



The Whole School Food Approach: A European framework and implementation to promote healthy and sustainable school food systems

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ABSTRACT

Objective: We describe the development of the Whole School Food Approach framework and its implementation in 12 European countries participating in the European-funded project, SchoolFood4Change.

Methods: The framework was developed in 2022 by a multidisciplinary team following an evidence-based approach. Data on implementation criteria were collected through mixed-methods in schools between 2022 and 2025 in 17 cities. Surveys with national project coordinators assessed achievement of bronze-level criteria for each framework component. Implementation scores were calculated based on the number of bronze criteria achieved. Semi-structured interviews with city representatives explored perceptions, challenges, and enablers of implementation.

Results: The framework comprised four interrelated components and three scalable levels of progress: bronze, silver, and gold. To date, 549 schools have implemented it. Online surveys from participating cities and schools ($n = 109$) showed diverse levels of implementation across schools, with 21 achieving bronze-level. Semi-structured interviews ($n = 16$) identified cross-departmental collaboration, staff capacity, and time availability as main barriers. Political and institutional support was reported as the main facilitator for promoting school food policies.

Conclusions: Findings showed a diverse implementation of the framework in participating European countries. Despite challenges, the Whole School Food Approach was perceived as a valuable tool for developing healthy and sustainable school food systems.

1. Introduction

Childhood malnutrition, including overweight and obesity, remains a major global public health challenge. (Di Cesare et al., 2019) Educational settings, where children spend a substantial portion of their daily lives, provide a unique opportunity to promote healthy eating, enhance overall well-being, and potentially improving academic outcomes. (Pineda et al., 2021; Micha et al., 2018; Bonell et al., 2014; Townsend et al., 2011) The World Health Organization adopted the *Health*

Promoting Schools framework in the late 1980s, integrating health into all aspects of school life through supportive policies, environments, and community partnerships. (World Health Organization, 1986; *Making every school a health-promoting school: global standards and indicators for health-promoting schools and systems*, 2021)

In Europe, pioneering initiatives like universal school meal programs in Sweden and Finland exemplify how whole-school approaches can improve diets, reduce health inequities, and yield long-term societal benefits. (Hopppu et al., 2010; Lundborg et al., 2022; Tilles-Tirkkonen

Abbreviations: WSFA, Whole School Food Approach; SF4C, School Food For Change.

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et al., 2011) Moreover, Europe benefits from strong commitments to scaling up health promotion initiatives, such as support from the international *School Meals Coalition* and the recently adopted *European Child Guarantee* (Guio, 2023), which support equitable access to healthy school meals. Additionally, several European cities are committed to the *Milan Urban Food Policy Pact*, which integrates health and sustainability into urban food policies. Comprehensive approaches also align with broader sustainability efforts like *Farm to Fork* strategy or the *United Nations Sustainable Development Goals*. (Moschitz et al., 2021; Fiore et al., 2022; Oostindjer et al., 2017; Mathie and Wals, 2022)

Evidence suggests that successful implementation of wholeschool approaches calls for intersectoral and multi-stakeholder collaboration, with institutional and political umbrella to enhance the quality, sustainability, and equity of health promotion initiatives. (McIsaac et al., 2019; Driessen-Willems et al., 2023; Bartelink et al., 2024) Effective implementation requires a flexible and scalable framework, adaptable to each context. (Bartelink et al., 2024; Darlington et al., 2020; Gugglberger, 2021) Some examples indicate that whole-school approaches can lead to positive and lasting outcomes, even beyond the school setting. (Gray et al., 2018) Evidence on the impact of holistic interventions on diet-related outcomes and academic outcomes remains inconclusive and scarce, due to the implementation approach, the length of the intervention, and the follow-up evaluation. (Langford et al., 2015; Wang and Stewart, 2013)

Furthermore, there is a limited understanding of the potential of strategies that adopt an integrated approach to food sustainability, such promoting awareness of local, seasonal, organic foods. (Jones et al., 2012) The four-year (2022–2025) SchoolFood4Change European project (SF4C) aims to address these gaps through a holistic and multi-component intervention, including the development of a whole-school approach to food and sustainable development, the Whole School Food Approach (WSFA). The objectives of this manuscript were two-fold: 1) to describe the development of the Whole School Food Approach, and 2) to describe its implementation in participating schools across Europe.

