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CAFÉ DA MANHÃ SEM GLÚTEN EM ESCOLAS PÚBLICAS: ADEQUAÇÃO DO MENU AO PROGRAMA NACIONAL DE ALIMENTAÇÃO ESCOLAR

IRIS VELECI DA SILVA SANTOS

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Trabalho de conclusão de curso apresentado à Universidade de Brasília- UnB como requisito parcial para obtenção do título de Bacharel em Nutrição.
Orientadora: Prof. Dra.: Renata Puppin Zandonadi
Coorientadora: Profa. Msc. Ana Luísa Falcomer

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LISTA DE ABREVIATURAS E SIGLAS – PORTUGUÊS

DHAA - Direito Humano à Alimentação Adequada
DF - Distrito Federal
DC - Doença Celíaca
DRG - Doenças Relacionadas ao Glúten
PNAE - Programa Nacional de Alimentação Escolar
PAE/DF - Programa Nacional de Alimentação Escolar do Distrito Federal
SAN - Segurança Alimentar e Nutricional

LISTA DE ABREVIATURAS E SIGLAS – INGLÊS

CD - Celiac disease
PCDT - Clinical Protocol and Therapeutic Guidelines
GRD - Gluten-related disorders
HRAF/DHAA - Human Right to Adequate Food
FNDE/MEC - National Education Development Fund of the Ministry of Education
CNA - National Food Commission
NSFP/PNAE - National School Food Program
NCGS - Non-celiac gluten sensitivity
PEAE/DF - School Feeding Program of the Federal District
SEE/GDF - School Food Manual of the Federal District
CAE - School Meals Councils
WA - Wheat allergy
TEV - Nutritional Information as Total Energetic Value

SUMÁRIO

APRESENTAÇÃO

No Brasil, o direito à alimentação foi incluído como um direito fundamental na Constituição Federal com a aprovação da Emenda Constitucional nº 64 em fevereiro de 2010 (BRASIL, 2010).

Entre as iniciativas brasileiras que contribuem para a garantia do Direito Humano à Alimentação Adequada (DHAA) à população está o Programa Nacional de Alimentação Escolar (PNAE) (BRASIL, 2009). O PNAE é considerado um dos maiores, mais abrangentes e duradouros programas no âmbito da alimentação escolar no mundo e é também a política pública mais antiga no país relacionada à Segurança Alimentar e Nutricional (SAN), com início em meados de 1950 (PEIXINHO, 2013) (BRASIL, 2009).

O PNAE passou por diversas transformações desde seu surgimento, em 2014 foi publicada a Lei nº 12982/2014, que determina a obrigatoriedade de elaboração de cardápios especiais para alimentação escolar, ratificando e fortalecendo as diretrizes do Programa Nacional de Alimentação Escolar.

As crianças com necessidades alimentares especiais (diabéticos, hipertensos, celíacos, intolerantes à lactose, fenilcetonúricos, e alergias alimentares diversas), não apresentam uma deficiência visível, mas necessitam de inclusão educacional e alimentar (ROSA; PAVÃO; MARQUEZAN, 2019). Esta modalidade de inclusão é de extrema importância não somente para a preservação da saúde da criança ou do adolescente em fase escolar, mas principalmente, para que o aluno portador desta necessidade especial alimentar tenha um desenvolvimento físico e cognitivo completo (RIBEIRO *et al.*, 2014).

Dentre estas desordens, a Doença Celíaca (DC) vem se destacando devido ao aumento do número de casos diagnosticados. A DC é uma enteropatia crônica do intestino delgado, de caráter autoimune, desencadeada pela exposição ao glúten (principal fração proteica presente no trigo, centeio e cevada) em indivíduos geneticamente predisposto (BRASIL. MS, 2015).

Uma vez que o tratamento é essencialmente dietético, indivíduos com DC, mas também com outras Doenças Relacionadas ao Glúten (DRG) necessitam de acompanhamento nutricional, devido a frequência de quadros de desnutrição e hipernutrição relacionados aos estágios da doença, observa-se a importância da avaliação do estado nutricional, da orientação relativa à escolha, ao

preparo dos alimentos e à contaminação por glúten na etapa de preparo ou distribuição do alimento (ARAÚJO *et al.*, 2010).

