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Emotions associated with the intention to purchase sustainable food: An assessment within and between different animal-sourced food categories

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ABSTRACT

This study investigates the role of emotions in predicting sustainable food purchase intentions. A national representative sample from Norway ($N = 785$) was randomly assigned to rate their emotional response to specific food categories: livestock, capture fishery, aquaculture, and hunting. Emotional responses to each food category were of moderate intensity but there were no significant differences between specific animal-sourced foods. Findings from a series of regression analyses showed that egoistic values positively predict the intensity of positive and negative emotions for all food categories. Additionally, it was shown that individual differences in biospheric values (when strong) and hedonic values (when weak) predicted stronger negative emotions. Further analysis showed that negative emotions are the most consistent predictor of willingness to pay for sustainable animal-sourced food. These findings suggest that negative emotions can potentially be leveraged to enhance sustainable animal-sourced food consumption intentions.

1. Introduction

Animal-sourced food is an important and high-quality source of protein in many people's diets (Elmadfa & Meyer, 2017) and recent years have seen an escalating demand for animal-sourced protein in many countries across the globe (Henchion et al., 2017). This poses a significant challenge for society, given that food consumption remains a leading contributor to household environmental impacts (Ivanova et al., 2016), with animal-sourced foods producing considerably higher levels of greenhouse gas (GHG) emissions than plant-based foods (Baroni et al., 2014; Tilman & Clark, 2014). In line with these insights, it has been suggested that producing animal-sourced food in a sustainable manner can provide a means to lower the environmental impacts from food consumption (Henchion et al., 2017).

Knowledge of consumers' decision-making processes and dietary preferences is critical for promoting wider uptake of sustainable diets across society (Verain et al., 2021). Against this background, there has been a growing body of literature that has looked at psychological factors that could drive the intention to purchase sustainable food. This includes, among other things, motives, attitudes, and awareness of sustainability issues related to food (Fonseca & Sanchez-Sabate, 2022; Lea & Worsley, 2001; Nguyen et al., 2022; Pakseresht et al., 2022). Egocentric motives (e.g., taste and health) in particular have been identified as having a stronger influence on sustainable (local) food choices, when compared with altruistic motives (e.g., ethical concerns; Birch et al., 2018). Sustainable food choices are also influenced by habits (Stoll-Kleemann & Schmidt, 2017), (un)familiarity with the food products (Onwezen et al., 2021), and static social norms (Sparkman & Walton, 2017).

Compared with the aforementioned factors, the role of emotions in consumers' decision-making processes has received less attention in the literature on sustainable food consumption. Decision-making was traditionally considered to be driven by rational cognitive processes and emotions were often considered irrational (Loewenstein, 1996). A growing body of more recent literature suggests otherwise (Böhm & Brun, 2008; Pfister & Böhm, 2017) by demonstrating how emotions profoundly shape human decision-making processes (e.g., provide information and direct attention on relevant aspects; Pfister & Böhm, 2008).

Emotions provide information about valuable objects in the environment, and allow people to adjust their behaviour accordingly (Deonna & Teroni, 2016). Also, there appears to be a link between basic values (i.e., trans-situational goals that serve as guiding principles in a person's life; Schwartz, 1992; Schwartz et al., 2012) and experienced

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emotions, which in turn have been shown to be fundamental drivers of behaviour (Brosch & Sander, 2016). For example, Conte, Hahnel, and Brosch (2023) showed that personal differences in biospheric values shape emotional responses to environmentally relevant information. Their results indicate that the intensity of the emotion that people experience in response to value-related stimuli can be predicted by their values. That is, people tend to exhibit emotional responses to things that are important to them and that they value highly, and these emotional responses in turn drive the urge to act (Conte, Hahnel, & Brosch, 2023). Thus, emotions have the potential to drive behaviour and (de)activate action, which is highly relevant when it comes to sustainable actions (Brosch & Steg, 2021).

It is known that consumers are more likely to change their behaviour when they have a stronger emotional involvement with a certain issue (Kollmuss & Agyeman, 2002), still emotions have often been overlooked in the available literature on sustainable food consumption (Onwezen & Dagevos, 2024). Against this backdrop, research suggests that both private emotions (i.e., emotions that are experienced due to a personal event) and collective emotions (i.e., emotions that are experienced due to the behaviour of groups to which one belongs) can increase intentions to buy organic food (Onwezen, 2015). Similarly, Kröger et al. (2022), in their systematic review, highlighted the relevance of emotions in shaping consumer responses to novel foods, such as insect-based products. Their review emphasized that particularly negative emotions, such as disgust and dissociation, add considerable predictive power for the acceptance of insect-based foods. Based on this literature, activating negative emotions towards unsustainable food products could be a way to reduce their consumption. For example, emotional messages triggering feelings of disgust or empathy towards animals had a negative effect on attitudes towards meat (Palomo-Vélez et al., 2018).

It should be stressed that research on the role of emotions is often limited to negative emotions and typically only includes one specific emotion, namely disgust, which is suggested as a hindering factor for sustainable food consumption (e.g., Hamerman, 2016; Powell et al., 2019). Disgust is particularly relevant due to its evolutionary role as a food rejection emotion that protects individuals from harmful substances (Siegrist et al., 2018). Research shows that disgust not only acts as a direct barrier to novel food acceptance but can also amplify the intensity of other negative emotions, potentially shaping beliefs about the food's naturalness and safety. For instance, in the context of cultured meat, perceived naturalness and disgust were found to significantly influence consumer acceptance, highlighting the intricate relationship between disgust and broader food-related perceptions (Siegrist et al., 2018).

Despite the central role of disgust and other negative emotions in shaping food-related perceptions and intentions, it is also important to understand how these interact with positive emotions. In this context, there have been calls for more research on the role of positive emotions, as knowledge about their influence on sustainable food consumption remains limited (Kwasny et al., 2022; Onwezen & Dagevos, 2024). A study by Fernández-Ferrín et al. (2024) substantiates the need for further research, as they found that pride mediated the effect of attitudes on the willingness to pay for fair trade products to a much larger extent than guilt. Additionally, Onwezen et al. (2022) found that positive emotions (e.g., joy, content, pride) are the strongest predictor of people's intention to consume alternative protein sources. These findings suggest that positive emotions have the potential to transform people's attitudes toward more sustainable food consumption.

Table 1
Descriptives of the socio-demographics.

