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Considering biodiversity in food purchases: consumer wishes and communication strategies

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Research on sustainable consumer behavior when purchasing food so far has mainly focused on organic products as well as on local and climate-friendly options and on minimizing packaging. Biodiversity protection—an increasingly urgent concern due to its global decline—has received little attention in this context. There is hardly any research available on the knowledge and attitudes consumers have regarding the protection of biodiversity, to what extent they are prepared to adapt their purchasing behavior accordingly and how companies can successfully communicate biodiversity protection measures to consumers. This article addresses this gap. Drawing on findings from two representative consumer surveys conducted in Germany in 2022 ($n = 1,028$) and 2023 ($n = 1,500$), it highlights the importance consumers place on food produced with biodiversity-friendly practices. The article identifies consumer groups who are particularly interested in this issue and discusses how information on product packaging can raise awareness of biodiversity protection. The results of a conjoint analysis suggest that strategic communication on product packaging—such as indicating a positive biodiversity value or using an appealing slogan—can enhance consumers' willingness to purchase and pay higher prices for biodiversity-friendly food products.

KEYWORDS

biodiversity, biological diversity, sustainable consumption, food consumption, purchasing behavior, communication

1 Introduction

Consumers are increasingly expected to consider ecological and social aspects when shopping to contribute to reducing environmental damage. When purchasing food, these aspects include organic and regional production, fair trade, animal welfare and climate friendliness. The aspect of biodiversity-friendliness is a new requirement in this context. The term biodiversity or biological diversity is used to describe the diversity of ecosystems, the diversity of animal and plant species and the diversity within these species ([Convention on Biological Diversity, 2005](#)). Biodiversity is of considerable importance as the basis of human life, particularly regarding ensuring long-term food security ([Ulian et al., 2020](#)) and the supply of other resources, as well as climate regulation. Biodiversity is declining worldwide due to the intensification of agriculture, the reduction of natural habitats, climate change and environmental pollution. According to scientific estimates, 25% of species worldwide are seriously threatened with extinction ([IPBES, 2019](#)).

As the agricultural production of food is a main driver of the decline in biodiversity ([Jaureguiberry et al., 2022](#)), it is important that greater consideration is given to biodiversity protection in the production and consumption of food. Especially food producers whose existence is particularly dependent on ecosystem services (e.g., the pollination of crops by insects), are increasingly committed to protecting biodiversity. In recent years, associations

have been founded in Germany, such as “Biodiversity in Good Company”¹ and “Food for Biodiversity,”² which pursue the goal of improving the biodiversity performance of companies. Retailers, associations, scientific institutions and environmental organizations are also part of these initiatives. Discussions with representatives of these initiatives revealed that there is often uncertainty about how commitment for biodiversity protection can be communicated effectively to consumers (Eberle and Timmer, 2024). Due to the complexity of the topic, it is not easy to communicate it in an understandable way. On the one hand, biodiversity is multi-layered and encompasses more than just species diversity, which is what it is usually reduced to in the general understanding of laypeople (Eylering et al., 2023; Lindner et al., 2021). In addition, the understanding of biodiversity loss is complicated by the fact that biodiversity is context-specific and protective measures can result in different effects in different regions. It is therefore challenging to design information on biodiversity in a way that it can be grasped easily by consumers without oversimplifying it (Stampa and Zander, 2022). Another challenge is that communication messages used in EU countries must comply with the standards for environmental claims for products (EU Green Claims Directive) to prevent the risk of greenwashing (Marcatajo, 2023). Despite these challenges, biodiversity-friendly products can also represent a competitive advantage for companies by attracting consumers who value sustainability and contributing to a positive image (White et al., 2023; Boiral et al., 2018).

The relevance of food with sustainability qualities is increasing in Europe, especially for organic food (FiBL and IFOAM, 2025), which is produced according to guidelines that also promote biodiversity such as avoiding pesticides (Seufert and Ramankutty, 2017). Consumer awareness of biodiversity has increased in recent years (UEBT Biodiversity Barometer, 2024; Valdelomar-Muñoz and Murgado-Armenteros, 2024; Murgado-Armenteros et al., 2020), even when the term biodiversity is not always completely understood (BMUV and UBA, 2023). However, little is known about consumer attitudes toward the protection of biodiversity and the impact this has on their food purchasing behavior. Studies with German consumers indicate that although most consumers consider the conservation of biodiversity to be important, the issue still plays a subordinate role when buying food (Stampa and Zander, 2022; Hörisch et al., 2024). Danner and Thøgersen (2022) also showed in a text mining study based on comments from users of a large German online news portal that biodiversity is significantly underrepresented in consumer awareness compared to other sustainability aspects such as animal welfare.

There have been individual campaigns in the food retail sector in recent years, particularly for the protection of insects. There are also initial approaches to introduce labels on food packaging from initiatives such as “Landwirtschaft für Artenvielfalt” (“Agriculture for biodiversity”), “PRO PLANET” and “Für mehr Artenvielfalt” (“For greater biodiversity”). However, as there do not exist any studies on this matter, it is not possible to discern whether these initiatives have affected consumer behavior. This leads to the question how consumers

can be made aware of the issue and how they can be supported in their decision to buy biodiversity-friendly food.

This article uses the results of two representative online surveys conducted in Germany in 2022 and 2023 as part of the transdisciplinary research project BioVal (Biodiversity Valuing and Valuation). The article answers the following questions:

Which knowledge (about the term biodiversity, its decline and the impact of food production on biodiversity) and attitudes do German consumers have toward the protection of biodiversity? Are they willing to contribute to the protection of biodiversity with their food purchases and what can be said about their willingness to pay?

Which communication channels and messages are suitable for communicating corporate measures to protect biodiversity?

2 Literature review

The following sections give a condensed overview of the aspects that have been studied related to consumer attitudes and behavior toward considering biodiversity in their purchasing decisions and efforts of communicating this issue.

2.1 Perception of species extinction

The representative German population surveys “Naturbewusstsein” (“Nature Awareness”; BMUV and BfN, 2023) and “Umweltbewusstsein in Deutschland” (“Environmental Awareness in Germany”; BMUV and UBA, 2023), indicate that there is a high level of awareness of the importance of biodiversity and the problems involved in protecting it. The majority of respondents (88%) perceive the extinction of species in the animal and plant world as a threatening environmental problem, and almost the same proportion (91%) consider the prevention of species extinction to be an important area of environmental protection (BMUV and UBA, 2023). The surveys show that the term biological diversity or biodiversity is becoming increasingly well known. Around 90% have heard the term before. People with a high level of education and an above-average net household income are particularly well informed, are in favor of purchasing products produced in an environmentally friendly manner and are also very willing to actively contribute to the conservation of biodiversity themselves (BMUV and BfN, 2023). Similar results regarding perceptions of species extinction were also found for other European countries (Eurobarometer, 2019). Although there are certain differences between countries, the trends resemble each other.

