



Nutrition education in the context of sustainable development

Recommendations for professionals, education system and policymakers

Silke Bartsch, Margareta Büning-Fesel, Ulrike Johannsen, Julia Kastrup, Petra Lührmann, Anke Oepping and Christel Rademacher; members of the Expert Group “Nutrition Education” of the German Nutrition Society

Abstract

Nutrition is one of the fields of action that can make a significant contribution to the transformation towards a more sustainable future. It is the people who eat and consume who can contribute to achieving the UN Sustainable Development Goals, in addition to the societal framework. Nutrition education is essential to help shape the ongoing transformation process. This leads to recommendations for action for professionals, education system and policy makers.

Citation

Bartsch S, Büning-Fesel M, Johannsen U, Kastrup J, Lührmann P, Oepping A, Rademacher C; Members of the Expert Group “Nutrition Education” of the German Nutrition Society: Nutrition education in the context of sustainable development. Recommendations for professionals, the education system and policymakers. *Ernahrungs Umschau* 2024; 71(1): 2–9.

Open access

This article is available online: DOI: 10.4455/eu.2024.002

Peer Reviewed

Manuscript (original contribution) submitted: July 19, 2022; Revision accepted: November 1, 2023

Prof. Dr. Silke Bartsch¹

Dr. Margareta Büning-Fesel²

Prof. Dr. Ulrike Johannsen³

Prof. Dr. Julia Kastrup⁴

Prof. Dr. Petra M. Lührmann⁵

Dr. Anke Oepping²

Prof. Dr. Christel Rademacher⁶

¹ TU Berlin, Institute of Vocational Education and Work Studies, Marchstraße 23, 10587 Berlin
silke.bartsch@tu-berlin.de

² Bundesanstalt für Landwirtschaft und Ernährung, Bonn

³ Europa-Universität Flensburg, Abteilung Ernährung und Verbraucherbildung, Flensburg

⁴ FH Münster, University of Applied Sciences Münster, School of Vocational Education, Münster

⁵ Pädagogische Hochschule Schwäbisch Gmünd, Abteilung Ernährung, Alltagskultur und Gesundheit, Schwäbisch Gmünd

⁶ Hochschule Niederrhein, FB Oecotrophologie, Mönchengladbach

Introduction

The way we eat and produce food affects not only human health and well-being, but also that of our planet. Food production is one of the most significant causes of biodiversity loss and greenhouse gas emissions and contributes significantly to exceeding the planetary boundaries [1]. If the greenhouse gas emissions resulting from the food system are aggregated across the value chain, they account for around 25% of total emissions in Germany. In order to implement the United Nations' Sustainable Development Goals (SDGs) set out in the Paris Climate Agreement [2], a transformation of the food system is necessary [1, 3]. This is a task for society as a whole, and everyone has a role to play ([4] p. 58). With regard to sustainability-oriented nutrition, various expert discussions are currently being held (e.g. [1, 3, 5]), including in the DGE Expert Group on Nutrition Education¹. This article presents the results of these discussions.

Sustainable development in the area of nutrition

Concepts for a more sustainable diet

The topic of sustainable development in the area of nutrition has been and continues to be addressed nationally and internationally in various concepts.

The interdisciplinary **scientific field of nutritional ecology** was coined by Claus Leitzmann at the Justus Liebig University in Giessen back in the 1980s and is still used in research and teaching today. It takes into account the various dimensions of nutrition (health, environment, economy and society)

¹ www.dge.de/dge/fachgruppen/ernaehrungsbildung/



as well as the network of (inter)effects within the complex system of nutrition [6]. In terms of nutritional practice, nutritional ecology is associated with the concept of Wholesome Nutrition – already in its first version four decades ago. The concept explicitly aims at a high quality of life, especially health, protection of the environment, fair economic relations and social justice [7].

At the international level, the FAO describes a sustainable diet as a dietary pattern that promotes human health and well-being, has a low impact on the environment and causes little environmental pollution, is available, affordable, safe and fair, and is culturally accepted (♦ box "Goals of a sustainable and healthy diet according to FAO and WHO").