No Brasil, a composição mais habitual do café da manhã é composta por: leite, café, pães, frios (queijos e embutidos), biscoitos, frutas e sucos de frutas, geleias, manteiga/margarina. Outro alimento comum na mesa do brasileiro na refeição matinal são os cereais matinais (GUIMARÃES, 2014). Alimentos como pães, biscoitos e cereais matinais, apresentam na sua composição geralmente glúten.

Ao relacionar capacidade das crianças de se concentrarem nas tarefas escolares com o consumo frequente do café da manhã, Benton e Jarvis (2007) constataram que as crianças que consomem café da manhã dedicam mais tempo aos estudos do que os que não são consumidores dessa refeição, consequentemente, esses alunos apresentaram melhor rendimento escolar. Esse resultado reforça a importância da existência de programas de café da manhã em escolas e a real necessidade de se incentivar o consumo dessa refeição entre as crianças e adolescentes (BENTON AND JARVIS 2007).

Segundo a Pesquisa Nacional de Saúde do Escolar (PENSE, 2015), 36,4 % dos escolares com idade de 13 a 17 anos, de ambos os sexos que frequentaram a escola não costumam tomar café da manhã 5 dias ou mais na semana, sendo que entre os escolares que frequentam o 9º ano esse percentual é de 35,6%. A pesquisa constatou que, no Distrito Federal (DF), dos escolares que frequentam o 9º ano na escola pública 40% não costumam tomar café da manhã em 5 ou mais dias na semana, sendo que nas escolas particulares esse percentual é de 33,8%. Esses dados revelam que os programas de alimentação do governo devam incentivar o consumo do café da manhã em crianças e adolescentes (BRASIL. MINISTÉRIO DA SAÚDE, 2015).

A alimentação, por estar intimamente ligada à sobrevivência humana, sempre foi palco de grande preocupação, seja individual ou coletiva. E não seria diferente quando o assunto é a alimentação no ambiente escolar, principalmente quando esta alimentação precisa ser diferenciada em virtude de alguma restrição alimentar apresentada pelo aluno (ROSA; PAVÃO; MARQUEZAN, 2019).

De acordo com a lei 11.914, a alimentação escolar abrange todo alimento oferecido no ambiente escolar, independentemente de sua origem, durante o período letivo. A alimentação deve ser saudável e adequada e ser composta por alimentos saudáveis, variados e seguros. O cardápio ofertado deve estar em conformidade com a faixa etária e o estado de saúde dos indivíduos,

inclusive dos que necessitam de atenção específica e os que se encontram em vulnerabilidade social (BRASIL, 2009).

No ambiente das escolas públicas é comum o relato de que não são realizadas as substituições para os alimentos com glúten ofertados na alimentação de escolas públicas e que, quando tal fato ocorre, o que é servido não é seguro para os estudantes que dependem de alimentação especial. Portanto, dar visibilidade as dificuldades enfrentadas pelos portadores de doença celíacas no consumo do café da manhã ofertado nas escolas públicas do Distrito Federal podem contribuir para que o DHAA seja uma realidade para esse grupo.

Realizou-se um estudo sobre a adequação da refeição café da manhã nos cardápios especiais para indivíduos com DRG, segundo os parâmetros do Programa Nacional de Alimentação Escolar do Distrito Federal (PAE/DF), que culminou na elaboração de um artigo científico que foi publicado como capitulo do livro: Breakfast Nutrition, Consumption and Health Benefits, 2020, Editor's Picks, Medicine & Health, Newly Published Books, ISBN: 978-1-53618-500-3.

