

Procuring local organic food for public schools: the case of the Lazio Region

Ambra Altimari, Luca Bartoli, Annalisa Castelli, Marcello De Rosa
Department of Economics and Law, University of Cassino and Southern Lazio

The authors acknowledge the Lazio Region who financed their work within the Lazio Innova financed project: "Green Agrifood PMI (GAP)".

Introduction

The present work aims to understand which factors influence the presence of organic food on public school menus in Italy. To this end, we have analyzed the case of the Lazio region. Lazio is one of the 20 Italian administrative regions. It is in the central-western part of Italy, along the Tyrrhenian Sea. The capital of Lazio is Rome, which is also the capital of Italy.

The agricultural sector plays an important role in the local economy of Lazio and contributes to the diversity and productivity of the region.

Lazio's varied geography, which includes plains, hills, and mountains, enables the cultivation of a wide range of crops. Cereals such as wheat and barley, vegetables and fruit are grown in the region. Olive trees are also widespread and contribute to the production of olive oil, which is a staple of Italian cuisine. Olive groves are widespread in Lazio and the region produces high-quality olive oil. Livestock farming is another aspect of the agricultural sector in Lazio. The region is known for its milk production and various cheeses, including Pecorino Romano, are produced here. Pecorino Romano is a famous sheep's milk cheese that has been produced in the region for centuries. Lazio also has a long tradition of wine production, and vineyards are scattered throughout the region. Some areas, such as the Roman Hills (Colli Romani), are particularly famous for their wine.

Some agricultural products from Lazio have been recognized under the European Union's system of protected designations of origin (PDO). These include products such as Pecorino Romano, which must meet certain criteria and be produced in specific geographical areas to bear the PDO label.

Overall, the agricultural sector in Lazio contributes to the region's cultural identity and provides a wide range of products that are not only important for local consumption, but also help to cement Italy's reputation for quality food and drink on the world stage.

Lazio, especially its capital Rome, has immense political and sociological importance. Rome is the capital of Italy and the political center of the country; decisions made in Rome have a direct impact on national politics. The city is a center of political discourse, policymaking and legislation. Lazio is therefore an important player in the Italian political and sociological landscape and for these reasons a good case for analysis.

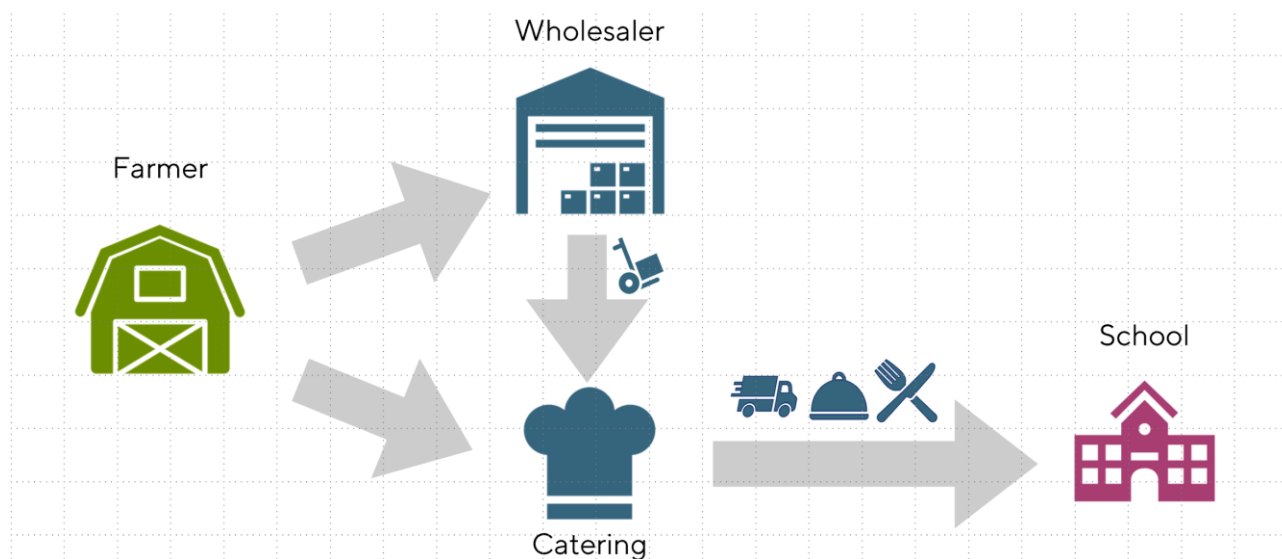
The Italian school food system and its educational relevance