In 2019, the Eat-Lancet Commission on Food, Planet, Health published the concept of the **Planetary Health Diet** [1]. Taking into account scientific evidence, an international team developed global recommendations for more sustainable food production and nutrition, which should make it possible to provide the future world population of 10 billion people in 2050 with a healthy diet within the planetary boundaries ([1] p. 447). The Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection (WBAE) at the Federal Ministry of Food and Agriculture has taken up the topic for Germany and recommends in the often quoted WBAE report a reorientation and strengthening of the policy field of nutrition, taking into account the sustainability dimensions of health, social issues, the environment and animal welfare [3].

In a position paper, the German Nutrition Society (DGE) also formulates the goal of its activities as demanding and promoting a more sustainable diet. In doing so, it is guided by the WBAE report statements. These are also being taken into account in the current revision of food-related nutritional recommendations for a wholesome diet (FDBGs) [9]. All of the concepts and reports mentioned above agree on some key recommendations for a more sustainable food system:

Goals of a sustainable and healthy diet according to FAO and WHO

"Sustainable Healthy Diets are dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable. The aims of Sustainable Healthy Diets are to achieve optimal growth and development of all individuals and support functioning and physical, mental, and social wellbeing at all life stages for present and future generations; contribute to preventing all forms of malnutrition (i.e. undernutrition, micronutrient deficiency, overweight and obesity); reduce the risk of diet-related NCDs; and support the preservation of biodiversity and planetary health. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences" [8].

- Diets should be plant-based,
- food waste should be reduced and
- the quality of food production should be improved.

As the average diet of our population is significantly different from these recommendations [10, 11], there is great potential for a more sustainable diet.

The complexity of everyday eating is a challenge for a more sustainable diet

The desired nutritional transformation often fails due to the seemingly banal implementation in everyday life, as eating is a social „total phenomenon“ [12] and challenging in its complexity. By providing energy and nutrients, food is not only a physiological condition for survival, but also serves to satisfy other basic psychological and social needs such as affection, security, recognition, friendship, identity and belonging, self-realization and staging [13, 14].

As the socio-cultural framework conditions of people's everyday (eating) lives differ significantly, it is not just an individual decision as to what to eat.

Personal resources (time, income, education, networks, etc.), values, attitudes and options for action are influenced by the socio-cultural environment. Consumption options, legislation, politics, global circumstances, etc. play a role here [15, 16]. Ultimately, various stakeholders and groups of actors with different interests and scope for action are involved in shaping everyday eating habits. In the case of adolescents, for example, these include their families, educational professionals, daycare centers and schools, their providers or caterers as well as politicians, the media and food companies.

People of all ages are challenged every day to shape their everyday eating habits – today and in the future – within this complex social framework. The numerous everyday questions of what, how, when, why and with whom to eat are therefore accompanied by extensive negotiation processes [14, 17].

Nutrition transformation and nutrition education

Dealing with complex everyday situations, as well as taking responsibility, requires individual skills that should be ensured through general education. The globally demanded and socially intended nutrition transformation relies on competence-oriented education – including nutrition education [18, 19]. For this reason,



the following section will first outline what forward-looking nutrition education can contribute to a more sustainable diet at an individual and societal level and defines its limits.

Education: Empowerment instead of paternalism

Education is a multi-layered term that is defined in different ways. The central characteristic of education can be described as the reflected relationship to oneself, to others and to the world. Education is therefore more than just retrievable (specialist) knowledge and includes the ability to reflect and act in a competence-oriented manner. Education is an open process that begins at birth, continues throughout life and is integrated into the socio-cultural environment and its interactions [20].

Learning environments in and outside of school

The places, forms, occasions and offers of education are correspondingly diverse and varied. **A basic distinction is made between formal education, non-formal education and informal learning.**

- **Formal education** processes are institutionally anchored, e.g. in daycare centers, schools or universities. They take place in a planned manner on a curricular basis (e.g. teaching or educational plans) and can lead to recognized qualifications.
- **Non-formal education** is planned learning that is individually requested (e.g. further and advanced training or hobby courses in leisure facilities with or without certificates, etc.). Unlike formal education, it is not structurally anchored, but is generally didactically organized.
- On the other hand, **informal learning** refers to non-organized learning in everyday life contexts, which often takes place more or less by chance in the family, educational institutions or via the Internet [21].

Nutrition education

People are the center of attention in modern nutrition education (♦ box "Nutrition education as understood by the DGE specialist group"). In this context, **nutrition education** is far more than just concept-based learning, which often conveys knowledge in conjunction with rules of conduct and has proven to be unsuccessful in retrospect. Rather, it is about empowerment, in which competencies (knowledge, skills and abilities) for health-promoting and more sustainable nutrition in connection with consumption are promoted [20, 22–26].

