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iPOPY

School catering supply chains: study on 5 cases



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Photos by Amiqua (Associazione per il miglioramento della qualità della vita – Milan Italy): IT school canteens in Piacenza (left) Rome (centre) - Sesto San Giovanni (right)

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Abstract

This study presents accurate data on the school catering systems of five different municipalities which decided to invest on service quality and sustainable development. The aim is to provide a compendium to be considered by other local authorities and then used as an educational tool for drafting new templates for tender specifications.

Regional laws as drivers for promoting organic consumption in school canteens and waste reduction through self service systems are two examples of interesting models for sustainable school food catering. This work does not present a unique best practice model but constellations of reference models for each different situation: in such way each municipality can consult the most fit case study and search the best solution according to specific variables.

1 Introduction

1.1 Framework and objectives of the study

Italian school catering has a long tradition: the first documents attesting a public catering system trace back to the 19th century (Bocchi et al., 2008). According to the latest trends for Italian public catering, the use of quality food ingredients in school canteens has a major role in terms of overall assessment of the catering system. Among the ingredients provided to school canteens, those coming from conventional agriculture are significantly decreasing and progressively replaced by "controlled chain products" (*filiere controllate*). The latter category includes mainly organic products and certified ones, as typical or local products (labelled as Protected Designation of Origin/PDO and Protected Geographical Indication/PGI), products from sustainable agriculture, and fair-trade products (Spigarolo 2006).

In light of such scenario the research question of the present work is: "Is it possible to find any criteria which can identify the current needs of public school catering and help to compare some different school catering systems by using of measurable data?" The first objective of this work is to create a tool for Public Administration decision-makers in order to compare different supply chains included in canteen services. The other objective is to use such methodology to analyze 5 specific case studies in order to depict the relevant characteristics of the food supplied.

1.2 Modern school catering supply requirements

Why organic products are so important and which are the elements that made organic products popular?

The link between organic and public catering food policies was done, explicitly, in 1999, when, in response to an increased public concern for healthy eating, the Italian Government issued the Finance Law 488. Quoting the section "Measures to facilitate employment and economic development" the law states: ".....to guarantee the promotion of organic agricultural production of "quality" food products, the public institutions managing school and hospital canteens will provide in the daily diet the use of organic traditional and typical products as well as those from denominated areas" (Morgan and Sonnino, 2005).

Consequently, the number of organic school meals increased, daily, from 24,000 in 1996 to 924,000 in 2007. The data referred to 2005/06 show that more than 94 % of the school canteens used organic products, at least once a week. The 76 %, in weight, of all the products were "controlled chain", 40 % organic, 18 % sustainable agriculture (integrated production methods with reduced amount of pesticides and fertilisers), 14 % typical local products (PDO and PGI), and fair trade 4 %. Only 24 % came from conventional agriculture (ACU "Eating out of home", 2006). Initially this increase was due to economical aspects supporting national producers. Then came also the will of Italian public administrations to implement more responsibility towards environmental protection (Congress "Gli Stati Generali dei Prodotti Biologici, Ministero delle Politiche agricole e forestali, Padova 14th April 2009). Organic production is defined by the Council Regulation (EC) No 834/2007: the organic production shall be

intended as an overall system of farm management and food production. This combines: the best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preferences of consumers for products, produced using natural substances and processes. Then the organic production plays a double social role: on one side it replies to the consumer demand for organic products, and on the other it delivers goods contributing to the protection of the environment and to animal welfare, as well as to rural development.

Besides organic food, local products have spread in school catering systems. This is because in Italy, the school meals are embedded in a food culture that is strictly related to local identity. The Italian Law 281 on the protection of customers' rights, issued in 1998, confirms this relation between health promotion and cultural development.

On one hand the law provides the right to health, including all aspects related to individual growth and development, by setting up high standards in relations to safety and quality of products and services for children. On the other hand, the above mentioned law underlines the importance to educate citizens to consumption also according local and cultural traditions (Morgan and Sonnino, 2006). Moreover, nowadays, the Italian Government started to evaluate the consumption of local products as a positive element for the environmental protection. This is due to the fact that the choice of introducing local products brings to a reduction of transportation distances and, consequently, a decrease of CO2 emission. That lower impact on the environment has been shown to be of considerable importance (Arachi, 2009) (8).

Although the trends described above are well defined and broadly shared by the Local Public Administration, there are no common laws nor voluntary standards for tender specifications regarding with specific data requirements and references. In Italy there are only few Regions (Emilia Romagna, Lazio, Friuli Venezia Giulia, Veneto, Marche and Basilicata) having issued specific laws. However, even such laws, apart from the Emilia Romagna Region, don't state any figures or numbers of reference. This study is therefore important because it can capture accurate data on school catering systems of some Municipalities which can then be assessed by other local authorities and then used as an educational tool for drafting new templates for tender specifications.

