Beef Cattle Manual

Eighth Edition Revised

2023

The Oklahoma *Beef Cattle Manual* has been available since 1983. Since that time, the manual has become a key resource for beef cattle producers, Extension professionals, veterinarians and many others associated with the beef cattle industry.

The development of this comprehensive resource for beef production in Oklahoma is the result of a team effort by faculty and staff in the Division of Agricultural Sciences and Natural Resources and Extension Area Specialists. Authors who contributed to the manual are listed below along with their departmental or agency affiliation. The authors would like to express their gratitude to Hayley Eberle in Agricultural Communications Services for formatting and editing this updated manual.

Agricultural Economics
Courtney Bir
Damona Doye
Amy Hagerman
J C. Hobbs
Derrell Peel
Kellie Curry Raper
Roger Sahs

Animal and Food Science
Paul Beck
Amanda Holder
Mark Johnson
David Lalman
Bob LeValley
Gretchen Mafi
Jazmin Markey
Alexi Moehlenpah
Joao G. N. Moraes
Brian Pugh
Chris Richards
Jeff Robe
Ryan Reuter
Glenn Selk (emeritus)
Daniel Stein

Area Specialists, Oklahoma Cooperative Extension Service
Scott Clawson
Brian Freking
Greg Highfill
JJ Jones
Earl Ward
Barry Whitworth, DVM
Dana Zook

Biosystems and Agricultural Engineering
Douglas W. Hamilton
Ray Huhnke

College of Veterinary Medicine
Rosslyn Biggs, DVM
John Gilliam, DVM

Entomology and Plant Pathology
Justin Talley

Natural Resource Ecology and Management
John Weir

Plant and Soils Sciences
Jeff Edwards
Alex Rocateli

Along with the *Oklahoma Beef Cattle Manual*, OSU Extension personnel offer a comprehensive educational program for beef producers, the Oklahoma Master Cattleman program. The Master Cattleman program uses the *Oklahoma Beef Cattle Manual* as its educational guide. The objective of this program is to enhance the profitability of beef operations and the quality of life of beef cattle producers by equipping them with vital information on all aspects of beef production, business planning, risk management and marketing. Components of the Master Cattleman program include an educational curriculum and a producer certification process. See https://extension.okstate.edu/programs/master-cattleman/ for more information.

We hope that you will find the *Oklahoma Beef Cattle Manual* to be a vital component in your beef production enterprise.

David Lalman
Extension Beef Cattle Specialist

Kellie Curry Raper
Extension Livestock Marketing Specialist

EXTENSION

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of $24,075 for 750 copies. Revised 03/2023 HE.

Table of Contents

Environment for Raising Cattle

Beef Industry Issues

1 Beef Industry Overview for Oklahoma

Derrell Peel, Kellie Curry Raper and David Lalman

Objectives

- **Review demographic statistics for beef production in Oklahoma.**
- **Introduce financial performance statistics for cow-calf producers.**
- **Describe current management practices of Oklahoma beef producers.**

By the U.S. Department of Agriculture's definition, a farm is an operation with the potential to sell $1,000 of agricultural products, so it includes many small non-commercial operations. The Census of Agriculture provides benchmarks for production agriculture (USDA/NASS) every five years. The 2017 Census lists 78,531 farms in Oklahoma, the 4th largest in the U.S., accounting for approximately 3.8% of the U.S. total. The National Agricultural Statistics Service (NASS) conducts additional annual surveys that supplement census information.

In 2017, Oklahoma ranked 22nd in total cash receipts from farm marketing, accounting for approximately $7.5 billion of the $388.5 billion in sales nationally. In 2019, Oklahoma livestock and products sales were $4.5 billion, and crop sales were $1.7 billion, for a total of $6.2 billion in farm marketing (NASS). The 2017 data shows 52,048 cattle operations in Oklahoma with 46,080 beef cow operations, the third largest in the nation in both categories (Table 1.1).

Needless to say, beef production is big business in Oklahoma. Cattle and calves are consistently the first ranked commodity within the state based on value of production, accounting for more than 40% of the state's agricultural production in recent years. In 2017, Oklahoma had the sixth highest value of cattle and calves sales of $3.7 billion. Numbers for cattle and calves include cow-calf enterprises on farms, stockers on pasture and cattle in feedlots. The state ranks in the top 10 states for all cattle and calves, beef cows, feeder supply and cattle on feed (Table 1.2). Figure 1.1 shows the value of production for all cattle and calves has been more than $2.6 billion in recent years.

The record high number of cattle and calves was 6.5 million in 1975 with the record low of 82,000 head in 1867, when the data series was first initiated. Since 1975, the number of cattle and calves in Oklahoma has generally followed the industry trend downward though cattle numbers recovered sharply following severe drought in 2011-2012 (Figure 1.2).

