



Food and nutrition literacy in general schools

An analysis of the framework conditions of the federal states for subject-related lessons

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Abstract

In the study “*Ernährungsbezogene Bildungsarbeit in Kitas und Schulen*” (Nutrition-related educational work in day-care centres and schools), a document analysis was carried out to examine the extent to which food and nutrition literacy is anchored in the curricula of the federal states. Furthermore, the amount of lesson-hours allocated to the identified subjects with a nutritional reference was investigated. At primary schools, *Sachunterricht* can be defined as the leading subject for food and nutrition literacy. At secondary level 1 schools, nutritional topics are anchored especially in the curricula for biology/natural sciences, whereby the natural science perspective is mainly considered. In addition, secondary level 1 schools offer federal-state-specific subjects with nutritional reference. In the curriculum of these subjects, nutritional topics are anchored in a multi-perspective manner. However, these are often offered in single grades and/or as an elective subject. Therefore, continuous and multi-perspective food and nutrition literacy in school for all pupils is not guaranteed. For this purpose, on the one hand, food and nutrition literacy in the existing subjects has to be ensured and, on the other hand, federal-state-specific subjects with nutritional reference should be firmly anchored in all school types at secondary level 1.

Keywords: school, food and nutrition literacy, curricula

Introduction

The aim of food and nutrition literacy is to enable people to democratically develop and shape their own nutrition in a politically and socially responsible way [1]. Food and nutrition literacy thus represents a basic education for everyday life and is a prerequisite for participation in society [2]. It is an active, life-accompanying process that should take place at home and, due to the rising importance of all-day schools, also increasingly in schools [1]. There are several opportunities for food and nutrition literacy at school: It can take place informally through the school's catering services as well as formally in class or in school working groups, reaching children and adolescents from all educational groups.

The basis for individual health is already set in childhood and adolescence and health-related behaviour once acquired often persists into adulthood [3]. Therefore, it is of central importance to give children and adolescents a solid basis of abilities, skills and knowledge, also with regard to their nutritional behaviour, along on their path through life. Initial systematic evaluations of studies on the influence of school-based interventions on nutrition, physical activity and behaviour on cognition and school performance [4, 5], of school-based nutrition programs on nutrition quality and health [6], and of multiple intervention approaches with an appropriate duration (≥ 6 months) [7] show that improvements in food and nutrition literacy can be successful in many ways.

In light of changing social and political conditions as well as of household and consumption structures, and with regard to the often contradictory information and myths surrounding food and nutrition, it is necessary to review nutrition-related educational work for children and adolescents regularly. Between 1998 and 2000, the study “*Ernährung*

Citation

Dankers R, Hirsch J, Heseke H: Food and nutrition literacy in general schools. An analysis of the framework conditions of the federal states for subject-related lessons. *Ernahrungs Umschau* 2020; 67(8): 146–54. e14–6.

This article is available online:

DOI: 10.4455/eu.2020.033

Peer reviewed

Manuscript (original) submitted: 26 September 2019

Revision accepted: 14 January 2020

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Educational policy reform in Germany since 2000 and competence-based teaching

As a reaction to the results of international school achievement studies (Trends in International Mathematics and Science Study [TIMSS], Programme for International Student Assessment [PISA], *Internationale Grundschul-Lese-Untersuchung* [IGLU]), the KMK formulated national educational standards in 2004, initiating a paradigm shift in educational policy [9]. Thus, there has been a shift from an input orientation to an output orientation within the educational system. Since then, the focus has been less on the content taught by the teacher but more on the learning outcomes, the acquisition of competencies by the pupils [10]. Competences comprises knowledge, abilities and skills that pupils need to solve problems [9]. The educational standards have led to the formulation of nationwide educational objectives and competences, which the federal states have committed themselves to implementing [9]. Consequently, new, competence-oriented curricula have been developed.

