

Short Communication

The nutritional quality of New Zealand breakfast cereals: an update

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Abstract

Objective: To compare the nutritional quality of New Zealand breakfast cereals in 2013 and 2017.

Design: Nutrition Information Panel data were collected from all cereals available from two large supermarket chains in 2017 and compared with earlier published data collected in 2013.

Setting: Urban New Zealand supermarkets.

Subjects: The nutritional content of breakfast cereals ('biscuits and bites', 'brans', 'bubbles, flakes and puffs', 'children's cereals', 'muesli' and 'oats') was analysed for total energy, protein, fat (total and saturated), carbohydrate, sugar, fibre and Na. The Nutrient Profile Scoring Criterion (NPSC) for each cereal was calculated to determine the proportion of 'less healthy' cereals (NPSC ≥ 4) in each product category.

Results: The energy and fat content of bubbles, flakes and puffs, muesli and oats were significantly higher in 2017 compared with 2013 (all $P \leq 0.01$). However, there was a small reduction in Na overall in 2017 ($P < 0.05$). There was no change between 2013 and 2017 in the proportion of 'healthy' or 'less healthy' breakfast cereals available.

Conclusions: The nutrient profile of breakfast cereals has not improved since 2013, suggesting that industry self-regulation of the nutritional composition of cereals in New Zealand is not working and needs urgent reconsideration.

Keywords
Breakfast cereals
Supermarket
New Zealand

Cereals are a staple breakfast food and their consumption is associated with improved diet quality and lower weight gain⁽¹⁾. In New Zealand (NZ), national nutrition surveys indicate that up to 67% of adults⁽²⁾ and 83% of children/youth⁽³⁾ usually consume breakfast every day, with 43.6% of children consuming cereals as their choice of breakfast at least once daily⁽³⁾. However, many cereals are energy-dense and nutritionally poor, containing high fat, sugar or Na, with little fibre⁽⁴⁾. Of special concern is the high sugar content of children's cereals^(4,5), particularly given the recent WHO guidelines reporting that both adults and children should reduce their sugar consumption to less than 10% of daily energy intake⁽⁶⁾. Data from the UK National Diet and Nutrition Survey show that children aged 4–10 years are regularly consuming twice the recommended daily sugar intake, with up to 11 g of sugar being attributed to breakfast alone⁽⁷⁾. However, despite these observations and policy directives, there appears to

be little improvement in the nutritional quality of ready-to-eat breakfast cereals.

There is no regulation of the formulation, labelling or promotion of breakfast cereals in NZ. However, Food Standards Australia New Zealand (FSANZ) implemented Food Standard 1.2.7 in 2016, which requires that health claims be present only on foods meeting a Nutrient Profile Scoring Criterion (NPSC) score of < 4 . This score represents a healthy proportion of energy, saturated fat, total sugar and Na in the product, with consideration given to protein, dietary fibre, fruit, vegetables, nuts, legumes, coconut, spices, herbs, fungi, algae and seed content⁽⁸⁾. The nutritional content of NZ cereals was reviewed in 2013 and data showed that the nutritional quality of many was poor, with more than a quarter of all cereals being classed as 'less healthy' based upon NPSC scores⁽⁹⁾. The current study aimed to measure any change in the nutrient profile and/or the proportion of 'less healthy' breakfast cereals in NZ between 2013 and 2017.

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Methods

Nutritional composition data were collected from the Nutrition Information Panel (NIP) of all available breakfast cereals from two large supermarket chains (Countdown and Pak 'n' Save) in January 2017. Data were obtained from both the online grocery shopping websites and by visiting the stores in person and taking photographs of the front of the package, ingredients list and NIP of each product. Data from the NIP were transferred to a product data set in Microsoft® Excel 2013. Products with multiple package sizes and those available in both supermarkets were included only once in the product data set. For validity, 10% of products from which the NIP and packaging data were sourced online, were manually checked against the actual product information in store. No discrepancies between online and actual product NIP data were observed.

For each product, the following data were recorded: brand name, product name, content of energy (kJ), protein, fat, carbohydrate, sugar, Na and fibre (g/100 g), serving size and number of servings per package. Labels where the amount of a nutrient was recorded as 'less than one gram' (three items) were entered into the spreadsheet as 0.5 g. Labels with missing nutritional information (e.g. where the amount of fibre was not recorded) were left blank. For analysis, breakfast cereals were grouped into

categories to align with the published 2013 data⁽⁹⁾. These included 'biscuits and bites', 'brans', 'bubbles, flakes and puffs', 'children's cereals', 'muesli' and 'oats'. Independent-sample *t* tests were used to compare the means and standard deviations of the 2013 data with those of the 2017 data. Significance was accepted at $P \leq 0.05$.