The number of beef cows in Oklahoma has trended higher since the late 1980sv (Figure 1.3). While numbers

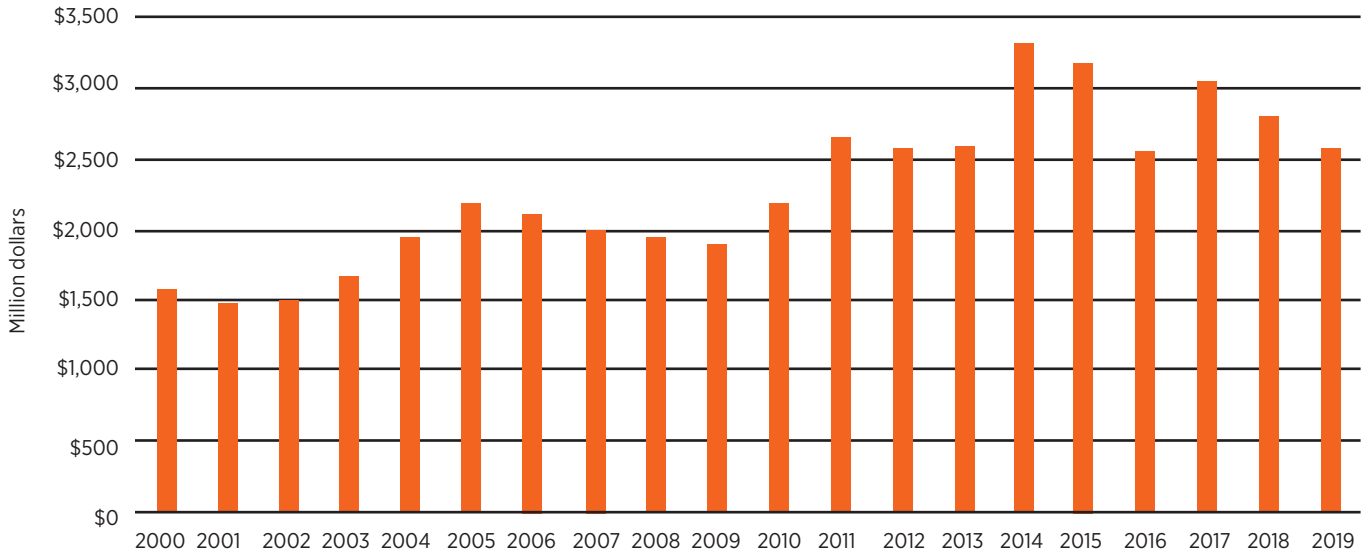

Figure 1.1. Value of production of all cattle and calves, Oklahoma. Source: USDA-NASS.

All Web addresses given in this chapter are subject to change. The links to these websites will be updated regularly at the Master Cattleman website at extension.okstate.edu/programs/master-cattleman.html

Table 1.1. Oklahoma cattle operations and percent of cattle Inventory by size group.*

	Total		*1 - 49 Head*		*50 - 99 Head*		*100 - 199 Head*		*200 - 499 Head*		*500 - 999 Head*		*1,000 - 2,499 Head*		*2,500+ Head*	
Year	*# of cattle operations*	*cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*	*# of cattle operations*	*% of cattle inventory*
1997	63,439	5,378,950	41,459	15	10,574	13	6,300	16	3,666	20	976	12	367	9	97	14
2002	59,155	5,324,240	38,205	14	9,550	12	6,171	16	3,699	21	1,002	13	430	11	98	13
2007	55,105	5,391,337	35,167	12	8,382	11	5,733	14	3,979	22	1,348	17	397	11	99	13
2012	51,043	4,245,970	35,181	15	7,139	12	4,439	14	2,949	21	1,007	16	255	9	73	14
2017	52,048	5,090,919	33,040	12	7,851	11	5,466	15	4,141	24	1,068	14	382	11	100	14

*Census of Agriculture, USDA-NASS.

Table 1.2. Top 10 Inventory for all cattle and calves, beef cows, feeder supply and cattle on feed, 2020

Rank	All Cattle and Calves		Beef Cows		Feeder Supply*		Cattle on Feed	
	State	Head (1,000)	State	Head (1,000)	State	Head (1,000)	State	Head (1,000)
1	TX	13,000	TX	4,570	TX	3,480	TX	2,980
2	NE	6,800	OK	2,099	OK	2,160	NE	2,600
3	KS	6,450	MO	2,083	KS	1,795	KS	2,580
4	CA (T)	5,400	NE	1,922	NE	1,700	IA	1,290
5	OK (T)	5,400	SD	1,733	MO	1,590	CO	1,120
6	MO	4,350	KS	1,433	CA	1,340	CA	540
7	IA (T)	3,900	MT	1,428	IA	1,170	SD	440
8	SD (T)	3,900	KY	1,021	SD	1,045	MN	400
9	WI	3,450	ND	995	WI	820	OK	340
10	CO	2,800	AR	915	KY	808	ID	310

* Calculated from inventory categories such as: (Steers >550 lb. + other heifers > 500 pounds + calves < 500 pounds) - cattle on feed = estimated feeder suuply, USDA-NASS.

