differed between small-scale cow-calf operations and larger operations. Operations with fewer than 100 beef cows were less likely to use specific production practices to target breed-influenced programs and age-and-source verification programs than operations with 100 or more beef cows. Small-scale operations were also less likely to utilize forward pricing of calves than larger cow-calf operations. Just 2.3 percent of operations with 1 to 49 beef cows and 3.1 percent with 50 to 99 beef cows marketed calves using forward pricing.

Utilization of reproductive technologies, such as estrus synchronization, palpation for pregnancy, ultrasound, and semen evaluation, generally increased with herd size. The two most common reproductive technologies used across all cow-calf operations were semen evaluation and palpation for pregnancy. Palpation for pregnancy was used by about 1 of 10 operations with 1 to 49 beef cows (10.8 percent) and about 1 of 4 operations with 50 to 99 beef cows (25.8 percent). For operations that did not use a particular reproductive technology, the most common reason cited was labor/time.

Producers were asked to consider whether certain diseases had a significant economic impact on their operations in 2007. Of operations with 1 to 49 beef cows, 58.8 percent strongly agreed or agreed that external parasites had a significant economic impact on their operation, while 49.6 percent strongly agreed or agreed that internal parasites had a significant economic impact. Over one-half of operations with 50 to 99 beef cows strongly agreed or agreed that open/late calvers, external parasites,

and internal parasites had a significant economic impact (73.9, 65.2 and 57.1 percent of operations, respectively). A lower percentage of operations with 1 to 49 beef cows than operations with 50 or more beef cows strongly agreed or agreed that calf scours, pneumonia/shipping fever, or open/late calvers had a significant economic impact.

About 6 of 10 operations with 1 to 49 beef cows (59.4 percent) vaccinated any cattle or calves in 2007 compared with about 9 of 10 operations with 50 to 99 beef cows (86.6 percent). A lower percentage of operations with 1 to 49 beef cows vaccinated calves against respiratory disease from birth to sale compared with operations with 50 or more beef cows.

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INTRODUCTION

This report is the second in a series of reports resulting from the Small-scale Operations Initiative implemented by the National Animal Health Monitoring System (NAHMS) at the request of the administrator of the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service. The primary objective of the Small-scale Operations Initiative is to investigate factors that set small-scale operations apart from larger operations. This particular report provides information comparing small and large beef cow-calf operations.

Defining farm size for cow-calf operations

The USDA defines a small farm as a sole proprietorship, partnership, or family corporation with annual gross sales of less than \$250,000 for all agricultural products sold from the farm. However, for this report small-scale cow-calf operations are defined as operations with fewer than 100 beef cows as of July 1, 2007. This definition has been utilized by other researchers as well (Lacy et al., 2003; Ward et al., 2008). In addition, most operations with fewer than 100 beef cows would be expected to have annual gross cattle sales well below \$250,000 (Benson and Poore, 2008; Forero et al., 2008), although some cow-calf operations also raise and sell other livestock or crops, increasing the operations' total gross sales. This report discusses characteristics and management practices of operations with 1 to 49 beef cows and 50 to 99 beef cows. These two size groups account for 79.4 and 11.0 percent, respectively, of all 764,984 farms with beef cows in the United States (NASS 2007 Census of Agriculture).

Data sources

Unless otherwise noted, data for this report were taken from the NAHMS Beef 2007–08 study, which was conducted in 24 States.* As of January 1, 2008, these 24 States accounted for 79.6 percent of all U.S. cow-calf operations and 87.8 percent of all U.S. beef cows. Furthermore, these States accounted for 76.8 percent of small-scale U.S. cow-calf operations (fewer than 100 beef cows) and 82.7 percent of U.S. beef cows on small operations (USDA-NASS).

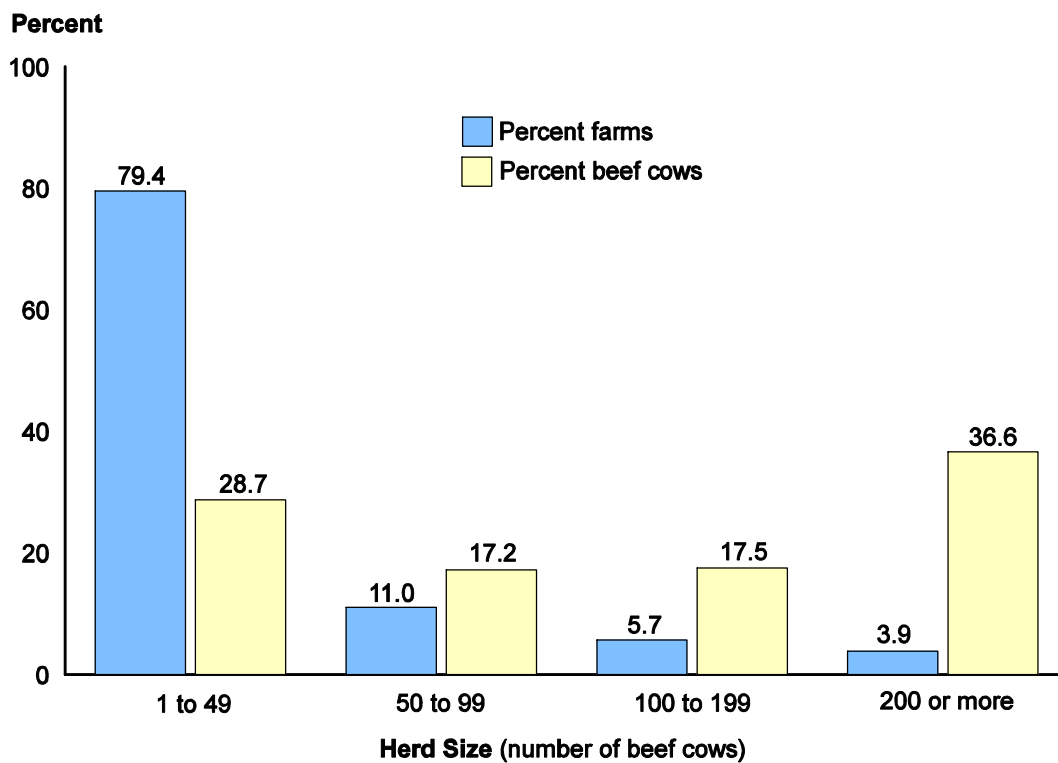
A total of 2,159 cow-calf operations participated in the NAHMS Beef 2007–08 study. The study used a stratified random sample with unequal selection probabilities. All respondent data were statistically weighted to reflect the population from which they were selected. Additional details of sample weighting and study design are published elsewhere (USDA-APHIS, 2008; USDA-APHIS, 2010).

Small-scale cow-calf farms in the United States

Farms with fewer than 100 beef cows accounted for 90.4 percent of all U.S. farms with beef cows and 45.9 percent of all U.S. beef cows (NASS 2007 Census of Agriculture) [figure 1]. Of these small farms, the majority had fewer than 50 beef cows.

*Alabama, Arkansas, California, Colorado, Florida, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Virginia, and Wyoming.

