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# Increasing organic consumption through school meals—lessons learned in the iPOPY project

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**Abstract** Increasingly, food consumption occurs in out-of-home contexts, where organic food can also have a role to play. Public food services may be utilised to increase the sustainability of providing nutrition. Although school meals may be well suited to integrating organic food and sustainable nutrition concepts, school food provision systems are very different across Europe. This paper compares school food provision systems and their utilisation of organic food in Denmark, Finland, Germany, Italy and Norway, discussing how various strategies and instruments used for organic food procurement in school meals may increase organic food consumption. Using five analytical categories—(a) type of school food service, (b) degree of public financing, (c) degree of political and administrative involvement in school food procurement in general, (d) degree of specific support for organic school food, and (e) availability of organic food supply adapted to school food service—values have been assessed for each country in order to summarise and visually display their differences. Especially, the degree of specific support for organic school food shows a significant relation to the actual use of organic food in school meals. To maximise the share of organic food in school meals, instruments should be adapted to the actual points of departure in each case. It is argued that strategies and instruments designed to promote public procurement of organic food increase the consumption of organic food in schools and that such policies will have the greatest impact when they are linked up with broader concepts such as a whole-school approach and sustainable nutrition.

**Keywords** School meals · Catering · Organic food · Children · Youth · Public procurement · Sustainable nutrition

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## Introduction: organic food in public food procurement for youth

Several trends in our current nutritional situation in Europe are not sustainable (Brunner and Schönberger 2005; Nölting and Schäfer 2007; Tischner et al. 2010). Over-consumption, unhealthy diets and the erosion of nutritional knowledge are contributing towards increasing obesity, cardiovascular diseases and cancers, especially in industrialised countries. Agricultural intensification is causing overexploitation and negative environmental effects, such as soil degradation, water pollution, loss of biodiversity,

climate change and reduced standards of animal welfare (Knudsen et al. 2006; McIntyre et al. 2009). Industrialised farming and global food trade, increasing the distance between producers and consumers (Morgan et al. 2006), are also creating food scandals that undermine consumers' trust in food production, such as the catastrophic outbreak of BSE disease in Great Britain in 1995–1996 (Reynolds 2006). Against this background, out-of-home food consumption has expanded rapidly in recent years and deserves greater attention when sustainable consumption is discussed. In Europe, the average EU-27 household expenditure for catering services, inflation adjusted, rose by 25% from 1995 to 2005, while expenditure for food in general rose by only 15% (European Commission 2008). Within the out-of-home eating sector, food procurement through public institutions comprises a significant volume, providing food to a wide range of users: from children, students and employees to elderly people. This requires that responsibility be taken by public institutions providing food and meal services to care about sustainability, health and nutritional issues (Morgan and Sonnino 2008).

Children and youth are of special interest in the context of sustainable consumption and healthy nutrition, as the EU white paper *A strategy for Europe on nutrition, overweight and obesity related health issues* states: 'Childhood is an important period to instil a preference for healthy behaviours, and to learn the life skills necessary to maintain a healthy lifestyle' (European Commission 2007, p. 8). Hence, public food provision of healthy meals and food education in day-care centres and schools seem to be a promising starting point (Mikkelsen et al. 2005) because of, for example, the impact school food procurement can have on pupils' food habits (Vereecken et al. 2005). As a consequence, schools have become an arena for public engagement in nutrition and food, as demonstrated by the EU's recognising its responsibility and supporting the implementation of a daily free-fruit school programme (European Commission 2009).

Food service in schools is very different in various European countries, ranging from complete, free meals, such as found in Sweden, Finland (Tikkanen and Urho 2009) and several other Eastern Europe countries, to simple subscription systems for school milk and fruit to accompany a packed lunch of home-made sandwiches, such as found in Norway and Denmark. In between these extremes, we find a range of school restaurants, canteens and school booths, where pupils can buy food items or even complete meals (BBC News 2005; Morgan and Sonnino 2008; Young et al. 2005). School meals have been heavily debated in many countries in recent years, such as in the UK, where via a TV show in 2005 the famous cook Jamie Oliver initiated a vigorous campaign—'Feed me better'—to increase the quality of the national school lunches (Naughton 2005).

The concept of sustainability may also provide orientation for (re-)organising school food services. For this paper, we adopt the notion of sustainable nutrition defined by Eberle et al. (2006, p. 54) as being environmentally friendly, healthy, satisfying nutritional needs and contributing to quality of life. Sustainable food supply should correspond with daily life routines and enable socio-cultural diversity. Furthermore, we draw on Morgan and Sonnino (2007), who propose that sustainable school meal systems should deliver fresh and nutritious food, conceive healthy eating as part of a socially negotiated 'whole-school' approach, and seek to source the food as locally and as seasonally as possible.

Organic-quality products should be the cornerstones of a sustainable food and nutrition concept. Increased consumption of certified organic food might be seen as a strategy towards sustainable production and nutrition (Eberle et al. 2006). Introduction of organic food in catering often implies that more focus is set on healthy eating (Mikkelsen et al. 2006). Due to relatively high premium prices on organic meat, organic strategies often include 'less meat, more vegetables' adaptations, which are usually also nutritionally and environmentally sound. However, there is no simple solution for public catering for youth, as Morgan and Sonnino propose: 'At first sight, the idea of serving fresh, locally produced food in schools looks very simple. But nothing could be further from the truth' (2008, p. XIII).

Bringing organic consumption and healthy eating habits together was a central approach in the *innovative Public Organic food Procurement for Youth* (iPOPY) research project, which was part of a European Research Area programme supporting organic food and farming: CORE Organic I. The overall goal of iPOPY was to contribute towards increasing the consumption of organically produced food among young people and focussed on organic school food as the most important channel of public

food provision for youth. The participating countries were Denmark, Finland, Italy, Norway and to some extent Germany.

This paper draws on knowledge acquired from the project. It assesses the current school food systems in the five countries mentioned and analyses how they impact the consumption of organic food in schools. Our hypothesis here is that public organic food procurement strategies and instruments used for school food do contribute towards increasing organic food consumption. We discuss this hypothesis via quantitative and qualitative data supplied from national cases and relevant examples. Experience gained from organic food in school meal systems may also be useful for other arenas of public out-of-home food procurement.

## Methods, data and analytical framework

The iPOPY project had a practical background and adopted a problem-oriented approach starting from real-life problems: What are the main challenges facing the introduction or increased consumption of organic food in public food service arenas for youth, and how can such hindrances be overcome? The project was composed of four explorative work packages, studying school food procurement from various perspectives: policy, supply chains and certification, users' perceptions and participation as well as healthy eating. The interdisciplinary research team was comprised of agronomists, food anthropologists, public health and nutrition experts, sociologists and political scientists. Stakeholders from the practical field were integrated into a transdisciplinary approach via national user groups, ensuring close contact with practitioners and cases to analyse.