		Study sample	Norwegian population
Age	18–24 years	12.9%	10.6%
	25–49 years	42.9%	42.3%
	50–64 years	24.1%	24.0%
	65–79 years	18.6%	17.5%
	80 year and older	1.5%	5.6%
Gender	Male	49.7%	50.4%
	Female	50.2%	49.6%
	Other	0.1%	N/A[a]
Education level	No education/elementary school	17.2%	23.8%
	Upper secondary education	43.2%	39.0%
	University/university college	39.6%	37.2%

Note. Socio-demographics of the study sample are shown next to their distribution in the Norwegian population (Statistisk Sentralbyrå, 2023a, 2023b).
[a] Not available

1.1. Research aims

The literature reviewed above suggests that much research on sustainable food choices has focused on cognitive aspects in consumers' decision-making (Onwezen et al., 2021). In the following, we explore emotional responses to specific animal-sourced food categories, how these relate to environmental values and general concerns about sustainability, and how well different emotions predict consumers' willingness to pay for sustainable animal-sourced food. We were especially interested to contrast the predictive value of emotions with other more general consumption motives such as for instance personal expectations that the chosen food is produced in an ethical manner. These motives and concerns reflect more specific, cognitive motivations directly tied to food choices (Grunert et al., 2014). Incorporating these cognitive aspects will allow us to explore the broader context of food decision-making, whilst also enabling to investigate how well emotional versus cognitive drivers predict sustainable food choices. Importantly, both positive and negative emotions are included in this analysis, as has been called for in previous literature (Onwezen & Dagevos, 2024).

2. Methods

2.1. Sample and procedure

We recruited a nationally representative sample of the population in Norway to participate in an online survey ($N = 785$; see Table 1 for descriptives). Sample recruitment was carried out by Flycatcher, a commercial research firm that distributed invitations to participate in an online survey to individuals from the target population.

Participants were informed about the main objective of the study, which was to gain insight into people's thoughts and feelings about different types of food. They were also informed that their participation was voluntary, and they could withdraw from the study at any time without any negative consequences. Following their informed consent, participants moved on to the survey and were randomly assigned to one of four food categories: livestock ($n = 197$), capture fishery ($n = 193$), aquaculture ($n = 196$), and hunting ($n = 199$). Participants were then shown pictures that belonged to their assigned food category, one at a time, and asked to rate the intensity of the emotions they experienced while looking at these pictures. Subsequently, they were asked a series of questions to assess other factors that may influence intentions to purchase sustainable food.

After participants were given the chance to provide comments or questions, they were debriefed and provided with contact information of the research team. This study was part of a larger survey that included further questions, which are not presented in the next section; these can be found in Böhm et al. (2024).

2.2. Materials

2.2.1. Stimulus materials

The survey assessed how members of the public think and feel about animal-sourced food from land (i.e., livestock, hunting) and sea (i.e., capture fishery, aquaculture). For each food category, we selected four

Table 2
Descriptives of the emotions for each food category, aggregated across all pictures.

	Livestock		Capture fishery		Aquaculture		Hunting		$F(3, 781)$
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Anger	2.20	1.41	2.09	1.45	2.13	1.44	2.35	1.69	1.18
Disgust	2.23	1.33	2.13	1.42	2.22	1.46	2.45	1.75	1.65
Worry	2.47	1.45	2.38	1.49	2.45	1.48	2.44	1.65	0.11
Sadness	2.44	1.44	2.30	1.45	2.31	1.44	2.52	1.68	1.00
Pity	2.82	1.50	2.51	1.33	2.47	1.47	2.83	1.54	3.40*
Guilt	2.32	1.46	2.15	1.38	2.09	1.39	2.40	1.62	1.94
Anxiety	1.99	1.32	1.97	1.35	1.94	1.38	2.16	1.52	0.92
Relaxation	3.23	1.47	3.52	1.62	3.24	1.55	3.14	1.57	2.23
Happiness	2.94	1.41	3.17	1.73	2.85	1.64	2.92	1.56	1.45
Pleasure	3.02	1.48	3.28_a	1.68	2.93	1.62	2.84_a	1.57	2.77*
Desire	3.00	1.43	3.37	1.61	3.12	1.60	2.99	1.63	2.44
Joy	3.10	1.44	3.24	1.68	2.97	1.68	3.01	1.60	1.06

Note. Means with the same subscript letter were significantly different at $p < .05$.
*$p < .05$.

Table 3
Descriptives and reliabilities of the scales measuring consumption motives, sustainability concerns, environmental values, and consumption choices.

Scale	Subscale	*M*	*SD*	α
CMS	Ethics	4.02	1.16	0.91
	Social acceptance	2.80	1.39	0.94
	Quality	4.72	0.88	0.89
FCQ	Health	5.09	1.00	0.88
	Convenience	5.04	1.00	0.83
	Sensory appeal	5.56	1.02	0.87
	Natural content	5.49	1.15	0.87
	Price	5.19	1.27	0.87
	Familiarity	4.82	1.19	0.76
CAS		4.95	1.24	0.95
E-PVQ	Biospheric values	4.79	1.27	0.89
	Altruistic values	5.51	1.13	0.90
	Hedonic values	5.23	1.26	0.89
	Egoistic values	3.59	1.38	0.87
Habits		3.39	1.85	
WTP		19.69	24.17	

Note. CMS = Consumer Motivation Scale (0 = *not at all,* 5 = *extremely important*), FCQ = Food Choice Questionnaire (1 = *completely disagree,* 7 = *completely agree*), CAS = Concern about sustainability (1 = *not at all concerned*, 7 = *extremely concerned*), E-PVQ = Environmental Portrait Values Questionnaire (1 = *not like me at all*, 7 = *very much like me*), Habits = Dietary habits (1 = *never*, 7 = *daily*), and WTP = Willingness to pay for sustainable food (0% = *nothing*, 100% = *double the price*). Habits and WTP were measured with a single item.

pictures that were prototypical of the production process within that category; for further information about the criteria for selecting these specific categories, see Böhm et al. (2024). A pilot study was conducted in which a convenience sample of undergraduate students rated how well each picture represented the production process of the food category in question (1 = *extremely bad*, 7 = *excellent*), as well as what could be improved about the pictures and if they had additional comments (open text field). Participants in this pilot study ($n = 52$; 73.1% female, 26.9% male; $M_{age} = 22.81$, $SD_{age} = 6.18$) rated the pictures as somewhat good ($M = 4.77$, $SD = 1.45$), and made no critical comments or suggestions about the representativeness of the pictures for the production process within each food category. Ultimately, we used the 16 initially selected pictures in the fielded survey (see supplementary data, Figs. S1–S4).

