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Panmela Soares, Suellen Secchi Martinelli, Leonardo Melgarejo, Suzi Barletto Cavalli, Mari Carmen Davó-Blanes,

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Using local family farm products for school feeding programmes: effect on school menus

Using local family farm products for SFP

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Panmela Soares

Public Health Research Group, Universidad de Alicante, Alicante, Spain

Suellen Secchi Martinelli

Nutrition in Foodservice Research Centre,

Universidade Federal de Santa Catarina, Florianópolis, Brazil

Leonardo Melgarejo

Associação Gaúcha de Proteção ao Ambiente Natural (AGAPAN),

Porto Alegre, Brazil

Suzi Barletto Cavalli

Nutrition Department and Nutrition Post-Graduate Program, Universidade Federal de Santa Catarina, Florianópolis, Brazil, and

Mari Carmen Davó-Blanes

Department of Community Nursing,

Preventive Medicine and Public Health and History of Science,

Universidad de Alicante, Alicante, Spain

Abstract

Purpose – The purpose of this paper is to explore the effect of the use of food products from family farms on school menus of the school feeding program (SFP) of a municipality in Southern Brazil.

Design/methodology/approach – A qualitative content analysis was carried out of 16 key informant interviews involved in the SFP, or in agriculture production related to SFP planning, development and supply. The resulting categories were used to construct a quantitative analysis protocol for school menus for three years both prior to and after ($n = 130$ days) procurement of the SFP with food from family farms. The studied variables were the presence (yes/no) of vegetables, fruits, legumes and concentrated foods. Monthly frequency and contrast of proportions were calculated for each variable during the years studied.

Findings – The interviewees recognized that the proximity between food production and the school increased the variety of fresh, natural and organic foods in school menus. The direct supply of the SFP with foods from local family farms resulted in a significant increase ($p < 0.05$) in the frequency of vegetables, fruits and legumes in school menus as well as a progressive reduction in concentrated foods.

Originality/value – The design of food and agriculture policy increases the availability of healthy foods in school menus and has beneficial results for promoting healthy meals in schools.

Keywords Local food, Food policy, Food system, School feeding program, School food

Paper type Research paper

Introduction

In 2013, it was estimated that 42 million children under age 5 worldwide were overweight. The health risks that accompany excess weight (diabetes, hypertension, heart disease, cerebrovascular accidents and certain types of cancer) and the probability that excess weight developed during childhood continues to adulthood (WHO, 2014) have resulted in the implementation of strategies to promote healthier lifestyles in the child population. However, up until now there is no evidence that any country has managed to successfully combat the problem of overweight and obesity. On the contrary, obesity continues to increase, especially in developing countries (Ng *et al.*, 2014). This situation can be attributed, in part, to changes in food



production and commercialization brought about by globalization. This has resulted in an increase in the availability and accessibility of processed foods that seems to influence changes in the diet and health of the population (Hawkes, 2006). The low consumption of fruits and vegetables is associated with 2.7 million deaths worldwide (WHO, 2002).

Schools have been considered favorable environments to reverse this situation, through providing healthy meals to the child population (WHO, 2004, 2013). According to international recommendations, a healthy diet should be based on consumption of fruits, vegetables, legumes, whole grains and nuts, with little sugar, salt, saturated fats and trans fats (WHO, 2004). Although education is important for acquisition of healthy habits, the availability of and access to fresh and healthy foods has been identified as a determinant of food consumption in schools (Blanchette and Brug, 2005). School interventions based on the creation of vegetable gardens and the distribution of fruits and vegetables have been proposed as favorable alternatives for promoting changes in school food consumption (French and Wechsler, 2004).

In this sense, in order to promote food security, some countries have incorporated initiatives that promote the direct purchase of food products from local producers in their school feeding programs (SFPs). In addition to favoring health promotion in schools, this initiative has been recognized as having a positive impact on agricultural and economic development (FAO *et al.*, 2015; WHO, 2004; FAO, 2015a). The “Farm to School” Program the USA is worth noting, as it increased availability (Nicholson *et al.*, 2014) and consumption (Bontrager Yoder *et al.*, 2014) of fruits and vegetables in school meals. Countries including Ghana (Quaye *et al.*, 2010), Indonesia (Studdert *et al.*, 2004), Italy (Sonnino, 2009) and Brazil (Brasil, 2003, 2009b) have also had similar experiences.

