

Cow Muscle Profiling

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Building on the success of the muscle profiling research, the University of Nebraska and the University of Florida undertook to profile the characteristics of muscles from beef and dairy cows. The National Cow and Bull Audit conducted by Colorado State University estimated that 43% of the market cow carcass is sold into boxed beef form. While this number is higher than many may have guessed, opportunities still exist to upgrade the value of cow muscles. This research was conducted to characterize 21 muscles in market cows, to compare dairy and beef cow muscle characteristics, and to explore the effects of carcass weight, maturity, muscling and fat thickness on these traits.

Over a 5-month period, 75 beef and 74 dairy carcasses were selected from 4 different plants to fit a grid of carcass weight (350 to 549 and 550 to 749 lb for beef and 550 to 749 and 750 to 949 lbs for dairy), fat thickness (0.1 inches of fat or less, or greater than 0.1 inch), muscling (light versus medium/heavy), and C/D or E maturity groups. A portion of the carcasses went to the University of Florida for shear force determination and taste panel evaluation and a portion went to the University of Nebraska for analysis of composition, color, heme iron, collagen content, pH, and water holding capacity. During fabrication, measures of muscle dimension and yield were also obtained.

One difference between this study and the A-maturity muscle profiling project is the muscles that were studied. Earlier, we focused on muscles of the chuck and round. In

this study, we examined muscles from all of the major primals, using size and weight as the primary selection criterion. We examined the following muscles: *adductor, biceps femoris, complexus, deep pectoral, gluteus medius, infraspinatus, latissimus dorsi, longissimus dorsi, multifidus/spinalis dorsi, psoas major, rectus femoris, semimembranosus, semitendinosus, serratus ventralis, supraspinatus, tensor fascia latae, teres major, triceps brachii, vastus intermedius, vastus lateralis, and vastus medialis*.

As expected, there was a fair amount of variation among the muscles for most of the traits considered. There were few significant effects of carcass weight, maturity, muscling and fat thickness on the muscle characteristics on a within-breed type basis. Generally, there were few differences in muscle traits between the beef and dairy cow populations. When comparisons were made, we compared only those carcasses that were similar in weight (i.e., the heavy weight beef cow carcasses were in the same weight range as the light weight dairy cow carcasses). Dairy cows tended to be a bit more consistent in most traits.

This database will provide the foundation for product enhancement and value-added initiatives for cow muscle. It will be included in a revised version of the bovine myology CD-ROM.

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