Product nutritional information was then used to calculate the FSANZ NPSC score⁽⁸⁾ for each cereal product. The numbers of products in each cereal category that achieved an NPSC score⁽⁸⁾ of ≥ 4 ('less healthy') were compared.

Results

A total of 243 products collected in 2017 were included in the present analysis, along with 247 products from 2013 whose mean and standard deviation values were derived directly from the published data⁽⁹⁾. The suggested serving size and nutritional information from both data sets is given in Table 1.

Overall, there were no significant changes in the content of carbohydrate, sugar and protein in NZ breakfast cereals between 2013 and 2017. However, the energy content was significantly higher in bubbles, flakes and puffs, as well as in muesli and oats (all $P \leq 0.001$ v. 2013 values), this being attributed to the significantly higher content of fat (including saturated fat) in these categories

Table 1 Suggested serving size and nutritional information of breakfast cereals collected from New Zealand supermarkets. All values are given as 2017 data/2013 data⁽⁹⁾

| | Children's cereals (n 31/n 36) | | Biscuits and bites (n 15/n 20) | | Brans (n 9/n 14) | | Bubbles, flakes and puffs (n 72/n 65) | |
|-------------------------------------|-----------------------------------|---------------|-----------------------------------|-------------|---------------------|--------------|--|---------------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Serving size (g) | 31.0 / 30.1 | 2.4 / 1.5 | 38.2 / 36.4 | 7.1 / 7.5 | 42.2 / 43.6 | 5.1 / 4.1 | 42.5 / 40.3 | 6.9 / 8.8 |
| Energy (kJ/100 g) | 1601.6 / 1608.6 | 37.7 / 37.3 | 1517.1 / 1500 | 58.4 / 68.9 | 1435.6 / 1445.0 | 46.7 / 79.3 | 1668.9*** / 1562.3 | 241.8 / 215.3 |
| Protein (g/100 g) | 7.0 / 8.5 | 1.2 / 4.4 | 10.6 / 11.5 | 1.9 / 1.2 | 10.2 / 11.0 | 1.8 / 2.5 | 10.3 / 9.2 | 3.7 / 3.2 |
| Total fat (g/100 g) | 1.9 / 2.1 | 2.1 / 1.9 | 2.4 / 2.3 | 1.3 / 1.9 | 2.4 / 2.9 | 1.3 / 1.6 | 6.1** / 3.4 | 6.2 / 3.6 |
| Saturated fat (g/100 g) | 0.5 / 0.6 | 0.4 / 0.7 | 0.9 / 0.9 | 1.0 / 1.2 | 0.4 / 0.6 | 0.1 / 0.3 | 1.3** / 0.7 | 1.4 / 0.8 |
| Carbohydrate (g/g) | 81.8 / 79.6 | 4.7 / 6.4 | 68.7 / 67.6 | 2.8 / 3.5 | 61.3 / 60.8 | 5.9 / 10.9 | 68.5 / 74.4 | 9.4 / 7.3 |
| Sugar (g/100 g) | 22.7 / 26.3 | 12.1 / 10.8 | 9.7 / 8.0 | 8.5 / 8.1 | 22.5 / 21.5 | 5.3 / 6.2 | 19.8 / 17.9 | 7.5 / 8.1 |
| Fibre (g/100 g)† | 3.9 / 4.9 | 2.5 / 2.9 | 9.6 / 10.6 | 1.2 / 2.0 | 16.8 / 17.2 | 5.1 / 8.3 | 7.9 / 6.6 | 3.6 / 3.9 |
| Na (mg/100 g) | 359.4 / 298.4 | 188.7 / 249.9 | 292.3 / 294.6 | 28.6 / 81.5 | 277.3 / 294.3 | 69.8 / 105.2 | 229.7* / 293.3 | 122.3 / 180.6 |
| % Products with NPSC score ≥ 4 | 64.2/58 | | 8.7/10 | | 11.0/14 | | 28.4/35 | |

