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Adaption of the Meat Attachment Scale (MEAS) to Germany - Interplay with Food Neophobia, Preference for Organic Foods, Social Trust and Trust in Food Technology Innovations

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Abstract

Meat-based diets are still the norm and vegans and vegetarians represent only a small minority of the population. A transition respectively behavioural change towards a diet with less meat can only occur with the adoption of a positive attitude towards dietary changes based on reasons and motivations. The main aim of this study is to validate the so-called meat attachment scale (MEAS) for Germany in order to analyse if this construct is a barrier towards a diet with less meat in this country. The findings show that the MEAS can be applied in Germany and a similar structure as reported for Spain and other countries could be found. Furthermore, a correlation analysis demonstrated that food neophobia and MEAS are not correlated with each other. That is, that meat attachment represents an independent and single predictor for trust in food (processing) technologies as e.g. plant-based proteins or cultured meat.

Keywords: meat attachment; food neophobia; consumer preference; preference for organic foods

1 Introduction

High consumption of meat, low regard for meat substitutes, and a lack of willingness to adopt a more plant-based diet are still the dominant cultural pattern in most western societies [10, 29, 35]. Meat-based diets are still the norm and vegans and vegetarians represent only a small minority of the population. As consumers' concerns about meat production systems are rising, they feel conflicted about consuming meat and thus look for more sustainable alternatives [1, 25, 28]. Nonetheless, many consumers like to enjoy meals with meals and want to stick to it but in parallel do not want their consumption to be associated with negative concerns pertaining to meat production [8, 24, 41]. Such conflicting emotions lead to the so-called "meat paradox" [6]. This is defined as disconnection between not wanting animals to suffer, yet killing them for food [11].
Securing a sustainable food supply for humankind is becoming a major challenge. Diets with a high share of animal proteins must be adapted in order to ensure that demand is not outstripping production [10, 19, 20]. Furthermore, the consumption of meat and meat products in larger portions is associated with a higher risk of cardiovascular, coronary and cerebrovascular diseases, stroke, diabetes type 2 and colorectal cancer [39]. Therefore, there is need a for a behavioural change viz. a reduced meat consumption.
Over the recent past, meat substitutes (in particular, plant-based meat, cultured meat and edible insects) have gained increasing popularity as an innovative way to circumvent some of the negative impacts induced by conventional meat production and consumption patterns [5, 23, 25, 28, 34], while also providing alternative sources to meet protein demand [2, 40]. However, its rapid growth is still countered by low consumer

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acceptance [24, 26, 31].
A transition respectively behavioural change towards a diet with less meat can only occur with the adoption of a positive attitude towards dietary changes based on reasons and motivations as outlined by Ogden et al. [32]. According to Fiddes [14] the issue is not why we eat meat at all, but rather why we do so consistently and in such quantities, and often with such ceremony and strong emotional responses. Likewise Graça et al. [16] demonstrated that consumers have an affective connection towards meat that plays a role in their willingness to change consumption habits. They developed the so-called meat attachment scale (MEAS) and found that this scale is a separate, self-standing and relevant psychological construct with respect to meat consumption and substitution. According to their research, it was found to provide explanatory power above and beyond that of the Theory of Planned Behaviour components alone and represents a useful tool to further understand meat consumption and potential motivations for reduction [16].
Graça et al. [16] argue that the affection towards meat may represent a continuum, in which one end refers to disgust (i.e., negative affect and repulsion, related with moral internalization), while the other shows a pattern of attachment (i.e., high positive affect and dependence towards meat, and feelings of sadness and deprivation when considering abstaining from meat consumption) that may hinder a change in consumption habits. Meat attachment mirrors the main characteristic of the general concept of attachment, which is the presence of a positive bond and desire to maintain closeness to the object of attachment.
The MEAS consists of the following four dimensions: (1) hedonism (i.e. higher scores referring to meat represented as a source of pleasure), (2) affinity (i.e. higher scores indicative of affinity towards meat consumption), (3) entitlement (i.e. higher scores referring to feelings of entitlement towards meat consumption) and (4) dependence (i.e. higher scores indicating feelings of dependence on meat consumption).
One aim of this study is to validate the MEAS for Germany in order to analyse if meat attachment is a barrier towards a diet with less meat in this country. For this purpose, 15 out of the 16 items of the scale of Graca et al. [16] were selected for measuring the psychometric construct (see Table 2). One item of the original MEAS list did not enter into the online survey because of a pre-study [36] showed that a shortened 15-item scale still captures sufficiently all dimensions. Furthermore, the level of food neophobia of the participants was recorded via the food neophobia scale (FNS). FNS refers to a reluctance to eat unfamiliar foods [33]. It has been the subject of many studies across many countries, and it affects the quality as well as a variety of foods in the diet [7, 9, 13, 22, 27]. The knowledge about population segments that have greater or lesser neophobia allows for identifying early adopters of innovative products e.g. meat substitutes or cultured meat [45]. Food neophobia and unfamiliarity are especially relevant barriers in the case of cultural meat, while they have less relevance in the case of plant-based meat. As a matter of fact, in many countries, a growing number of plant-based meat products are already present on the market. In contrast, cultural meat has not been commercialized yet and is thus often perceived as an unfamiliar food product [25]. Similarly, Wilks et al. [47] identified cognitive factors related to food neophobia and distrust in biotechnology as important negative determinants of consumer willingness to buy cultured meat.
It is to highlight, that there are only very few studies that capture the constructs of meat attachment and food neophobia at the same time, whereas both exert an influence on the diet. According to Apostolidis and McLeay [3] and Siegrist and Hartmann [42] low levels of acceptance for meat substitutes have been associated with high levels of the construct food neophobia. Similar, has been been found from Graca et al. [16] for the MEAS. From this, it can be hypothesized that MEAS and FNS are linked to each other. Therefore, the correlation between both scales is analysed in this paper. Additionally, in this correlation analysis the Witzenhausen Food Inventory – Organic Food (WFI-OeL) (in press) and the social trust scale of Gefen and Straub [15] are considered as well. The first mentioned WFI-OeL is an item-set for measuring consumers preferences for organic food. Regular consumers of organic food have a higher ratio of plant to animal foods, with a strong relationship between vegetarian/vegan consumers and organic consumption [4, 43]. Contrarily, organic consumers evaluate meat substitutes more negatively than non-organic buyers [37]. This is the first study that examines the dependency between consumers' preference for organic food products and the MEAS. Furthermore, the correlation of the MEAS with the social trust scale of Gefen and Straub [15] is considered in this study. The latter scale demonstrated to have an impact on purchase decisions.
In the final part of the analysis, we consider the impact of all analysed scales on consumers' trust in different