2.2 Willingness to pay for biodiversity-friendly food

In international studies, in which biodiversity conservation is addressed in connection with consumer behavior, biodiversity is often one characteristic among several sustainability aspects (such as local, organic, eco-conscious packaging) but is not considered in a differentiated way (e.g., Smith et al., 2021; Markova-Nenova and Wätzold, 2018). Studies that explicitly examine the purchasing behavior of consumers with regard to biodiversity can be divided into studies on the conservation of agrobiodiversity, in which mainly

1 <https://www.business-and-biodiversity.de>

2 <https://food-biodiversity.de>

attitudes and purchasing intentions toward old fruit and vegetable varieties are analyzed (e.g., Kliem and Sagebiel, 2023; Posadinu et al., 2021) and studies that examine the willingness to buy food that has been produced in a biodiversity-friendly way (e.g., Grunert et al., 2024). In most cases, these studies look at the willingness to buy important staple foods (as, e.g., grain, vegetables, meat) or typical local products, based on one specific product. So far, consumer behavior has most frequently been examined related to biodiversity-friendly produced rice. The studies found a willingness to pay up to 30% more (e.g., Tokuoka et al., 2024; Herring et al., 2022; Mameno et al., 2021; Mameno and Kubo, 2023). Tokuoka et al. (2024) report that in particular women and people with children in the household prefer biodiversity-friendly rice. This example also showed that an interest in nature conservation and the prior provision of information on biodiversity have a positive influence on willingness to pay. French and Italian studies consistently found that consumers are willing to pay higher prices for wine and sparkling wine with a biodiversity label (Lecomte, 2021; Ruggeri et al., 2020; Mazzocchi et al., 2019). However, the results of Ruggeri et al. (2020) and Lecomte (2021) also show that the willingness to pay more for biodiversity-friendly produced wine is lower than for certified organic wine. Gatti et al. (2022) came to a similar conclusion regarding the willingness to pay for biodiversity-friendly produced coffee. The results indicate that biodiversity protection is not yet perceived as an important sustainability feature by many consumers. Consumers may also assume that biodiversity protection is already sufficiently guaranteed when it comes to organically produced food. Gatti et al. (2022) found that people with a high income and knowledge of the “Bird Friendly” biodiversity label showed a particular preference for biodiversity-friendly produced coffee. The importance of consumer knowledge and attitudes is also emphasized in a study by Larochelle and Chishimba (2022), who looked at the willingness to pay for beef from bee-friendly pasture farming. It was shown that price premiums are particularly accepted by people who are informed about the decline of insects and who are aware that they themselves can contribute to the restoration of insect populations.

The study results indicate a general willingness to pay more for food produced in a biodiversity-friendly manner. Consumer knowledge about biodiversity and trust in the protective measures are key influencing factors.

2.3 Product-related communication

Labels on product packaging, such as environmental labels, slogans, information texts or images, can provide guidance to consumers and help them make sustainable purchasing decisions. Several studies have investigated how labels for environmentally friendly products are perceived and how they influence purchasing behavior.

The impact of eco-labels and environmental labels (e.g., labels for organic products, Rainforest Alliance, Carbon Footprint) was examined most frequently. Trustworthiness, knowledge of the environmental issue being communicated, environmental awareness and the perceived personal benefit of the labels were identified as important factors influencing the perception of labels. According to the study results, the perceived relevance and practical usefulness of labels depend primarily on their design, comprehensibility and the

information they convey (Taufique et al., 2019; Grunert et al., 2014). Eldesouky et al. (2020) found that the certification of sustainability labels plays an important role and that many consumers lack knowledge about the meaning of labels. It also was investigated how the combination of labels (e.g., organic and regional) on a product affects consumer perception. The results show that combining several labels can lead to confusion and misperceptions (Chen et al., 2023; Jürkenbeck et al., 2024).

In a study on a biodiversity label which characterized various environmental measures in beef production, Stampa and Zander (2022) found a general appreciation for biodiversity conservation in focus groups with consumers. However, they also showed that there is little knowledge about the importance of biodiversity and uncertainty about how to evaluate conservation measures.

Several studies state that only certain groups of people read texts on food packaging. The results of Tian et al. (2022) and Moreira et al. (2019) show that consumers with prior knowledge, a need for information (e.g., people with dietary restrictions, with a healthy lifestyle, athletes) and a high educational level use the relevant information.

Maász et al. (2024) identified requirements for communicating sustainability measures in the beverage industry based on focus groups with environmentally conscious consumers. The study shows that there is a desire for a stronger link between products and online communication channels. It was recommended that food manufacturers place QR codes on products or product packaging that link to the manufacturers' websites. The websites should provide important information and short informational videos about the products and their sustainability characteristics. In addition, the websites should also contain more in-depth information for consumers who want to learn more about the sustainability aspects of products.

The effect of images on food packaging has also been investigated. For example, Tokuoka et al. (2024) found that landscape photos of rice fields are preferred over images of specific animal and plant species for packaging rice produced in a biodiversity-friendly way.

Summing up, many studies have shown that consumers still know little about biodiversity and biodiversity conservation and that there is uncertainty in this area. This must be considered when selecting appropriate communication tools and content.

Previous studies have only examined one communication feature at a time, such as environmental labels or images of landscapes and flagship species. In contrast, the present study tested several different communication options (slogans, biodiversity value, informational texts, information on implemented conservation measures, standards, cooperation and certification, visual representation and references to further information; see Table 2) with different specifications. This makes it possible to identify not only preferred characteristics of individual communication features but also preferred forms of presentation.

3 Materials and methods

The results presented below are based on two consumer surveys conducted as part of the BioVal research project. Both surveys are closely interlinked in terms of content. The second survey builds on the first one by asking for consumers' knowledge and attitudes toward

the protection of biodiversity in detail and then focusing on their willingness to buy food produced in a biodiversity-friendly way. People between the ages of 18 and 75 participated in the surveys. Both samples are representative of the internet-using population in Germany in terms of gender, age, education and federal state of residence of the respondents. Table 1 gives an overview of the socio-economic background of the respondents of the two surveys.

3.1 Consumer survey on information, attitudes and willingness to act

The first online survey was carried out in June 2022 and focused on consumers' knowledge and attitudes toward biodiversity protection and their willingness to act when buying food. Secondary data analyses of relevant studies (Environmental Awareness in Germany 2022; BMUV and BfN, 2023; UEBT Biodiversity Barometer, 2020; Eurobarometer, 2019) served as the basis for the development of the questionnaire. Five-point Likert scales were used to assess respondents' attitudes and perceptions regarding biodiversity. A few questions were

taken from renowned studies (BMUV and BfN, 2023; Eurobarometer, 2019). Most of the questions were developed by the research team itself, as there were no validated scales available for the research questions. Analyses conducted on the applied scales indicate high reliability and validity (reliability analyse: Cronbachs Alpha = 0.866; validity analyse: Kaiser-Meyer-Olkin test = 0.890, significance according to Bartlett < 0.001). The market research institute Forsa was commissioned to collect the data. Forsa carried out the online survey with a representative random selection as part of the forsa.omninet panel. The responses of 1,028 participants were included in the analysis, which was done using SPSS analysis software.