2. Methods

2.1. Development of the Whole School Food Approach framework

As part of the SF4C project, a working group composed of project partners began drafting the WSFA framework in 2022. Based on their expertise, several partners were enrolled: World Wildlife Fund Sweden and Danachda (school education), Speiseräume (school kitchens), Copenhagen (city-level food policy), Ghent (sustainable procurement), and International Federation of Organic Agriculture Movements and the Fair-Trade Advocacy Office (organic and fair trade). In addition, other partners brought experience in school-based programs, including Zdravá škola (“*Truly Healthy School Meals Model*”, inspired by the United Kingdom’s “*Food4Life*” initiative) and Rikolto (“*GoodFood@School*” program). Also, partners like Mensa Cívica, Fondazione Ecoistemi, and Eating City joined voluntarily.

The WSFA framework was initially built upon the Flemish Institute framework “*Healthy School*,” which offers guidance and tools to design, implement, and evaluate a comprehensive health policy in Flemish schools. Central to this mode is the health matrix, an assessment tool that guides policy development. To broaden its applicability across Europe, the working group met monthly during the first 18 months of the project to restructure the matrix’s strategies – “rules & regulations”, “environment”, “education” and “care and guidance” – and its four action levels (i.e., individuals, classroom, school, and school environment) into four mutually reinforcing components (pillars), based on the “*Food4Life*”-initiative (Jones et al., 2017). The results section provides a detailed overview of each pillar.

To enhance the implementation of the WSFA pillars, the working group developed a streamlined, checklist-based framework in early 2022. This replaced the abstract Flemish matrix with a pragmatic, user-

oriented tool that enables schools to take concrete, integrated actions to offer healthy, sustainable school food. The initial criteria were further streamlined to ensure all essential components were included at the minimum (bronze) level, which is mandatory for an integrated approach. Similar frameworks, such as the Czech *Truly Healthy School* and *Food4Life* models, were also reviewed to complete the formulation

Table 1

Bronze-level criteria and corresponding indicators for each pillar of the Whole School Food Approach framework in European schools, 2023.

Framework pillars	Minimum criteria for bronze level	Criteria indicators for bronze level
Policy and leadership	BR.A.1. Internal school food working group	The school has a group (teachers, staff, pupils, possibly parents) that meets regularly to plan and monitor food-related activities.
	BR.A.2. School vision on food and nutrition	The school has ambitions, based on a food vision.
	BR.A.3. Review of the school’s food culture and action plan	The school food working group yearly conducts a review which leads to a written whole school action plan.
	BR.A.4. School food vision and Whole School Food Approach actions	The school regularly informs caregivers and wider school community about its food vision/ambitions and Whole School Food Approach actions.
	BR.A.5. Pupil participation	Pupils are engaged in the promotion of healthy, sustainable food.
Food and sustainability	BR.B.1. Healthy dining environment	The school provides a pleasant dining area where healthy, sustainable meals are promoted.
	BR.B.2. Promotion of fruit and vegetable intake	The school takes initiatives to encourage children to eat fresh fruit and vegetables on a daily base.
	BR.B.3. Share menu details	Menus are clearly displayed or shared with families, showing ingredients, and meal options.
	BR.B4. Complimentary water	The school provides free (tap) water for all pupils.
	BR.B5. Lunch boxes and/or snacks guidelines	Clear guidelines for lunch boxes and/or snacks are available for pupils and caregivers/parents.
	BR.B6. Additional facilities for children with special needs	Children with special dietary needs have access to adapted food at school or the possibility to bring their lunch to school in a safe way.
	BR.B7. Food waste monitored	The various fractions of food waste on the plates are measured at least once a year for one week.
Education and learning	BR.C.1. Food in the curriculum	The topic of healthy, sustainable food is integrated in different lessons and/or interdisciplinary projects.
	BR.C.2. Hands-on food activities	Pupils take part in hands-on activities such as gardening, cooking, or farm visits to learn about food.
	BR.C.3. Staff workshops and educational resources	Staff receive training or materials that help them integrate food and sustainability into lessons or activities.
Community and partnership	BR.D.1. Caregiver involvement in school food	Parents and caregivers are invited to join school food activities (workshops, events, menu discussions)
	BR.D.2. Collaboration community stakeholders	The school shares its food-related vision and actions with local stakeholders (e.g., municipalities, farmers, community groups)

