THE EFFECT OF RESISTANT STARCH ON COLONIC PROTEIN METABOLISM

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Dietary meat protein has been positively correlated with colon cancer (Drasar and Irving 1973), and it is possible that by-products of colonic protein metabolism may be associated with reduced levels of colonic health (Bingham 1988), particularly in the distal colon (Macfarlane et al. 1992). Carbohydrate (non-starch polysaccharide, NSP) fermentation in the colon is thought to be protective against the effects of these metabolites by providing an energy source for bacterial growth, thereby enhancing the uptake of luminal nitrogen by the colonic bacteria, and decreasing the absorption of colonic nitrogen (Cummings and Bingham 1987). In this study this effect has been investigated using dietary resistant starch (RS).

Eleven subjects participated in a randomised cross-over study where they ate diets for three weeks containing either 6g or 41g RS. Levels of energy, protein, fat, NSP and starch were maintained at a constant level for both diets, and urine and faeces were collected for 24 hours in the third week. The following significant differences were observed using a paired Student's t test, * $P<0.05$ (mean ± SEM).

Diet	Urine				Faeces				
	pH	N	NH_3	urea	pH	N	NH_3	NSP	starch
		g/gcreatinine				g/d	µg/g	g/d	g/d
Low RS	6.44	9.1	0.66	24.2	6.9	1.84	397	7.6	1.7
	±0.11	±0.4	±0.06	±1.6	±0.1	±0.15	±33	±0.5	±0.7
High RS	6.16	9.3	0.71	25.3	6.3	2.86	278	11.4	8.5
	±0.11*	±0.5	±0.08	±2.2	±0.1*	±0.42*	±49*	±1.4*	±2.0*

It appears that dietary RS acts similarly to NSP with regard to colonic protein fermentation (Cummings et al. 1979), by reducing faecal ammonia concentration and increasing faecal nitrogen output. No significant differences were observed for urine nitrogen and nitrogen-containing compounds. Interesting, however, is the increase in faecal NSP levels with increased dietary RS, indicating a possible effect on distal colonic fermentation for both carbohydrate and protein.

BINGHAM, S.A. (1988). Am. J. Clin. Nutr. 48: 762.
CUMMINGS, J.H. and BINGHAM, S.A. (1987). Cancer Surv. 6: 601.
CUMMINGS, J.H., HILL, M.J., BONE, E.S., BRANCH, W.J. and JENKINS, D.J.A. (1979). Am. J. Clin. Nutr. 32: 2094.
DRASAR, B.S. and IRVING, D. (1973). Br. J. Cancer 27: 167.
MACFARLANE, G.T., GIBSON, G.R. and CUMMINGS, J.H. (1992). J. Appl. Bacteriol. 72: 57.

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