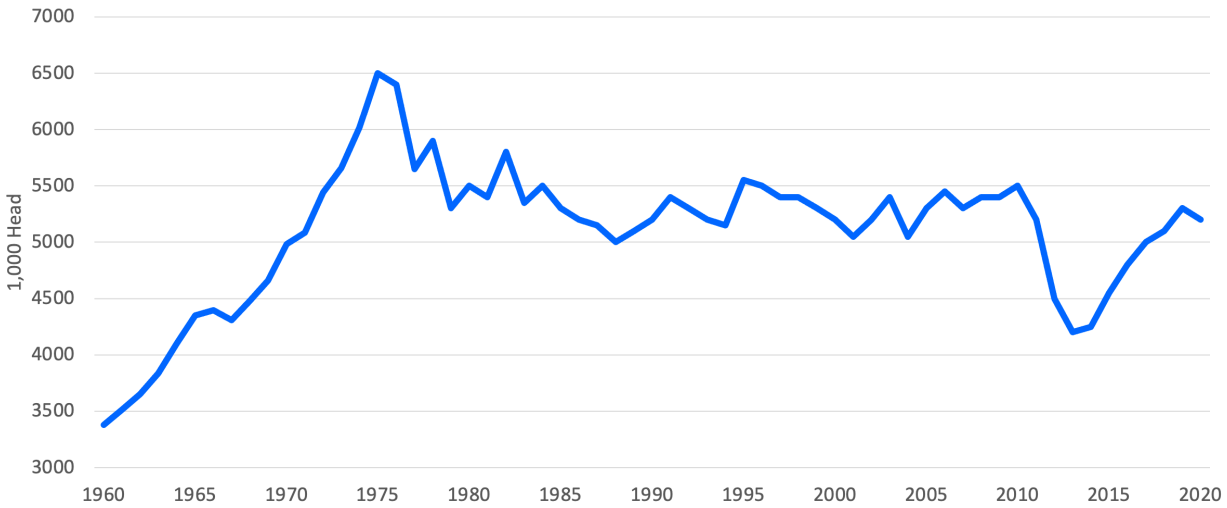

Figure 1.2. All cattle and calves in Oklahoma, 1960-2020. Source: USDA-NASS

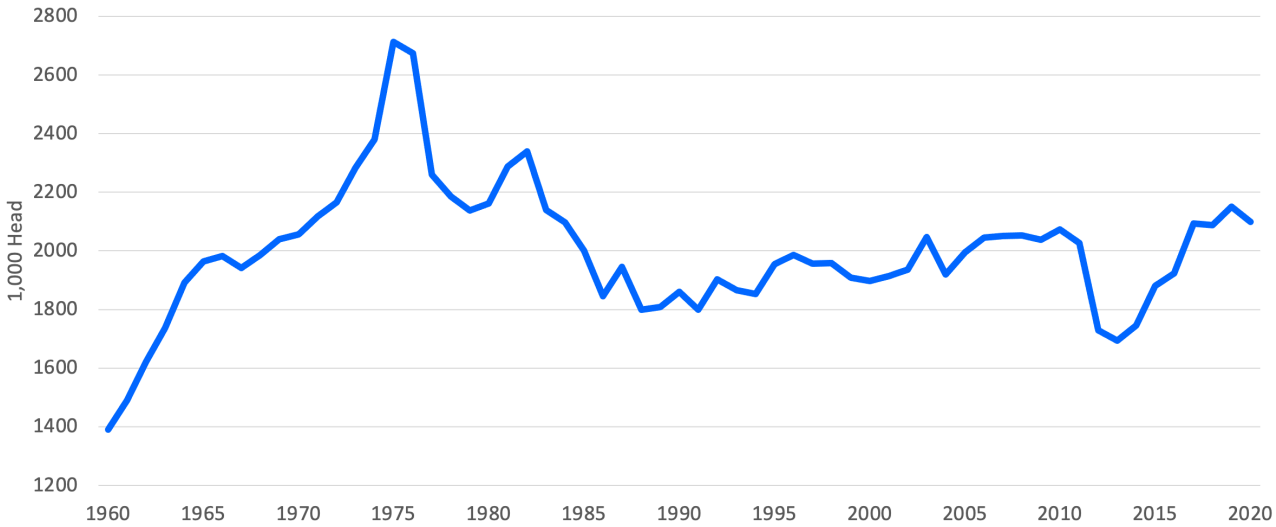

Figure 1.3. Beef cow inventory, Oklahoma, 1960-2020. Source: USDA-NASS

are down from the mid-1970s, the state averaged about 1.9 million beef cows on hand as of Jan. 1 for the past decade, recovering from the drought low of 1.7 million head in 2013 to 2.1 million head in 2020.

