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(In)safety of labeling of cereal-based infant foods in relation to current brazilian legislation

In)segurança da rotulagem de alimentos infantis à base de cereais em relação à legislação brasileira vigente

Abstract

Introduction: Cereals are widely used in children's nutrition. ***Objective:*** to evaluate the nutritional composition and labeling of cereal-based infant foods, in relation to current legislation. ***Material and Methods:*** cross-sectional, analytical and descriptive study that evaluated cereal-based foods, as well as labeling compliance with current Brazilian legislation. ***Results:*** 72 food samples were evaluated: cereal for baby food; mixture for the preparation of porridge and cereal flour. One hundred percent of the samples showed some non-compliance with the legislation, including the presence of a false concept of advantage and safety, illustrations not allowed, absence of mandatory warnings and, absence of the minimum age for consumption of the product. In bromatological and labeling analyses, the carbohydrate content of all categories exceeded 80% of the total energy value of the product. The protein, lipid, carbohydrate and energy contents of the cereal category for infant feeding showed significant differences, being, respectively, $p=0.015$, $p<0.001$, $p=0.013$ and $p<0.001$. The mix category for porridge preparation also showed significant differences for proteins, lipids, carbohydrates and energy ($p<0.001$). In the category of cereal flours, only the protein content showed a difference ($p=0.05$). ***Conclusion:*** considering the sample universe of the study, it is possible to conclude that even in the presence of specific legislation, we still find legal non-conformities in the labeling of cereal-based foods intended for infant feeding, and these foods have a nutritional composition different from the information presented on their labels, negatively impacting children's food safety.

Keywords: Cereals. Infant Feeding. Food Composition. Food Labeling. Food Legislation. Child.

Resumo

Introdução: Os cereais são amplamente utilizados na alimentação das crianças. ***Objetivo***: avaliar a composição nutricional e a rotulagem de alimentos infantis à base de cereais, em relação à legislação vigente. ***Material e Métodos***: Estudo transversal, analítico e descritivo que avaliou alimentos à base de cereais, bem como a conformidade da rotulagem em relação à legislação brasileira vigente. ***Resultados***: Avaliaram-se 72 amostras de alimentos: cereal para alimentação infantil; mistura para o preparo de mingaus e farinha de cereais; 100% das amostras apresentaram alguma não conformidade em relação à legislação, incluindo a presença de falso conceito de vantagem e segurança, ilustrações não permitidas, ausência de advertências obrigatórias e ausência da idade mínima para consumo do produto. Nas análises bromatológicas e de rotulagem, o teor de carboidratos de todas as categorias ultrapassou 80% do valor energético total do produto. Os teores de proteínas, lipídios, carboidratos e energia da categoria cereal para alimentação infantil mostraram diferenças significativas, sendo, respectivamente, $p=0,015$, $p<0,001$, $p=0,013$ e $p<0,001$. A categoria “mistura para preparo de mingaus” também mostrou diferenças

significativas para proteínas, lipídios, carboidratos e energia (p<0,001). Na categoria de farinhas de cereais, somente o teor de proteínas apresentou diferença (p=0,05). *Conclusão*: Considerando o universo amostral do estudo, é possível concluir que mesmo na vigência de legislações específicas, ainda encontramos não conformidades legais na rotulagem de alimentos à base de cereais destinados à alimentação infantil, sendo que esses alimentos apresentam composição nutricional diferente das informações apresentadas em seus rótulos, impactando negativamente a segurança alimentar de crianças.

Palavras-chave: Cereais. Alimentação infantil. Composição de alimentos. Rotulagem de alimentos. Legislação sobre alimentos. Criança.

INTRODUCTION

Children's cereals are one of the first foods introduced into children's diets due to their high energy value and because they are well accepted in sensory and digestive terms.[1] However, the early introduction of these foods results in a decrease in the bioavailability of important minerals at this stage, such as iron and zinc, which, in turn, is associated with immune compromise, deficiency anemia, allergic reactions and problems related to the development and growth of this public.[2-5]

Observations regarding the Brazilian dietary pattern reveal a high prevalence of consumption of ultra-processed foods, such as the group of instant rice, corn, wheat or oat flours, among children aged 6 to 59 months.[6] The consumption of these foods, with higher energy density, more free sugar and less fiber, favors an increase in preference for them and, consequently, reduces the proportion of consumption of fresh or minimally processed foods and impoverishes the nutritional quality of children's diets.[7,8]

Bearing in mind that the children's public corresponds to a very attractive marke niche for the food industry and that, in addition, there is a need on the part of family members to seek more practical alternatives that facilitate the eating routine,[9] foods intended for infants and early-childhood children have specific regulations in order to guarantee the food and nutritional security of the target audience.