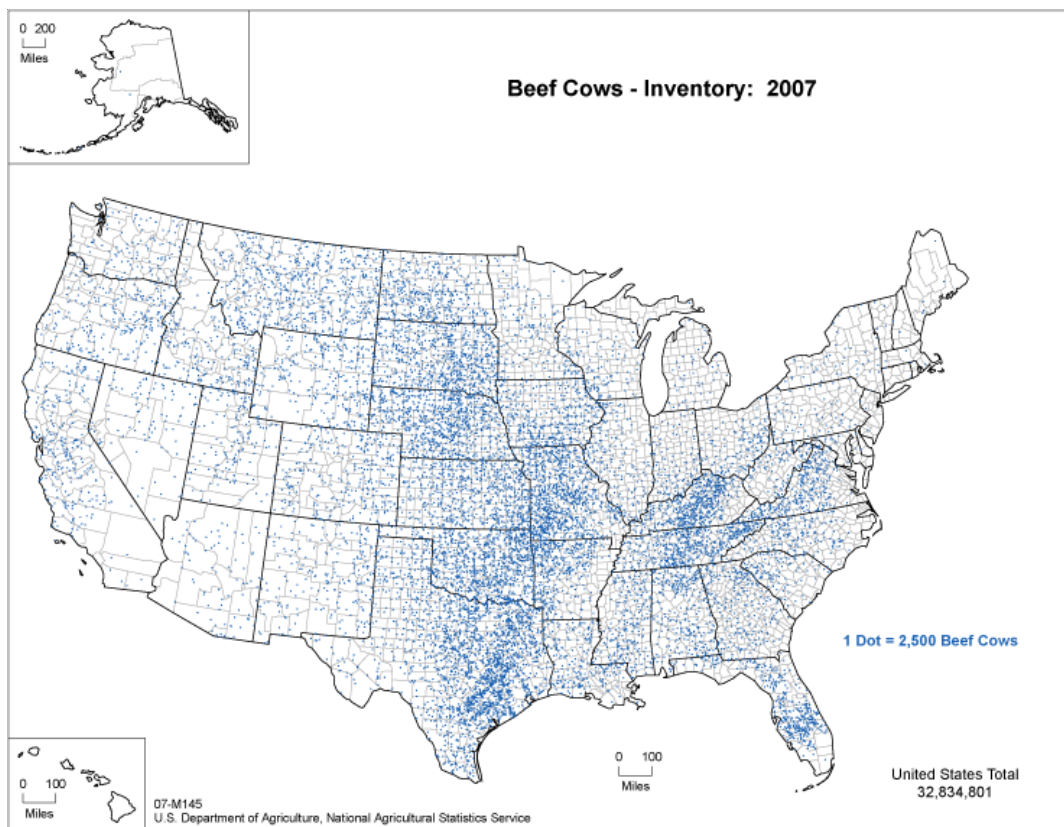
Figure 1. Percentage of beef cow-calf farms and percentage of beef cows on these farms, by herd size



Source: NASS 2007 Census of Agriculture

Distribution of Beef Cow-calf Farms, by State

Texas has more beef cow-calf farms across all farm sizes than any other State. In general, the northeast States have fewer beef cow-calf farms than the central States. The majority of small cow-calf farms (fewer than 100 beef cows) are located in the central and eastern States, while the majority of large beef cow-calf farms (200 to 499 beef cows) are located in the central and western States (NASS 2007 Census of Agriculture).



TERMS USED IN THIS REPORT

Beef cow: Female bovine that has calved at least once.

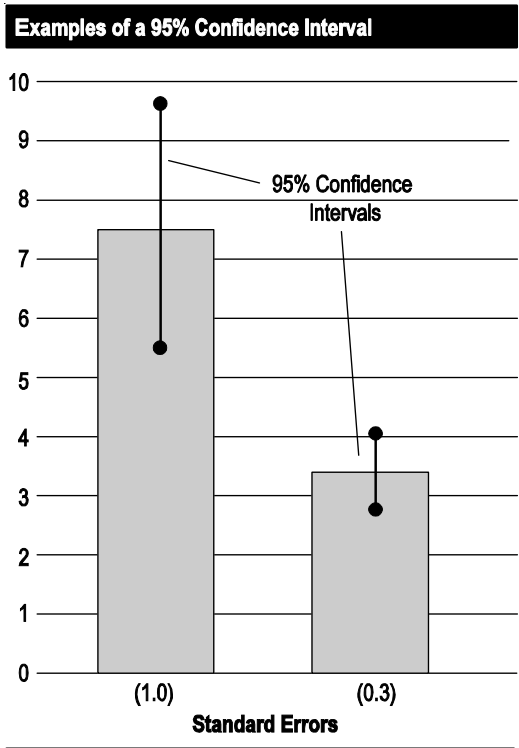
Herd size: Herd size is based on October 1, 2007, cow inventory. If there were no cows on October 1, 2007, then July 1, 2007 cow inventory was used.

Operation: Premises with at least one beef cow on October 1, 2007, or July 1, 2007.

Population estimates: The estimates in this report make inference to all operations in the target population (USDA-APHIS, 2008; USDA-APHIS, 2010). Data from the operations responding to the survey are weighted to reflect their probability of selection during sampling and to account for any survey nonresponse.

Precision of population estimates: Estimates in this report are provided with a measure of precision called the standard error. A 95-percent confidence interval can be created with bounds equal to the estimate plus or minus two standard errors. If the only error is sampling error, the confidence intervals created in this manner will

contain the true population mean 95 out of 100 times. In the example below, an estimate of 7.5 with a standard error of 1.0 results in limits of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of 0.3 and results in limits of 2.8 and 4.0. Alternatively, the 90-percent confidence interval would be created by multiplying the standard error by 1.65 instead of 2. Most estimates in this report are rounded to the nearest tenth. If rounded to 0, the standard error was reported (0.0). If there were no reports of the event, no standard error was reported (--).