Abbreviations: BR: bronze; A: Pillar A criteria; B: Pillar B criteria; C: Pillar C criteria; and D: Pillar D criteria.

of the criteria. An overview of the bronze-level criteria is provided in Table 1. (See Fig. 1.)

The working group developed the criteria drawing on partners' experience and expertise with existing sustainable catering frameworks, such as the Brussels region's Good Food canteen label and the United Kingdom initiative *Food4Life* awards and canteen labels, which set mandatory standards for healthy, sustainable institutional meals, alongside optional improvement actions. Similarly, WSFA criteria indicators work as self-assessment tools, where schools can assess their strengths and identify areas for improvement to reach a higher level of implementation (silver and gold). Bronze-level concrete indicators were designed to be as simple as possible to accommodate the wide diversity of school systems across Europe. Additional criteria allow schools to take further steps, tailoring their approach to their own vision, context, and level of ambition. A detailed description of the concrete indicators of all levels can be found in elsewhere. (School Food4Change, 2025)

2.2. Whole School Food Approach implementation strategy

2.2.1. Study population

Each city was responsible for recruiting five schools for the first project year (2022) with an additional five schools to be recruited in the second year (2023) and gradually scaling up to 20 schools in 2025. The recruitment methods employed varied across cities, with some using written communications, while others relied on established relationships. These diverse approaches were tailored to the local context and the networks available to each city. To support the recruitment process, Rikolto provided cities with a template outlining the expected implementation plans, outcomes, strategies, and needs.

2.2.2. Whole School Food Approach data collection at schools

To test the consistency and replicability of the framework, criteria, and criteria indicators across EU countries, approximately five schools per city participating in the SF4C –17 cities in total – piloted the beta version in the second half of 2022. We used the second annual project General Assembly in October 2023 to collect feedback from national project coordinators and cities involved in the pilot implementation. We also maintained regular contact with the cities and the working group, gathering continuous feedback.

While we received positive feedback on the overall conceptual

framework, schools found bronze-level criteria too ambitious. As a result, mandatory criteria that could not be met in some participating countries were reclassified as additional criteria (e.g., requiring official endorsement of the WSFA by school management) while others were simplified (e.g., increase healthy food availability at school instead of daily hot meals). The silver and gold level criteria remained unchanged within the additional criteria to ensure sufficient challenges for schools progressing beyond bronze. To ensure flexibility within the local context, schools can choose from additional criteria to progress. Furthermore, the responsible (sub)national authorities in each context – guided by national project coordinators — can tighten bronze-level criteria, provided they remain attainable for all schools in the area. For instance, the *Generalitat Valenciana* in the Valencia region (Spain), integrated the SF4C project into its 'Health Promotion and Prevention Service' portfolio for the educational environment and included the requirement for a communication person within bronze-level criteria. Finally, the practical guide for schools, *How to WSFA*, was released in 2023. This guide provides schools interested in applying the framework with an overview of its pillars, criteria, and indicators. This guide, alongside additional guidelines to adapt the WSFA framework for children aged zero to six, can be found on the project website (School Food4Change, 2025).

Beginning in September 2022, aligned with the start of the 2022–23 school year, each city/regional project coordinator developed several activities at both the school and community levels, targeting different stakeholders and addressing two main objectives: 1) to assess strengths, opportunities, constraints, and challenges when implementing the WSFA strategy in their specific contexts, and 2) to provide the necessary tools and guidance to help with the implementation process.