School canteens can be provided in two ways: directly, by cooking and providing meals in the school; indirectly, by cooking outside the school and providing meals cooked in the schools. The service is normally managed by the school's local authority (Municipality), which formulates its own rules for managing the service. The Municipality can manage the service directly with its own staff or contract it out to catering companies. The latter is the most popular way because, according to the Italian Ministry of Education (MIUR)¹, the majority of public school buildings in Italy do not have their own kitchen: only 25.8% of public school buildings have a canteen; of those that do, the majority do not have their own kitchen. Most school buildings do not have adequate kitchen facilities; therefore, it is not possible to cook at school. This means

¹ Portale Unico del Dati della Scuola: <https://dati.istruzione.it/opendata/>

that the public administration outsources the full canteen service; the catering companies prepare the food in their cooking centers and deliver the food to the school. Figure 1 shows a schematic of the supply chain.

Figure 1 – School food supply chain



The Italian law sets some rules for environmental sustainability of food public procurement. The Minimal Environmental Criteria (CAMs)² are the environmental requirements defined for the various stages of the purchasing process to strike a balance between environmental criteria and the market availability of products throughout their life cycle. The CAMs set minimum quotas for organic food that must be met. The minimum quotas for pupils vary depending on the type of food, for example: at least 50% of the weight for vegetables, cereals, and pulses, 30% of the weight for sausage and cheese, 20% for poultry and beef and 10% for pork.

The educational role of school feeding is widely recognized (World Health Organization, 2012). Children spend a large part of their days at school, and employ around one third of their energy intake during that time (Dacunha et al., 2022).

Nevertheless, the evidence suggests that we are still far from an efficient and effective school canteen management in public school. Thus, school menu evaluation protocols are essential to ensure their planning. Much has already been done, but the road ahead is still long. The nutrition aspects are the most important criterion in evaluating schools' menus, few countries consider also the sensorial criterion and the sustainability, nobody takes into account the cultural criterion (AF Cupertino et al., 2021).

Childhood overweight and obesity are a major public health problem in Italy, especially in the southern regions. In 2019, "Okkio alla SALUTE", the Italian monitoring system for overweight and obesity in primary school children, found that 20.4% of the observed sample aged 8-9 years were overweight, 6.9% were obese and 2.4% were severely obese³. The picture is even more serious when looking at habits: About 9% of children do not eat breakfast and about 36% do not eat breakfast properly; 24% do not eat fruit and vegetables daily, 25% consume carbonated and/or sugary drinks daily and 55% overeat during school hours. Educational interventions in elementary school play an important role in preventing and combating overweight and obesity. They are most effective when they are long-term and influence children's eating habits as well as their physical activity and sedentary behavior. In Italy, 75.4% of schools have a canteen. The menus are planned by the local health authorities (Aziende sanitarie locali) together with the contractors (catering

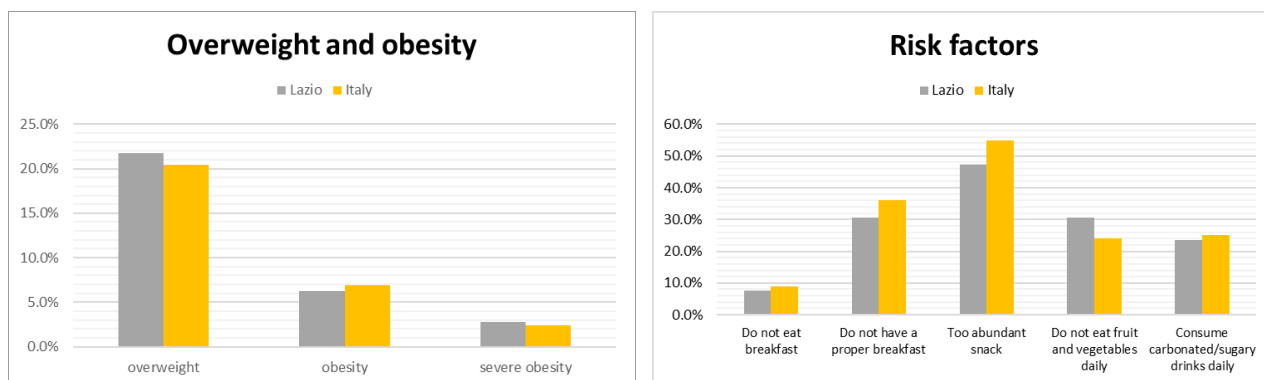
² See: <https://gpp.mite.gov.it/CAM-vigenti>