While beef production is big business, it also includes many small businesses, as there are many Oklahoma farms and ranches with fewer than 50 head of cattle (Table 1.1). Two-thirds of the state's 78,531 farms have some cattle. Figures 1.4 and 1.5 show the number of operations with cattle by size of operation and percent of cattle inventory by size of operation for 2017, respectively.

Statistics for farms with beef cows (as opposed to all cattle and calves) are shown in Figures 1.6 and 1.7. Most farms (74%) have fewer than 50 cows. Only 11.5% of farms have more than 100 cows. Cow numbers are more concentrated in the larger herds, with 52.3% of the cows in herds of more than 100 cows.

Financial Performance Statistics

In 2019, the Kansas Farm Management Association data listed total variable costs per cow at approximately $748 annually, with total costs at $1,088 per cow on average. Just as herd sizes vary widely, so do costs of production. Cost of production calculated by the Kansas Farm Management Association's data is sorted using profit categories. The difference between the high- and low-profit category producers is approximately $428 per cow. Differences in major cost components are highlighted in

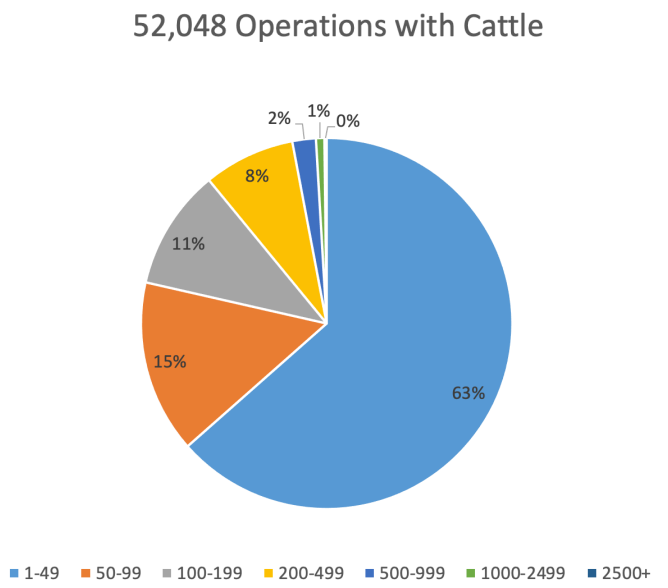

Figure 1.4. Number of Oklahoma farms and ranches with cattle by size of operation. Source: 2017 Census of Agriculture, USDA-NASS.

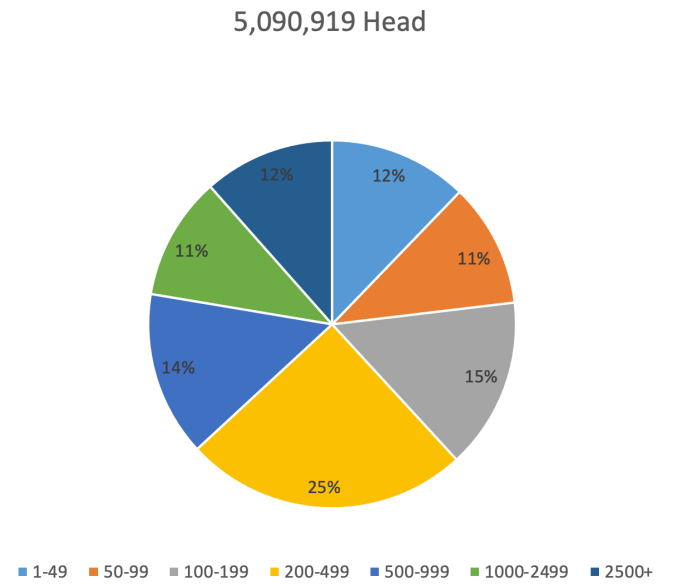

Figure 1.5. Percent of Oklahoma cattle inventory by size of operation. Source: 2017 Census of Agriculture, USDA-NASS.