At the school level, workshops for pupils and teachers were conducted to establish an action group and develop an action plan for WSFA implementation. Additionally, cooking sessions were organized to train school cooks in preparing healthy and more sustainable meals. At the community level, *School Canteen Day Parties* engaged pupils, caregivers, local farmers, and local authorities to promote awareness of the implementation process. *Farm-to-School Twinning* activities connected pupils with local farmers to enhance their understanding of food origins. To facilitate WSFA implementation at the school level, training materials for teachers on food and nutrition education, sustainable development, growing and cooking activities, and the pedagogical school-farm education concept (Blair et al., 2023) were compiled in the guide *How to WSFA*. (School Food4Change, 2025) At the city level, Rikolto compiled annual implementation success stories to inspire other cities. Since 2023, and until the end of the project, national project coordinators have submitted success stories using a standardized template provided by Rikolto. These are compiled into the "Yearly State of Play" report, which is disseminated through project channels (e.g., website) and included in project deliverables. The 2024 edition is available in project website. (School Food4Change, 2025) Final edition will be available at the end of the project.

2.3. Evaluation of Whole School Food Approach framework and criteria implementation

To assess criteria implementation at school level, Rikolto began collecting quantitative and qualitative data from 2023/24. An online survey, translated into 13 languages and distributed to all schools implementing the WSFA, gathered data on bronze-level criteria using "KoboToolBox". Due to schools' administrative workload, national project coordinators often assisted or completed the form. Field experts will gather and analyze the data at the end of the project, employing both descriptive statistics and graphical representations.

In parallel, Rikolto held online semi-structured interviews (around one hour) with national coordinators and local authorities to identify barriers and enablers, complementing the quantitative data.

This study met the institution's guidelines for protection of human

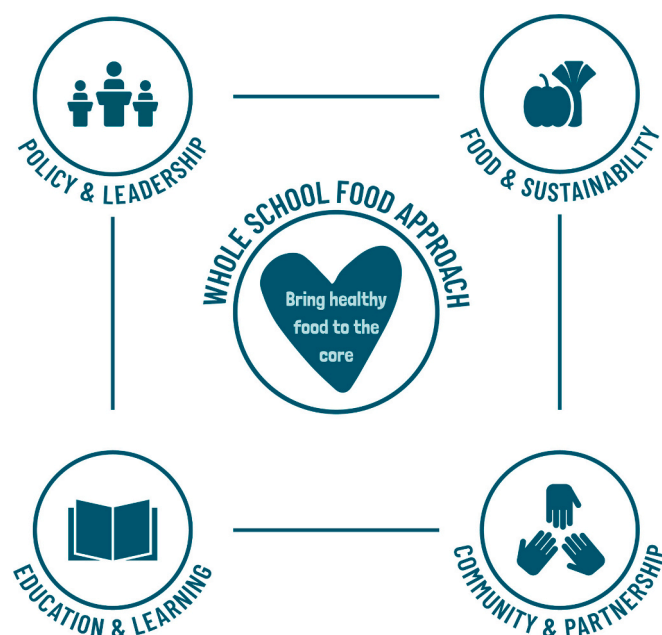


Fig. 1. Whole School Food Approach Components (pillars)

subjects concerning safety and privacy. This study was exempt from ethical approval. The next section summarizes preliminary findings drawn from written records collected by the interviewers.

3. Results

3.1. Components (pillars) of the Whole School Food Approach framework

The WSFA consists of four mutually reinforcing pillars to help schools implement this approach:

Policy and leadership (Pillar A) broadened from a top-down approach (“rules & regulations”) to a shared vision embraced by all stakeholders to promote healthy and sustainable food through school food policies, activities, culture, and education. Key elements include establishing a school food working group to drive the WSFA, developing action plans with annual evaluations, establishing a communication strategy to engage relevant stakeholders, and involving students in food-related decisions and initiatives.