CHAPTER

GLUTEN-FREE BREAKFAST IN BRAZILIAN PUBLIC SCHOOLS: THE MENU ADEQUACY TO THE NATIONAL PROGRAM

Iris Veleci da Silva Santos, Ana Luisa Falcomer, Priscila Farage and Renata Puppin Zandonadi

Department of Nutrition, University of Brasília, Brasília, Distrito Federal/Brazil

ABSTRACT

In Brazil, the right to food was included as a fundamental right in the Federal Constitution. Among the Brazilian initiatives that contribute to guaranteeing the Human Right to Adequate Food (HRAF/*DHAA*) is the National School Food Program (NSFP/*PNAE*). Since 2014, offering special menus for children with food restrictions has become mandatory, as in cases of children with gluten-related disorders (GRD). In Brazilian public schools, GRD individuals commonly report that there are not substitutes for the gluten-containing foods offered. In some cases, the meal offered at school represents the main meal for low-income children living in a situation of food scarcity at home. Moreover, when alternative gluten-free food is provided, itis not safe for the students due to issues such as gluten cross-contamination. Therefore, the visibility of the difficulties faced in the implementation of special menus for children with celiac disease in Brazilian public schools can contribute to making the Human Right to Adequate Food a reality for this group.

RESUMO

No Brasil, o direito à alimentação foi incluído como direito fundamental na Constituição Federal. Entre as iniciativas brasileiras que contribuem para a garantia do Direito Humano à Alimentação Adequada (DHAA) está o Programa Nacional de Alimentação Escolar (PNAE). Desde 2014, a oferta de cardápios especiais para crianças com restrições alimentares tornou-se obrigatória, como nos casos de crianças com Doenças Relacionadas ao Glúten (DRG). Nas escolas públicas brasileiras, os indivíduos de DRG comumente relatam que não há substitutos para os alimentos que contêm glúten oferecidos. No ambiente das escolas públicas é comum o relato de que não são realizadas as substituições para os alimentos com glúten ofertados na merenda de escolas públicas e que, quando tal fato ocorre, o que é servido não é seguro para os estudantes que dependem de alimentação especial. Portanto, dar visibilidade as dificuldades enfrentadas pelos portadores de doença celíacas no consumo do café da manhã ofertado nas escolas públicas do Distrito Federal podem contribuir para que o DHAA seja uma realidade para esse grupo.

Keywords: Brazilian public schools; gluten-related disorders; celiac disease; gluten-free diet

INTRODUCTION

A ‘school meal’ is defined as a meal provided to children by the school (Oostindjer et al. 2017). School meals traditionally include at least one main meal (breakfast and/or lunch). In developing countries where some households face food insecurity, school meal programs primarily aim to prevent children’s hunger and undernutrition (Oostindjer et al. 2017), since these conditions in early childhood are associated with poor cognitive development, behavior problems, and learning performance in later childhood.

In Brazil, the right to food was included as a fundamental right in the Federal Constitution. Among the Brazilian initiatives that contribute to guaranteeing the Human Right to Adequate Food (HRAF/*DHAA*) is the National School Food Program (NSFP/*PNAE*) (Araújo, Santos, and Araújo 2011; General Assembly of the United Nations 1948; Brasil 2010). It reinforces the right of all people to adequate and healthy food, and it determines that the Government becomes the guardian of the right and has the responsibility to implement public policies guaranteeing the dignity of the individual (Angelica and Lonchiati 2019).

Food and nutritional security consist of the right of everyone to regular and permanent access to quality food, on sufficient quantity, without compromising access to other essential needs, based on health-promoting food practices that respect cultural diversity and that are environmental, culturally, economically and socially sustainable (Brasil. 2006).

In Brazilian public schools, the Government funds the school meal. Since 2014, offering special menus for children with food restrictions has become mandatory, as in cases of children with gluten-related disorders (GRD). Gluten related disorders are characterized by the group of diseases triggered by gluten, including celiac disease (CD), non-celiac gluten sensitivity (NCGS), gluten ataxia, dermatitis herpetiformis (DH), wheat allergy, among others. Gluten is a protein network (composed by prolamins and glutelins) formed in products that contain cereal grains like wheat, barley, rye, and, in some cases, oats (Farage et al. 2014; Koerner et al. 2011). Although studies are looking for new treatment alternatives for GRDs, the total exclusion of gluten from the diet is still the only safe treatment (Barada et al. 2012; Tonutti and Bizzaro 2014).

In Brazilian public schools, GRD individuals commonly report the absence of substitutes for the gluten-containing foods offered. It is important to mention that, in some cases, the school meal is the main meal consumed on the day among low-income children living in a situation of food

scarcity at home. Also, when alternative gluten-free meals are provided, these may not be safe for the students due to the risk of gluten contamination (Falcomer et al. 2018).