3.2 Consumer survey on communication options and willingness to pay

An online survey in the form of a choice-based conjoint analysis was conducted in October 2023. It was examined which communication channels and communication messages are suitable for communicating corporate measures to protect biodiversity and

TABLE 1 Description of the consumer survey samples.

	Consumer survey: knowledge, attitudes, willingness to act (June 2022)		Choice-based conjoint analysis: communication, willingness to pay (October 2023)	
Number of respondents	1,028		1,500	
	Number	Percent	Number	Percent
Gender				
Male	520	51	746	50
Female	504	49	750	50
Diverse	4	0*	4	0*
Total	1,028	100	1,500	100
Age				
18–30 years	180	18	300	20
31–40 years	240	23	449	30
41–50 years	177	17	300	20
51–60 years	252	25	301	20
61–75 years	179	17	150	10
Total	1,028	100	1,500	100
Educational qualification				
Low (basic school or no degree)	257	25	149	10
Middle (intermediate secondary school)	339	33	596	40
High (high school, university degree)	432	42	755	50
Total	1,028	100	1,500	100
Monthly household net income				
Low (<2,000 €)	219	21	443	30
Middle (2,000 to <4,000 €)	451	44	587	39
high (≥4,000 €)	317	31	470	31
No information	41	4	0	0
Total	1,028	100	1,500	100

* = value < 0.5%.

whether consumers are more willing to pay for food produced in a biodiversity-friendly way. Conjoint analysis is an established market research method that is used to simulate a purchasing situation to test different product concepts (including hypothetical products). The method can be used to determine consumers' preferences for individual product features and their willingness to pay for products with certain features. In choice-based conjoint analysis, the most common form of conjoint analysis, respondents are shown several products with different characteristics simultaneously in a choice set and are asked to choose the option they would buy or that appeals to them the most (Eggers et al., 2022). This is repeated several times with the combination of different options. It comes close to a real-life purchasing situation, in which there usually also are several product alternatives to choose from. Eggers et al. (2022) show that more realistic results can be achieved with this method compared to using questionnaires. The survey was designed and analyzed by the scientific institution. The recruitment of the sample of 1,500 people and the data collection were carried out by the market research institute Sago Schlesinger.

In the study, various features for the communication about biodiversity-friendly produced food were tested using three sample products from the companies involved in the project. The sample products are typical products of the companies: frozen peas, walnut kernels and (an advertising poster for) chocolate. The communication attributes tested are fictitious and have not yet been used in this manner. The attributes and levels were selected on basis of a literature review, the results of the first consumer survey (2022) and of a qualitative exploratory focus group discussion. In the focus group with six consumers, key aspects of consumers' information needs were identified based on communication messages already used on food packaging in Germany to protect biodiversity. Since the representative survey in 2022 showed that people with a high level of formal education and higher incomes, as well as women, are particularly relevant target groups, the sample for this exploratory study was primarily selected according to these criteria. The participants included: 4 women and 2 men with ages between 30 and 75 characterized by high educational qualifications (mainly university degrees) and high incomes, different household types such as single, couple and family households, participants from 5 German federal states (Berlin, Bremen, Hessen, Nordrhein-Westfalen, Rheinland-Pfalz).

The literature (see Section 2) and the focus group show that the trustworthiness and scope of information, a concise slogan and the form of corporate commitment are particularly important aspects of biodiversity communication for consumers. Trust can be conveyed, for example, through independent certification or cooperation with renowned institutions (Truong et al., 2021). To determine which term is most appealing for biodiversity protection in a slogan, the use of the terms biodiversity, biological diversity and species protection, which are often used synonymously, was compared. The attribute "biodiversity value" was included because a method for assessing the impact of food on biodiversity (BVI method) was also further developed as part of the BioVal project, which can be used to calculate biodiversity values for products (Lindner et al., 2019, 2020). It was therefore of interest to what extent such values are suitable for communication. To ascertain the willingness to pay for food, that was produced in a biodiversity-friendly way, the attribute price was used. The companies involved in the project

were also included in the discussion on the selection of attributes to design realistic product options.

For methodological reasons, only a limited number of attributes could be included in the analysis for each product. To obtain information on aspects that were relevant for the participating companies, different attributes were used for the three products which also differed based on the companies' choices (food, advertising poster). The "no choice" option was deliberately omitted to "force" respondents to indicate their preferences for the presented communication messages, because the primary goal of the study was to determine preferred communication options. This approach also aimed to ensure that sufficient data on preferred product features were available to determine part-worth utilities (Orme, 2010). Table 2 gives an overview of the tested attributes and levels.

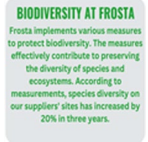
The experimental design was created using the "Conjointly" survey platform. The Conjointly algorithm generates a fractional factorial choice design using all the attributes and levels provided, which reduces the number of mathematically possible combinations to a manageable number. In this way, a combination of 8 choice sets per product was created for each respondent. For capacity reasons, each interviewee only evaluated two of the three sample products. Each respondent was assigned two products which resulted in ratings from 1,000 consumers for each product. Despite the limited number of stimuli evaluated, it is possible to derive part-worth utilities for all levels for each respondent. This was done using Markov Chain Monte Carlo Hierarchical Bayes (MCMC HB) estimation, based on which the part-worth utilities of all attribute values were calculated.

The respondents were asked in the conjoint analysis to always select the product, they would buy from three variants shown at the same time (or, in the case of the advertising poster, the one they found most appealing). It can be assumed that they chose the product concept with the greatest utility for them in each case. Based on the selection decisions, it is therefore possible to deduce which individual attributes, and their levels provide how much utility for the respondents (part-worth utilities). An additive utility model was used in this study. It assumes that the total utility of a specific product configuration for an individual corresponds to the sum of all part-worth utilities.

To ensure data quality, a minimum processing time of at least 20 s was specified for each choice set to rule out speeding and two control questions (attention checks) were integrated. The content of the free text comments was also analyzed. Qualitatively unsatisfactory cases were excluded and replaced by newly collected cases.

