Fatty acids in reproductive tissues of dairy cows fed diets supplemented with rolled canola, sunflower or flaxseed

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INTRODUCTION

Knowing fatty acid (FA) concentrations in reproductive tissues is essential to understand the roles of FA on reproductive function.

OBJECTIVES

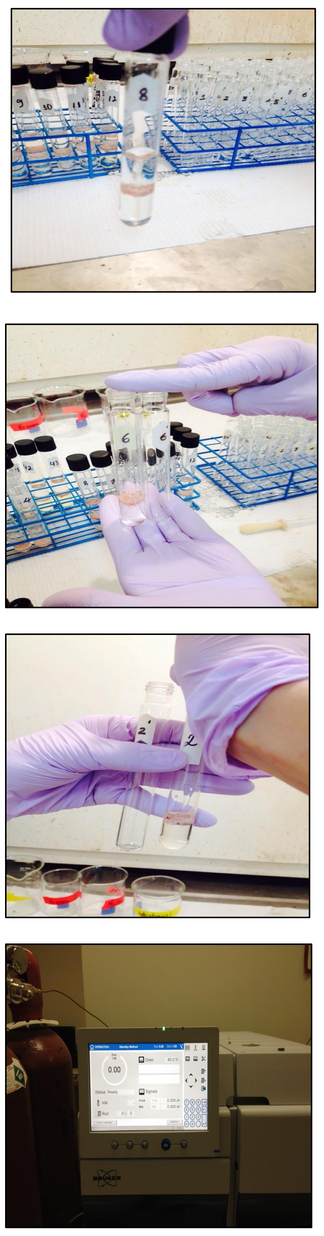
1. To compare two methods of FA quantification (Expt 1)
2. To use the better method to determine FA in reproductive tissues of cows fed different lipid diets (Expt 2), and
3. To compare FA in serum and follicular fluid (Expt 3)

MATERIALS AND METHODS

Expt 1: fresh placenta samples collected from 13 cows were assigned in duplicate to either a direct method (samples directly methylated with no FA extraction step) or indirect method (samples first subjected to FA extraction and then methylated) before being subjected to gas chromatography for FA determination.

Expts 2 and 3: fifteen non-lactating cows were equally divided to receive one of the three diets supplemented with rolled canola, sunflower or flaxseed. After consuming experimental diets for at least 5 weeks, cows were slaughtered and samples of uterus, oviduct, corpus luteum (CL) and follicular fluid collected.

Frozen-thawed samples were subjected to FA determination using gas chromatography in all 3 experiments.



RESULTS

Expt 1: 32 of 45 FA were significantly higher in the indirect method than in the direct method; therefore, indirect method was used in Expts 2 and 3.

Expt2: FAs were differentially accumulated in the reproductive tissues, with CL having the highest FA content, followed by the uterus and oviduct (Figure 1).

Expt 3: No correlation was detected between FA profiles of follicular fluid and serum. However, in regards to follicular fluid, cows fed sunflower had the highest concentration of linoleic acid while cows fed flaxseed had highest concentration of α - linolenic acid.

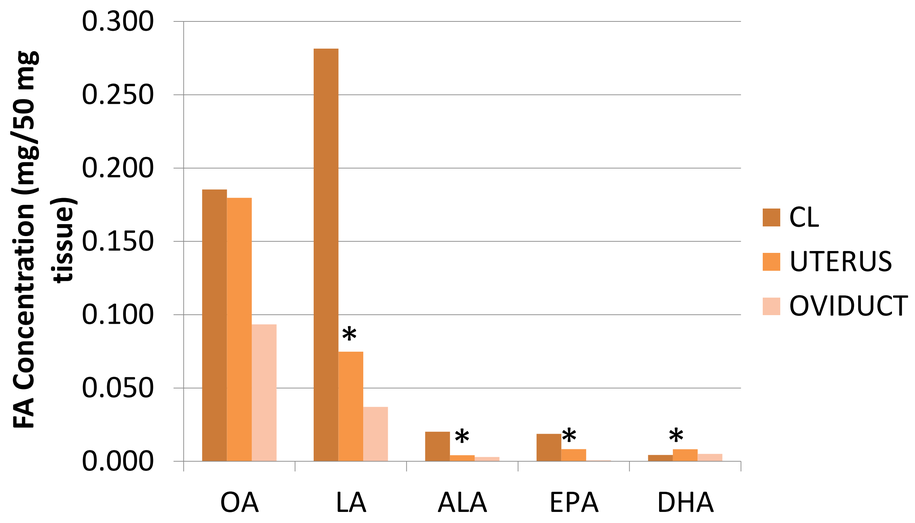


Figure1: Concentration of OA: Oleic acid, LA: Linoleic acid, ALA: α linolenic acid, EPA: Eicasopathaenoeic acid and DHA: Docosahexaenoic acid in reproductive tissues of dairy cows.

TAKE HOME MESSAGE

Provision of oilseeds in diets alter the FA content of reproductive tissues.

Differences in FA content among reproductive tissues imply the importance of FA in reproductive processes.

ACKNOWLEDGMENT

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