food technology innovations e.g. foods made of plant-based proteins, cultured meat or products based on insect proteins. Furthermore, the impact on additional food processing technologies as e.g. high pressure, Crispr-CAS is analysed. Over the recent past, meat substitutes (in particular, plant-based meat, cultured meat and edible insects) have gained increasing popularity as an innovative way to circumvent some of the negative impacts induced by conventional meat production and consumption patterns [5, 23, 25, 28, 34], while also providing alternative sources to meet protein demand [2, 40]. However, its rapid growth is still countered by low consumer acceptance [24, 26, 31].
Before the presentation of the research method, data collection and the results, an overview of the use of the MEAS in research is given.

2 Research Findings - Meat Attachment Scale (MEAS) and interplay with Food Neophobia

Graça et al. [16] argued that holding a pattern of attachment towards meat consumption may hinder society's transition to a more plant-based diet and that the MEAS could be applied to analyse the acceptance of alternatives as e.g. meat substitutes or lab-grown meat. In their own studies, [16–18] they found that meat attachment measured by their developed MEAS is indeed negatively associated with the willingness and intentions to reduce meat consumption and to follow a more plant-based diet. Highly meat attached individuals eat meat more often and hold more positive attitudes towards it.
Likewise, other researchers like Wang et al. [46] found that Chinese and New Zealand's consumers' willingness to consume alternative proteins was significantly linked to all the four meat attachment factors (hedonism, affinity, entitlement and dependence). Lentz et al. [30] demonstrated that the MEAS was found to provide explanatory power above and beyond that of the theory of planned behaviour components alone and their results support the use of the MEAS as a tool to further understand meat consumption and potential motivations for reduction.
It is to highlight, that there are only two studies that consider the impact of the psychological constructs meat attachment and food neophobia on the intention to buy respectively the acceptance of meat alternatives (cultured meat, plant-based meat) simultaneously. Whereas in China, India, and the USA a higher level of food neophobia goes along with a lower acceptance for cultured and plant-based meat the findings for the effect of the MEAS are mixed [5]. In India and China, the MEAS exerts a positive effect on the intention to purchase clean (cultured) meat whereas no significant effect could be measured for the US. Concerning plant-based meat in the US with increasing meat attachment the intention to buy such an alternative falls whereas in China the opposite effect and in India, no significant effect can be found. Thus, it appears that cultural differences exist in the context of this construct. In a second study, Profeta et al. [38] analysed the impact of MEAS and FNS on so-called meat hybrids. In meathybrids, only a fraction of the meat product (e.g., 20% to 50%) is replaced with plant-based proteins. The idea of such a product is, that it may represent an option for the broad consumer segment that is not interested in totally vegan or vegetarian alternatives to meat. The findings show that both MEAS and FNS exerts a negative effect on the choice of this product type whereas the effect of the MEAS is stronger compared to the effect of the level of food neophobia.

3 Material and Methods

3.1 Data Collection

The online survey was carried out in Germany and after data cleaning 896 complete questionnaires could be collected (see Appendix **??**). The sample is representative for Germany concerning the parameters age, education, gender, and federal state. Data collection took place in the time period from 17th December 2020 until 5th January 2021 (see Table 1). The questionnaire contained two attention checks. Furthermore, speeders were eliminated and the data screened for recognising strategical answers patterns. For identifying speeders half of the median time needed for answering the questionnaire was chosen.

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Table 1: Sample

Attribute	characteristics	%
Gender	female	51.2
	male	49.8
Age groups	18-29 years	19.3
	30-39 years	17.9
	40-49 years	18.0
	50-59 years	25.2
	60-69 years	19.6
Education level	low	23.1
	middle	34.9
	high	42.0
Federal state	Schleswig-Holstein	3.6
	Hamburg	2.5
	Niedersachsen	9.9
	Bremen	0.8
	Nordrhein-Westfalen	22.0
	Hessen	6.0
	Rheinland-Pfalz	5.5
	Baden-Württemberg	14.2
	Bayern	14.6
	Saarland	1.1
	Berlin	4.0
	Brandenburg	3.5
	Mecklenburg-Vorpommern	2.0
	Sachsen	5.1
	Sachsen-Anhalt	2.2
	Thüringen	3.0

Consumer data were collected using a quantitative online survey approach. The respondents have been recruited by the market research company GapFish (www.gapfish.com). All participants used a checkbox on the questionnaire to indicate their informed consent. The questionnaire comprised questions about general meat consumption on the one hand and specific questions concerning preferences for meat substitutes on the other hand (see questionnaire in the Supplementary Materials). At the end of the questionnaire, participants were asked for demographic information, including age (range 18 to 69 years), gender, and education. Finally, participants were invited to provide any final comments before being debriefed and thanked for their time. For the online questionnaire the software SoSci that is running on its own Quick & Smart survey-server of the German Institute of Food Technology.

