

CEEREAL STATEMENT ON VITAMIN AND MINERAL FORTIFICATION OF BREAKFAST CEREALS

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CEEREAL represents the European breakfast cereal and oat milling industry and consists of 12 member companies and 7 national associations from 7 countries. We bring together international brands as well as family-owned businesses of all sizes. Our members are committed to providing consumers with breakfast cereals that are enjoyable, safe, nutritious, affordable, and sustainable.

FORTIFICATION OF BREAKFAST CEREALS IS A LONG-STANDING AND TRUSTED PRACTICE

Fortification is the practice of adding nutrients, e.g., certain vitamins and minerals, to a food to enhance its nutritional quality, and, ultimately, to deliver a public health benefit.

The breakfast cereal industry has a long-standing history of fortification, with the first fortified breakfast cereals entering the European market in the late 1930s¹.

In 2025, as much as 61% of breakfast cereals sold by CEEREAL members were fortified, amounting to 9.2 billion fortified breakfast cereal servings sold in the same year across Europe.

FORTIFIED BREAKFAST CEREALS AND NUTRIENT INTAKE

The regular consumption of breakfast cereal has been associated with diets that are higher in vitamins and minerals for adults, adolescents, and children², and, subsequently, may help reduce the risk of inadequate intakes³.

A recent systematic review of the scientific literature confirms that fortification is a central driver of the nutritional contribution of ready-to-eat breakfast cereals. Specific findings include:

1) Fortification improves micronutrient intake and adequacy

The review shows strong and consistent evidence that fortified breakfast cereals can

- Increase intakes of key nutrients, including iron, B-vitamins (e.g., folate, vitamin B12), vitamin D, and calcium.
- Increase the likelihood of meeting dietary reference values.
- Reduce the prevalence of inadequate micronutrient intakes at population level.

¹ Personal communication by CEEREAL member companies.

² Williams, P.G. (2014). *The benefits of breakfast cereal consumption: a systematic review of the evidence base*. *Advances in Nutrition* 5, 636S–73S. doi: <https://doi.org/10.3945/an.114.006247>.

³ *Effects of Ready-to-Eat-Cereals on Key Nutritional and Health Outcomes: A Systematic Review*. *PLoS One*. 11(10):e0164931. doi: <https://doi.org/10.1371/journal.pone.0164931>.

These benefits are particularly evident in children and adolescents as well as individuals with lower diet quality.

2) Fortification can help address key nutrient gaps

- a) **Iron:** Iron deficiency remains one of the most common micronutrient deficiencies worldwide, particularly affecting women of childbearing age, children, and the elderly. Breakfast cereals provide 7-24% of daily iron intakes for children, adolescents and adults across France, UK, Ireland, the US, and Canada.
- b) **Vitamin D:** Vitamin D is a nutrient of public health concern due to widespread inadequate intakes and deficiency. Fortification enables breakfast cereals to provide vitamin D, which is otherwise present only in limited amounts in the diet. For example, in the UK breakfast cereals contribute 21% of vitamin D intake in children, 18% in adolescents, 9% in adults

Moreover, the scientific evidence demonstrates the benefits of breakfast cereals in the provision of vitamins and minerals across a **range of population groups**, including for example:

- Children and adolescents: National dietary survey data from Ireland shows that breakfast cereals are one of the highest contributing sources of vitamin D (23%), dietary folate equivalents (30%) and iron (28%) amongst Irish children (5-12 years)⁴.
- Low-income populations: A study of the materially deprived/low-income population in the UK showed that breakfast cereal consumers had higher intakes of a host of vitamins and minerals relative to non-consumers (thiamine, riboflavin, niacin, biotin, folate, vitamin B6, vitamin B12, calcium, iron and zinc)⁵. Additionally, a recent US study further supports the nutritional benefits of ready-to-eat cereal across all income groups^{6,7}.
- Restrictive consumers: Fortified plant-based foods - such as fortified breakfast cereals - may play a particularly important role in alleviating concerns regarding nutritional adequacy of plant-based diets⁸. Fortified foods may be especially important in helping to meet requirements for nutrients predominantly found in animal-derived food sources, e.g., vitamin D vitamin B12⁹. Purposeful fortification in this regard may become more critical in parallel with increasing consumption of plant-based foods in healthy, sustainable diets.

⁴ Irish Universities Nutrition Alliance (2019). *National Children's Food Survey II. Summary Report on Food and Nutrient Intakes, Body Weight, Physical Activity and Eating Behaviours in Children Aged 5-12 Years in Ireland*. <https://irp-cdn.multiscreensite.com/46a7ad27/files/uploaded/The%20National%20Children%27s%20Food%20Survey%20II%20Summary%20Report%20-%20September%202019.pdf>. Accessed on 23 April 2026.

⁵ Holmes, B. A., et al. (2012). *The contribution of breakfast cereals to the nutritional intake of the materially deprived UK population*. *European Journal of Clinical Nutrition*. 66(1):10-7. doi: <https://doi.org/10.1038/ejcn.2011.143>.

⁶ Smith, J., et al. (2022). *Associations of ready-to-eat cereal consumption and income with dietary outcomes: results from the National Health and Nutrition Examination Survey 2015–2018*. *Frontiers in Nutrition*. 9:816548. doi: <https://doi.org/10.3389/fnut.2022.816548>.