Therefore, the visibility of the difficulties faced in the implementation of special menus for children with celiac disease or other GRD in Brazilian public schools can contribute to make the Human Right to Adequate Food a reality for this group. In this sense, this chapter aims to review the history of school meals in Brazil and assess the suitability of gluten-free special menus for public schools' students with gluten-related disorders according to the parameters of the National School Feeding Program in the Brazilian Federal District".

HISTORY OF SCHOOL MEALS IN BRAZIL

In the 1930s to 1940s, food in the public school environment became part of the agenda of social movements, which brought up the topic of school (Peixinho 2013). Schools in a particular way began to organize themselves by setting up "school fund", which aimed to raise money in order to offer food to students. The school fund was maintained by voluntary contributions from local companies and students in a position to contribute. This service provided food to all students, or the neediest, being conditioned to the need and/or availability of resources (Tadahiro Shima 2003). Regarding State participation, the proposal did not materialize, as the Government had no financial resources to these initiatives, despite it recognized the importance of school meals on the permanence of students in schools and the reduction of child malnutrition in the country (DIAS and ESCOUTO 2016).

In 1950, the distribution of school lunches began with the Federal Government supporting the States (Tadahiro Shima 2003). In the Brazilian Northeast region, where food was scarce, a group of children with a higher rate of malnutrition started receiving food during class time. At this moment, the food provided was limited to some industrialized products (wheat flour, powdered milk, and soy) donated by international organizations. Thus, the Federal Government did not buy food but distributed it (DIAS and ESCOUTO 2016).

On March 31, 1955, the Brazilian Government officialized the School Lunch Campaign, under the responsibility of the National Food Commission (CNA), through Legislation No. 37106 (Brasil 1955) being the oldest food supplementation program in the country gained national coverage (Tadahiro Shima 2003)

In the 70's, there was a reduction in international donations, and the Federal Government started to buy Brazilian products for school meals. Despite that, the acquisition of industrialized products represented about 54% of the total expenses with school meals compared to local products. The main products purchased in this period were: peanut candy (paçoca); milk powder; industrialized soup (bean soup with noodles, corn cream soup with soy protein, and cereal with vegetables), cookies, among others (DIAS and ESCOUTO 2016), most of them containing gluten.

Over the years, several denominations were attributed to the operationalization of food in the school environment and, in 1979, what was commonly known as "school lunch", became the National School Food Program officially (Peixinho 2013).

In the 1980s, financial and management decentralization of the National School Food Program (PNAE) was started. The participation of states and municipalities in the actions started, as well as the insertion of social participation in inspection, through the School Food Councils (CAE). Since then, PNAE was committed to respecting the food culture of each Brazilian region and to seeking improvements in the acceptance of meals by the students (Verônica et al. 2013)

With Law 11,947 (July 16, 2009), there was a major advance in the PNAE, which set that 30% of the acquisition of foodstuffs should come from local producers. This new proposal contributed to the achievement of healthy and adequate food in the school environment, using varied foods and respecting healthy cultures, traditions, environment, and habits (Brasil 2009).

This program is managed by the National Education Development Fund of the Ministry of Education (FNDE/MEC), serving students in basic education (kindergarten, elementary school, high school, and youth and adult education) in public and philanthropic schools, through the transfer of financial resources (Brasil 2009). The transfer is made directly to the states and municipalities, based on the School Census carried out in the year before the service. The program is monitored and supervised directly by society, through the School Meals Councils (CAE) and by the FNDE (FNDE 2009).

The PNAE receives a name related to its execution at the state level in each Federated Unit. In the Federal District, the PNAE is called the School Feeding Program of the Federal District (PEAE/DF), regulated through Legislation No. 167 (September 10, 2010), which establishes the School Food Manual of the Federal District (SEE/GDF 2010).

The PEAE/DF is guided by the same principals as PNAE, including the use of healthy, varied, adequate safe food, in accordance with the cultural aspects and traditions of the population. The

PEAE/DF included ‘food and nutrition education’ in the teaching-learning process (SEE/GDF 2010). In this sense, the theme of healthy and adequate food should be addressed across the curriculum, promoting educational actions (Almeida 2006).