The first place for nutrition education is usually the family household. With increasing age, other people, places and learning environments are added: friends, acquaintances and colleagues, daycare centers, schools, clubs and workplaces, communal catering and restaurants, shopping facilities such as supermarkets as well as media such as magazines, books, films and the Internet. These places – often referred to as socialization instances – have different significance and influence depending on age. For adolescents in particular, the internet has developed into an influential social space in recent years due to the newly formed social media structure with its innovative, digital networking options and has

therefore also gained in importance as a place for nutrition education [20].

Nutrition education: key to a more sustainable diet

The transformation to sustainability is a global task for the future [18, 19] and is seen as an education-based, participatory process for society as a whole [18, 27]. Education is seen as a key to success [1, 4, 19]. Consequently, a corresponding educational mandate is derived. Following the conclusion of the UN Decade of Education for Sustainable Development (ESD; 2005–2014) and the subsequent Global Action Plan (GAP; 2015–2019), there are extensive findings on the need for action, which relate both to individually responsible eating behavior and to the conditions of everyday eating for which society as a whole is responsible ([3] p. 651; [28–31], [32] p. 9ff.).

Nutrition education as understood by the DGE Expert Group

Education is understood as people's engagement with themselves and their cultural, material and social environment [23].

Accordingly, nutrition education is understood as enabling people to "develop and shape their own diet in a politically responsible, socially responsible and democratically participatory way under complex social conditions. It is always also food culture education, includes aesthetic-cultural and culinary educational elements and contributes to the development of the culture of living together." ([20] M85; [22, 23]). The target dimensions are a health-promoting and more sustainable approach to nutrition, combined with corresponding consumer skills.

Making the individual everyday eating more sustainable

In the didactic discussion about the German initiative REVIS (reform of nutrition and consumer education in schools), a didactic claim to general education is theoretically derived and postulated with formulated educational goals [22, 26; 28]. Accordingly, nutrition ed-



ucation at the individual level can contribute to this, among other things,

- **understand everyday nutritional phenomena** – also in the context of sustainability – and clarify everyday questions about nutrition **on the basis of cultural and scientific knowledge** and
- enable people to **shape their everyday eating habits** in a sustainability-oriented way now and in the future.

Ultimately, it is about thinking in networks, a process- and problem-oriented approach, multi-perspective considerations and the ability to reflect as well as an awareness of lifelong learning, for example to think about the conditions of eating behavior and to be able to (discover) goals for one's own eating behavior and implement them in a self-determined manner. This is the only way to meet the challenge of preparing ourselves for a world whose future is unknown.

This **competence-oriented approach** can create the conditions for people to be aware of the connections between nutrition and sustainability and to (learn about) more sustainable alternatives in their everyday eating habits. Based on scientifically proven findings, the aim is for people to also be able to assess the benefits of a more sustainable diet for themselves and others in their social environment and in global society so that they can make informed decisions about what to eat in their everyday lives. For example, knowledge of food labels (e.g. the European BIO organic logo) can be used in a skills-oriented way to promote a more sustainable diet.

Helping to shape the social transformation process

Nutrition education as a general education can contribute to a more sustainable nutrition (environment) at a societal level because, among other things, people are empowered to

- understand **social discourse** on nutrition-related topics (e.g. the regulation of children's food marketing),
- participate in **social negotiation processes** on the basis of appropriate education and thus be able **to actively and competently shape** the nutritional environment, e.g. in the family and communal catering, in associations or in the community.

Ultimately, transformation processes in democracies are primarily dependent on the participation of their educated citizens, who can make informed decisions on the basis of a broad information base [33]. Particularly in the area of nutrition, the challenge is to be able to distinguish between the flood of interest-related "half-truths" and to recognize methods of influence and manipulation [34].