3.2 Data Analysis

3.2.1 Applied Scales

For scale development (MEAS, FNS, WFI-OeL-organic index, social trust scale) Cronbach's alpha is calculated and reported. For MEAS, the participants answered on a five-point response scale [16] that was verbally and numerically anchored (1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree). The items indicated with (r) in Table 2 were inversely re-coded. When considering that the inclusion of invalid items creates the risk of invalid conclusions [21], an exploratory factor analysis (Varimax rotation, eigenvalues greater than one) and confirmatory factor analysis were carried out in order to explain the variability of the MEAS. Furthermore, the distribution of the summed scale values of the individuals was checked via a QQ-plot for normal distribution.

For measuring FNS, the list of Pliner and Hobden [33] was selected (see Table 4). The wording of the German version has been chosen from a study by Siegrist and Hartmann [42]. The participants answered on a five-point response scale that was verbally and numerically anchored (1 = totally disagree, 2 = disagree, 3 = neither disagree nor agree 4 = agree, and 5 = totally agree). The five-point scale was used instead of the originally used seven-point scale for a better display of the questionnaire on tablets and smartphones. The items indicated with (r) were inversely re-coded.
For measuring the organic preference of the respondent the WFI-OeL inventory (in press) was applied whereas for the construct social trust the three-item scale of Gefen and Straub [15] was used.
For revealing relationships across the scales a correlation analysis was carried out. For this purpose for each individual, the summed value for each of the scales was calculated.

3.2.2 Regression analysis

In the regression analysis, the impact of the considered scales on the trust in selected food technologies respectively alternative proteins as dependent variable were analysed. Trust in food technologies was measured on a five-point response scale that was verbally and numerically anchored (1 = no trust at all, 2 = less trust, 3 = neither disagree nor agree 4 = high trust, and 5 = very high trust). Trust has been measured for the following food (processing) technologies: High-pressure approach, cultured meat, plant-based meat, insect-protein based meat substitutes), Crispr-CAS, Ohmic heating and Pulsed electric fields (source). Before the evaluation of these technologies, the respondents received a simple explanation of each technology.

4 Results and Discussion

4.1 Meat Attachment Scale (MEAS)

4.1.1 Descriptives

On average, the respondents agree to all of the statements (see Table 2). The highest means received the statements 'I love meals with meat' (3.71) and the reverse-coded item 'Meat reminds me of diseases'(4.22). This evaluation demonstrates that most of the respondents consider meat not as an unhealthy product but as an essential part of their diet. The higher the MEAS-score, the higher individual's attachment to meat.
For Germany, we received with a mean value of 3.4 ($\sigma = 0.95$) for the total scale (15 items $\Rightarrow$ see exploratory and confirmatory factor analysis) similar values as Graca et al. [16] for the two Spanish samples (study 1: $\overline{x} = 3.4$, $\sigma = 0.8$; study 2: $\overline{x} = 3.6$, $\sigma = 0.9$). Compared with the findings of Bryant et al. [5] we found lower values than in the USA ($\overline{x} = 3.8$, $\sigma = 0.54$) and China ($\overline{x} = 3.7$, $\sigma = 0.5$) whereas Germany has a higher meat attachment as India ($\overline{x} = 3.3$, $\sigma = 0.7$).
The distribution of individuals MEAS-values (see Figure 1) and the corresponding QQ-plot (see Figure 2) reveal an approximately normal distribution of the scale.

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Table 2: Descriptive Results MEAS.

Statement	**std. α**	$\overline{x}$	σ
i1: I love meals with meat.	0.93	3.71	1.15
i2: To eat meat is one of the good pleasures in life.	0.93	3.04	1.26
i3: I'm a big fan of meat.	0.93	3.28	1.30
i4: A good steak is without comparison.	0.94	3.43	1.36
i5: By eating meat I'm reminded of the death and suffering of animals.(r)	0.94	3.65	1.24
i6: To eat meat is disrespectful towards life and the environment.(r)	0.94	3.54	1.25
i7: Meat reminds me of diseases.(r)	0.94	4.22	1.06
i8: To eat meat is an unquestionable right of every person.	0.94	3.34	1.27
i9: According to our position in the food chain, we have the right to eat meat.	0.94	3.08	1.28
i10: Eating meat is a natural and indisputable practice.	0.94	3.50	1.17
i11: I don't picture myself without eating meat regularly.	0.93	3.20	1.36
i12: If I couldn't eat meat I would feel weak.	0.93	2.95	1.41
i13: I would feel fine with a meatless diet.(r)	0.94	3.32	1.25
i14: If I was forced to stop eating meat I would feel sad.	0.94	2.97	1.39
i15: Meat is irreplaceable in my diet.	0.93	3.04	1.34