Finally, the guidelines established on the PEAE/DF advise that the acquisition of foodstuffs must be diversified (covering all food groups), with preference to foods produced and traded locally, by family farming and family entrepreneurs, in order to promote support for sustainability actions (SEE/GDF 2010).

SCHOOL MEALS MENU

School meal menus are planned by dietitians, also responsible for the acquisition and use of basic foodstuffs (FNDE 2009). The food purchased must respect the nutritional references, eating habits, culture, and local food tradition, based on the sustainability and agricultural diversification of the region, on healthy and adequate food (Ginani et al. 2020; FNDE 2009).

It is the dietitians’ responsibility to develop a meal that meets at least 20% of the daily nutritional needs of primary education students when they attend school part-time. For indigenous students and for part-time students when two meals are offered, a minimum of 30% of the nutritional needs that must be provided. For children enrolled full time at school, meals should cover 70% of their daily nutritional needs (Ministério da Educação 2013).

According to Law 11,914 (Brasil 2009), school meals cover all food offered in the school environment, regardless of its origin. The menu offered must be following the age group and health status of individuals, including those who need specific attention and those who are in social vulnerability.

The menus are key documents in the operationalization of the program. They must be planned based on information about the type of meal, the name of the dish, the ingredients that compose it and its texture, as well as nutritional information as total energetic value (TEV), macronutrients, priority micronutrients (vitamins A and C, magnesium, iron, zinc, and calcium) and fibers (FNDE 2009). The menus must also present the identification (name and register number) and the signature of the dietitian responsible for its planning (Ministério da Educação 2013).

Food security must be contemplated in all stages of the production of school meals. In this sense, the FNDE (FNDE 2009) prohibits the acquisition of foodstuffs like drinks with low

nutritional content (soft drinks, artificial soft drinks, and similar), canned food, sausages, sweets, ready-to-eat dishes, or concentrated foods (powdered or dehydrated for reconstitution) with a high amount of sodium (> 500 mg of sodium per 100 g or ml) or saturated fat (> 5.5 g of saturated fat per 100 g, or 2.75 g of saturated fat per 100 ml). Also, The FNDE requires at least three portions of fruits and vegetables per week (200g/student/week) in the meals in order to ensure a healthy and adequate diet (FNDE 2009).

ASSISTANCE TO STUDENTS WITH SPECIAL DIETARY NEEDS

Food, as it is closely linked to human survival, has always been a matter of great concern. The same applies to food in the school environment, especially when food needs differentiation due to some restrictions required by a student's dietary specific condition (Rosa, Pavão, and Marquezan 2019).

Institutions linked to the protection and assistance of people with special dietary needs consider that the experience of dietary restrictions without the right of access to adequate food, based on public policies, is the main factor of social exclusion characterizing a situation of food and nutritional insecurity, aggravated by the social restrictions imposed on people with organic disabilities (Angelica and Lonchiati 2019).

Public policies that aim at food security and its continuous advances draw attention to the problem of the human right to adequate food and people with special dietary needs (Brasil. 2006). Within the scope of sectoral policies with an interface in food assistance and focus on food security, PNAE presents proposals that may represent advances towards the care of these individuals (Ribeiro et al. 2014).

Children with conditions that require special dietary adequacies (diabetes, hypertension, celiac disease, lactose intolerance, phenylketonuria, and others), may not have a visible deficiency but need educational and food inclusion (Rosa, Pavão, and Marquezan 2019). This inclusion modality is essential not only to preserve children’s health at school but mainly to enable a complete physical and cognitive development (Ribeiro et al. 2014).

The inclusion of students with dietary restrictions in the school environment is not just about offering special school lunches, as several diseases need adequate and safe ingredients to produce the meal, as is the case of gluten-related disorders (GRD (Benatti 2018). The gluten-free diet goes

beyond the care with food intake, and it demands strict conduct of food handlers in the use of gluten-free ingredients solely, the use of exclusive utensils and equipment, and the prevention of cross-contamination (Petruzzelli et al. 2014; Farage et al. 2018). It is in this perspective that inclusion must prevail (FNDE 2017).

