Utilization of school meals

Results from the nationwide nutrition survey EsKiMo II

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Abstract

The importance of offering appropriate meals at schools has increased with the development of the all-day school system. About ten years after the first "Eating Study as a KiGGS Module" (EsKiMo I; 2006), the nutrition study (EsKiMo II; 2015–2017) was conducted again, also collecting current information about the offer and utilization of school meals by 6- to 17-year-old students. 86.8% of the children and adolescents have the option of having a warm lunch at school. In the last ten years, the possibility and consumption of this offer have doubled. As before, reasons why the offer of a school lunch is only consumed by 37.4% are: a warm lunch or dinner is provided at home, classes are only held in the mornings, or the students do not like the taste of the food. The students also frequently criticize the organization of the school meals. Thus, the quality and basic conditions of the meal offer should be improved to increase acceptance among children and adolescents.

Keywords: School meals, communal catering, nutrition survey, EsKiMo, KiGGS, children and adolescents

Introduction

The all-day school system in Germany has been expanded significantly in recent years. By now, the number of children and adolescents visiting an all-day school is four times higher than it was 15 years ago [1]. The number of students who should be provided with a lunch meal or snack has, thus, increased. However, the circumstances of meals offered at schools in Germany is often criticized [2] and continues to be a politically controversial topic [3] regarding an appropriate diet. As a crucial setting for public food distribution for children and adolescents, school also provides a great potential to actively contribute to the formation of dietary habits [4]. The offered meal should not just promote health and provide an optimal nutrition; it should also be adjusted to the eating habits and taste preferences of the young generation [5].

Although it was decided at the Conference of the Ministers of Education in early 2004 that all-day schools are obligated to provide a school lunch, no legally obligatory regulations regarding nationwide quality standards for school meals have yet been established [6]. The German Nutrition Society (DGE) developed a "quality standard for school meals" [5], but so far, its compliance has only been mandatory in Berlin, Hamburg, and Saarland [7]. As part of the National Action Plan "IN FORM – German national initiative to promote healthy diets and physical activity", the establishment of networking centers for school catering was initiated [5]. Among other things, these should promote the dissemination of the DGE standard. A recent study about the quality of school meals shows that these recommendations by the DGE have not yet been implemented nationwide and that they are insufficiently known in some areas. This heterogeneity in the organization of school meals can still be attributed to the federalist

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education system in Germany, according to which the individual districts, cities, and municipalities are responsible for regulating school meals [8, 9].

However, these structural obstacles are only partly responsible for the low priority placed on school meals among children and adolescents; the low acceptance of the meals offered at schools is also a problem. The nationwide "Eating Study as a KiGGS Module" EsKiMo I (2006) showed that 41% of children aged 6–11 years and 51% of the adolescents aged 12–17 years have the option of having a warm lunch at school or at the care facility. However, among the 6- to 11-year-olds, only 26% of the girls and 24% of the boys, and 13% of the girls aged 12–17 years and 19% of the boys of the same age actually consumed this offer. The main reasons expressed for not consuming the school lunch were: the students had the option of having a warm lunch at home, the classes only took place in the morning, or they did not like the taste of the food [10].

Other studies show similar reasons why school canteens are not used very often. The reasons range from the students' subjective views, such as insufficient variety or change in the offered meals – including complaints about the taste and appearance of the food – to criticism of the basic conditions, such as noise levels and comfort [2, 3, 8, 11, 12].

After about ten years, information about the options and participation in school meals were collected again within EsKiMo II (2015–2017). Current results regarding the utilization of a warm lunch by children and adolescents at schools in Germany are presented in the following. Additionally, changes in the consumption of school meals compared to ten years ago are described.