Limits of nutrition education and political responsibility

Everyday actions concerning nutrition are socioculturally embedded. In individualized consumer societies, nutrition has a high degree of distinction as a lifestyle issue. Eating decisions are always made under the conditions of the nutritional environment. The individual assumption of responsibility and a self-determined lifestyle often overwhelm people in complex consumer societies. The following factors, among others, contribute to this:

- **Variety of offerings:** There is a dynamically changing range of food and eating options, which individual consumers are often no longer able to keep track of [16].
- **Information overload:** People are inundated with information on the topics of nutrition, health and sustainable development: domain-specific individual scientific findings as well as sometimes unscientific, false (fake news) or interest-driven information and advice, which is often disseminated via social media channels, etc.
- **High expectations:** Socially inflated expectations in relation to individual health, planetary pressures, values, social crises, etc.
- **Distorted risk perception:** People are confronted with abstract and diverse, often distorted risks in their eating decisions on a daily basis, both in terms of the private provision of basic needs associated with their lifestyle and with regard to the planetary boundaries. An overall assessment is often hardly possible [24, 25].

This structural overburdening of people in their individual everyday actions cannot be solved by educational approaches alone. Even with the best will in the world, individuals can only take limited responsibility for the ecological, social and economic consequences of their consumption. Political solutions are needed here, which in turn are shaped by people who are sufficiently educated to be able to assume their responsibility.

Strategy: Nutritional skills for a more sustainable diet

A socially desirable, more sustainable diet leads to greater complexity in everyday life because more and more factors need to be considered in their interactions between individual and social interests. Forward-looking nutrition education is therefore particularly important for the success of the transformation process. This relates both to individual responsibility in shaping everyday eating habits and to helping to shape more sustainable eating environments, e.g. in the respective communal or company environment.



Mandatory anchoring of nutrition education in the canon of general education

Keeping in mind the lack of or inconsistent structures and requirements, formal education does not currently provide the necessary transformation-relevant education in the field of nutrition for any age group.

Against this backdrop, the Expert Group on Nutrition Education is committed to seeking a resolution at the level of the Standing Conference of the Ministers of Education and Cultural Affairs (KMK) to include nutrition education in the canon of general education on a mandatory basis. Nutrition education should be comprehensively and obligatorily anchored within the existing state-specific curricula for all pupils. Therefore, "new" subjects need not necessarily be implemented. It is recommended that existing (compulsory elective) subjects or groups of subjects such as "Alltagskultur, Ernährung, Soziales" (Everyday Culture, Nutrition, Social Issues) in Baden-Württemberg, "Arbeitslehre" (vocational education) in Berlin and Brandenburg or "Verbraucherbildung" (Consumer Education) in Schleswig-Holstein be expanded to include nutrition education as a compulsory subject in all school types and grades, generally with elaborated curricula [25, 27, 35].

Integration of nutrition education into the training of all educational professionals

Only professionally trained teachers should be responsible for nutrition-related teaching. This is the only way to ensure that nutrition education is based on current methodological and didactic concepts [22, 26, 35]. In addition, the Expert Group on Nutrition Education recommends integrating nutrition education into the training of all educational professionals and including it as a mandatory part of the curriculum in teacher training courses and in the training regulations for educators, etc., in order to raise awareness of the potential of nutrition for sustainable development [36].

Strategy: Ensuring science-based nutrition education

As nutrition education cannot currently always be ensured through formal education in schools and other educational institutions [29, 37, 38], various non-formal education programs have been established in the short term or as a supplement to this. Examples of this include offers from external partners such as health insurance companies or municipalities to promote social space-oriented education and actors in civil society engagement such as urban gardening. Daycare centers and schools in particular are currently confronted with a large number of such offers, which can certainly make a valuable contribution to the lifeworld-related discussion of nutrition and sustainability and support educational professionals. However, the prerequisite is that the offers are selected in a quality-oriented manner and, in the case of schools, linked to formal education.

Development of a quality assurance system for nutrition education

As voluntary work or other activities with educational content on nutrition and sustainability are often independent of a corresponding professional qualification, professional action based on nutritional and educational science is left to chance. Given the complexity and dynamic developments in the field of more sustainable nutrition, it is a challenge to build up science-based knowledge and to deal with different opinions and lay theories in a differentiated manner. In order to place activities in all areas of education on a scientifically sound basis, quality must be assured at various levels. Thus, professional and responsible action with minimum standards for the quality of nutrition education is an important starting point in all areas at all levels. The DGE Expert Group on Nutrition Education therefore recommends developing, introducing and subsequently evaluating a science-based quality assurance system in all areas of education – including non-formal education [18, 31].