in der Schule" (Study on nutrition education at school or briefly EiS study) was the first to investigate this situation [8]. Since then, there have been central changes in educational policy, which also have an impact on nutrition and food literacy in schools. In 2004, the resolutions of the *Kultusministerkonferenz* (Conference of Ministers of Education and Cultural Affairs or briefly KMK) on educational standards marked the beginning of a reorientation towards competence-oriented teaching [9] (♦ Box). Furthermore, the REVIS reference framework for nutrition and consumer education (REVIS = *Reform der Ernährungs- und Verbraucherbildung in Schulen*) was developed in 2005 as part of a model project of the University of Paderborn in cooperation with the Heidelberg University of Education and the University of Flensburg [11]. With this document, for the first time, a reference curriculum with educational objectives and contents for the compulsory school period was developed for this area of education. The resolutions of the KMK on "Health promotion and prevention in schools" [12] and "Consumer education in schools" [13] represent further central changes in educational policy with regard to food and nutrition literacy in schools. The KMK defines "food, nutrition and consumer literacy" as one of 12 topics and topic areas in health promotion and names "nutrition and health" as a topic in consumer education.

These changes gave occasion to conduct a new study on nutrition-related educational work in Germany after about 16 years. Within the nationwide study "*Ernährungsbezogene Bildungsarbeit in Kitas und Schulen*" (Nutrition-related educational work in day-care centres and schools), formal nutrition education was examined [14]. The objective was to determine the importance of formal food and nutrition literacy in class. For this purpose, it was analysed whether and how food and nutrition literacy is set in the curricula of the federal states and what amount of time is allocated to the corresponding subjects according to the subject table in the federal states regulations.

Glossary

BB	Brandenburg
BE	Berlin
BW	Baden-Württemberg
BY	Bavaria
HB	Bremen
HE	Hesse
HH	Hamburg
MV	Mecklenburg-Vorpommern
NI	Lower Saxony
NW	North Rhine-Westphalia
RP	Rhineland-Palatinate
SH	Schleswig-Holstein
SL	Saarland
SN	Saxony
ST	Saxony-Anhalt
TH	Thuringia

Method

For the analysis of the curricula, the currently valid documents of the general education schools of all 16 federal states and subjects were researched via the websites of the responsible state ministries from October 2016 to January 2017. In a first step, the curricula researched were reviewed using the keywords "*Nahrung*" (food) and "*Essen*" (eating). Curricula with positive references were included in further analysis. However, documents in which "*Nahrung*" is exclusively related to animal nutrition or the food chain were excluded. Subsequently, the identified curricula were analysed with regard to nutrition-related content using the structuring qualitative content analysis according to Mayring [15]. An analysis grid was developed for the realisation according to the REVIS tableau [11]. This analysis grid contains seven main categories, which are divided into sub-categories. The main categories correspond to the topics areas of the REVIS tableau, the subcategories mainly represent the related content. However, in some cases they were inductively supplemented with content from the curricula. The contents and competences of the curricula were then assigned to one or more categories of the anal-



ysis grid. A distinction was made between nutrition-related obligatory content and facultative content regarding to the integration of food and nutrition literacy in the classroom.

In order to determine the extent of nutrition-related classes, the state ordinances, administrative regulations and/or circulars from which the subject tables can be taken, were researched and then evaluated for *Sachunterricht*¹, biology/natural sciences and the federal-state-specific-subjects with nutritional reference. Often for individual grades and subjects lesson hours are not shown in the subject tables, but are presented as so-called contingent or regular subject tables. Unless in this case concrete information on the distribution of hours was provided, an equal distribution between subjects was assumed to ensure a comparability between the federal states. Elective subjects were only taken into account if curricula with nutritional reference were available. The following analyses refer to the guidelines of the ministries of education exclusively; individual offers from single schools are not taken into account.

Results

The federalism of education in Germany allows each federal state to organise the school system independently. As a result, the school system and also the existing types of school differ between the federal states, in some cases considerably. In order to ensure comparability between the federal states, the secondary school types were assigned to the degree which can be acquired on the basis of school laws valid in May 2017.

Analysis of the curricula

Below, the results of the curriculum analysis are presented. Nutrition-related content was found in the following subjects: *Sachunterricht*¹ (exclusively at primary school), biology/natural sciences, federal-state-specific-subjects with nutritional reference (such as *Hauswirtschaft* [home economics], *Verbraucherbildung* [consumer education], *Arbeit-Wirtschaft-Technik* [work-economy-technology], *Alltagskultur, Ernährung, Soziales* [everyday culture, nutrition, social issues]), subjects of social sciences (including geography, *Werte und Normen* [values and norms], religious education, ethics) as well as chemistry, foreign languages and sports.

