Influence of Degree of Doneness on the Alpha-Gal Content of Striploins and its Relationship with Red Meat Allergy

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As residents of the Southwind District, everyone is familiar with the pesky ticks that emerge each spring to find its next meal on you, your pets or your livestock. In recent years, Alpha-Gal Syndrome has been becoming more prevalent in people in the area. Alpha-Gal comes from the bite of a Lone Star Tick (for now) and symptoms can onset as soon as 3-6 hours after a bite. Meat Scientists at Kansas State University have started research to determine the Alpha-Gal content and how much that concentration is at various degrees of doneness. See below for their findings.

Alpha-Gal Syndrome (**AGS**) is an acquired sensitivity to galactosealpha-1, 3-galactose (α-Gal) after exposure to a bite from the Lone Star Tick (Amblyomma americanum). Affected individuals can experience a range of symptoms from mild itching to potentially fatal anaphylaxis after consuming products containing mammalian tissues that contain α-Gal. Little research has been done to examine the α-Gal content of different products; thus, the objective of this study was to establish the α-Gal content of striploin steaks cooked to varying degrees of doneness to evaluate if heat treatment reduces the α-Gal content of red meat.

Ten beef striploins were collected from a Midwest beef processing plant and transported under refrigeration to the Kansas State University Meat Laboratory (n = 10). Striploins were cut into four steaks each and either left raw or cooked to medium rare (MR; 130°F), medium (MED; 140°F), or well done (WD; 160°F). Whole muscle proteins were extracted, and proteins were separated by gel electrophoresis, transferred to a polyvinylidene difluoride membrane, and tested by immunoblot against a primary anti-α-Gal antibody. Each gel contained a reference sample of α-Gal conjugated human serum albumin with known α-Gal content.

Striploins that were cooked to well done had the greatest α-Gal concentration among all cooking treatments, followed by steaks cooked to medium rare and medium, while steaks that were left raw had the lowest α-Gal concentration ($P < 0.01$).

The Bottom Line: Our results are consistent with other studies, which indicated that cooking seems to concentrate α-Gal glycans to a higher degree than that of the raw striploins. Further research is needed to evaluate the efficacy of other interventions to improve the care and management of AGS patients. If you found this interesting, the complete report is available at https://doi.org/10.4148/2378-5977.8679. If you have any questions regarding the content in this article, feel free to reach out to any Southwind Extension District office, or email at nickell99@ksu.edu.

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