

nature of dietary fibre is still rather confused. Dietary fibre is a mixture comprising a range of complex polysaccharides derived principally from the plant cell walls in food. The composition of the mixture varies from food to food and therefore from diet to diet and it is therefore difficult to relate values for total dietary fibre intakes to specific physiological effects. 25

It will be argued that the range of physiological effects observed with dietary fibre may be due to different components of the mixture and that an understanding of the role of dietary fibre depends on a detailed knowledge of the chemistry and physical properties of the mixture. The chemistry and physical properties of dietary fibre will be discussed in relation to its physiological properties in the gastrointestinal tract.

### 9. Clinical implications for dietary fibre consumption

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There is now little doubt that the presence of non absorbable carbohydrate (NAC) in food confers health benefit. Much of the initial interest in NAC was with regard to gastrointestinal disease, but more recently its role in the prevention or amelioration of ischaemic heart disease (IHD) and of diabetes mellitus (DM) have come under scrutiny. Little, if any, epidemiological data to link dietary fibre intake to disease have been available in Australia. We have recently shown, however, by dietary pattern analysis, that the greater the intake of dietary fibre rich foods, the less the prevalence of constipation in preschool children in the Latrobe Valley of Victoria (Duncan Jones, unpublished data). English men with a higher intake of dietary fibre from cereals have been shown prospectively to have less IHD (Morris *et al.*, BJ 2: 1307; 1977). Several studies now indicate that diets high in absorbable carbohydrate (AC) and NAC lead to lower fasting and post-prandial blood glucose concentrations (Wahlqvist, Med. J. Aust. 1980). However, the relative importance of AC and NAC and of different types of NAC remain to be determined. Various NACs appear to reduce the reactive hypoglycaemia seen with refined carbohydrate and this may have implications for appetite control. For the moment, it would seem prudent to recommend to Australians an increase in a variety of dietary fibres from whole grain cereals, fruits and vegetables.

### 10. Dietary fibre, saponins and plasma cholesterol

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Various fibre-rich foods and isolated fibre fractions such as pectin have been shown to lower plasma cholesterol levels in man and experimental animals. A general explanation for this effect is that bile acids are adsorbed by plant fibre in the small intestine. This increases the loss of bile acids by faecal excretion and this loss is offset by an increased conversion of cholesterol into bile acids by the liver.

Saponins are strongly surface active compounds of plant origin which promote adsorption of bile acids by fibre. Formally, they are a component of dietary fibre since they pass unchanged through the gut. Saponins have been fed to various experimental animals including humans and shown to increase faecal excretion of bile acids, and they have been known for many years to lower plasma cholesterol concentrations in animals. Saponins are, therefore, probably important in human diets to reduce the risk of coronary heart disease.

The more commonly eaten plants which contain saponins are soya beans, chick peas, broad beans and peanuts, but we do not yet have reliable quantitative information about the saponin content of foods other than soya beans and a few soya bean products. It appears, though, that saponins are robust compounds which survive cooking and such processes as the production of defatted soya bean flour and protein isolate.