In the case of Brazil, the development of direct purchase policies began in 2003 as a part of the Zero Hunger Program. Up until 2003, procurement was based on economic criteria that made participation of family farmers difficult. The purchase of family farm products for use in Brazilian public schools began with the implementation of the Food Procurement Program (PAA for its original acronym). Special public procurement programs were developed specifically for family farmers (Brasil, 2003). In 2012, it was estimated that the PAA resulted in the purchase of 374 types of food products from approximately 128,000 family farms (Porto *et al.*, 2014). Thanks to its success in 2009, the federal government extended this initiative and made it mandatory for all public schools in the country. It stipulated that a minimum of 30 percent of the federal funds destined for the national SFP (PNAE for its original acronym) be used for the direct purchase of food products from family farms (Brasil, 2009b). Although other suppliers continued to supply most of the food products for use in schools, the direct purchase from farms promoted a greater role for family farms in the supply of food for school feeding (Soares *et al.*, 2017). Currently, the Brazilian experience is guiding the development of pilot projects in El Salvador, Honduras, Paraguay (Ballesteros, 2015), Niger, Senegal, Ethiopia, Mozambique and Malawi (PAA-Africa, 2013).

The Brazilian SFP was aligned with international recommendations to promote healthy foods as a part of strategies to reverse the increase in overweight and obesity. In Brazil, as in other Latin American countries, the prevalence of obesity has increased (Kain *et al.*, 2014). It is estimated that 34.8 percent of children ages five to nine are overweight and 16.6 percent are obese (IBGE, 2010). Furthermore, the consumption of traditional foods, such as beans, has decreased, and the consumption of processed foods has increased (IBGE, 2011). Therefore, beginning in 2006, it was recommended that foods with high levels of saturated and trans fat, sugar and salt be restricted, and that fruits and vegetables be promoted with respect to school feeding (Brasil, 2006). Additionally, in 2009 minimum quantities of vegetables and fruits were established for school menus, and budget restrictions were implemented for food products considered unhealthy (with high levels of salt and fat) (Brasil, 2009a).

The factors that influence the development of programs for food procurement from local suppliers (Smith *et al.*, 2013; Conner *et al.*, 2014) and the benefits they can provide to SFPs

has been documented (Smith *et al.*, 2013; Sidaner *et al.*, 2013; Bontrager Yoder *et al.*, 2014; Nicholson *et al.*, 2014). However, the effect of these programs on the development of school menus is unknown. Given the Brazilian experience in applying this type of policy to its SFP, the objective of this study was to explore the effect of the use of food products from family farms on school menus, within the context of the SFP in a municipality in Southern Brazil (Santa Catarina).

Methodology

We approached the objective of this study from a qualitative and quantitative perspective. The qualitative study, based on open-ended interviews of key informants (KI) of the SFP, allowed us to establish the categories of analysis and to interpret the results of the quantitative study, which were based on the analysis of school menus before and after family farms began supplying SFPs.

Context

Qualitative and quantitative data collection was carried out simultaneously in September of 2010, in a municipality in Southern Brazil (Santa Catarina). This municipality was selected because it already had some experience with local food procurement for school feeding. In 2007, before it was mandatory to do so nationwide, the municipal education network received food from the PAA for its SFP. The municipality was also chosen because researchers had easy access to the needed study data. The municipality includes 21 public primary schools that attend to approximately 6,000 students each day.

Qualitative study

The qualitative study was based on open-ended interviews of 16 KI that had influence in the planning and execution of the SFP, as well as procurement of food products from family farms in the studied municipality.