Both qualitative and quantitative research methods were applied. Quantitative data were collected by structured and open web-based questionnaires about school food procurement and school food policies from schools in Denmark, Finland, Germany and Italy, as well as from about one hundred Italian municipalities about calls for tender and criteria for selecting deliverance. Qualitative methods employed were expert interviews, focus groups with young consumers and observation at school canteens, congregation camps and a music festival. Furthermore, statistics, public websites and reports were analysed. Municipal case studies were conducted in Denmark, Norway, Italy, and Finland. To provide a common ground of knowledge, reports describing the national school meal systems in Italy, Finland, Norway and Denmark—and to what extent organic food was included there—were published in 2008 and revised in 2010 (Hansen et al. 2010; Løes 2010; Mikkola 2010; Spigarolo et al. 2010a). A national report for Germany was published in 2009 (Nölting et al. 2009b). These reports have provided the main basis for the systematic comparison of school meal systems presented here. Furthermore, a first comparative analysis by Nielsen et al. (2009) and other results and publications from iPOPY were also used. All publications from the project are available in the open digital archive *Organic E-prints*.

For the synthesis of results, we have developed an analytical framework. Firstly, the iPOPY project defines public organic food procurement (POP) for youth, taken as our object of research, as follows:

> POP for youth includes all activities required to integrate organic produce into food offered—for free, subscription or sale—in public settings to children and young people up to 25 years of age. POP for youth is thus part of activities within schools and other institutions, such as day-care centres, universities, and hospitals. Such meal systems are organised and their costs are carried, at least partially, by the public institutions in question, and their food supplies include organic products conforming to EU regulations on organic production.

Secondly, in order to take account of their manifold facets, we conceptualise school food systems as complex constellations. Food chains from producers to end users comprise material, economic and symbolic flows, along which materials, information and values are transported and transformed (Lebel et al. 2010; Morgan et al. 2006; Tappeser et al. 1999). School food systems are shaped by supply chains, regulatory frameworks, policies and decision-making processes at various organisational levels as well as perceptions, preferences, and practices of young users. Heterogeneous elements such as food items, kitchen technologies, nutritional guidelines, cooks and administrative staff, pupils' behaviour and eating habits etc. form the specific school food constellations in each case (Nölting et al. 2009a).

Hence, organic school food is not an isolated research object, but needs to be analysed as being *embedded* in technological, social and environmental systems. Organic school food may be considered with regard to various contexts, such as mass catering, school system and type of school food service. Mass catering is bound to manifold restrictions because kitchens and caterers have to balance supply and demand within very tight organisational, logistical, time and budget limits. Changing these structures and routines is challenging, and the relationships between actors along the chain are crucial for the quality and sustainability of food services (Mikkola 2008; Rückert-John 2007). Meanwhile, the school system (e.g. half-day or all-day school) frames the specific organisation of school meals and their fitting into school routines. Finally, the types of school food service are highly variable among countries, reflecting history, social policy traditions and national food cultures.

In order to assess the status of organic school food and compare it between countries, we, thirdly, need to disentangle the complexity of school food systems as such. For this purpose, we propose five *analytical categories,* drawing on an initial conceptualisation from Løes and Nölting (2009):

1. Type of school food service
2. Degree of public financing
3. Degree of political and administrative involvement in school food procurement
4. Degree of specific support for organic school food
5. Availability of organic food supply adapted to school food service

We developed these explorative categories in order to assess whether and how a specific school meal system is supportive of organic food consumption. While the first three categories characterise school food systems in general, the last two focus on *organic* school food. Each category is conceptualised as a scale between two extremes, with values ranging from 1 (indicating a very low or very little developed level), through 2 (low/little), 3 (medium), 4 (high/well-developed) level, to 5 (very high or very well-developed level). The specific scales for the five categories are explained below and summarised in Table 1. The national school food systems were assessed in each category according to the 1–5 scale on the basis of national reports and further research in each country. The values were compared and discussed in a project meeting towards the end of the project. We are aware that our assessment is an approximation which could be refined with more data. Moreover, the criteria are often based on arguments concerning what kind of conditions will likely support or hamper increased consumption of organic food, because no research data are available in this domain. Hence, the scales are not as exact as would have been desirable.

1. The *type of school food service* determines the type of food items or meals and the quantity of food offered to pupils and other users in school. We differentiate the type of food service and the share of pupils participating in this service (all or few schools, all or few pupils in a school). The scale of 1–5 ranges from only single food items being available for few or for all pupils (e.g. in milk or fruit schemes), though broader food service offers (e.g. in booths or canteens), to complete school meals served for all pupils in such a way that a majority of them participate. By a complete meal, we mean one or more dishes, such as a warm dish with salad and bread followed by a desert or fresh fruit. Such a meal cannot be easily replaced by a packed lunch from home or food items purchased in nearby shops. Studies indicate that food served and consumed in common, as a social activity for the whole class, significantly increases the pupils' appetites, even if the food is the same kind as the pupils would bring from home (Bjelland 2006). We conclude that the amount of served complete meals may indicate potential for achieving high consumption of organic food in a school system.

2. The *public financing* of a school food system determines the financial scope for purchasing of organic food and indicates the priority assigned to school food by politicians and other decision makers. The costs of school food services consist of running costs for food, catering staff, and administration as well as investments in infrastructure (canteens, kitchens, equipment). The scale ranges from entirely privately financed to completely publicly financed school meals. The values of 1–5 indicate a stepwise increase from some support for school staff administrating

simple service systems such as subscription schemes for milk, through support for infrastructure (kitchens and dining halls), to support as well for some food costs, to complete coverage of all school food costs. A publicly financed infrastructure and at least subsidised food costs may extend the use of organic school food, presuming that it is easier to implement organic school food when the users pay no or only a small share of the costs. This presupposes that public procurement is willing to spend money for best value in its broadest sense—understood in terms of long-term sustainability (Morgan and Sonnino 2008, pp 171–176).

3. *Political and administrative involvement in school food provision*: For school food procurement, the local/municipal level is crucial because it is on this level that school lunch offerings and demand have to be calibrated (Morgan and Sonnino 2007). For this task, municipal actors need responsibilities and capacities. However, higher political and administrative levels may support such activities and frame them through regulations, guidelines and standards, and provide information and advice. These levels may compensate deficiencies at the municipal level. The extent of such support may be highly variable. The scale of 1–5 ranges from no political involvement, where the responsibility lies with each single school; through municipal political and administrative support, including gradually more levels such as regions and the national level offering funding and information for canteens and caterers; up to developing and deciding national nutritional standards and administrative structures for school meals. We presume that a high consumption of organic food in schools can best be achieved by a high degree of political and administrative support and commitment for school meals in general on all levels.
4. The degree of *specific support for organic school food,* such as policies and regulations, will impact the capacity and interest of public institutions to procure organic school food. Policies may be linked up to different topics related to organic food, such as the environment, health, or food education. The scale of 1–5 ranges from no political initiative, regulation or funding; through supportive programmes and funds for organic food procurement; to regional or national goals and, finally, to regulations for the use of organic food in school meals that may prompt requirements such as the demand for organic produce in calls for tenders. Such political and administrative support obviously has a great potential to promote organic school food.
5. The *availability of organic food supply adapted to school food service* refers to the presence of suppliers (e.g. catering companies) that are specialised in products for the school sector and that also offer organic products or vice versa. This category is influenced by the general development of the organic market and the level of organic consumption in each country, but also by the type of school food service. The scale of 1–5 ranges from no organic supply; to specific supply chains, like for organic school milk; to well-organised supply chains adapted to the demands of organic school food catering. The availability of organic produce is a prerequisite for organic procurement at schools. We presume that well-developed supply chains, specialised to deliver school food of organic quality, can facilitate public organic food procurement.