Strengthening independent communication centers for nutrition issues

A central challenge in the field of nutrition education is dealing with the flood of (un)reliable information on more sustainable nutrition. Against this background, it is recommended that appropriate measures be taken to promote independent institutions, in particular the Federal Center for Nutrition (BZfE) and the German Nutrition Society (DGE), which provide scientifically sound information and offer further education and training on an independent, scientific basis.

Strategy: Food policy measures to create more sustainable food environments

Even if nutrition education is a central basis for the transformation to sustainability [18, 19], it cannot take responsibility for shaping the transformation process. Politics – supported by nutrition-educated citizens – is also in demand here. Nutrition policy measures, such as incentives or obligations, are of central importance. They are intended to help shape food environments so that they promote more sustainable eating decisions [3].

In this context, for example, the binding implementation of DGE quality standards in



daycare and schools plays a role [39, 40]. The daycare and school environment makes a contribution to informal learning in the field of more sustainable nutrition that should not be underestimated, especially when adolescents spend a lot of time there. In this way, school meals can be interlinked with formal nutrition education and thus mutually support sustainable nutrition.

Conclusion

For the success of the transformation process towards a more sustainable diet, forward-looking nutrition education is particularly important. On the one hand, it can help people make their everyday eating routine more sustainable. On the other hand, it enables competent participation in political discourses and negotiation processes and the assumption of responsibility with regard to the necessary transformation processes, e.g. B. in designing more sustainable food environments. In order to be able to utilize this potential, the DGE nutrition education specialist group has formulated five recommendations for action (♦ Box “Recommendations for action for nutrition education in the context of sustainable development”).

Information on conflicts of interest and the use of AI

The authors are members of the Nutrition Education Specialist Group of the German Nutrition Society. V. JK is the first chairwoman of the Federal Working Group for Vocational Training in the field of nutrition and home economics – BAG E&H for short. At the time the manuscript was written, MBF was head of the Federal Center for Nutrition (BZfE). The authors declare that there are no other conflicts of interest. The authors declare that no AI applications were used in the creation of the original manuscript. The English translation was created with AI support.

Recommendations for action for nutrition education in the context of sustainable development

1. Mandatory anchoring of nutrition education in the canon of general education
2. Integration of nutrition education into the training of all educational professionals
3. Development of a quality assurance system for nutrition education
4. Strengthening independent communication centers for nutrition issues
5. Nutrition policy measures to create more sustainable nutrition environments



