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Scientists Find Genes to Lower Saturated Fats in Beef

by Stacy Kish, CSREES

Diets rich in foods with saturated fats have been linked to an increased rate of cardiovascular disease. Saturated fat is found mostly in foods that come from animal products, including beef, lamb, pork, and poultry with skin. >>

With funding from USDA's Cooperative State Research, Education, and Extension Service (CSREES), a team of scientists in Iowa identified genes to regulate fat deposits in beef.

Fat deposits in beef and other ruminant animals are not as closely linked to diet as other non-ruminant animals. In the ruminant animal's digestive system, enzymes released by microorganisms within the rumen break down most dietary unsaturated fatty acid and produce saturated fatty acids that are deposited in the muscle mass.

Donald Beitz and colleagues at Iowa State University examined three single nucleotide polymorphisms (SNPs), pronounced "snips," that are related to fatty acid production in beef cattle. The scientists looked into the relationship between the genetic traits for high fatty acid content and the actual fat deposit in the muscle content of Angus bulls.

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Right: Dairy cows eating.

Credit: Don Beitz, Jon Schoonmaker, and Portia Allen

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Above: Obtaining a milk sample.

Credit: Don Beitz, Jon Schoonmaker, and Portia Allen

SNPs occur when a single nucleotide in the genome sequence is altered. Many scientists believe SNP maps may lead to the identification of multiple genes associated with animal productivity and composition.

Animal breeders can use the findings from this study to select for animals with lower deposits of saturated fat, and thereby produce a healthier product for the consumer. Breeders may also select for cattle that contain greater monounsaturated fatty acid deposits.

The ability to control fatty acid content in meat will have powerful implications for human health and nutrition. Many consider the saturated fatty acids in beef meat, such as lauric acid, myristic acid and palmitic acid, to be the most harmful fatty acids linked to cardiovascular disease. Polyunsaturated fatty acids and monounsaturated fatty acids are also found in beef meat, but are not as harmful.

CSREES funded this research project through the National Research Initiative (NRI) Animal Genome program. Through federal funding and leadership for research, education and extension programs, CSREES focuses on investing in science and solving critical issues impacting people's daily lives and the nation's future. For more information, visit www.csrees.usda.gov. ■

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References

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