We argue that the highest value of all five categories represents the best situation for a maximum of organic food consumption at schools, characterised by a high share of organic produce (ideally 100%) and a high volume of food consumed. Hence, a situation where the country is assessed to be a 5 in all categories would be the ideal to maximise the consumption of organic food in schools. In a radar diagram (Figs. 1, 2, 3, 4, 5 and 6), the ideal case is shown as a complete pentagon.

## Results: status of organic school meals in Italy, Finland, Germany, Norway and Denmark

In this section, the status of organic school food and the underlying structures in the five selected countries are described in terms of the five analytical categories explained above, with values of 1–5 being assigned in each case. A historical overview concerning the development of the school meal system and a short description of the main actor groups involved and the

**Table 1** Categories for analysing the variation between national school food systems, including scales (1–5) for assessment

| Category | Ranking and description of levels 1–5 | | | | |
|---|---|---|---|---|---|
| | 1—very low/very little developed level | 2—low/little developed level | 3—medium/ medium developed level | 4—high/well-developed level | 5—very high/very well-developed level |
| Type of school food service | Single food items available in some schools | Single food items available in many schools (for instance, subscription schemes for milk and fruit) | Single food items or complete meals available to some pupils in many schools | Complete meals served daily in many schools | Complete meals served daily in all schools |
| Degree of public financing | Some support for school staff to administrate subscription schemes etc. | Support for staff, subsidies for fruit or milk schemes | Support for catering infrastructure, dining halls and staff | Support for infrastructure, some funding for running costs, support for low-income families | Complete coverage of all costs by public funding, free meals for all pupils |
| Degree of political and administrative involvement in school food procurement | Hardly any capacity at any level, due to lack of traditions concerning school meals | Capacities at the municipal level, for instance, via cooperation with other public food services | Capacities at the municipal level plus support from the regional *or* national level | Capacities at the municipal level plus initiatives at regional *and* national level to increase the volume and/or quality of food served in schools | Capacities at all levels, comprehensive national structures, for instance, nutritional standards |
| Degree of specific support for *organic* school food | Hardly any funding, programmes, or administrative capacity | Model projects and programmes for organic consumption in schools, no funding for (organic) food | Programmes and some funding for organic food costs (for instance, from municipal actors) | Comprehensive programmes, goals and some funding for organic food | Comprehensive programmes and specific requirements demanding organic food, for instance, in calls for tenders |
| Availability of organic food supply adapted to school food service | Hardly any supply chains; very low share of organic fruit and milk in subscription schemes | Some supply chains available that could offer organic if demanded | Supply chains available, high share of selected food items (for instance, organic school milk) | Many supply chains available, but high prices for organic food; need for development of school food products | Highly developed supply chains, low premium prices due to efficient distribution, products designed for school meals |

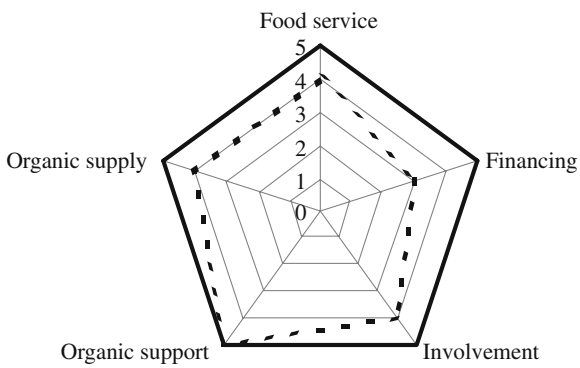


**Fig. 1** Radar diagram showing the Italian school food system as compared with the ideal case (complete pentagon) of a maximum share of organic consumption in school food

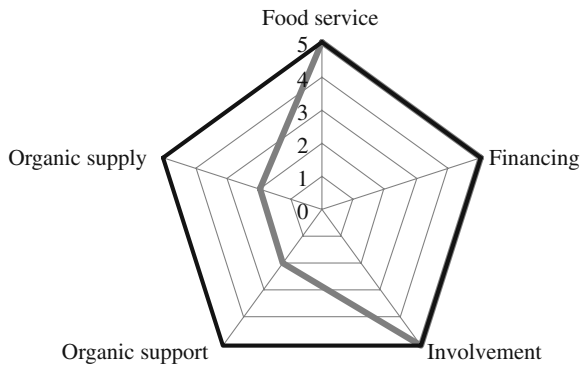


**Fig. 2** Radar diagram showing the Finnish school food system as compared with the ideal case (complete pentagon) of a maximum share of organic consumption in school food

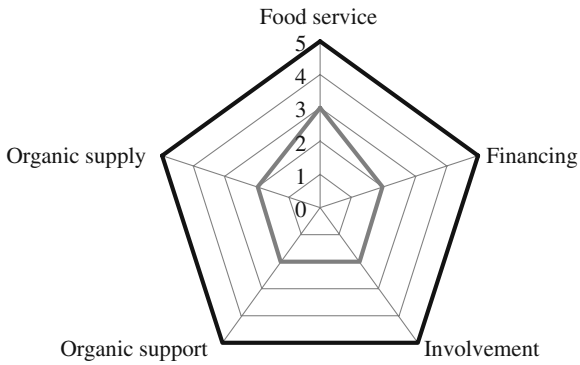


**Fig. 3** Radar diagram showing the German school food system as compared with the ideal case (complete pentagon) of a maximum share of organic consumption in school food

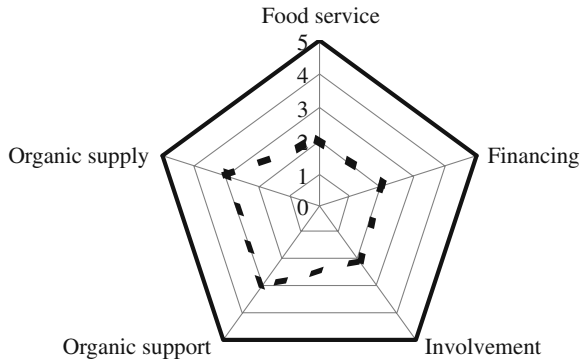


**Fig. 5** Radar diagram showing the Danish school food system as compared with the ideal case (complete pentagon) of a maximum share of organic consumption in school food

institutional settings are presented as an introduction for each country, because these determine further developments (Gustafsson 2002; Young et al. 2005). Each country description concludes with a summary and a radar figure showing the assessment in all categories.

The extent of organic production and consumption in each country is shown in Table 2, together with some basic statistical data and prices of school meals. As an indicator for the willingness to pay for a complete school meal in each country, we divided the average user price in € cents by the national GDP and multiplied it by 100 to generate a practical amount for each computed number.

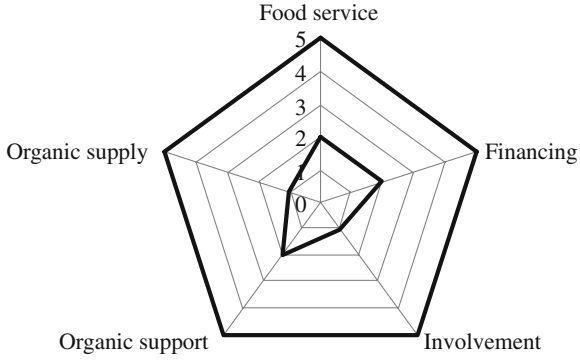


**Fig. 4** Radar diagram showing the Norwegian school food system as compared with the ideal case (complete pentagon) of a maximum share of organic consumption in school food

## Italy

In Italy, school meals have been provided to children from poor families in large cities like Milan, where such a service had already been started around 1880. Over the last four decades, three phases of school food development can be differentiated (Spigarolo et al. 2010a): Up to about 1970 the food security phase, during 1980–1990 the food safety phase, and since 1990 the food quality phase. There is a consensus shared between all political parties to provide complete school meals of good quality. This demonstrates that school food is anchored in Italian food culture, with its great esteem for daily meals.