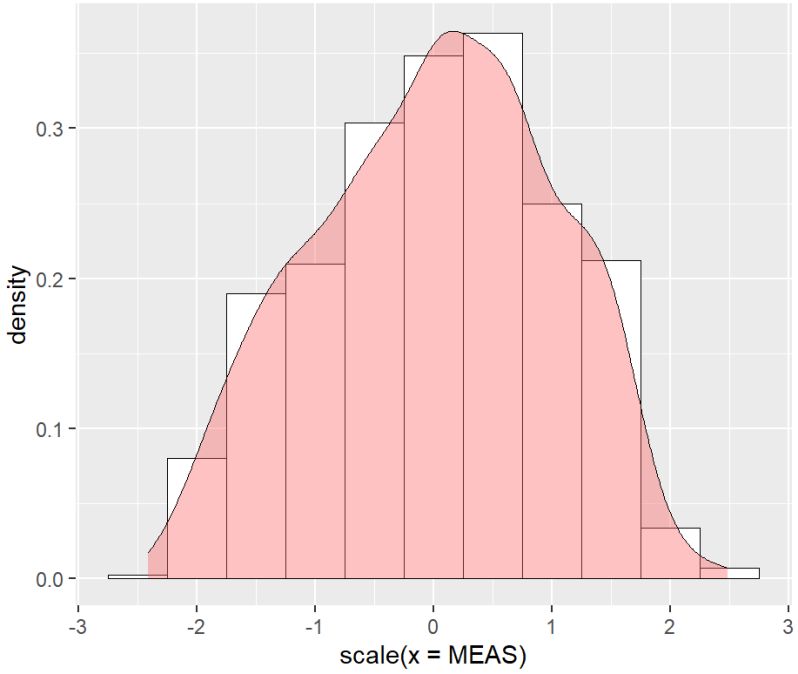

Figure 1: Distribution standardised MEAS-values

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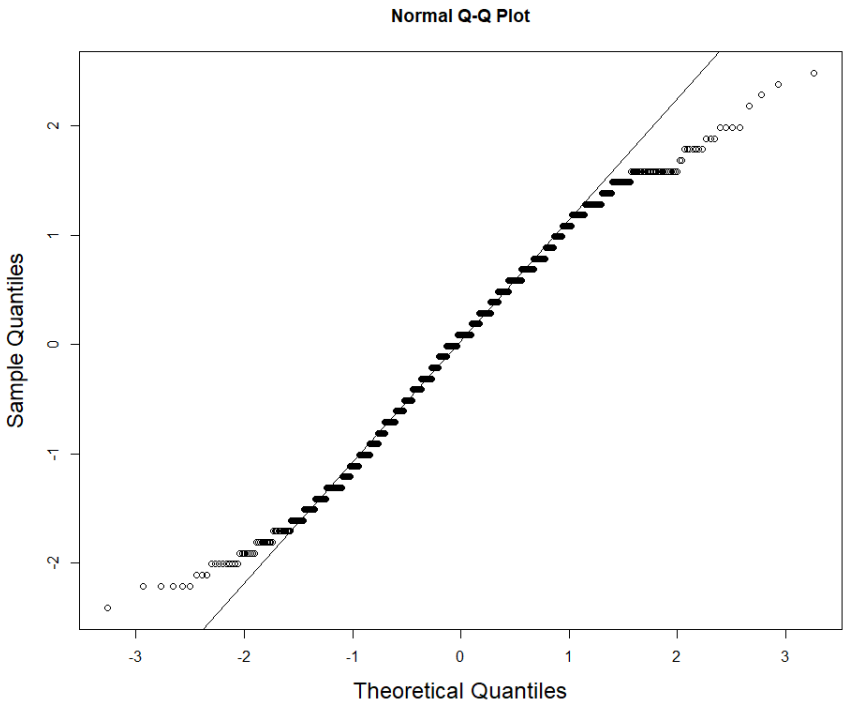

Figure 2: QQ-Plot standardised MEAS-values

4.1.2 Exploratory and Confirmatory Factor Analysis

The exploratory factor analysis resulted in a model with four factors which explains 70% of the variance (see Table 3). The findings confirm the research of Graca et al. [16] and the four underlying factors hedonism, affinity, entitlement and dependence can be identified.

Due to the confirmatory factor analysis (see Figure 3), the item "I would feel fine with a meatless diet"(i13) was deleted from the MEAS. In the four-factor solution, this item has a similar loading on different factors and its deletion increased the calculated indices. The reliability analysis for the global MEAS (14 items) showed a high internal consistency with a standardized Cronbach α of 0.94. The Comparative Fit Index (CFI = 0.961), the Tucker–Lewis Index (TLI = 0.951), and the Root Mean Square Error of Approximation (RMSEA = 0.076) are acceptable.

Table 3: Explorative Factor Analysis - MEAS.

	Factors				
Statement	**1**	**2**	**3**	**4**	h^2
i1: I love meals with meat.	**0.68**	-0.31	0.30	0.28	0.73
i2: To eat meat is one of the good pleasures in life.	**0.72**	-0.18	0.36	0.29	0.76
i3: I'm a big fan of meat.	**0.81**	-0.21	0.34	0.27	0.90
i4: A good steak is without comparison.	**0.61**	-0.28	0.28	0.24	0.59
i5: By eating meat I'm reminded of the death and suffering of animals.(r)	-0.24	**0.77**	-0.19	-0.17	0.71
i6: To eat meat is disrespectful towards life and the environment.(r)	-0.14	**0.75**	-0.18	-0.24	0.67
i7: Meat reminds me of diseases.(r)	-0.15	**0.71**	-0.07	-0.04	0.53
i11: I don't picture myself without eating meat regularly.	0.43	-0.26	**0.57**	0.35	0.71
i12: If I couldn't eat meat I would feel weak.	0.35	-0.15	**0.78**	0.27	0.83
i13: I would feel fine with a meatless diet.(r)	-0.35	**0.46**	**-0.48**	-0.23	0.62
i14: If I was forced to stop eating meat I would feel sad.	0.29	-0.19	**0.82**	0.24	0.86
i15: Meat is irreplaceable in my diet.	0.46	-0.22	**0.61**	0.38	0.77
i8: To eat meat is an unquestionable right of every person.	0.19	-0.09	0.17	**0.62**	0.45
i9: According to our position in the food chain, we have the right to eat meat.	0.25	-0.15	0.24	**0.68**	0.61
i10: Eating meat is a natural and indisputable practice.	0.29	-0.34	0.28	**0.64**	0.69
Cumulative variance	0.20	0.39	0.55	0.70	