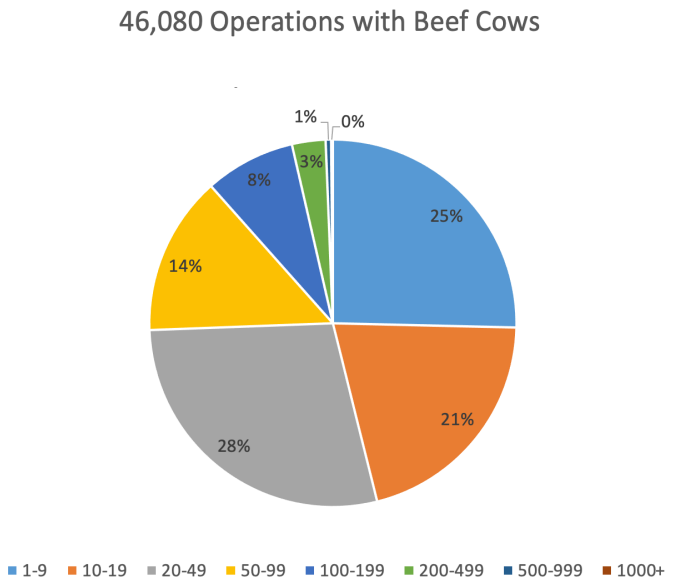

Figure 1.6. Percent of Oklahoma farms and ranches with beef cows by size of operation. Source: 2017 Census of Agriculture, USDA-NASS.

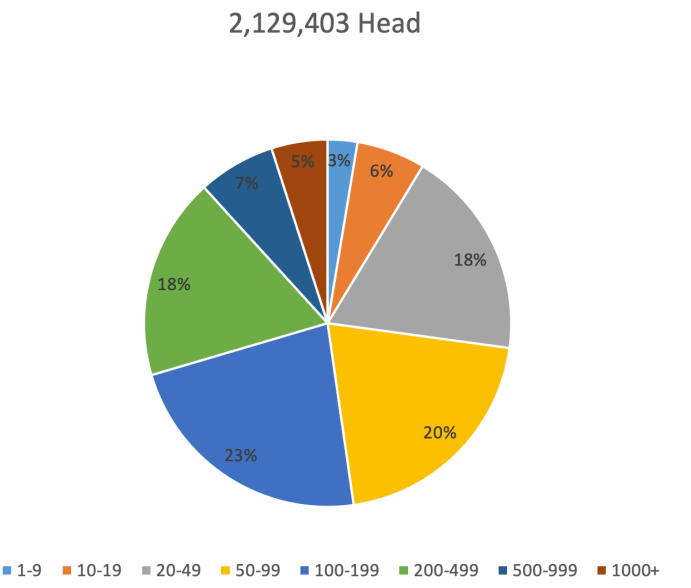

Figure 1.7. Percent of Oklahoma beef cow inventory by size of operation. Source: 2017 Census of Agriculture, USDA-NASS.

Figure 1.8. Producers with above-average net income spend significantly less in maintaining a cow and producing a calf crop than those with lower-than-average income. Producers with high profits tend to have larger herds and generate more gross income per cow.

Cost of production for small herds can be high on average. For example, as fixed costs for a vehicle and other machinery and equipment are borne by a few cows, the cost is high. However, there are many profitable herds in this group. Thus, while it may be more difficult to be profitable with a small herd, it is not impossible. Production must be monitored closely, costs must be controlled carefully and smart choices must be made with respect to investments in capital assets.

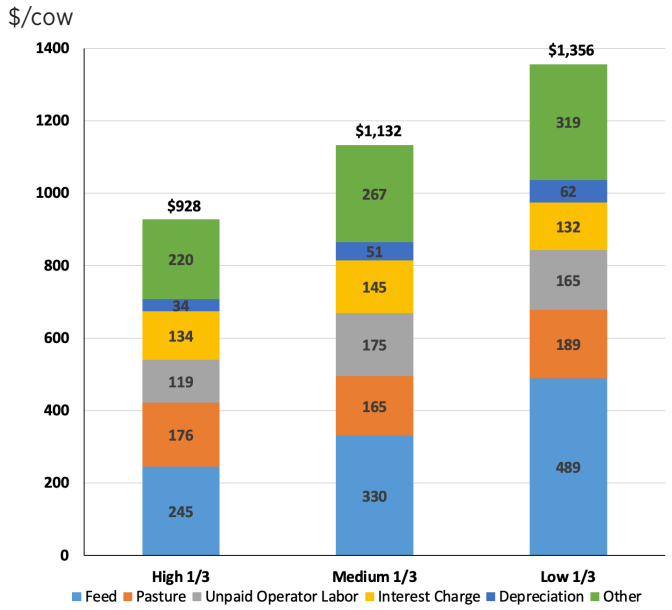

Figure 1.8. Cost of production by profit category ($/cow). Source: Kansas Farm Management Association, 2019

Management Practices

Beef production operations vary considerably in size, available resources, profitability and use of technology. Strategies to increase profitability of small and medium-sized beef cow enterprises like those most prevalent in Oklahoma are crucial to increasing the overall profitability