2 Analysis

2.1 Case study selection

Then 5 case studies from the Municipalities of Turin, Rome, Sesto San Giovanni, Piacenza and Argelato have been chosen. The overview for the case study selection was gained throughout the examination of 100 Italian tender specifications undertaken in the iPOPYP project framework. In particular, the reasons for the choices were:

- **Rome** provides the greatest number of school meals (150.000 per day) and it is important to evaluate the management of such a large supply
- **Piacenza** (5.000 meals per day) designed its canteen service in tight connection with the local resources.
- **Turin** (55.000 meals per day) is a well-managed Municipality in terms of service quality and price.
- **Argelato** (800 meals per day) is a small town outside Bologna purchasing only organic products, reflecting therefore a marked inclination towards green procurement.
- **Sesto San Giovanni** (6000 meals per day) chooses to supply food with an high quality grade

2.2 Methodology

The first step in defining the study method was to set up the criteria to match the current requirements for school catering through data, information and activities which could be well-defined and measurable in order to set up a close comparison.

TABLE 1: Relationships among principles inspiring ingredient quality and related indicators and data

PRINCIPLES GUIDING THE RESEARCH	INDICATORS	DATA/ INFO / MEASURED ACTIVITIES
Environmental protection	Raw materials production methods	Organic product quantity
	Food miles for raw materials until the cooking centre	Local and short chain products quantity
Raw materials quality	Raw materials compliant with quality standards	Controlled chain products quantity (PDO, PGI, etc.)
Users' involvement	Canteen service activities	Self-service, food and consumption education programs

There is a direct relationship between the above-mentioned variables: for instance, looking at environmental protection, the more organic/quality products, the more the principle is respected through its applications (reducing the environmental impact on agricultural soils and CO₂ emissions).

Supply chains and their procurement systems have been analysed and compared in the 5 case studies. Data have been collected through checklists, interviews and technical documents. The study strategy has therefore been based on both qualitative and quantitative analysis (Bauer and Gaskell, 2000).

Table 2 is an example of checklist used for the milk and milk by-products supply chain, and the results of the checklist are presented in table 3, comparing the five different case studies. The other checklists and raw results are to be found in the appendix.

TABLE 2: Checklists for milk and by-products supply chains

QUESTION/EVALUATION ELEMENT	ANSWER/DATA
% organic milk and by products in relation to total amount of milk and by products	
Which kinds of product are organic and which are not organic? Which are the reasons of these chooses?	
Which kind of policy and approach is used in the choosing of this supplying chain? (just local cheese, mainly local cheese, DOP cheese in general, fresh cheese, matured cheese, etc.)	
Short chain or long chain? Do you have direct relation with producers or are there other interlocutors in the chain? If yes, how many interlocutors between you and producers?	
How many suppliers have you got? Have you got a traceability system that let you know the producers of raw materials (milk)?	
Do you do some controls on producers? If yes, which kind of controls?	

TABLE 3: Case study results concerning milk and by-products supply chains

<i>Milk and by products</i>						
REQUIREMENT		PIACENZA	ARGELATO	ROMA	SESTO SAN GIOVANNI	TORINO
ORGANIC % <i>(Organic milk and by products in relation to total amount of milk and by products)</i>		60	100	100	65	0
KIND OF ORGANIC PRODUCTS		<i>Grana Padano (cheese), Milk and yogurt</i>	<i>All products</i>	<i>All products</i>	<i>Parmigiano Reggiano (cheese), Milk, Yogurt and Butter</i>	<i>No product</i>
CHOOSE ABOUT QUALITY PRODUCTS		<i>Milk and dairy products (mainly organic) Cheese mainly DOP (typical origin production)</i>	<i>Organic products</i>	<i>Fresh cheese and cheese local DOP (typical local production) and Organic</i>	<i>Milk and dairy products (mainly organic) Cheese mainly DOP (typical origin production)</i>	<i>Mainly fresh cheese and some cheese DOP (typical origin production)</i>
SHORT / LONG CHAIN?	<i>PRODUCER > CATERING COMPANY > SCHOOL (SHORT CHAIN)</i>	NEARLY 100 %	NEARLY 0 %	ABOUT 50 %	NEARLY 0 %	NEARLY 0 %
	<i>PRODUCER > INTERMEDIARIES > CATERING COMPANY > SCHOOL (LONG CHAIN)</i>	NEARLY 0 %	NEARLY 100 %	ABOUT 50 %	NEARLY 100 %	NEARLY 100 %
NUMBER OF SUPPLIERS		<i>MAINLY ALL LOCAL PRODUCERS ASSOCIATED TO BIOPIACE</i>	3	8 / 10	3 / 4	<i>EVERY CATERING COMPANY HAS GOT ITS DISTRIBUTION PLATFORM</i>

