Proceedings of the Nutrition Society (2010), **69 (OCE1)**, E96 doi:10.1017/S0029665109992849

Over- and undernutrition: challenges and approaches. 29 June–2 July 2009

The effect of prawn consumption on lipoprotein subclasses in healthy males

W. S. Jones[1], M. Wong[2], G. M. Lowe[1], I. G. Davies[1], C. Isherwood[2] and B. A. Griffin[2]
[1]*Liverpool John Moores University, Liverpool L17 6BD, UK and* [2]*University of Surrey, Guildford GU2 7XH, UK*

Dietary guidelines for the reduction of CHD risk advise against the consumption of cholesterol-rich foods such as eggs and prawns on the grounds that they will increase serum LDL-cholesterol[(1)]. Although evidence from prospective cohort and intervention trials shows that dietary cholesterol has a clinically insignificant effect on blood LDL-C and the risk of developing CHD[(2,3)], there is no specific evidence to refute the link between prawn consumption, LDL-cholesterol and CHD risk. The aim of the present study was to assess the effects of cold-water prawns on lipoproteins, in particular small, dense LDL (sdLDL), VLDL and HDL, in a randomly-controlled dietary intervention trial in healthy male volunteers. Prawns (200 g) contain dietary cholesterol equivalent to a large egg yolk and approximately 1 g long-chain *n*-3 fatty acids EPA and DHA, a level that has been shown to favourably influence serum lipids.

Healthy male volunteers, (*n* 18; 20–65 years) were recruited from existing subject databases held at the University of Surrey. All subjects were normolipidaemic (total cholesterol <6.5 mM, TAG <2.3 mM), free of dietary supplements (e.g. fish oil), medication or medical conditions known to affect lipid metabolism. None of the subjects had any previous fish allergy or any recent history of weight loss. Subjects were randomised to receive a daily protein of either prawns (225 g/d) or an equivalent weight of white fish as crab sticks for 4 weeks. Following a 4-week washout period of 4 weeks, subjects changed to alternative experimental intervention for a further 4 weeks. Subjects were advised to follow their normal habitual diet throughout the study, not to consume additional shellfish or fish and not to change other lifestyle variables such as physical exercise.

Blood samples were obtained from subjects at the start and end of each intervention stage (four in total); lipoproteins (LDL, HDL, sdLDL and VLDL) were separated from plasma by iodixanol density-gradient centrifugation[(4)], followed by fractionation and estimation of cholesterol in collected fractions[(5)].

Comparison of the changes in sdLDL-, HDL-, VLDL- and total LDL-cholesterol all showed no significant difference between the two intervention legs (Table); however, there were some apparent individual alterations in lipoproteins, which may require further investigation. Positive correlations were observed between TAG and estimated concentrations of sdLDL, VLDL and total LDL and a negative correlation between TAG and HDL-cholesterol.

Table. Statistical analysis of changes in lipoprotein subclasses between the two legs of the study

	Prawn		Crab stick		
Lipoproteins	Mean	SD	Mean	SD	*P**
Total LDL (mM)	−0.023	0.76	+0.04	0.52	0.273
VLDL (mM)	+0.04	0.15	−0.02	0.24	0.260
sdLDL (mM)	<0.01	0.29	+0.12	0.25	0.150
HDL (mM)	0.09	0.15	+0.10	0.24	0.240

*Paired Student's *t* test on difference between pre- and post-intervention measures.

In conclusion, the present study provides evidence that consumption of prawns is unlikely to have a significant effect on levels of cholesterol in total LDL and sdLDL.

1. Krauss RM, Eckel RH, Howard B *et al*. (2000) *Stroke* **31**: 2751–2766.
2. Leeds AR & Gray J (2009) *Nutr Bull* **34**, 66–70.
3. Lee A & Griffin B (2006) *Nutr Bull* **31**, 21–27.
4. Davies IG, Graham JM & Griffin BA (2003) *Clin Chem* **49**, 415–418.
5. Roschlau P, Bernt E & Gruber JW (1974) *Clin Chem Clin Biochem* **12**, 403.