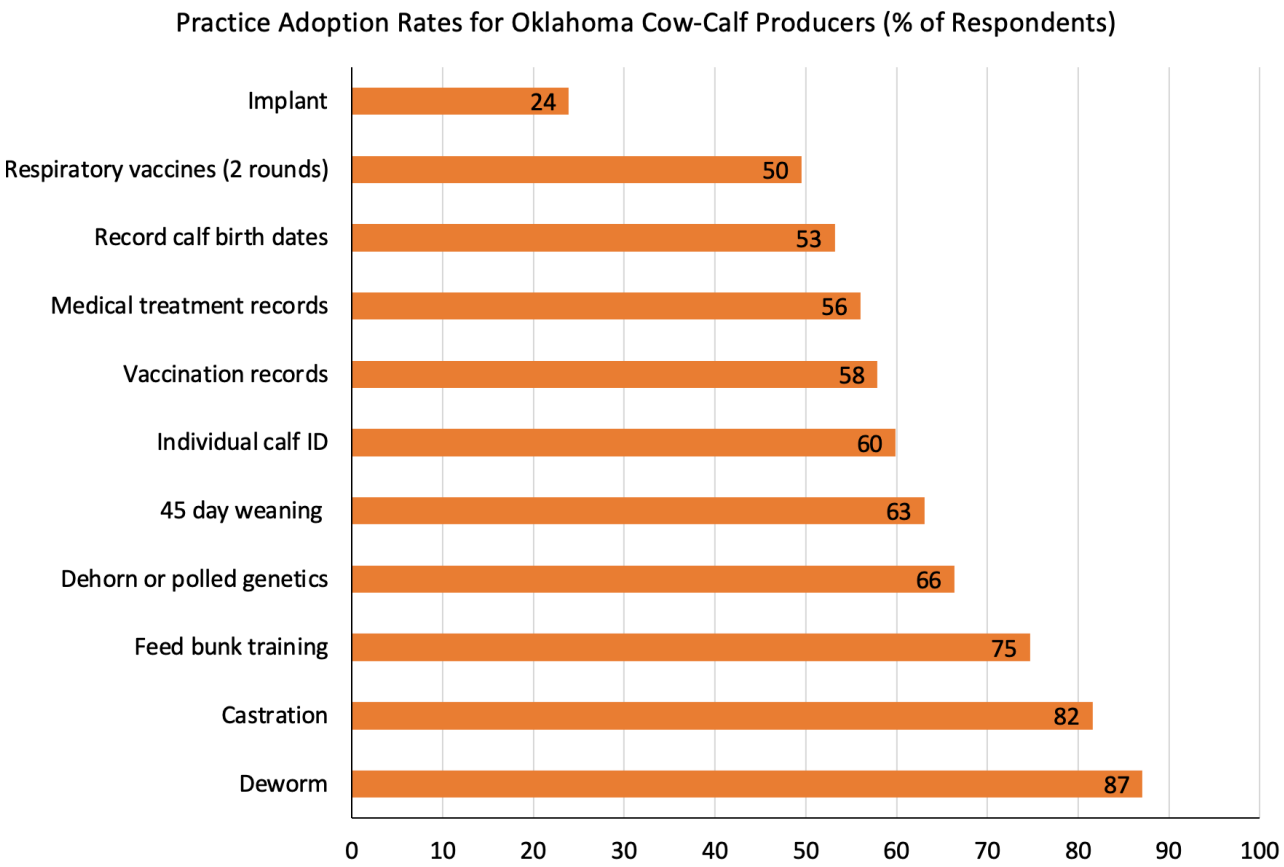

Figure 1.9. Rate of adoption by management practice. Source: Raper, Oklahoma Beef Management and Marketing Survey (2017).