Sachunterricht

In the curricula of 15 federal states, topic areas of food and nutrition literacy are included obligatory in *Sachunterricht* lessons (♦ Table 1 in the online supplement → www.ernaehrungs-umschau.de). They mention at least one nutrition-related topic. Only in the Hessian curriculum there are no fields of content with an explicit nutritional reference; nevertheless, points of reference can be found. "Nutrition, body and health" is the most frequently topic area found in the curricula (n = 15). In particular, in this topic area dietary recommendations for a healthy eating as well

as food/nutrients and their functions are dealt with. "Food and self-perspective" is anchored as a topic in the curriculum for *Sachunterricht* in 14 federal states. In this topic area, contents on sensory perception are mainly mentioned. "Eating habits, sociocultural influences" and "production, processing and distribution of food" are mentioned in the curricula of eleven federal states. In particular, the own eating habits and the eating habits of others or the production and processing of traditional food and contents on global and social responsibility are taken into account.

Depending on the federal state, a total of between 6 and 20.7 lesson hours per week are available in grades 1 to 4 for lessons in *Sachunterricht* (♦ Table 2 in the online supplement → www.ernaehrungs-umschau.de). This is equivalent to a percentage of 6.3% or 22.0% (referred to the respective total lesson hours a week). The median is 12.4 lesson hours per week or 13.0%. In the federal states BB, BY, NW, RP, ST and TH, lesson hour quota are given for *Sachunterricht* together with main subjects such as German or mathematics. It can be assumed that, in this case, the actual number of lesson hours is overestimated. In contrast, the lesson hour quota in HB and TH include the minor subjects *Textilarbeit* (textile work) and *Technisches Werken* (technical work) or religious education. Thus, the actual number of lesson hours might be underestimated.

Biology/Natural Sciences

In the curricula for biology/natural sciences of all federal states and school types, obligatory nutritional content is mentioned. Most frequently, the content relates to the topic area of "nutrition, body and health", such as digestion and metabolism, food/nutrients and their functions as well as dietary recommendations for healthy eating. However, the as-

Tab. 3: Lesson hour quota for the federal-state-specific-subjects by federal state and school type

The index of the school type indicates the degree to be acquired.

* Lesson hour quota for several subjects weighted according to the information given in the subject table. If no information is given an equal distribution between the subjects is assumed; ^a taken from the subject table of primary school; ^b taken from the subject table of *Orientierungsstufe* (a school which comprises 5th and 6th grades) AHR = *Allgemeine Hochschulreife* (general qualification for university entrance); C = compulsory subject; E = elective subject; EBR = *erweiterte Berufsbildungsreife* (vocational education maturity); MSA = *mittlerer Schulabschluss* (intermediate school-leaving certificate)

¹ *Sachunterricht* is a subject at primary schools in Germany and can have different names depending on the federal state. It includes fundamental concepts of natural and social science, geography and history.