In 1998, ANVISA created a technical regulation regarding transitional foods for infants and early-childhood children, in addition to a technical regulation regarding cereal-based foods for infant feeding.[10,11] In 2006, Law 11.265 was published, which regulates the sale of food for infants and children of early childhood, in addition to related childcare products.[12] In 2020, with the objective of improving the clarity and legibility of packaged food labels, the Resolution of the Collegiate Board of Directors – RDC No. 429 and Normative Instruction No. 75 is established, for the adoption of frontal nutritional labeling, changes in the information table and also, on nutrition claims.[13,14]

Recent studies have shown the presence of legal non-compliance on the labels of the products in question[15,16] and that the presence of frontal nutrition labeling increases the understanding of the nutritional content, reduces the perception of healthiness and the purchase intention of foods with high sugar content, such as breakfast cereals.[17-22] There is, therefore, an effort by civil society, together with health professionals, so that public policies act in the regulation of advertising for ultra-processed products, aimed at children, to promote improved food labeling, promotion of healthy complementary foods, autonomy and food sovereignty, in addition to strengthening fair and health promoting food systems.

Therefore, carrying out studies in the field of infant feeding that can collaborate with health professionals and consumers regarding the actual composition of cereal-based foods, in addition to promoting results that support changes in children's eating behavior and nutritional profile and support effective public policies through the production and dissemination of scientific evidence on the subject, is justified. Therefore, the present study aimed to evaluate the nutritional composition and labeling of cereal-based foods intended for infant feeding in relation to current legislation.

MATERIAL AND METHODS

This is a cross-sectional, analytical and descriptive study that included a bromatological analysis of cereal-based foods consumed by children, as well as verifying the adequacy of labeling in relation to current legislation. The study was carried out between April 2018 and January 2019.

According to Law No. 11265/2006, cereal-based foods for infants and early childhood children are defined as “any cereal-based food suitable for feeding infants after six months of age and early-childhood children, respecting their physiological maturity and neuropsychomotor development”.[12] On the other hand, Ordinance 36/98 establishes that cereal for infant feeding is a food based on a mix of cereals, with or without legumes, with low moisture content and fragmented to allow its dilution with water, milk or other convenient liquid for feeding of infants and early-childhood children. Thus, infants are understood as children aged between 0 and 11 months and 29 days, and early-childhood children, those aged between 12 months and 3 years.[11]

Cereal-based foods intended for children are found on the national market under different sales names, such as "mixture for the preparation of porridge" or "cereal flour", and these products have the same nature (based on cereals), similar nutritional compositions and are generally intended for children.

For the present study, cereal-based infant foods were purchased in supermarkets in the municipalities of São Paulo and Santos, SP. As a selection criterion for the foods included in the sample, the most commercialized brands in Brazil were adopted, according to a shopping trend survey.[23] All samples came from different batches, of different flavors and were coded to ensure the confidentiality of product identification during analyses.

To organize and analyze the information on the labels, a checklist was created with the items described in the legislation, in accordance with RDC No. 259, of September 20, 2002 (labeling for packaged foods); Ordinance No. 36, of January 13, 1998 (technical regulation referring to cereal-based foods for infant feeding); Ordinance No. 34, of January 13, 1998 (technical regulation regarding transitional foods for infants and early-childhood children); RDC No. 40, of February 8, 2002 (labeling of packaged foods and beverages containing gluten); RDC No. 222, of August 5, 2002 (technical regulation on commercial promotion of foods for infants and early-childhood children); Law 11.265 of January 3, 2006 (regulates the sale of foods for infants and early childhood children and related childcare products) (Brazil. Deputy Chief for Legal Affairs, 2006);[12] RDC No. 360, of December 23, 2003 (technical regulation on nutritional labeling of packaged foods, making nutritional labeling mandatory). All resolutions, ordinances and laws that guided the checklist are highlighted in Chart 1.

Chart 1. Criteria based on current legislation for the labeling checklist of cereal-based infant foods evaluated in the study.