Although choice-based conjoint analysis is the most reliable method to date for investigating consumer preferences and willingness to pay, it is still an experiment. This can lead to deviations between behavioral statements and actual behavior in real situations (hypothetical bias), which are generally unavoidable in surveys. Measures to reduce hypothetical bias included repeated requests in the questionnaire to look closely at all product variants, to compare them carefully and to answer honestly, as well as the above-mentioned technically enforced minimum thinking time for each choice set. In addition, an additional block of questions using the KSE-G scale (Kemper et al., 2014) was used to record the extent to which socially desirable response tendencies (exaggerating their own positive characteristics, understating their own negative characteristics) exist among the respondents in order to be able to assess the response behavior in retrospect.

TABLE 2 Overview of the tested attributes and levels (translated from German).

Product	Attribute	Levels			
Walnut kernels	Slogan	Without slogan			
	Scope of information	Without information			
	Form of engagement	Without engagement	<i>To protect biodiversity, we support the creation of flower strips on our suppliers' fields</i>	<i>To protect biodiversity, we are participating in the BioVal project, which aims to reduce the negative effects of food on biodiversity</i>	<i>To protect biodiversity, we donate 5 cents of the product revenue to a biodiversity conservation project</i>
	Certification	Without certification			
	Price	Basic price	Basic price + 0.30 €	Basic price + 0.80 €	Basic price + 1.60 €
Frozen peas	Slogan	Without slogan			
	Scope of information	Without information			
	Form of engagement	Without engagement	<i>We have set up beehives and flowering meadows at our company site to protect biodiversity</i>	<i>To protect biodiversity, we focus on soil health projects with our contract farmers</i>	<i>To protect biodiversity, we donate 5 cents of the product revenue to a biodiversity conservation project</i>
	Biodiversity score	Without score			
	Price	Basic price	Basic price + 0.59 €	Basic price + 1.09 €	Basic price + 1.79 €
Advertising poster	Standard/cooperation	Without standard	<i>We are certified according to the sustainability standard:</i> 	<i>We source our cocoa 100% sustainably, including certified according to:</i> 	<i>We are a member of the Biodiversity Initiative:</i> 

(Continued)

TABLE 2 (Continued)

Product	Attribute	Levels			
	Scope of information	Variety instead of uniformity - We promote biodiversity	Variety instead of uniformity We promote biodiversity. On our cocoa farm, we grow cocoa in a sustainable agroforestry system. We leave half of the farm untouched for native animal and plant species.	We promote biodiversity. On our cocoa farm, we grow cocoa in a sustainable agroforestry system. We leave half of the farm untouched for native animal and plant species.	We promote biodiversity. Our 2500-hectare cocoa farm in Nicaragua is cultivated using a sustainable agroforestry system. This form of cultivation protects the soil from erosion, regulates the water balance and creates a healthy microclimate. This promotes biodiversity. We leave half of the farm untouched for native animal and plant species.
	Visual presentation				
	Additional information	Without additional information	Find out more on our website: 	Visit us at www.rittersport.de	Find out more from WWF about biodiversity and food: 

The results of the survey are the utilities determined with Conjointly, i.e., the influence of all tested attributes and levels on the product choice. This makes it possible to show how strongly the respective attributes and levels influence the respondents' decisions for the product variants. The Latent Class Estimation for Choice-Based Conjoint software from Sawtooth was used to be able to make more differentiated statements about individual respondent groups. With Latent Class Multinomial Logit (MNL) in this software, it is possible to divide the sample into segments with similar preferences, e.g., similar sensitivity to certain attributes or similar willingness to pay (Sawtooth Software, Inc, 2021). The Consistent Akaike Information Criterion (CAIC) was used to determine the number of segments used. Through linking segment membership to the socio-demographic data of the respondents, it was possible to characterize the segments in terms of gender, age, educational level, income and other characteristics (results 4.4). Significant deviations between the segments and the overall sample were analyzed with the chi-square goodness-of-fit test, using SPSS software.

As part of the survey, knowledge of the term biodiversity, attitudes toward biodiversity conservation and socio-demographic data were also collected, as well as questions on social desirability. This data was analyzed using SPSS software.

A special feature of this study is that extensive data is available for a large sample (2022: $N = 1,028$; 2023: $N = 1,500$) and the respondents evaluated different products in a conjoint analysis (survey 2023). This provides an indication of whether the results can be generalized. In addition, various communication options were tested (see Table 2), which provide information about the attractiveness of different communication features and preferred forms of presentation.

4 Results

The percentages shown in the following results were collected using a five-point Likert scale. For a clear presentation of the results, agreeing and disagreeing items were added together (e.g., "Strongly agree" and "Somewhat agree" or "Strongly disagree" and "Somewhat disagree").

4.1 Knowledge and attitudes toward the protection of biodiversity

The results of the consumer survey (2022) show that most consumers (87%) have heard the term "biodiversity" or "biological diversity" and usually think they know what it means. However, a closer look reveals that only 17% know the correct meaning of the term. The most common assumption was that biodiversity only refers to the diversity of animal and plant species and sometimes also to the diversity of ecosystems and habitats. In contrast, most respondents were unaware that it also includes the diversity of genes, genetic information and genetic material.

The majority of the respondents are aware that biodiversity is declining worldwide (82%) and that food production has a negative impact on biodiversity (68%). The protection of biodiversity is a relevant topic for consumers. 91% of respondents think it is important that biodiversity is preserved, and more than half (55%) said that they feel personally affected if biodiversity declines. The most important motive for preserving biodiversity according to the respondents is that it contributes to coping with climate change (see Table 3). The motive that biodiversity must be preserved because it is important for people's health and well-being and because it enables people to experience nature was also frequently agreed on. The importance for economic development and for food production was cited somewhat less frequently. It is possible that consumers are even less aware of these ecosystem services than they first mentioned. Overall, however, approval is also quite high for these motives.

Besides the generally very positive attitudes toward biodiversity protection, consumers often lack information and are uncertain about their own options for action. Most respondents (84%) do not feel sufficiently informed about the topic. Many of the survey participants are therefore unsure how they themselves can contribute to the preservation of biodiversity when buying food and would like to be offered support. 61% would like to receive information about the impact on biodiversity of the food on offer when buying food. And 79% would like to be informed about measures that companies are taking to conserve biodiversity.

A clear majority of respondents (85%) consider it important that companies in the food industry are committed to preserving biodiversity. When buying food, however, biodiversity protection

TABLE 3 Motives for preserving biodiversity (*N* = 1,009*, figures in %).

Biological diversity should be preserved ...	Strongly agree + somewhat agree	Partly agree	Strongly disagree + somewhat disagree	Total
For the stability of ecosystems and to cope with climate change	93	6	1	100
Because it is important for people's health and well-being	88	10	2	100
Because it enables people to experience nature	72	20	8	100
Because of its beauty	71	21	8	100
Because it is important for long-term economic development	64	24	12	100
For the production of food	60	28	12	100

*Total sample = 1,028; here only respondents, who consider it important that biodiversity is preserved.

currently seems to play a rather subordinate role compared to other sustainability aspects. When asked how important various sustainability features are to them when buying food, respondents cited low packaging waste (86%) and local and seasonal food as more important (84, 79%) than food whose production does not harm biodiversity (61%).

