

NUTRITIONAL ACTIVITIES OF AUSTRALIAN ACACIA TREE GUMS

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Non-starch polysaccharides (NSP) are added to foods for gel formation, emulsion stabilization or thickening. These NSP contribute to the 'dietary fibre' content of the foodstuffs and may have nutritional activities, influencing serum lipids levels, the glycaemic index and large bowel fermentation. Gum arabic, a gum exudate of the African tree *Acacia senegal* is imported into Australia and is used to stabilise oil/water emulsions.

The gum exudates of Australian trees *Acacia pycnantha* and *Acacia baileyana* were added (0.0-80g/kg) to hypercholesterolaemia inducing purified diets (replacing cellulose) and fed to rats (eight per group) for 14 days. Plasma cholesterol and triacylglycerol concentration were determined as well as the level of starch and soluble and insoluble NSP in the caecal contents.

Diet	cellulose (g/kg)	gum (g/kg)	Plasma cholesterol (mM)	Plasma triacylglycerol (mM)	Caecal starch (d.wt)	Caecal solNSP (d.wt)	Caecal ins. NSP (d.wt)
A. control	80	0	6.63	1.08	0.78	7.5 ^a	26.3 ^a
B. <i>A. pycnantha</i>	60	20	6.72	1.30	0.91	25.9 ^c	16.3 ^c
C. <i>A. pycnantha</i>	40	40	6.95	1.37	0.80	34.2 ^d	7.6 ^b
D. <i>A. pycnantha</i>	0	80	6.80	1.19	0.56	57.4 ^e	0.0 ^a
E. gumarabic	60	20	7.38	1.15	0.50	21.4 ^{bc}	14.5 ^c
F. gumarabic	40	40	6.13	1.64	0.16	18.4 ^b	15.7 ^c
G. gum arabic	0	80	5.82	2.01	0.30	37.8 ^d	0.0 ^a
H. <i>A. baileyana</i>	0	80	7.24	1.03	0.10	43.2 ^d	0.0 ^a
significant effects			ns	ns	ns	P<0.01	P<0.01

The food gums had no effect on plasma cholesterol or triacylglycerols. Gum arabic has been reported to lower serum cholesterol in humans (McLean Ross et al. 1983) although recently other workers have suggested that it has no hypocholesterolaemic action (Haskell et al. 1992). Soluble NSP were recovered from the caeca of rats fed the gums. Sugar analyses confirmed that this material was essentially the same as the fed gums (data not presented). Very little starch was present indicating that unlike some NSP the acacia gums do not inhibit starch digestion. It is likely that similar to gum arabic, the Australian gums will be highly fermentable. Hindgut fermentation is now considered to confer considerable health benefits and this attribute may increase the commercial benefits of using Australian gums in the food industry.

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