2.3 Results

Data from the five case studies about the organic products used in the catering supply chains are presented in tables 4, 5, 6, 7, divided according to type of product (in the appendix is to be found the raw result tables). In order to interpret the following data it's useful to bear in mind the national average of organic products employed in school canteen menus (calculated only among the school catering services buying organic ingredients in their meals), corresponding to 40 % of the total product weight (ACU "Mangiare Fuori Casa", 2006).

TABLE 4: Results for organic milk and milk by-products

	Piacenza	Argelato	Roma	Sesto San Giovanni	Torino
% of organic milk and dairy products in relation with the total weight of milk and dairy products procured in the service	60 %	100 %	100 %	65 %	0 %
Type of organic milk and dairy products	<i>Grana Padano cheese, milk and yogurt</i>	<i>All products</i>	<i>All products</i>	<i>Parmigiano Reggiano cheese, butter, milk and yogurt</i>	<i>None</i>

Both Argelato and Rome (respectively the smallest and largest municipalities among the examined cases) employ only organic milk and dairy products. Piacenza and Sesto San Giovanni, two municipalities with similar size, employ several organic dairy products and milk; Turin instead makes no use of organic products within this sector. Except Turin all other municipalities use at least organic milk and yogurt.

TABLE 5: Results for organic cereals and by-products

	Piacenza	Argelato	Roma	Sesto San Giovanni	Torino
<i>% of organic bread in relation with the total weight of bread procured in the service</i>	20 %	100 %	100 %	100 %	0 %
<i>% of organic pasta in relation with the total weight of pasta procured in the service</i>	100 %	100 %	100 %	100 %	0 %
<i>% of organic rice in relation with the total weight of rice procured in the service</i>	100 %	100 %	100 %	100 %	0 %

Organic cereal and by-products, except for the case of Turin, are wide-spread; the municipality of Piacenza serves exclusively organic bread one day per week.

TABLE 6: Results for organic meat and by-products

	Piacenza	Argelato	Roma	Sesto San Giovanni	Torino
<i>% of organic meat in relation with the total weight of meat procured in the service</i>	0 %	100 %	0 %	55 %	0 %

Argelato, which buys 100 % organic meat and meat by-products, and Sesto San Giovanni stocking up half of its meat provision from organic producers, are the only two cases investing in the organic meat sector.

TABLE 7: Results for organic fruit and vegetables

	Piacenza	Argelato	Roma	Sesto San Giovanni	Torino
<i>% of organic fruit in relation with the total weight of fruit procured in the service</i>	90 %	100 %	100 %	100 %	100 %
<i>% of organic vegetables in relation with the total weight of vegetables procured in the service</i>	90 %	100 %	100 %	90 %	100 %

The fruit and vegetable supply chain is the most characterised for its organic provision: all municipalities stock up mainly on organic products.

TABLE 8: Results for local and short-chain products

	Piacenza	Argelato	Roma	Sesto San Giovanni	Torino
<i>% of short chain or local fruit & vegetables in relation with the total weight of all fruit & vegetables procured in the service</i>	90 %	0 %	95 %	0 %	0 %
<i>% of short chain or local milk & dairies in relation with the total weight of all milk and dairies procured in the service</i>	100 %	0 %	50 %	0 %	0 %
<i>% of short chain or local cereal products in relation with the total weight of all cereal products procured in the service</i>	0 %	0 %	0 %	0 %	15 %
<i>% of short chain or local meat in relation with the total weight of all meat procured in the service</i>	100 %	0 %	0 %	0 %	100 %

Piacenza (90 %) and Rome (95 %) are the only ones buying local/short chain fruit and vegetables. Piacenza implements meat, milk and dairies procurement from local producers, so does Rome, in a more reduced percentage (50 %). Turin buys certain typical products (PDO, PGI) such as meat (Piedmont breed) and rice.

3 Concluding remarks

The final picture (see

A2.4 Sum-up table for the 5 case studies main features in Appendix 2) is fragmented due to inhomogeneous data; the lack of comparable parameters is due to variables such as local food culture, number of service users, raw material availability, and economic resources.

Nevertheless there are some major consideration which can be drawn from the results.