Both consumer surveys showed that there is a correlation between awareness for biodiversity conservation and the socio-demographic characteristics of the respondents. A high level of awareness for biodiversity conservation, which is expressed in terms of a pronounced knowledge of biodiversity, a strong personal concern, a positive attitude toward biodiversity conservation and a high willingness to act, was found significantly more frequently among people with a high level of education (high school diploma, university degree), with above-average income (net household income $\geq$ € 4,000), among women and consumers in the 41–60 age group. The characteristics “formal education” and “net household income” have a stronger influence on respondents’ awareness of biodiversity conservation than the characteristics “gender” and “age.”

4.2 Readiness to act

As part of the consumer survey (2022), the extent to which consumers are willing to pay attention to the protection of biodiversity when buying food and prefer biodiversity-friendly products was also asked for. The results indicate that the willingness to do something to preserve biodiversity is high. 71% stated that they would be prepared to look out for appropriate labels when buying food and give preference to biodiversity-friendly products. Almost half of the respondents (48%) stated that they avoid or reduce food that endangers biodiversity (e.g., products containing palm oil, meat, sea fish). 38% consciously buy organic food, also to protect biodiversity. However, comparatively few respondents (19%) said that they pay close attention to the issue by specifically looking for old or rare varieties of fruit and vegetables when shopping.

The general comments in the survey (2022) indicate a high willingness to pay a higher price for biodiversity-friendly food. 64% of respondents stated that they would be willing to pay a little more for food whose production does not harm biodiversity. However, it is known from consumer research that there can be differences (attitude-behavior gap) between the expressed behavioral intentions to pay more for sustainable food and the actual purchasing behavior (e.g., Sharma, 2021).

4.3 Effective messages

In addition to the willingness to pay, it was also tested which messages are best suited for communicating biodiversity protection. The survey participants preferred product packaging as an information medium for corporate measures to protect biodiversity (87%), followed by information in food stores (69%), on websites (51%) and in company sustainability reports (49%). The latter, more formal type of report is probably expected to provide particularly reliable information. Advertising in public places and communication via social media platforms are comparatively less attractive (37, 36%). It is evident from the qualitative responses to a feedback question that the reliability of information regarding biodiversity conservation measures is of significant importance to consumers. Information that is verified by well-known, company-independent institutions is desired, as there is a great deal of skepticism toward information from companies, which is often (negatively) perceived as advertising.

The choice-based conjoint analysis was used to investigate how strongly the tested attributes and levels influence consumers’ product choice. The results can be used to determine which communication messages are particularly suitable for drawing attention to biodiversity-friendly products (Figure 1).

Of the attributes tested for frozen peas and walnut kernels, price is the criterion that most influences consumers’ overall choice. Low prices are preferred for all product variants. Among the communication features tested, the biodiversity value and the slogan proved to be attributes that are particularly important for product choice. In the case of frozen peas, the indication of a biodiversity value contributed 23% to the choice of product and the indication of a slogan 16%. In the case of walnut kernels, the inclusion of a slogan contributed to 18% of the product choice. Respondents chose products whose packaging had a high positive biodiversity value (6 or 4) or an understandable slogan (“Promotes biological diversity” or “Promotes species conservation”). The slogan “Promotes biodiversity” is apparently less attractive due to the abstract term “biodiversity.” The scope of information on biodiversity protection measures and the type of engagement (measures at the company site or at suppliers, participation in research, donation to biodiversity projects) were somewhat less important to the respondents in the product concepts tested.

References to well-known standards such as the rainforest Alliance label and the visual design with images associated with the product (rainforest, sloth) were particularly effective in making the advertising poster for chocolate attractive. The provision of additional

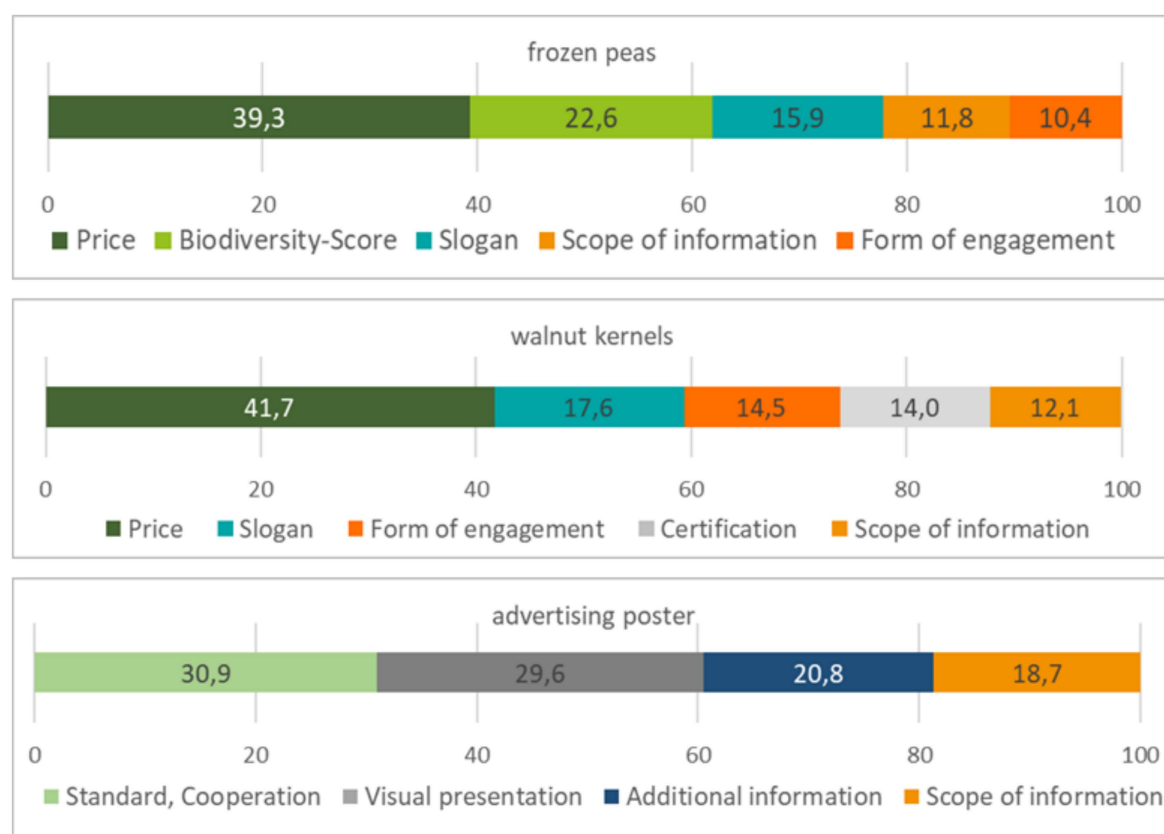


FIGURE 1
Share of attributes in the total utility when choosing a product ($n = 1,000$; figures in %).

information such as the company's website or a QR code for information from the WWF and the amount of information were slightly less important in comparison (21, 19%).