Federal state	Type of school	Subject	C/E	Grade						
				5	6	7	8	9	10	
BB	Oberschule _{EBR, MSA}	Wirtschaft-Arbeit-Technik	C	2 ^a		2		4		
			E	/	/	8		6		
	Gesamtschule _{EBR, MSA, AHR}	Wirtschaft-Arbeit-Technik	C	2 ^a		2		4		
			E	/	/	8		6		
BE	Sekundarschule	Wirtschaft-Arbeit-Technik	C	/	/	2	2	2	2	
			E	/	/	3	3	2	2	
BW	Hauptschule _{EBR}	Alltagskultur, Ernährung, Soziales	E	/	/	12				
	Realschule _{MSA}	Alltagskultur, Ernährung, Soziales	E	/	/	12				
	Werkrealschule _{EBR, MSA}	Alltagskultur, Ernährung, Soziales	E	/	/	12				
	Gemeinschaftsschule _{EBR, MSA, AHR}	Alltagskultur, Ernährung, Soziales	E	/	/	12				
BY	Mittelschule _{EBR}	Soziales	C	/	/	1,67*	/	/	/	
		Werken und Gestalten	C	2	2	/	/	/	/	
		Soziales	E	/	/	/	4	4	3	
	Realschule _{MSA}	Haushalt und Ernährung	C	/	/	2	/	/	/	
			E	/	/	3	3	3	3	
HB	Oberschule _{EBR, MSA, AHR}	Wirtschaft-Arbeit-Technik	C	/	7					
HE	Hauptschule _{EBR}	Arbeitslehre	C	7			6		3	
	Realschule _{MSA}	Arbeitslehre	C	4			4			
	Mittelstufenschule _{EBR, MSA}	Arbeitslehre	C	3		3	6			
	Gesamtschule _{EBR, MSA, AHR}	Arbeitslehre	C	/	/	1	1	1	1	
HH	Stadtteilschule	Lernbereich Arbeit und Beruf	C	6						
MV	Regionale Schule _{EBR, MSA}	Arbeit-Wirtschaft-Technik	C	2* ^b		4*				
			E	/		6*				
	Gesamtschule _{EBR, MSA, AHR}	Arbeit-Wirtschaft-Technik	C	2* ^b		3,5*				
			E	/		10,5*				
NI	Hauptschule _{EBR}	Hauswirtschaft	C	/	/	0,67*	1*	/	/	
			E	/	2	/	/	2	2	
	Realschule _{MSA}	Hauswirtschaft	C	/	/	/	1*	/	/	
			E	/	2*	2*	/	/	/	
	Oberschule _{EBR, MSA}	Hauswirtschaft	C	/	/	0,67*	1*	/	/	
			E	/	2*	/	/	2*	2*	
	Gesamtschule _{EBR, MSA, AHR}	Arbeit-Wirtschaft-Technik	C	2	2	2	2	1	1	
			E	/	/	2	2	2	2	
	NW	Hauptschule _{EBR}	Hauswirtschaft	C	/	/	4*			
				E	/	/	8			
Realschule _{MSA}		nonexistent								
Sekundarschule _{EBR, MSA}		Hauswirtschaft	C	1*		2,33*				
			E	2		10				
Gesamtschule _{EBR, MSA, AHR}		Hauswirtschaft	C	1*		2,33*				
	E		/	0,67*	3,33*					
RP	Realschule Plus _{EBR, MSA}	Hauswirtschaft und Sozialwesen	E	4		14				
	Gesamtschule _{EBR, MSA, AHR}	nonexistent								
SH	Gemeinschaftsschule _{EBR, MSA, AHR}	Verbraucherbildung	E	1*		2,5*				
SL	Gemeinschaftsschule _{EBR, MSA, AHR}	Arbeitslehre	C	2	2	/	/	/	/	
			E	/	/	2	2	2	2	
SN	Oberschule _{EBR, MSA}	Wirtschaft-Technik-Haushalt & Soziales	C	/	/	2	3	3	/	
		Neigungskurse	E	/	/	2	2	2	/	
ST	Sekundarschule _{EBR, MSA}	Hauswirtschaft	E	2*		2*		1*	1*	
	Gesamtschule _{EBR, MSA, AHR}	Hauswirtschaft	E	1*	1*	1*	1*	1*	1*	
TH	Regelschule _{EBR, MSA}	nonexistent								
	Gesamtschule _{EBR, MSA, AHR}	nonexistent								



pect of "recommendations for healthy eating" often only includes "health-promoting or healthy nutrition" and the content is rarely concretised, e.g. by the food pyramids. The second most frequent topic area is "production, processing and distribution of food" with contents on the production and processing of traditional food. Depending on the federal state and school type, biology/natural sciences is also offered as an additional elective subject. In this case, some of the nutrition-related content can be dealt with in a greater depth as well as further content and topic areas of food and nutrition literacy can be dealt with. Thus, for example, the curricula of BB and BE for academic secondary schools as well as for *Gesamtschulen*² cover all seven topic areas by the elective content. In contrast, the curriculum for *Hauptschulen* and *Realschulen* in NI only set "food and its energy content" as explicit nutrition-related content. The analysis shows that the focus in biology/natural sciences is on the topic area "nutrition, body and health" and thus covers the scientific perspective of food and nutrition literacy. But, it should be noted that there are some considerable differences between the federal states.