Assistance to students with special dietary needs is a spontaneous demand. In all cases, the school principal will receive a medical report to start the process of meeting the student's food needs. A counter reference between the health and education sectors is necessary for the start of student service in the school environment as established by Law nº 12,982/2014, which determines the mandatory plan of special menus for school meals, ratifying and strengthening the guidelines of the National School Food Program, determined by Law 11,947 / 2009 (FNDE 2017).

SPECIAL MENUS IN BRAZILIAN SCHOOLS

The special school menus are prepared by dietitians when demanded by the student's family (through the presentation of the medical report). In some cases, the special menu has a composition similar to the standard menu. In others, it may be necessary to redesign the entire menu and calculate its nutritional value. After approval, the special menus are explained to the food handlers for the preparation of the meal (Angelica and Lonchiati 2019).

At the time of meal preparation, depending on the number of special menus required, it may be necessary to label the meals to avoid exchanges and accidents, such as allergic reactions that can be dangerous, especially when it comes to children. Intake of inappropriate food by people with special dietary needs may directly affect their psychosocial and cognitive development, in addition to their physical health. That is why it is so important to have a differentiated diet for those who need special attention (Madalena and Dos 2012). Serving food to students with special dietary needs implies in the planning of menus, which are adapted according to technical criteria and recommendations of the Ministry of Health and Guidelines and Consensus published by medical and scientific entities (FNDE 2017)

In addition, the school must have a specific place to prepare special food to avoid cross-contamination, so that it does not compromise food safety. The Resolution RDC No. 26/2015 states that cross-contamination is associated with all stages of the food production chain through poor hygiene practices (Anvisa 2015). Cross-contamination is defined as the presence of any food

allergen not intentionally added to the food as a result of growing, producing, handling, processing, preparing, treating, storing, packaging, transporting, or preserving food, or as a result of environmental contamination (Anvisa 2015).

Thus, all food for students who need a special diet must come with their own menu, planned by a dietitian and in compliance with medical guidelines. The preparations must be produced in a safe place, packed in proper packaging, separated from other foods, named and dated so that there is no confusion at the time of meal offer (Angelica and Lonchiati 2019).

Dietary care includes the complete exclusion of allergens in food and the use of exclusive utensils (sponge, cutlery, plastic pots, planks, bottles, blender cups, and mixer). Glass and stainless steel utensils, if well sanitized, can be of common use, but food cannot be prepared together (FNDE 2017)**.**

Another challenge for the school foodservice is the quantitative forecast of the acquisition of differentiated foodstuffs. In general, these foods are not part of the usual school menu but will be necessary for the adaptation of the special menus. They may range from common foods that are not purchased due to high cost, such as olive oil and flaxseed, to specific foods, such as infant formulas or gluten-free products (Angelica and Lonchiati 2019).

GLUTEN RELATED DISORDERS AND THE GLUTEN-FREE DIET

Celiac disease (CD) is an autoimmune disorder that affects genetically predisposed individuals, caused by permanent intolerance to gluten, the main protein complex fraction present in wheat, rye, barley, oats, and malt (a by-product of barley). The Clinical Protocol and Therapeutic Guidelines (PCDT) was established for the management of CD in Brazil through Ordinance / SAS / MS nº 1149 (BRASIL. MS 2015). In addition to Celiac Disease, there are other gluten-related disorders (GRD), such as non-celiac wheat/gluten sensitivity (NCGS), gluten ataxia, and wheat allergy. Despite immunological differences, all those conditions have a common treatment based on a strict gluten-free diet (Benatti 2018).

Wheat allergy (WA) is a hypersensitivity reaction to wheat protein - gliadins, particularly ש 5-Gliadin (the main wheat-dependent allergen). It is a food allergy in which the individual may be sensitized by exposure through the skin or airways (baker's asthma), typical of an IgE-mediated allergy. In WA, symptoms develop within minutes to hours after eating wheat, and they include

gastrointestinal, skin and respiratory manifestations, with a risk of death due to anaphylaxis. NCGS may also present with gastrointestinal or extraintestinal manifestations. Since there are no specific markers for it, the diagnosis of NCGS is based on the symptoms described by the patient, when the possibility of CD and WA has been excluded (Guerra 2017).