³ 2019 survey "Okkio alla SALUTE" is a survey managed by the Italian Istituto Superiore di Sanità and the Italian Ministry for Education. The survey was submitted to students of the third year of primary schools. Data refer to the 2019 survey. <https://www.epicentro.iss.it/okkioallasalute/indagine-2019>.

companies) and the municipality; only in a few cases (19.5% and 14% respectively) are a canteen committee and an external nutritionist consulted.

The Lazio region shows values in line with the national average, as shows the Figure 2.

Figure 2 – Overweight, obesity and risk factors



Authors' elaboration on ISS data

It is worth noting that among the risk factors, the proportion of children who eat fruit and vegetables less than once a day is higher than the national average. This underlines the need for a specific policy for school nutrition.

Methodology

School food supply chain organization

We conducted in-depth interviews with 5 catering companies and 3 wholesalers/distributors currently providing canteen services in the Lazio region; this sample of interviewees covers almost 70% of public school canteens in Lazio. The interviews were semi-structured and divided into 4 sections: Type of activity and the role of organic food; Certifications; Logistics and organization; General information.

Potential supply

We estimated the potential supply of organic food from the Lazio region based on the data from ARSIAL (Agenzia Regionale per lo Sviluppo e l'Innovazione dell'Agricoltura del Lazio). In particular, the summary reports on the annual programs for crop production (PAPV) and livestock breeding (PAPZ) were drawn up. These refer to the organic operators active in the Lazio Region and are provided by ARSIAL based on the data reported by the operators through the SIAN portal's organic information system. The files used contain all the information contained in the reports of the annual programs for crop production (PAPV) and livestock production (PAPZ), as well as some information on the status of the organic operator. They have been compiled by ARSIAL on the basis of extractions from the reports of the Biological Information System (SIB) of the SIAN portal. The companies are identified by an identification code and all data is collected as of 31.12.2020. The file contains records relating to the same farmer and repeated according to the number of varieties grown. The maximum permitted territorial level of detail is the maximum territorial level of data representation. Crops are classified (where indicated) by macrospecies and species. For each crop variety, the area in square meters, the expected production and the unit of measurement in which it is expressed (T/Ha or Kg/Ha or number) are indicated. Then the elaborations for the summary report on the annual livestock breeding programs were prepared.

Breeders are also identified by an identification code in the zootechnical file. As far as the type of farming is concerned, the information available allows identification by group, species, and type of production (if indicated); information on the number of animals is also available.

In terms of production, the available data allows a breakdown by type of product.

Therefore, the planned products are indicated with provincial details. The unit of measurement of production is expressed in number, kilograms and liters. For this reason, the tables showing the number of animals bred by species and the quantities by type of production and planned production have been processed separately for each unit of measurement.

Potential demand from schools

The menus proposed by the catering company ALL FOOD⁴ have been used in schools of all levels in the Lazio region to identify agricultural food needs. In addition to the weekly list of proposed dishes, each menu also included information on the quantities provided for each age group and the cookbook with the corresponding ingredients and quantities. Based on this information, a standard menu was drawn up and the quantities indicated in the recipe books were used to calculate the requirements for each ingredient (only agricultural products were taken into account).