The research team established three groups to represent the principal KI involved in SFP management (Group A) and in the family farm food production of the municipality (Groups B and C): Group A: managers and civil servants of the SFP ($n = 7$), made up of one representative of the school feeding council, two nutritionists for the program, one education council member and three cooks; Group B: managers and civil servants of the agricultural council ($n = 5$), including one rural development manager, one agricultural engineer, one agricultural council member and two agriculture technicians; and Group C: representatives of agricultural organizations, made up of one representative from the agricultural cooperative and three family farmers.

The KI were identified with the help of the nutritionist from the Municipal Education Council, charged with the planning and supervision of the SFP. The nutritionist contacted possible participants (in person or by phone) (based on a prior list provided by the research team) and informed them of the objective of the study.

Data were collected in 2010 through an interview with 14 open-ended questions related to aspects of planning and development of the SFP and of the Food Procurement Program (PAA), food quality, and their personal opinions. The topics discussed in the interview are presented in Table I.

Although the representatives of agricultural organizations (managers, civil servants and agricultural organizations) were not involved in the implementation of the program in schools nor in menu planning, it was decided that they be involved in the study. This is because given their participation in production, transport, distribution and delivery of food supplies for school meals, they might contribute information that was important for understanding the diverse dimensions of the program (from food production to meal preparation).

Table I.
Topics addressed in
interviews with key
informants

Topics addressed in interviews	Questions
<i>Planning and development of the SFP and of the food procurement program</i>	
Development of school menus	What are the criteria used for the planning of school meals?
Purchase and sale of food products	Which suppliers make up the SFP?
Composition of menus	What is the structure of school menus? With what frequency are vegetables and fruit offered?
Food products provided by local family farms	Which food products are provided by family farms in the area? What are the products supplied by family farms for school feeding?
Inclusion of locally produced foods in menus	Were these locally produced foods supplied through the PAA present in school menus before the program?
Delivery, distribution and transport of food products	How often are food products delivered? How does product distribution to schools take place?
<i>Food quality</i>	
Quantity, variety and quality of products supplied by local family farms	What is your opinion about the quantity, variety and quality of products supplied by family farms to schools?
Form of production of food products	What is the mode of food production used by the family farmers that supply schools?
<i>Opinion about the incorporation of family farms as suppliers of food to schools</i>	
Opinions about local family farm food provision for school feeding	What is your opinion about the inclusion of family farms as suppliers of foods to schools after the implementation of the PAA?
Opinions regarding changes in school feeding after the implementation of the PAA	When comparing "before" and "after" implementation of the PAA, have you become aware of any changes in school feeding?

Interviews were carried out by one of the members of the research team at the participants' workplaces, except for farmers, who were interviewed in schools at the time of product delivery. Participation was voluntary and anonymity of participants was guaranteed. Before beginning the interview process, participants were informed of the study objective. The average interview time was 48 minutes and varied depending on the involvement of the informant in the program.

Interviews were digitally recorded with the consent of the participants and literally transcribed. Texts were imported using (Atlas.ti-4) software in order to conduct the qualitative analysis (Graneheim and Lundman, 2004). After repeated readings, text fragments with the same meaning were coded, and categories were established by grouping codes by the researchers' consensus.

Quantitative study

A quantitative content analysis of municipal school menus was carried out for three years prior to (from 2003 to 2005) and three years after (2007, 2009, 2010) the implementation of the PAA. The menus from 2006 were unavailable, and those from 2008 did not include enough information to be included in the analysis.

Menus were provided by a nutritionist from the education council (who was responsible for menu planning) at the time of the interview. In total, one standard monthly menu was provided for 20 consecutive days for 2003, 2004, 2005, 2007 and 2009; for 2010 one menu for 30 consecutive days was provided, resulting in a sample of 130 daily menus.

After the interviews and initial menu analysis, a protocol was designed to carry out menu content analysis. The following dichotomized variables (yes/no) were defined, taking into account interview results: vegetables served as salads; dishes with vegetables; dishes with fruits; fresh fruits; legumes; and concentrated foods (processed foods that need to be reconstituted, with or without the addition of another ingredient, such as soup or cake mixes or powdered milk drinks).