⁷ Sanders LM, Zhu Y, Jain N, Normington J, Holschuh N, Nechanicky M, Tucker M and Garcia-Bailo B (2024) *Ready-to-eat cereal consumption is associated with improved nutrient intakes and diet quality in Canadian adults and children across income levels*. *Front. Nutr.* 10:1282252. doi: [10.3389/fnut.2023.1282252](https://doi.org/10.3389/fnut.2023.1282252)

⁸ Neufingerl, N., Eilander, A. (2022). *Nutrient Intake and Status in Adults Consuming Plant-Based Diets Compared to Meat-Eaters: A Systematic Review*. *Nutrients*. 14(1): 29. doi: <https://doi.org/10.3390/nu14010029>.

⁹ World Health Organisation. (2021). *Plant-based diets and their impact on health, sustainability and the environment: a review of the evidence: WHO European Office for the Prevention and Control of Noncommunicable Diseases*. Copenhagen: WHO Regional Office for Europe. WHO/EURO:2021-4007-43766-61591.

Furthermore, the daily consumption of **fortified breakfast cereal with milk** has shown to increase the intake of specific micronutrients (B-vitamins, folate, iron, vitamin D); the intake of which was significantly greater versus unfortified breakfast cereal consumption. This was reflected in significant improvements in a range of biomarkers of micronutrient status (B2, B12, folate, iron) among the fortified cereal consumers (adolescent girls in the UK) versus the unfortified group¹⁰.

A modelling study conducted in the UK¹¹ has shown that fortification of ready-to-eat breakfast cereals can contribute to **improved intake and status of vitamin D**. Ready-to-eat-breakfast cereals, being eaten by a large proportion of the UK population, offer a suitable vehicle for vitamin D fortification.

REMOVING FORTIFIED CEREALS FROM THE DIET MAY HAVE UNINTENDED NUTRITIONAL CONSEQUENCES

The removal of nutrient-rich grain-based foods from the diet could lead to unintended nutritional consequences – a hypothesis which is supported within the scientific literature.

- A recent modelling study on the impact of iron removal on children in Ireland showed removing iron fortification from breakfast cereals would increase the risk of inadequate iron intakes among all children aged 5-12 years from 19% to 46%¹². Therefore, changes to fortification policy must consider the risk of deepening nutritional inadequacy.
- A modelling study of US diets found that removing fortified refined grains (e.g., bread and ready-to-eat cereals) increased the proportion of adults not meeting recommended nutrient intakes, with greater deficits when all grains were removed. Even for nutrients like riboflavin, thiamine, and niacin—typically adequate due to fortification—eliminating grains raised the share of adults falling below requirements¹³.

The authors of the abovementioned study caution that calls for the lowering of certain fortified or enriched grain foods in the American diet may be counter intuitive to public health initiatives aiming to improve nutritional adequacy.

- A similar sentiment is echoed in an Australian publication which also warns of potential negative consequences arising from the elimination of fortified, grain-based foods, risking to “roll back the documented improvements in nutrient intake and health status resulting from food fortification initiatives”¹⁴.

¹⁰ Powers, H. J., et al. (2016). *Fortified breakfast cereal consumed daily for 12 wk leads to a significant improvement in micronutrient intake and micronutrient status in adolescent girls: a randomised controlled trial*. Nutrition Journal. 15(1):69. doi: <https://doi.org/10.1186/s12937-016-0185-6>.

¹¹ Calame, W., et al. (2020). *Vitamin D Serum Levels in the UK Population, including a Mathematical Approach to Evaluate the Impact of Vitamin D Fortified Ready-to-Eat Breakfast Cereals: Application of the NDNS Database*. Nutrients. 12(6): 1868. doi: <https://doi.org/10.3390/nu12061868>.

¹² Pre-print under review: <https://www.researchsquare.com/article/rs-8895504/v1>

¹³ Papanikolaou, Y., Fulgoni, V. L. (2021). *The role of fortified and enriched refined grains in the US dietary pattern: A NHANES 2009–2016 modeling analysis to examine nutrient adequacy*. Frontiers in Nutrition. 8:655464. doi: <https://doi.org/10.3389/fnut.2021.655464>.

¹⁴ Estell, M. L., et al. (2022). *Fortification of grain foods and NOVA: the potential for altered nutrient intakes while avoiding ultra-processed foods*. European Journal of Nutrition 61:935–45. doi: <https://doi.org/10.1007/s00394-021-02701-1>.

DISCUSSIONS ON HARMONISED MAXIMUM LEVELS FOR VITAMINS AND MINERALS IN THE EU

In the context of ongoing discussions between Member States and the European Commission on harmonised maximum levels for vitamins and minerals, it is essential that the scientific evidence outlined here is carefully considered. Policymaking in this area should strike a balance between consumer safety and maintaining the nutritional benefits currently delivered through food fortification. In particular, preserving the ability to use nutrition and health claims for added micronutrients remains important—not only to incentivise continued fortification of products such as breakfast cereals, but also to ensure consumers are informed about their associated health benefits.

CONCLUSIONS

Fortification is a well-established and safe practice and an important tool to increase people's intake of vitamins and minerals, thereby contributing to positive health outcomes, including in specific population groups, such as children and adolescents, low-income populations, or those on certain, restrictive diets. By the same token, removing fortified foods from the diet may have unintended nutritional consequences and could impede achieving public health objectives. CEEREAL members are committed to offering people a diverse range of nutritious breakfast cereals, which include fortified options to contribute to public health benefits.