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Effects of high oleic acid in beef fat (Korean native beef cattle) on blood characteristics and fatty acid composition in adipose tissue of rats

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As consumers are increasingly concerned about the impact of beef on health, the studies about beef contents are becoming popular recently. Oleic acid, the main components of Korean native beef (Hanwoo) fat, is usually known as beneficial material in reducing cardiovascular disease. Therefore, we studied the effects of oleic acid on lipid metabolism of rats, and then tried to see the possible effects on humans. To each twenty rats, 5% of olive oil, 10% of olive oil or 10% of coconut oil (control) in diet was added at a total feed amount of 30g/day. After 4 or/and 8 weeks, the rats feeding the oleic acid were increased oleic acid concentration in blood ($P=0.001$). In adipose tissue, there was a significant difference in C18-long chain fatty acid in the group fed with olive oil compared with control. Especially, cis-9 C18:1 contents had a big difference ($P<0.0001$). There was an increase in C18-long chain fatty acid, arachidonic acid(C20:4) and docosahexaenoic acid(C22:6) when fed with olive oil, but there was no effect of olive oil on adipose tissue except for C18 long chain fatty acid. Based on these results, followed experiment were conducted for finding the effects of Hanwoo fat, which is higher oleic acid than the other American beef (Angus) fat, on lipid metabolism of blood and adipose tissues of rats. The content of unsaturated fatty acid in blood was higher in the rats fed with diet including 7% of Hanwoo fat (HF) than the group fed with 7% of Angus fat (AF) ($P<0.0001$). High density lipoprotein was also higher in HF ($P=0.005$). However, AF was higher trans-type oleic acid in adipose tissue ($P<0.0001$). From these results, we have predicted that Hanwoo fat (high oleic acid) will have a positive effect on index of cardiovascular disease.

Biography

Ye Hyun Lee earned Bachelor's degree in Animal Science at Chungbuk National University, Korea. She completed internship program during a month at subtropical livestock research institute, National Institute of Animal Science, in Korea in July 2015, and Department of Meat Science Texas A&M, College Station, Texas, in January 2016. Currently, she is pursuing Master's course of Ruminant Nutrition Physiology Laboratory at Chungbuk National University, Korea. She has great interests in lipid metabolism of living organisms like cattle, rats, even including human. She is keen on studying the effects of fatty acid in meat or other foods.

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