Methods

The EsKiMo nutrition survey is a module of the "German Health Interview and Examination Survey for Children and Adolescents" (KiGGS) by the Robert Koch Institute. It aims to collect nationwide representative data about the current nutritional status of children and adolescents aged 6–17 years. EsKiMo was first conducted in 2006 (EsKiMo I) as part of the KiGGS baseline survey (2003–2006). Approximately ten years later, the nutrition study (EsKiMo II) was conducted again from June 2015 to September 2017, and the dietary behavior of 2,644 children and adolescents, a subsample of the cross-sectional population of KiGGS Wave 2, was investigated in 167 locations. Detailed information about the conception, study design, and execution is provided elsewhere [13, 14].

EsKiMo II inquiries took place approximately 3–6 months after the participation in KiGGS Wave 2. For dietary assessment, different methods were used depending on age: Parents of 6- to 11-year-olds were instructed to keep a weighted food record for a total of four days. The 12- to 17-year-olds participated in a computer-assisted diet history interview (DISHES) about their dietary behavior in the last four weeks. A short standardized interview was conducted following the instructions for the food records for the parents and the DISHES interview with the adolescents. Hereby, information regarding school meals, shared family meals, or the use of dietary supplements was inquired. Regarding school meals, all participants who attend the school were asked whether their school (or the after-school care center) offers the option of a warm lunch, whether they regularly consume school meals, and how often they did so ("daily", "3 to 4 times/week", "once or twice/week" and "less frequently"). If they did not consume it or only rarely (once or twice/week or less frequently), they were asked about the reasons why. One or more of the following reasons could be selected: "a warm lunch or dinner is served at home", "classes are only held in the mornings", "the food at school does not taste good", "the food is too expensive", "the break is too short", or "I prefer to eat something else". Other reasons could be listed in a free text field.

Information from KiGGS Wave 2 was also included for correlation analyses. This concerns information about the region of residence (former West Germany vs. former East Germany [with Berlin]), the type of school (primary school, lower secondary school, upper secondary school, others), size of the community (rural ≤ 5,000 inhabitants, small 5,000 < 20,000 inhabitants, medium 20,000 < 100,000 inhabitants, large town ≥ 100,000 inhabitants, and the socioeconomic status (SES) of the families. The SES was determined by using an index based on the net household income, the highest education level and the parents' occupational status and divided into low, medium, and high social status groups [15].

For the current analyses, children and adolescents who did not take part in a short interview (n = 3) and did not provide information about school meals (n = 5), as well as children and adolescents who did not attend school (n = 144), were excluded. The analyses thus include 2,492 students from EsKiMo II.

The data show the proportion of children and adolescents who have the possibility to have school meals and how many consume it. Prevalences (%) with 95% confidence intervals (95% CI) were described in relation to the sociodemographic characteristics. Differences were considered to be statistically significant if the 95% CI did not overlap.

The data from EsKiMo II was analyzed with

	Warm lunch at school					
	Possibility to have a school meal		Utilization		Utilization if offer available	
	n = 2,492		n = 2,492		n = 2,226	
	%	[95% CI]	%	[95% CI]	%	[95% CI]
total	86.6	[83.9–89.3]	37.4	[34.2–40.7]	43.2	[39.9–46.6]
sex						
boys	87.1	[83.8–90.5]	36.7	[32.6–40.8]	42.2	[37.8–46.6]
girls	86.0	[82.5–89.4]	38.2	[34.1–42.2]	44.4	[40.2–48.6]
age						
6–11 years	84.4	[80.3–88.6]	47.7	[42.8–52.5]	56.4	[51.8–61.1]
12–17 years	88.5	[85.5–91.5]	28.3	[24.5–32.1]	32.0	[27.8–36.1]
school type						
primary school	83.0	[78.3–87.8]	47.1	[41.5–52.6]	56.7	[51.3–62.0]
lower secondary school	86.7	[82.5–91.0]	23.3	[19.0–27.6]	26.9	[22.0–31.8]
upper secondary school	92.6	[89.3–95.9]	35.1	[30.4–39.9]	37.9	[33.0–42.9]
others	86.0	[76.5–95.5]	52.6	[39.8–65.4]	61.2	[47.0–75.4]
region of residence						
former West Germany	84.7	[81.6–87.8]	33.9	[30.4–37.5]	40.1	[36.2–43.9]
former East Germany (incl. Berlin)	95.7	[92.2–99.2]	54.4	[49.2–59.6]	56.8	[52.2–61.4]
community size						
rural	83.7	[77.5–89.9]	33.5	[26.8–40.2]	40.1	[33.0–47.2]
small	86.5	[80.6–92.4]	34.6	[29.0–40.3]	40.0	[33.7–46.3]
medium	88.9	[84.0–93.8]	35.3	[30.1–40.6]	39.7	[34.5–44.9]
large	85.8	[80.6–91.0]	45.0	[37.5–52.6]	52.5	[45.1–59.9]
socioeconomic status						
low	82.8	[76.4–89.1]	31.9	[24.6–39.1]	38.5	[30.0–47.1]
medium	86.4	[83.3–89.5]	36.0	[32.1–39.9]	41.7	[37.7–45.6]
high	90.5	[86.8–94.2]	47.2	[41.7–52.7]	52.1	[46.6–57.7]