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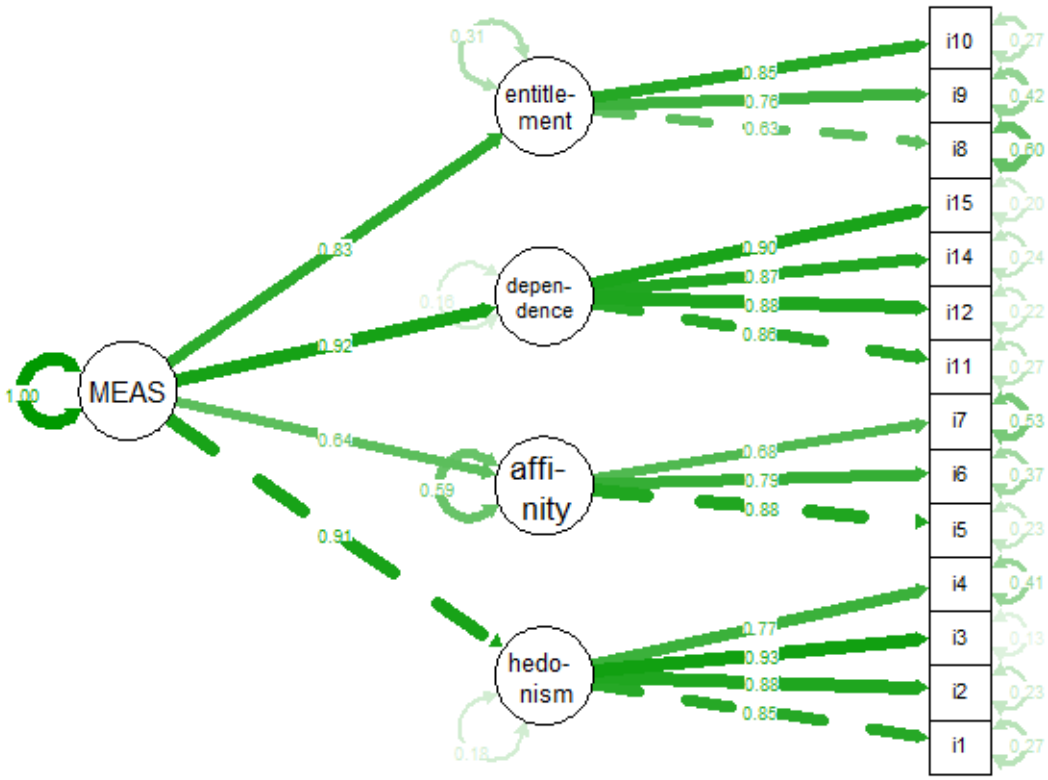

Figure 3: Graphical presentation of CFA

4.2 Scales - FNS, Organic Index, Social trust

After deleting one item from the original FNS-list due to a low item-correlation in the reliability analysis, FNS showed an acceptable internal consistency with a standardized Cronbach α of 0.83 (see Table 4). The deleted item was: "I am very particular about the food I eat". Likewise, the social trust scale (α=0.84) and the organic scale (α=0.83) showed acceptable Cronbach α values (see Tables 5 and 6).

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Table 4: Food neophobia scale (FNS).

Statement	**std. α**	$\overline{x}$	σ
I constantly taste new and different foods.(r)	0.75	3.18	1.06
I do not trust new foods.	0.78	3.33	0.99
If I don't know what a food is, I won't try it.	0.80	2.94	1.09
I prefer food from different cultures.(r)	0.76	3.35	1.08
I'm afraid to eat foods that I did not eat before.(r)	0.76	3.03	1.11
If I go to a buffet, meetings or parties, I'll eat new food.	0.74	3.57	1.10
I am very particular about the food I eat.	0.83	3.30	0.99
I eat whatever is good.(r)	0.78	3.31	1.22
I like to try new ethnic restaurants. (r)	0.75	3.52	1.17
Ethnic food looks to weird to eat.	0.78	3.89	1.14

Table 5: Organic scale.

Statement	**std. α**	$\overline{x}$	σ
When I buy foods I prefer organic products.	0.77	3.08	1.19
Organic food is healthier than conventional food.	0.80	3.34	1.09
I trust producer of organic foods more than conventional producers.	0.78	3.21	1.16
I do not buy organic foods, because they are too expensive.(r)	0.83	3.02	1.29
I do see only marginal differences between organically and conventionally produced foods.(r)	0.83	3.16	1.17

Table 6: Social trust scale

Statement	**std. α**	$\overline{x}$	σ
I generally trust other people.	0.80	3.10	0.92
I feel that people are generally trustworthy	0.75	3.04	0.94
I feel that people are generally reliable.	0.78	3.01	0.90

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4.3 Correlations between MEAS, FNS, Organic Index and Social Trust

The correlation analysis (Figure 4) reveals that the preference for organic foods is negatively linked with respondents' meat attachment (-0.40***). The higher the preference for organic foods the lower is an individual's meat attachment.The correlation can be considered as strong. This result is in line with the behavioural data from Baudry et al. [4] and Simoes-Wüst et al. [43] which found that organic consumers have a lower meat consumption compared to non-organic consumers.

