WSRO POSITION STATEMENT

Sugar and Behaviour

Updated July 2013

Background
A high intake of sugar is widely assumed to cause hyperactivity and behavioural problems in both children and adults. However, the results of the majority of scientific studies do not support this belief.

The most comprehensive meta-analysis on this subject to date was undertaken by Wolraich et al., (1995) which analysed the results of 16 studies examining the effects of sugar (mostly sucrose) on a variety of behavioural and cognitive measures. The studies had been undertaken on normal children, as well as children with Attention Deficit Hyperactivity Disorder (ADHD), and children whose behaviour was reportedly adversely affected by sugar. Subjects, parents and research staff were blinded to conditions in these studies. The review concluded that sugar did not affect the behaviour or cognitive performance of children, and suggested that beliefs and expectations can have a profound effect and override perception. However, the authors did note that they could not rule out a small effect of a high sugar intake on subsets of children.

Since the definitive review by Wolraich et al., (1995) the role of sugar on behaviour has attracted little attention. However, more recently Benton (2008) reviewed the specific effects of sucrose in detail and examined the results of studies by: sub-group of children (ADHD and sugar reactors); childrens’ age; the timing of the test in comparison to the sugar exposure; and placebo type. All yielded negative results with sucrose determined not to affect the behaviour of children.

Benton (2008) also reviewed the evidence supporting the 3 main hypotheses linking sucrose intake to behavioural problems, namely: sucrose intolerance (i.e. food allergy or hypersensitivity); hypoglycaemia; and micronutrient deficiency. With respect to sucrose intolerance, although there may be individual idiosyncratic cases of sucrose intolerance, the percentage of children who reportedly respond adversely (migraine or hyperactivity) to sucrose in elimination diets is much lower than for other foods which are commonly reported to cause migraine or hyperactivity. It is unlikely that sucrose causes hypoglycaemia since, in normal and obese individuals without diabetes, blood glucose is kept remarkably stable even when sucrose is provided within drinks between meals (Manders et al., 2009). Although some individuals may report symptoms with lower blood glucose levels (although not necessarily clinical hypoglycaemia (Simpson et al., 2006), it is unlikely that such symptoms would be attributable to sucrose, since sucrose has a moderate glycemic index of ~68 (Foster-Powell et al., 2002) and thus a lower insulin response than other high-glycemic index foods. Finally, although evidence may exist for a role of inadequate micro-nutrient intake on behaviour, evidence is not conclusive regarding a high sugar intake and micronutrient inadequacy (see WSRO Position Statement – Sugar and Micronutrient Dilution).
It should also be noted that evidence exists to suggest that ADHD is largely influenced by genetic rather than environmental factors (Stevenson 1992).

**Recommendations for sugar and behaviour**

A number of organisations have assessed the possible relationship between sugar intake and behaviour. The Australian National Health and Medical Research Council found no evidence for the involvement of sugar or sugar-containing foods in attention deficit or hyperactivity disorders (NHMRC, 2003). The Institute of Medicine could not set up upper limit for sugars with respect to altered behavior (IOM, 2005). Finally, a joint FAO/WHO report concluded that sugars do not affect behavior in children (FAO/WHO, 1997).

**Statement**

Despite evidence to the contrary, it is frequently asserted that sugar intake causes hyperactivity. The overriding evidence from scientific studies examining groups of children does not support adverse effects or sucrose intolerance. It is highly unlikely that sucrose would result in a reactive hypoglycemia due to its moderate glycemic index and lower insulin response. Although evidence does exist for a micronutrient dilution effect with a high sugar intake, micronutrient intake is usually adequate. Therefore it is highly unlikely that sugar intake per se has an effect on behavior via a low micronutrient intake.

**References**


IOM (2005) Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, proteins, and amino acids