SECTION I: POPULATION ESTIMATES

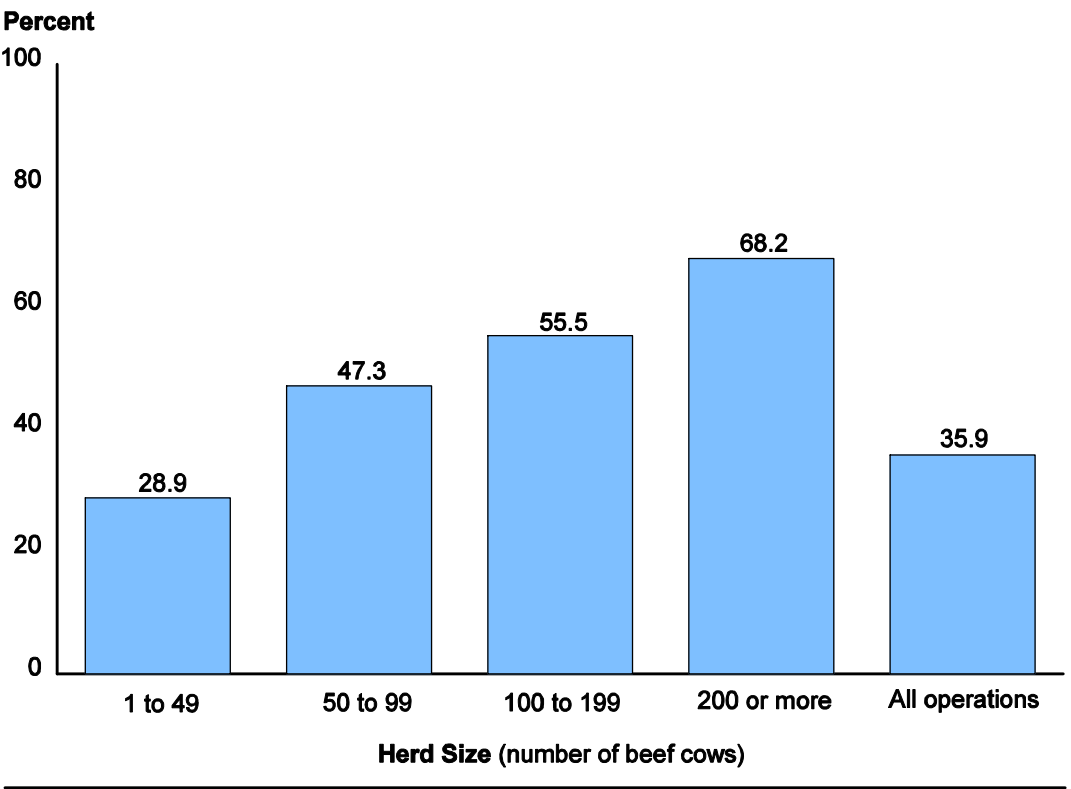
A. BUSINESS CHARACTERISTICS

1. Contribution of the cow-calf operation to household income

The majority of small farms in the United States, including small-scale cow-calf operations, rely at least partially on off-farm income to support the household (Hoppe et al., 2010). In fact, based on the U.S. Census of Agriculture (USDA–NASS, 2007a), less than 3 percent of all cow-calf producers obtained all of their income from farming.

Cow-calf producers were asked to consider all the hours worked on and off farm and then estimate the percentage of work time devoted to the cow-calf operation. On average, the amount of work time devoted to the operation increased as herd size increased (figure 2). Producers on operations with fewer than 50 beef cows devoted an average of 28.9 percent of their work time to the operation compared with 47.3 percent for operations with 50 to 99 beef cows. In other words, small-scale cow-calf producers dedicate 50 to 70 percent of their time to working off farm, raising other livestock, or producing crops.

Figure 2. Operation average percentage of operator’s work time devoted to the cow-calf operation, by herd size

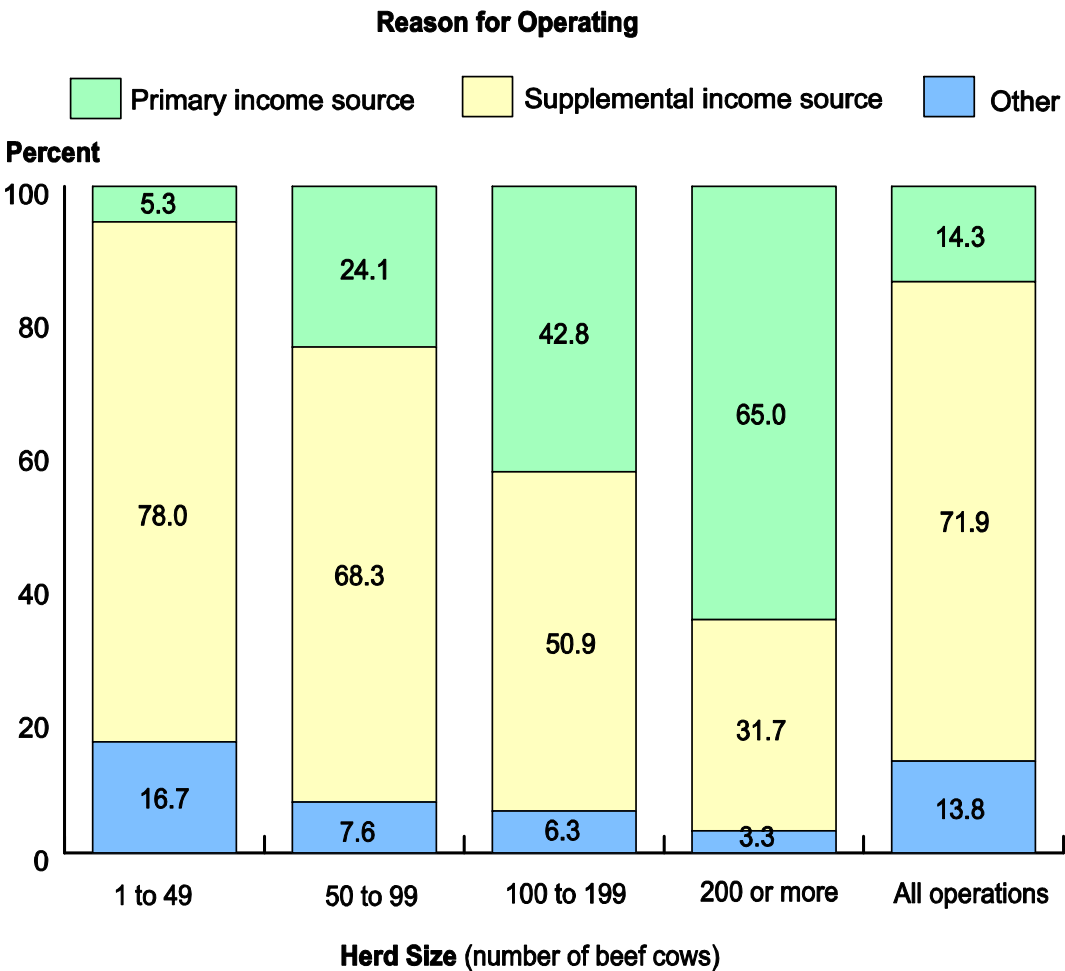


Cow-calf producers were asked if they operated their cow-calf operations as the primary source of household income, as a supplemental source of income, or for some other reason, such as pleasure. The percentage of beef cow-calf operations that operated as a primary source of household income increased with herd size. For example, 5.3 percent of operations with 1 to 49 beef cows, 24.1 percent with 50 to 99 beef cows, and 65.0 percent with 200 or more beef cows were operated as the primary source of household income. The majority of all

operations (71.9 percent) functioned as a supplemental source of income (figure 3).

The percentage of cow-calf operations that operated for reasons other than income also varied by herd size. Only 3.3 percent of operations with 200 or more beef cows raised cattle for reasons other than income, while 16.7 and 7.6 percent of operations with 1 to 49 and 50 to 99 beef cows, respectively, operated the cow-calf operation for other reasons, such as pleasure.

Figure 3. Percentage of operations by reason for operating the cow-calf operation and by herd size



2. Marketing channels

Cow-calf producers were asked if they used specific production practices to target the following marketing channels:

Breed-influenced programs

Of operations with 1 to 49 and 50 to 99 beef cows, 11.7 and 15.9 percent, respectively, used specific production practices to market to breed-influenced programs (figure 4). A higher percentage of operations with 200 or more beef cows used specific production practices to target a breed-influenced program compared with operations in the other size categories. Among small-scale operations, the percentage targeting breed-influenced programs was not statistically different for operations that were operated as the primary source of household income, as a supplemental source of income, or for reasons other than income.