Today, a complete school meal service is offered to all pupils from 6 to 13 years old, either two or five times a week, according to the school times chosen by the parents, whereas only a few upper secondary schools provide a meal service. The meal is composed of at least two dishes. Typically, the pupils are served while sitting at tables in a dining hall, because learning good manners is considered an important part of the meal situation. In addition to the high demand for staff, large amounts of waste are a problem. Altogether, about 2.8 million meals per day are served in public schools. Relatively more meals are served in northern than in southern regions. We have assessed the meal service with a value of 4; all value assessments are summarised in Table 4.

With regard to public financing, the municipalities provide the infrastructure for school meals and

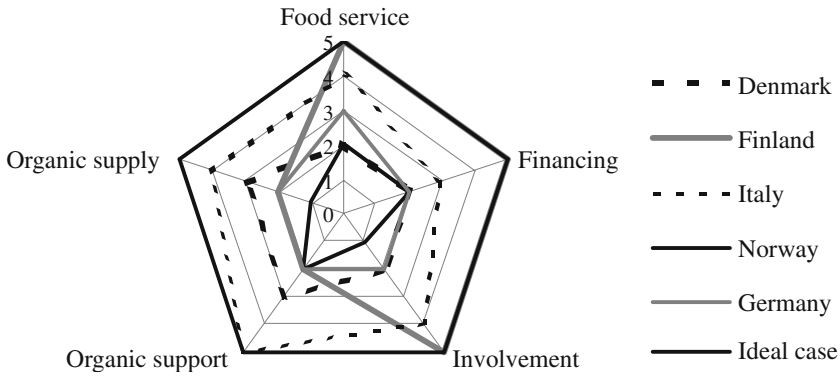


**Fig. 6** The potential for organic school food in the five studied countries, shown by radar diagrams and compared with the ideal case

manage the meal procurement, while the families have to pay for the meal service according to family income, with reductions for low-income families. The maximum average price level of 3.86 € per meal is comparatively high (Table 2), but does not seem to hamper interest in purchasing the food. The willingness to pay for the school meals is much higher in Italy than in Norway and Denmark (Table 2). Mentioned challenges comprise high cost levels for the municipalities due to much staff being engaged in food service, which consequently lowers the resources available for food, impacting negatively on food quality. The degree of public financing in Italy was assessed with a value of 3.

The municipalities are responsible for school meal service. They either source this task out to private caterers (70%) or public companies (25%), such as the Milano Ristorazione in Milan, which serves about 80,000 meals daily. Furthermore, the municipalities decide the meal prices, the funding for the catering and the quality requirements for their meal service. Canteen commissions composed of parents and teachers at each school monitor the quality and satisfaction with the meals among the users. Several, mainly northern, regions have laws concerning school meal provision (Spigarolo et al. 2010a), while national guidelines play only a minor role, and there are no national regulations to ensure things like

**Table 2** Background information for the five analysed countries on population, economy, organic production and consumption, school meal costs and willingness to pay for a school meal

| | Italy | Finland | Germany | Norway | Denmark |
|---|---|---|---|---|---|
| Inhabitants (2010, Eurostat), millions | 60.3 | 5.4 | 81.8 | 4.9 | 5.5 |
| GDP per capita in euros (2007, Eurostat) and relative GDB, Italy =100 | 25,900 | 34,000 | 29,500 | 60,400 | 41,700 |
| | 100 | 131 | 114 | 233 | 161 |
| Organically managed agricultural land, share of total, % (2009)[a] | 8.7 | 7.3 | 5.6 | 5.5 | 5.9 |
| Number of organic producers (2009)[a] | 43,029 | 4,087 | 21,047 | 2,851 | 2,694 |
| Share of organic products in the food market, % (2009)[a] | 3.0[c] | 1.0 | 3.4 | 1.3 | 7.2 |
| Average user price for a complete school meal, in euros[b] | 3.86 | 0 | 2.43 | 4.39 | 2.93 |
| Willingness to pay for a complete school meal=average user price in € cent [a]100/GDB per capita | 1.49 | 0 | 0.82 | 0.73 | 0.70 |

[a] Information marked from Willer and Kilcher 2011

[b] Information marked from iPOPY national reports (Hansen et al. 2010; Løes 2010; Mikkola 2010; Spigarolo et al. 2010a; Nölting et al. 2009b)

[c] The organic market share in Italy was not given for 2009 in Willer and Kilcher 2011; however, in a similar reference dated 2010 the share for 2008 was given (3%)

nutritional composition. A patchwork of national and regional rules and regulations with regard to school meals supports municipalities in fulfilling this task. Italian school meals are well established and rather popular, and municipalities are very capable in procuring them, so we assessed the political involvement in school meals with a value of 4.

In the 1980s, organic pioneers started to introduce organic food in school kitchens and kindergartens at a local level. From the mid-1990s, national and regional policy promoted the use of organic products for school canteens. A national law (1999) and ten regional laws and guidelines (2000–2007) recommend or even require the use of organic or otherwise certified food (from local, fair trade or integrated production) (Spigarolo et al. 2010a). The regional regulations have proved to be very efficient means for ensuring high consumption of organic food in Italian schools. Additionally, many municipalities have designed sophisticated and ambitious calls for tenders and contracts demanding the inclusion of organic food (Spigarolo et al. 2010b). Hence, we assessed this category with a value of 5.

Municipalities and organic farmers' organisations, such as ProBER in the region of Emilia Romagna, have initiated the establishment of specific organic supply chains for school meals, often on a regional basis. A best practice case is the city of Rome, which decided to introduce organic, regional and fair trade food in all school meals (in total, 140,000; Sonnino 2009). However, this initiative was recently restricted for political reasons. Altogether, up to 40% (by weight) of the food consumed in Italian schools is organic (Table 3), though with large regional differences, with organic consumption being highest in the northern and central regions. All in all, this category was assessed at a value of 4 in Italy.

Summing up, Italy has a complete meal service, with a warm lunch for the majority of pupils up to 13 years old, with a high user payment, but still a significant public financial support for infrastructure and staff. With respect to involvement, there are hardly any national nutritional standards for school food, but the municipalities have well-established capacities for providing school food and they are well rooted in Italian daily life. Striving for high-quality school food, many Italian regions have implemented ambitious laws and guidelines specifically supporting the use of organic produce, and municipalities use calls for tenders and contracts as effective steering instruments. In Italy, up to 40% (by weight) of the food products procured for school meals are organic. This high volume is significantly higher than the organic market share of 3% (Table 2). To conclude, Italy has generally high values, especially for specific organic support (Fig. 1). So the level of organic school food consumption is high, and Italy can be seen as a pioneer for organic school food in Europe.