In WA, wheat exclusion (in some cases, cross-reaction to barley and rye) is necessary, making the diet less restrictive. Unlike CD, this restriction may not be definitive, since the development of tolerance may occur. As to NCGS, the treatment requires a gluten-free diet. However, the rigidity of this food restriction is not yet well defined. It is also unclear so far when the diet needs to be implemented and how to monitor the response to treatment (Guerra 2017).

Although the importance of the gluten-free diet is well established in the literature for the management of GRD, diet compliance rates may vary a lot among patients. A Brazilian study including 34 children and 29 adolescents diagnosed with CD treated consecutively and undergoing treatment for more than 12 months, at the Pediatric Gastroenterology Outpatient Clinic of Escola Paulista de Medicina (Unifesp), showed that a total of 41.2% (n=14) of children and 34.5% (n=10) of adolescents transgressed the gluten-free diet (Andreoli et al. 2013).

Low gluten-free diet adherence may be related to the social and emotional burden that the food restriction generates. A Canadian study conducted with members of two Canadian celiac associations assessed the emotional impact of the difficulties experienced in daily food-related situations by Canadians with celiac disease who followed a gluten-free diet. Among the reported difficulties, the authors found: limited food options in foodservice (87.5%); limited restaurant choices (76.9%); being concerned that gluten does not always appear on food labels (78.9%); high cost of gluten-free foods (61.1%); not liking others feeling sorry for them; worrying about staff in restaurants not being trained in preparing gluten-free meals (63.7%); limited choices in the school/work cafeteria (84.8%); not being able to eat many local/national special dishes (61%), and having to bring their own food to school/work (33.5%) (Zarkadas et al. 2013).

Foods commonly used as substitutes for primary foods that contain gluten (wheat, oats, rye, barley, and malt) are rice (grain, flour, powdered brown rice); corn (flour, flakes, cornmeal, starch, hominy, popcorn); cassava (flour, starch, sweet and sour starch, arrowroot, tapioca); potato starch; millet; quinoa; amaranth; buckwheat; and mixtures of them. Many foodstuffs are naturally gluten-free and can be used to prepare gluten-free dishes, as long as the packaging displayed the inscription

“does not contain gluten”/“gluten-free” and there are no traces of wheat, oats, barley or rye (Benatti 2018).

It is also important that the handling of gluten-free food is done with tools for exclusive use. These include skimmers, filters, plates, pots, pans, meat and vegetable chopping boards, pots with lids, tongs, among others. When preparing a gluten-free meal, food handling must be carried out following an orderly and sequential process flow to avoid cross-contamination. The written recipes must be updated and available for consultation by the handler responsible for preparing gluten-free meals. It is necessary to include all process steps to prepare the dish, pointing out the most critical points to avoid cross-contamination (Brasil 2012)

EVALUATION OF BREAKFAST GLUTEN-FREE SPECIAL MENUS IN PUBLIC SCHOOLS FROM THE FEDERAL DISTRICT OF BRAZIL

In the Federal District of Brazil, where the national capital is located, the PNAE is contemplated by the PEAE/DF. In order to implement the human right to food access and the program’s agenda, a team of dietitians plans the school meal menus considering the population nutritional needs, and also its eating habits, culture, and tradition, and taking into account sustainability issues (FNDE 2009; Ginani et al. 2020).

As previously mentioned, the school menus must contribute to the daily nutritional needs of the students enrolled. For that purpose, children receive one to two meals per day in school. The frequency and the overall percentage of nutrients daily granted vary according to the ethnic population, age, and time spent in school (part-time or full time) (Ministério da Educação 2013).

Brazilian food guideline considers healthy eating as one of the determinants of good health. It also emphasizes that breakfast is one of the three most important meals of the day and suggests meals according to Brazilians food habits (Brasil 2014). Even though the national guideline underlines the importance of breakfast, the PNAE does not have a specific recommendation for this meal (FNDE 2009).