For each of the study years, the number of days that each distinct food group was present on monthly school menus was calculated. Later, the proportion of each group was calculated, with respect to the total number of days analyzed on the monthly menu for the corresponding year. In order to explore the evolution of the presence of each food group on menus for all of the studied years, a *Z*-test for contrast of proportions was carried out, using 2003 as the reference year. This same contrast was applied, using the year immediately prior to the studied year as the reference, in order to identify the time period in which menu changes took place. The digitization and analysis of data was carried out using Stata 11.0 (Stata Corp, College Station, TX, 2011). Graphs were designed using Excel 2007 software (Microsoft Corp, USA).

Results

Qualitative content analysis of interviews

Three categories were identified that describe the opinions of KI regarding the effect of SFP food procurement from local family farms for school meals: availability of fresh foods, increase in food offerings, supply of healthy foods, and a topic related to all of the categories that explains the changes in meals after the implementation of the PAA: Benefits of proximity of local family farming to schools for the food supply in school meals (Table II).

Availability of fresh foods

KI agreed that the direct supply of food to schools by local family farmers (place of consumption) reduced the distance and time of food transport:

It is not worth it to take the product to the cooperative [...] I live close to the school and I'll leave it there directly (Farmer).

Before, it passed through the hands of a middleman, now we produce and sell directly to the consumer [...] (Agricultural engineer).

In their opinion, the proximity of production and consumption had a beneficial effect on the food offering of the municipal schools, given that they had incorporated fresh, high quality ingredients:

Since the farmer delivers to the school closest to his/her property, the products arrive fresh and with better quality than if they had come from another supplier (Nutritionist).

Furthermore, it boosted consumer confidence, in this case the school, regarding the food products and their means of production:

If the consumer wants to know about the production process, he can do so, he knows who he is buying from (Agricultural engineer).

Theme	Benefits of proximity of local family farming to schools for the food supply in school meals		
Category	Availability of fresh foods	Increases in food offerings	Supply of healthy foods
Codes	Origin	Inclusion of new foods	Form of production (without pesticides)
	Local foods	Increase in variety	Level of processing (industrialized/natural)
	Proximity	Increase in quantity	Good quality
	Direct delivery	Varieties produced/received	
	Access	Increase in production	
	Sensory characteristics (freshness)		
	Familiarity with the production process		

Table II.
Themes, categories and codes identified in the analysis of the interviews

Increases in food offerings

Representatives of agricultural producers described how the demand generated by the program resulted in food production opportunities for farmers. This affected the quantity and quality of the food produced at the municipal level to supply schools, particularly the supply of vegetables, fruits and legumes:

Before, we planted tobacco and I worked as an electrician, but then this opportunity came about [...]. We intend to continue only with vegetables (Farmer).

Little by little, more is being produced for schools, therefore, I think that there have been changes in production quality and quantity, it's still not enough, but it has changed (Rural development adviser).

We grow potatoes, onions, carrots, beets, broccoli, other vegetables (Agricultural Councilman).

The availability of fresh foods, according to managers and school food workers, allowed for incorporating new products and increasing variety in the meals offered by schools:

Before, there were few options in terms of food for children, now there are many options and children are accepting them well [...] (Cook).

Variety increased a lot with the PAA, with products that had never before been available in school meals (Nutritionist).

Supply of healthy foods

According to KI, the distance to production and the availability of a greater variety of fresh foods resulted in healthier foods being offered for school meals. The representatives of the SFP described an increase in the supply of perishable foods, such as vegetables, which reduced the supply of concentrated foods:

Before the program, lettuce was not included in school meals, because it was a delicate product, now, after the program, there is cabbage, lettuce and other products (Nutritionist).

Now it is all vegetables, before there were those prepared soups. Now you have vegetables to make a soup or a salad (Cook).

On the other hand, representatives of agricultural organizations made a personal commitment to supplying quality products to the schools:

First we try what we produce at home. If you produce it and you don't try it, you don't know what you are selling (Farmer).

Also, agricultural production representatives signaled the beginning of a process of change in the production system that favored foods without agrochemical residues (organic), although not all were certified organic:

We have some farmers with the PAA's organic certification, but there are very few. The majority still uses the conventional method (Representative of the agricultural organization).