Since the proportion of nutrition-related lessons in biology/natural sciences cannot be derived from either the curricula or from the subject tables, and for comparability between the federal states, numerous assumptions would have to be made, no evaluation of the subject tables is made here.

Federal-state-specific-subjects

Just as heterogeneous as the school types, are the subjects with a nutritional reference, which are grouped under the umbrella of "federal-state-specific-subjects". These subjects are mainly taught at level 1 secondary schools and only rarely at academic secondary schools. ♦ Table 3 shows the federal-state-specific-subjects for the various school types at level 1 secondary schools and illustrates the diversity of names. Also the content and the binding nature of these subjects varies considerably between the federal states. In BW, RP, SH and ST the subjects are solely electives. In other federal states, such as in NI (*Oberschule*, *Realschule* and *Hauptschule*) or BY (*Realschule*), the corresponding subject is a compulsory subject in some grades, in others it is an elective. Therefore, these subjects are usually not taught continuously. Furthermore, ♦ Table 3 shows the planned lesson hours per week in the various grades for the federal-state-specific-subjects.

Overall, these subjects make up between 1.9% and 5.6% of compulsory lessons at secondary level 1 schools. If elective subjects are taken into account, this range increases to between 2.3% and 7.4%. It should be noted that these subjects often comprise basic economic and technical education in addition to food and nutrition literacy. Therefore, the number of lesson hours per week cannot be equated with nutrition-related instruction. The actual extent of nutrition-related lessons is neither specified in the subject table nor in the curricula.

♦ Table 4 presents the results of the curriculum analysis for the federal-state-specific-subjects exemplary for *Gesamtschulen* and comparable school types (exist in 14 federal states). The table shows, that in SL, for example, nutrition-related content is only optionally anchored in the curriculum. Therefore, food and nutrition literacy is not necessarily part of *Arbeitslehre* (the-

ory of work). Furthermore, in the curriculum for *Arbeitslehre* in HE as well as for *Arbeit, Wirtschaft, Technik* in MV nutrition-related content is rare. For example, only "health promoting nutrition" is mentioned in the context of food and nutrition literacy. There is no concretisation. Overall, it can be stated that in comparison to biology/natural sciences, the curricula for federal-state-specific-subjects cover a much wider range of nutrition-related content. Often, contents on various topic areas are anchored and there is a multi-perspective view of food and nutrition literacy. In addition to natural science, aspects like nutrients and their functions or dietary recommendations, further nutrition related content on social science topics is anchored. Including global social responsibility, like the effects of consumer behaviour (social, ecological, economic) for example. In addition, the social and psychological function of eating and drinking is included in the curricula of some federal states (topic areas 1 and 2).

Federal-state-specific-subjects are offered at academic secondary schools in four federal states (BB, BY, HB, MV). A wide range of nutrition-related topics and contents are found in the compulsory subject *Wirtschaft-Arbeit-Technik* (economics-work-technology) in BB as well as in the elective subject *Sozialpraktische Grundbildung* (basic social education) at economic and social science academic secondary schools in BY.

Ernährungslehre (nutrition science)

Ernährungslehre is the only subject taught at academic secondary schools that has "nutrition" in its title. It can be offered as an elective subject at the secondary level 2 of the academic secondary schools in NW. This is unique for NW. In addition, the subject is natural scientific orientated and claims to be a MINT subject (MINT stands for the subjects mathematics, informatics, natural science and technics) [16]. The curriculum contains content on all seven topic areas, with the focus on "nutrition, body and health", "production, processing and distribution of food" and "food, marketplaces, consumer and consumption".

² The secondary level 1 school types differ between the federal states with regard to their name and definition. ♦ Table 3 illustrates this heterogeneity and shows the school names with the individual degree which can be acquired.



Further subjects with nutritional aspects

Furthermore, topics and contents of food and nutrition literacy are part of the curricula of social science subjects. Depending on the federal state, these nutrition-related topics are either compulsory or elective. Eating and nutrition is primarily considered from a social and global nutritional perspective. A more detailed description of the topic areas and contents can be found in the final report of the study “*Ernährungsbezogene Bildungsarbeit in Kitas und Schulen*” [14].

In the curricula of chemistry, foreign languages and sports, nutrition-related content is occasionally listed. However, food and nutrition literacy is more a marginal issue. In chemistry, for example, it's about the properties of nutrients and their detection reactions, and in foreign languages some content on cultural eating habits is addressed. But, the actual objective is to learn a new language with its vocabulary and grammar.

