THE RELATIONSHIP BETWEEN REFINED SUGAR AND MICRONUTRIENT INTAKES

K.I.BAGHURST, S.J.RECORD and P.A.BAGHURST

A comprehensive review of the role of refined sugars in chronic disease aetiology by the Food and Drug Administration in the USA found no evidence that refined sugar, at levels currently consumed in the community, plays a specific role in the development of conditions such as obesity, coronary heart disease, diabetes or high blood pressure. However, one concern that still exists in the minds of some health professionals is that high consumption of refined sugar, within the context of a diet of appropriate energy content, might lead to displacement of more nutritious foods and thus increase the potential for deficiency of certain micronutrients. This might be of particular importance in those with relatively low overall food intakes or energy requirements such as the inactive or elderly. For this reason, we re-examined data from three large-scale ramdom population surveys of the dietary habits of the adult Australian population that we undertook between 1984 and 1989, to determine the sociodemographic profile of high and low refined sugar consumers, their micronutrient intake profile and some aspects of their biomedical profile. The studies were undertaken using a postal, quantified food frequency approach using a specially developed food data base which has been described in detail elsewhere (Baghurst et al. 1989). The data relating to nutrient profile are described here.

People with a higher percentage of energy coming from refined sugars in their diet had higher energy and fibre intakes, lower % energy from fat, complex carbohydrates, protein and alcohol (all with an inverse linear trend of $P<0.001$). They also had lower intakes of a range of micronutrients despite having a higher energy intake. However, the form of the relationship between % refined sugar and micronutrient intake varied. For some there was a strong linear trend across deciles of refined sugar intake with vitamin B_6, beta-carotene, folate and magnesium showing the strongest inverse linear trends in both men and women (all $P<0.001$). In women, there was also a strong trend ($P<0.001$) for niacin and weaker but still significant inverse linear trends ($P<0.05$-0.01) for retinol, vitamin C, vitamin B_{12}, potassium and zinc. In men, weaker trends of the order $P<0.05$-0.01, were evident for vitamin B_{12}, sodium, calcium and zinc. There were no significant linear trends for thiamine, riboflavin or iron in either sex, nor for retinol, vitamin C or potassium in men and sodium and calcium in women. For some of the micronutrients however, the relationship between % refined sugar and micronutrient intake was not strictly linear with lower nutrient intakes occurring at either end of the % refined sugar intake range. This kind of relationship was particularly evident in women for thiamine, riboflavin, niacin, iron and zinc and for sodium in men. "Risk" of deficiency for micronutrients as assessed by the percentage of people below 70% RDA in the various deciles of refined sugar intake did not show a consistent pattern. For some nutrients such as folate or vitamin A, there was a gradual increase in "risk" with increasing % refined sugar but in others such as zinc, magesium or calcium in men, "risk" was highest in the medial deciles of refined sugar intake indicating a varying distribution range for certain micronutrients in the different deciles of refined sugar intake.

The underlying differences in food patterns and sociodemographic and biomedical profile of people with varying refined sugar intakes and the educational implications will be discussed.

BAGHURST, K., RECORD, S., SYRETTE, J., CRAWFORD, D. and BAGHURST, P. (1989). Med. J. Aust. 151: 512.

CSIRO Division of Human Nutrition, Kintore Avenue, Adelaide, South Australia 5000