| | Muesli (n 80/n 67) | | Oats (n 36/n 45) | | All cereals (n 243/n 247) | |
|-------------------------------------|-----------------------|---------------|---------------------|---------------|------------------------------|---------------|
| | Mean | SD | Mean | SD | Mean | SD |
| Serving size (g) | 47.9 / 48.8 | 5.2 / 10.2 | 40.4 / 39.7 | 5.8 / 6.3 | 42.0 / 40.9 | 8.6 / 9.8 |
| Energy (kJ/100 g) | 1786.3*** / 1682.3 | 205.5 / 109.6 | 1608.8*** / 1520.8 | 122.9 / 109.8 | 1665.2*** / 1582.1 | 194.2 / 153.4 |
| Protein (g/100 g) | 11.2 / 10.2 | 2.5 / 2.0 | 11.9 / 11.6 | 1.6 / 2.3 | 10.3 / 10.1 | 3.1 / 3.0 |
| Total fat (g/100 g) | 16.5*** / 11.4 | 9.8 / 5.0 | 8.0** / 6.1 | 4.3 / 2.1 | 9.2*** / 5.7 | 9.8 / 5.0 |
| Saturated fat (g/100 g) | 3.7** / 2.7 | 2.6 / 1.7 | 1.6** / 1.2 | 1.3 / 0.4 | 2.0*** / 1.3 | 2.3 / 1.4 |
| Carbohydrate (g/100 g) | 56.2 / 60.1 | 9.7 / 7.7 | 62.2 / 62.7 | 7.6 / 7.0 | 64.3 / 67.8 | 13.4 / 10.3 |
| Sugar (g/100 g) | 16.7 / 18.8 | 6.2 / 6.1 | 11.4 / 10.9 | 12.5 / 10.6 | 17.0 / 17.5 | 9.7 / 10.0 |
| Fibre (g/100 g)† | 8.9 / 9.0 | 2.1 / 2.8 | 9.6 / 9.5 | 2.1 / 3.2 | 8.5 / 8.5 | 3.6 / 4.6 |
| Na (mg/100 g) | 70.8 / 94.0 | 83.5 / 110.9 | 57.8 / 39.2 | 95.8 / 69.8 | 171.6* / 193.3 | 161.3 / 187.9 |
| % Products with NPSC score ≥ 4 | 27.5/25 | | 5.7/0 | | 27.2/26 | |

NPSC, Nutrient Profile Scoring Criterion.

* $P < 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$ v. 2013 data. All other comparisons are $P > 0.05$.

†Fibre is not a compulsory Nutrition Information Panel requirement; hence n 24, 15, 9, 72, 80 and 36 for the above categories, respectively.

(all $P \leq 0.01$ *v.* 2013 values). The mean content of total fat increased by 31, 44 and 79% in oats, muesli and bubbles, flakes and puffs, respectively (Table 1).

Overall there was a significant mean reduction in Na of approximately 20 mg/100 g from 2013 to 2017 ($P < 0.05$) and a mean Na reduction of 60 mg/100 g in bubbles, flakes and puffs ($P < 0.05$). No significant differences were observed for any of the nutrients assessed in children's cereals, biscuits and bites, or brans between 2013 and 2017 (Table 1).

No differences were seen in the overall numbers of 'healthy' and 'less healthy' cereals between 2013 and 2017. Contributing to this statistic was the subgroup of children's cereals where the high sugar and Na and low dietary fibre contents meant that two-thirds of products were considered 'less healthy' (Table 1).

Discussion

As the present study shows, there is an urgent need to improve the nutritional quality of cereals that are available for purchase in major NZ supermarkets. Out of all available cereals, over a quarter of these (including nearly two-thirds of children's cereals) did not meet the NPSC score (< 4) for having a healthy enough proportion of energy, saturated fat, sugar or Na to make health claims about the product. There appears to have been minimal improvement in the nutritional quality of NZ breakfast cereals since 2013⁽⁹⁾. However, the present study was only able to undertake combined category-level comparisons and any individual product improvements between 2013 and 2017 will not have been observed.