Tab. 1: **Possibility to have and utilization of a warm school lunch at school by sex, age group, school type, region of residence, community size, and parents' socioeconomic status**
95% CI = 95% confidence intervals

a weighting factor that corrects deviations in the sampling from the population structure in terms of age, sex, federal state (as of 31.12.2015), nationality (as of 31.12.2014), educational level of the parents (Microcensus 2013 [16]), as well as differences in the willingness to participation according to seasonality, SES of the family and school type attended by the child.

Participation in the school meals was recorded in the same way in both EsKiMo studies. To determine changes in the offer and the utilization of school meals between 2006 and 2015–2017, information about the school meals of 2,285 students aged 6–17 years from EsKiMo

I were used. The data from EsKiMo I was also analyzed with a weighting factor, which corrects for the disproportionately higher share of persons from the former East Germany and other deviations from the sampling in terms of the population structure (as of 31.12.2004). The analyses were carried out with the survey procedures of the statistics software SAS version 9.4 (SAS Institute, Cary, NC, USA), taking the sampling's cluster design into account.

Results

A total of 86.6% of the surveyed students have the possibility to have a warm lunch at school and 37.4% of the surveyed students consume it at least once or twice a week or more often (◆ Table 1). Therefore, 43.2% of the students in schools that offer school meals actually consume them. There are no differences in the utilization between the boys and girls. With a total of 56.4%, children aged 6–11 years consume the available meal offer significantly more often than 12- to 17-year-old adolescents (32.0%). Primary school students consume the supplied warm lunch significantly more often than students in secondary schools. Students in upper secondary schools consume the school meal more often than those in lower secondary schools.

The offer of a warm school meal is more prevalent in the former East Germany (incl. Berlin) (95.7%) than in the former West Germany (84.7%). At the same time, considerably more children and adolescents from the former East Germany eat lunch at school than those in the former West Germany (56.8% vs. 40.1%). Regarding the community size, the consumption of the school meals tends to be slightly higher in large cities (52.5%) than in medium cities (39.7%), small towns (40.0%), and rural areas (40.1%). Children and adolescents in families with a high SES consume the existing meal offers more often (52.1%) than children and adolescents in families with medium (41.7%) or low SES (38.5%).

A total of 31.1% of the 6- to 11-year-olds and 5.3% of the 12- to 17-year-olds eat at school every day. 43.7% of the 6- to 11-year-olds and 68% of the 12- to 17-year-olds who have the possibility to eat a meal at school never do so (◆ Figure 1). The main reason for never or rarely consuming school lunches stated by parents of 6- to 11-year-olds is that their child gets a warm lunch or dinner at home (59.2%). Another frequently mentioned reason is that classes only take place in the morning (39.2%). 16% of the children do not like the taste of school meals and 6% prefer to eat something else. Among adolescents, the main reasons for not consuming are: they eat a warm lunch or dinner at home (39.5%), the food does not taste good (31.7%), they prefer to eat something else (19.1%), or classes only take place in the morning (20.5%). Other frequently cited reasons by both age groups concern the