2.2.2. Measures

Socio-demographics. Socio-demographics included age (in years), gender (1 = *male*, 2 = *female*, 3 = *other*, 4 = *prefer not to say*), and highest completed education level (1 = *no education/elementary school*, 2 = *upper secondary education*, 3 = *university/university college*). Moreover, we measured political orientation, given that political ideology can affect food preferences, such as meat consumption and plant-based diets, due to underlying moral and ethical considerations (e.g., Chuck et al., 2016; Grünhage & Reuter, 2021; Hodson & Earle, 2018). We asked participants about their political orientation with the following question: "In politics, people often talk about the 'left wing' and the 'right wing'. Below is a scale where 0 represents those who are on the far left politically, while 10 represents those who are on the far right. Where would you place yourself on such a scale?". Participants indicated their political orientation on an 11-point scale (0 = *left*, 10 = *right*; $M = 5.39$, $SD = 2.29$). This matches common approaches to measure individual differences in political orientation among members of the Norwegian public (see e.g., Ivarsflaten et al., 2024).

Discrete emotions. The selection of emotions is largely based on the Discrete Emotion Questionnaire (DEQ; Harmon-Jones et al., 2016). We added three emotions (pity, guilt, and pleasure) that other literature considers relevant to understanding sustainable behaviour and food consumption (Brosch, 2021; Kunst & Hohle, 2016; Steg et al., 2014). This resulted in a set of 12 discrete emotions: anger, disgust, worry, sadness, pity, guilt, relaxation, happiness, pleasure, desire, joy, and anxiety. Participants were asked to indicate how much (intensely), if at all, they experience these emotions while viewing the pictures (1 = *not at all*, 7 = *an extreme amount;* see Table 2 for descriptives).

Consumption motives. The two instruments that were used to measure consumption motives were both tailored towards the assigned food category (see Table 3 for descriptives).[1] The first instrument was the Consumer Motivation Scale (CMS; Barbopoulos & Johansson, 2017), from which we included subscales about ethics (e.g., "should give me a good conscience"), social acceptance (e.g., "should be popular in my circle of friends"), and quality (e.g., "must be of the highest class"). Participants indicated for each aspect how important it was to them on a scale from 0 (*not at all*) to 5 (*extremely important*).

The second instrument was the Food Choice Questionnaire (FCQ; Steptoe et al., 1995), from which we used subscales on health (e.g., "is nutritious"), convenience (e.g., "is easy to prepare"), sensory appeal (e.g., "smells nice"), natural content (e.g., "contains no additives"), price (e.g., "is cheap"), and familiarity (e.g., "is what I usually eat"). Participants rated how important each aspect was to them, when considering buying food from the assigned food category, on a scale from 1 (*completely disagree*) to 7 (*completely agree*).

Sustainability concerns. The extent to which a consumer shows some general concern about sustainability was measured with a 14-item scale (CAS; Grunert et al., 2014). Each item comprised a sustainability-related issue statement (e.g., "Poor treatment of animals in food production"), which was rated by the participants in terms of whether it was a concern to them (1 = *not at all concerned*, 7 = *extremely concerned*; see Table 3 for descriptives).

Environmental values. We included the Environmental Portrait Values Questionnaire (E-PVQ; Bouman et al., 2018), which consists of 17 items that describe the characteristics of a specific person. The gender of the person in that description was adjusted to the same gender as indicated by the participant themselves (i.e., "It is important to [him/her] to …"), followed by the request to indicate how much they are like them (1 = *not like me at all*, 7 = *very much like me;* see Table 3 for descriptives). Following the E-PVQ instructions, the obtained statements were grouped into the following four subscales: biospheric values (e.g., "protect the environment"), altruistic values (e.g., "be helpful to others"), hedonic values (e.g., "have fun"), and egoistic values (e.g., "be influential").

[1] In cases where participants indicated to never buy products from that category, they were directly forwarded to the questions addressing sustainability concerns and environmental values.

Table 4
Descriptives of the potential confounders for each food category.

	Livestock		Capture fishery		Aquaculture		Hunting		$F(3, 781)$
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Scenic beauty	0.57	2.10	1.06	2.08	0.56	2.16	0.52	2.20	2.79*
Trust in sustainability labels	3.69	1.65	3.62	1.62	3.34	1.70	3.68	1.75	1.83
Self-perceived knowledge	3.55_a	1.64	3.34	1.66	3.08_a	1.66	3.47	1.78	2.89*

Note. Descriptives for scenic beauty were aggregated across all pictures. Means with the same subscript letter were significantly different at $p < .05$. Exact item formulations were as follows: "Please move the slider on the bar, according to how much scenic beauty or ugliness you think the picture shows" (scenic beauty; −5 = *ugly*, +5 = *beautiful*), "How much do you trust information provided by sustainability labels on [assigned food category]" (trust in sustainability labels; 1 = *not at all*, 7 = *very much*), and "I have a lot of knowledge about sustainable production of [assigned food category]" (self-perceived knowledge; 1 = *completely disagree*, 7 = *completely agree*).
*$p < .05$.

Consumption choices. Two single items estimated current and future choices of specific sustainable food products (see Table 3 for descriptives). One item asked the participants about their dietary habits, where they indicated how often they consume products from their assigned food category (1 = *never*, 7 = *daily*). Another item measured purchase intentions in terms of how much more participants would be willing to pay (WTP) for a product from their assigned food category assuming that this product would be produced in a sustainable manner (i.e., "How much more, if at all, are you willing to pay for a variant that is produced in a sustainable manner?"). Specifically, participants were asked to indicate the percentage that they would be willing to pay extra for a sustainable product version in their assigned food category, which could range from 0% (*nothing*) to 100% (*double the price*).

Potential confounders. The survey included several items to measure potential confounders of each food category (see Table 4 for descriptives). To account for possible differences in aesthetics, participants were asked to rate the pictures on scenic beauty on a semantic differential anchored by −5 (*ugly*) and +5 (*beautiful*). Participants were also asked whether they trust information provided by sustainability labels (1 = *not at all*, 7 = *very much*) and to what extent they agree to have a lot of knowledge about sustainable production (1 = *completely disagree*, 7 = *completely agree*) of products within their assigned food category.

