

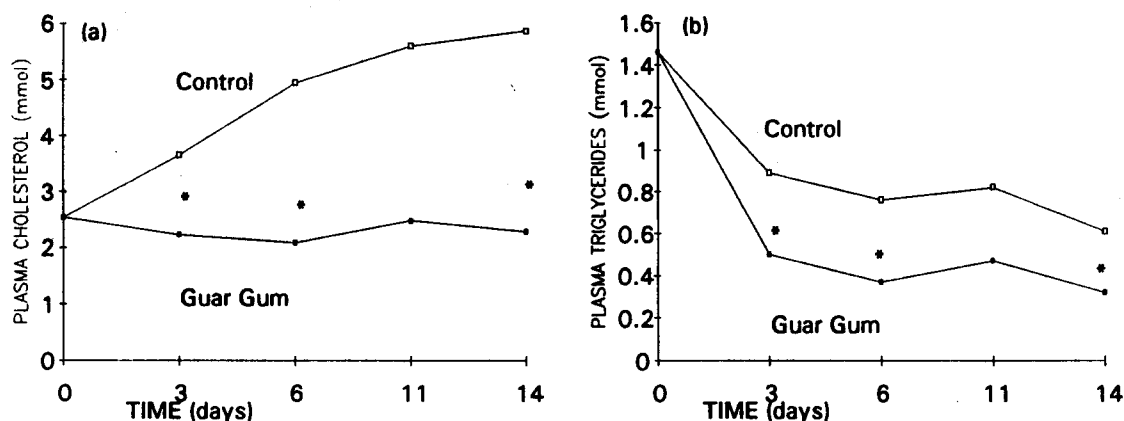
RAPID ASSAY FOR ASSESSING CHOLESTEROL LOWERING BY NSP

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Much of the interest in the nutritional activities of dietary fibre has focussed on the lowering of plasma cholesterol and triacylglycerols attributed to these components. The rat is often used as a model in feeding experiments and typically trial diets are fed for longer than two weeks when assessing accessible dietary fibre such as wheat bran or commercially available purified non-starch polysaccharides (NSP). The purification of novel NSP in the laboratory is expensive and it is desirable to minimise the quantity needed for experiments.

To estimate the minimum amount of NSP needed in feeding trials to demonstrate cholesterol lowering activity, guar gum, (a known hypocholesterolaemic NSP), was fed to rats for 14 days. The guar gum replaced cellulose at 40g/kg in a control diet containing starch (600g/kg), sucrose (49 g/kg), casein (200g/kg), corn oil (50g/kg) minor nutrients (50g/kg), cholic acid, 1g/kg and cholesterol (10g/kg). Rats fed the trial diets were killed periodically and plasma cholesterol and triacylglycerols were determined (see figure).

Effect of guar gum on plasma cholesterol (a) and plasma triacylglycerols (b).



(* values differ significantly from controls, $P < 0.05$)

After three days the plasma cholesterol concentration of rats fed guar gum differed significantly from the control rats. The hypocholesterolaemic activity persisted through the whole of the trial period. Plasma triacylglycerols levels in both groups of rats fell during the experiment. This was probably because the maintenance diet used before the trial period had a higher fat content (90g/kg) than the experimental diets. Guar gum enhanced the general depression of plasma triacylglycerols with significantly lower levels being recorded after three days. Guar gum is particularly hypocholesterolaemic and therefore in order to detect the hypocholesterolaemic activity of less efficacious NSP it would be prudent to run the trial for 6 days. This would require only 50g of test NSP is for the bio-assay (groups of eight rats, 25g feed/day per rat, 40g/kg inclusion) using this system.