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Levels of n-3 enrichment and Japanese consumer sensory panel ratings for lamb meat from sheep supplemented with protected linseed oil for different numbers of weeks

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Background- Most Australian export lambs spend a certain number of weeks in feedlots. This practice provides opportunity for value-adding lamb meat through the use of ingredients known to be beneficial for human health, eg n-3 fatty acids.
Objective- To determine the optimum period of supplementation required to enrich lamb meat with linolenic acid through dietary linseed oil supplementation and the consequent effect on the sensory characteristics of lamb meat as perceived by a Japanese taste panel.
Design- Forty-eight weaner lambs of similar liveweight and condition were drafted from the Yalanbee Research Station (Bakers Hill, WA) flock. They were randomly divided into 4 groups and assigned to the treatments of 0, 3, 6 or 9 weeks of protected linseed oil (PLO) supplementation (3% dry matter). The trial was arranged to have all sheep slaughtered on the same day. All sheep were fed indoors. Those assigned to the 9-week treatment were offered hay-grain mix plus PLO from Day-1. Every three weeks after that, the next group of 12 lambs was shifted to the hay-grain plus PLO diet. At slaughter, both back straps (*Longissimus dorsi*) from each animal were obtained; one was used for total fat and fatty acid analysis and the other for sensory evaluation using a 48-member consumer panel at Food Science Australia, Werribee. All the Japanese panellists had been in Australia for less than 12 months.
Outcomes- The concentration of linolenic acid (18:3n-3) in muscle was tripled after 3 weeks of supplementation (0.41 versus 1.22% total fatty acids) and continued to increase up to nine weeks (1.87%). Consumer panel acceptability ratings for most sensory attributes were not different ($P>0.05$) between muscle from unsupplemented sheep and those supplemented with PLO for the number of weeks used in this study.
Conclusions- This study suggests that there is an opportunity to significantly value-add to lamb in as little as three weeks of indoor feeding. The Japanese panellists gave similar ratings for juiciness, tenderness, flavour, odour and aftertaste for meat from all groups of lambs.

Milk conjugated linoleic and *trans*-vaccenic acids are highest in Spring in grazing cows

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Background – Conjugated linoleic acid (CLA) and *trans*-11 18:1 (vaccenic acid; VA) from dairy products are purported to confer health benefits. Concentrations of CLA and VA are particularly high in milk from cows grazing at pasture but little is known about seasonal and management impacts on these fatty acids (FA).
Objective – To determine the effect of season and farm management practices on milk CLA and VA concentrations.
Design – Milk was sampled from cows every 13 wk over 12 mo on 24 farms in northern Victoria. All farms had Spring and Autumn calving herds. Sampling of 12 farms commenced ca. 7 wk after the initial 12 farms so samples were obtained ca. every 7 wk. Farms were selected to reflect a range in input of concentrates (<15-50% of energy to support lactation) with most of the remaining energy from pasture and conserved forage. Methylated CLA and *trans* 18:1 FA isomers were separated using Ag^{2+} reverse-phase HPLC and data were analysed by REML.
Outcomes – The mean total CLA concentration was 9.1 mg/g milk FA (range 1.1-35.4 mg/g) with the *cis,trans* 9,11 accounting for about 84% of the total CLA. The mean total *trans* 18:1 concentration was 60.2 mg/g milk FA (range 13.6-268 mg/g) with VA accounting for about 54% of total *trans* 18:1 FA. Total CLA and VA were highest in August/September (Spring) (15.1 and 76.3 mg/g FA) and lowest in November to March (5.6 mg/g FA) and May to July (9.53 mg/g FA), respectively. For every MJ increase in pasture ME/kg DM there were increases in *cis,trans* 9,11 CLA and VA contents of 1.61 ($P<0.001$) and 5.6 mg/g FA ($P=0.028$), respectively. For every mg/g increase in *cis,trans* 9,11 CLA and VA contents milk fat decreased by 0.013 ($P=0.046$) and 0.004% ($P=0.002$), respectively. Other minor *trans* 18:1 and CLA isomers, particularly *trans,trans* isomers, were also inversely related to milk fat %.
Conclusions - Seasonal factors appear to be major drivers of variation in CLA and VA in milk fat produced in northern Victoria. Some CLA and *trans*-18:1 FA isomers may be involved in the regulation of milk fat content.