


 Mariana Balestrin<sup>1</sup>  
 Carla Cristina Bauermann  
Brasil<sup>2</sup>  
 Vanessa Ramos Kirsten<sup>3</sup>  
 Mario Bernardes Wagner<sup>1</sup>

<sup>1</sup> Universidade Federal do Rio Grande do Sul, Programa de Pós-Graduação em Saúde da Criança e do Adolescente. Porto Alegre, RS, Brasil.

<sup>2</sup> Universidade Federal de Santa Maria, Curso de Nutrição. Palmeira das Missões, RS, Brasil.

<sup>3</sup> Universidade Federal de Santa Maria, Programa de Pós-Graduação em Saúde e Ruralidade. Palmeira das Missões, RS, Brasil.

#### Correspondence

Vanessa Ramos Kirsten  
kirsten.vr@gmail.com

This article is part of a thesis entitled “Efeito de um programa de intervenção na implementação de cantinas escolares saudáveis: um estudo controlado randomizado”, authored by Mariana Balestrin, under the guidance of Mario Bernardes Wagner and co-guidance of Vanessa Ramos Kirsten, defended on March 19, 2021, Graduate Program in Child and Adolescent Health, *Universidade Federal do Rio Grande do Sul* (Federal University of Rio Grande do Sul).

*Funding:* Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq – Brazilian National Council for Scientific and Technological Development) and Ministério da Ciência, Tecnologia, Inovações e Comunicações (MCTIC – Ministry of Science, Technology, Innovations and Communications) – CNPq/MCTIC 016/2016 Call-Food and Nutrition Security (FNS).

## School canteens of Rio Grande do Sul, Brazil: profile diagnosis and adequacy to the Healthy School Canteens Law

### *Cantinas escolares saudáveis no Rio Grande do Sul, Brasil: diagnóstico e adequação à legislação*

#### Abstract

**Introduction.** School canteens are associated with a greater probability of consuming industrialized/ultra-processed foods by schoolchildren. **Objective** To analyze the profile, health risk and adequacy of the Healthy School Canteens Law in Rio Grande do Sul. **Methods.** This is a cross-sectional study carried out at public and private school canteens. School characterization and the functioning profile of school canteens were assessed through a questionnaire applied to school canteen owners and school principals. To assess health risk, a checklist of Ordinance 817 of May 2013 was applied, consisting of 51 items, allocated in nine categories. To assess Law 15,216 of June 2018, a checklist was prepared based on the eight guiding articles of the Healthy School Canteens Law. **Results.** Of the 337 schools assessed for eligibility, only 31 (9.19%) reported the presence of a school canteen. Of these, 63.0% belonged to public institutions; 70.4% provided school meals and had an outsourced system; and only 7.4% had nutritionists in the canteens. Regarding compliance with Law 15,216 of July 30, 2018, in Rio Grande do Sul, there was a high percentage of non-conformities, with a low supply of natural foods and a high supply of ultra-processed foods, in addition to the low percentage of employees trained in good handling practices. As for health risk, 92.6% of the canteens did not have minimum requirements for operation. **Conclusion.** The expressive majority of the assessed canteens present high inadequacy of commercialized food and unsatisfactory health risk.

**Keywords:** School Feeding. Snacks. Legislation, Food. Food Hygiene. School Health Services

#### Resumo

**Introdução.** As cantinas escolares estão sendo associadas a uma maior probabilidade de consumir alimentos industrializados/ultraprocessados pelos escolares. **Objetivo.** Analisar o perfil, o risco sanitário e a adequação a legislação de Cantinas Saudáveis do Rio Grande do Sul. **Métodos.** Trata-se de um estudo transversal realizado em cantinas de escolas da rede pública e privada. A caracterização da escola e o perfil de funcionamento das cantinas escolares foram avaliados através de um questionário aplicado com os responsáveis pela cantina escolar e diretores das escolas. Para a avaliação do risco sanitário, foi aplicado um *check-list* da Portaria n. 817, de maio de 2013, composta por 51 itens, distribuídos em nove categorias. Para a avaliação quanto à Lei 15.216, de junho de 2018, elaborou-se um *check list* com base nos oito artigos orientativos da lei. **Resultados.** Das 337 escolas avaliadas por elegibilidade, apenas 31 (9,19%) informaram a presença de cantina escolar. Destas, 63,0% pertenciam a instituições públicas, 70,4% distribuíam alimentação escolar e possuíam sistema terceirizado e apenas 7,4% possuíam nutricionistas nas cantinas. Quanto à adequação

a Lei 15.216, de 30 de julho de 2018, Rio Grande do Sul, observou-se alto percentual de não conformidades, com baixa oferta de alimentos *in natura* e alta oferta de alimentos ultraprocessados, além do baixo percentual de colaboradores capacitados em boas práticas de manipulação. Quanto ao risco sanitário, 92,6% das cantinas não possuíam requisitos mínimos para o funcionamento. **Conclusão.** A expressiva maioria das cantinas avaliadas apresenta alta inadequação dos alimentos comercializados e risco sanitário insatisfatório.