Age-and-source verification programs

As with breed-influenced marketing, participation in age-and-source verification marketing differed between small operations and larger operations. Only 5.2 percent of operations with 1 to 49 beef cows used production practices to target age-and-source verification marketing compared with 29.0 percent of operations with 200 or more beef cows (figure 4). Of operations with 50 to 99 beef cows, 11.7 percent used specific production practices to market to age-and-source verification programs. In addition, the percentage of small-scale operations targeting age-and-source verification programs was not statistically different for operations that were operated as the primary source of household income, as a supplemental source of income, or for reasons other than income.

Breed-influenced programs and age-and-source verification programs are marketing strategies intended to add value to the end product.

Breed influenced programs refer to a marketing strategy in which a beef product is labeled based on cattle breed, such as Certified Hereford beef. Internet information networks are available to help connect cattle buyers and sellers with breed-influenced programs. These programs usually have specific requirements for producer-level management practices, including identification of cattle.

Age-and-source verification programs allow the buyer to verify the source and age of beef cattle to target certain marketing channels. Some major food chains in the United States purchase verified products in response to customer demand. These programs involve the use of animal identification tags, which allow the age and source of the cattle to be traced.

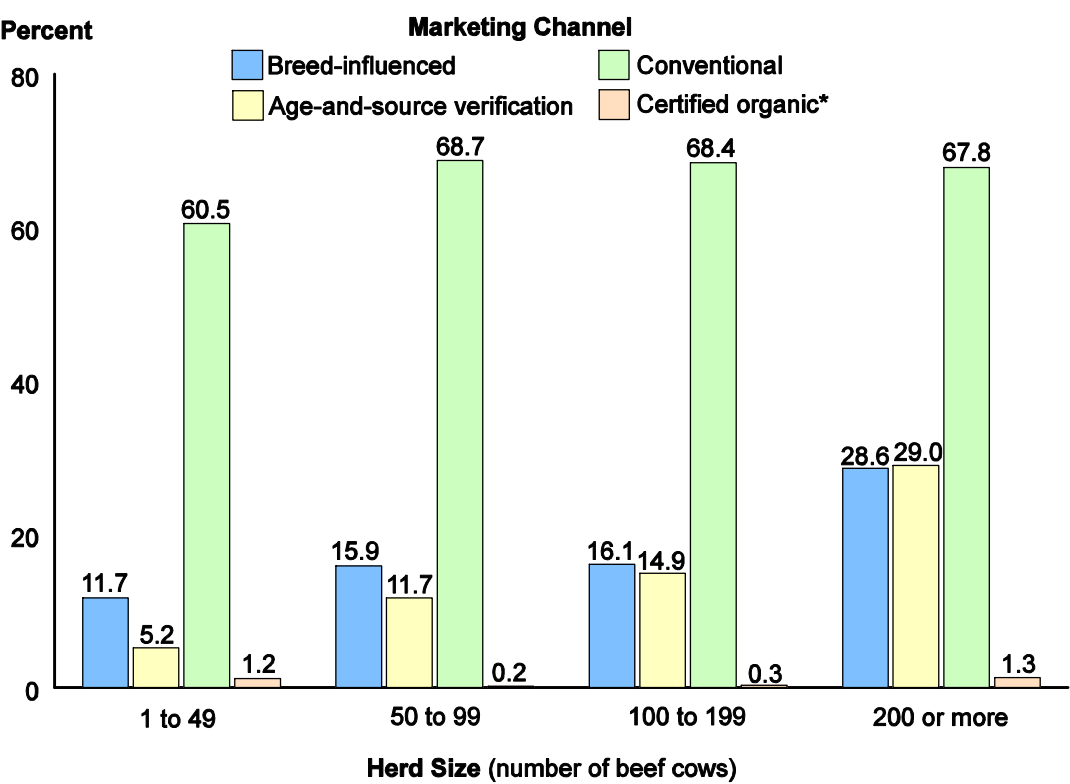
Conventional marketing

Conventional marketing refers to the marketing of a standard commodity product, as opposed to targeting specialized markets. Overall, 62.8 percent of cow-calf operations used production practices to target conventional markets. The percentage of operations that targeted conventional marketing did not differ by herd size (figure 4). However, small-scale operations that operated as the primary source of household income were more likely to target conventional marketing channels (72.7 percent) than small-scale operations that operated for reasons other than income (55.8 percent; $p=0.018$).

Natural and certified organic marketing refers to product statements or labels regarding how a product is produced. The percentage of operations that targeted these two channels did not differ substantially by herd size. Almost 30

percent of cow-calf operations¹ used specific production practices in order to target natural marketing² channels, and about 1 percent used specific production practices to target certified organic marketing channels.

Figure 4. Percentage of operations that used specific production practices to target the following marketing channels for calves produced, by herd size



*Operation certified by USDA.

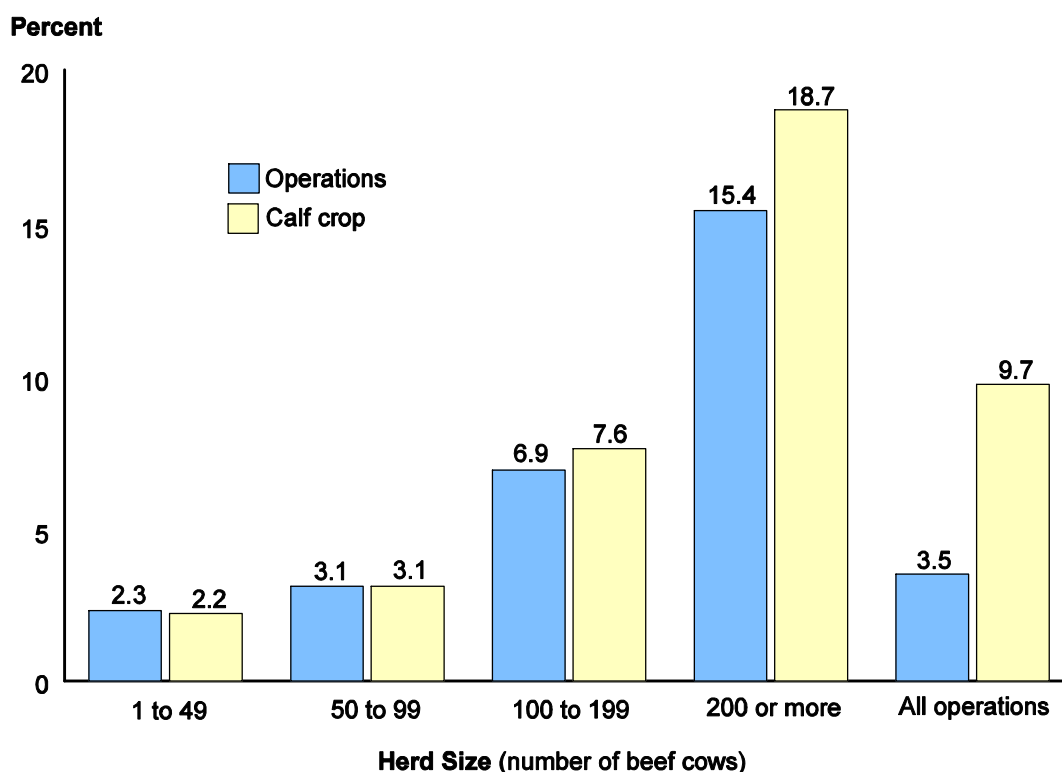
¹Data not shown
²As defined by producer

3. Forward pricing

Producers were asked how many of the calves in the 2007 calf crop would be marketed using forward pricing, such as forward cash, futures contract, and options. Small-scale cow-calf operations were less likely to utilize forward pricing of calves than large cow-calf operations. Just 2.3 percent of operations with 1 to 49 beef cows and 3.1 percent with 50 to 99 beef cows marketed calves using forward pricing (figure 5). The percentage of small-scale operations that used forward pricing was not statistically different for operations that operated as the primary source of household income, as a supplemental source of income, or for reasons other than income.