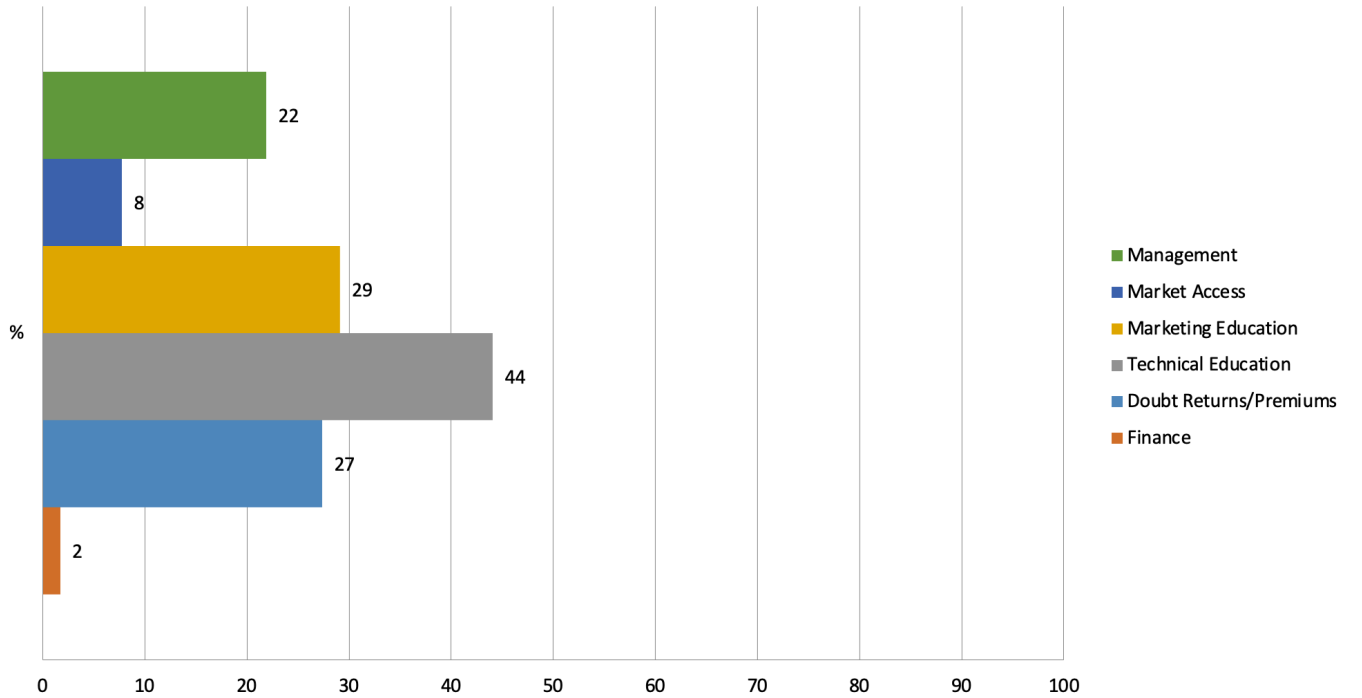

Figure 1.10. Constraints to castration (%) as identified by non-adopters. Source: Raper (2015), Oklahoma Beef Management and Marketing Survey.

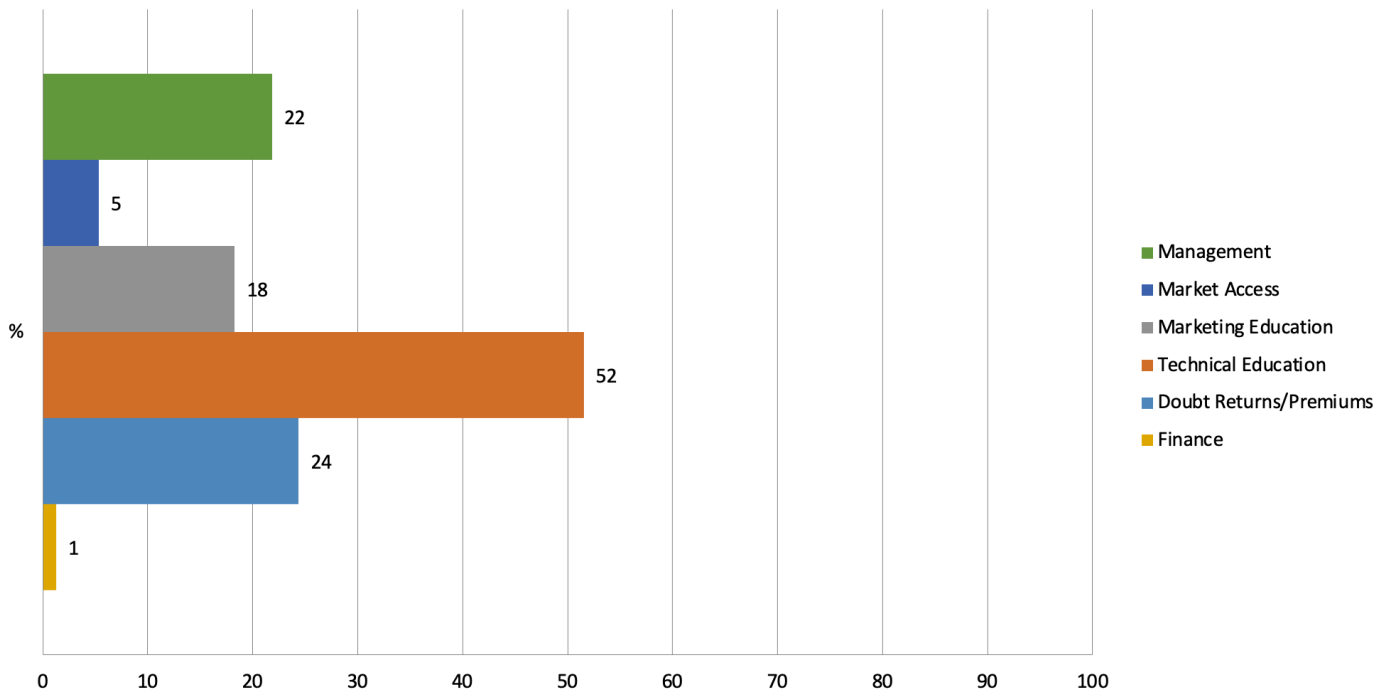

Figure 1.11. Constraints to dehorning (%) as identified by non-adopters. Source: Raper (2015), Oklahoma Beef Management and Marketing Survey.

