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Management characteristics of beef cattle production in the eastern United States

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ABSTRACT

As part of the United States Beef Sustainability Program, a nationwide characterization of regional beef production practices was conducted. Data on cattle production practices were gathered through voluntary surveys and on-site visits in the Northeast and Southeast, the last of 7 cattle-producing regions studied. Participating farms and ranches (n = 817) represented 1.2 and 1.0% of beef cows in the Northeast and Southeast, respectively. Responses from finishing operations (n = 55) represented 4 and 23% of cattle fed in the Northeast and Southeast, respectively. Herd sizes reported were larger in the Southeast than in the Northeast; however, stocking rates were similar. Cow-to-bull ratios were slightly greater in the Southeast, and the proportions of replacement heifers were comparable in both regions. Supplemental feed production and indoor housing were more prevalent in the Northeast compared with the warmer Southeast, where longer grazing periods were possible. Fewer feedlots were reported in the Southeast, with most being backgrounding facilities. Finishing on grass was more common in the east than in other regions. Feed intake estimated by survey respondents was comparable across regions, but relatively more silage was fed in the Northeast, whereas hay was dominant in the Southeast. Cropland producing cattle feed received most of the manure in both regions, although 25% was composted and sold in the Northeast. Labor, equipment, and energy use information was also gathered from the various operation types. The data collected help guide the development of representative production systems used in the life cycle assessment of beef.

Key words: cattle management, feedlot, farm, beef

INTRODUCTION

Nationwide, region-specific data collection on cattle production was initiated as part of a comprehensive life cycle assessment (**LCA**) under the United States (**US**) Beef Sustainability Research Program. The purpose of this LCA is to quantify metrics of sustainability for the beef industry, establish benchmarks, and identify opportunities for improvement.

Beef production practices vary regionally based on climate, available natural and man-made resources, and culture. The purpose of region-specific data collection is to characterize the various production and management practices in each region. The data collected are used along with other sources of information to develop representative operations in each region that are analyzed to produce a farm gate partial LCA based on methods developed by Rotz et al. (2013). As such, the data collected are not used directly to support the LCA, but they help guide the development of representative cattle production systems for the regions.

Production and management data have already been collected for 5 regions (Southern and Northern Plains, Midwest, Northwest, and Southwest), and a farm gate assessment was completed for the Southern Plains (Asem-Hiablie et al., 2015, 2016, 2017; Rotz et al., 2015). The objective of the present study was to survey and record beef production and management practices in the final 2 regions of the country, the Northeast and Southeast. These data provide information that is not readily available from other sources to help characterize cattle production systems.

MATERIALS AND METHODS

States of the eastern US were divided into the 2 regions: the Southeast (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North and South Carolina, Tennessee, and Virginia) and the Northeast (Connecticut, Delaware, New Hampshire, Maine, Maryland, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and West Virginia). The climate varied across these states, with much warmer ambient temperatures in the south and the coldest in the northern states of the Northeast (Table 1). Annual precipitation also varied with 18% more in the Southeast than in the Northeast and the greatest precipitation in the Gulf Coast states of Florida, Alabama, Mississippi, and Louisiana. Within the

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Table 1. Average annual temperature and precipitation for the 24 states making up the Northeast and Southeast of the United States[1]

State	Temperature (°C)	Precipitation (mm)
Northeast		
Connecticut	9.4	1,279
Delaware	12.9	1,160
Maine	5.0	1,072
Maryland	12.3	1,131
Massachusetts	8.8	1,211
New Hampshire	6.6	1,103
New Jersey	11.5	1,196
New York	7.4	1,062
Ohio	10.4	993
Pennsylvania	9.3	1,089
Rhode Island	10.1	1,218
Vermont	6.1	1,085
West Virginia	11.0	1,147
Region	9.3	1,134
Southeast		
Alabama	17.1	1,480
Arkansas	15.8	1,284
Florida	21.5	1,385
Georgia	17.5	1,287
Kentucky	13.1	1,242
Louisiana	19.1	1,528
Mississippi	17.4	1,499
North Carolina	15.0	1,279
South Carolina	16.9	1,264
Tennessee	14.2	1,376
Virginia	12.8	1,125
Region	16.4	1,341

[1]Climate data are from the National Oceanic and Atmospheric Administration website: https://www.climate.gov/maps-data.

Northeast, precipitation was greater along the east coast and least in Ohio.

Surveys and Visits

In both the Northeast and Southeast regions, surveys were administered via the Internet and through on-site interviews. Two surveys were used: one for farm or ranch cattle producers and the other for finishing operations. Survey questions for each region were developed in consultation with state beef councils and cattlemen's associations to ensure the inclusion of region-specific characteristics. Similar to procedures followed in previous regions (Asem-Hiablie et al., 2015, 2016, 2017), invitation letters providing web addresses to the surveys were sent to producers by each participating state's beef council or cattlemen's association. In addition, Internet addresses of the surveys were distributed through periodicals and websites of the state councils. For this reason, it was impossible to adequately quantify the total number of survey recipients. Both surveys were kept as short as possible to encourage participation, requiring approximately 15 min for farms and ranches and slightly more for finishing operations. On-site interviews were conducted to obtain more detailed information including energy and equipment use. The operations visited were chosen following recommendations by state beef council representatives and were based on the representativeness of the operations of the state's production systems, availability of records, and willingness to participate. Survey responses from individual producers were treated as confidential information and were collated and analyzed in spreadsheet format. The survey and visits were not a randomized sample, but they did provide wide representation in operation size and management practices. Survey questions are available in the Supplementary Material (SM 1a and 1b; https://doi.org/10.15232/pas.2018-01728).

We have defined 2 major categories of operations for use in this paper. "Farms" or "ranches" are operations that predominately include cattle on pasture or rangeland and include cow-calf–to–finish operations where calves are weaned, raised, and finished on the same operation. For these regions, we refer to these as "farms." "Feedlots" are operations where cattle are predominantly fed in confinement (open lot or barn) for either backgrounding on a high-forage diet or finishing on a high-concentrate diet. "Background" and "stocker" cattle both refer to the intermediate stage of development between weaning of the calf and finishing of the animal on a high-concentrate diet; however, the former refers to cattle fed predominately in confinement and the latter, on grazing land. Cattle raised on farms or feedlots and fed a high-concentrate diet with the goal of providing finished carcasses were termed "feeders." The common names for different operations vary, but for consistency, these terms are used as defined.

Respondents consisted of cow-calf only, cow-calf and stocker, stocker only, cow-calf–to–finish, and stocker-to-finish operations. A total of 817 responses were compiled from surveys and visits of farms in the eastern region: 158 from the Northeast and 659 from the Southeast. Farm visits numbered 26 in the Northeast and 30 in the Southeast. On-site visit data were collected from 8 states in each region with 1 to 5 operations visited per state depending on the size and diversity of the industry in the state and the availability of those making visits. The 2015 inventory of beef cattle by the National Agricultural Statistics Service (NASS, 2017), reported total beef cows of 0.80 million in the Northeast and 6.87 million in the Southeast. Based on these inventories, our surveys and visits represented approximately 1.2% of the beef cow inventory in the Northeast and 1.0% in the Southeast.

During farm visits, information on equipment as well as fuel and electricity use was collected from beef producer records. Those visited in the Northeast consisted of 7 cow-calf operations (12 to 260 brood cows), 6 cow-calf and stocker operations (39 to 750 brood cows and 14 to 800