More Than Muscle: A Comparative Analysis of Functional Anatomy: Heart vs. Tongue Size in Plains Bison (Bison bison) in Relation to Weight per Day of Age (WDA)

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Bison are highly efficient grazers that convert forage into high-quality protein, making growth efficiency an important factor in livestock production. Weight per day of age (WDA) is a key measure of growth performance, reflecting how effectively an animal converts feed into body mass. Identifying anatomical traits that correlate with WDA can provide valuable insights for improving productivity in grazing animals. Heart size and tongue length are two physical traits that may influence growth efficiency. A larger heart could support better cardiovascular capacity, improving oxygen delivery and metabolic efficiency, which are essential for sustaining muscle growth and overall health. Similarly, tongue length may affect forage intake, as the tongue is the primary tool grazing animals use to harvest feed. Animals with longer tongues may be able to consume more forage, supporting higher nutrient intake and faster growth. While much research has examined growth traits in cattle, fewer studies have focused specifically on bison. Because bison and cattle share similar digestive systems and grazing behaviors, insights from cattle research may be applied to bison; however, species-specific studies are needed to confirm these relationships. The purpose of this project, More Than Muscle, was to investigate whether heart size and tongue length are associated with WDA in bison. By examining these anatomical traits in bison obtained from routine commercial processing, this study aimed to determine whether these physical characteristics could serve as indicators of growth performance and inform future breeding and selection strategies in livestock production.

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