2.3. Statistical analyses

Jamovi (The Jamovi Project, 2023) was used to analyse the data. First, to assure comparability between the food categories, we conducted a one-way ANOVA followed by Tukey's post hoc tests on the three potential confounders (i.e., scenic beauty, trust in sustainability labels, self-perceived knowledge). Second, we conducted a principal component analysis (PCA) regarding the items on discrete emotions. The components that resulted from this analysis were then used in the proceeding steps. Third, we conducted multiple linear regressions to explore whether socio-demographics, sustainability concerns, and environmental values predict a more intense experience of discrete emotions in each food category.[2] Fourth, we fitted linear regressions to explore the predictive value of emotions on consumption choices (i.e., dietary habits, willingness to pay) in comparison to other consumption motives (i.e., CMS, FCQ), again controlling for socio-demographics. For this last step, we analysed only a subsample from each food category: livestock (n = 165), capture fishery (n = 144), aquaculture (n = 141), and hunting (n = 93).[3]

[2] Participants (n = 1) who indicated 'other' as their gender were excluded from the linear regressions.

[3] Participants (n = 242) who indicated that they never consume products from their assigned food category were excluded from this stage of the analyses.

3. Results

3.1. Exploring differences in potential confounders between food categories

An initial exploration (see Table 4) indicated significant differences between food categories when it comes to judgments of scenic beauty and self-perceived knowledge but not for trust in sustainability labels. For scenic beauty, despite the initial significant ANOVA, the Tukey post-hoc tests did not reveal any significant pairwise differences between any of the food categories. For self-perceived knowledge, post-hoc tests showed a significant difference between livestock and aquaculture, $M_{diff} = 0.47$, $t = 2.75$, $p = .031$. Thus, participants indicated to know the least about production of food from aquaculture.

3.2. Exploring the structure of emotions across food categories

An initial exploration (see Table 2) showed significant differences between food categories when it comes to experiencing pity and pleasure. For pity, despite the initial significant ANOVA, the Tukey post-hoc tests did not reveal any significant pairwise differences between any of the food categories. For pleasure, the post-hoc tests showed a significant difference between capture fishery and hunting, $M_{diff} = 0.44$, $t = 2.74$, $p = .031$. Thus, participants experienced more pleasure in reaction to capture fishery compared to hunting.

To explore the structure of emotions, we ran principal component analyses (PCAs) for the 12 discrete emotion items, reported separately for each food category (see Table 5). The results indicated two components: negative emotions (sadness, anger, worry, disgust, guilt, anxiety, and pity) and positive emotions (joy, happiness, pleasure, desire, and relaxation). The PCAs explained a highly satisfactory cumulative variance for all food categories: livestock (85.2%), capture fishery (87.6%), aquaculture (88.4%), and hunting (87.9%).

Subsequently, we used composite scores for the two emotion components (see Fig. 1) as predictors in the regressions. Positive emotions were consistently higher than negative emotions across all investigated food categories. However, an ANOVA analysis revealed no significant differences in emotional intensity between the food categories for either positive emotions, $F(3,781) = 2.03$, $p = .108$, or negative emotions, $F(3,781) = 1.24$, $p = .296$).

3.3. Predicting emotions by socio-demographics, sustainability concerns, and environmental values

We found that egoistic values were associated with positive emotions across all food categories (see Table 6). This indicates that positive emotions were stronger for people who also endorse egoistic values. Age was positively related to positive emotions for livestock and capture fishery to the extent that older respondents expressed stronger positive

Table 5
Component loadings of the discrete emotions on the PCA components for each food category.

	Livestock			Capture fishery			Aquaculture			Hunting		
	1	2	Communality	1	2	Communality	1	2	Communality	1	2	Communality
Anger	**0.95**	−0.10	0.92	**0.94**	0.08	0.89	**0.95**	0.13	0.92	**0.96**	−0.02	0.92
Disgust	**0.92**	−0.12	0.87	**0.96**	0.05	0.92	**0.95**	0.07	0.91	**0.93**	−0.02	0.87
Worry	**0.94**	−0.11	0.90	**0.94**	0.10	0.89	**0.93**	0.07	0.88	**0.96**	0.05	0.93
Sadness	**0.93**	−0.19	0.91	**0.97**	0.02	0.93	**0.96**	0.08	0.93	**0.96**	−0.05	0.93
Pity	**0.85**	−0.09	0.72	**0.87**	0.10	0.87	**0.88**	0.15	0.80	**0.91**	0.06	0.83
Guilt	**0.89**	−0.07	0.90	**0.92**	0.14	0.87	**0.92**	0.19	0.88	**0.92**	0.07	0.85
Anxiety	**0.87**	0.03	0.76	**0.93**	0.17	0.89	**0.89**	0.26	0.86	**0.94**	0.11	0.89
Relaxation	−0.18	**0.86**	0.78	0.06	**0.88**	0.77	0.06	**0.86**	0.74	0.01	**0.88**	0.77
Happiness	−0.07	**0.95**	0.91	0.10	**0.96**	0.93	0.14	**0.95**	0.93	0.08	**0.96**	0.93
Pleasure	−0.10	**0.94**	0.89	0.07	**0.95**	0.90	0.14	**0.95**	0.92	0.07	**0.93**	0.88
Desire	−0.06	**0.93**	0.86	0.04	**0.92**	0.85	0.13	**0.94**	0.89	0.05	**0.91**	0.82
Joy	−0.12	**0.95**	0.91	0.07	**0.95**	0.91	0.12	**0.96**	0.94	0.05	**0.96**	0.93

Note. Varimax rotation was used. All component loadings above 0.30 are in boldface. Assumptions were assessed with Bartlett's test of sphericity ($p < .001$) and the Kaiser-Meyer-Olkin (KMO) criterion of sampling adequacy (KMO > 0.855 for all emotions).