**Palavras-chave:** Alimentação Escolar. Lanches. Legislação sobre Alimentos. Higiene dos alimentos. Serviços de Saúde Escolar

## INTRODUCTION

Schools are the ideal environment to promote and reinforce healthy behaviors among children and adolescents, as they spend a large part of their day there.<sup>1,2</sup> There are some barriers to adopting healthy practices in these spaces,<sup>3</sup> due to the high availability of ultra-processed foods sold in school canteens, in foods brought for snacks and in the school environment.<sup>3-6</sup>

Data from the Brazilian National School Health Survey show that the percentages of foods considered unhealthy consumed by schoolchildren on five or more weekdays are high. Sweet consumption (sweets, candies, chocolate bars, chewing gums, chocolate truffles, or lollipops) reached 41.6%, ultra-processed savory products, 31.3%, soft drinks, 26.7%, and fried snacks, 13.7%. This research also points out that 90% of respondents had access to foods considered unhealthy and less than half had access to healthy foods.<sup>7</sup>

According to Noll et al., school canteens were associated with a higher probability of consuming industrialized/ultra-processed foods by Brazilian adolescents.<sup>8</sup> For this reason, states and municipalities have been drafting technical-orientation legislation across the country, in order to improve the nutritional quality of food sold in canteens, encompassing nutritional and hygienic-health aspects and encouraging the formation of healthy eating habits.<sup>9-13</sup>

Although there are normative instruments regulating the food to be sold in canteens, studies show non-compliance with legislation.<sup>3,6,14-18</sup> In addition to food supply quality, there is also a concern with food safety, as foodborne diseases continue to be a serious public health concern.<sup>19</sup>

The state of Rio Grande do Sul had its first law on healthy school canteens enacted on August 16, 2008, which dealt with the sale of snacks and beverages in schools across the state.<sup>20</sup> Ten years later, there was the creation of a new Law 15,216 of July 30, 2018, which provides for the promotion of healthy eating and prohibits the sale of products that contribute to obesity, diabetes and hypertension in canteens and the like in public and private schools in Rio Grande do Sul.<sup>21</sup> However, only with Decree 54,994 of January 17, 2020, Law 15,216 was regulated.<sup>9</sup>

In this regard, knowing the canteen profile, health risk and compliance with current legislation in these establishments are a necessary diagnosis to support intervention and inspection actions, in addition to creating tools to help them adapt to existing legislation. Thus, this study aimed to analyze the profile of school canteens, investigate their health risk and compliance with the Healthy School Canteens Law of Rio Grande do Sul.

## METHODS

This is a cross-sectional study carried out at public and private elementary and high school canteens, located in northern and northwestern Rio Grande do Sul (RS), from March to April 2019. This region is made up of 36 municipalities, of which 17 have a population of less than five thousand inhabitants (12 have 5-20 thousand; 4 municipalities have 20-50 thousand inhabitants; and only 2 municipalities with a population between 60-80 thousand inhabitants), and are in a situation of social vulnerability, with an average HDI of 0.720.<sup>22-24</sup>

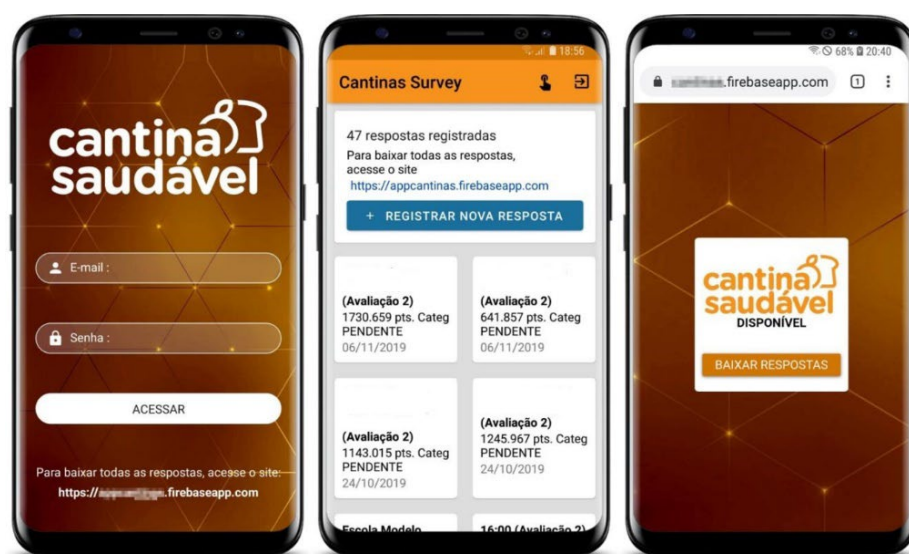
To define the sample, a survey of the number of schools and relevant information (name, zone, sphere, education level, contact telephone, e-mail and address) was carried out through the website

of the State Department of Education of Rio Grande do Sul.<sup>25</sup> Confirmation of existing data and identification of schools with the presence of canteens were verified by standardized telephone calls to schools between June 2018 and February 2019.

Schools were eligible to participate in the study when they had a physical sales structure in the form of a school canteen and the owner accepted to participate in the research by signing the Informed Consent Form. Schools with exclusive services for children with special needs were excluded. Data collection was carried out on-site by two researchers with a degree in nutrition and previously trained.