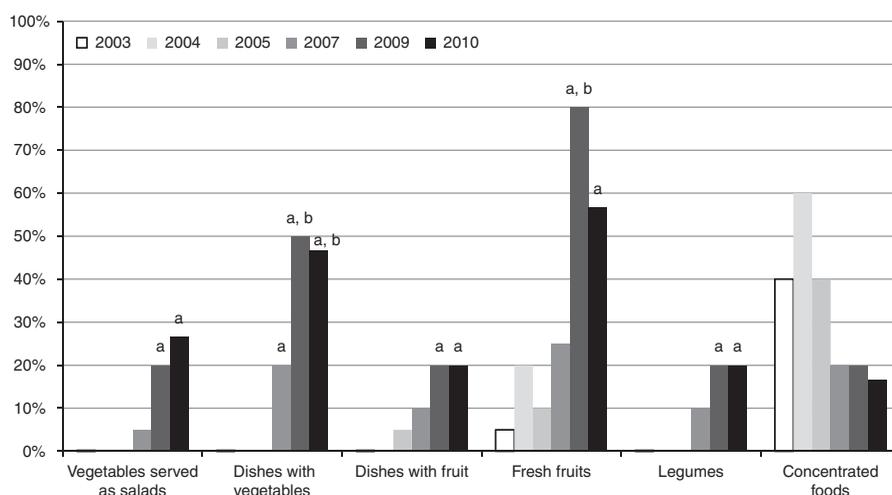
Raspberries are produced organically. They still don't have the certification, but no agrochemicals are used, nor for grapes (Agricultural engineer).

In their opinion, this represented an opportunity to promote organic production among farmers:

Our objective is to work with farmers on organic production and on reducing the use of chemical products [...] (Agricultural technician).

Quantitative content analysis of school menus

Figure 1 shows the frequency of vegetables, fruits, legumes and concentrated foods in monthly school menus for the studied years. Using 2003 as the reference year, a statistically



Notes: ^aContrast of proportions $p < 0.05$ – using 2003 as the reference year; ^bcontrast of proportions $p < 0.05$ – with respect to the prior year

Figure 1. Frequency of vegetables, fruits, legumes and concentrated foods in monthly school menus during the studied years

significant increase was observed ($p < 0.05$) in the frequency of meals with vegetables in 2007. This increase is similar in 2009 for vegetables served as salads, for meals prepared with fruits, natural fruits and legumes ($p < 0.05$). Although preparation of meals using vegetables and natural fruits decreased in 2009 and 2010, the presence of these foods in school menus was significantly greater in 2010 than in 2003.

Furthermore, the comparison of the menus from each of the studied years with the respective menus from the prior year, showed a significant increase in the frequency of meals prepared with vegetables; this was the case for 2005 and 2007 as well for 2007 and 2009. Also, for this last period, the increase in natural fruits was significant ($p < 0.05$). There were no significant differences found among the other years and food groups studied.

The analysis of the evolution of foods available in school menus also shows important changes. After the implementation of the PAA in 2007, vegetables and legumes were introduced (foods that were not a part of school menus in prior years). Vegetables were more often served as salads, and meals were prepared using vegetables and legumes for 5, 20 and 10 percent of the days analyzed, respectively. These foods registered a progressive increase in the following years.

Fresh fruits were present in school menus for all of the years analyzed, although there was an important trend of increase during the study period. There was an increase from 2007 to 2009 (from 25 to 80 percent), and a later reduction in 2010. In any case, the meals prepared with fruits began to be present in 5 percent of school menus for the days analyzed after 2005, with a progressive increase until 2010.

On the other hand, although concentrated foods were present in school menus for all of the years analyzed and their frequency increased between 2003/2004, there was a progressive reduction in later years to 17 percent in 2010.

Discussion

This study explored the effect of the use of food products from family farms on school menus of the SFP of a municipality in Southern Brazil. The opinion of KI and the menu analysis shows that the direct supply of foods from local family farms, which began with the implementation of the PAA, resulted in an improvement in the school meals of the studied municipality. Together with the increase in the quantity and variety of fresh and organic foods, there was a

reduction in the offering of processed foods (concentrated foods). The changes related to the incorporation of foods from family farms can favorably affect SFPs.