References

1. Willett W, Rockström J, Loken B, et al.: Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *Lancet* 2019; 393: 447–92.
2. United Nation (UN) Historic Paris Agreement on Climate Change 195 Nations Set Path to Keep Temperature Rise Well Below 2 Degrees Celsius. <http://newsroom.unfccc.int/unfccc-newsroom/finale-cop21/> (last accessed on 26 May 2022).
3. WBAE – Wissenschaftlicher Beirat für Agrarpolitik, Ernährung und gesundheitlichen Verbraucherschutz beim BMEL: Politik für eine nachhaltigere Ernährung: Eine integrierte Ernährungspolitik entwickeln und faire Ernährungsumgebungen gestalten. Gutachten, Berlin 2020. www.bmel.de/SharedDocs/Downloads/DE/_Ministerium/Beiraete/agrarpolitik/wbae-gutachten-nachhaltige-ernaehrung.html (last accessed on 6 November 2023).
4. Die Bundesregierung (eds.): Deutsche Nachhaltigkeitsstrategie. Weiterentwicklung 2021. Berlin. www.bundesregierung.de/resource/blob/975274/1873516/9d-73d857a3f7f0f8df5ac1b4c349fa07/2021-03-10-dns-2021-finale-langfassung-barrierefrei-data.pdf?download=1 (last accessed on 6 November 2023).
5. Breidenassel C, Schäfer AC, Micka M, Richter M, Linseisen J, Watzl B für die Deutsche Gesellschaft für Ernährung e. V.: Einordnung der Planetary Health Diet anhand einer Gegenüberstellung mit den lebensmittelbezogenen Ernährungsempfehlungen der DGE. Eine Stellungnahme der Deutschen Gesellschaft für Ernährung e. V. *Ernährungs Umschau* 2022; 69(5): 56–72
6. Hoffmann I, Leitzmann C, Schneider K: Ernährungsökologie. München: Oekom 2011.
7. von Koerber K, Männle T, Leitzmann C: Vollwert-Ernährung. Stuttgart: KH Haug 2012.
8. FAO, WHO: Sustainable healthy diets – Guiding principles. Rome 2019
9. Renner B, Arens-Azevêdo U, Watzl B, Richter M, Virmani K, Linseisen J for the German Nutrition Society (DGE): DGE position statement on a more sustainable diet. *Ernährungs Umschau* 2021; 68(7): 144–54.
10. Krems C, Walter C, Heuer T, et al.: Lebensmittelverzehr und Nährstoffzufuhr Ergebnisse der Nationalen Verzehrsstudie II. In: Deutsche Gesellschaft für Ernährung e. V. (DGE) (eds.): 12. Ernährungsbericht 2012. Bonn 2012; 40–85.
11. Schmidt T, Schneider F, Claupein E: Lebensmittelabfälle in privaten Haushalten in Deutschland – Analyse der Ergebnisse einer repräsentativen Erhebung 2016/2017 von GfK SE, Thünen Working Paper, No. 92. Braunschweig: Thünen Institut 2018.
12. Mauss M: Die Gabe. Frankfurt/M.: Suhrkamp 1968.
13. Methfessel B, Oliva Guzmán R, Lührmann P: Bedürfnisbefriedigung durch Essen und Trinken. *HiBiFo* 2020; 1: 105–36.
14. Oliva Guzmán RA, Lührmann P, Schneider K, Häußler A: Essen und Trinken in der mediatisierten und digital gestaltbaren Welt: Herausforderungen für die Ernährungs- und Verbraucherbildung im Sachunterricht. In: Irion T, Peschel M, Schmeink D (eds.) *Grundschule und Digitalität*. Frankfurt am Main: Grundschulverband 2022, 130–42.
15. Barlösius E: *Soziologie des Essens*. 3. Aufl., Weinheim, München: Juventa 2016.
16. Bartsch S, Methfessel B: Ernährungskompetenz in einer globalisierten (Ess-)Welt. *EiF* 2016; 16(3–4): 68–73.
17. Rückert-John J: Der Wandel des Ernährungsalltags als Herausforderung für die Ernährungs- und Verbraucherkommunikation. *HiBiFo* 2015; 4(3):39–50.
18. WBGU – Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (2023): *Gesund leben auf einer gesunden Erde*. Berlin: WBGU. www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/hauptgutachten/hg2023/pdf/wbgu_hg2023.pdf (last accessed on 6 November 2023).
19. WBGU – Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (2011): *Welt im Wandel Gesellschaftsvertrag für eine Große Transformation*. Berlin: WBGU. www.wbgu.de/fileadmin/user_upload/wbgu/publikationen/hauptgutachten/hg2011/pdf/wbgu_jg2011.pdf (last accessed on 6 November 2023).
20. Bartsch S, Büning-Fesel M, Cremer M, et al.: Ernährungs-bildung – Standort und Perspektiven. *Ernährungs Umschau* 2013; 60(2): 84–95.
21. Autoren:innengruppe Bildungsberichterstattung. *Bildung in Deutschland 2022*. Bielefeld: wbv 2022. www.bildungsbericht.de/de/bildungsberichte-seit-2006/bildungsbericht-2022/pdf-dateien-2022/bildungsbericht-2022.pdf (last accessed on 6 November 2023).
22. Hesecker H, Heindl I, Methfessel B, et al.: Reform der Ernährungs- und Verbraucherbildung in Schulen 2003–2005. Schlussbericht für das Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft. <http://www.evb-online.de/docs/schlussbericht/REVIS-Schlussbericht-mit-Anhang-mit.pdf> (last accessed on 26 May 2022).
23. D-A-CH-Arbeitsgruppe zur Ernährungs- und Verbraucher-bildung. *Ernährungsbildung*. <http://www.evb-online.de/docs/GlossarISB.pdf> (last accessed on on 26 May 2022).
24. Heindl I: *Studienbuch Ernährungsbildung – Ein europäisches Konzept zur schulischen Gesundheitsförderung*. Bad Heilbrunn: Klinkhardt 2003.
25. Fischer D: Nachhaltige Ernährungsbildung. Konturen eines Bildungskonzeptes für die Schule. In: Kolffhaus S A, Herrmann M-E (eds.): *Ernährungsbildung - Grundlagen und Praxismodelle*. Schriftenreihe Ökotrophologie der Fachhochschule Osnabrück. Aktuelle Themen der Ökotrophologie. Band 3. Aachen: Shaker 2008, 23–76.
26. Schlegel-Matthies K, Bartsch S, Brandl W, Methfessel B: *Konsum – Ernährung – Gesundheit. Didaktische Grundlagen der Ernährungs- und Verbraucherbildung*. Opladen, Toronto: Verlag Barbara Budrich 2022.
27. OECD – Organisation for Economic Cooperation and Development: *Definition und Auswahl von Schlüsselkompetenzen*. Zusammenfassung. 2005. <http://www.oecd.org/dataoecd/36/56/35693281.pdf> (last accessed on 21 June 2022).
28. Bartsch S: *Ernährungsbildung heute: Herausforderungen und Chancen*. In: Dr. Rainer Wild-Stiftung (eds.). 25. *Heidelberger Ernährungsforum 2021*. Heidelberg: Verlag DRWS 2023, 118–59.
29. Maschkowski G: *Vom Verbraucher zum Change Agent: Impulse der Transition-Town-Bewegung für eine große Transformation aus salutogenetischer Perspektive*. In: Bala C, Schuldzinski W (eds.): *Der verantwortungsvolle Verbraucher*. Düsseldorf: Verbraucherzentrale 2015, 19–39.
30. Reisch LA, Fischer C, Griefshammer R, et al.: *Sustainable Consumption Now! The German National Programme for Sustainable Consumption on the Test Bed*. <https://ssrn.com/abstract=3679773> (last accessed on 21 June 2022).
31. KMK, DIJK: *Empfehlung der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland (KMK) und der Deutschen UNESCO-Kommission (DIJK) vom 15.06.2007 zur „Bildung für nachhaltige Entwicklung in der Schule“*. <https://nachhaltigkeit.bildung-pp>