Food and sustainability (Pillar B) transforms the food environment within the school to foster healthy and sustainable eating habits. Key elements include creating a pleasant dining environment, prioritizing sustainable food procurement, encouraging healthy food choices during the school day, ensuring access to school meals for all students, especially the most vulnerable ones, and reducing food waste through effective planning and management strategies. The food environment around the school and its actors were placed in a separate pillar D.

Education and learning (Pillar C) focuses on integrating food education into the school curriculum to empower students with knowledge and skills to make informed decisions about health and the environment. Key elements include embedding food and food systems education across subjects, providing training and resources for teachers and canteen staff, and encouraging cross-curricular or cross-class hands-on learning projects.

Community and Partnership (Pillar D) emphasizes the need to collaborate between schools and their surrounding communities to create a supportive environment for healthy and sustainable food practices. Key elements include engaging students’ families and caregivers, as well as local businesses, farmers, and community organizations to promote healthy food choices. It also involves celebrating the cultural significance of food and organizing events that highlight diverse food cultures and local food systems.

The ‘Care and Guidance’ component of the original Flemish matrix was not retained because it was closely linked to the Flemish education system, and less relevant for a European framework.

3.2. Implementation of the Whole School Food Approach

As of the present analysis, a total of 549 schools are implementing the WSFA. Among them, 213 schools are in the Czech Republic, while the remaining 336 schools are distributed across the 17 project study cities. According to the collected quantitative surveys ($n = 109$) in Belgium, Denmark, Sweden, Czech Republic, Austria, Slovakia, Spain,

Estonia, and Germany, 21 schools – five in the Czech Republic, eight in Estonia, and eight in Austria – have reached the bronze level, while no schools have yet reached the silver or gold standards. While most countries successfully met the Pillar B criteria for the bronze level, where actions in schools focused on improving the physical and social school food environment, including efforts to reduce food waste and enhance the comfort of dining areas, differences were observed across all pillars in the participating countries. An overview of the bronze compliance across the four pillars in the surveyed participating cities is presented in [Table 2](#).

At submission date, 149 best practices are currently compiled. Since 2023, two *Yearly State of Play* reports have been published. A selection of effective implementation practices for each framework component is presented in [Table 3](#). The complete list of examples, along with more detailed information, can be found in the project website, ([School Food4Change, 2025](#)) while the 2023 report is available on the School-Food4Change website.

Since October 2023, 66 *School Canteen Day Parties* have been organized in 29 cities, involving 150 schools and around 11,000 people – from pupils, school staff, and caregivers to farmers, and local authorities. At this stage, no data is yet available on *Farm to School* activities.

3.3. Results of the Whole School Food Approach criteria evaluation

Since February 2025, Rikolto has conducted 16 interviews with city representatives (e.g., school leaders, city administrators, regional project collaborators) including Malmö, Budapest, Umeå, Nurnberg, Nuoro, Milan, Copenhagen, Vienna, Region of Valencia, Tallinn, Viimsi, Region of Dordogne, Lyon, Leuven, Ghent, and Essen. The main barriers encountered at the city-level framework implementation were the lack of cross-departmental collaboration and the time needed to implement a

Table 3

Examples of good practices in the Whole School Food Approach framework pillars implementation among schools in four project participating cities, 2023–2024.

Framework pillar	Site	Description
Policy and leadership	Vienna (Austria)	Quarterly, a school working group shares experiences, discusses challenges, and monitors progress in criteria implementation
Food and sustainability	Umea (Sweden)	Offering tasting spoons at the canteen serving line transformed student’s attitudes toward trying new foods
Education and learning	Nuoro (Italy)	In December 2023, a five-month health promotion program for primary school-aged children, “ <i>Cl.Buo</i> ”, was launched. It contained 12 interactive and non-formal educational modules
Community and partnership	Veltěže (Czech Republic)	The school staff organized two community meals (i.e. breakfast and dinner) in Veltěže Kindergarten to actively involve families in the school community while highlighting their commitment with school meals

Table 2

Compliance percentage with bronze-level criteria for each pillar of the Whole School Food Approach among schools in nine project participating cities, 2022–2025.