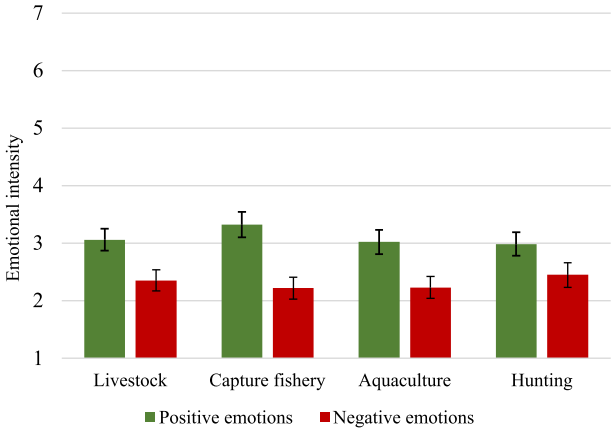

Fig. 1. Mean Ratings Across Positive Emotions (Green Bars) and Negative Emotions (Red Bars) per Food Category, Aggregated Across all Pictures. The error bars displayed indicate the 95% CI. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

emotions toward livestock and capture fishery than their younger counterparts. Gender was negatively related to positive emotions for capture fishery and hunting, with women being less likely to express positive emotions than men. Finally, political orientation was a significant predictor of positive emotions for the hunting category whereby people towards the right end of the political spectrum showed stronger positive responses to this food category.

Egoistic values also explained the intensity of negative emotions expressed for each food category (see Table 7). Similarly, biospheric values positively predicted the intensity of negative emotions regarding livestock, capture fishery, and hunting. In contrast, hedonic values were inversely related to the strength of negative emotions felt regarding livestock, capture fishery, and hunting. That is, the more respondents endorsed hedonic values, the less they experienced negative emotions towards these food categories and inversely for biospheric values. Higher general concern about sustainability was significantly associated with negative emotions toward capture fishery and hunting, while age was inversely related to negative emotions toward all food categories. This means that older participants were less likely to express negative emotions than younger participants. Education level was also inversely related to negative emotions regarding livestock, indicating that higher educated participants were less likely to express negative emotions regarding livestock.[4]

3.4. Predicting willingness to pay by socio-demographics, consumption motives, and emotions

Table 8 shows that negative emotions predicted willingness to pay extra within each food category, indicating that people who experience more negative emotion are willing to pay more for a sustainable version of the food. Additionally, for livestock, we found that the more important social acceptance is to someone, and the less important pricing is, the more they are willing to pay more for a sustainable variant of the food. WTP for sustainable livestock products was also significantly higher among younger people and among people towards the right end of the political spectrum. In the capture fishery category, we found that the more important social acceptance and familiarity is to someone, and the less important the sensory experience is, the more willing they are to pay more for a sustainable variant of the food. WTP for sustainable food from aquaculture is, in addition to negative emotions, significantly predicted by ethics, familiarity, and age. Meaning that the more important ethics and familiarity are to someone, and the younger people are, the more willing they are to pay more for a sustainable variant of the food. Overall, negative emotions were the only constant predictor of WTP across food categories. However, for most categories, apart from hunting, there were additional variables that accounted for differences in WTP.

3.5. Predicting dietary habits by socio-demographics, consumption motives, and emotions

Table 9 shows that the lower a person's education level and importance of social acceptance, and the less negative emotions they experience, the more frequently people consume food from livestock. For capture fishery, the analysis showed that the more important ethics and familiarity are to people, and the less they care about social acceptance, the more frequently they consume food from capture fishery. Dietary habits of food from aquaculture were significantly predicted by both education level and positive emotions. Indicating that the higher people's education level, and the more positive emotions they experience,

[4] Supplementary analyses explored the variability in emotional responses across the different production stages. While emotional intensity varied between these stages (see Table S1 and Fig. S5), the relationships between environmental values, sustainability concerns, and experienced emotions largely resembled those reported above (see Tables S2–S3).

Table 6
Linear regression coefficients predicting positive emotions towards each food category.

	Livestock		Capture fishery		Aquaculture		Hunting	
Predictor	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$
Intercept	**2.89 (0.83)*** **	1.24, 4.53	1.68 (0.86)	−0.02, 3.37	0.70 (0.93)	−1.13, 2.53	**1.65 (0.73)***	0.20, 3.10
Age	**0.02 (0.01)***	0.00, 0.03	**0.02 (0.01)****	0.01, 0.03	0.01 (0.01)	−0.01, 0.02	0.01 (0.01)	0.00, 0.02
Gender (Female)	−0.34 (0.21)	−0.76, 0.07	**−0.55 (0.22)***	−0.98, −0.12	−0.36 (0.23)	−0.81, 0.08	**−0.75 (0.20)*** **	−1.14, −0.36
Education level	0.00 (0.13)	−0.26, 0.26	−0.15 (0.14)	−0.43, 0.14	−0.16 (0.15)	−0.46, 0.15	0.10 (0.13)	−0.16, 0.36
Political orientation	0.06 (0.04)	−0.03, 0.14	0.07 (0.04)	−0.01, 0.16	0.07 (0.05)	−0.02, 0.16	**0.15 (0.05)****	0.05, 0.24
Sustainability concerns	−0.15 (0.10)	−0.35, 0.05	−0.18 (0.11)	−0.40, 0.04	0.05 (0.12)	−0.19, 0.28	−0.20 (0.11)	−0.41, 0.01
E-PVQ_Biospheric	−0.05 (0.11)	−0.27, 0.17	0.10 (0.11)	−0.11, 0.32	0.13 (0.11)	−0.09, 0.35	0.14 (0.11)	−0.08, 0.35
E-PVQ_Altruistic	−0.08 (0.13)	−0.33, 0.17	0.00 (0.14)	−0.27, 0.27	−0.07 (0.14)	−0.33, 0.20	0.09 (0.13)	−0.17, 0.34
E-PVQ_Hedonic	0.08 (0.10)	−0.12, 0.27	0.14 (0.11)	−0.07, 0.35	0.13 (0.11)	−0.09, 0.35	0.04 (0.09)	−0.14, 0.23
E-PVQ_Egoistic	**0.18 (0.08)***	0.03, 0.34	**0.29 (0.09)*** **	0.12, 0.46	**0.36 (0.08)*** **	0.20, 0.52	**0.20 (0.09)***	0.03, 0.38
R^2	0.15		0.19		0.20		0.22	
df	(9, 186)		(9, 183)		(9, 186)		(9, 189)	
F	**3.58*** **		**4.67*** **		**5.32*** **		**5.97*** **	

Note. Reference group for gender is male. E-PVQ = Environmental Portrait Values Questionnaire. All significant findings are in boldface. VIF values ranged between 1.03 and 2.63.
*$p < .05$ **$p < .01$ ***$p < .001$.

Table 7
Linear regression coefficients predicting negative emotions towards each food category.