Current Brazilian Legislation	Checklist Items
RDC No. 259, of September 20, 2002	• Denomination of food sale. • Ingredient list. • Liquid contents. • Origin identification. • Name or corporate name and address of the importer in the case of imported food. • Batch identification. • Expiration date. • Information that may mislead the consumer. • Language in Portuguese. • Font size.

Chart 1. Criteria based on current legislation for the labeling checklist of cereal-based infant foods evaluated in the study. (Continues)

Current Brazilian Legislation	Checklist Items
Ordinance No. 36, of January 13, 1998 Ordinance No. 34, of January 13, 1998	• Illustrations, photos, images of early-childhood children or other humanized figures. • Phrases or expressions that raise doubts about the ability of mothers to breastfeed their children. • Sales designation according to the composition (simple, mixed or compound cereal). • Warning phrase highlighted and bold: "This product should not be used in infant feeding in the first nine months of life", when the product contains cocoa in its formulation. • Instructions on its preparation and use, as well as its storage and conservation, before and after opening the package, when applicable, on the label or leaflet that comes with the product. • When dealing with food to be consumed by adding liquid, the list must be headed by the indication "ingredients after preparation", which cannot include added liquid ingredients.
RDC No. 40, of February 08, 2002	• Warning: “Contains gluten” / “Gluten-free”.
RDC No. 222, of August 5, 2002 Law 11.265 of January 3, 2006	• Expressions or denominations that identify the product as more suitable or preferable for feeding infants younger than 6 months. • Use of information that may induce the use of products due to a false concept of advantage or security. • Warning phrase: "The Ministry of Health warns: This product should not be used for children under the age of six (6) months of age, unless expressly indicated by a doctor or nutritionist. Breastfeeding prevents infections and allergies and is recommended up to two (2) years of age or older". • Information on the front panel of the labels of these products the age from which they can be used. • Promotion of cereals that can be given by bottle.
RDC No. 360, of December 23, 2003	• Nutrition table formatting. • Declaration of energy value, carbohydrates, proteins, total fats, saturated fats, trans fats, fibers and sodium. • Percent Daily Value (%DV) statement. • Portion statement. • Home measurement statement.

For each item on the checklist, cereal-based infant foods were classified as “compliant”, when the labeling met the standards of current legislation, and “non compliant” when the labeling was in disagreement with current legislation and also, “does not apply”, when the food did not fit the item in question.

In the evaluation of the nutritional composition, the moisture content, ash, proteins, carbohydrates and lipids were determined according to the analytical methods of the AOAC (Association of Analytical Chemists)[24] and all analyses were carried out in triplicates at the Laboratory of Bromatology of Universidade Federal de São Paulo – *Campus* Baixada Santista. The study variables were analyzed using the Paired *t* Test and the Signed Rank Test. Epi Info software - version 7.2.2.16 was used.[25] For all tests, the level of rejection of the null hypothesis was set at ≤0.05 or 5%. The study was approved by the Research Ethics Committee of the Federal University of São Paulo, under number CAAE 4468051217.

RESULTADOS

Of the 72 cereal-based infant foods, 36 (50%) are cereal-based infant foods, 24 (33.3%) are mixtures for preparing porridge and 12 (16.7%) are cereal flour.

The descriptive analysis of items in compliance and non-compliance, regarding labeling in relation to Brazilian food legislation, is presented in Table 1. All groups showed some non-compliance. Among the analyzed groups, the categories mixture for the preparation of porridge and cereal flour had the highest number of non-compliant items (n=5) compared to the category of cereal for infant feeding (n=2).

Table 1. Descriptive analysis of according to and nonconforming items in relation to the labeling of foods intended for infant feeding. Sao Paulo, 2019.

