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NUTRINEWS

In the current issue, we look at the association of regular breakfast consumption and body weight.

The role played by breakfast cereals in a balanced diet has been well-recognized. In addition to providing an important source of vitamins and minerals and other essential nutrients like protein and fibre, breakfast cereals consumption is associated with lower measures of overweight or obesity in several cross-sectional studies.

Overall, there is significant scientific evidence available that suggest the benefits of regular consumption of breakfast cereal, especially ones with high whole grain and fibre content with respect maintaining healthier BMIs.

As always, we welcome your valuable feedback and comments.

Happy reading!

Regards,
Kellogg's® Nutrition Team.

People who eat breakfast cereals on a regular basis tend to have lower BMIs and healthier body weights. In fact, skipping breakfast is one of the predictors linked with obesity for both children and adults. Empirical support is provided by a large number of cross-sectional, observational studies, summarized in several systematic reviews and meta-analyses.

Regular breakfast cereal consumption is linked to lower BMI and reduced risk of overweight and obesity

A) In children and adolescents :

A large number of cross-sectional studies have consistently demonstrated that regular breakfast cereal consumption is associated with lower BMI and reduced likelihood of being overweight or obese in children and adolescents.[1]

The multi-centre European HELENA study, conducted on a sample of 1215 adolescents (aged 12.5 – 17.5 years) revealed that consumers who ate ready-to-eat cereal (RTEC) daily were 57 % less likely to be overweight and had more desirable body composition than RTEC non-consumers.[2]

Frantzen BL, et al. revealed that children who frequently consumed RTEC had significantly lower BMI over a 3-year period.[3]

A US cross-sectional study conducted on a sample of 603 children aged 4-12 years demonstrated that frequent consumption of breakfast cereals was associated with a lower BMI ($P < 0.01$).[4]

Findings from another cross-sectional study conducted in 700 Greek children aged 10 -12 years (PANACEA study) provided evidence that daily consumption of breakfast, and consumption of breakfast cereals in particular, were associated with a lower prevalence of overweight or obesity.[5]

Similar results were reported by a cross-sectional study conducted wherein breakfast cereal consumption was associated with 33% (95% CI 14%, 48%) lower likelihood of overweight/obesity, irrespective of age, sex and physical activity

status in over 2,000 Greek adolescents, aged 12-17 years. Results observed were more prominent for daily or > 2 daily servings of cereals consumed for breakfast.[6]

Other studies have reported similar associations. A US cross-sectional study among a sample of 1,389 children aged 1 - 12 years showed that the consumption of breakfast cereals at breakfast was associated with a healthier body weight.[7]

In a cohort of 2,379 US girls, aged between 9 and 10 years at baseline, regular consumption of cereal at breakfast within an overall healthful lifestyle was predictive of a lower BMI at age 19 to 20 years.[8]

Cross-sectional data from 4,320 children (aged 9-13 years) and 5,339 adolescents (aged 14-18 years) in the US National Health and Nutrition Examination Survey evaluated body weight among breakfast cereals consumers, breakfast skippers and other breakfast consumers. The findings suggested that RTEC consumers had lower Z scores of BMI for age, waist circumference and prevalence of obesity relative to other two groups (Figure 1).[9]