A forward-pricing contract legally binds the buyer and the seller to a specific price for a specific quantity of livestock to be delivered at a certain time to a specified place. Forward pricing contracts can help producers manage the economic price risk associated with fluctuations in market prices for calves. If the forward price is greater than the spot price (current price at the time the exchange takes place), then the cattle seller (cow-calf operator) will make more money on the cattle than if the forward contract was not in place. Forward pricing contracts allow cow-calf producers to lock in a price at or above their break-even price, allowing them to be less affected by fluctuations in market prices.

Figure 5. Percentage of operations (and percentage of 2007 calf crop) that used forward pricing of calves, by herd size

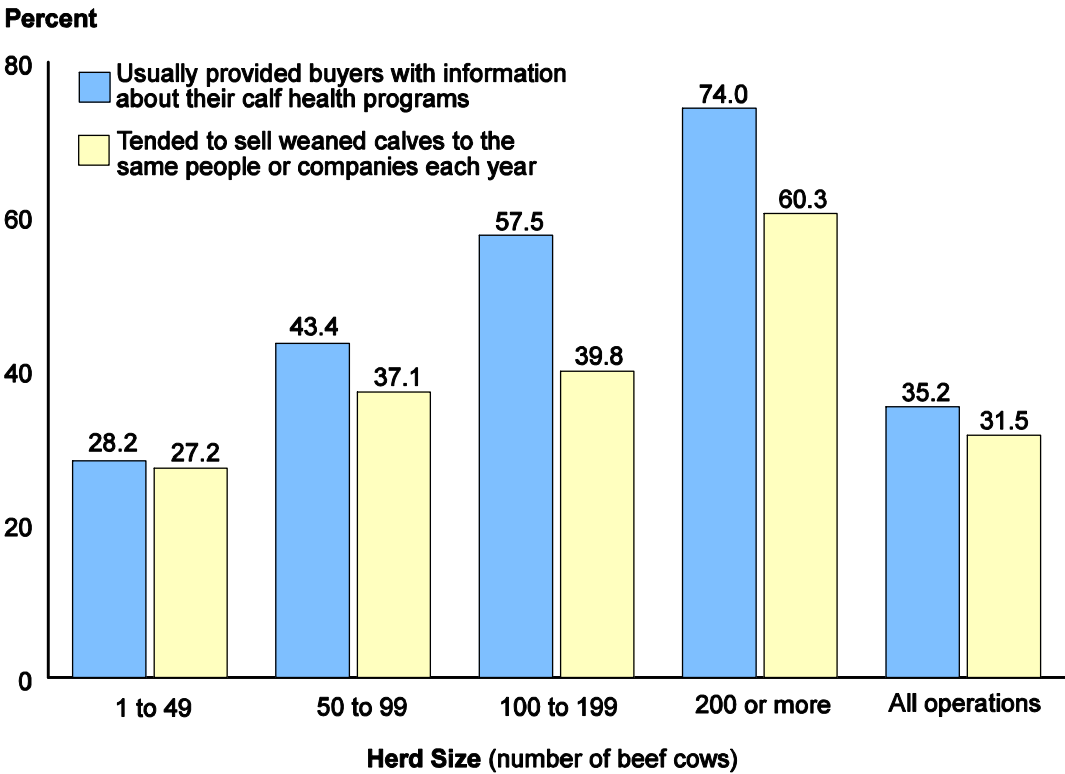


4. Sales and customers

The percentage of cow-calf operations that usually provided information about their calf health program to buyers increased as herd size increased (figure 6). Additionally, the percentage of operations that sold weaned calves to the same buyers each year increased as herd size increased, ranging from 27.2 percent of operations with 1 to 49 cows to 60.3 percent of operations with 200 or more cows. These findings are partially explained by the higher percentage of large operations that use breed-influenced and source verification marketing programs. These programs typically involve vertical alliances, which are relationships between organizations in two adjacent stages of the production-marketing channel without full ownership by one individual firm (Ward and Estrada, 1999).

With vertical alliances between cow-calf producers and buyers, calf health information is often passed along to the buyer, and the same buyers purchase calves each year (Schroeder and Kovanda, 2003). Operations with fewer than 100 beef cows are less likely to engage in sales contracts with the same buyers each year ($p < 0.001$) and are less likely to provide information to their buyers about their calf health program ($p < 0.001$). A higher percentage of small-scale operations that operated as the primary source of household income or as a supplemental source of income provided information about their calf health program to buyers (46.5 and 31.1 percent, respectively) compared with small-scale operations operated for reasons other than income (20.4 percent).

Figure 6. Characteristics of sales and customers for cow-calf operations, by herd size



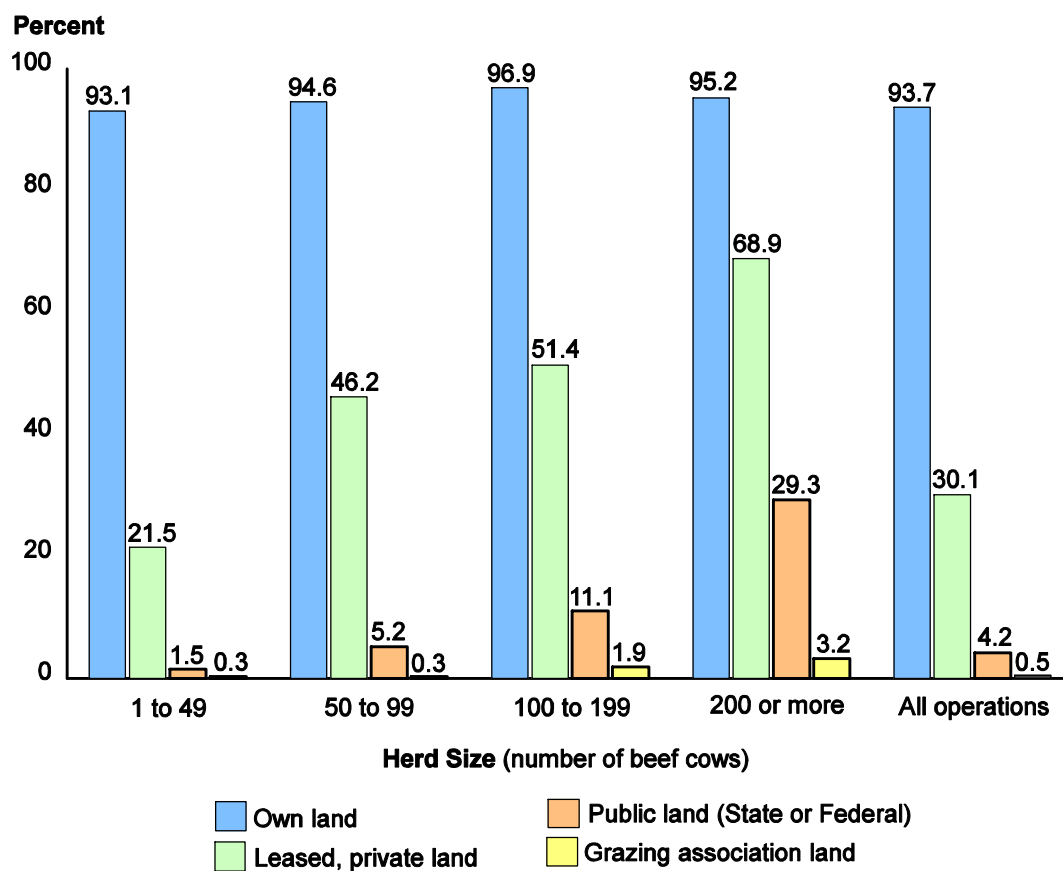
B. ANIMAL HEALTH AND MANAGEMENT PRACTICES