4.4 Target groups

To be able to identify relevant target groups among the consumers surveyed, a segmentation of the sample was carried out for each sample product using Latent Class Multinomial Logit (MNL) regarding the preferred attributes. Data quality was ensured using Consistent Akaike Information Criterion (CAIC). The analysis showed that dividing the participants in three segments per product with typical patterns of product choice yielded the best-fitting model (Table 4). The segments "price-oriented," "biodiversity value-oriented," "slogan-oriented," "standards-oriented" and "visually oriented" are of particular interest for the question addressed here. Linking the segments with the socio-demographic data makes it possible to characterize the consumer groups.

4.4.1 Price-oriented consumers

Clustering by consumer group shows that a low price is the most important selection criterion for around one third of the respondents (27 and 33% of respondents, respectively, for frozen peas and walnut kernels). Compared to the overall sample, older respondents (particularly those aged 61–75), men, people with low levels of

education and low incomes are overrepresented among this group of consumers. The representatives of this group live more frequently in one- and two-person households and buy more food from supermarkets or discount stores than the overall sample.

4.4.2 Biodiversity value-oriented

Almost a quarter of respondents (24%) primarily based their product choice on a positive biodiversity value (frozen peas product). Younger respondents (especially those aged 18–30) and people with a high level of education are overrepresented in this consumer group. Compared to the overall sample, respondents who also buy a higher proportion of their food in specialized stores such as greengrocers, butchers, bakeries and organic food stores or supermarkets are slightly more frequent in this group.

4.4.3 Slogan-oriented

Almost half (46%) of the consumers surveyed about walnut kernels based their choice of product primarily on the features relating to biodiversity, of which the slogan was the most important feature. The slogan "Promotes species conservation" had a slightly greater influence on product choice than the slogan "Promotes biological diversity." Regarding this target group, parallels can be seen with the "Biodiversity value-oriented" segment. Here too, younger respondents (18–30 years), people with a high level of education, high incomes and respondents who also buy food in specialized stores and organic food stores or

TABLE 4 Segments for typical patterns of product choice and socio-demographic characteristics of respondents (N = 1,000 per product).

Segment	Frozen peas				Walnut kernels				Advertising poster			
	Price oriented	Oriented toward biodiversity value	No clear preference	Total	Price oriented	Oriented toward the slogan	No clear preference	Total	Standards oriented	Visually oriented	No clear preference	Total
<i>n</i>	272	235	493	1.000	326	464	210	1.000	284	260	456	1.000
Share of the subsample	27%	24%	49%	100%	33%	46%	21%	100%	28%	26%	46%	100%
Gender ¹	<i>* 0.037</i>	<i>0.809</i>	<i>0.087</i>		<i>0.42</i>	<i>0.812</i>	<i>0.514</i>		<i>0.116</i>	<i>0.057</i>	<i>0.841</i>	
Male	57%	51%	47%	51%	52%	49%	47%	49%	55%	43%	50%	50%
Female	43%	49%	53%	49%	49%	51%	53%	51%	45%	57%	50%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Age	<i>** <0.001</i>	<i>0.158</i>	<i>0.068</i>		<i>** <0.001</i>	<i>** <0.001</i>	<i>0.483</i>		<i>0.115</i>	<i>0.23</i>	<i>0.647</i>	
18–30 years	11%	26%	23%	20%	13%	27%	18%	21%	17%	21%	20%	19%
31–40 years	24%	31%	32%	30%	25%	31%	35%	30%	28%	36%	29%	31%
41–50 years	24%	17%	18%	19%	21%	20%	19%	20%	22%	17%	22%	21%
51–60 years	22%	17%	20%	20%	26%	18%	19%	21%	18%	17%	20%	19%
61–75 years	18%	9%	7%	10%	16%	4%	10%	9%	15%	8%	9%	11%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Educational qualification	<i>0.217</i>	<i>** <0.001</i>	<i>0.436</i>		<i>0.215</i>	<i>0.393</i>	<i>0.418</i>		<i>0.246</i>	<i>0.541</i>	<i>0.492</i>	
Low	14%	3%	13%	11%	12%	8%	9%	9%	7%	11%	12%	10%
Middle	39%	43%	40%	40%	38%	40%	44%	40%	43%	37%	40%	40%
High	47%	54%	48%	49%	50%	53%	47%	51%	51%	52%	47%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Monthly household net income	<i>** <0.001</i>	<i>** <0.001</i>	<i>** <0.001</i>		<i>** <0.001</i>	<i>** <0.001</i>	<i>** <0.001</i>		<i>** <0.001</i>	<i>** <0.001</i>	<i>** <0.001</i>	
Low (<2.000 €)	41%	28%	27%	31%	35%	25%	22%	28%	25%	33%	30%	30%
Middle (2.000 to <4.000 €)	39%	39%	38%	38%	39%	39%	44%	40%	42%	33%	40%	39%
High (≥4.000 €)	20%	33%	35%	30%	26%	36%	34%	32%	33%	33%	30%	32%

(Continued)

TABLE 4 (Continued)

Segment	Frozen peas				Walnut kernels				Advertising poster			
	Price oriented	Oriented toward biodiversity value	No clear preference	Total	Price oriented	Oriented toward the slogan	No clear preference	Total	Standards oriented	Visually oriented	No clear preference	Total
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Household type	** <0.001	0.841	** 0.003		** <0.001	** 0.019	0.839		0.368	0.226	0.659	
Single household	38%	29%	23%	29%	35%	22%	24%	27%	27%	26%	26%	26%
2 person household	31%	29%	25%	28%	31%	25%	28%	28%	34%	30%	28%	30%
More than 2 adults without children	8%	11%	9%	9%	9%	9%	11%	9%	7%	10%	10%	9%
One adult with at least 1 child	4%	4%	3%	4%	4%	6%	5%	5%	4%	8%	4%	5%
At least two adults with at least 1 child	19%	28%	39%	31%	21%	38%	31%	31%	29%	26%	32%	29%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Most frequent shopping locations ²	** <0.001	0.623	** <0.001		** <0.001	** 0.002	** <0.001		* 0.049	0.100	0.600	
Supermarket or discount grocery store	93%	84%	82%	85%	91%	88%	73%	82%	79%	87%	85%	83%
Food delivery service	7%	23%	30%	22%	7%	11%	36%	21%	25%	15%	17%	20%
Specialty grocery store (e.g., bakery)	19%	49%	53%	43%	30%	45%	53%	44%	46%	40%	38%	43%
Drugstore	25%	37%	46%	39%	32%	40%	52%	43%	41%	34%	39%	39%

