Clinical & Experimental Allergy

WILEY

EDITORIAL

Plant-Based and Dairy-Free Drinks: An Emerging Health Hazard for Young Children

Rachel M. Childs[1] | Robert J. Boyle[2] | Victoria L. Sibson[1]

[1]First Steps Nutrition Trust, London, UK | [2]National Heart and Lung Institute, Imperial College, London, UK

Correspondence: Victoria L. Sibson (vicky@firststepsnutrition.org)

'Growing up' or 'toddler' milks (GUM), marketed for children aged 1–3 years and older, are widely recognised by health bodies as unnecessary and unhealthy. Public health advice is that breastmilk, water, cows' milk or another animal milk should be the main drink for young children from age 1 onwards. Manufacturers claim that GUM are an effective medium to deliver nutrients to young children, especially vitamin D, calcium and iron, which are commonly used to fortify GUM. But GUM are advised against, mainly due to their high free sugars content. UK data show that GUM are the main source of free sugars among those 12- to 18-month-old children who consume them, accounting for half of their total free sugars intake [1]. In 2011, 36% of children in this age group were GUM consumers. That figure is likely to have risen, because GUM sales are increasing worldwide. Globally, there was a more than twofold increase in GUM sales per child born, from 2005 through 2019 [2]. In the context of increasing overweight and obesity and high levels of dental decay in young children, increasing GUM sales represent a worrying trend. While marketing of infant formula suitable from 0 to 12 months is strictly regulated in many regions, GUM marketing for children over 12 months has very few restrictions. This is despite World Health Organization recommendations that inappropriate marketing of all commercial milk formulas aimed at children < 36 months old should be prohibited. The lack of regulations means that manufacturers are able to market GUM using misleading nutrition and health claims and in ways which cross-promote infant formula.

One GUM product category that has received much attention recently and appears to be growing in popularity is plant-based GUM. The increase in availability of plant-based GUM reflects a shift in consumption patterns in the general population—away from cows' milk, towards plant-based alternatives [3]. The nutrient content of plant-based GUM is a cause for concern. Some of the highest-sugar GUM available are plant-based, and a lack of labelling regulation means that consumers are often not aware of the high free sugars content. Indeed, plant-based GUM marketing may misleadingly suggest these products are low in sugar. For example, most oat milks contain free sugars, which are produced by the processing of the oats, where naturally present starch is broken down into sweet-tasting free sugars. This means that an oat milk can claim to have 'no added sugars', while containing even more free sugars than a standard cows' milk–based GUM.

Plant-based GUM have low nutritional value in terms of protein concentration or quality and certain micronutrients, compared with animal milks [3]. Thus, their role in young child feeding is uncertain, but there are clear health hazards associated with many plant-based GUM. In parallel with the shift towards plant-milk consumption, there is widespread and growing milk allergy overdiagnosis among infants internationally [4, 5]. Infants with a milk allergy diagnosis are often prescribed or advised to consume specialised low-allergy formula products with high free sugars content. For these children, continuation of a dairy-free diet and substitution with plant-based or specialised low-allergy GUM beyond age 1 year is likely to further promote early-onset dental decay, overweight and obesity [6] (Table 1).

For most GUM, consumption of just 260 ml takes a 1- to 2-year-old child over their recommended total daily free sugars intake, using the UK Department of Health and Social Care (DHSC) limit of 5% of total energy intake [7]. For plant-based and specialised low-allergy GUM, this figure can be as low as 100 mls (Figure 1).

The regulatory environment in many countries rightly focusses on infant formula. However, increasing GUM consumption worldwide, including high-sugar plant-based and specialised low-allergy GUM, has highlighted a need to regulate GUM.

TABLE 1 | Free sugars content of growing up milks for 1- to 2-year-old children available in the United Kingdom.

Product	Free sugars/100 mls	Energy from free sugars as % total energy[a]	Free sugars as % recommended maximum daily intake[a]	Source of free sugars
Cow or goat milk–based GUM				
SMA advanced growing up milk	8.1	15.3	306	Lactose
Aptamil 3 toddler milk	3.9	7.4	147	Lactose, maltodextrin
Aptamil advanced 3 toddler milk	3.7	7.0	140	Lactose, maltodextrin
Cow & gate 3 toddler milk	3.7	7.0	140	Lactose, maltodextrin
SMA little steps growing up milk	3.6	6.8	136	Maltodextrin, lactose
Kendamil goat toddler milk stage 3	3.5	6.6	132	Lactose
Kendamil classic toddler milk 3	3.3	6.2	125	Lactose
Nannycare 3 goat milk based growing up milk	3.1	5.9	117	Lactose
Kendamil organic stage 3 toddler milk	3	5.7	113	Lactose
Hipp organic 3 growing up milk	1	1.9	38	Lactose
Plant-based GUM[b]				
Alpro soya growing up drink	8.2	15.5	310	Maltodextrin, sugar, fructose
SMA little steps plantygrow plant-based growing up drink	7.8	14.7	295	Hydrolysed flour, maltodextrin, corn starch
Alpro oat growing up drink	5.9	11.1	223	Oat, maltodextrin
Koko free from milk	1.9	3.6	72	Concentrated apple juice
Specialised low-allergy GUM				
Neocate junior	11.8	22.3	446	Glucose syrup
Nutramigen 3 LGG	7.7	14.6	291	Glucose syrup