Data entry of all collection instruments was performed through the *Cantinas Survey* mobile application, developed for this research, in order to assist in information collection, analysis, interpretation and monitoring. The application generated a file in Excel® spreadsheet format, with all the data collected. Subsequently, the data in the spreadsheet were manually coded to facilitate statistical analysis. The *Instituto Nacional da Propriedade Industrial* (Brazilian National Institute of Industrial Property) granted software registration number BR512019002503-2. The mobile application can be seen in Figure 1.

Figure 1. Illustration of the home screens and logo of the *Cantinas Survey* app, 2019.



Source: Prepared by the author, 2022.

For the characterization of the school canteen profile (type of management, teaching modality, number of students, presence of school meals, type of canteen management, number of people working at the canteen, place where snacks are produced, aspects involved with the choice of food offered, presence of other types of food sales in schools and presence of a nutritionist), a questionnaire prepared by Giacomelli et al.<sup>18</sup> and Porto<sup>26</sup> was applied to school canteen owners and school principals. The questionnaire consisted of 12 multiple-choice closed-ended questions.

To assess health risk degree, a validated instrument,<sup>27-29</sup> developed based on Normative Ordinance 817, published on May 10, 2013 by the Ministry of Health, was used.<sup>30</sup> The classification of school canteens in terms of

health risk followed the recommendations of Resolution 10 of March 11, 2014.<sup>31</sup> This assessment took place through an on-site inspection, carried out by a trained nutritionist, using the Assessment List for Categorization of Food Services checklist.

The checklist consists of 51 items, allocated in nine categories, namely: 1) water supply; 2) structure; 3) cleaning of facilities, equipment, furniture and fixtures; 4) control of vectors and urban pests; 5 food handlers; 6 raw material, ingredients and packaging; 7 food preparation; 8) storage, transportation and display of prepared foods; 9. liability, documentation and registration. Each item could be classified as “Adequate”, “Inadequate” or “Not applicable” to current legislation.

Health risk assessment consists of a continuous scoring system that ranges from zero (least severe) to 2,498.89 (most severe). The score is awarded when the assessed canteen does not meet some of the requested requirements; therefore, the higher the score, the greater the number of non-conformities verified and, consequently, the greater the health risk and the possibility of food outbreaks.<sup>32</sup> The scores for each of checked items are defined based on risk criteria, in order to identify those that have the most direct impact on food quality and consumers' health. In the score, the impact index is used, representing the importance in the prevention of foodborne diseases (FBDs), as well as the factor loading of the items, as validated.<sup>27-29</sup>

To assess the adequacy of canteens to state legislation, a checklist was prepared based on the requirements of the Healthy School Canteens Law 15,216, which provides for the promotion of healthy eating and prohibits the sale of products that contribute to obesity, diabetes and hypertension in canteens and the like in public and private schools in Rio Grande do Sul.<sup>21</sup>

The following criteria were analyzed, based on the law guiding articles: administration by a person trained in hygienic-health aspects (Article 3); presence of candies, lollipops, chewing gum, sandwich cookies (Article 4); soft drinks and artificial juices (Article 4); industrialized snacks (Article 4); fried foods in general (Article 4); industrialized popcorn (Article 4); sale of at least two fresh seasonal fruit varieties, whole or in pieces, or in the form of juice (Article 4); advertising in the school environment (Article 4).

Simple descriptive statistics were performed to describe the characteristics of participating schools (mean;  $\pm$ standard deviation, frequencies and percentages). Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.0. For comparison of proportions, chi-square test and Fisher's exact test were used, and for the medians of health risk, the Mann-Whitney test was used. Statistically significant differences were considered when  $p < 0.05$ .

This study was submitted to the *Comissão de Pesquisa da Faculdade de Medicina* (COMPESQ-FAMED - Research Committee of the Faculty of Medicine), approved by the Research Ethics Committee of the *Universidade Federal do Rio Grande do Sul* (UFRGS - Federal University of Rio Grande do Sul), under CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 89504618.9.0000.5347, registered in the *Registro Brasileiro de Ensaios Clínicos* (REBEC - Brazilian Clinical Trial Registry) RBR-9rrqhk

## RESULTS AND DISCUSSION

Of the 337 schools selected for eligibility, only 9.19% ( $n=31$ ) had a school canteen, 20 accepted to participate in the research and 11 were excluded (7 were disabled and 4 did not sign the Informed Consent Form). Of the 27 canteens assessed, 63.0% ( $n=17$ ) belonged to public educational institutions (municipal and state), and 51.9% ( $n=14$ ) had 500 or more students with active enrollment. The majority, 70.4% ( $n=19$ ), provided school meals

through the *Programa Nacional de Alimentação Escolar* (PNAE - Brazilian National School Feeding Program), as shown in Table 1.

**Table 1.** Characteristics of school canteens in northern and northwestern Rio Grande do Sul (n=27, 2019). Brazil, 2019.

