Camelina meal, a novel source of omega-3 for enrichment of poultry products
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Summary
Camelina is a novel oilseed crop increasingly grown for biofuels in marginal lands of the North American Great Plains. Its expeller meal has 10 - 20% residual oil, 30% of which is α-linolenic acid (ALA). Therefore, CM has potential as a source of omega-3 fatty acids to enrich broiler meat.

Challenge
- Omega-3 polyunsaturated fatty acids (n-3 PUFA) have shown health benefits in preventing chronic heart disease.
- Feeding flax or fish oil supplementation in the broiler diets is the most common and efficient way to enrich the meat with n-3 PUFA and long chain (LC) n-3 PUFA.
- Novel feedstuffs to enrich n-3 PUFA are needed not only for their nutritional properties, but also for their feed cost advantage (e.g., lower cost per Mcal of feed energy).
- The lower cost and increasing availability of camelina meal (CM) as a co-product of biodiesel production and its lack of competition as food for humans makes it a great candidate for n-3 PUFA enrichment of poultry products.

Objectives
The specific objectives of this broiler trial were:
- To analyze the diet and enrichment responses to increasing inclusions of CM in typical broiler rations on the fatty acid composition of brain tissue, liver tissue, breast meat and thigh meat.
- To determine the combination of CM level and duration of feeding to broilers to achieve the labeling claim of 300 mg n-3 PUFA / 100 g meat.

Our Approach
- 744 Ross 308 male chicks were randomly distributed among 24 cages.
- Birds were fed 1 of 4 diets in each of 3 growth phases (starter (0 – 14d); grower (15 – 28d); & finisher (29 – 42)).
- Feed treatments consisted of 4 inclusions of screw-pressed CM (0, 8, 16 or 24%) fed for a 42d growth cycle.
- On each of d 14, 28 and 42, 3 birds were randomly selected from each test pen (total of 18 birds/treatment).
- Birds were euthanized to collect of thigh, breast, liver and brain tissue samples.
- The pooled tissue samples were analyzed for fatty acid composition.

Our Observations
- Feeding Camelina meal increased n-3 PUFA by 2 and 4 fold in breast and thigh muscle, respectively (Figure 1).
- There were different trends in n-3 PUFA deposition in organs (liver and brain) vs. muscles (breast and thigh).
- Docosahexaenoic acid was the predominant n-3 PUFA in liver and brain tissue (50% and 89% of total n-3 PUFA); whereas ALA was the major n-3 PUFA in breast and thigh muscles (58% and 81% of total n-3 PUFA).
- Camelina meal supplementation increased LC-PUFA and the less inflammatory n-6 PUFA in liver. However, their transfer to muscle was not enhanced.
- We exceeded the labeling claim requirement for n-3 PUFA enrichment (300 mg/100 g meat) in thigh and breast meat by feeding the 24% CM diet for 28 and 42d, respectively.

What Does this mean?
- Camelina meal can be efficaciously included in feed to enrich omega-3 fatty acids content of broiler meat.

Acknowledgements
We thank the students at the Poultry Research Centre for help in tissue collection. Funding for this project was provided by Alberta Agriculture and Rural Development.

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