	Livestock		Capture fishery		Aquaculture		Hunting	
Predictor	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$
Intercept	**1.47 (0.73)***	0.02, 2.91	**1.60 (0.68)***	0.26, 2.94	1.44 (0.83)	−0.19, 3.08	0.33 (0.74)	−1.13, 1.78
Age	**−0.01 (0.01)***	−0.03, 0.00	**−0.02 (0.01)*** **	−0.03, −0.01	**−0.01 (0.01)***	−0.03, 0.00	**−0.01(0.01)***	−0.03, 0.00
Gender (Female)	0.33 (0.19)	−0.04, 0.69	−0.13 (0.17)	−0.47, 0.21	0.33 (0.20)	−0.07, 0.73	0.36 (0.20)	−0.04, 0.75
Education level	**−0.24 (0.12)***	−0.47, −0.01	0.08 (0.11)	−0.14, 0.31	0.02 (0.14)	−0.25, 0.29	0.21 (0.13)	−0.05, 0.48
Political orientation	−0.03 (0.04)	−0.10, 0.05	0.06 (0.04)	−0.01, 0.13	0.06 (0.04)	−0.02, 0.14	0.00 (0.05)	−0.10, 0.10
Sustainability concerns	0.12 (0.09)	−0.05, 0.30	**0.19 (0.09)***	0.01, 0.36	0.12 (0.10)	−0.09, 0.32	**0.21 (0.11)***	0.00, 0.43
E-PVQ_Biospheric	**0.26 (0.10)****	0.07, 0.46	**0.18 (0.09)***	0.01, 0.35	0.14 (0.10)	−0.06, 0.33	**0.26 (0.11)***	0.05, 0.48
E-PVQ_Altruistic	0.08 (0.11)	−0.14, 0.30	−0.08 (0.11)	−0.29, 0.14	−0.09 (0.12)	−0.33, 0.15	−0.11 (0.32)	−0.36, 0.15
E-PVQ_Hedonic	**−0.23 (0.09)****	−0.40, −0.06	**−0.21 (0.08)***	−0.38, −0.05	−0.16 (0.10)	−0.36, 0.03	**−0.20 (0.09)***	−0.39, −0.02
E-PVQ_Egoistic	**0.17 (0.07)***	0.03, 0.30	**0.30 (0.07)*** **	0.16, 0.43	**0.20 (0.07)****	0.06, 0.34	**0.31 (0.09)*** **	0.14, 0.49
R^2	0.28		0.30		0.19		0.28	
df	(9, 186)		(9, 183)		(9, 186)		(9, 189)	
F	**7.87*** **		**8.66*** **		**4.92*** **		**8.12*** **	

Note. Reference group for gender is male. E-PVQ = Environmental Portrait Values Questionnaire. All significant findings are in boldface. VIF values ranged between 1.03 and 2.63.
*$p < .05$ **$p < .01$ ***$p < .001$.

the more frequently they consume food from aquaculture. None of the variables in the model significantly predicted dietary habits for food from hunting. Overall, it was shown that for all categories except hunting, there were some variables that accounted for differences in habits. However, there were no constant predictors of habits across food categories.

4. Discussion

The findings from this study support the notion that values are fundamental to emotional experiences (Conte, Brosch, & Hahnel, 2023, Conte, Brosch, & Hahnel, 2023). This is in line with appraisal theories of emotions, describing that emotions are elicited by (parts of) objects and situations that people find particularly important (Moors et al., 2013). This was particularly visible for negative emotions, which were consistently predicted by weak endorsement of hedonic values and strong endorsement of biospheric values. It implies that people experience more intense negative emotions when they value the environment and place less importance on pleasurable outcomes for their own benefit. In contrast, egoistic values consistently predicted a stronger emotional response, both positive and negative, across all food categories.

While the detected relationship between egoistic values and positive emotions can be explained through a value-congruence framework (Contzen et al., 2021), the pervasive prediction of negative emotions by egoistic values adds complexity to this interpretation. The value-congruence framework posits that positive emotions arise when the characteristics of an object or situation align with one's core values. For example, egoistic values may predict positive emotions because animal-sourced food is perceived as aligning with self-interest (e.g., fulfilling personal needs or preferences). However, the finding that egoistic values also predicted negative emotions in this study suggests that value-congruence alone might not fully explain the emotional response to the presented pictures.

The universality of value-congruence effects has been challenged (e.g., Palomo-Vélez et al., 2021), particularly when the object or situation being evaluated does not clearly align with the relevant values. Emotional responses may depend not only on value-congruence but also on contextual factors such as framing and individual perceptions. Applying this to our current findings, it is possible that egoistic values predict both positive and negative emotions due to mixed perceptions of animal-sourced food production. While such food may align with self-interest, negative emotions could arise when aspects of the production process conflict with personal or societal expectations. These findings suggest that emotional responses are shaped by an interplay of values, perceptions, and contextual influences, which may be particularly pronounced when evaluating food production processes that evoke mixed emotions or challenge societal norms around sustainability.

Moreover, our findings suggest that negative emotions can play a crucial role in motivating more sustainable food consumption. Specifically, experiencing emotions such as anger, worry, and guilt was

Table 8
Linear regression coefficients predicting willingness to pay for each food category.