Considering children´s need for nutritionally balanced food, it is important to highlight that kids with special dietary needs require food adaptations in order to obtain adequate healthy meals. In regards to children with GRD, aspects such as susceptibility to malnutrition due to small bowel mucosal damage, inability to access gluten-free products due to its higher cost, and restricted food options must be considered for the elaboration of a well-designed meal plan.

For those reasons, the evaluation of breakfast school menus' quality and its adapted special menus for kids with GRD is fundamental. Therefore, analysis of the gluten-free breakfast provided in the public schools of the Federal District of Brazil was carried out. For this purpose, all original and gluten-free adapted menus outlined by the PEAE/DF and implemented in all the 14 regions of the Federal District during the 11 months of school from February to December (2019) were considered.

The meals offered as breakfast in the schools were composed of a main dish and a side dish. Data analysis show that in the original menus, biscuits (most of them gluten-containing) were present in 85.04% (n=273) of the days, varying between four types of biscuits: 36.26% of sweet buttery biscuits (n=99); 15.02 % of corn starch and wheat flour-based biscuits (*biscoito de maisena)* (n=41), 26.74% of salty crackers *(biscoito cream cracker*) (n=73), and 21.98% corn starch based biscuits (*sequilhos)* (n=60). A total of 14.96% (n=48) of breakfast menus include gluten-containing bread, which is offered in two versions, bread accompanied by a protein option (81.25%, n=39) and bread with vegetable pate (18.75%, n=9).

The side dishes are mainly beverages varying between coffee with milk, fruit juice, fruit smoothies, and caramelized milk. Sometimes, juices or smoothies are also offered with fresh fruits. However, the menu does not characterize the juice suggested, therefore it sometimes is made by fruits and water, nectars, or powder juice mixes.

In cases of students with GRD, the meals are adjusted to the following dishes and side dishes: corn starch-based biscuits (8.06%, n=5), cassava starch biscuits (16.14%, n=10), *cuscuz* (prepared with cornflour) (12.9%, n=8), rice pasta (38,7%, n=24), soup with rice pasta (3.23%, n=2) or tapioca served with a protein option or butter (20.97%, n=13).

It noticeable that gluten-free food alternatives in the school menus are mainly composed of simple carbohydrates and tend to have more fat to obtain similar texture to gluten-containing preparations (Missbach et al. 2015). As a consequence, the meal plan becomes abundant in non-nutritional calories, also it does not present critical nutrients such as a protein that children require, especially the ones that are part of the sociable vulnerable population (Missbach et al. 2015; Oostindjer et al. 2017).

Considering that celiacs are part of the group of GRD, it is primordial to consider the group's physiological characteristics. Since celiac disease is an intestinal pathology that causes mucosal damage and is associated with malnutrition due to the inability to absorb nutrients, offering

nutritionally adequate food is essential to ensure the health and avoid the consequences of malnutrition-related such as iron and calcium deficiency (Sapone et al. 2012).

As a consequence of the small intestine damage, celiacs may present lactose intolerance and, therefore, require lactose and gluten-free diet (Collin et al. 2015). However, when a child presents both restrictions, the school meal is adapted to either a fruit or juice. Those options do not include calcium and are not an adequate substitute to milk preparations. In addition, as the juices can be made of powdered juice mixes, it cannot have nutritional value at all.

For those reasons, special school menus for GRD in Brazil require to rework. The last edition of the Brazilian Nutritional Guide (Brasil 2014) presents suggestions to a balanced breakfast and takes into consideration the population food culture and habits. According to the guide, bread is usually substituted by *cuscuz* (prepared with corn flour), *tapioca* (prepared with cassava starch), or cheese bread, which are all naturally gluten-free options (Brasil 2014). Then it is viable to apply those national food habits to school meal plans, replacing the most frequent food that is bread by the three mentioned options that are all made of non-expenses ingredients.

In addition to making gluten substitutes more suitable for national habit, performing the change of gluten-containing ingredients into some of the regular school menus and not having gluten-free food only in the special menus help children feel more included, reducing the feeling of being different and even bullying due to having an unusual diet (Skjerning et al. 2014). Nonetheless, improving the gluten-free options to more nutritional ones and also including gluten-free options in the original menus can reduce children's overall health, cognitive development and may minimize gluten cross-contamination due to preparation of gluten in the school food-producing units.

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