In summary, it can be said that *Sachunterricht* has been identified as the leading subject for food and nutrition literacy at primary schools. At secondary schools this is replaced or continued by biology/natural sciences and supplemented by federal-state-specific-subjects (elective) at secondary level 1 schools. Although *Sachunterricht* and biology/natural sciences are mostly compulsory subjects, nutrition-related content is rarely taught continuously. Additionally, the focus in these subjects is on the functions of the nutrients and the digestive system as well as on dietary recommendations. Since federal-state-specific-subjects are rarely taught at academic secondary schools, it can be assumed that food and nutrition literacy is not taught continuously and, that the focus is on the scientific perspective. At secondary level 1 schools, federal-state-specific-subjects are offered more widely. But, they are often electives and therefore they always compete with other interesting subjects. For this reason, these subjects are not taught continuously as well.

Discussion

As children and adolescents spend more and more time at school and often have their lunch there, the importance of the family as a place for food and nutrition literacy is decreasing and school is gaining in importance [2]. Due to the glut in the consumer environment of nutrition, the demands on consumption decisions are increasing [2]. At the same time, (young) consumers are insecure by the often contradictory information and myths surrounding food and nutrition. This leads to the need and responsibility of schools for implementing and forming food and nutrition literacy. This educational mandate can also be derived from the recommendations of the KMK on “Health promotion and prevention in schools” [12] and on “Consumer education in schools” [13]. The implementation of these recommendations is the responsibility of the federal states and can in principle be carried out on an interdisciplinary or subject-specific basis. Some federal states formulate framework plans for interdisciplinary teaching of consumer education or health promotion, while in other federal states interdisciplinary or even cross-school educational objectives are defined [14].

The educational federalism leads to a variety of school types in Germany. While there is a primary school and an academic secondary school in each federal state, there are considerable differences with regard to secondary level 1 schools. In addition to the conventional *Hauptschule* and *Realschule*, which are increasingly disappearing from the school system of the federal states, there are nowadays *Gesamtschulen*, *Gemeinschaftsschulen*, *Oberschulen*, *Sekundarschulen* and some more.

In addition to different types and names of schools, there is a wide range of subjects for nutrition education (federal-state-specific-subject). Since the EiS study in some federal states, these subjects have been reformed with regard to their content or the names of the subjects have been changed. In BB and BE for example the federal-state-specific-subject was formerly called *Arbeitslehre*; today it is called *Wirtschaft-Arbeit-Technik*. In BW and SH the subjects were realigning. In BW there used to be a subject *Hauswirtschaft/Textiles Werken* (home economics/textile work) at *Hauptschulen* and *Mensch und Umwelt* (human and environment) at *Realschulen*. Today, all school types offer the subjects *Alltagskultur*, *Ernährung*, *Soziales*. Within the context of REVIS, the subject of *Hauswirtschaft* in NW was further developed into a subject of consumption, nutrition and health by a decision of the state parliament [17]. At the same time the contents of the university teacher-training were adapted accordingly. The current federal state government of NW, consisting of CDU and FDP, introduced the new subject economics at academic secondary schools for the school year 2019/20. From the school year 2020/21 it is to be taught at all types of secondary schools [18]. If the number of lesson hours for the learning area of *Arbeitslehre* remains the same (10 hours for all grades), the introduction of a new subject is always in competition with other subjects, like *Hauswirtschaft* and therefore also with nutrition-related content. In SH the subject *Haushaltslehre* (similar to the subject *Hauswirtschaft*) was further developed in 2009 on the basis of the European curriculum for nutrition education [19] and the REVIS reference framework [11]. As a result, it was replaced by *Verbraucherbildung*. While the subject *Haushaltslehre* focused on what happens in private households (economy, finance, prevention and care), *Verbraucherbildung* focuses on the acting consumer and his/her *Lebenswelt* (life-world). The new subject is based on the competences of a private lifestyle



in the areas of finance and market affairs, media and communication, nutrition and health, consumption and sustainable lifestyle as well as consumer rights and duties. In addition, BB has established the subject *Wirtschaft-Arbeit-Technik* at academic secondary schools, whereas the federal states HB and NI have cancelled the subject *Ernährungslehre* at academic secondary schools.