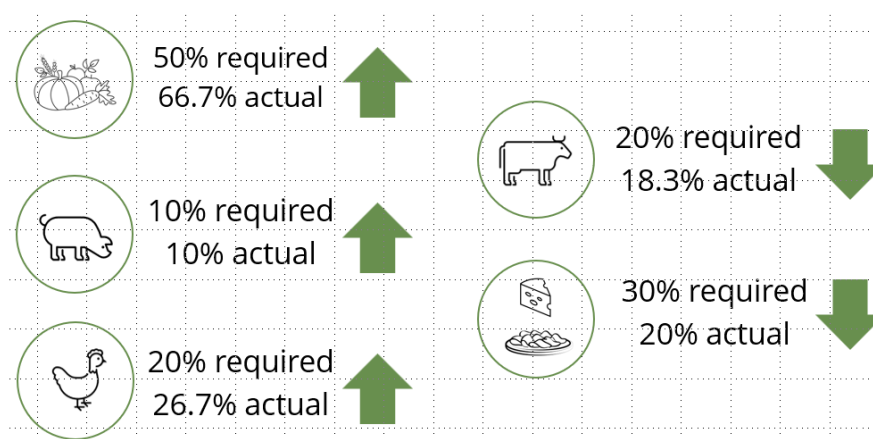
As for the schools, the data provided by the regional education authority was compiled by excluding the normal classes without canteen service and considering only the all-day classes. The number of all-day classes was then multiplied by the average number of students per class, resulting in an estimate of the total number of students attending all-day classes. The sum of pupils from all provinces was calculated to obtain the entire Lazio region. The average annual demand for each food and per pupil was then calculated.

A comparison was then made between the potential production and the potential demand of schools in Lazio.

Results

If we compare the CAM percentages with the actual average percentages of the companies surveyed, we find that the average percentages for organic vegetables, pulses and cereals are higher than the minimum percentages stated by the CAMs; the same applies to chickens. Figure 3 shows the CAM percentages and the percentages actually declared by the contractors, calculated as the average of the percentages declared by the companies surveyed.

Figure 3 – Presence of organic food and comparison with CAMs provisions for school (average percentages)



After reconstructing the supply chain and legal framework, we matched demand and supply. Table 1 shows the number of students using the canteen service.

Table 1 - Students attending full-time classes, by grade level in the Lazio region.

⁴ <https://www.allfoodspa.com/>

	No. of full-time sections/classes	Average number of students per section/class	Total
Preschool	2,856	21	60,833
Primary	6,697	19	127,243
Secondary (I level)	293	21	6,153
Total			194,229
Source: Authors elaboration on Regional School Office of Lazio data			

We used the ALLFOOD's meal plan as a typical menu and determined the total amount of each vegetable type required to prepare all meals in one year for the 188,076 pupils attending preschool and primary school. We then compared the results with the potential supply (Table 2).

Table 2 – Matching demand and supply

supply \geq demand		supply < demand
Beans	Lentils	Beef, Beef shoulder
Broccoli	Lettuce	Eggs
Cappuccina	Onions	Green beans
Carrots	Potatoes	Pork, Arista
Cauliflower	Pumpkin	Pork, pork shoulder
Celery	Spinach	Robiola
Chard	Tomato for salad	Sweet provolone
Chickpeas	Tomato peeled	
EVO oil	Tomato sauce	
Fennel	Zucchini	
Frozen pees	UHT milk	

The results show that the potential production of organic food in the Lazio region would be sufficient to cover 100% of the annual demand for vegetables and pulses for pre-school and elementary school. Nevertheless, 80% of organic food for school catering comes from outside the region. There are 3 main reasons for this: i) not all ingredients can be produced in Lazio; ii) the catering companies need stability in terms of quantity, price and quality; iii) many local organic farmers are not willing to join the public supply chain network.

The following points summarize the main points that emerged from the in-depth interviews on reasons ii and iii.