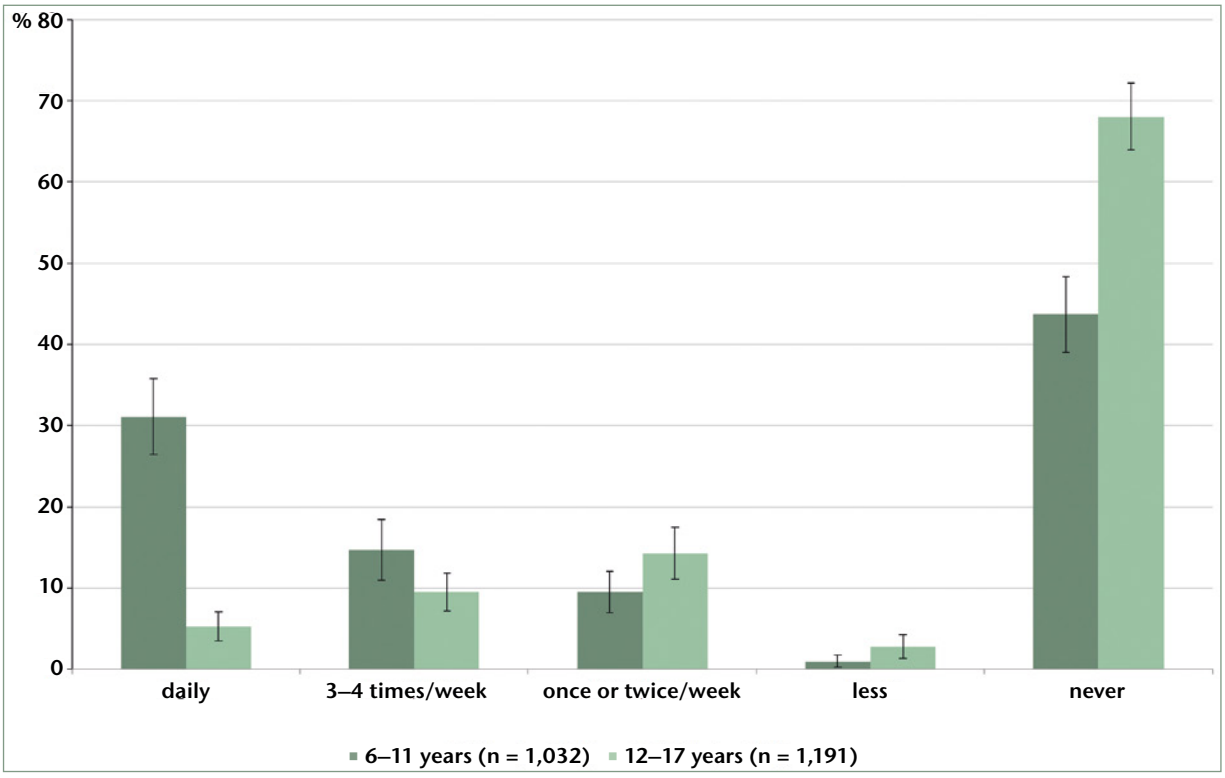


Fig. 1: **Utilization of a warm lunch in case of existing offer at school according to age groups**

basic conditions of the school meals, such as break times, price, and organization (◆ Figure 2).

EsKiMo I showed that 46.1% of the students had the opportunity to eat a warm lunch at school in 2006; in EsKiMo II were almost twice as many students: 86.6%. The utilization has also nearly doubled: while 19.1% consumed a school meal at least once or twice a week or more often in EsKiMo I, now the percentage is of 37.4% in EsKiMo II. In the former West Germany, the utilization rates increased slightly more than in the former East Germany (◆ Figure 3).