With regard to the whole of Germany, the present study shows that *Sachunterricht* can be regarded as the leading subject for food and nutrition literacy at primary schools. In no other subject at primary schools food and nutrition literacy is acquired to a comparable extent. The *Gesellschaft für Didaktik des Sachunterrichts* (Society for Didactics of *Sachunterricht*) also anchors nutrition-related topics in the perspective framework of *Sachunterricht* within the topic area of “health and health prophylaxis” [20]. At secondary schools, nutrition topics are mainly anchored in the curricula for biology/natural sciences. Therefore, this subject can be regarded as a leading subject for food and nutrition literacy at all secondary school types. The analyses have shown that in this subject eating and nutrition are viewed particularly from a scientific perspective in the context of individual health. Biology/natural sciences is supplemented by federal-state-specific-(elective)-subjects, especially at secondary level 1 schools. The curricula of these subjects anchor nutrition-related content usually more comprehensively and in a multi-perspective manner. Therefore, they can be regarded as leading subjects for food and nutrition literacy. However, it should be noted that not every federal state has such a subject (TH) or that the focus within the curriculum is not on food and nutrition literacy (HE, MV). Also, the nutrition-related content is only optionally anchored in the curriculum (SL). Furthermore, these subjects are often not taught continuously. Either because they are only compulsory subjects in selected grades (NI, BY) or because they are exclusively elective subjects (BW, RP, SH, ST) and consequently they do not reach all pupils. However, federal-state-specific-subjects are a rarity at academic secondary schools. Depending on the federal state, other subjects such as social sciences, chemistry, foreign languages or sports offer opportunities to integrate nutrition-related educational work into classes to a greater extent or to work across subjects. Nevertheless, it can be assumed that especially at academic secondary schools only partial aspects of food and nutrition literacy are addressed in class.

Whether and how nutrition-related educational activities are actually implemented in the classroom, cannot be determined on the basis of a document analysis. Finally, this is the responsibility of each teacher with his or her teaching methods and depends on their engagement as well as on their existing expertise.

Conclusion

The results show that all federal states define food and nutrition literacy as a mission of schools. But the importance and implementation varies from state to state.

While biology/natural sciences only focuses on single topic-areas of food and nutrition literacy, federal-state-specific-subjects

often anchor nutrition-related content comprehensively and in a multi-perspective manner. However, these are (almost) exclusively taught at secondary level 1 schools and are often offered as elective subjects or in single grades. A continuous and multi-perspective anchoring of food and nutrition literacy in school is therefore not guaranteed. In order to achieve this, corresponding content in existing subjects must be ensured on the one hand, and federal-state-specific-subjects should be firmly anchored at secondary level 1 at all school types (including academic secondary schools) on the other.

Funding

The study was funded by the Federal Ministry of Food and Agriculture (BMEL) on the basis of a resolution of the German *Bundestag*, via the Federal Agency for Agriculture and Food (BLE), grant no. 2816HS006.

Conflict of Interest

The authors declare no conflict of interest.

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References

1. Bartsch S, Büning-Fesel M, Cremer M, et al: *Ernährungsbildung – Standort und Perspektiven. Ernährungs Umschau* 2013; 60(2): M84 – M95.
2. Lührmann P: *Ernährungsbildung ist kulturelle Bildung. In: Rademacher C, Heindl I (eds.): Ernährungsbildung der Zukunft. Wiesbaden: Umschau Zeitschriftenverlag* 2019.
3. Lampert T: *Frühe Weichenstellung. Zur Bedeutung der Kindheit und Jugend für die Gesundheit im späteren Leben. Bundesgesundheitsbl* 2010; 53: 486–97.
4. Martin A, Saunders DH, Shenkin SD, et al.: *Lifestyle intervention for improving school achievement in overweight or obese children and adolescents. Cochrane Database Syst Rev* 2014; 14(3): CD009728.
5. Martin A, Booth JN, Laird Y, et al.: *Physical activity, diet and other behavioural interventions for improving cognition and school achievement in children and adolescents with obesity or overweight. Cochrane Database Syst Rev* 2018; 29(1): CD009728.
6. Black AP, D’Onise K, McDermott R, et al.: *How effective are family-based and institutional nutrition interven-*