Our study results agree with those of prior studies, which suggest that incorporating family farms as suppliers of SFPs seems to contribute to an increase in the presence of healthy foods in school meals (Soares *et al.*, 2017; Sidaner *et al.*, 2013; Smith *et al.*, 2013; Bontrager Yoder *et al.*, 2014; Nicholson *et al.*, 2014). These results could be explained by the proximity between production and consumption, given that a reduction in transport time favors the availability of fresh and natural foods (Cavalli *et al.*, 2014). Proximity also affects development of school meals in accordance with the recommendations for healthy eating (WHO 2003, 2004). This is especially relevant considering the fact that accessibility and availability of these foods also seems to contribute to increasing their consumption in schools, more so than in other successful programs and interventions (Fogarty *et al.*, 2007; Reinaerts *et al.*, 2008). In this sense, these results suggest that the Brazilian program for school feeding, which is free and universal (Brasil, 2009b), can promote the consumption of healthy foods.

Furthermore, our results also show that bringing together family farm suppliers and consumers can have a positive impact on the preservation of the traditional cuisine of the population. Beans are a food product that is characteristic of the Brazilian diet, and furthermore, is recommended (Brasil, 2008). According to our results and those of a prior study (Soares *et al.*, 2017), the presence of beans in school meals increased after the incorporation of family farms into the SFP. This result could be explained by the fact that family farms produce the majority of legumes (Soto-Baquero *et al.*, 2007). Legumes become more important in the context of changes in the food system (Hawkes, 2006), which is characterized by reduced consumption of products that make up traditional diets. This is the case of beans in Brazil (IBGE, 2011).

In addition, the SFP engagement with local family farming seems to have favored the production and delivery of organic foods for SFPs. The reduction in pesticide residues and the nutritional superiority attributed to organic foods (Barański *et al.*, 2014) brings about important benefits for health and the environment (Schneider *et al.*, 2014). Despite certification difficulties of organic foods, as shown in other studies (Soares *et al.*, 2015), this is a process that is in its infancy and requires greater institutional support in order to find alternatives that increase production and consumption.

According to our results, the direct purchase of food from family farms represents an opportunity for farms in the municipality to retake food production. The public purchase of food stimulates an increase in agricultural production, in addition to providing for more stable and structured food markets (FAO, 2015b). In fact, a study carried out in Brazil (Wittman and Blesh, 2015) showed that even those farmers with scarce resources participated in public food procurement programs. This could represent an advance in reducing rural poverty and in promoting food security. However, in order for this policy to be sustainable in rural areas, social protection and public infrastructure development programs are also recommended (FAO, 2015b; Wittman and Blesh, 2015).

In interpreting these results, it is important to keep in mind that the opinion of the different KI could be influenced by commercial interests or professional experiences (Davó-Blanes *et al.*, 2013). In any case, we tried to compensate for this by selecting professionals with different profiles from both governmental and non-governmental sectors. Also, the study took place during a period that is marked with changes in the SFP. These changes could have influenced the food supply for school meals, and the proportion of food products supplied by local farms is not known. In any case, the combination of different methodologies permitted contrasting results and identifying the effect of the direct supply of food produced by local family farmers on school menus of the municipality. Therefore, even though this study was focused on a single municipality – which makes it difficult to

extrapolate and generalize results – the municipal experience with use of food products from family farms has permitted the identification of changes in the food supply that could impact the diets of students. Even though this is a process that is just beginning, this information could be helpful in order to support decision-making to strengthen and/or modify the program. Certainly, the articulation of public policies related to food and agriculture increases the availability and variety of healthy foods in school menus and is beneficial for the promotion of healthy feeding programs in schools.

Human Subjects Approval Statement: this study was approved by the Ethical Committee for Human Subjects Research.

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Corresponding author

Pannela Soares can be contacted at: panmela_soares@yahoo.com.br