Discussion

The results of EsKiMo II show that the option of receiving a warm lunch at school and the utilization of this offer have nearly doubled during the last ten years. There are significantly fewer differences in terms of the region of residence: In 2006, considerably fewer students in the former West Germany (38.2%) had the option of having a warm school meal than in the former East Germany (85.1%). EsKiMo II shows that 84.7% of students in the former West Germany now have the option to have a warm lunch at school. Thus, the offer has nearly adjusted to the levels found in the former East Germany. This development could be a result of the increased implementation of the all-day school system, among other things [1].

The most often-stated reasons for not consuming school meals are, as in EsKiMo I, that children and adolescents get a warm lunch or dinner at home and/or only have classes in the mornings. The fact that a warm meal is available in many families may indicate that a family meal is considered a priority or that parents consider themselves responsible for providing the meals. However, it cannot be ruled out that the low acceptance of school meals is also associated with the parents' lack of trust in the offered school meal. More transparency and information about the school meal offer could eliminate the parents' reservations and increase its consumption [11]. Additionally, non-consumption of school meals was often attributed to such aspects as taste, cost, break times, and organizational conditions, which provide further approaches for increasing the utilization, for example through policy interventions.

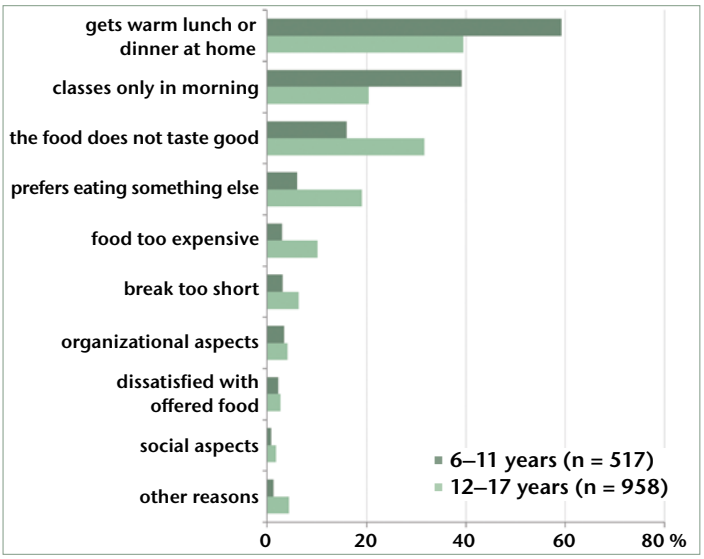
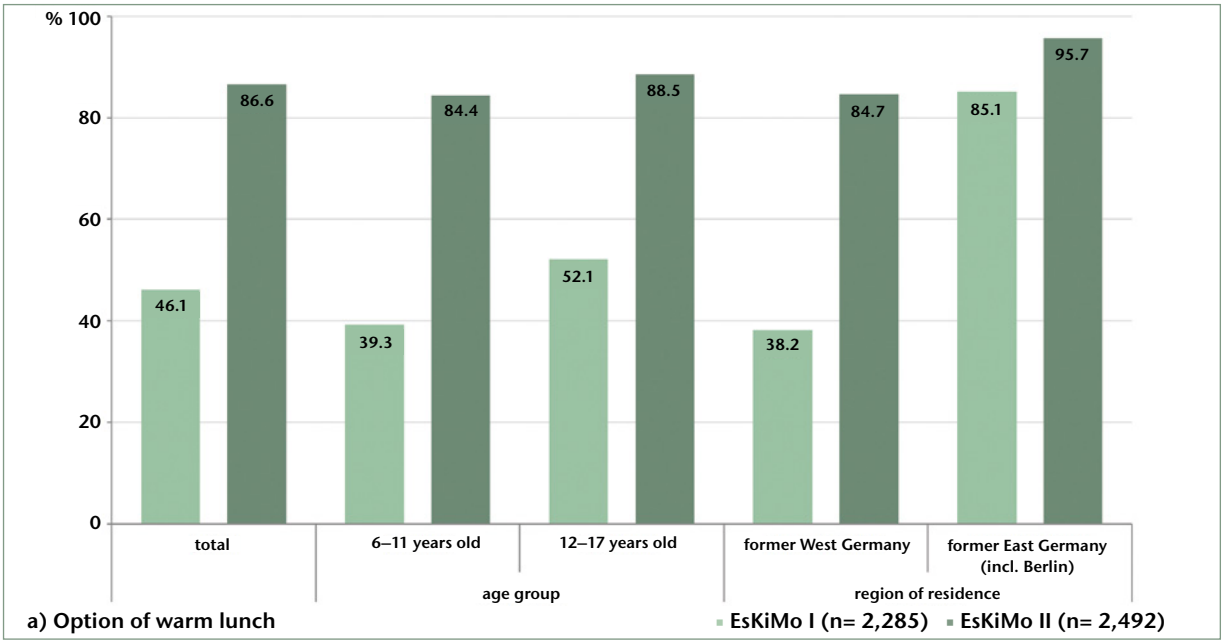