(Continued)

TABLE 4 (Continued)

Segment	Frozen peas				Walnut kernels				Advertising poster			
	Price oriented	Oriented toward biodiversity value	No clear preference	Total	Price oriented	Oriented toward the slogan	No clear preference	Total	Standards oriented	Visually oriented	No clear preference	Total
Organic store or organic supermarket	7%	30%	32%	25%	8%	20%	40%	26%	29%	23%	20%	25%
Health food store	4%	20%	25%	18%	5%	10%	31%	18%	20%	11%	14%	16%
Weekly market	8%	24%	32%	24%	11%	20%	38%	26%	28%	20%	21%	24%
Direct sales from farmers	5%	16%	28%	19%	6%	14%	32%	20%	25%	14%	17%	20%

Significance level: ** = $p < 0.01$; * = $p < 0.05$.
¹The category “diverse” was excluded from the calculation due to the small number of cases.
²Multiple answers.

organic supermarkets are overrepresented. Family households with children are more strongly represented in this group than in the overall sample.

When testing the communication messages using the advertising poster for chocolate produced in a biodiversity-friendly way, no price information was provided. The distinguishing features are therefore primarily the attributes “standard/cooperation” and “visual presentation.” The respondent groups that prefer one or the other are roughly equal in size.

4.4.4 Standards-oriented

Of the respondents who rated the advertising poster, 28% primarily focused on the manufacturer’s standards and cooperation attribute. Compared to the overall sample, men, older respondents (61–75 years), people with a medium and high level of education and with a medium and high income are overrepresented in this consumer group. The proportion of respondents living in two-person households is also slightly higher here than in the overall sample. Consumers who are primarily guided by standards when choosing products buy food less frequently in supermarkets or discount stores than the overall sample and use other shopping outlets such as specialized stores, organic food stores and delivery services slightly more often.

4.4.5 Visually oriented

For 26% of respondents, the images shown (rainforest, sloth, bee, flower meadow) were the primary selection criterion when evaluating the advertising poster. Compared to the overall sample, the consumer group contains a slightly larger proportion of women, younger respondents and middle-aged respondents (18–40 years).

Overall, the findings show that the communication features that had the strongest impact were particularly effective in addressing consumers with a higher level of formal education and above-average income.

4.5 Willingness to buy and pay

The results of the conjoint analysis show that references to biodiversity-friendly production of the food products in question have a positive effect on product choice.

As expected, price was a major factor in product selection and the product with the lower price was always preferred, given the same biodiversity performance. However, the tests showed that a low price was the primary selection criterion for only a quarter to a third of respondents (4.4). To be able to make more differentiated statements, the extent to which the preferred communication messages (biodiversity value, slogan) affect the willingness to pay was determined. By comparing the part-worth utilities for different price levels and certain attribute values, it is possible to deduce how different slogans and biodiversity values influence the willingness to pay.

Overall, it was found that the willingness to pay for the two highest price categories almost doubles if the products are labeled with a high positive biodiversity value or with an attractive slogan (Table 5). For example, 16% of respondents were willing to pay the price of the highest price category for walnut kernels without any reference to biodiversity-friendly production by means of a slogan. If the slogan “Promotes species conservation” was also stated on the product packaging, this proportion increased to 30%. The slogan “Promotes biological diversity” also contributed almost equally to a

TABLE 5 Willingness to pay when specifying biodiversity values and slogans, comparison with base price ($N = 1,000$, figures in %).

Walnut kernels	Basic price +0.30 €	Basic price +0.80 €	Basic price +1.60 €
Willingness to pay if the slogan “Promotes species conservation” is indicated	58	42	30
Willingness to pay if the slogan “Promotes biological diversity” is indicated	54	40	28
Without slogan	25	20	16
Frozen peas	Basic price +0.59 €	Basic price +1.09 €	Basic price +1.79 €
Willingness to pay if biodiversity value 6 is indicated	53	40	31
Willingness to pay if biodiversity value 4 is indicated	49	33	25
Willingness to pay if biodiversity value 2 is indicated	28	19	15
Without score	32	22	17

higher willingness to pay (28%). Similar results were obtained for the biodiversity value. 17% of the survey participants agreed to pay the highest category price for frozen peas without any reference to biodiversity-friendly production by means of a score. If the product was also labeled biodiversity value of 4 this proportion rose to 25%, with the most positive biodiversity value of 6 to 31%. Interestingly, a lower biodiversity value of 2 did not increase the willingness to pay (see Table 5).

The results indicate that suitable communication messages can help consumers to accept higher prices for food produced in a biodiversity-friendly way. The analysis of response behavior about social desirability did not reveal any anomalies.

5 Discussion

5.1 Importance of biodiversity protection when purchasing food

Regarding the research gap described, the results of the study show, that consumers are interested in the topic and consider it important that food is produced in a biodiversity-friendly way. Awareness of the need to protect biodiversity is particularly pronounced among people with a high level of education and above-average net household income. Other studies, in which German consumer behavior was analyzed also came to similar conclusions (BMUV and BfN, 2023; BMEL, 2023). However, German consumers' attitudes toward biodiversity protection and their willingness to purchase biodiversity-friendly products have not yet been examined in such detail as in the present study.

Price proved to be the most important purchasing criterion in the conjoint analysis. The fact that price plays a major role in the choice of sustainable food is well known in consumer research (e.g., Lehberger, 2021; Winterstein and Habisch, 2021; di Vita et al., 2021). However, the approach chosen in the study, which uses the willingness to purchase three different products as examples to determine the effectiveness of various communication options for the protection of biodiversity, goes beyond previous studies.

The present study showed that biodiversity protection can be communicated particularly well through information on the product packaging and that a high positive biodiversity value or an understandable slogan are particularly suitable for this purpose. Both attributes had a positive effect on the purchase decision and significantly increased the willingness to pay. However, the indication of standards and cooperation of food producers with environmental associations (such as Rainforest Alliance), the visual design with images that are associated with the product and biodiversity as well as the indication of websites or QR codes for further information on the topic of biodiversity also proved to be effective communication options.

The choice-based conjoint analysis method used makes it possible to efficiently achieve realistic results (Eggers et al., 2022). However, as this form of survey is also based on self-reporting by the respondents, deviations between the statements and actual purchasing behavior are possible. These deviations can only be prevented through observations and surveys on actual purchases directly at the point of sale. It should also be noted that the results presented on price willingness are based on data collected in 2023. Since then, high food inflation rates in Europe, and particularly in Germany, have led to more economic purchasing behavior among consumers. This could also have an impact on the willingness to purchase biodiversity-friendly food products, but no data is available on this. However, the well-documented purchasing behavior for organic products can be used as a reference. The purchase of organic food declined slightly in Germany and most European countries in 2022. In 2023, sales figures stabilized again and since 2024, significant growth has been recorded (BÖLW, 2025; FiBL and IFOAM, 2025). It can therefore be assumed that sustainable consumption behavior is generally on the rise again and that the results presented here are still relevant today.