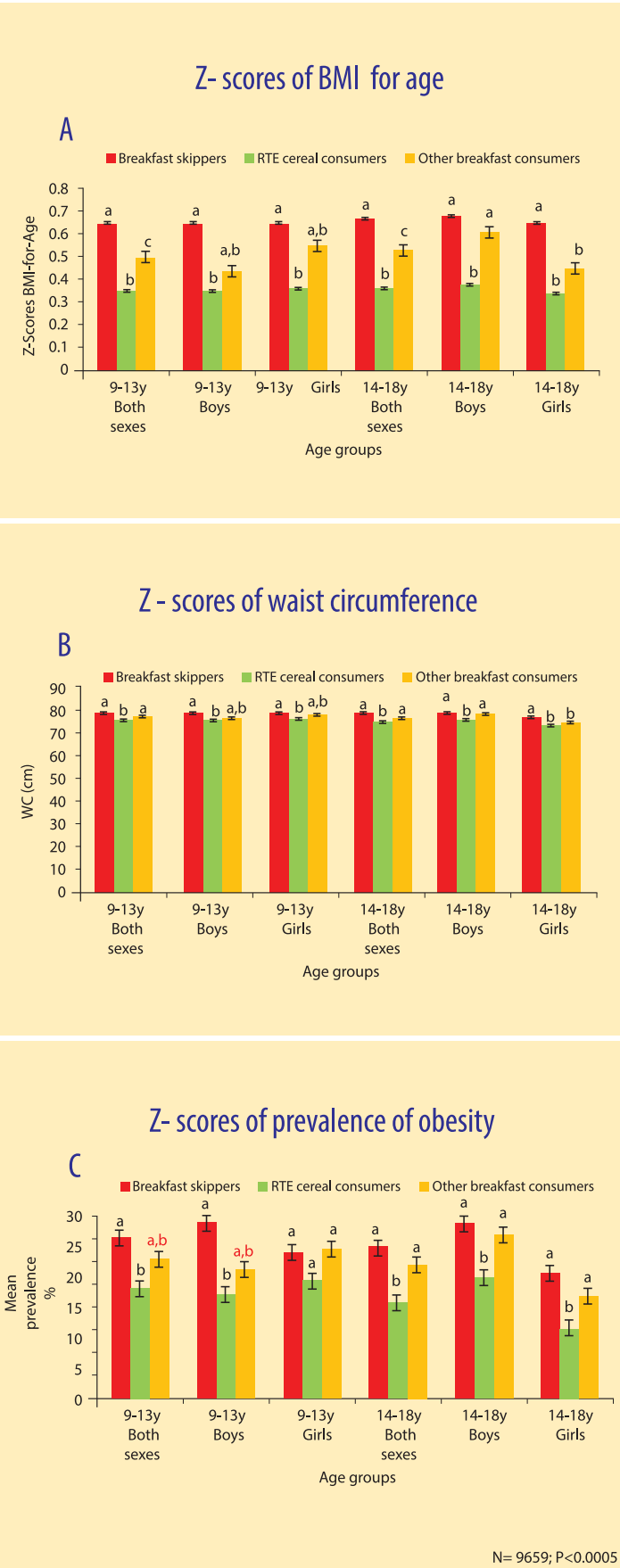

Figure 1. Z scores of body mass index (BMI) for age (A), waist circumference (WC) (B), and prevalence of obesity (C) by type of breakfast consumption groups in children/adolescents, based on data from the National Health and Nutrition Examination Survey 1999-2006.[9]

B) In adults :

In a US study of 17,881 adult men, those who consumed breakfast cereal, regardless of type, consistently weighed less than those who consumed breakfast cereals less often (p value for trend = 0.01). Those who consumed > or =1 serving/d of breakfast cereals were 22% and 12% less likely to become overweight during follow-up periods of 8 and 13 years compared with men who rarely or never consumed breakfast cereals (relative risk, 0.78 and 0.88; 95% confidence interval, 0.67 to 0.91 and 0.76 to 1.00, respectively).[10]

Cross-sectional data from 5,316 young adults (aged 20-39 years) in the US National Health and Nutrition Examination Survey (1999-2006) showed that RTEC consumers were 31% and 39% less likely to be overweight/obese or have abdominal obesity relative to breakfast skippers. Relative to other breakfast consumers, RTEC consumers were 22% and 31% less likely to be overweight/ obese or have abdominal obesity.[11]

A recent nationally-representative, cross-sectional study consisting of 12,377 Canadian adults (≥ 18 years) has found that mean BMI was significantly lower among RTEC-breakfast consumers than other breakfast consumers.[12]

Pre-sweetened vs. minimally sweetened breakfast cereals

According to a research published in peer-reviewed healthcare journal Infant, Child, & Adolescent Nutrition (ICAN), children who start their day with a cereal breakfast - even if that cereal is presweetened - tend to have lower body mass indexes (BMIs) and less chance of being overweight or obese than children who eat other breakfasts or skip the meal entirely.[13]

This research further confirms that children, who eat cereal breakfasts, including presweetened cereal, are much more likely to have healthier body weights than those who eat other breakfasts. In fact, children who skip breakfast or choose non-cereal options are nearly twice as likely to be overweight or obese as their cereal-eating counterparts. [13]

Similar findings have been confirmed by a study conducted by O'Neil, CE in children and adolescents.[14]

In the VYRONAS study, consumption of pre-sweetened breakfast cereals was associated with lower BMI compared with non pre-sweetened or no intake of cereals, in both genders (P<0.001).[6]