- de/fileadmin/user_upload/nachhaltigkeit.bildung-rp.de/Downloads/070615_KMK-DUK-Empfehlung_BNE.pdf (last accessed on 21 June 2022).
32. SRU – Sachverständigenrat für Umweltfragen: *Politik in der Pflicht: Umweltfreundliches Verhalten erleichtern. Kurzfassung.* Berlin: Mai 2023. https://www.umweltrat.de/SharedDocs/Downloads/DE/02_Sondergutachten/2020_2024/2023_05_SG_Umweltfreundliches_Verhalten_KF.pdf?__blob=publicationFile&v=2 (last accessed on 30. October 2023).
33. Engartner T, Hedtke R, Zurstarssen B: *Sozialwissenschaftliche Bildung*, 1. Aufl., Paderborn: Schöningh UTB 2021.
34. Methfessel B: „Artgerecht“ und mit „gesundem Menschenverstand“ – zu typischen Mustern der Manipulation von Meinungen und Verhalten im Umgang mit Ernährungskonzepten. In: Hesecker H (eds.). *Neue Aspekte der Ernährungsbildung.* Wiesbaden: Umschau Zeitschriftenverlag 2005, 44–52.
35. Heindl I, Rademacher C (eds.) *Ernährungsbildung der Zukunft: Maßnahmen und Wirksamkeit der Professionalisierung und Wirksamkeit der Professionalisierung.* Wiesbaden: Umschau Zeitschriftenverlag 2019.
36. Bartsch S, Methfessel B: „Der subjektive Faktor“. *Bildung in einem lebensweltorientierten Fach.* HiBifo 2014; 3(3), 3–32.
37. Singer-Brodowski M: *Transformatives Lernen als neue Theorie-Perspektive in der BNE.* In: *Umweltdachverband GmbH (ed.): Jahrbuch Bildung für nachhaltige Entwicklung – Im Wandel.* Wien: Forum Umweltbildung im Umweltdachverband 2016, 130–39.
38. *Global Education Monitoring Report Team: EFA global monitoring report. 2015. Education for All 2000–2015: achievements and challenges.* 2015.
39. *Deutsche Gesellschaft für Ernährung e. V. (ed.): DGE-Qualitätsstandard für die Verpflegung in Kitas,* 6. Aufl., Bonn 2020.
40. *Deutsche Gesellschaft für Ernährung e. V. (ed.): DGE-Qualitätsstandard für die Verpflegung in Schulen,* 6. Aufl., Bonn 2020.