	Livestock		Capture fishery		Aquaculture		Hunting	
Predictor	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$
Intercept	**31.74 (14.85)***	2.41, 61.08	−1.51 (14.28)	−29.75, 26.74	4.55 (14.76)	−24.66, 33.77	**−45.82 (20.06)***	−85.77, −5.88
Age	**−0.23 (0.11)***	−0.44, −0.02	−0.23 (0.12)	−0.47, 0.01	**−0.34 (0.10)*****	−0.53, −0.14	−0.19 (0.15)	−0.49, 0.11
Gender (Female)	0.10 (3.49)	−6.79, 7.00	6.34 (3.66)	−0.91, 13.59	−3.73 (3.50)	−10.67, 3.21	−0.91 (5.14)	−11.14, 9.32
Education level	−1.17 (2.14)	−5.41, 3.07	−4.27 (2.30)	−8.83, 0.29	3.35 (2.26)	−1.12, 7,82	2.48 (3.23)	−3.95, 8.91
Political orientation	**1.54 (0.72)***	0.11, 2.97	0.75 (0.76)	−0.76, 2.26	0.59 (0.67)	−0.73, 1.91	1.46 (1.22)	−0.96, 3.89
CMS_Ethics	1.87 (1.68)	−1.46, 5.19	−0.78 (2.02)	−4.78, 3.21	**3.86 (1.82)***	0.25, 7.47	4.82 (2.81)	−0.78, 10.43
CMS_Social Acceptance	**3.16 (1.29)***	0.60, 5.71	**4.13 (1.65)***	0.87, 7.39	1.57 (1.38)	−1.16, 4.30	4.22 (2.45)	−0.67, 9.10
CMS_Quality	−3.51 (2.23)	−7.92, 0.89	2.43 (2.79)	−3.10, 7.96	−3.52 (2.15)	−7.77, 0.74	−0.82 (4.04)	−8.86, 7.23
FCQ_Health	−0.24 (2.29)	−4.76, 4.29	3.68 (2.59)	−1.45, 8.80	−3.05 (2.08)	−7.18, 1.07	2.98 (3.52)	−4.03, 10.00
FCQ_Convenience	0.62 (2.19)	−3.71, 4.94	−1.73 (2.24)	−6.17, 2.71	3.09 (2.33)	−1.53, 7.70	−0.26 (3.26)	−6.75, 6.23
FCQ_Sensory Appeal	2.34 (2.44)	−2.48, 7.16	**−4.94 (2.32)***	−9.54, −0.35	−1.18 (2.19)	−5.51, 3.16	5.29 (3.86)	−2.40, 12.98
FCQ_Natural Content	0.98 (1.73)	−2.45, 4.40	0.39 (2.01)	−3.58, 4.36	0.78 (1.91)	−2.99, 4.56	−3.55 (3.20)	−9.91, 2.82
FCQ_Price	**−5.32 (1.57)*****	−8.42, −0.21	−0.83 (1.39)	−3.58, 1.92	−2.37 (1.44)	−5.21, 0.48	−2.36 (2.42)	−7.17, 2.46
FCQ_Familiarity	−1.17 (1.79)	−4.72, 2.37	**3.73 (1.77)***	0.22, 7.24	**4.48 (1.77)***	0.97, 7.99	1.52 (2.64)	−3.74, 6.78
Positive emotions	−0.63 (1.26)	−3.12, 1.87	0.13 (1.39)	−2.62, 2.88	0.31 (1.24)	−2.15, 2.76	2.60 (1.94)	−1.27, 6.46
Negative emotions	**4.46 (1.50)****	1.50, 7.41	**5.76 (1.54)*****	2.71, 8.81	**5.54 (1.28)*****	3.00, 8.08	**6.54 (1.89)*****	2.78, 10.30
R^2	0.32		0.48		0.46		0.61	
df	(15, 149)		(15, 128)		(15, 125)		(15, 77)	
F	**4.77*****		**7.75*****		**7.23*****		**8.00*****	

Note. Reference group for gender is male. CMS = Consumer Motivation Scale, FCQ = Food Choice Questionnaire. All significant findings are in boldface. VIF values ranged between 1.04 and 2.91.
*$p < .05$ **$p < .01$ ***$p < .001$.

Table 9
Linear regression coefficients predicting dietary habits for each food category.

	Livestock		Capture fishery		Aquaculture		Hunting	
Predictor	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$	*B (SE)*	$CI_{95\%}$
Intercept	**5.66 (1.03)*****	3.63, 7.69	**1.89 (0.89)***	0.13, 3.66	**1.87 (0.94)***	0.01, 3.73	−0.40 (1.17)	−2.74, 1.93
Age	−0.00 (0.01)	−0.02, 0.01	−0.00 (0.01)	−0.02, 0.01	0.00 (0.01)	−0.01, 0.01	−0.01 (0.01)	−0.03, 0.01
Gender (Female)	0.22 (0.24)	−0.26, 0.70	−0.15 (0.23)	−0.60, 0.31	−0.21 (0.22)	−0.65, 0.23	−0.07 (0.30)	−0.67, 0.53
Education level	**−0.39 (0.15)****	−0.68, −0.10	−0.01 (0.14)	−0.29, 0.28	**0.30 (0.14)***	0.01, 0.58	0.21 (0.19)	−0.17, 0.59
Political orientation	0.03 (0.05)	−0.07, 0.12	0.07 (0.05)	−0.03, 0.16	0.01 (0.04)	−0.08, 0.09	0.06 (0.07)	−0.08, 0.20
CMS_Ethics	−0.09 (0.12)	−0.32, 0.14	**0.29 (0.13)***	0.04, 0.54	−0.08 (0.12)	−0.31, 0.15	0.17 (0.16)	−0.16, 0.50
CMS_Social Acceptance	**−0.22 (0.09)***	−0.40, −0.04	**−0.22 (0.10)***	−0.42, −0.02	0.13 (0.09)	−0.04, 0.30	0.11 (0.14)	−0.18, 0.39
CMS_Quality	0.09 (0.15)	−0.21, 0.40	−0.16 (0.17)	−0.51, 0.18	0.12 (0.14)	−0.15, 0.39	−0.14 (0.24)	−0.61, 0.33
FCQ_Health	0.05 (0.16)	−0.26, 0.37	0.06 (0.16)	−0.26, 0.38	0.05 (0.13)	−0.21, 0.31	0.08 (0.21)	−0.33, 0.49
FCQ_Convenience	−0.15(0.15)	−0.45, 0.15	−0.02 (0.14)	−0.30, 0.26	−0.21 (0.15)	−0.50, 0.09	0.08 (0.19)	−0.30, 0.46
FCQ_Sensory Appeal	0.28 (0.17)	−0.05, 0.62	−0.21 (0.14)	−0.50, 0.08	0.06 (0.14)	−0.21, 0.34	−0.06 (0.23)	−0.51, 0.39
FCQ_Natural Content	−0.02 (0.12)	−0.26, 0.21	0.11 (0.13)	−0.13, 0.36	−0.19 (0.12)	−0.43, 0.05	−0.05 (0.19)	−0.42, 0.32
FCQ_Price	−0.13 (0.11)	−0.34, 0.09	0.04 (0.09)	−0.13, 0.21	0.12 (0.09)	−0.06, 0.30	0.08 (0.14)	−0.20, 0.36
FCQ_Familiarity	0.14 (0.12)	−0.11, 0.38	**0.34 (0.11)****	0.13, 0.56	0.10 (0.11)	−0.12, 0.32	0.29 (0.15)	−0.02, 0.60
Positive emotions	0.12 (0.09)	−0.05, 0.29	0.05 (0.09)	−0.12, 0.22	**0.21 (0.08)***	0.05, 0.36	0.20 (0.11)	−0.02, 0.43
Negative emotions	**−0.24 (0.10)***	−0.44, −0.03	0.10 (0.10)	−0.09, 0.29	0.01 (0.08)	−0.15, 0.18	0.07 (0.11)	−0.15, 0.29
R^2	0.23		0.23		0.24		0.42	
df	(15, 149)		(15, 128)		(15, 125)		(15, 77)	
F	**2.95*****		**2.62****		**2.60****		**3.66*****	

