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Lack of effect of sugar cane and sunflower seed policosanols on plasma cholesterol in rabbitsKJ Murphy¹, DA Saint², PRC Howe^{1,2}*Nutritional Physiology Research Group, ¹School of Health Sciences, University of South Australia, SA 5000
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Background- Policosanols, a mixture of high molecular weight primary aliphatic alcohols from sugar cane (SCP), has been shown to be safe and effective at lowering blood cholesterol when administered in low (pharmacological) doses (5-20 mg/day) to experimental animals, healthy patients and patients with type II hypercholesterolemia.

Objective- We attempted to see whether a similar product derived from winteriser cake containing policosanols during sunflower oil production (SFP) has cholesterol-lowering potential.

Design- Normocholesterolemic rabbits were administered either a control oil (water/emulsifier/sunflower oil emulsion), 100 mg/kg SCP (Lesstanol®, provided by Johnson & Barana) (in control) or 100 mg/kg SFP winteriser cake (provided by Goodman Fielder) (in control) by gavage at 48 hour intervals for 4 weeks. Fasting blood samples were taken for cholesterol (C) and triglyceride (TAG) analysis at weekly intervals from 1 week beforehand.

Outcomes- The table shows changes in plasma lipids between averaged pre- and post-treatment values. Food intake and body weight were unaffected by the treatments. Plasma low-density lipoprotein (LDL)-C increased and plasma TAG decreased in all groups following gavage: hence there was no treatment effect of either policosanols.

| Change from baseline (mmol/L) | Total C | HDL-C | LDL-C | TAG |
|-----------------------------------|--------------------------|-------------|--------------------------|---------------------------|
| Control (n=7) | 0.07 ± 0.05 | 0.04 ± 0.04 | 0.05 ± 0.02 ¹ | -0.06 ± 0.02 ¹ |
| SFP (100 mg/kg body weight) (n=8) | 0.05 ± 0.04 | 0.03 ± 0.03 | 0.05 ± 0.02 ¹ | -0.06 ± 0.03 ¹ |
| SCP (100 mg/kg body weight) (n=8) | 0.17 ± 0.07 ¹ | 0.08 ± 0.05 | 0.11 ± 0.03 ¹ | -0.06 ± 0.02 ¹ |

Values are mean±SEM; ¹Significant change from pre-treatment (P<0.05; repeated measures ANOVA with simple contrasts).

Conclusions- Our data do not confirm a hypocholesterolemic effect of policosanols extracted from either sunflower oil cake or sugar cane, even though a lower dose of SCP than used here (5 mg /day) has been reported to lower cholesterol in rabbits.¹

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The effect of diet standardisation on postprandial chylomicron response

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Background - Postprandial dyslipidaemia has been repeatedly demonstrated in subjects with or at risk of cardiovascular disease. Acute exposure of remnant lipoproteins to the blood vessel wall increases the risk of atherosclerosis¹ and endothelial dysfunction.² Despite interest in the effect of diet on lipoprotein metabolism, many studies do not control for the observation that a subjects' recent dietary patterns may influence lipoprotein levels. We have previously shown that the chylomicron response to a fat challenge examined on two occasions can vary by as much as 56% when diet is not standardised. Hence we conducted a pilot study to investigate the effect of three days of diet standardisation on postprandial chylomicron kinetics.

Methods - Five non-obese, normolipidaemic males consumed a three-day standard diet on two occasions four weeks apart. Following each diet the postprandial chylomicron (measured as apo B₄₈) and triacylglycerol responses to a high-fat meal were assessed. The standard diet represented an average dietary pattern that allowed subjects limited freedom to choose from food/snack options. The diet provided 9800 kJ, 30% of energy as fat, 52% of energy from carbohydrate and 15.3% of energy from protein.

Results - Fasting apoB₄₈ concentration was similar on both study days following the diet standardisation (8.35 ± 0.67 v 9.67 ± 1.74 µg/mL, P>0.05). A comparison of the postprandial apo B₄₈ response measured as incremental area under the curve showed no significant difference following diet standardisation (18.80 ± 2.18 v 20.34 ± 7.36 µg/mL⁻¹ h, P>0.05). In the present subjects postprandial triacylglycerol varied more than in subjects who had not undergone diet standardisation (24% v 14% variability).

Conclusion - In non-obese, normolipidaemic subjects, standardising food intake for three days reduces the intra-individual variability associated with postprandial chylomicronaemia (apoB₄₈) but it may require more days for a similar effect to be seen with postprandial lipaemia (triacylglycerol).

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2. Vogel RA, Corretti MC, Plotnick GD. Effect of a single high-fat meal on endothelial function in healthy subjects. *Am J Cardiol* 1997; 79:350-354.