Characteristics	n (%)
School scope	
Public (municipal, state or federal)	17 (63.0)
Private	10 (37.0)
Students with active enrollment	
≥ 500 students	14 (51.9)
< 500 students	13 (48.1)
Canteen administration	
Outsourced	19 (70.4)
By the school itself	8 (29.6)
Participation in PNAE	
Yes	19 (70.4)
No	8 (29.6)
Number of employees	
1 or 2	19 (70.4)
3 or 4	7 (25.9)
≥ 5	1 (3.7)
Employees trained in good handling practices	
Yes	3 (11.1)
No	24 (88.9)
Main place of production of snacks	
Purchased from suppliers	12 (44.4)
In the canteen and suppliers	6 (22.2)
In the canteen itself	4 (14.8)
Others	4 (14.8)
In the canteen staff's house	1 (3.7)
Presence of nutritionist in the canteen	
No	25 (92.6)
Yes	2 (7.4)
Health permit	
Yes	3 (11.1)
No	24 (88.9)
Aspects observed in the choice of foods offered*	
What students say they like	24 (88.9)
What sells most	21 (77.8)
What the school requires	12 (44.4)
What you know/can produce/acquire	11 (40.7)
In the profitability percentage	10 (37.0)
Others	4 (14.8)

\*Respondents could choose more than one option.

Source: Prepared by the authors, 2022.

The results of this study showed a low presence of canteens in schools in the region assessed, when compared to other studies,<sup>18,33</sup> which can be attributed to several factors, such as the region with a small number of inhabitants per municipality and, consequently, schools with fewer students and low purchasing power, when

compared to larger cities.<sup>18,33</sup> Studies on the characterization of food sales in the school environment were carried out in capital cities, the Federal District<sup>15,33-37</sup> and in midsize and large cities.<sup>3,18,38,39</sup>

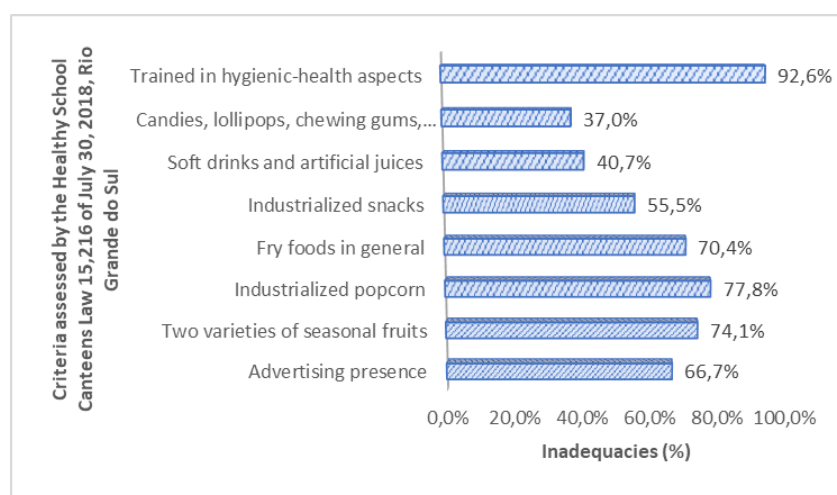
The high frequency of outsourced management, present in this study, corroborates studies carried out in the states of Santa Catarina, Rio Grande do Sul and Paraná.<sup>18,33,34,40</sup> Wognski<sup>6</sup> and Porto<sup>34</sup> report that outsourced services offered by school canteens do not show the effective participation of school management both in the choice of food offered and in actions aimed at the formation of healthy eating habits in a school environment. The presence of this system seems to facilitate canteen owners' decision-making power on what will be offered.<sup>6,15</sup>

The low interference of schools in the choice of food offered may be an interesting point to be discussed, since schools may tend to exempt themselves from such responsibility in the presence of outsourced canteens. It is worth noting that the Southern State Decree 54,994 of January 17, 2020<sup>9</sup> recommends that actions related to healthy eating promotion should involve the entire school community.

The assessed canteens had small physical spaces, with characteristics of domestic kitchens, which favored the small number of employees found. This fact also seems to influence the choice of food not prepared on-site, reducing labor costs<sup>6</sup> as a strategy to increase profit,<sup>41</sup> which promotes the commercialization of ultra-processed foods.

The present study analyzed the food trade adequacy in canteens, according to the state law of Rio Grande do Sul, in schools located in the countryside. The most frequent inadequacies were lack of training in good handling practices (92.6%; n=25), sale of industrialized popcorn in canteens (77.8%; n=21) and lack of commercialization of at least two varieties of fresh fruit (74.1%; n=20). The lowest percentages of inadequacy comprised the sale of soft drinks and artificial juices (40.7%; n=11), and candies, lollipops, chewing gums and sandwich cookies (37.0%; n=10) (Figure 2).

**Figure 2.** Inadequacies of canteens assessed according to state legislation, Rio Grande do Sul, 2019 (n=27)



Source: Prepared by the authors, 2022.

The sale of soft drinks was higher in self-managed schools, which can be explained by the presence of a contract between schools and outsourced canteens, prohibiting the sale of soft drinks in these places. Laws that restrict soft drinks in schools have been linked to a decrease in the availability of sales in more developed regions.<sup>42</sup>

State legislation 15,216 of July 30, 2018 establishes that the recommendations are for all schools, regardless of whether they are public or private. The differences found are due to characteristics that these factors condition to the place. In the private network, contracts are formal and face a higher level of competition. Furthermore, parents usually demand a certain standard of quality, more related to variety and appearance than to health.<sup>42,43</sup>

From the point of view of the quality of food sold in educational institutions, only fruit sales were higher in private schools. This difference was also observed in other studies.<sup>6,18,33</sup> However, the authors point out that the occurrence of foods considered unhealthy was also higher in private institutions.<sup>18,33</sup>

High inadequacy in the commercialization of ultra-processed foods was observed. Moreover, aspects that would denote the possibility of offering healthy food in these schools, due to the availability of fresh fruit, were present in only 25.9% of assessed canteens. It was evidenced, therefore, that most canteens presented environment that promotes unhealthy eating habits, corroborating Willhelm et al.,<sup>36</sup> Wognski et al.,<sup>6</sup> Gabriel et al.<sup>33</sup> and Machado et al.,<sup>15</sup> who suggest that school canteens are an obesogenic environment.

