



Management characteristics of cow-calf, stocker, and finishing operations in Kansas, Oklahoma, and Texas¹

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ABSTRACT

An assessment of the sustainability of beef production in the Kansas, Oklahoma, and Texas region requires information on their production practices. A voluntary survey was conducted for ranches and feedyards in the region along with site visits to gather information on production practices. Responses to the survey along with site visits represented 0.8% of the cows maintained and 9% of the cattle finished in the region, with a wide range in size and types of operations. Most characteristics of cow-calf and stocker ranches did not vary much across states, but there were differences in cow stocking rates and forage production from the wetter east side of the region to the drier, semiarid condi-

tions of the west side. Average stocking rate decreased from 2.4 ha/cow (1.3 ha/stocker) in the east to 15.7 ha/cow (4.6 ha/stocker) in the west, and more forage was harvested in the east along with greater use of fertilizers. The largest feedyards were located on the west side of the region; no other consistent differences in feedyard management were found across the region or among states. Two feedyards in central Kansas produced a major portion of their feed, whereas most of the others appeared to manage just enough cropland to dispose of feedyard runoff and minor amounts of manure. The information gathered is being used to develop representative operations for a comprehensive life-cycle assessment of the economic and environmental sustainability of beef cattle production in the region.

sustainability of production systems. The beef industry has defined sustainability as meeting the growing demand for beef by balancing environmental responsibility, economic opportunity, and social diligence. Measuring sustainability is challenging because the beef supply chain is one of the most complex food systems in the world. In a proactive effort to identify opportunities to improve sustainability, the US Beef Sustainability Research Program was launched in 2011. The objective of this program is to conduct comprehensive life-cycle assessments based on regional production practices throughout the nation.

A methodology has been developed to characterize and evaluate the environmental and economic sustainability of beef cattle production systems (Rotz et al., 2013). Production information is then used along with information gathered from the processing, marketing, and consumer portions of the industry to define economic, social, and environmental factors of sustainability using the BASF socio-economic efficiency tool (SEEBALANCE;

Key words: beef cattle, management, ranch, feedyard

INTRODUCTION

Both producers and consumers of animal products have concern for the

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Kölsh et al., 2008). To verify this methodology, an assessment was done for the beef produced by the US Meat Animal Research Center, Clay Center, Nebraska (Rotz et al., 2013). Through this analysis, the sustainability of beef was found to have improved by 5% between 2005 and 2012 (Stackhouse-Lawson et al., 2013).

The first region for in-depth study consists of Kansas, Oklahoma, and Texas. Our objective was to conduct surveys to obtain information on common management practices of cow-calf, stocker, and finishing operations for use in representing and modeling representative production systems for the region. The ultimate goal is to identify and quantify environmental, social, and economic inputs and outputs of representative production systems for all cattle-producing regions of the United States. Because the Kansas, Oklahoma, and Texas region maintains 25% of the beef cows and finishes 37% of the beef cattle produced in the United States (NASS, 2014), this region plays an important role in the nation's production of beef.

MATERIALS AND METHODS

Two surveys were developed and implemented through the Internet to gather information on management practices of beef cattle producers in Kansas, Oklahoma, and Texas. The first survey was developed for cow-calf, stocker, and cow-calf-to-finish ranches. A second survey was developed for feedyard finishing operations. Participation was voluntary and encouraged by state beef-council staff. The ranch survey was designed to be completed in approximately 15 min to encourage greater participation and completion. The feedyard survey required a little more time and information. The intent was to avoid asking for information that required time for gathering data. Questions were developed for more general responses relying on the general knowledge of the producer. Survey questions are available in the Supplemental Materials (<http://dx.doi.org/10.15232/pas.2014-01350>).

A total of 352 and 14 responses were obtained from ranch and feedyard operations, respectively. The ranch responses represented a wide range in size and type of operations producing calves, stockers, and in some cases finished cattle. The 2012 agricultural census reported an inventory of 7.3 million beef cows in 3 states (NASS, 2014). Survey responses represented 59,054 brood cows or about 0.8% of the cows maintained in the region. The feedyard responses also represented a wide range in size and other characteristics. The number of cattle finished on these feedyards in 2012 was 1.03 million, which was about 9% of the finished cattle sold for slaughter from this region in the 2012 census (NASS, 2014).

Ranch and feedyard visits were also conducted to gather more specific information on a few operations in all 3 states. These visits included 9 ranches and 3 feedyards. Information collected included that in the survey, and these data were included in the survey analysis. Additional information was gathered on feeding practices; truck and equipment use; and fuel, electricity, and chemical use.

Responses from cow-calf operations were summarized into 3 areas as the east, central, and west portions of each state. The Texas panhandle and High Plains area was included in the west area. These divisions were made to characterize the effects of precipitation patterns across the 3-state region. The east area obtained relatively high annual precipitation, but rainfall decreased across each state with a drier, semiarid climate in the west. This difference in precipitation creates differences in stocking rates and other important management characteristics. Responses from cow-calf operations were also summarized by state to determine any differences from the northern to the southern part of the region.

Where possible, data were statistically compared to determine differences across the region. These data included animal numbers per operation, cow BW, stocking rates, and labor requirements. The means of

each were visually inspected for a trend across the 3 areas and states. Where trends were observed, significant differences ($\alpha = 0.05$) in those management characteristics among states and areas within states as well as interactions between states and areas were assessed using the general linear model procedure of SAS/STAT software, Version 9.2 (SAS Institute Inc., Cary, NC). Where significant differences were found, mean comparisons were done post hoc with Tukey's honestly significant difference (SAS, 2008).

RESULTS AND DISCUSSION

Ranch Survey

Of the 356 responses received for the ranch survey, 25 were from Kansas, 40 from Oklahoma, and 291 from Texas. For Kansas and Oklahoma, the number of responses was similar from each area of the state, but in Texas about 60% of the responses came from the center of the state. Over the 3-state region, 23% of the responses were from the east, 59% from the center, and 18% from the west (Table 1).

Of all the ranches surveyed, about 94% included cows, with the remainder being stocker only, or combined stocker and finish operations. This proportion did not vary much from the east to west areas of the state (Table 2). Among the operations with cows, the predominant type in the east was cow-calf and stocker operations (70.7%) followed by cow-calf only (19.5%) and cow-calf to finish (9.8%). In the central and west areas, there were more cow-calf and cow-calf-to-finish operations (Table 2). The types of operations were more uniformly distributed across the whole region with 34% being cow-calf only, 42% cow-calf with stockers, and 24% cow-calf to finish. Most of the ranches in the east that included finishing were in Kansas and Oklahoma, with one operation in Texas maintaining 12,000 stockers and finishing 2,000 cattle per year. In the central region, the majority of the operations that in-

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