	Cereal for baby food				Mix for porridge				Cereal flour			
	ACCORDING TO		NONCONFORMING		ACCORDING TO		NONCONFORMING		ACCORDING TO		NONCONFORMING	
	n	%	n	%	n	%	n	%	n	%	n	%
Warning about the presence of gluten	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Storage and conservation	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Net content	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
False concept of advantage	0	0,0	36	100,0	6	25,0	18	75,0	0	0,0	12	100,0
Mandatory warning phrases from the Ministry of Health	36	100,0	0	0,0	6	25,0	18	75,0	0	0,0	12	100,0
Illustrations, photos, images of children or humanized figures	19	52,7	17	47,2	0	0,0	24	100,0	0	0,0	12	100,0
Age indication	36	100,0	0	0,0	6	25,0	18	75,0	0	0,0	12	100,0
List of ingredients after preparation	36	100,0	0	0,0	6	25,0	18	75,0	0	0,0	12	100,0
Batch and validity	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Origin	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Presence of nutritional information	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Font size and language	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Using the product with milk and not water	36	100,0	0	0,0	24	100,0	0	0,0	12	100,0	0	0,0
Minimum value of nonconforming			0				0				0	
Maximum value of nonconforming			36				24				12	

It was found that among the cereal for infant feeding group, 47.2% (17/36) of the foods showed non-compliance regarding the presence of illustrations, photos, images of early-childhood children or other humanized figures. Regarding the display of expressions that may induce the use of the product based on the false concept of advantage or safety, it was observed that 100% of the samples were non-compliant because they presented expressions, such as: "*it may contribute to healthy growth and development"; "My 1st cereal".*

Regarding the labeling of products categorized as mixtures for the preparation of porridges, 75% (18/24) of the samples showed non-compliance regarding the presence of a false concept of advantage and safety, illustrations not allowed, absence of mandatory warnings, list of ingredients after the preparation and, not presentation of the minimum age for consumption of the product. Among the expressions with allegation of false concept of advantage, the following was observed: "*Much more health"; "it contributes to a balanced diet".*

As for the non-compliant illustrations, images of giraffes, cows and humanized bears were observed. The category of products like cereal flour was the one with the highest number of non-compliance items with Brazilian legislation. One hundred percent (12/12) of foods in this category showed non-compliance because they did not declare the list of ingredients on their labels after preparation; presence of humanized figures and images of early-childhood children; presence of phrases with a false concept of advantage and security, such as, *"Nutrition grade 10"*, in addition to the absence of the mandatory warning phrase and also, the absence of an indication of the ideal age for consumption of the product. In addition to the items already highlighted, 100% of the cereal flour samples did not have a list of ingredients on their labels after preparation, that is, after adding liquids.

Advertising and/or advertising aimed at children was observed on all analyzed labels, however, in 75% of the mixture samples for the preparation of porridges and 100% of the cereal flour samples did not contain information on the front panel of the label about the age from which they can be used. In addition, the stated energy recommendations on the labels of all evaluated products were based on the needs of the adult population.

Regarding the nutritional composition of cereal-based infant foods and according to the list of ingredients declared on the label, simple carbohydrates were presented in higher concentrations, according to the ordering criterion. Among them prominently are rice flour, corn flour, cereal flour (wheat, barley, oats and rice), wheat flour and sugar. The list of ingredients of all samples was presented in accordance with the legislation, as well as the declaration of macro and micronutrients, in addition to the percentage of recommended daily energy value.

The bromatological analysis, when compared with the label, showed statistically significant differences between the macronutrient contents declared on the labeling of foods in the categories cereal for baby food and mixture for the preparation of porridges (Table 2).

Table 2. Nutritional composition of macronutrients (g/100 g) and energy (Kcal/100g) of cereal-based infant foods according to bromatological analysis and labeling. São Paulo. 2019.

		Bromatological Analysis	Labeling	p
Cereal for baby food (N = 36)	Proteins (g)	7.3 ± 2.1	6.5 ± 1.2	**0.015***
	Lipids (g)	2.6 ± 1.8	0.0 ± 0.0	**<0.001***
	Carbohydrates (g)	84.7 (83.3 87.1)	81.8 (80.9 85.7)	**0.013#**
	Energy (Kcal)	389.2 (383.9 399.6)	369.8 (354.5 371.2)	**<0.001#**
Mix for porridge (N = 24)	Proteins (g)	6.3 ± 3.3	5.2 ± 3.3	**<0.001***
	Lipids (g)	4.8 (1.9 5.6)	0.00 (0.00 0.00)	**<0.001#**
	Carbohydrates (g)	85.4 ± 4.4	87.5 ± 2.5	**<0.001***
	Energy (Kcal)	399.3 ± 11.6	377.5 ± 10.5	**<0.001***
Cereal flour (N = 12)	Proteins (g)	12.7 ± 0.7	12.0 ± 0.6	**0.050***
	Lipids (g)	4.4 (3.8 11.3)	6.3 (6.3 6.3)	0.850#
	Carbohydrates (g)	78.3 (72.7 79.0)	75.0 (73.3 76.6)	0.569#
	Energy (Kcal)	404.8 (400.2 441.4)	405.0 (400.0 410.0)	0.092#