Country	Policy & leadership (%)	Food & sustainability (%)	Education & learning (%)	Community & oartnership (%)
Belgium	59.5	53.5	45.8	25.0
Czech Republic	86.6	80.9	77.7	100.0
Austria	96.0	88.5	46.6	60.0
Slovakia	83.3	92.8	77.7	69.1
Spain	90.0	96.4	50.0	62.5
Estonia	100.0	95.2	92.5	77.7
Sweden	96.2	96.5	92.3	100.0
Denmark	58.0	80.0	46.6	25.0
Germany	60.0	74.2	90.0	65.0

comprehensive school approach, especially in those cities with no background on school health promotion initiatives, such as Nuoro (Italy). At the school level, the cities surveyed agreed that political and institutional support is essential to develop and implement a comprehensive school food policy. Both for cities and schools, peer-to-peer exchanges were valued for knowledge sharing, but participation remained a challenge. On the contrary, all interviewed cities acknowledged the WSFA framework as a valuable tool for fostering collaboration among municipal departments and engaging stakeholders, including caterers and civil society organizations.

4. Discussion

The present study reports early findings from the implementation of the WSFA in 549 schools across 17 European cities. The WSFA framework proved to be a valuable tool for supporting schools, local authorities, and other stakeholders in co-creating, monitoring, and adapting school food policies across diverse educational systems, levels, and sociocultural contexts, while also highlighting the critical role of strong cross-departmental collaboration in ensuring smoother and more effective implementation.

Establishing a shared purpose and sense of responsibility among stakeholders is essential for the effective and sustainable school food policy implementation. (McIsaac et al., 2019) Our findings suggest that preliminary steps – such as forming a working group, conducting a school food review, and determine the school needs and priorities – are recommended before implementation. Similarly, Rose et al. proposed a six-phase guideline to support secondary schools implementing a whole school food approach in the United Kingdom, which also included an initial school context screening phase, the establishment of a working group, and the prioritization of areas to intervene in the school system. (Rose et al., 2023)

Establishing a standardized tool to evaluate and monitor the implementation of comprehensive approaches is needed. (O'Halloran et al., 2020) Evidence supports a stepwise approach to implementation, facilitating a more holistic process in which all minimum criteria can be progressively achieved. (Bartelink et al., 2024) In 2019, O'Halloran and colleagues systematically reviewed the measurements methods used to assess the school food environment. Mostly, self-administrative quantitative questionnaires were used to assess the school food physical, economic, social, and policy environment. (O'Halloran et al., 2020) Beyond this, the WSFA evaluates school food education activities, a dimension overlooked in previous European approaches. (Moore et al., 2023) In addition, the WSFA provides implementation and monitoring guidelines adapted to preschools, extending beyond primary and secondary schools.

Schools operate within broader educational system, exercising limited autonomy under externally imposed constraints. (Moore et al., 2019) For example, some schools in Lyon face challenges in meeting the bronze-level criteria, particularly in Pillar D, as its implementation falls outside the school's sphere of competence. Moreover, these complex and dynamic systems are part of a broader network of agents, whose interactions influence health. (Moore et al., 2019) Therefore, school-based interventions should be tailored to each school context, considering its social, political, economic, and physical environment as well as the school needs and resources. (Darlington et al., 2020) A “one-size-fits-all” approach does not exist and health promoting principles need tailored translation to create effective and sustainable actions that fit the specific context. (Bartelink and Bessems, 2019) Our findings suggest that the WSFA framework is a promising tool for supporting local authorities, school leaders, and stakeholders in developing a flexible, shared school food policy adaptable to different contexts and progress stages. However, evidence show a need for more process guidance to support professionals apply a whole-school approach to their specific context via training or other types of support. (Driessen-Willems et al., 2023)

A review of qualitative evidence highlighted the importance of

continuous training and professional skills to support holistic health interventions in schools. (Hung et al., 2014) However, schools often struggle to provide capacity building activities for school staff. (Dadaczynski and Hering, 2021) A significant barrier is the limited time available for teachers, who are already overburdened with curricular and administrative responsibilities, leaving little room for engaging in additional health-related activities. (Driessen-Willems et al., 2023) As part of our findings, semi-structured interviews revealed that peer-to-peer exchanges (i.e., interactions between schools at the city level) were perceived as valuable opportunities for knowledge sharing and implementation support.