In 2017, the Na content of cereals was significantly reduced in some product categories when compared with 2013. This is an improvement because high levels of Na in processed foods are of concern in NZ, despite the lack of a national Na reduction strategy as seen in other Western countries⁽¹⁰⁾. However, it is concerning to note that there have been significant increases in the fat content of several cereal categories leading to an increase in mean energy overall. Research indicates that many consumers eat larger quantities than the recommended serving size⁽¹¹⁾; therefore, their fat intake may actually be two to three times higher than that reported on the NIP. The increase in nutrient composition between 2013 and 2017 was significant only for fats, not for sugar, protein, carbohydrate or fibre content. However, as individual product composition data were not available for the 2013 data set, it was not possible to determine what change to the ingredients contributed to this increase in fat content without a change in the other nutrients. Further follow-up studies are needed to see if this 2017 trend of increased fat content continues.

It is concerning to note that there have been no changes to the nutritional content of children's cereals since 2013, despite the fact that these are approximately 25% sugar, with approximately 60% of products being scored as 'less healthy'. Similar findings have also been reported in the USA⁽¹²⁾ with 66% of children's breakfast cereals not

meeting national nutrition standards⁽¹³⁾, particularly with respect to sugar content⁽¹²⁾. Comparable results were also observed in an Australian study of the nutritional quality of breakfast cereals⁽⁴⁾. The sugar and fat contents of cereals exceeded national nutrition guidelines, although a twofold increase in the fibre content of children's cereals between 2004 and 2010 was also noted in that study⁽⁴⁾. Regardless of the cereal category, the majority of products marketed in both 2004 and 2010 in Australia did not differ in nutritional content, other than a marginal improvement in protein⁽⁴⁾. These authors suggest that neither front-of-pack labelling strategies nor public health group lobbying had any impact on the nutritional quality of Australian cereals.

Importantly, however, voluntary regulation of the breakfast cereal industry in the USA has been shown to improve the nutritional profile of children's cereals⁽¹⁴⁾. In 2006, eighteen leading food and beverage companies in the USA joined the voluntary 'Children's Food and Beverage Advertising Initiative' (CFBAI) with the objective to improve diet and lifestyle for children under 12 years of age. Under self-regulation, CFBAI-participating companies have decreased the total energy of all children's cereals to 130 kcal (543.9 kJ) per serving, with two-thirds of products in 2016 containing zero grams of saturated fat⁽¹⁴⁾. The proportion of products containing ≥ 11 g sugar per serving has decreased from 51% in 2009 to 0% in 2016, with three-quarters of all cereals containing less than 35% sugar⁽¹⁴⁾. Defined CFBAI criteria now report that children's breakfast cereals must contain no more than 10 g sugar per 1 oz (28.3 g) serving⁽¹⁴⁾.

Unlike the USA, there appears to be little impetus in either Australia or NZ for manufacturers to reformulate breakfast cereals into a healthier product, despite the fact that one bowl of cereal can exceed the recommended dietary intake of sugar⁽⁶⁾, Na⁽¹⁰⁾ and fat⁽¹⁵⁾. While the 2016 FSANZ Standard 1.2.7 regulates the health claims that can be made on product packaging in NZ, there is no regulation of the food composition of products such as cereals. Given the lack of change from 2013 to 2017 it is timely to consider policies regulating cereal composition, particularly for cereals that are marketed to children. With regard to consumer acceptability of more healthy cereals, findings from food preference studies shows that both children and youth will consume low-sugar cereals when they are offered to them^(5,16) and will consume smaller portion sizes compared with when they are offered high-sugar cereals⁽⁵⁾. Thus, while consumer tolerability would need to be assessed in further studies, it is likely that consumers would continue to buy and consume breakfast cereals that are reformulated to provide a healthier nutrient profile.

Conclusion

Despite recognition of cereals as an important contributor to daily dietary intake, over one-quarter of the cereals available in two NZ supermarkets in 2017 exceeded the recommended proportion of energy, saturated fat, sugar or

Na. Moreover, of the cereals that are marketed to children, nearly two-thirds exceeded the recommended proportions of Na and sugar. Although there has been a decrease in the Na content of all cereals since 2013, this is offset by an increase in saturated fat content and no change in sugar in 2017. NZ has voluntary industry regulation of the nutritional composition of food products, including cereals, and there has been little progress in improving the nutritional quality of breakfast cereals. However, data from the USA suggest that self-regulation of the food industry can still allow for the improvement of the nutritional profile of breakfast cereals. Strategies similar to the CFBAI should be evaluated in NZ and Australia, and further research is also warranted in other countries to evaluate the nutritional content of breakfast cereals, particularly their contribution of sugar and fat to the daily diet.

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