Regional laws, despite displaying several limits, are an important driver for promoting organic consumption in school canteens: municipalities benefiting of such laws are indeed facilitated in the organic and local food implementation process.

Raw material high quality has high costs due to ingredient availability. A tighter collaboration can be set up by local administration and specific working group in order to reach lower costs for a more rationalised supply chain management.

Catering companies adopting self-service systems well address the issue of waste reduction, impacting positively the service total costs.

Local food implementation should also be supported by short chain procurement systems in order to guarantee real short transportation distances and therefore an effective CO₂ emissions reduction.

The studied cases have revealed that a best practice model for school catering, which could be applied in all real cases, does not exist. There are instead constellations of reference models for each different situation, and each municipality can search the best solution according to the above mentioned variables and then consulting the most fit case studies.

Last but not least, producers, catering staff and public decision-makers still work following separated logics, the lack of a holistic approach hampers long-run solutions, hindering a better environment protection/cost ratio and a more efficient resource management.

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Annex 1 - Checklists for other food supply chains

A1.1 Cereals and by products chain

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
% Organic bread	
% Organic pasta	
% Organic rice	
% Organic legumes	
Which are the reasons of these choices? (just for rice, pasta and legumes)	
Short chain or long chain? Do you have direct relations with producers or are there other stakeholders in the chain? If so, how many actors between you and producers?	
(just for bread) How is bread supplying? Is there a chain such as producers – school or school – central kitchen – school?	
Do you make any controls on producers? If so, which kind of controls? <i>Draw a representation of the rice supplying chain</i>	

A1.2 Meat and by-products chain

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
% organic meat in relation to total amount of meat	
% organic meat by-products in relation to total amount of meat by products	
Which kind of products are organic and which are not? Which are the reasons of these choices?	
(Just for meat) Short chain or long chain? Do you have direct relations with producers or are there other stakeholders in the chain? If so, how many actors between you and producers?	
Do you make any controls on producers? If so, which kind of controls? <i>Draw a representation of the meat supplying chain</i>	

A1.3 Fruits and vegetables chain

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
% organic vegetables in relation to total amount of vegetables	
% organic fruits in relation to total amount of fruit	
Which kind of policy and approach is used in choosing such chain? (for example: only local and seasonal fruits, mainly local and seasonal fruits, only local vegetables, frozen vegetables, etc.)	
Short chain or long chain? Do you have direct relations with producers or are there other stakeholders in the chain? If so, how many actors between you and producers?	
Do you make any controls on producers? If so, which kind of controls?	
<i>Draw a representation of the fruit supplying chain</i>	

A1.4 Procurement study

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
How are the food raw materials managed?	
Which criteria do you use to guarantee traceability of organic foods?	

A1.5 Technological process of food preparation

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
How many schools have are there in your municipality? How many meals do you provide every day?	
Have you got a central kitchen? If so, how many central kitchens? Which production capacity (meals per day) have they got? How many schools does every kitchen provide? How many employers has each kitchen got?	
Which kind of technologies are used? Cook & chill + warm up in the school before the lunch? Cook and keep warm until the consumption? Just cold lunch?	
Have you got at-school-kitchens? If so, how many? Which kinds of technologies are employed in these kitchens? Cook & chill or "in express"? How many employers per meal are there in average?	

A1.6 Other information

QUESTION / EVALUATION ELEMENT	ANSWER / DATA COLLECTED
Food catering service is contracted to a private society? Food catering service is directly managed by public administration? Other management solutions?	
Assess your food catering service	
What are Strengths of your service (low costs, mainly organic products, mainly local and quality products, short chain, attention to nutritional elements, etc.)?	
What are the Weaknesses of your service?	

Annex 2 - Case studies results for the other supply-chains

A2.1 Meat and by-products

REQUIREMENTS		PIACENZA	ARGELATO	ROMA	SESTO SAN GIOVANNI	TORINO
ORGANIC % (% of total organic meat related to total meat weight)		0	100	0	55	0
ORGANIC % (%of total organic meat by-products related to total m. by-product weight)		0	100	0	0	0
QUALITY PRODUCTS		Meat and by-products MAINLY LOCAL (Coppa e Salame) PDO(Prosciutto di Parma).	ORGANIC products	LOCAL meat, beef or lamb	PDO meat by-products	Meat by-products PDO (Prosciutto di Parma) PGI (Bresaola) LOCAL meat (Razza Bovina Piemontese)
SHORT CHAIN / LONG CHAIN	PRODUCERS> CATERING COMPANY> SCHOOL> (SHORT CHAIN)	APPROX. 100 %	APPROX. 0 %	APPROX. 0 %	APPROX. 100 %	APPROX. 0 %
	PRODUCERS> OTHER CHAIN ACTORS> CATERING COMPANY> SCHOOL> (LONG CHAIN)	APPROX. 0 %	APPROX. 100 %	APPROX. 100 %	APPROX. 0 %	APPROX. 100 %