## Finland

Finnish school meals were developed beginning about 1900, based on a tradition where industry owners were regarded as being responsible for the food service of their employees during the working day (Mikkola 2010). The current system has survived several political attacks, especially during periods of economic crises. Finnish pupils enjoy a highly professional, scientifically based school meal service with complete and warm daily meals for all pupils from 6 to 18 years old. The meals—consumed in dining halls—are designed to be nutritionally

**Table 3** Share of products in Italian school canteens from various certified supply chains, analysed in 185 canteens (Spigarolo 2006, cited from Spigarolo et al. 2010a)

| | Origin | Share (by weight), % |
|---|---|---|
| Controlled chain | From organic agriculture | 40 |
| | From sustainable/integrated agriculture | 18 |
| | Typical products (protected designation of origin and protected geographical indication) | 14 |
| | From fair trade | 4 |
| Non-controlled chain | From conventional agriculture | 24 |

balanced, and a self-service system combined with surveillance by the generally well educated kitchen staff ensures that waste is minimised. Taking these factors into account, the food service was assessed with a value of 5.

Finland is one of very few countries providing completely free school meals, where all costs since 1948 have been covered by the state (tax financed), giving a value of 5 for public financing. However, there is severe pressure to reduce costs. The average cost of a Finnish school meal was 2.45 € in 2008, including food costs and costs for work, cleaning, electricity and premises (Mikkola 2010).

Municipalities are responsible for food service, either organising meals as their own public service or outsourcing to commercial caterers. Furthermore, they provide meals to day-care centres, hospitals, homes for the elderly and state-based workplaces. This makes public catering in Finland a large industry as a whole, resulting in the intertwining of school catering with catering for other sites through central kitchens. National regulations in this domain are well developed. Free school meals are guaranteed by national law and the composition of a lunch is regulated by national nutrition recommendations, presented in the so-called 'plate model', and should cover about one third of pupils' daily nutrition requirements (Tikkanen and Urho 2009). A nutritious school meal is considered as an integral part of education. We assessed the Finnish school meal service, with its scientifically based approach, a value of 5 in terms of political involvement in school food in general.

The interest in increasing the use of organic food products in schools has been much less in Finland than, for example, in Italy. Nevertheless, there are developments towards increased use of organic food. Some programmes have been carried out to support organic food in school meals, and sustainability holds a strong position in Finnish educational and school culture (Roos and Mikkola 2010). Guidelines from the Ministry of Environment aim at procuring sustainable food—defined as being organic, vegetable-based or seasonal—once a week in 2010 and at least twice a week by 2015 in public canteens (Ministry of Environment 2009). Hence, the use of organic food is embedded in a sustainability perspective in Finland to a much larger extent than in the other studied countries. Yet, combined with a high trust in local products in Finland, the quality of imported organic products is often questioned, and local conventional products may be considered as more sustainable and, hence, preferred. Furthermore, the benefits of organic food are often claimed not to be scientifically proven. All in all, then, we gave Finland's specific support for organic a value of 2.

The exact volumes and value of organic products used in Finnish public catering are not well known, as statistics on this are not compiled. Schools' environmental schemes and organic food certification schemes suggest that a few hundred school catering units use organic food. Furthermore, it is estimated that about 1,500 professional kitchens out of a total of 22,000 in Finland use organic food to some extent (Rahtola 2010). Altogether, the number of schools serving particular organic foods to young people is moderate. Based on the information in Mikkola (2010) and Roos and Mikkola (2010), we have assessed that the organic share of school meals is about 3%. Due to the well-developed school meal system, supply chains are well established, but they are thus far not adapted towards distributing organic products, so we assessed a value of 2 for this category.

Summing up, Finland has a professional, complete meal service which is free for users (tax financed). Involvement from public bodies is strong, with a well-developed capacity on the municipal level. The well-run public food procurement system reaches way beyond school food procurement. There is a strong trust in conventional Finnish food and a strong preference for local food, which contributes towards explaining a lower interest in organic food. However, there is some public support for programmes to increase the use of organic food in school meals and an ambitious national aim for sustainability that includes organic consumption. Altogether, Finland represents a high potential for organic food consumed in school meals, as shown by the partly ideal pentagon figure covering the general school meal system (Fig. 2). However, low specific support for organic, lack of organic supply chains and competition with local/regional food seem to limit organic consumption in school meals.

## Germany

The German school system is organised by the federal states and, hence, scattered. For decades, school meal provision in the Federal Republic of Germany (West)

hardly had any importance, because pupils went home for lunch in the afternoon, whereas in the former German Democratic Republic (East) pupils were served warm meals daily until 1990. After German unification, the East German school system was aligned to the West German model. Hence, the basis for complete school meals eroded in eastern Germany (Nölting et al. 2009b). Since German schools were ranked below average in the first PISA evaluation in 2000, German politicians have started many initiatives to reform the school system. One pillar of these reforms is the extension of all-day schools. Thus the need for a school food service is increasing.

In western Germany, the current standard type of school food is a supplementary food provision. Food items are procured as add-ons to the traditional lunch box brought from home or bought outside school. In the schools, vending machines, kiosks and cafeterias—often organised by parents' initiatives or janitors—offer milk, bread, rolls, snacks, sweets, lemonade, fruits etc. With the expansion of the all-day-school model since 2003, the situation is changing. More and more all-day schools offer a warm lunch, involving professional caterers in school meal provision. However, the organisation of school meals is confusing, because there is an enormous range of services in various qualities. To assess the food service system in this patchy situation was not easy; we decided on a value of 3.

The average price per meal that parents have to pay in all-day schools is 2.43 €. The majority of all-day schools offer meals between 2.00 und 3.00 € (Arens-Azevedo and Laberenz 2008). The willingness to pay for a complete meal is significantly lower than in Italy but slightly above Denmark and Norway (Table 2). The mentioned prices are usually not sufficient to cover all costs related to preparation of the meals. There are reductions for needy families in some federal states. Since 2003, a national programme has equipped nearly 7,000 all-day schools with infrastructure for school meals (canteens and kitchens). We assessed the degree of public financing for Germany with a value of 2.

With respect to political involvement, up to now school reforms have engaged administrations in topics other than school food. German school meal provision is still inadequately structured and insufficiently organised, especially because there are no national regulations; each federal state has its own. The municipalities are in charge of organising school food, and only recently have they begun to gain experience and build capacities needed for school meal procurement. In 2007, the non-governmental German Society for Nutrition (*Deutsche Gesellschaft für Ernährung e.V.*) published voluntary national guidelines for school food provision. Altogether, political involvement results in a broad variety of institutional, organisational and financial structures; we assessed this situation with a value of 2.

Interest in organic food—also in school food provision—is generally high in Germany. Thus far, however, organic plays a rather minor role in school food, because organic products require an additional effort and a minimum of professionalism which the school food sector is still often lacking. At the school level, there are examples of organic school food—even 100% organic—organised by committed parents, schoolmasters, teachers and associations. At the municipal level, the cities of Munich and Nuremberg (Gsell 2010), for example, have launched initiatives for promoting organic school food in the context of becoming model eco-cities. The city-state of Berlin is frontrunner in organic school food at the regional level. In 2003, a non-governmental organisation published quality criteria for Berlin school meals, requiring amongst other things a 10% share (by price) of organic food, which has become the accepted standard. At the national level, a programme has been supporting the introduction or increased use of organic produce for kindergartens and school canteens since 2004. These signs of progress notwithstanding, altogether we gave a value of 2 for specific support for organic school food.