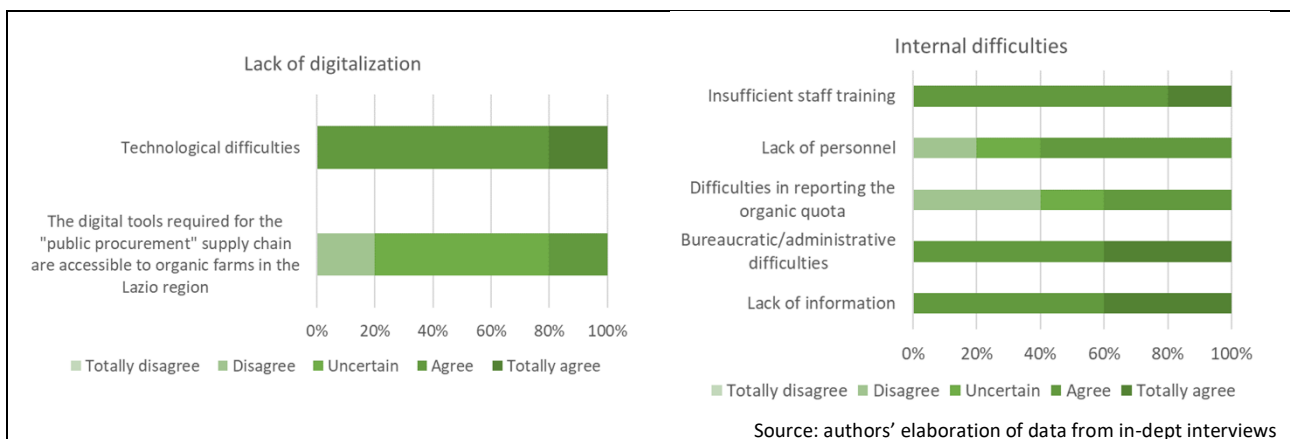
- The organic farming sector in Lazio is fragmented: farmers work autonomously without joining consortia or producer groups.
- There is little choice, small quantities, and unstable prices: Organic farmers are generally small and have a low production volume; in addition, the product range is limited, and prices are unstable due to the fragility of this type of production.
- Another important problem is logistics. As already mentioned, the catering companies prepare the meals in their cooking centers. The cooking centers are scattered all over the area and work just in

time. The suppliers must therefore also offer a logistics service by delivering the orders directly to the cooking centers. Small farmers are often not in a position to offer a delivery service.

- Joining a network means losing decision-making powers. As a rule, farmers who join the supplier network of large wholesalers must adhere to the production plans set by the wholesaler as part of the tendering process. However, many smallholders are not willing to abide by these conditions and prefer not to join the PA's supply network.

Apart from the reasons just mentioned, there are some practical difficulties that complicate the relationship between farmers, wholesalers, and catering companies: lack of digitalization of farmers, lack of organizational skills and lack of information (Figure 4).

Figure 4 – Difficulties met by catering companies and wholesalers in dealing with local farmers



Conclusions

We are conducting an in-depth analysis of the current school food supply chain in the Lazio region to understand the factors that influence the proportion of organic food on school menus. School canteens represent an important part of the demand for organic food in Lazio. Although the regional supply of organic food is greater than the demand, 80% of the food procured comes from outside the region for the following reasons:

- Fragmentation and small size of farmers/producers
- Organizational and administrative weaknesses of farmers/producers
- Digital divide
- Logistical infrastructure

Minimum quotas for organic food are set by CAMs and included as qualification criteria in tenders, but the actual shares of contractors are higher, especially for vegetables, pulses and cereals. The reason for this is that the percentage of organic food is higher than the percentage set by the CAMs, which is considered a premium criterion.

References

AF Cupertino, MAynard, D., Queiroz FLN, Zandonadi RP, Ginani VC, Raposo A, Saraiva A, & Botelho RBA.

(2021). How Are School Menus Evaluated in Different Countries? A Systematic Review. *Foods*, 2(10), 374. <https://doi.org/10.3390/foods10020374>

Dacunha, C., Ng, E., & Elton, S. (2022). The school food solution: Creating a healthy school food environment with Canada's Food Guide. *Journal of Agriculture, Food Systems, and Community Development*, 12(1), 157–169. Scopus. <https://doi.org/10.5304/jafscd.2022.121.010>

MIUR. (n.d.). *Portale Unico dei Dati della Scuola* [dataset]. <https://www.miur.gov.it/mensa-e-trasporti>

World Health Organization. (2012). *Population-based approaches to childhood obesity prevention*. <https://iris.who.int/handle/10665/80149>