1. Grazing land

Across herd sizes, the highest percentage of beef cow-calf operations grazed their cows on their own land or leased private land rather than on public or grazing association land. The percentage of operations that grazed cows on leased private land and public land (State or

Federal) increased as herd size increased (figure 7). More public land is available for grazing in the western United States (DOI-BLM, 2010), and cow-calf operations in the western United States tend to be larger operations (USDA-NASS, 2007b).

Figure 7. Percentage of operations by type of grazing used during the previous 12 months, and by herd size



2. Reproductive technology

Many reproductive technologies are available to cow-calf producers. Some of these technologies can help improve reproductive efficiency or allow producers to take advantage of top-tier genetics. Cow-calf producers were asked whether they used any of the following reproductive technologies:

- Estrus synchronization
- Artificial insemination
- Palpation for pregnancy
- Ultrasound
- Pelvic measurement
- Body condition scoring
- Semen evaluation
- Embryo transfer

The percentage of operations that used reproductive technologies generally increased with herd size. The two most common reproductive technologies used across all cow-calf operations were semen evaluation and palpation for pregnancy (19.5 percent and 18.0 percent of operations, respectively). Palpation for pregnancy was used by about 1 of 10 operations with 1 to 49 beef cows and about 1 of 4 operations with 50 to 99 beef cows (table 1).

Table 1. Percentage of operations by reproductive technology used and by herd size									
Percent Operations									
Herd Size (number of beef cows)									
Reproductive Technology	1–49		50–99		100–199		200 or More		All Operations
	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct. Std. Error
Estrus synchronization	5.7	(0.9)	10.5	(1.8)	14.9	(2.1)	19.3	(1.9)	7.9 (0.7)
Artificial insemination	5.6	(0.8)	8.4	(1.6)	16.3	(2.1)	19.8	(2.0)	7.6 (0.7)
Palpation for pregnancy	10.8	(1.2)	25.8	(2.6)	41.2	(2.8)	58.3	(2.6)	18.0 (1.0)
Body condition scoring	10.5	(1.1)	19.1	(2.3)	26.8	(2.5)	34.4	(2.5)	14.3 (0.9)
Semen evaluation	10.9	(1.1)	33.2	(2.7)	45.9	(2.8)	56.8	(2.5)	19.5 (1.0)

Producers who did not use a particular reproductive technology were asked the primary reason for not using the technology. The most common reason for not using a reproductive technology was labor/time (table 2).

Table 2. For operations with fewer than 100 beef cows that did not use a specific reproductive technology, percentage of operations by reason for not using the technology

Reproductive Technology	Percent Operations Reason Not Used												
	Does Not Work		Labor/ Time		Cost		Lack of Facilities		Too Difficult/ Complicated		Other		Total
	Std. Pct.	Err.	Std. Pct.	Err.	Std. Pct.	Err.	Std. Pct.	Err.	Std. Pct.	Err.	Std. Pct.	Err.	
Estrus synchronization	2.1	(0.5)	37.3	(1.6)	17.2	(1.3)	11.1	(1.1)	17.8	(1.3)	14.5	(1.2)	
Artificial insemination	1.4	(0.4)	35.9	(1.6)	21.5	(1.4)	11.3	(1.1)	16.4	(1.3)	13.5	(1.1)	100.0
Palpation for pregnancy	1.1	(0.4)	37.4	(1.7)	19.6	(1.4)	11.0	(1.1)	16.8	(1.3)	14.1	(1.2)	100.0
Body condition scoring	1.6	(0.4)	39.1	(1.7)	17.3	(1.3)	8.8	(1.0)	18.7	(1.4)	14.5	(1.2)	100.0
Semen evaluation	1.1	(0.4)	33.5	(1.7)	25.4	(1.6)	9.6	(1.0)	16.5	(1.3)	13.9	(1.2)	100.0

3. Impact of health problems

Producers were asked to indicate whether they strongly agreed, agreed, disagreed, or strongly disagreed that specific health problems had a significant economic impact on their operations in 2007. Producers were instructed to include the cost of prevention, cost of treatment, and lost production when evaluating economic impact.

Of operations with 1 to 49 beef cows, 58.8 percent strongly agreed or agreed that external parasites had a significant economic impact on their operation, while 49.6 percent strongly agreed or agreed that internal parasites had a significant economic impact. Over one-half of operations with 50 to 99 beef cows strongly agreed or agreed that open/late calvers, external parasites, and internal parasites had a significant economic impact (73.9, 65.2 and 57.1 percent of

operations, respectively). A lower percentage of operations with 1 to 49 beef cows than operations with 50 or more beef cows strongly agreed or agreed that calf scours, pneumonia/shipping fever, or open/late calvers had a significant economic impact (table 3). One reason a lower percentage of operations with 1 to 49 beef cows strongly agreed or agreed that open/late calvers had a significant economic impact might be that a higher percentage of smaller operations had no defined breeding season. However, even when controlling for the type of breeding season used by the operation (one defined breeding season, two or more defined seasons, or no set breeding season) the difference between operations with 1 to 49 beef cows and operations with 50 or more beef cows was still significant.

