Fibre Shortfalls in Children

Can fruit-based snacks help?

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Fruit and vegetable (F&V) intakes in children and young people have stalled over the past decade, suggesting that the 5 A DAY message is not resonating with parents, or that there are too many barriers to compliance. This highlights a major challenge for health professionals, particularly given new fibre recommendations from the Scientific Advisory Committee on Nutrition (SACN)[1] which, for the first time, specify dietary reference values (DRV) for children.

Fibre offers a host of health benefits, including normal laxation and protection against cardiovascular disease, colorectal cancer and Type 2 diabetes. F&V are an important source of soluble fibre, with vegetables providing around 15% of total daily fibre intakes in UK children, while fruit provides 7-16% depending on the age group.[2] This article will examine shortfalls in fruit, vegetables and fibre and will explore practical ways to encourage greater consumption, including the use of fruit-based snacks.

Current intakes

The National Diet and Nutrition Survey (NDNS),[2] which collected dietary data using a 4-day diary, gives the best estimate of F&V consumption in UK children. As **Figure 1** shows, intakes marginally increase with age for vegetables and fruit juice but not by much. Adolescents eat the lowest amount of fruit, and fewer consumed any fruit during the dietary assessment period (67%) than younger age groups (>90%).

Compliance with the 5 A DAY target was calculated for 11-18 year olds in the NDNS by assuming that 80 g of fruit or vegetables counted as a portion, and including up to one portion of beans/pulses and up to 150 ml of fruit juice daily. This gave an average intake of three portions a day, with girls' consumption marginally lower than boys'. Only 10% of boys and 7% of girls actually met the 5 A DAY target.

For younger children, the NDNS did not estimate 5 A DAY compliance as 80 g was deemed too large a portion. However, an estimate can be made by dividing the intakes in **Figure 1** by 80 g and adding a portion of fruit juice. This rough method suggests that younger children are getting around 2-3 portions daily.

Turning to fibre, a comparison between intakes and the new recommendations is complicated by the fact that the NDNS expresses fibre as non-starch polysaccharide while the DRV (and food labels) are expressed as AOAC fibre. However, SACN[1] noted that 18 g NSP is equivalent to 23-24 g of AOAC, which suggests a conversion factor of 1.3. **Figure 2** presents fibre intakes in children as AOAC using this conversion. The approximate DRV for each age group is shown as a comparison but readers should note the mismatch between the NDNS age categories and those upon which the DRVs are based, i.e. 15 g/day for 2-5 year olds; 20 g/day for children aged 5-11 years; 25g/day for 11- =16 year olds; and 30 g/day for older children and adults. The key message from this figure is the hefty gap between fibre intakes and DRVs, particularly for older children who consume just half the DRV at present.

Benefits

It is well accepted that fibre, fruit and vegetables are beneficial for children and adults even though most evidence relates to adult populations.

Based on systematic reviews, SACN[1] concluded that higher fibre intakes were associated with reduced risk of heart disease, stroke, Type 2 diabetes and colorectal cancer. More emerging evidence has linked fibre consumption with weight management,[3] cholesterol lowering,[4] treatment of constipation[5] and irritable bowel syndrome,[6] and prevention of hypertension,[7] with some conclusions pointing to different outcomes for different fibre types. In children, very few studies have examined the impact of higher fibre intakes on health, and with mixed results. Positive findings were reported for high fibre breakfast cereal and insulin sensitivity,[8] and for prebiotics and enhanced calcium absorption.[9] Other studies found no impact of fibre on chronic constipation[10] or on body weight in obese children.[11]

These findings do not suggest that fibre fails to benefit to children, only that there is a serious lack of controlled trials with good compliance. This drawback led SACN[1] to estimate children's fibre DRVs by establishing ideal levels as a proportion of daily energy intakes (based on the adult DRV) then considering maximum fibre levels that were consistent with normal growth.

Turning to F&V, the World Health Organisation states that low intakes of F&V contribute to increased risk of heart disease, stroke, cancer and Type 2 diabetes.[12] In adults, higher fruit diets are associated with lower fat consumption and higher intakes of micronutrients.[13] Specific fruits have been found to improve gastrointestinal function,[14] while cruciferous vegetables may have a role in cancer prevention.[15] Again, in children, direct evidence is lacking although several reviews and meta-analyses discuss interventions for improving intake and overcoming barriers. These have identified that multi-component interventions work best[16] and that factors such as parental F&V intakes, knowledge of recommendations, reduced access to unhealthy snacks and restricted television viewing, all encourage children to eat more F&V.[17]