*Teste t pareado (média±DP);
Signed Rank Test (mediana; p25 e p75)

The cereal category for infant feeding showed an average of 7.3g/100g of protein while the label had an average of 6.5g/100g, this result being statistically different (p=0.015). The carbohydrate content also showed different medians, being 84.7g/100g according to the bromatological analysis, against 81.8g/100g found on the label (p=0.013). The same result behavior was observed for the energy content, whose bromatological analysis showed a median of 389.2 Kcal/100g and the labeling showed a median of 369.8 Kcal/100g, being statistically significant (p<0.001).

Among the products in the mixture category for porridge preparation, the protein contents were also different according to chemical analysis and labeling, being, respectively, 6.3g/100g and 5.2g/100g ($p<0.001$). The same occurred with carbohydrate contents, with averages of 84.5g/100g observed in the bromatological analysis and 87.5g/100g on the label ($p<0.001$). The energy content also showed a statistically significant difference, with averages of 399.3Kcal/100g according to laboratory analysis and 377.5Kcal/100g found on the label ($p<0.001$).

The groups of cereal for infant feeding and mixture for preparing porridge showed the greatest variation in the concentration of lipids, with statistically significant results ($p<0.001$). On the labeling of products in these categories, the lipid content found was 0.00g/100g, against 2.6g/100g for the category of cereal for baby food and 4.8g/100g for the category of mixture for preparing porridge.

The bromatological analysis of the cereal flour category showed a statistically significant difference, only for the protein content ($p=0.05$), in relation to the labeling. The lipid contents found on the labels and in the bromatological analysis were practically the same and showed no statistical difference ($p=0.850$). The same occurred with the results of carbohydrates ($p=0.596$) and energy ($p=0.092$).

DISCUSSION

It is important to emphasize that cereal-based infant foods have different sales denominations, which in itself constitutes a confusion factor for the consumer, since they are products with similar physical characteristics and nutritional composition, with the same nature (based on cereals), aimed at infants and early-childhood children.

As for the expressions that are non-compliant and are present on the label, they imply that the referred products are complete and that their consumption contributes to the growth and development of the child, which in turn is false, given that such aspects depend on many other factors and not only on the consumption of a certain product. Furthermore, when the manufacturer mentions that its product is the first cereal to be consumed by infants and young children, the right to healthy food, the choice of other in natura or minimally processed foods, which are also based on cereals, is transgressed.

Legal non-conformities regarding the use of prohibited phrases and illustrations have already been described in studies by Brito et al.,[16] Silva, Dias & Ferreira,[27] Silva, Nomelini & Pascoal.[28] In these studies, the authors observed illustrations of early-childhood children, humanized figure of a teddy bear crawling or walking, and humanized little giraffes. These authors also observed the following non compliance expressions: "*The porridge that helps your child grow*"; "*Its exclusive formula has ideal ingredients for your child to grow strong and health.*"

According to the Ministry of Health[18] and the technical regulations of ANVISA,[19] foods intended for early-childhood children must have three mandatory phrases: 1st) "*The Ministry of Health warns: this product should not be used for children younger than 6 months, unless expressly indicated by a doctor or nutritionist*"; 2nd)"*Breastfeeding prevents infections and allergies and is recommended up to two years of age or older*" and; 3rd)" *The Ministry of Health warns: after six months, continue breastfeeding your child and offer new foods*". It is important to emphasize that the presence of these mandatory phrases on the label aims to avoid interference in the practice of breastfeeding and to promote control of indiscriminate advertising of foods that compete with breastfeeding.

In the study carried out by Silva et al.[28] the labeling of cereal-based foods for infant feeding was analyzed and it was observed that 100% of the products (n=13) did not have the mandatory child protection phrases. If we consider that the target audience of the analyzed foods are infants and early-childhood children, it is extremely important that the product label presents the minimum age for consumption, in order to guarantee the food and nutritional security of this population. The study carried out by Britto et al.[16] corroborates our results and also reveals that even though the ideal age range for consumption is not indicated, these products are advertised to encourage their use by children. Furthermore, it is important to emphasize that although the presence of nutritional information on the labels was in conformity and there was advertising for children, the nutritional recommendations present on the labels of all evaluated samples were based on the energy recommendation of adult individuals, which hurts the consumer's right to information and puts the child in a situation of vulnerability and food and nutritional insecurity.