5.2 Behavioral change through knowledge transfer?

The result, that many consumers have a lack of knowledge about biodiversity suggests that more information campaigns and knowledge transfer are needed to promote the purchase of biodiversity-friendly food. However, various studies in environmental education research have shown that simply imparting knowledge is not sufficient to

promote environmentally friendly behavior (e.g., Dieterle et al., 2023; Müller et al., 2023). Müller et al. (2023) describe that although an educational workshop comprising several sessions significantly increased environmental knowledge and the participants' conviction that they could contribute to environmental protection themselves, no change in behavior was achieved. Individual and social barriers as well as external factors are cited as causes that block the conversion of knowledge into action. Accordingly, barriers can be, for example, low emotional involvement and low motivation, a lack of available resources such as income, social norms such as habitual (environmentally harmful) behavior within a social group or a lack of access to certain products (Clayton and Myers, 2009; Kollmuss and Agyeman, 2002). This indicates, that while the provision of information on biodiversity constitutes an essential basis for promoting awareness of biodiversity conservation, additional measures to create a supportive environment, such as facilitating easy access to products and offering attractive pricing, are necessary to effect a change in purchasing behavior.

5.3 Communicating biodiversity in comparison to organic

In terms of possible communication strategies for biodiversity-friendly foods, it is worth comparing the findings with the results of studies on purchasing behavior for organic food, since food with organic labels have been established for many years.

There are clear parallels between the target groups. Many studies describe the typical buyers of organic food as female, middle-aged, with a high level of education and above-average income (Gericke et al., 2023; Winterstein and Habisch, 2021; Marreiros et al., 2021; Hansmann et al., 2020). Several studies on organic products have also shown that consumers' attitudes and environmental awareness play an important role in their willingness to buy. In addition, other, less altruistic, motives such as better taste, higher quality and health benefits are often mentioned. Of these motives, the personal benefit of maintaining one's own health has a particularly strong influence on consumers' purchasing intentions (Pant et al., 2024; Hansmann et al., 2020). Communication should therefore highlight the personal benefits of biodiversity for consumers, in particular the ecosystem services for health and human well-being. These include, for example, raw materials for medicines and the value of typical regional landscapes as recreational areas for maintaining physical and mental health (IPBES, 2019). It can be assumed that consumers do not perceive the personal health benefits of biodiversity-friendly produced food to the same extent as those of organic food.

Most studies on organic food have found that trustworthy organic labels have a positive effect on willingness to buy (e.g., Katt and Meixner, 2020). However, it was also shown that consumers make differences in this regard according to product groups (Li and Kallas, 2021). It is possible that similar differences exist for biodiversity-friendly food. A lack of trust in compliance with organic label standards and a lack of information and knowledge were identified as major barriers for the consumption of organic food (Hansmann et al., 2020). The increasing price orientation of consumers in times of crisis (Hempel and Roosen, 2024) is also an obstacle to the purchase of organic food, which is generally more expensive.

There is an important difference in terms of consumers' level of knowledge. As the consumer surveys conducted in 2022 and 2023 showed, knowledge about biodiversity conservation in connection with food is still rather low. Organic food, on the other hand, has been established for some time and it can be assumed that consumers are better informed about it than about biodiversity-friendly products. Many studies show that consumers value sustainably produced food but prefer established concepts such as local or organic production (e.g., Smith et al., 2021). One reason for the preference for established concepts could be that consumers are more familiar with them. The challenge in communicating biodiversity conservation is to present this complex topic in a way that is understandable to laypeople. Since some measures which are already familiar from organic farming, also promote biodiversity (e.g., avoiding pesticides and synthetic fertilizer), this can be used as a basis for communication.

5.4 Limitations

Although the study presented here, was more extensive than most existing studies, it also had some limitations. Since only a selection of products could be included in the study as examples, the results only provide explorative insights of the acceptance of biodiversity-friendly food products. It is possible that consumer attitudes differ between staple foods and "luxury" products (such as chocolate), but this could not be addressed in the study. This would be an interesting question for future research.

Future studies could also consider the methodological limitations of the study. The option "no choice" could be included in the conjoint design so that respondents could also choose the option "no purchase." Such an approach would be closer to real purchasing behavior. In addition, specific psychometrically validated scales could be developed to determine consumer attitudes toward biodiversity protection, based on existing scales for environmental awareness.

6 Conclusion

It has been shown that consumers are interested in the topic of biodiversity protection and suitable communication messages can help to increase the willingness to buy and pay for food produced in a biodiversity-friendly way. Consumers should be guided by appropriate information on products when shopping. However, a new, separate biodiversity label is not recommended since many labels already exist. The so-called "label flood" is often viewed critically and using several labels simultaneously on a product packaging can limit the effectiveness of the purchasing decision. It therefore seems sensible to communicate the aspect of biodiversity protection in an ecological sustainability label together with other important aspects such as climate protection. This seems particularly appropriate if the same or very similar protective measures are implemented to achieve the respective goals, such as the reduction of synthetic fertilizers and pesticides and the reduction of intensive livestock farming. There already exist activities in this direction as the planet score, which provides information on the environmental impact of food and in which biodiversity is part of the overall score [developed by the Institut de l'agriculture et de l'alimentation biologique (ITAB)].

In this article, the focus is on the consumer perspective. A change in consumer behavior when buying food (i.e., a preference for sustainable and biodiversity-friendly products) is an important contribution to the conservation of biodiversity, but only part of the necessary changes. Responsibility for biodiversity conservation should not be attributed solely to consumers. Rather, the development of biodiversity-friendly agriculture and the consumption of these products should be pursued in parallel by politics and the farmers. Possible measures to protect biodiversity on agricultural land could include, for example, a reduction in the use of pesticides and fertilizers, the creation of structural diversity, e.g., through flower strips, hedges and groups of trees, as well as a lower frequency and depth of cultivation (Eberle and Timmer, 2024).

The findings of these consumer surveys can encourage companies to do more to protect biodiversity. However, as has been shown, there is still a need for further research into measures that can increase the willingness to buy biodiversity-friendly products. In particular, the question of the extent to which the purchase of biodiversity-friendly food is product-specific would be interesting for future research.

Data availability statement

The data that support the findings of this study are openly available in GESIS – Leibniz Institute for the Social Sciences at <https://doi.org/10.7802/2735>, reference number SDN-10.7802-2735.

Author contributions

UB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. MS: Conceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Resources, Supervision, Writing – review & editing.

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