Organic food has not yet become established as an important part of the daily school food business. Caterers and supply chains for organic school meals exist, but the volume of organic food consumed at schools is still limited, we assessed a value of 2 for availability of organic food supply adapted to school food service. A broad survey of school food provision in German all-day schools estimated the average use of organic food to be about 3–4%, which corresponds with the share of organic food in the German food market (Arens-Azevedo and Laberenz 2008).

Altogether, the German situation regarding organic school meals indicates a rather low level (Fig. 3), reflecting state of a school meals system that is currently undergoing far-reaching changes. Even if the whole catering system for schools all around Germany is still in its infancy, there are many initiatives and projects underway where organic food is being inte-

grated successfully. This very dynamic situation provides a window of opportunity to promote greater use of organic school meals.

## Norway

Free school meals for underprivileged children in the larger cities became common in Norway around 1900: often soup or porridge. However, the meals were not further developed in the direction of complete meals with warm dishes, such as in Italy and Finland. Instead, some dedicated stakeholders argued that a school meal composed of open sandwiches made with whole grain bread, served with milk, raw vegetables and cod liver oil, was much healthier. This was the starting point for the well-established Norwegian packed lunch—typically consisting of two to three open sandwiches with cheese or salami (Løes 2010)—which has dominated the Norwegian school food system for more than 60 years.

In schools, such sandwiches are complemented by subscription schemes for fat-reduced milk or fruit. The school meal is usually consumed in the class room, each pupil sitting at his/her desk. Over time, more schools have developed canteens where food items may be purchased, but thus far the food consumption resulting from them has been more an addition to the packed lunch than a replacement. In fact, Norwegian pupils do not complain about the packed lunch (Bugge 2007). Their first priorities to improve the school food system are rather to increase the length of the lunch break, having nice places to consume their lunches, and cooling facilities for the food they bring to school. Due to the free fruit served daily in schools with classes 8–10 (see below), we gave a value of 2 for the type of food service.

The national fruit subscription scheme is supported by public funding, and the milk scheme is supported by the main dairy company, but the prices the users pay for the food items are still comparable to prices for the same items in normal food stores. Due to the funding for free fruit at some schools (see below), the financial support from the public was assessed with a value of 2, even though other public funding is lacking.

The fruit and milk subscription schemes are nationally organised, and since 2007 fruit has been served daily without any cost to pupils in schools with grades 8–10. This was regarded as a first step towards free public school meals, but has not been further developed. No national regulations for school meals exist except that the schools have to ensure that the school environment includes possibilities for eating. The political debate about school meals, which was quite active from 2005 to 2007, has declined. Hence, on the national level actors to change the Norwegian school meal system are scarce. Introducing alternatives to the packed lunch is a topic for each single school, or in some cases, (small) municipalities. Hence, the degree of political and administrative involvement in school meals was assessed at a value of 1.

Actors to support organic production and consumption on the national level do exist, such as the Ministry for Agriculture and Food. A national aim of organic production has existed since 1999, and the current aim is 15% organic consumption and production by 2020 (MAF 2009). These ambitious aims have led to programmes for regions and municipalities to support public organic consumption. Many municipalities participating in this programme have chosen to focus on organic school meals and food education in schools (Løes 2010). Even so, the value for specific organic support in Norway was assessed at 2.

The actual use of organic food in Norwegian school meals is close to zero. The milk subscription scheme offers milk in organic quality only in a small part of the country, and the share of organic fruit in the subscription scheme and free service is low. As school meals in general are not well developed, supply chains for organic produce to schools are not well developed either. We thus gave a value of 1 for this category in Norway.

To sum up, the type of school meal service in Norway is a packed lunch supplemented by single food items. The involvement and capacities of public bodies on various levels to promote and develop school meals in general are low. The national government has formulated ambitious goals for organic food consumption that may foster an increased use of organic school food. The share of organic school food is estimated to be equal to the general market share, which is about 1% (Table 2).

In conclusion, for Norway the situation is far from the ideal pentagon (Fig. 4). A general increase in public school food service is not very realistic for the time being, and interest in organic food is lower than in other European countries, as shown by the low market share (Table 2). This is remarkable, considering the country's high income level. Norway seems to

be the iPOPY country where organic school food seems most difficult to develop and, hence, the iPOPY country where organic school food has the least potential to increase overall organic consumption, unless the government should decide to require that all fruit served for free be organic.

Denmark

Similarly to Norway, free school meals have also been a tradition in Danish cities since around 1900. However, in contrast to Finland, the Danish school meals did not withstand pressure during economy crises. At the same time, the Danish were inspired by the Norwegian sandwich-type school lunch, introducing the so-called Oslo breakfast. Consequently, the Danish school meal system is also based on a packed lunch brought from home. However, the picture seems to be changing more rapidly in Denmark than in Norway. Due to political activities and public debates, for example on obese children, school meals are being offered in more and more municipalities. Some large municipalities, like the capital Copenhagen, have invested large amounts of funding for several years to establish healthy, cheap and popular alternatives to the packed lunch (Hansen et al. 2010).

School food service approaches vary from complete meals made at each school, through simple dishes in cook-chill-heat systems offered in school tuck shops, to subscription schemes for milk and fruit accompanying home-packed food consumed in the classroom, such as in Norway. Most schools have a booth where at least some food items may be purchased, but the availability of dining halls for consumption is scarce, and, like their Norwegian counterparts, the Danish pupils also complain about short lunch breaks. We gave a value of 2 for the type of school food system in Denmark, because the majority of municipalities offer no comprehensive food systems.

The meals offered for sale in Danish schools are subsidised, but never free, so the degree of public financing was assessed with a value of 2. The willingness to pay for school meals is comparable to Norway and much lower than in Italy (Table 2). In spite of the ambitious programmes to develop popular and cheap meals, in for example Copenhagen, participation has for long been very low. It remains unclear how much this is due to price, availability of eating facilities, having enough time to enjoy a complete meal, or if the anchoring of the food systems in the school organisation has been too weak. The general involvement of public bodies in school food is rather low and was assessed with a value of 2. While national regulations and programmes are lacking, there are various municipal initiatives.

With respect to the specific support for organic school food, 'green' municipalities have often combined the introduction of school meals with an introduction of organic food to realize their ambitions about being environmentally sound. They have contributed significantly, not least by teaching kitchen and school staff about organic food. Green procurement programmes have been conducted to support the conversion to organic products in many public kitchens. Hence, we gave a value of 3 for the specific support for organic food in Denmark.

Organic food is well established in the Danish food market, with a world high for organic consumption (Table 2). Half of the Danish school milk (49%) is certified organic (Anonymous 2010), and altogether the share of organic school food has been estimated at 8% (Hansen et al. 2010). Catering companies specialising in organic school meals have been established, but struggle to grow and survive. We gave a value of 3 for the availability of organic food supply adapted to school food services.

To sum up, the traditional Danish school meal has been a lunch box brought from home, but this picture is slowly changing. *S*chool meals are now being offered in more and more schools and municipalities. Users have to pay for the meals, and participation in public food service systems is often low. At the same time, organic food is well established in the food market, and private catering companies as well as some municipalities (e.g. Copenhagen) support the use of organic food in school meals. Organic consumption in Danish schools is mainly restricted by the low performance of the school food system in general, which is, however, under change. Currently, there is support for organic school meals (Fig. 5).