[a]Energy intake is calculated based on consumption of 350 mls per day by a 1- to 2-year-old child.
[b]Data presented for plant-based GUM assume that the starch in hydrolysed flour and oat is completely converted to free sugars during processing. The UK DHSC recommends that free sugars should make up no more than 5% of total energy intake, due to the risk of dental decay, overweight and obesity associated with free sugars consumption. Although maltodextrins are not included in the UK DHSC definition of free sugars, they are included here as free sugars [7]. Maltodextrins have a high glycaemic index and can contribute to dental decay, and they are regarded for regulatory purposes as 'added sugars' in the United States, Canada, New Zealand and Australia [8]. Of note, the DHSC free sugars limit is lower than that proposed by the WHO, which is 10% of total energy intake. Recommendations from other authorities vary—for example, the European Food Safety Authority advises free sugars consumption should be 'as low as possible' [9].

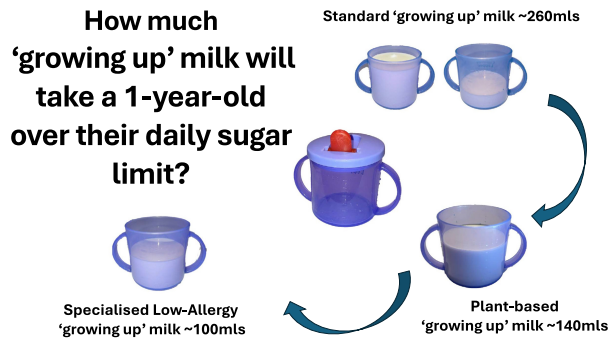

FIGURE 1 | Approximate quantity of different types of 'growing up' milk that contains the maximum recommended daily intake of free sugars for a 1- to 2-year-old child. Maximum daily intake is based on the UK DHSC recommendation that free sugars should make up no more than 5% of total energy intake. Figures are median values, based on publicly available information from manufacturers of GUMs marketed in the United Kingdom. For the purpose of this figure, maltodextrins are classified as free sugars and where the nature or processing of ingredients is unclear, maximum possible free sugars content has been estimated.

Steps need to be taken to ensure that families have access to clear and accurate information about any health risks associated with GUM, enabling them to make informed choices about what to feed their young children, in line with public health recommendations. Product reformulation to limit free sugars content is also likely to be necessary—here, mandatory standards are likely to be more effective than voluntary standards.

Author Contributions

R.M.C. and V.L.S. wrote the original report. R.J.B. wrote the first draft of the editorial. All authors edited and commented on the editorial and approved the final version.

Acknowledgements

This editorial builds on a 2024 report by First Steps Nutrition Trust: 'Drinks for young children marketed as 'growing up' and 'toddler' milks and drinks'. The full report can be accessed at Drinks+marketed+as+toddler+and+growing+up+milks+and+drinks_FINAL1.pdf (squarespace.com).

Conflicts of Interest

The authors declare no conflicts of interest.

References

1. A. Lennox, J. Sommerville, K. Ong, H. Henderson, and R. Allen, *Diet and Nutrition Survey of Infants and Young Children, 2011* (London, UK: Department of Health and Food Standards Agency, 2013).

2. P. Baker, T. Santos, P. A. Neves, et al., "First-Food Systems Transformations and the Ultra-Processing of Infant and Young Child Diets: The Determinants, Dynamics and Consequences of the Global Rise in Commercial Milk Formula Consumption," *Maternal & Child Nutrition* 17, no. 2 (2021): e13097.

3. R. J. Wall, M. E. Clegg, and S. Stergiadis, editors, "Changes in the Declared Nutrients and Price of Plant-Based Milk Alternatives in UK Supermarkets Between 2020 and 2023," *Proceedings of the Nutrition Society* 82 (2023): E356.

4. S. Mehta, H. I. Allen, D. E. Campbell, K. F. Arntsen, M. R. Simpson, and R. J. Boyle, "Trends in Use of Specialized Formula for Managing Cow's Milk Allergy in Young Children," *Clinical and Experimental Allergy* 52, no. 7 (2022): 839–847.

5. A. J. Strzalkowski, K. M. Jarvinen, B. Schmidt, and B. E. Young, "Protein and Carbohydrate Content of Infant Formula Purchased in the United States," *Clinical and Experimental Allergy* 52 (2022): 1291–1301.

6. C. E. Anderson, S. E. Whaley, and M. I. Goran, "Lactose-Reduced Infant Formula With Corn Syrup Solids and Obesity Risk Among Participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)," *American Journal of Clinical Nutrition* 116, no. 4 (2022): 1002–1009.

7. G. E. Swan, N. A. Powell, B. L. Knowles, M. T. Bush, and L. B. Levy, "A Definition of Free Sugars for the UK," *Public Health Nutrition* 21, no. 9 (2018): 1636–1638.

8. A. Jones and T. Scapin, *Supporting Evidence-Informed Policy Work on Added Sugar: A Report Commissioned for VicHealth* (Australia: George Institute for Global Health, 2020).

9. D. Turck, J. Castenmiller, S. De Henauw, et al., "Tolerable upper intake level for dietary sugars," *EFSA Journal* 20, no. 2 (2022): 7074.