

RATE OF DIGESTION AND ABSORPTION OF AUSTRALIAN
ABORIGINAL STARCHY BUSHFOODS

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Studies in Australian Aborigines, American Indians and Pacific Islanders have suggested that these groups have a genetic susceptibility to Type 2 diabetes which is unmasked when they make the transition from a traditional to an urban lifestyle (Zimmet 1982). Among the dietary factors that change is the source of complex carbohydrate. Our aim was to test the hypothesis that the carbohydrate in traditional starchy foods is digested and absorbed slowly, thereby requiring a small insulin response and protecting the individual from developing diabetes.

An in vitro technique (Jenkins et al. 1980) was used to study the rate of digestion of the foods and the result compared with the in vivo plasma glucose response. In the in vitro study, carbohydrate portions (2 g) of lentils, soya beans, wholemeal bread and five Aboriginal bushfoods were incubated for 3h with human digestive juices. The bushfoods were Castanospermum australe (seed), Macrozamia communis (seed), Arthropodium milleflorum (root), Caesia vittata (root) and Dianella laevis (root). Soya beans and lentils, which have been labelled as slow-release in other studies (Jenkins et al. 1980), released only 13% and 43% respectively of the sugars and oligosaccharides liberated from bread. The five Aboriginal bushfoods liberated 74%, 35%, 52%, 27% and 27% respectively.

In the in vivo study, four healthy volunteers ingested 25 g carbohydrate portions of lentils, soya beans, wholemeal bread and two of the bushfoods (C. australe and M. communis) and plasma glucose was measured over 2h. The soya beans and lentils raised the blood glucose concentrations (as measured by area under the curve) by $19.7 \pm 3.4 \%$ and $37.4 \pm 2.8 \%$ of the bread value (mean \pm SEM). The Aboriginal bushfoods raised the blood glucose by $40.0 \pm 1.8 \%$ (M. communis) and $74.4 \pm 3.3 \%$ (C. australe) of the bread value. There was a significant positive correlation between the in vivo and in vitro results ($r = 0.95$, $P < 0.01$).

These results show that four of the five Aboriginal bushfoods studied contain slow-release carbohydrate, in contrast to the fast-release carbohydrate found in bread, the staple in many western societies. This lends support to the view that traditional foods may protect genetically predisposed populations from developing diabetes. It is suggested that studies in vitro may help identify further slow-release carbohydrate foods.

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