## Discussion: utilising organic school food to increase organic consumption—is it worthwhile?

The actual organic consumption in schools varies considerably both among and within the five

countries studied, due to very great variation in the circumstances of their school food systems (Table 4, Fig. 6). The results of our investigation likely represent the total variation currently existing, at least for European conditions (Young et al. 2005). The two main types of school meal systems are, on the one hand, complete school meals, such as those served to a vast majority of pupils in Italy and Finland. The complete meal system requires that extended lunch breaks and facilities for eating are integrated into daily school routines. On the other hand, single food items, such as school milk and fruit, are offered to children in addition to, or instead of, a packed lunch brought from home in Norway, Denmark and Germany. Whilst systems are moving towards more food/meals offered in all these countries, along different paths of development and at different speeds, infrastructure is still lacking, both physically (kitchens and dining halls) and socially (personnel for administration, food preparation and serving) (Nielsen et al. 2009).

Based on the example of Italy, where a significant amount of school food is organic, we argue that the food service type with complete meals served in a way that includes a majority of the pupils has the greatest potential to maximise the consumption of

**Table 4** Overview of the situation for organic school food in Italy, Finland, Germany, Norway and Denmark and the estimated actual organic consumption in schools for 2009

| Category and comments | Type of school food service, share of pupils consuming complete meal daily | Degree of public financing | Degree of political and administrative involvement in school food procurement | Degree of specific support for *organic* school food | Availability of organic food supply adapted to school food service | Use of organic school food, share of total food consumed in schools (%)[a] |
|---|---|---|---|---|---|---|
| Italy | 4<br>Approximately 60% of children 6–13 years | 3<br>Public infrastructure, but significant user payment | 4<br>High capacities on the municipal level. Strong support from regions | 5<br>Regulations, laws, call for tenders, administrative capacities, committed municipalities | 4<br>Many supply chains, but high prices and lack of specific products | Up to 40% |
| Finland | 5<br>All children 6–18 years | 5<br>Close to 100% | 5<br>High capacity in municipalities. National framework and nutritional guidelines | 2<br>Some support programmes | 2<br>Few supply chains | About 3% |
| Germany | 3<br>Only in all-day schools, share not estimated | 2<br>Infrastructure for all-day schools, some subsidies for needy families | 2<br>Decisions on municipal level. Scattered support from federal states and the national level | 2<br>Some national, regional, local programmes and guidelines | 2<br>Some supply chains | About 4% |
| Norway | 2<br>Very few schools offer complete meals | 2<br>Daily free fruit in schools with grades 8–10 | 1<br>Decisions on school level | 2<br>Some support programmes | 1<br>Hardly any supply chains | About 1% |
| Denmark | 2<br>Some municipalities offer meals, low utilisation | 2<br>Significant support from some municipalities | 2<br>Decisions on municipal level | 3<br>Support programmes, some municipal engagement | 3<br>Several supply chains, large share of organic school milk | About 8% (school milk 49%) |

[a] Rough estimation based on national reports with regard to procured school food, share by weight (Italy) or by price (other countries)

organic food in schools, because this type implies the largest possible volume of consumed food. Moreover, complete meals for all provide a scope and critical mass required for professional management and catering. The example of Finland, however, shows that complete meals served for all is not a sufficient prerequisite for high organic food consumption in school. Public regulations requiring high-quality school food have been an important driver in Italy, but may not necessarily be the most efficient strategy for fostering organic school food in other countries. Finland is in a good position to integrate organic food into school food service, but as the school meals there are generally considered to be of high quality, more important challenges to overcome may be related to the still immature organic market: with a lack of organic products and supply chains, high premium prices and a general scepticism towards organic food among many stakeholders. The nutritional benefits of organic produce are questioned, not least by professional caterers and nutritional administrative staff, who are generally convinced of the soundness of the scientifically based Finnish school meal system. Where complete school meals are difficult to introduce, other options to increase the share of organic food at schools should not be neglected. For example, in Denmark large-scale campaigns have been run by the Organic Denmark association to inspire and tutor pupils and parents in preparing a nice, healthy, palatable and organic packed lunch. Meanwhile, in Norway positive experiences were had when sandwiches were prepared and consumed in common at school instead of being brought from home (Bjelland 2006). It should also be a relatively easy task to require that milk and fruit offered in schools should be of organic quality, provided that the public covers the additional costs related to this. This would reach many young users and efficiently communicate the will of the public towards investing in a more sustainable future.

Publicly funded or significantly supported school meal systems seem to bear the greatest potential for organic food, because public bodies may be more positive towards it (e.g. due to public goals for organic consumption) than the average citizen. If organic food is introduced in schools as a public, political decision with no extra costs for the users, people will be more ready to accept organic food than if they would have to pay high premium prices individually. However, public infrastructure and administration of school meal systems is a costly task and obviously much more difficult to establish than to maintain. Hence, if consumption of organic food in schools is the goal, it may be a very time- and energy-consuming strategy to first establish free school meals for all. Furthermore, for public funding of school meals to be a driver for organic consumption, necessitates a strong political will to support organic food. In Rome, for example, the high organic share decreased rapidly when the city elected a council less willing to support organic. The willingness of parents to pay for high-quality food was revealed to be highly variable between countries (Table 2). Does this indicate that public funding is not necessarily a prerequisite for a high organic share? Italians appreciate quality food and are willing to pay for it. Concurrently, significant public funding is used for Italian school meals. Funding of school meals is a complicated issue, but in general we argue that public funding for school meals will make it easier to increase organic consumption in schools.

With regard to political involvement in school meals in general, top down-and bottom up-strategies optimally reinforce each other reciprocally, such as in Finland. Many Italian municipalities have developed their own ambitious systems bottom up, benefitting from the experience and know-how of stakeholders from the field (Bocchi et al. 2009). An advanced system of criteria to select caterers in calls for tenders lays the basis for a reliable and high-quality meal service there (Spigarolo et al. 2010b). On the other hand, a fully established and well-functioning school food system may hamper the introduction of organic food, such as the Finnish example suggests, whereas changes in the school food systems, as in Denmark or Germany, may open a window of opportunity for organic school food. When political involvement in school food is scarce, such as in Norway, too much is required from local actors when they have to introduce not only school food, but also organic school food simultaneously. As a rule, schools do not have the capacity or competence to organise sophisticated school food procurement—especially in terms of including a high share of organic produce. Even though there are examples of highly committed schools serving 100% organic, they cannot function as a role model for a majority of schools (Morgan and Sonnino 2008). In general, we argue that public

regulations and political interest for school food will facilitate the development of school food service systems, including the utilisation of organic products.

Summarising the three categories of the general school meal system, the largest potential for a high organic consumption should then be found in Finland. However, the actual organic share there is currently low. Therefore, a well-established school meal system seems to be a convenient, but not a sufficient condition for high organic food consumption in schools. This draws attention, then, to the categories of organic support and organic supply chains.

Based on the experience and knowledge acquired in the iPOPY project, we argue that political and administrative support for *organic* school food at all levels is the most important precondition for high levels of organic consumption. Table 4 indicates that this category has the closest relation to the actual organic consumption levels in schools. National or regional goals, laws and guidelines as well as carefully designed calls for tenders and negotiated procurement contracts at the municipal level are central instruments. Calls and contracts are most effective when they include specific requirements for the use of organic products, strive for a balance between price and quality in the evaluation of bids, and reward precisely formulated optional quality offers from caterers—as is demonstrated by many Italian municipalities (Spigarolo et al. 2010b). Obviously, a dedicated policy for organic school food can make a difference—as long as such initiatives are not restricted by a little developed school meal system, such as in Norway and partly in Denmark and Germany. Furthermore, organic supply chains may support organic consumption. Such chains often have great potential for optimisation, because most producers, caterers and school administrations still work from their point of view. Knowledge about the needs of the 'other side' is rare and hampers the supply of organic food appropriate for school food service.

