

FATTY ACID COMPOSITION OF BEEF AND BACKFAT FROM CULL COWS FED FLAXSEED AND FORAGE BASED DIETS

NASSU, R. T. (1,2); DUGAN, M.E.R. (1); HE, M.L. (3,4); MCALLISTER, T.A. (3); AALHUS, J.L. (1); ALDAI, N. (1,5); KRAMER, J.K.G. (6)

(1)Lacombe Research Centre, Agriculture and Agri-Food Canada, Lacombe, AB, Canada; (2) Embrapa Pecuária Sudeste, São Carlos, SP, Brazil; (3) Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada; (4) University of Saskatchewan, Saskatoon, SK; (5) Instituto de Ganadería de Montaña, CSIC-ULE, Spain; (6) Guelph 12 Food Research Centre, Agriculture & Agri-Food Canada, Guelph, ON, Canada. E-mail: renata@cpps.e.br

The relationship between diet, health and lifestyle is now a key focal point for consumers, researchers and policy makers alike as there is an increase in obesity and the rise of diet-related chronic diseases. In this context, the various health benefits of consuming omega-3 (n-3) polyunsaturated fatty acids (PUFA) have been widely reported. Development of beef with enhanced levels of total n-3 fatty acids could, therefore, result in substantial increases in LC n-3 PUFA intake for humans, and provide an opportunity to add value to beef. Flaxseed contains ~40% oil, and of this 50-60% is linolenic acid (LNA), making it one of the richest plant sources of n-3 fatty acids. Feeding cattle flaxseed increases n-3 fatty acids in beef and also provides accumulation of partial hydrogenation of LNA such as vaccenic acid (VA, *trans* (t)11-18:1) and rumenic acid (RA, *cis* (c)9,t11-18:2) which have many health benefits. This study was conducted to investigate changes in fatty acid profiles of beef cows fed grass hay or barley silage based diets, with or without flaxseed supplementation. Both flaxseed and hay feeding increased levels of α -linolenic acid (LNA; 18:3n-3) in *Longissimus thoracis* (LT) and backfat ($P < 0.001$). A forage type by flaxseed level interaction was observed for most LNA biohydrogenation intermediates ($P < 0.05$) that indicated feeding hay combined with flaxseed led to the greatest levels of total conjugated linolenic acid (CLNA), total conjugated linoleic acid (CLA), total non-conjugated dienes and total *trans*-18:1. Predominant biohydrogenation intermediates included t11,c15-18:2, rumenic acid and vaccenic acid. Feeding flaxseed resulted in an increase of n-3 fatty acids and this was mainly LNA in backfat and LT. A forage type by flaxseed level interaction indicated a preferential accumulation of LNA biohydrogenation intermediates (*trans*-MUFA, non-conjugated dienes, CLA and CLNA) in LT and backfat when feeding flaxseed combined with grass hay as compared to barley silage.

Key words: beef, fatty acids, flaxseed