- tions in improving children's diet and health? A systematic review. *BMC Public Health* 2017; 17(1): 1–19.
7. Murimi MW, Moyeda-Carabaza AF, Nguyen B, et al.: Factors that contribute to effective nutrition education interventions in children: a systematic review. *Nutr Rev* 2018; 76(8): 553–80.
 8. Heseke H, Schneider L, Beer S: Abschlussbericht des Forschungsprojekts „Ernährung in der Schule“. BM-VEL Forschungsprojekt-Nummer: 423-7620-0/135. Paderborn 2001.
 9. Kultusministerkonferenz (KMK): Bildungsstandards der Kultusministerkonferenz. Erläuterungen zur Konzeption und Entwicklung. München: Luchterhand Verlag 2005.
 10. Müller K, Gartmeier M, Prenzel M: Kompetenzorientierter Unterricht im Kontext nationaler Bildungsstandards. *Bildung und Erziehung* 2013; 66(2): 127–44.
 11. Heseke H, Schlegel-Matthies K, Heindl I, Methfessel B: Schlussbericht des Modellprojektes „Reform der Ernährungs- und Verbraucherbildung in Schulen“. Paderborn 2005. www.evb-online.de/docs/schlussbericht/REVIS-Schlussbericht-mit-Anhang-mit.pdf (last accessed on 16 September 2019).
 12. Kultusministerkonferenz (KMK): Empfehlungen zur Gesundheitsförderung und Prävention in der Schule. www.kmk.org/fileadmin/Dateien/veroeffentlichungen_beschluesse/2012/2012_11_15-Gesundheitsempfehlung.pdf (last accessed on 28 August 2019).
 13. Kultusministerkonferenz (KMK): Verbraucherbildung an Schulen. www.kmk.org/fileadmin/Dateien/veroeffentlichungen_beschluesse/2013/2013_09_12-Verbraucherbildung.pdf (last accessed on 28 August 2019).
 14. Heseke H, Dankers R, Hirsch H: Ernährungsbezogene Bildungsarbeit in Kitas und Schulen (ErnBildung). Schlussbericht für das Bundesministerium für Ernährung und Landwirtschaft (BMEL) (Förderkennzeichen 2816HS006). 2018. https://sug.uni-paderborn.de/fileadmin/sug/ekg/ernaehrungswissenschaft/190717_Abschlussbericht_ErnBildung.pdf (last accessed on 16 September 2019).
 15. Mayring P: Qualitative Sozialforschung. Grundlagen und Techniken. 12. Aufl., Weinheim, Basel: Beltz 2015.
 16. Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen (ed.): Kernlehrplan für die Sekundarstufe II Gymnasium/Gesamtschule in Nordrhein-Westfalen. Ernährungslehre. 2014. www.schulentwicklung.nrw.de/lehrplaene/lehrplan/177/KLP_GOST_Ernaehrungslehre.pdf (last accessed on 28 August 2019).
 17. Landtag Nordrhein-Westfalen (ed.): Beschlussempfehlung und Bericht des Ausschusses für Schule und Weiterbildung. Verbraucherbildung in der Schule nachhaltig und vielfältig gestalten. 2014. www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-5298.pdf (last accessed on 28 August 2019).
 18. Ministerium für Schule und Bildung Nordrhein-Westfalen (ed.): Schulfach Wirtschaft kommt 2020/21. Faktenblatt. 2018. www.schulministerium.nrw.de/docs/bp/Ministerium/Presse/Hintergrundinformationen/Schulfach-Wirtschaft/Faktenblatt_Schulfach_Wirtschaft.pdf (last accessed on 28 August 2019).
 19. Heindl I: Studienbuch Ernährungsbildung. Ein europäisches Konzept zur schulischen Gesundheitsförderung. Bad Heilbrunn: Klinkhardt 2005.
 20. Gesellschaft für Didaktik des Sachunterrichts: Perspektivrahmen Sachunterricht. Vollständig überarbeitete und erweiterte Ausg., Bad Heilbrunn: Verlag Julius Klinkhardt 2013.

DOI: 10.4455/eu.2020.033