Table 3. Percentage of operations that strongly agreed or agreed that the following health problems had a significant economic impact on their operation during 2007, by herd size

Health Problem	Percent Operations							
	Herd Size (number of beef cows)							
	1–49		50–99		100–199		200 or More	
	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Internal parasites	49.6	(4.5)	57.1	(6.1)	69.4	(5.1)	63.7	(4.9)
External parasites	58.8	(4.5)	65.2	(5.8)	76.6	(4.5)	76.4	(4.6)
Calf scours	23.2	(3.9)	45.4	(6.2)	54.3	(5.9)	57.6	(5.0)
Coccidiosis	18.2	(3.6)	31.4	(6.0)	34.7	(5.4)	41.5	(5.2)
Open/late calvers	44.2	(4.5)	73.9	(5.0)	73.7	(4.7)	72.3	(4.6)
Calf pneumonia/shipping fever	25.5	(4.0)	48.7	(6.2)	58.0	(5.6)	56.8	(5.1)
Pinkeye	30.4	(4.1)	46.8	(6.1)	48.7	(6.0)	48.6	(4.9)

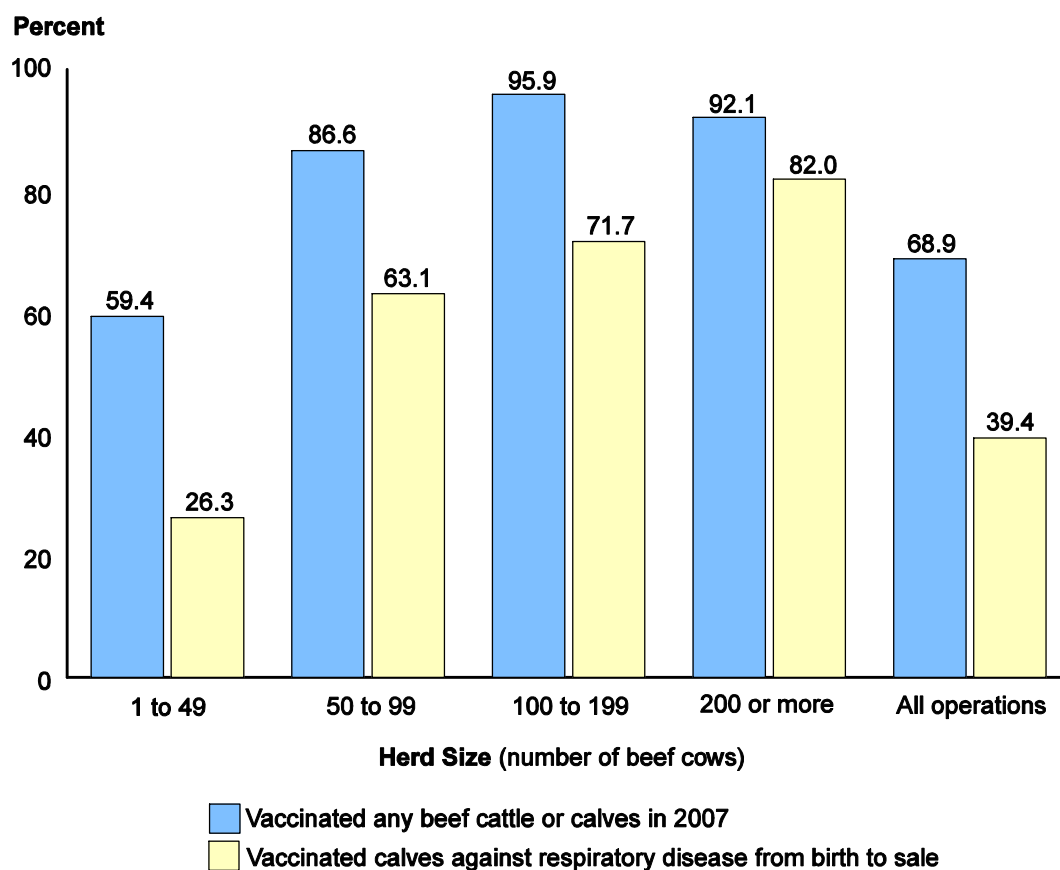
4. Vaccinations

A total of 59.4 percent of operations with 1 to 49 beef cows vaccinated any cattle or calves in 2007 compared with 86.6 percent of operations with 50 to 99 beef cows, 95.9 percent of operations with 100 to 199 beef cows, and 92.1 percent of operations with 200 or more beef cows (figure 8).

Bovine respiratory disease (BRD) complex, also known as shipping fever, is an important disease in feedlot cattle. BRD is responsible for

economic losses in the form of medical treatment costs, decreased daily weight gain in affected cattle, and death losses. Vaccinating calves against respiratory disease before they are sent to the feedlot is one way to reduce the occurrence of BRD after arrival at the feedlot. A lower percentage of operations with 1 to 49 beef cows vaccinated calves against respiratory disease from birth to sale compared with operations with 50 or more beef cows (figure 8).

Figure 8. Percentage of operations by vaccination practices for cattle and calves, and by herd size



SECTION II: CONCLUSIONS

1. Marketing channels

An array of marketing opportunities is available to cow-calf producers. Breed-influenced programs allow cooperation between feedlots, packers, and cow-calf producers that can be mutually beneficial. However, these programs were targeted by less than 1 of 6 small-scale operations. Forward contracts, which can help producers manage economic risk, were utilized by less than 1 of 20 small-scale operations. Participating in breed-influenced marketing programs or forward contracts may require small-scale producers to make changes in the genetics of their cattle and/or management practices to meet buyer requirements, which might be why so few choose to participate. Also, some sales arrangements may require a lot size larger than can be provided by a small-scale operation. A better understanding of the reasons small-scale producers are not participating in these programs may reveal ways to make a variety of marketing channels more accessible to small-scale operators.

Some sales arrangements for calves may require a lot size larger than can be produced by small-scale operations. A lot is a group of calves of similar weight and age that are sold and shipped together. Sometimes small-scale operations will pool their calves with those from other small operations to meet lot-size requirements.

2. Vaccination

A lower percentage of operations with 1 to 49 beef cows vaccinated cattle or calves in 2007 compared with operations with 50 or more cows. A variety of factors can influence decisions about vaccination of cattle and calves. A lower percentage of operations with 1 to 49 cows reported that calf pneumonia/shipping fever had a substantial economic impact on their operations in 2007, compared with operations with 50 or more cows. The level of perceived or actual risk of significant economic impact from shipping fever is likely to influence producers' decisions about vaccination of calves against respiratory disease.

While vaccination can be costly, it can also be an effective risk management tool for improving herd health and productivity. Often, a new disease introduced into a naïve, unvaccinated herd has devastating effects. A local veterinarian is the best resource to assist producers with assessing disease risk, developing an appropriate vaccination protocol, and designing an overall herd health program.

3. Reproductive technology

Some reproductive technologies are expensive and may seem impractical for many small-scale operations. However, body condition scoring is practical and inexpensive technology that can be of value to small-scale operations that use a defined breeding season. Body condition scoring does not require any restraint facilities, but does require some training. Cows with low body condition scores can be given additional feed to optimize their body condition scores before calving, which will facilitate an early return to cycling and more chances to conceive during the next breeding season.

Palpation for pregnancy is another technology that can be useful and practical for some small-scale operations. Palpation for pregnancy allows

the producer to make decisions about culling (selling) cows that are not pregnant. The procedure can be done by a veterinarian or an experienced producer. Although there are labor and/or costs involved— as well as the need for restraint facilities—palpation can make economic sense for certain operations, especially those with lower or variable pregnancy rates. Cows that do not calve are often culled, since production of a calf is the critical task for a cow. By culling an open (nonpregnant) cow early, the producer avoids the expense of feeding her for a full year while waiting to see if she calves (Lamb, 2008).

4. General conclusions

There are several potential reasons that small-scale cow-calf operations utilize the aforementioned management and marketing practices less often than larger operations. It is possible that small-scale operations do not have access to as many outside financial and/or information resources as larger operations. For example, some operations may not have easy access to veterinarians who specialize in large animals, and the cost of having a veterinarian travel a long distance to the farm may make certain procedures, such as palpation for pregnancy, cost prohibitive. Also, the majority of small-scale operations rely on income from off-farm jobs or other farming activities outside of the cow-calf operation. The limited amount of time available for the cow-calf operation may restrict the use of more rigorous management

and marketing practices. For example, this study found that the primary reason cited by producers for not using reproductive technologies was labor/time.

