Project Title:	Effects of Postmortem Aging on Beef Tenderness and Aging Guidelines to Maximize Tenderness of Different Beef Subprimal Cuts
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Layman's Summary:

Improvements in the consistency of beef tenderness through technology have been a primary focus of the beef industry in recent years. A literature review was conducted to assess the current state of scientific knowledge concerning the effects of postmortem aging on the tenderness of muscles in different beef subprimal cuts and to develop recommendations for aging different beef subprimals to maximize consumer acceptability of beef.

Muscle fibers are composed of a large number of myofibrils that are comprised of sarcomeres containing thick and thin myofilaments. A sarcomere is the basic contractile unit between two z-lines, which allow the muscle to contract or relax. The length of the sarcomere is greatest during relaxation, resulting in less overlap of protein filaments and a more desirable degree of tenderness. Postmortem aging or proteolytic degradation of this muscle structure can improve beef tenderness significantly. This aging is somewhat dependent upon the relationship between the calpain and calpastatin activities. Calpains can aid in the degradation of the muscle proteins while calpastatin regulates the release of calpain and acts as an inhibitor. Supplementation of Vitamin D has resulted in improved tenderness in combination with aging, due to an increase in calcium and consequently and increase in calpain. Electrical stimulation of the carcass prior to chilling has also improved the tenderness of beef products in combination with aging, in fact results have suggested that less aging is needed for some cuts that have been electrically stimulated. A significant amount of research has been done to determine the optimal aging time for both different subprimal cuts and various breed types of cattle.

Based on the literature review, there is a definite need for a standard set of "aging time" recommendations for different types of beef subprimal cuts to help assure consistency in tenderness and palatability for the consumer. The minimum recommended postmortem aging time for steaks from the rib section, based on the literature cited, was 11 to 15 days. The chuck roll and shoulder clod cuts should be aged a minimum of 12 and 11 days respectively; strip loin and top sirloin for at least 14 and 21 days respectively; and the top round and bottom round for a minimum of 16 and 12 days.

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