Summing up the empirical results, we argue that our hypothesis—that public organic food procurement policies are contributing towards increasing organic food consumption at schools—seems justified. However, the effectiveness of such policies is clearly dependent on the national as well as the local context. In general, the most important instruments seem to be political and administrative support for organic school food. In combination with other instruments establishing a well-running school food system, they can build an effective strategy. These findings are in line with the claim of Morgan and Sonnino (2007) that the 'most important vehicle for securing a sustainable school meals service is creative procurement policy'.

As shown by our national cases, the starting points towards increased consumption of organic food in schools can be very different, and there is no simple solution or one best strategy to approach an ideal state. Best practice cases from Italian municipalities, where close to 100% organic, complete school meals are consumed by a large share of the pupils daily (Spigarolo et al. 2010b), suggest that each municipality has to find its own solution adapted to its context. Our analysis describes a corridor for the development of organic food consumption in schools. It does not seem appropriate to strive for turning a minimum-value situation into a maximum one, such as by introducing free public school meals in Norway or Denmark. The analysis should rather inspire stakeholders and actors to become aware of the main criteria or categories defining the consumption of organic food in schools. Knowledge about the shortcomings, strengths and complexity of an existing school food system may facilitate creativity and engagement in work to optimise public organic food procurement in this sector. As there are many actors and levels involved in school food systems, we conclude our discussion by proposing three comprehensive strategies that could guide proponents of organic school food.

At the individual level, the Italian and Finnish school meal systems reveal the power of a kind of 'captive catering' situation, where the users have a limited choice and the institutions procuring the food to a large extent determine food offerings and quality. This may lead pupils to eat healthier and to consume more organic food (Morgan and Sonnino 2008, p. 171). However, in many countries, school meal systems are far from a 'captive catering' situation. Public organic food procurement is exposed to severe competition of all sorts, both inside and outside schools. When the 'school food market' is totally free and open, consumption of organic school food will be restricted, because it is only an add-on feature. This indicates that public organic food procurement policies focussing exclusively on supply deal only with one side of the coin. Such policies are a good starting point, but the users' side is also important.

The school as well as the social environment influence perceptions of the school food by school staff, parents and pupils (Gustafsson 2002; Lülfs-Baden and Spiller 2009; Worsley 2007). Users' choices are 'framed' by factors such as school routines, the degree of participation in school meal systems, formal and informal education about food, coherence of curricula and school food provision and more, influencing the scope and degree of sustainable food education (Mikkola et al. 2009). This has an impact on food uptake and, hence, the consumption of organic school food, as several qualitative studies by iPOPY suggest (Marley 2008; Mikkola 2010). As a consequence, to ensure that both the food supply and the consumption situation are considered, we argue that public organic food procurement needs to be anchored and embedded into broader contexts at the school as well as at the political level.

At the school level, organic school food needs to be matched with daily routines as well as with formal and informal food education. Thus, organic food should be embedded in a *whole-school approach* for healthy schools which promotes health and wellbeing and is characterised by coherence of a school's policies and practices (Wyn et al. 2000, Morgan and Sonnino 2008). A whole-school approach for organic food may link up, for example at the European level, with the network 'Schools for Health in Europe' (www.schoolsforhealth.eu) or, at the national level, with programmes such as 'Food for life' in Great Britain of the Soil Association (www.foodforlife.org.uk), or 'Økologisk skolemad' (organic school food) in Denmark, run by the NGO Organic Denmark.

At the political level, public organic food procurement is an emerging policy field that—with the exception of Italy—cuts across established policies for food and farming, health, education, public procurement etc. Hence, it requires new responsibilities, capacities, knowledge and funding. From this perspective, it does not seem appropriate to focus policy actions only on organic food. A too narrow focus may suffer from lack of support and competition from alternative topics. For this reason, public organic food procurement should be part of a broader policy strategy for what we call *public sustainable nutrition* (Morgan and Sonnino 2008; Sustainable Consumption Roundtable 2005). Within this strategy, organic food is one, but not the only, important option for making school meal systems more sustainable. On the EU level, there are some trends heading in this direction. The 'European Action Plan for Organic Food and Farming' from 2004 explicitly addresses large-scale kitchens for schools (European Commission 2004). The handbook 'Buying Green!' issued by the EU Communities (2004) emphasises organic food in school canteens as a measure to build awareness about green procurement policy and link it to other environmental projects. Support for school fruit schemes is another element (European Commission 2009). However, these activities need to be better aligned in order to systematically foster public sustainable nutrition, including organic school food. Information, advice, and guidelines coordinated and provided through European networks, supporting exchanges, showing best practices and stimulating learning processes may provide valuable orientation.

## Conclusion: not one optimal model, but optimising each system

This paper has analysed the question of whether public organic food procurement strategies and instruments used for school food contribute towards increasing organic food consumption. We have suggested five analytical categories and scales for the assessment of the use of organic food in school food systems as a first analytical tool with regard to (organic) school meal systems. As the empirical cases of five countries reveal it may serve as a tool for further understanding of the complex issue of school food systems and how to integrate organic food into them. Nevertheless, these categories may be refined. On the one hand, more quantitative data should be included, when more research is conducted in this field, in order to make the assessment of the values more precise. On the other hand, categories such as education for sustainable development and food education or users' acceptance of organic school food might be developed because the user side is crucial, too. Public institutions have to attract pupils and parents to organic offerings; this is, however, difficult to govern. Furthermore, the analytical categories could be adapted and applied to regional or local school food systems.

Specific support for organic school food seems to be most important for attaining a high share of organic school food use. However, introducing or

increasing organic school food needs to go beyond a simple replacement of conventional by organic produce. To maximise the consumption of organic food in schools, the ideal school food system would be composed of a complete meal service: all paid, prepared and served by the public in a rather decentralised system that empowers local/municipal actors to fulfil this task. The system should be supported by a clear political will to prioritize organic food and by well-developed supply chains offering organic produce adapted to the needs of school meal catering. In this vein, calls for tenders and contracts with school caterers requiring organic produce are a very effective instrument, as the Italian cases show.

However, as made apparent by all of the national cases, the starting points of school food systems vary considerably. Therefore, there is no single optimal solution for public organic food procurement strategies and instruments to maximise the consumption of organic food in schools. Hence, each municipal school food situation should be analysed separately in order to identify its strengths and weaknesses, such as via use of our proposed radar figure, which provides a rapid overview of key features. This should enable actors to develop a comprehensive governance strategy and to balance the diverging interests and requirements of different actors in their school food systems. The iPOPY project has identified a rich source of experience, best practices, innovative instruments, and strategic approaches.

The strategies and instruments discussed here have focused on the procurement side. Public organic food procurement policies can be more efficient when they are systematically linked up with a broader concept of sustainable nutrition. Public organic food procurement should be integrated into a captive catering approach, at the school level into a whole-school approach, and on the political level into policies for public sustainable nutrition, as an additional strategic domain.

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