Regarding the list of ingredients after preparation, Silva et al.,[27] found 38.5% of non-compliance in the analysis of their samples, while Britto et al.,[16] found non-compliance in 20% of the analyzed products.

As for the nutritional composition of these products, considering that they are cereal-based foods, high concentrations of carbohydrates are expected. In the samples analyzed, this macronutrient exceeded 80% of the total energy value of the product. However, it should be noted that the manufacturers of these products may have samples and bromatological analyzes with methodologies different from those used by us, which would support the information found on the labels.

However, here is an alert for the excess of refined sugar in the composition of these products as highlighted in the list of ingredients, mainly for those responsible for feeding children and health professionals who provide medical and nutritional assistance to this public. In addition, it is important to emphasize that these food categories are increasingly included in children's meals, with a frequency that varies between five or more times a day, being introduced into children's diets earlier.[29]

Long-term effects on child growth and development such as overweight and deficiency of micronutrients such as iron and zinc, may be associated with the consumption of these products, as observed in other studies.[5,29,30]

Another important highlight is due to the fact that one of the analyzed products contained probiotics in its formulation, as stated on the label. The addition of probiotics in the context of the product and in the form of consumption still requires investigation, feasibility and functionality studies. However, Shah & Ravula,[31] studying the count of probiotic bacteria (*Lactobacillus acidophilus* and *Bifidobacterium spp*) in yogurts that were made with skimmed milk and reconstituted with 0, 4, 8, 12 or 16% of sucrose, alert to the fact that the addition of sugar can be deleterious to the growth of microorganisms, such as probiotic bacteria in products containing for around 16% of sugar, because this process is influenced by the reduction of water activity and acidification time. Although the study was carried out with a product other than cereals, the method of preparing the porridge is similar to the technique used (dilution of the product in milk and reconstitution in sugar).

Regarding the limitations of the analytical methods used to support the determination of product compliance with regulatory requirements, a recent study pointed out that changing the composition of products with additions of optional ingredients challenges the performance of test methodologies. These authors suggest that new analytical methodologies that can show greater selectivity, specificity and sensitivity can provide results that support the assessment of regulatory compliance.[32] Thus,

despite the differences in the method of bromatological analyses and the sample size, which may constitute limitations of the present study, in addition to the fact that Brazilian legislation aimed at foods marketed to children has been published for a considerable time, the results found by us, reinforce the need for greater supervision by government agencies, with a view to compliance and regulation of laws, as well as the punishment of those who violate them.

The non-conformities found on cereal-based infant food labels put the child population in a situation of vulnerability and food insecurity, since labeling, in addition to being a vehicle of communication between the industry and the consumer, also serves as an instrument to direct the guidelines provided by health professionals.

Despite the existence of specific regulations for infants and young children, what is observed is that industries have not yet adapted to legislation. Important requirements such as the presence of mandatory phrases, prohibition of the use of humanized illustrations and allegations of false concept of advantage are still not respected. Facts like these are corroborated with the findings by Pereira et al.,[33] who states that regulatory bodies are delegitimized by the industry, being associated with the state's difficulty in supervising, evaluating and punishing infractions, which negatively impacts regulatory advances.

In this context, although the new frontal nutritional labeling was released after the execution of this study, authors already suggested that capturing the consumer's attention is influenced by the color, image or text presentation, position and symbol used on the label.[34] In studies that evaluated the consumer's perception of the frontal nutrition labeling model, they identified this new standard as reliable, easy to see and interpret to improve the understanding of the nutritional content of foods.[17,35]

That said, it is worth noting that the present study has the strengths of guiding professional actors in comprehensive child care and allowing improvements in the elaboration of the labeling of ultra-processed products, as has been discussed in public health agendas. On the other hand, the sample size, as well as the different analytical methods, can be considered as limitations of the present study, however, they can drive the improvement of new studies in the field of infant feeding.

CONCLUSION

In view of the results found, it is possible to conclude that even in the presence of specific legislation, we still find legal non-conformities in the labeling of infant foods based on cereals, and the analyzed samples have a different nutritional composition from the information presented on their labels, negatively impacting children's food security.

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