Contrarily to this first finding, no significant correlation between MEAS and FNS can be found. This is surprising because due to a recent study in Germany [38] both scales showed to exert a negative effect on the choice of meat alternatives. Thus, it appears as if for Germany both constructs can be considered as completely independent from each other despite the fact that both negatively affect the consumption of meat alternatives. People with high meat attachment are not identical with people that reveal high levels of food neophobia.

At a first glance, it appears as if there is only a small negative correlation between organic preference and food neophobia (-0.05). Nonetheless, the inspection of the scatter-plot (Figure 4) reveals that this negative effect is higher in the range from a medium to a high level of food neophobia. Thus higher levels of food neophobia are associated with a lower preference for organic foods.

The social trust scale is positively correlated with the preference for organic products (0.15***) and negatively correlated with food neophobia (-0.13***). Interestingly, there is no correlation between MEAS and social trust.

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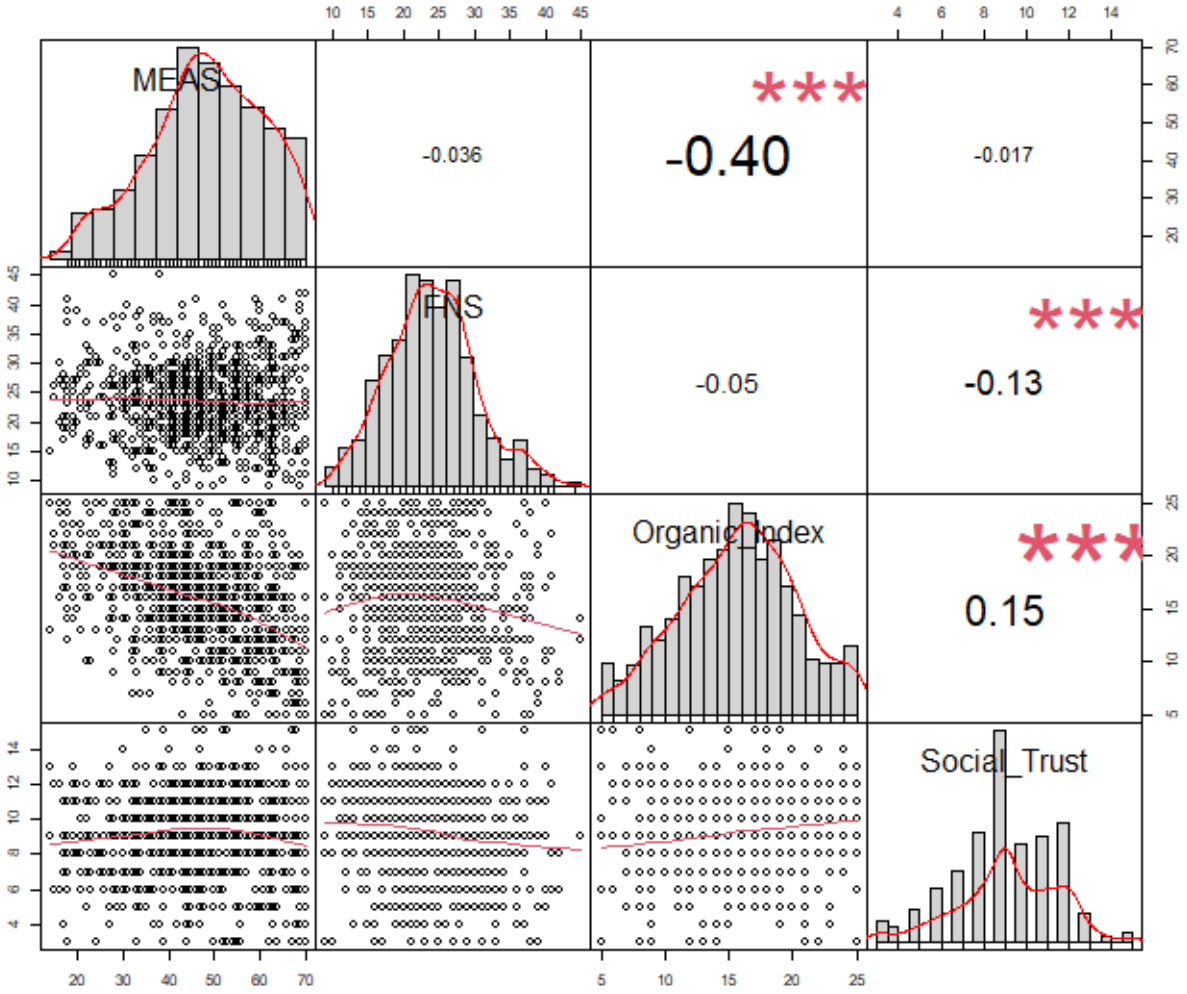

Figure 4: Correlation plot—MEAS, FNS, Organic Index, Social Trust.

4.4 Impact of MEAS, FNS, Organic Index, and Social Trust on Trust in Food Technologies

The survey reveals that consumers trust the high-pressure technology, the ohmic heating and pulsed electric field technique most whereas the genome editing approach via Crispr-CAS and cultured meat are trusted least (Figure 5). Focusing on the meat alternatives, consumers have a significantly higher trust in plant-based foods compared to insect protein-based products and cultured meat. This trust ranking for alternative proteins is in line with the preference ranking found for these product types in literature [12, 44]. From this, it can be concluded that trust in the analysed meat alternatives is a good predictor and antecedent for the final preference in the same products.

In the regression analysis the impact of the considered scales on the selected food technologies respectively alternative proteins was analysed (Figure 6, see Table 7 in the Annex for detailed coefficients). For use in the regression analysis, the individual scores, which is the z-standardised mean value across the items of the four scales, were calculated.