Fig. 2: **Reasons for non-consumption and irregular consumption of the school meals according to age groups (if meals are offered)**

While adolescents often make their own decisions regarding what they want to eat and where to eat lunch, the dietary habits of younger children are mostly (co-)determined by the parents. This is also reflected by a declining utilization of the school meals with increasing age. In adolescence, decisions regarding what is eaten and where is strongly influenced by the peer group. Snacks are considered to be highly popular among adolescents, since they can be consumed quickly, anytime, anywhere, and regardless of other persons [17]. Older adolescents can also to some extent leave the school grounds to have a meal elsewhere, or they prepare their own meal at home [3, 18]. Other surveys show a similar picture of the school meal situation in Germany [2, 11, 18, 19].

The taste and quality of the meals play an important role in the decision to consume school meals. The offer should thus be not just balanced and varied but also appetizing to increase the acceptance. The needs and requirements of the target group should be considered. At secondary schools, the lunch offer could be expanded with varied and balanced snacks to increase participation by adolescents [20]. School meals contribute to nutritional education and socialization and thus have an impact on dietary habits. Lunch at school does not just satisfy hunger but also involves a social exchange. This requires corresponding basic conditions. They include such aspects as facilities that are primarily dedicated to the provision of school meals. The organization should also be subject to needs-oriented planning, with adequate break times and short queues for the food distribution in the canteens.

School is a formative influencer for children and adolescents in terms of learning, experience, and life, which makes it one of the most crucial institutions for nutritional education