The debate around the regulation or adoption of measures that can transform school canteens into places that guarantee healthy food and meal supply, especially with regard to the increase in natural or processed foods and the restriction of ultra-processed foods, has taken on an international dimension.<sup>44-47</sup>

When comparing legislation adequacy with the type of administration and school scope, fruit supply was higher in private schools ( $p=0.04$ ), and the presence of soft drinks was statistically higher ( $p=0.033$ ) in self-managed canteens (managed by the schools themselves) (Table 2).



**Table 2.** Assessment of school canteens according to state legislation, comparing school scope and administration, 2019 (n=27). Brazil, 2019.

Items assessed	Total	Public (n=17)	Private (n=10)	p- value	Self-managed (n=8)	Outsourced (n=19)	p- value
	n (%)	n (%)	n (%)		n (%)	n (%)	
Canteen administered by a person trained in hygienic and health aspects*	2 (7.4)	1 (50.0)	1 (50.0)	1.000	0 (0.00)	2 (100)	1.000
Sale of candies, lollipops, chewing gums, sandwich cookies*	10 (37.0)	5 (50.0)	5 (50.0)	0.415	5 (50.0)	5 (50.0)	0.102
Sale of soft drinks and artificial juices*	11 (40.7)	5 (45.5)	6 (54.4)	0.224	6 (54.5)	5 (45.5)	0.033
Sale of industrialized snacks*	15 (55.5)	7 (46.7)	8 (53.3)	0.107	5 (33.3)	10 (66.7)	0.696
Sale of fried foods in general*	19 (70.4)	10 (52.6)	9 (47.4)	0.190	7 (36.8)	12 (63.2)	0.364
Sale of industrialized popcorn*	21 (77.8)	12 (57.1)	9 (42.9)	0.363	7 (33.3)	14 (66.7)	0.633
Sale of two varieties of seasonal fruit*	7 (25.9)	1 (14.3)	6 (85.7)	0.04	1 (14.3)	6 (85.7)	0.633
Presence of advertising in the school environment*	18 (66.7)	10 (55.6)	8 (44.4)	0.406	7 (38.9)	11 (61.1)	0.201
Overall health risk score**	1242.1±399.1	1188.3±467.4	1333.5±238.6	0.44	866.2±401.6	1400.3±279.50	0.033

\*Chi-square Test \*\*Mann-Whitney Test

When assessed from the health point of view, of the 27 canteens, 92.59% (n=25) were classified as “pending” and the others in “Category C”. The “pending” classification means that the health quality of the products sold is unsatisfactory and does not have minimum operating requirements. The most unsatisfactory criteria were related to water supply, food handlers, physical structure and aspects of raw materials, ingredients and packaging of the products sold.

When comparing the general health risk score with the presence of a nutritionist (data not shown), canteen administration and school scope, there was a statistically significant difference only in the type of administration, as outsourced canteens had a higher score than self-managed canteens (p=0.033).

**Table 3.** Health risk degree of canteens assessed, Rio Grande do Sul, 2019 (n=27). Brazil, 2019.

<i>Health risk (Categories assessed)</i>	<i>Mean ± standard deviation</i>	<i>Median (p25 -p75)</i>
1. Water supply	57.66 ± 33.80	40 (33.3-100)
2. Structure	25.93 ± 35.00	0 (0 – 50)
3. Cleaning of facilities, equipment, furniture and utensils	7.78 ± 14.55	0 (0 -16.7)
4. Control of vectors and urban pests	18.51 ± 21.35	0 (0 -33.3)
5. Food handlers	30.83 ± 8.89	33.3 (33.3-33.3)
6. Raw material, ingredients and packaging	24.44 ± 34.63	16.7 (0 -33.3)
7. Food preparation	17.22 ± 17.20	13.4 (0 -33.3)
8. Storage, transportation and display of prepared food	9.35 ± 14.99	0 (0 -15.65)
9. Liability, documentation and registration	5.56 ± 21.18	0 (0 – 0)
Total score	1242.06 ± 399.09	1232.32 (1077.55-1552.29)

Source: Prepared by the authors, 2022.

Although state legislation focuses on promoting healthy eating in chronic disease prevention, in Article 3, it states that school canteens must be managed by a person trained in hygienic-health aspects relevant to the exercise of preparing and selling food. According to Wognski,<sup>40</sup> the lack of trained staff can also negatively impact food quality. The low presence of nutritionists as technical managers in assessed canteens may be one of the factors linked to the high inadequacy with current legislation, also reported in studies in Brazilian capitals.<sup>6,34,36</sup>

The term “healthy canteen” has been widely used with a claim to the type of food sold and little discussed in literature, regarding health risk analysis. This diagnosis can identify risks to students’ health, by compromising food safety and making them more susceptible to developing FBDs.<sup>32</sup> Unfavorable conditions compromise the food safety of foods sold.