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In general, it can be stated that food neophobia has significant negative effects on the trust perception of all technologies with the exemption of the Crispr-CAS approach. Contrarily, with increasing social trust all technologies are trusted more.
In this study, meat attachment has negative effects on the trust of all three protein alternatives but no negative effects on the other processing technologies. This finding confirms the studies of Circus et al. [8] who likewise found such a relationship between meat attachment and meat substitutes. Interestingly, the negative effect is highest for plant-based proteins and lowest for insect-protein based products. It is to highlight, that contrarily to the findings of Bryant et al. [5] for India and China, a high meat attachment exerts a negative effect on the trust in cultured meat.
Concerning protein alternatives, the organic preference measured by the organic index has no impact on the trust evaluation of cultured meat or insect protein-based products. Only for plant-based meat alternatives and high-pressure technology, positive effects can be found. Furthermore, the organic preference negatively influences the trust perception of the genome-editing technique Crispr-CAS.

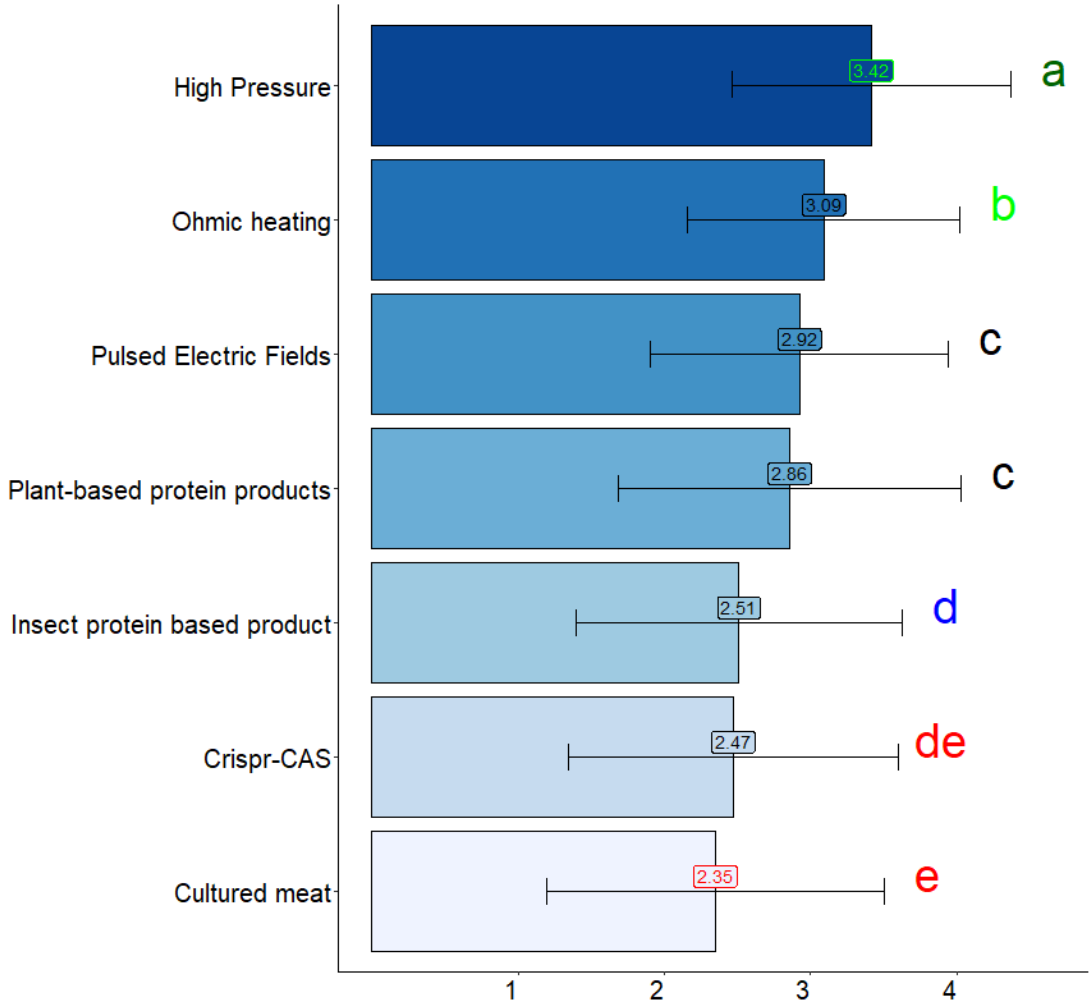

Figure 5: Trust (1= 'no trust at all' to 5= 'very high trust') in different food technologies (Different letters indicate a significant different trust perception ($p<0.05$))