Data from the 1995 UK National Diet and Nutrition Survey (NDNS) of children aged 1.5-4.5 years were reanalyzed to examine the relationship between breakfast cereal consumption and non-milk extrinsic sugars (NMES) intake and the possible implications of this for caries in preschool children. Findings of the study indicated that whilst pre- sweetened cereals consumption was positively associated with NMES intake, incidence of caries was unrelated to breakfast cereal consumption, whether presweetened or not.[15]

Some of the other studies that compared the effects of consumption of pre-sweetened or non-pre-sweetened breakfast cereals mostly found no significant differences in daily nutrient or energy intake, although the consumption of total sugars may be increased, and that consumption of pre-sweetened breakfast cereals does not increase the risk of overweight or obesity in children.[1]

Type of breakfast cereal and weight management

The systematic review conducted by Williams PG found *"there isn't sufficient evidence to describe the best types of breakfast cereals to prevent weight gain as yet, although there are suggestions of a greater protective effect of higher-fibre and oat cereals in some (but not all) studies".*[1]

In the study conducted by Bazzano LA et al., whole and refined grain breakfast cereal intake was inversely associated with body weight gain, after adjustment for all confounding variables in a group of U.S. male physicians (aged 40 to 84 years of age). The authors concluded that BMI and weight gain were inversely associated with intake of breakfast cereals, independently of other risk factors.[10]

Cereal fibre intake associated with reduced body weight and waist circumference

Epidemiological studies have shown inverse associations between cereal fibre intake and BMI, weight gain and body fat.[16,17]

A European prospective cohort study that is part of the DiOGenes project followed close to 90,000 participants. After adjustment for potential confounders, total fibre intake was found to be inversely associated with both body weight and waist circumference change over 6.5 years. However, not all fibre types were equally effective.[18]

"Our finding may support a beneficial role of higher intake of dietary fibre, especially cereal fibre, in prevention of body-weight and waist circumference gain."[18]

The change in weight per year for each of the types of fibre was[18]:

- -39g/y for total fibre (95% CI, -71, -7 g/y)
- -77g/y for cereal fibre (95% CI, -127, -26 g/y)
- +2g/y for fruit and vegetable fibre (95% CI, -40, 44 g/y)

Whilst this effect may appear small on the individual level, the authors state that the effect can be of public health significance: 77g/year represents 67% of the average weight change of this study population.

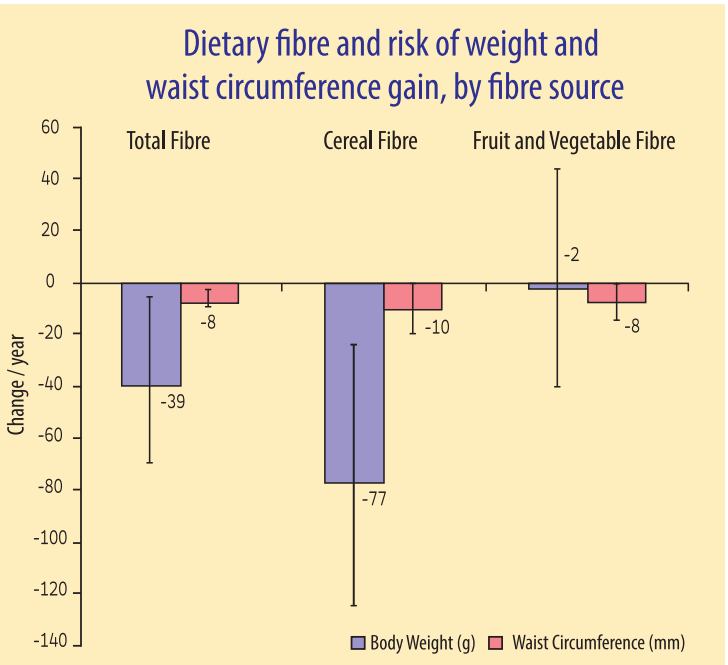

Figure 2. Body weight and waist circumference change for 10g higher intake of total, cereal and fruit and vegetable fibre. Both total and cereal fibre, but not fruit and vegetable fibre, were significantly associated with a reduced change in yearly weight.[18]

Key take-outs:

- Breakfast cereals are relatively inexpensive, nutrient-dense, and convenient foods, which can be recommended to form part of a balanced breakfast and a healthy well balanced diet
- Consistent scientific evidence is available on association of regular breakfast cereal consumption with lower measures of overweight or obesity
- Cereal fibre intake is inversely associated with body weight and waist circumference

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