Implementing educational programs for food handlers seems to be an important strategy to reduce the occurrence of FBDs,<sup>48</sup> but it needs to be better informed in legislation, since the public power needs to give conditions to this sector to receive training and define the service that will carry out the health inspection. The main problems in implementing quality control programs in food production are food handlers’ low education level, hygiene, lack of financial resources, inadequate equipment and physical conditions.<sup>49</sup>

Legislations that regulate the sale of food in a school environment lack clarity, objectivity and coherence regarding allowed and prohibited foods<sup>43</sup> and regarding the difficult understanding of what is a healthy food.<sup>6</sup> It is evident that, although there is no national legislation, there is great difficulty in complying with state laws, and the regulatory process needs consolidation and discussion by civil society in the country.<sup>50</sup>

## CONCLUSION

Although there is legislation in Rio Grande do Sul, there was a low adequacy of canteens assessed in relation to the Healthy School Canteens Law. The results show that the sale of unhealthy foods still persists in Brazil and the criteria established in legislation are not guaranteeing the sale of adequate and healthy foods.<sup>51</sup>

Schools should focus on a scenario with alternatives to increase the availability of healthy food and drinks.<sup>52</sup> Joint actions with family, school, health professionals, managers, among others, strengthen the effectiveness of these regulations, promoting a healthy environment.<sup>53</sup>

## REFERENCES

1. Singh A, Bassi S, Nazar GP, Saluja K, MinHae P, Kinra S, et al. Impact of school policies on non-communicable disease risk factors - a systematic review. *BMC public health*. 2017;17(1):292. doi:10.1186/s12889-017-4201-3
2. Foster GD, Sherman S, Borradaile KE, Grundy KM, Veur SSV, Nachman J, et al. A policy-based school intervention to prevent overweight and obesity. *Pediatrics*. 2008;121(4):e794-802. doi:10.1542/peds.2007-1365
3. Gabriel CG, Vasconcelos FDAG, Andrade DF, Schmitz BAS. First Law regulating school canteens in Brazil: Evaluation after seven years of implementation. *Archivos Latinoamericanos de Nutricion*. 2009;59(2):128-138. doi:http://ve.scielo.org/scielo.php?pid=S0004-06222009000200003&script=sci\_abstract&tlng=en
4. Bell AC, Swinburn BA. What are the key food groups to target for preventing obesity and improving nutrition in schools? *European Journal of Clinical Nutrition*. 2004;58(2):258-263. doi:10.1038/sj.ejcn.1601775
5. Filho JDL, Mendes LL. Comercialização de lanches e bebidas em escolas públicas: análise de uma regulamentação estadual. *Demetra: alimentação, nutrição & saúde*. 2016;4. doi:https://doi.org/10.12957/demetra.2016.19641
6. Wognski ACP, Ponchek VL, Dibas EES, Orso MR, Vieira LP, Ferreira BGCS, et al. Comercialização de alimentos em cantinas no âmbito escolar. *Brazilian Journal of Food Technology*. 2019;22. doi:https://doi.org/10.1590/1981-6723.19818
7. Brasil. Pesquisa Nacional de Saúde Do Escolar 2015. Instituto Brasileiro de Geografia e Estatística - IBGE; 2016.
8. Noll PR e. S, Noll M, de Abreu LC, Baracat EC, Silveira EA, Sorpreso ICE. Ultra-processed food consumption by Brazilian adolescents in cafeterias and school meals. *Scientific Reports*. 2019;9(1):7162. doi:10.1038/s41598-019-43611-x
9. Rio Grande do Sul. Decreto Nº 54.994, de 17 de Janeiro de 2020. Governador do Estado; 2020.
10. Paraná. Lei Nº 14.855, de 19 de outubro de 2005. Governador do Estado; 2005.
11. Rio de Janeiro. Lei Nº4.508, de 11 de janeiro de 2005. Governador do Estado; 2005.
12. Santa Catarina. Lei Nº 12.061, de 18 de dezembro de 2001. Governador do Estado; 2001.
13. São Paulo. Portaria Conjunta COGSP/CEI/DSE, de 23 de Março de 2005.; 2005.

