

FRUIT PROCESSING WASTES AS DIETARY FIBRE SUPPLEMENTS

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Wheat bran is now the most common dietary supplement used by Australians (Worsley & Crawford 1984), but there are other plant residues available in quantity which might be more effective in promoting health. We are therefore comparing bran with residues from processing fruit and vegetables and report here some preliminary observations on apple and orange.

The fibres used were the residues from whole fruit (including skins) after removal of the water soluble components by counter-current extraction (Casimir 1983). The dried residue was milled to produce coarse, medium and fine particles. We measured (1) the water holding capacity (WHC) of the fibre as prepared and after fermentation *in vitro* with faecal microorganisms and (2) the ability of the fibre to adsorb bile acids. We also used scanning electron microscopy to examine the effects of fermentation on the surface characteristics of the fibres and the types of microbial population.

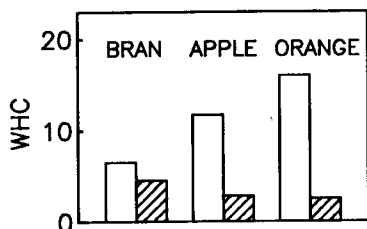


Fig. 1 Water holding capacity (g/g dry weight of fibre) before (open) and after fermentation (crosshatched).

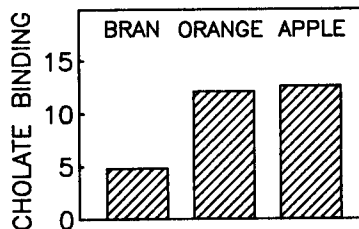


Fig. 2 Adsorption of the bile acid sodium cholate ($\mu\text{mol}/100\text{mg}$) by fibre at 37° .

The measurements of WHC (Fig. 1) showed that the fruit fibres had a greater affinity for water than bran but that this advantage disappeared after fermentation. Finer milling produced a small decrease in WHC. Thus our results suggest that the fruit fibres may be less effective than bran in promoting laxation (McBurney et al. 1985). The fruit fibres also had a greater affinity for bile acids (Fig. 2). Adsorption of bile acids is a mechanism by which fibre may lower plasma cholesterol concentrations. (Since cholesterol is the immediate precursor of bile acids in hepatic synthesis.) Bran itself has no effect on plasma cholesterol (Truswell and Kay 1976) but our results suggest that the fruit fibre may. Scanning electron microscopy showed extensive pitting of the fruit fibre particles after fermentation and distinctly different microbial populations associated with each type of fibre.

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