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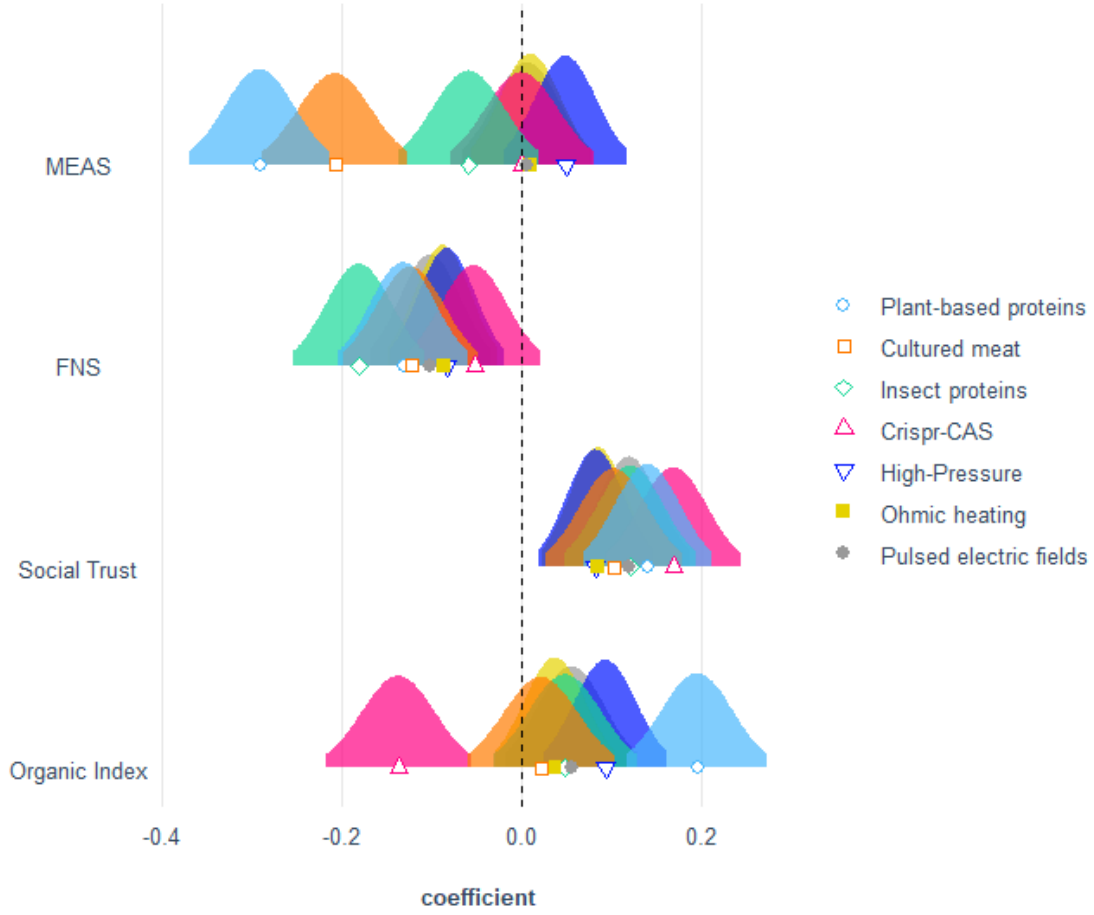

Figure 6: Regression plots - Impact of applied scales on trust in different food (processing) technologies

5 Conclusions

The findings show that the MEAS can be applied in Germany and a similar structure as reported by Graça et al. [16] could be found. Furthermore, the relatively high mean value of the scale indicates that this construct could play a role in preference/trust formation for meat alternatives in Germany. This hypothesis is confirmed by the applied regression analysis. A high level of meat attachment goes along with lower trust in plant-based proteins. Similar holds for cultured meat. Thus it appears that at least at the moment cultured meat is not a logical substitute for the heavily meat attached consumer.
Surprisingly, the correlation analysis demonstrated that FNS and MEAS are not correlated with each other. That is, that meat attachment represents an independent and single predictor for trust in food (processing) technologies as e.g. plant-based proteins or cultured meat. Thus highly food neophobic consumers are not equal to highly meat attached respondents and vice versa. Therefore, in a next research step it is planned to analyse sociodemographic and attitude differences between the groups for gaining detailed insight into both segments.
The results of this study already illustrate very clearly that the preference for organic products and the underlying attitude constructs appear to play an important role in this context. Whereas the preference for organic products and food neophobia are not correlated there is a strong and negative correlation between MEAS and the applied organic scale. Therefore, it appears that highly meat attached consumers reveal a

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less sustainable consumption behaviour.

6 Appendix

Table 7:

	Dependent variable:						
	TA30_13 plant-based proteins	TA30_14 cultured meat	TA30_15 insect protein	TA30_07 Crispr-CAS	TA30_02 High Pressure	TA30_08 Ohmic heating	TA30_12 Pulsed electric fields
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
meas_scale	−0.291***	−0.207***	−0.059	0.0003	0.049	0.010	0.006
	(0.039)	(0.041)	(0.040)	(0.041)	(0.035)	(0.034)	(0.037)
fns_scale	−0.132***	−0.123***	−0.181***	−0.052	−0.083***	−0.087***	−0.102***
	(0.036)	(0.038)	(0.037)	(0.038)	(0.032)	(0.031)	(0.034)
bio_scale	0.195***	0.022	0.049	−0.137***	0.093***	0.037	0.056
	(0.040)	(0.042)	(0.040)	(0.041)	(0.035)	(0.034)	(0.037)
social_trust_scale	0.140***	0.103***	0.121***	0.169***	0.082**	0.085***	0.119***
	(0.037)	(0.038)	(0.037)	(0.038)	(0.032)	(0.032)	(0.034)
Constant	2.857***	2.348***	2.511***	2.471***	3.415***	3.092***	2.924***
	(0.036)	(0.038)	(0.036)	(0.037)	(0.032)	(0.031)	(0.034)
Observations	896	896	896	896	896	896	896
R^2	0.160	0.057	0.051	0.035	0.028	0.022	0.032
Adjusted R^2	0.156	0.053	0.046	0.031	0.024	0.018	0.028
Residual Std. Error (df = 891)	1.077	1.125	1.092	1.111	0.944	0.924	1.003
F Statistic (df = 4; 891)	42.487***	13.430***	11.897***	8.171***	6.517***	5.067***	7.382***
Note:							*p<0.1; **p<0.05; ***p<0.01

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