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Positional distribution of palmitic acid (16:0) in triglyceride moiety of palm oil beneficially alters LDL- and HDL-cholesterol synthesis and fat deposition in young weaner piglets: a biomedical model for young children

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Background - Studies have shown that the absorption of palmitic acid is lower when a greater proportion of dietary palmitic acid occurs at Sn-1 & -3 than Sn-2 position. Palm olein (PO), the liquid fraction of palm oil, contains 70% oleic acid (18:1) occurring at Sn-2. As a result, the level of palmitic acid in the lipoprotein complex in the circulatory systems of people consuming palm oil would be lower and may result in lower blood cholesterol.

Objective - To investigate the effect of palmitic acid distributed at Sn-1, -2 & -3 positions in palm oil on cardiovascular health and the development of obesity.

Design - Forty weaner piglets were randomly allocated to one of four dietary treatments: 1) pork lard; 2) natural palm olein (NPO); 3) chemically inter-esterified PO (CPO) or 4) enzymatically inter-esterified PO (EPO) as the fat source. Pigs were fed for 12 weeks and fasting blood samples were collected on days 0, 28, 56 & 84 of feeding.

Outcomes - Back fat depth was reduced by 22, 10 and 1% for NPO, CPO and EPO, respectively compared with lard diet. In a sub-sample of 16 pigs, plasma LDL-C content of pigs fed NPO, CPO and EPO was reduced by 22, 14 and 1% while HDL-C content was increased by 30, 1 and 10%, respectively compared with the lard diet. The ratio of LDL-C/HDL-C was 1.72, 1.39, 1.63 and 1.56 for lard, NPO, CPO and EPO diets, respectively.

Conclusions - These preliminary results suggest that palm oil may have a beneficial effect in preventing the development of cardiovascular disease and obesity in childhood compared to lard. This effect appears to be related to palm oil’s positional distribution of palmitic acid (16:0) at triglyceride moiety.

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Randomised controlled trial of probiotics on diarrhea in tube-fed critically ill patients

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Background - In critically ill patients, diarrhea may be painful and distressing to the patient and inhibit recovery from sickness or injury, as well as diverting staff effort and attention from more effective therapeutic concerns. Probiotics have the potential to prevent this diarrhoea. VSL3 is a multi-component, high bacterial count probiotic (Bifidobacterium breve, longum and infantis, Lactobacillus acidophilus, plantarum, casei and bulgaricus, and Streptococcus thermophilus in fixed ratios; 450*109 per dose; Orphan Australia Pty. Ltd., Berwick, Victoria 3806).

Objectives - To estimate the effect of the probiotic VSL3 on number of episodes and volumes of liquid and loose stools in tube-fed critically ill patients.

Design – Double-blind randomized placebo-controlled single-centre trial of adults expected to require tube feeding for over 3 days received either VSL3 or placebo twice daily. Diarrhea was measured using the validated King’s College Stool Chart. Statistical analysis was by Poisson regression.

Outcomes - A total of 45 patients were recruited. The probiotic (n=20) and placebo (n=25) groups had similar demographic and clinical characteristics. Participants were tube-fed for 8.5 ± 5.4 days, and observed for an average 12.4 ± sd 5.6 days. Episodes of liquid stools were reduced from 7.0 (CI95% 4.8-10.2) in the placebo group to 3.6 (2.3-5.7) in the probiotic group (IRR 0.51 (0.28 to 0.93); P=0.029). When adjusted for potential confounders and weighted for the duration of enteral feeding the beneficial effects increased (IRR 0.46 (0.26 to 0.86); P=0.015). There was a comparable reduction in diarrhoea episodes by the WHO definition (IRR 0.45 (0.22 to 0.86); P=0.028), and a 50% reduction in volume of liquid stools (95 ml (-191 to 0); P=0.05).

Conclusions - Probiotic VSL3 was effective in reducing enteral feed associated diarrhoea in critically ill ICU patients, and the effect increased when adjusted for longer duration of enteral feeding. Further and larger studies are needed to establish the positive or negative health outcomes (mortality and severe morbidity effects) that might be associated with routine VSL3 use in this patient group.