

ABSTRACT

Failure to supply quality beef to a rapidly growing premium market has primarily been attributed to three factors namely; heavy reliance of the subsector on indigenous cattle, animals not intensively fed prior to slaughter and failure to practice post-mortem quality enhancing interventions. The objectives of this study were to establish the effects of genotype, finishing system and post-mortem treatment on quality of beef from selected cattle genotypes in Uganda. The study comprised of three trials.

The first trial investigated effects of age and method of carcass suspension on meat quality attributes from Ankole bulls (2-5 years) raised in pastoral communities. The bulls were divided into three groups of 2, 3 and ≥ 5 years of age. Results revealed that carcasses suspended by the pelvic bone had higher ($P < 0.001$) water holding capacity than those suspended by the *Achilles tendon* across all age groups. Collagen solubility decreased ($P < 0.001$), while shear force values increased ($P < 0.001$) with increasing age. Pelvic bone suspended carcasses had their post-mortem myofibrillar degradation improve ($P < 0.01$) by 20, 23 and 30% among 2, 3 and ≥ 5 year old bulls respectively while tenderness improved ($P < 0.001$) by 19, 21 and 29% among 2, 3 and ≥ 5 year old bulls respectively over those suspended by the *Achilles tendon*. It was recommended to suspend carcasses from unfinished mature bulls by the pelvic bone in order to improve beef tenderness and overall meat quality. To attain tenderness levels that would guarantee “acceptability” by beef consumers, it was suggested that pelvic suspension be combined with other postmortem tenderness improvement techniques such as aging.

The second trial compared carcass and meat quality traits of beef from Ankole (A), Boran (B), AnkolexFriesian (AxF), AnkolexBoran (AxB) and AnkolexBoranxBonsmara (Composite, Co) steers solely grazed (GZ), grazed and supplemented (GZS) or finished in a feedlot (FL) for a period of 120 days. Carcasses of AXB and B steers had the highest grades and fat scores while Co steers had the highest marbling scores. Beef from A, AXF and Co steers finished under the GZS system produced beef of similar tenderness and sensory panel ratings. Beef from B and AXB steers was less tender with lower ($P < 0.01$) sensory panel ratings than that of A, AXF and Co steers. However, under the FL system, AXB and B steers produced beef of similar tenderness and sensory ratings to that of A, AXF and Co steers. Finishing steers under the GZS and FL systems improved tenderness and sensory tenderness ratings by 18.8N and 1.9

respectively over GZ steers. Beef from A, AXF and Co steers finished under the GZS attained an acceptable tenderness level (53.8N) when aged for 7 days, while that from AXF, B and Co steers finished under the FL system attained it when aged for 5 days. It was concluded that in addition to finishing steers either under the GZS or FL systems, carcasses be aged for an average of a week to produce beef of acceptable tenderness. In addition to the current weight-based pricing criterion, tenderness should be considered so that the final price is based on both quantity and quality.

Effects of finishing system and duration on carcass and meat quality of Ankole (A), Boran (B), AnkolexFriesian (AxF), AnkolexBoran (AxB) and AnkolexBoranxBonsmara (Composite, Co) finished under grazing and supplementation (GZS) or in a feedlot (FL) were studied in the third trial. Steers were finished and slaughtered after 60, 90 and 120 days. For all genotypes and finishing system, carcass grades, fat and marbling scores ($P < 0.05$); meat tenderness and sensory panel ratings increased ($P > 0.0001$) as the duration of finishing was increased. The optimum durations of finishing under the grazing and supplementation system were established at 107, 101 and 105 days for Ankole, Ankole X Friesian and Composite genotypes. The corresponding WBSF values at optimum durations were 53N for Ankole, 52N for AnkoleXFriesian and 52N Composite. Under the feedlot, the optimum durations of finishing for Boran, AnkoleXFriesian, and Composite genotypes were 104, 101 and 104 days with corresponding WBSF values of 51N, 52N and 52N, respectively. To produce carcasses of good quality and beef of acceptable tenderness levels, a finishing duration of 104 days was recommended for grazing and supplemented Ankole cattle; and 103 days for Boran, AnkoleXFriesian and Composite genotypes finished by supplementing grazing or in a feedlot.