14. Ferro ÉLBS, Mendes MGM, Alves K de O, Pereira CHC, Silva SC, Manochio-Pina MG. Cantina escolar e sua influência no estado nutricional. *Brazilian Journal of Development*. 2019;5:2525-8761. doi:10.34117/bjdv5n10-187
15. Machado CO, Höfelmann DA. Cantinas de escolas estaduais de Curitiba/PR, Brasil: adequação à lei de regulamentação de oferta de alimentos. *Ciência & Saúde Coletiva*. 2019;24:3805-3814. doi: <https://doi.org/10.1590/1413-812320182410.00272018>
16. Nathan N, Yoong SL, Sutherland R, Reilly K, Delaney T, Janssen L, et al. Effectiveness of a multicomponent intervention to enhance implementation of a healthy canteen policy in Australian primary schools: a randomised controlled trial. *International Journal of Behavioral Nutrition and Physical Activity*. 2016;13(1):106. doi:10.1186/s12966-016-0431-5
17. Reilly K, Nathan N, Wiggers J, Yoong SL, Wolfenden L. Scale up of a multi-strategic intervention to increase implementation of a school healthy canteen policy: findings of an intervention trial. *BMC public health*. 2018;18(1):860. doi:10.1186/s12889-018-5786-x
18. Giacomelli S de C, Londero A de M, Benedetti FJ, Saccol AL de F. Comércio informal e formal de alimentos no âmbito escolar de um município da região central do Rio Grande do Sul. *Brazilian Journal of Food Technology*. 2017;20(0). doi:10.1590/1981-6723.13616
19. de Freitas Saccol AL, Serafim AL, Hecktheuer LH, Medeiros LB, Silva EADJ. Food Safety in Feeding Services: A Requirement in Brazil. *Critical reviews in food science and nutrition*. 2016;56(8):1363-1369. doi:10.1080/10408398.2012.691917
20. Rio Grande do Sul. Lei Nº 13.027, de 16 de agosto de 2008. Governador do Estado; 2008.
21. Rio Grande do Sul. Lei Nº 15.216, de 30 de julho de 2018. Governador do Estado; 2018.
22. Deckert CT. Configuração do poder no Codeter: uma análise do Território da Cidadania Noroeste Colonial-RS. *Redes - Santa Cruz do Sul: Universidade de Santa Cruz do Sul*. 2017;22. doi:<http://dx.doi.org/10.17058/redes.v22i1.5259>
23. Deckert CT, Allebrandt SL. A efetividade da cidadania no programa Territórios da Cidadania: um estudo de caso do noroeste colonial do Rio Grande do Sul. *Amazônia, Organizações e Sustentabilidade*. 2013;2:2238-8893. doi:<http://dx.doi.org/10.17800/2238-8893/aos.v2n2p139-152>
24. Deckert CT, Allebrandt SL, Sausen JO. A Gestão Social no Território da Cidadania Noroeste Colonial do Rio Grande do Sul. *Desenvolvimento em Questão*. 2012;21.
25. Secretaria da Educação do Estado do Rio Grande do Sul. Busca de escolas.
26. Porto EBS. Perfil das cantinas escolares do Distrito Federal. Published online 2011.
27. ANVISA. Categorização Dos Serviços de Alimentação: Elaboração e Avaliação Da Lista de Avaliação. Agência Nacional de Vigilância Sanitária; 2013.
28. Cunha DT da, Rosso VV de, Stedefeldt E. Food safety performance and risk of food services from different natures and the role of nutritionist as food safety leader. *Ciência & Saúde Coletiva*. 2018;23:4033-4042. doi: <https://doi.org/10.1590/1413-812320182312.21042016>
29. Cunha DT, Saccol AL de F, Tondo EC, Oliveira ABA, Ginani VC, Araújo CV, et al. Inspection Score and Grading System for Food Services in Brazil: The Results of a Food Safety Strategy to Reduce the Risk of Foodborne Diseases during the 2014 FIFA World Cup. *Frontiers in Microbiology*. 2016;7:614. doi: <https://doi.org/10.3389/fmicb.2016.00614>

30. Ministério da Saúde. Portaria N. 817, de 10 de maio de 2013: Aprova as Diretrizes Nacionais Para a Elaboração e Execução Do Projeto-Piloto de Categorização Dos Serviços de Alimentação Para a Copa Do Mundo FIFA 2014.; 2013.
31. ANVISA. Resolução Da Diretoria Colegiada-RDC Nº 10, de 11 de março de 2014: Dispõe Sobre Os Critérios Para a Categorização Dos Serviços de Alimentação. Agência Nacional de Vigilância Sanitária; 2014.
32. Verдум DCP, Selva JP da, Copatti F, Batista M, Pereira LS, Kirsten VR, et al. Condições higiênico-sanitárias das cantinas escolares da rede estadual de ensino no município de Palmeira das Missões, Rio Grande do Sul. *Vigilância Sanitária em Debate*. 2017;5. doi:<https://doi.org/10.22239/2317-269x.00960>
33. Gabriel CG, Santos MV dos, Vasconcelos F de AG de, Milanez GHG, Hulse SB. Cantinas escolares de Florianópolis: existência e produtos comercializados após a instituição da Lei de Regulamentação. *Revista de Nutrição*. 2010;23(2):191-199. doi:10.1590/S1415-52732010000200002
34. Porto E, Schmitz BA, Recine E, Rodrigues M de L. Condições higiênico-sanitárias das cantinas de escolas públicas e privadas do Distrito Federal – Brasil e seus fatores associados. *Vigilância Sanitária Em Debate: Sociedade, Ciência & Tecnologia*. 2015;3(4). doi:<https://doi.org/10.3395/2317-269x.00317>
35. Amorim NF de A, De Abreu Soares Schmitz B, De Lourdes Carlos Ferreirinha Rodrigues M, Lole Recine EG, Gabriel CG. Implantação da cantina escolar saudável em escolas do Distrito Federal, Brasil. *Revista de Nutricao*. 2012;25(2):203-217. doi:10.1590/S1415-52732012000200003
36. Wilhelm FF, Ruiz E, Oliveira AB. Cantina Escolar: Qualidade Nutricional e Adequação à Legislação Vigente. *Rev HCPA*. 2010;3.
37. Ruwer CM, Mainbourg EMT. Promoção da alimentação saudável em escolas particulares. *Visa em Debate*. Published online 2015. doi:10.3395/2317-269x.00232
38. Gaetani R dos S, Ribeiro LC. Products sold in school canteens of the municipality of Ribeirão. *Rev Bras Promoç saúde*. 2015;28(4):587-595. doi:10.5020/18061230.2015.p587
39. Ochsenhofer K, Quintella LCM, Silva EC da, Nascimento A, Ruga GMNA, Philippi ST, et al. O papel da escola na formação da escolha alimentar: merenda escolar ou cantina? *Nutrire Rev Soc Bras Aliment Nutr*. Published online 2006.
40. Wognski ACP, Choma C, Gava GR, Ferreira BGCS, Vieira LP, Oliveira EC, et al. Good hygiene practices in school canteens: evaluation between types of schools and administration as well as presence of technical professional. *Brazilian Journal of Food Technology*. 2021;24. doi: 10.1590/1981-6723.25719
41. Porto EBS. Perfil das cantinas escolares do Distrito Federal, Brasil. Dissertação [Pós-graduação em Nutrição Humana] - Universidade de Brasília; 2011.
42. Azeredo CM, Leite MA, Rauber F, Ricardo CZ, Levy RB. Are laws restricting soft drinks sales in Brazilian schools able to lower their availability? *Revista de Saúde Pública*. 2020;54. doi: <https://doi.org/10.11606/s1518-8787.2020054001227>
43. Carmo AS do, Assis MM de, Cunha C de F, Oliveira TRPR de, Mendes LL. The food environment of Brazilian public and private schools. *Cadernos de Saúde Pública*. 2018;34. doi: <https://doi.org/10.1590/0102-311X00014918>
44. Brasil. Regulamentação Da Comercialização de Alimentos Em Escolas No Brasil : Experiências Estaduais e Municipais. Ministério da Saúde; 2007.