Health is not yet consistently embedded within educational policies across Europe. (Bartelink et al., 2024) To build a positive school climate and foster shared nutrition goals, nutrition should be positioned as a core mandate within education systems. (McIsaac et al., 2019) Our findings indicate that countries with well-established health promotion programs demonstrated stronger performance in implementing the WSFA framework and achieving the bronze-level criteria, as seen in Sweden, Estonia, and the Czech Republic. In contrast, “add – on” approaches, which operate outside the core curriculum, often require additional resources. (Driessen-Willems et al., 2023) For instance, a mapping study within the SF4C project found that some countries struggled to provide healthier and more sustainable schools meals due to a lack of expertise among procurers in applying sustainability criteria. (Piirsalu et al., 2022) Alternatively, “add – in” approaches integrate whole-school strategies within existing curricula, guidelines, and legislation, making them more feasible and increasing educator awareness. (Driessen-Willems et al., 2023) However, these bottom-up strategies require dedicated time for schools' staff to ensure meaningful and sustainable change. (Driessen-Willems et al., 2023)

4.1. Limitations and strengths

This study had several limitations. Firstly, this study is part of a larger, four – year European project launched in 2022 that is still in its implementation phase. Consequently, we lack empirical data, which might affect the generalizability of the findings. However, this data will be made available in December 2025, upon the conclusion of the project. Secondly, data on silver and gold-awarded schools is currently unavailable, as most participating institutions are still in the process of meeting the criteria for bronze-level recognition. We acknowledge that developing and implementing a whole-school approach to health and sustainability takes time, especially in schools that have not previously implemented health promotion initiatives. (McIsaac et al., 2019; Driessen-Willems et al., 2023) Thirdly, while this manuscript does not report on financial, social, or health impact assessments, these analyses are part of a separate work package and are intended to be presented at the end of the project.

Despite these limitations, the WSFA framework offers several key strengths. Its criteria are tailored for all age groups, from preschool to secondary education, and its structured and scalable design allows schools to adapt the framework to their specific contexts. Embedding a whole-school approach within a European project enables alignment of national, regional, and local efforts with transnational objectives, fostering shared knowledge, funding opportunities, and collaborative networks. Together, these features position the WSFA as a replicable and adaptable framework capable of promoting healthier and more sustainable school food environments across European cities.

5. Conclusions

The study findings revealed a heterogeneous level of the WSFA implementation among participating countries, with varying degrees of achievement among the four framework pillars. Findings highlight both the potential and challenges for adopting a comprehensive approach to school food across diverse educational and policy contexts. This study

underscores the importance of tailored support, capacity building, and policy alignment to advance the effective implementation of WSFA and promote healthier and more sustainable school meals.

CRedit authorship contribution statement

Irene Vidal: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Katharina Beelen:** Writing – review & editing, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Annelies Smets:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Monika Rut:** Writing – review & editing, Writing – original draft, Resources, Project administration, Methodology, Investigation, Conceptualization. **Evelin Piirsalu:** Writing – review & editing, Resources, Project administration, Methodology, Investigation, Funding acquisition. **Julia Diez:** Writing – review & editing, Writing – original draft, Methodology, Funding acquisition. **Manuel Franco:** Writing – review & editing, Writing – original draft, Resources, Project administration, Investigation, Conceptualization.

Ethical approval

Ethical approval was not required.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data is available under the SchoolFood4Change website (schoolfood4change.eu).

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