of the industry. Following recommended best management practices as encouraged by research-based OSU Extension educational programming can help producers both manage costs and generate more gross income per cow. Recommended management practices are based on scientific analysis. According to Ward et al. (2008), cow herd management practices, such as a limited period breeding season and limited use of harvested forages, are generally more cost-effective than alternative strategies and enhance profitability, but adoption among Oklahoma cow-calf producers is inconsistent at best. For example, data provided by Oklahoma producers indicated that only 34% effectively have a defined breeding season (OBBM Survey). Examples of recommended management practices for calves include retention of calves on the ranch for a significant period after weaning and respiratory and other vaccinations, with ample on-farm time post-vaccination prior to marketing – practices that, when bundled together, are known as preconditioning. Science indicates calf health and calf performance is improved by these practices as calves move through the supply chain.

Economic studies have shown that buyers value these practices enough to pay higher market prices for such calves, relative to similar calves without these backgrounds (Williams et al., 2014). However, producers do not always adopt recommended management practices. Figure 1.9 indicates that non-adoption among Oklahoma producers is high across many recommended practices for calf health management and marketing (Williams et al., 2013).

Schumacher, Peel and Raper (2017) reported producer-identified constraints to adoption often includes a lack of technical knowledge or doubt in the returns for practice adoption. For example, producers with herds of 50 to 99 head are more likely to doubt returns from a 45-day weaning period than other herd sizes. Recently, survey and marketing data has identified adoption of castration and implantation, two very specific management practices proven to add value at relatively low cost and to increase efficiency in cow/calf operations, have been on the decline. Raper (2015) reports 44% of respondents who did not castrate bull calves prior to marketing indicated a lack of technical education was a constraint to implementing castration in their cow-calf operation (Figure 1.10). For producers who do not dehorn calves prior to marketing, 52% indicated technical education was a constraint (Figure 1.11).

Increasing adoption rates of basic recommended management practices in beef production increases market access for small- and medium-sized farms, particularly as producers begin to bundle various management practices together, such as the bundle of on-farm calf health management practices known as preconditioning. The implications for future calf health and quality make those calves more attractive to buyers and increase the probability of premiums (Williams et al., 2014). Adoption of basic recommended production and management practices for cow herds can decrease input costs and increase the economic viability of Oklahoma's beef industry.

References

Kansas Farm Management Association, 2019. Enterprise Reports. agmanager.info/KFMA/ Accessed August 13, 2020.

Raper, Kellie Curry. "Producer-Identified Constraints to Preconditioning Feeder Calves." State-wide Livestock Economics In-Service, Stillwater, Oklahoma. February 11, 2015.

Schumacher, Stephanie, Derrell S. Peel and Kellie Curry Raper. ""Demographic Influences on Nonadoption of Calf Management and Marketing Practices for Cow-Calf Operations." *Journal of Applied Farm Economics* 1(2), Article 3. 2017. Available at docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1012&context=jafe.

USDA, National Agricultural Statistics Service, (2012). Census of Agriculture. Table 28: Beef Cow Herd size by Inventory and Sales. nass.usda.gov/Census/

USDA, National Agricultural Statistics Service, Oklahoma Department of Agriculture. Oklahoma Agricultural Statistics Bulletin. (Various Years) nass.usda.gov/Statistics_by_State/Oklahoma/Publications/Annual_Statistical_Bulletin/index.asp

Ward, C.E., M. K. Vestal, D.G. Doye, and D.L. Lalman. 2008. "Factors Affecting Adoption of Cow-Calf Production Practices in Oklahoma." *Journal of Agricultural and Applied Economics*, 40(3):851-863.

Williams, Brian R., Eric A. DeVuyst, Derrell S. Peel and Kellie Curry Raper. "The Likelihood of Positive Returns from Value-Added Calf Management Practices." *Journal of Agricultural and Applied Economics* 46(1):125-138. February 2014

Williams, Brian R., Kellie Curry Raper, Eric A. DeVuyst, Derrell Peel, David Lalman, Chris Richards, and Damona Doye. "Demographic Factors Affecting the Adoption of Multiple Value-Added Practices by Oklahoma Cow-Calf Producers." *Journal of Extension*, Volume 51-6 (December 2013): Article 6FEA7. Accessible at joe.org/joe/2013december/pdf/JOE_v51_6a7.pdf