45. Reilly K, Nathan N, Grady A, Wu JHY, Woggers J, Yoong SL, et al. Barriers to implementation of a healthy canteen policy: A survey using the theoretical domains framework. *Health promotion journal of Australia: official journal of Australian Association of Health Promotion Professionals*. 2019;30 Suppl 1:9-14. doi:10.1002/hpja.218
46. Silva-Sanigorski A, Breheny T, Jones L, Lancy K, Kremer P, Carpinteiro L, et al. Government food service policies and guidelines do not create healthy school canteens. *Australian and New Zealand journal of public health*. 2011;35(2):117-121. doi:10.1111/j.1753-6405.2010.00694.x
47. New Zealand. Food and nutrition for healthy, confident kids. Published 2020. Accessed May 10, 2020. <https://health.tki.org.nz/Key-collections/Healthy-lifestyles/Food-and-nutrition-for-healthy-confident-kids>
48. Uggioni PL, Salay E. Consumer knowledge concerning safe handling practices to prevent microbiological contamination in commercial restaurants and socio-demographic characteristics, Campinas/SP/Brazil. *Food Control*. 2012;26(2):331-336. doi:https://doi.org/10.1016/j.foodcont.2012.01.057
49. Bas M, Ersun AS, Kivanc G'khan. Implementation of HACCP and prerequisite programs in food businesses in Turkey. *Food Control*. 2006;17:118-126. doi: <https://doi.org/10.1016/j.foodcont.2004.09.010>
50. Aliança pela Alimentação Adequada e Saudável. Alimentação Adequada e Saudável para Todos: Por políticas de alimentação adequada e saudável. Published 2018. Accessed July 27, 2021. [https://alimentacaosaudavel.org.br/wp-content/uploads/2018/09/Carta\\_Alianca\\_3008.pdf](https://alimentacaosaudavel.org.br/wp-content/uploads/2018/09/Carta_Alianca_3008.pdf)
51. Horta RL, Andersen CS, Pinto RO, Horta BL, Oliveira-Campos M, Andreazzi MAR, et al. Health promotion in school environment in Brazil. *Revista de Saúde Pública*. 2017;51. doi:https://doi.org/10.1590/s1518-8787.2017051006709
52. Arcan C, Kubik MY, Fulkerson JA, Davey C, Story M. Association between food opportunities during the school day and selected dietary behaviors of alternative high school students, Minneapolis/Saint Paul, Minnesota, 2006. *Preventing chronic disease*. 2011;8(1):A08. doi: PMC3044019
53. Gabriel CG, Dalsasso G, Ostermann RM, Corso ACT, Assis MAA, Di Pietro PF; et al. Regulamentação da comercialização de alimentos no ambiente escolar: análise dos dispositivos legais brasileiros que buscam a alimentação saudável. *Rev Inst Adolfo Lutz*. 2012;71. doi: <https://doi.org/10.53393/rial.2012.v71.32385>

### Contributors

Balestrin M, Brasil CCB, Kirsten VR and Wagner MB contributed to the conception and design, analysis and interpretation of data, review and approval of the final version.

Conflict of Interest: The authors declare that there is no conflict of interest.

---

Received: November 8, 2021

Accepted: March 8, 2022