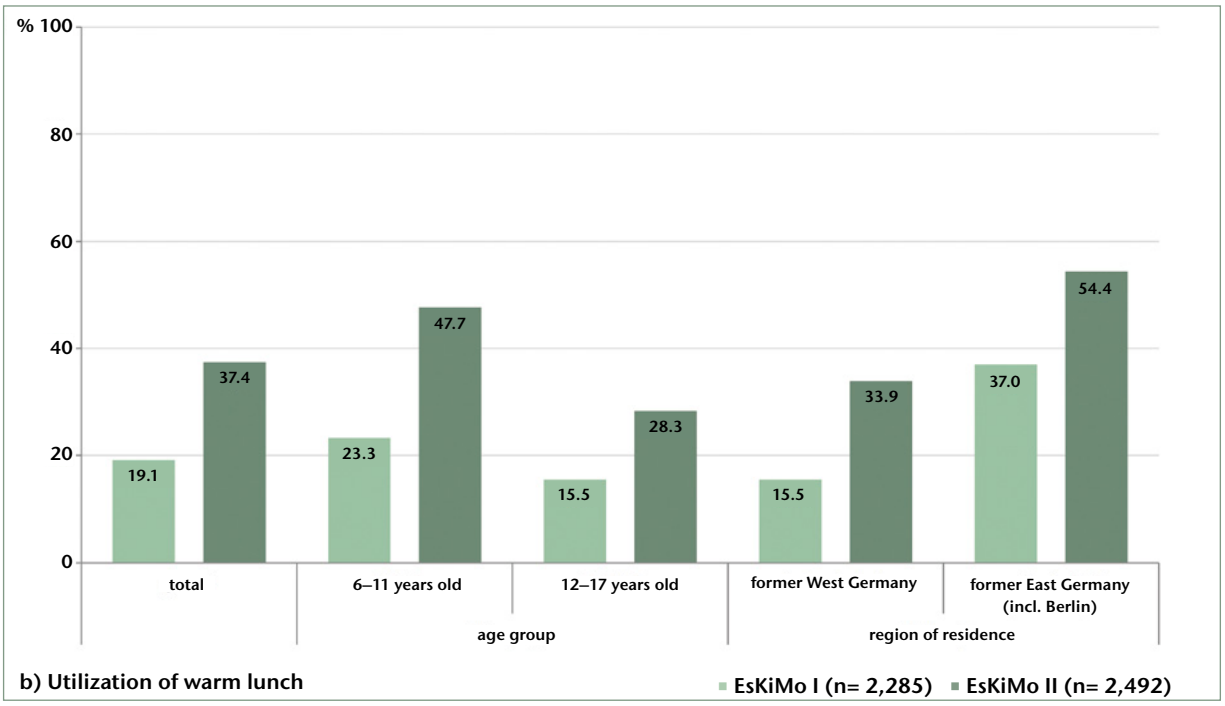


Fig. 3: **(a) Option and (b) utilization of a warm lunch at school according to age groups and region of residence in a comparison between EsKiMo I and EsKiMo II**

aside from the family. Therefore, the school setting is an appropriate place to establish broad interventions that reach every child and every adolescent, regardless of their social status. In addition to the DGE quality standard and the networking centers for school, there are numerous other projects and campaigns designed to improve the quality of meals. However, there is no nationwide standardization of the basic conditions, such as an obligatory adherence to the DGE quality standard, similar to the guidelines for hygiene and labeling. Berlin, Hamburg, and Saarland, which have introduced the DGE quality standard for school meals on a mandatory basis, have already set a good example [7]. If the quality standard becomes mandatory in all states, for example for all-day schools, the certification of the menu planning and meal production [5] should be subsidized or free of charge, since e.g. smaller catering companies cannot always afford it.

The National Quality Center for Nutrition in Daycare Centers and Schools (NQZ) was established at national level in 2016 and assigned to pool, coordinate, and develop existing quality development interventions. It connects the relevant stakeholders and promotes the cooperation between the federal government and the states. Furthermore, the NQZ, Fulda University of Applied Sciences, and the University of Paderborn are developing a nationwide monitoring plan for the meals at daycare centers and schools [21].

The structures pertaining to school meals are complex and characterized by the cooperation of various stakeholders (municipalities, school authorities, school administrations, caterers, etc.) and students as the guests and their parents as the paying customers. In EsKiMo, the school meals are a partial aspect and it merely captures the perspective of the students and their parents. However, the results give a representative overview of the current utilization of school meals in Germany and show changes compared to the situation ten years ago.

Conclusion

Although the option to have a warm lunch at school has improved over the last ten years, the relatively low utilization of this offer indicates a further need for optimization. A warm meal at home is often preferred. Other reasons why the offer is not consumed are related both to the quality and the basic conditions for school lunches, which have not been satisfactory for the students so far. To increase the acceptance of the meal offer among the children and adolescents as well as among their parents, the meal offer and the basic conditions should be adjusted to meet the needs of the students and to obtain the parents´ trust. Besides the family, the school is the most important place for the socialization of dietary habits, which gives schools and the relevant stakeholders the obligation to provide an appropriate lunch. School meals should, therefore, be understood as a task for the whole society.

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Conflict of Interest
The authors declare no conflict of interest.

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