Note. Reference group for gender is male. CMS = Consumer Motivation Scale, FCQ = Food Choice Questionnaire. All significant findings are in boldface. VIF values ranged between 1.04 and 2.91.
*$p < .05$ **$p < .01$ ***$p < .001$.

associated with a higher willingness to pay for sustainable food in each of the investigated food categories. This may be explained by psychological discomfort due to cognitive dissonance, which can occur if there is a conflict between one's values and behaviours (Festinger, 1957). Previous studies have shown that people can experience cognitive dissonance when their meat-eating behaviour and feelings towards animals are conflicting (Rothgerber, 2020). In our study, individuals who value sustainability as important but purchase less sustainable food possibly experience negative emotions resulting from an experienced dissonance. To reduce the psychological discomfort, individuals may be motivated to change their behaviour to realign with their values, thereby alleviating the negative emotions they experience. In support of this, research has demonstrated that guilt in particular is an important driver of behaviours aimed at managing cognitive dissonance in the context of ethical consumption choices (Gregory-Smith et al. (2013).

While past studies have identified positive emotions as the most relevant driver of intention to consume alternative proteins (Onwezen et al., 2022), our study found positive emotions to be unrelated with the willingness to pay for sustainable food. One interpretation is that when individuals already feel positively about animal-sourced food production, they may lack the motivation to alter their dietary habits. It is plausible that positive emotions play a crucial role in maintaining and committing to sustainable dietary changes for those who have already made such changes. Research indeed suggests that anticipating positive emotions has a stronger effect on intentions to fight climate change for individuals who are already engaged in climate-protective behaviours,

whereas negative emotions have a more significant impact on those not yet involved in climate mitigation (Odou & Schill, 2020). Thus, while negative emotions might take a bigger role in initiating behavioural change, positive emotions could have a stronger role in maintaining that change. Still, our findings support this interpretation only for food that comes from aquaculture. This underscores the nuanced roles of positive and negative emotions at different stages of behavioural change, and for different food categories.

Our study did not find a consistent pattern across food categories for consumption motives predicting WTP. This finding contradicts previous research (e.g., Birch et al., 2018; Sanchez-Sabate et al., 2019) that identified consumption motives such as price, taste, and health as significant predictors of sustainable food consumption. A possible explanation for this discrepancy might be that animal-sourced foods are often not perceived as sustainable, as they generally have a higher environmental impact compared to plant-based foods (Baroni et al., 2014; Tilman & Clark, 2014). This perception could diminish the relevance of typical consumption motives when predicting willingness to pay for sustainable versions of these foods, as individuals may view the very notion of producing and consuming sustainable food from animals as contradictory. Consequently, this highlights the need for tailored approaches (Bostrom et al., 2013) in promoting sustainable consumption that address specific perceptions and beliefs associated with different food categories.

Attempts at promoting sustainable food consumption behaviour could focus on strategies that leverage negative emotions. This has already been demonstrated, through targeted messaging and narrative storytelling, to promote household recycling behaviours (Morris et al., 2019), signing petitions addressing environmental issues (Rees et al., 2015), and intentions to promote sustainable battery production (Amatulli et al., 2019). When applied to sustainable food consumption, these approaches could be utilized to encourage a shift from conventional animal-sourced protein consumption towards more sustainable alternatives. Since influencing people's emotional states can be perceived as coercive and ethically questionable (Fulmer & Barry, 2009), it is yet imperative to approach these methods with considerable caution.

4.1. Limitations

Several limitations must be acknowledged. First, the order in which the discrete emotions were presented was fixed rather than randomized, which may have influenced participants' responses due to potential order effects. Randomizing the order of the discrete emotions to mitigate these effects could in turn have enhanced the reliability of the findings.

Second, we aimed to maintain consistency across food categories regarding potential confounders like scenic beauty, trust, and knowledge. An initial screening of the data suggested that the different food categories were comparable on most dimensions, with one notable exception. Specifically, we observed differences in self-perceived knowledge for two of the food categories, namely livestock and aquaculture. This could have influenced the responses that were provided by the participants within their assigned food category.

Finally, the reliance on participants' own interpretations of the term 'sustainable' when reporting their willingness to pay is a limitation. While this allowed to capture real-world ambiguity about the concept of sustainability, it also introduces a certain level of variation in how participants may have understood the term. A more detailed definition, which can be done by making explicit references to sustainability certified products, could have provided greater consistency but was not employed due to potential issues with certification and variability in participants' trust and familiarity with such certifications (Brown et al., 2020).

5. Conclusion

This study addresses the role of different types of emotions on a person's willingness to pay for sustainable animal-sourced food. In addition to demonstrating that environmental values are tied to emotions that people experience in relation to specific food categories, the findings hint at the importance of negative emotions in shifting towards more sustainable food choices. Not only were negative emotions more strongly associated with the willingness to pay extra for sustainable food than positive emotions, but emotional responses to specific food categories were also better predictors than other consumption motives. Future research and policy interventions might concentrate on negative emotions as a lever to enhance the intention to consume more sustainable animal-sourced food.

CRediT authorship contribution statement

Nienke Böhm: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Rouven Doran:** Writing – review & editing, Supervision, Methodology, Investigation, Conceptualization. **Charles A. Ogunbode:** Writing – review & editing, Supervision. **Gisela Böhm:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Ethics

This study complied with the data protection regulations of the Norwegian Agency for Shared Services in Education and Research (SIKT) and the ethical guidelines for research by The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH). In addition, The Board for Research and Research Training (FFU), Faculty of Psychology, University of Bergen (UiB), provided an ethical assessment and granted ethical approval for the study (reference: 2020/1926-18).

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Declaration of competing interest

The authors have no conflicts of interest to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.appet.2025.107892.

Data availability

Participants in the survey provided their answers to both closed-ended and open-ended questions. The data that support the findings of this article will be made available on request.

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