Limited literature is available on factors affecting the adoption of various technologies and management practices on cow-calf operations. Farm characteristics, operator demographics, farm goals, and off-farm income have been found to be related to the adoption of practices and technologies (Ward et al., 2008; Kim et al., 2005; Wozniak, 1993). A study in Mississippi found that management and marketing practices were less intensive on small-scale cow-calf operations compared with larger operations and concluded that the reliance on off-farm income coupled with the older age

of many small-scale producers may partially explain the difference in Mississippi. Further, the study found that producers in Mississippi were somewhat reluctant to consider adopting new management and marketing practices, even in the context of increasing income from the cow-calf operation. Specifically, the study concluded that producers may be concerned about having to give up autonomy when adopting new marketing practices and may not fully understand the potential benefits of certain management and marketing practices (Lacy et al., 2003).

Publications are available on marketing and animal health management opportunities for small-scale cow-calf operations (Commerford et al., 2010; Troxel, 2010). Educational outreach may be helpful in encouraging the adoption of new practices by small-scale cow-calf operations. Outreach programs should focus on the benefits of the practices, including those not strictly financial. This study found that almost 17 percent of the smallest operations (1 to 49 beef cows) have reasons other than income for operating the cow-calf operation. Approximately 100,000 cow-calf operations in the United States would fall into this category, based on the NASS 2007 Census of Agriculture number of

farms with 1 to 49 beef cows in the United States (607,708 total farms with 1 to 49 beef cows x 16.7 percent = 101,487 farms; USDA–NASS, 2007b). Other reasons for operating the cow-calf operation may include enjoyment of the rural lifestyle, for pleasure, as a learning experience for children, or as a way to use or maintain land. Any educational outreach program should also propose realistic ways to implement management and marketing practices under the time constraints faced by small-scale operators, who must simultaneously meet the demands of off-farm employment and their farm duties.

Producer alliances may also be a way to help small-scale producers implement new management and marketing practices. Some practices are more practical or affordable on a larger scale, which can be achieved using producer alliances (Bailey, 1996). Alliances in the beef cattle industry may be a growing phenomenon (Fanatico and Rinehart, 2006; Schroeder and Kovanda, 2003). Future research should continue to investigate the motivations for marketing and management decisions on small-scale operations to elucidate ideal methods for assisting them and maximizing the persistence and success of small cow-calf operations in the United States.

REFERENCES

- Bailey, D. 1996. Cooperation in cattle marketing. Utah State University. Accessed December 17, 2010, at: <http://ag.arizona.edu/arec/wemc/cattlemarket/Coop.pdf>
- Benson G, Poore M. 2008. Budget 20-1. North Carolina Cooperative Extension. Accessed September 1, 2010, at: <http://www.ag-econ.ncsu.edu/extension/budgets/beef/Beef20-1Cowbud06Print.pdf>
- Comerford JW, Greaser GL, Moore HL, Harper JK. 2010. Agricultural alternatives: beef cow-calf production. Penn State Agricultural Research and Cooperative Extension. Accessed September 1, 2010, at: http://agalternatives.aers.psu.edu/Publications/beef_cow-calf.pdf
- Fanatico A, Rinehard L. 2006. Beef marketing alternatives. National Sustainable Agriculture Information Service. Accessed December 17, 2010, at: <http://attra.ncat.org/attra-pub/PDF/altbeef.pdf>
- Forero LC, Nader GA, Klonsky KM, De Moura RL. 2008. Sample costs for beef cattle cow-calf production: 300 cow head. University of California Cooperative Extension. Accessed September 1, 2010, at: http://coststudies.ucdavis.edu/files/beefcowcalfsv_2008.pdf
- Hoppe RA, MacDonald JM, Korb P. 2010. Small farms in the United States: persistence under pressure, EIB-63, U.S. Department of Agriculture, Economic Research Service.
- Kim SA, Gillespie JM, Paudel KP. 2005. The effect of socioeconomic factors on the adoption of best management practices in beef cattle production. *Journal of Soil and Water Conservation*. 60, 3(May/June 2005): 111-120.
- Lacy RC, Little RD, Forrest CS, Gregory TL. 2003. Attitudes of small beef producers toward selected production and marketing practices. Bulletin 1126. Mississippi State University. Accessed September 1, 2010, at: <http://msucares.com/pubs/bulletins/b1126.pdf>
- Lamb C. 2008. Cow calf – pregnancy diagnosis for the beef herd. University of Minnesota Beef Team. Drovers, 10/6/2008. Accessed December 17, 2010, at: <http://www.cattlenetwork.com/Cow-Calf—Pregnancy-Diagnosis-For-The-Beef-Herd/2008-10-06/Article.aspx?oid=568169>
- Schroeder TC, Kovanda J. 2003. Beef alliances: motivations, extent, and future prospects. *Vet Clin Food Animal* 19 (2003) 397-417.
- Troxel TR. 2010. Best management practices for small beef cow-calf herds. University of Arkansas Cooperative Extension. #FSA3117. Accessed September 1, 2010, at: http://www.uaex.edu/Other_Areas/publications/PDF/FSA-3117.pdf
- USDA-APHIS. 2008. Beef 2007–08, Part I: Reference of Beef Cow-calf Management Practices in the United States, 2007–08. USDA–APHIS–VS, CEAH. Fort Collins, CO. #N512-1008.

- USDA-APHIS. 2010. Beef 2007-08, Part IV: Reference of Beef Cow-calf Management Practices in the United States, 2007-08. USDA:APHIS:VS,CEAH. Fort Collins, CO. #523.0210
- USDA-NASS. 2007a. Fact Sheet: 2007 Census of Agriculture, Cattle Production. Accessed June 16, 2010 at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Fact_Sheets/beef_cattle.pdf
- USDA-NASS. 2007b. 2007 Census of Agriculture—State Data. Table 11: Cattle and Calves—Inventory and Sales: 2007 and 2002, p 381.
- US Department of the Interior: Bureau of Land Management. 2010. Fact Sheet on the BLM's Management of Livestock Grazing. Accessed December 17, 2010, at: <http://www.blm.gov/wo/st/en/prog/grazing.html>
- Ward CE, Estrada TL. 1999. Vertical coordination and beef industry alliances. Department of Agricultural Economics, Oklahoma State University. Visions 1999; 72:16-21.
- Ward CE, Vestal MK, Doye DG, Lalman DL. 2008. Factors affecting adoption of cow-calf production practices in Oklahoma. *Journal of Agricultural and Applied Economics*. Volume 40 Number 3. pg 851-863.
- Wileman BW, Thomson DU, Reinhardt CD, Renter DG. 2009. Analysis of modern technologies commonly used in beef cattle production: Conventional beef production versus nonconventional production using meta-analysis. *J Anim Sci*. 87:3418-3426.
- Wozniak GD. 1993. Joint information acquisition and new technology adoption. *Review of economics and statistics*. 75, 3(1993):438-445.