A2.2 Cereals and by-products

REQUIREMENTS		<i>PIACENZA</i>	<i>ARGELATO</i>	<i>ROMA</i>	<i>SESTO SAN GIOVANNI</i>	<i>TORINO</i>
ORGANIC % <i>(organic bread % related to total bread weight)</i>		20 <i>(1 day/week)</i>	100	100	100	0
ORGANIC % <i>(organic pasta % related to total pasta weight)</i>		100	100	100	100	0
ORGANIC % <i>(organic rice % related to total rice weight)</i>		100	100	100	100	0
SHORT CHAIN / LONG CHAIN	<i>PRODUCERS> CATERING COMPANY> SCHOOL> (SHORT CHAIN)</i>	70 %	0 %	100 %	<i>APPROX. 25 % Rice and pasta are bought dir. From producers</i>	<i>APPROX. 15 % Rice bought from producers</i>
	<i>PRODUCERS> OTHER CHAIN ACTORS> CATERING COMPANY> SCHOOL> (LONG CHAIN)</i>	<i>APPROX. 30 %</i>	<i>APPROX. 100 %</i>	<i>APPROX. 0 %</i>	<i>APPROX. 75 %</i>	<i>APPROX. 85 %</i>

A2.3 Fruit and Vegetables

REQUIREMENTS		<i>PIACENZA</i>	<i>ARGELATO</i>	<i>ROMA</i>	<i>SESTO SAN GIOVANNI</i>	<i>TORINO</i>
ORGANIC % <i>(organic FRUIT % related to total fruit weight)</i>		90	100	100	100	100
ORGANIC % <i>(organic VEGETABLES % related to total vegetables weight)</i>		90	100	100	90	100
QUALITY PRODUCTS		<i>Mainly all LOCAL products according to season</i>	<i>All LOCAL products according to season</i>	<i>Mainly all LOCAL products according to season</i>	<i>Mainly all LOCAL products according to season</i>	<i>All LOCAL products according to season</i>
SHORT CHAIN / LONG CHAIN	<i>PRODUCERS> CATERING COMPANY> SCHOOL> (SHORT CHAIN)</i>	100 % (2 providers: one of them is an association of local producers)	<i>APPROX.</i> 0 %	100 % <i>320 LOCAL PRODUCERS</i>	100 % <i>3 LOCAL PRODUCERS</i>	<i>APPROX.</i> 0 %
	<i>PRODUCERS> OTHER CHAIN ACTORS> CATERING COMPANY> SCHOOL> (LONG CHAIN)</i>	<i>APPROX.</i> 0 %	<i>APPROX.</i> 100 %	<i>APPROX.</i> 0 %	<i>APPROX.</i> 0 %	<i>APPROX.</i> 100 %

A2.4

Sum-up table for the 5 case studies main features

REQUIREMENTS	PIACENZA	ARGELATO	ROMA	SESTO SAN GIOVANNI	TORINO
Weaknesses	<p>AVAILABILITY OF RAW MATERIAL HIGH WASTE VOLUME HIGH SERVICE COSTS</p>	<p>HIGH COSTS AVAILABILITY OF RAW MATERIAL LONG TRANSPORTATION DISTANCES FOR RAW MATERIALS</p>	<p>HIGH SERVICE SATFF COSTS AVAILABILITY OF RAW MATERIAL HIGH WASTE VOLUME</p>	<p>HIGH COSTS HIGH WASTE VOLUME AVAILABILITY OF RAW MATERIAL</p>	<p>LONG TRANSPORTATION DISTANCES FOR RAW MATERIALS</p>
Strengths	<p>SHORT DISTANCES FOR RAW MATERIAL TRANSPORTATION HIGH RAW MATERIAL QUALITY PREPARATION SYSTEM STRUCTURE</p>	<p>HIGH RAW MATERIAL QUALITY ENV. SUSTAINABLE PREPARATION TECHNIQUES RATIONALISED CATERING MANAGEMENT (SELF SERVICE)</p>	<p>SHORT DISTANCES FOR RAW MATERIAL TRANSPORTATION HIGH RAW MATERIAL QUALITY</p>	<p>HIGH RAW MATERIAL QUALITY</p>	<p>LOW MANAGEMENT COSTS WASTE REDUCTION (SELF SERVICE) GOOD RAW MATERIAL QUALITY</p>