

Fatty Acids in Reproductive Tissues of Dairy Cows Fed Diets Supplemented With Rolled Canola, Sunflower or Flaxseed

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Knowing fatty acid (FA) concentrations in reproductive tissues is essential to understand the roles of FA on reproductive function. Our objectives were to: compare two methods of FA quantification (Expt 1), use the better method to determine FA in reproductive tissues of cows fed different lipid diets (Expt 2), and compare FA in serum and follicular fluid (Expt 3). In 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. In 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. Blood was collected one day before slaughter to harvest serum. Frozen-thawed samples were subjected to FA determination. In 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. In Expt 2, FAs were differentially accumulated in the reproductive tissues, with CL having the highest FA content, followed by the uterus and oviduct. In Expt 3, there was no correlation between FA profiles of follicular fluid and serum but FAs were significantly higher in follicular fluid than in serum and differed among dietary treatments. The biological reasons underlying the differential accumulation of FA among reproductive tissues warrants investigation.

Take Home Message: Provision of oilseeds in diets can alter the FA content of reproductive tissues. Differences in FA content among reproductive tissues imply the importance of FA in reproductive processes.