FUNDAÇÃO GETULIO VARGAS
ESCOLA BRASILEIRA DE ADMINISTRAÇÃO PÚBLICA E DE EMPRESAS
MESTRADO EM GESTÃO EMPRESARIAL

MARKETING STRATEGIES FOR CULTURED MEAT

DISSERTAÇÃO APRESENTADA À ESCOLA BRASILEIRA DE ADMINISTRAÇÃO PÚBLICA E DE EMPRESAS PARA OBTENÇÃO DO GRAU DE MESTRE

LEA DOEPKENS

Rio de Janeiro - 2023

Dados Internacionais de Catalogação na Publicação (CIP)
Ficha catalográfica elaborada pelo Sistema de Bibliotecas/FGV

Doepkens, Lea

Marketing strategies for cultured meat / Lea Doepkens. – 2023.

52 f.

Dissertação (mestrado) – Escola Brasileira de Administração Pública e de Empresas, Centro de Formação Acadêmica e Pesquisa.
Orientador: Yan Bernardes Vieites.
Inclui bibliografia.

1. Sustentabilidade. 2. Marketing. 3. Comportamento do consumidor. 4. Carne – Indústria -Brasil. I. Vieites, Yan. II. Escola Brasileira de Administração Pública e de Empresas. Centro de Formação Acadêmica e Pesquisa. III. Título.

CDD - 338.476649

Elaborada por Marcelle Costal de Castro dos Santos - CRB-7/016/20

FUNDAÇÃO GETULIO VARGAS
MESTRADO EM GESTÃO EMPRESARIAL
ESCOLA BRASILEIRA DE ADMINISTRAÇÃO PÚBLICA E DE EMPRESAS

LEA DÖPKENS

"MARKETING STRATEGIES FOR CULTURED MEAT''.

DISSERTAÇÃO APRESENTADA AO CURSO DE MESTRADO EM GESTÃO EMPRESARIAL PARA OBTENÇÃO DO GRAU DE MESTRA EM ADMINISTRAÇÃO.

DATA DA DEFESA: 06/07/2023

ASSINATURA DOS MEMBROS DA BANCA EXAMINADORA

PRESIDENTE DA COMISSÃO EXAMINADORA: PROFº YAN BERNARDES VIEITES CASTRO DOS SANTOS

PROFº YAN BERNARDES VIEITES CASTRO DOS SANTOS
ORIENTADOR

PROFº RAFAEL GUILHERME BURSTEIN GOLDSZMIDT
MEMBRO INTERNO

PROFº JOÃO PEDRO NIZA JACINTO BRAGA
MEMBRO EXTERNO

PROFº DANIEL FERNANDES
MEMBRO EXTERNO

RIO DE JANEIRO, 06 DE JULHO DE 2023.

PROFº FLAVIO CARVALHO DE VASCONCELOS
DIRETOR

PROFº ANTONIO DE ARAUJO FREITAS JUNIOR
PRÓ-REITOR DE ENSINO, PESQUISA E PÓS-GRADUAÇÃO

D4Sign 72633108-a6eb-46e5-b942-201e7fed2c47 - Para confirmar as assinaturas acesse https://secure.d4sign.com.br/verificar
Documento assinado eletronicamente, conforme MP 2.200-2/01, Art. 10º, §2.

Lea Döpkens

Marketing Strategies for Cultured Meat

Master's thesis presented to Master in Management program, Escola Brasileira de Administração Pública, Fundação Getulio Vargas, as a requirement for obtaining the title of Master in Management.

Advisor: Yan Bernardes Vieites

Rio de Janeiro, 2023

Dedication page

I dedicate this work to the visionaries in business who work tirelessly to create a sustainable future.

Acknowledgements

With this dissertation, the journey of my last years and my masters comes to an end. I would like to say thank you to the institutions, without which my reality and my horizon, both professionally and personally, would be very different today. Católica Lisbon School of Business and Economics and Fundação Getulio Vargas Escola Brasilieria de Administração Pública e de Empresas made me build up profound and high-quality knowledge in the fields of Marketing and Sustainability Management and grow personally from people skills to dealing with moral in business. At both institutions I met inspiring people such as inspiring professors like Kyryl Lakishyk and Sergio Henrique Collaço de Carvalho, whose impact extended beyond the lectures, people who made everything possible outside the lectures, like Anderson Ricci, and people without whom all the effort and joy would not have been half as enriching and whom I can now call my friends.

Aiming to combine both fields Marketing and Sustainability Management within the final chapter of my masters, I am beyond thankful for my supervisor Yan Bernardes Vieites Castro, who supported me to conduct this purposeful study. His expertise, mentorship and enthusiasm did highly contribute to the outcome of my thesis. Also, the support and expertise of Larissa Elmor was crucial to my achievement in this study. I thank both very much for their friendly nature, which always made the joint work pleasant and enriched my experience.

An outstanding inspiration in my studies and probably the most decisive influence for the decision to write my thesis on consumer behavior and sustainability is my Professor Jose Mauro Nunes. He is one of the most passionate, inspiring, and generous people I have had the privilege to know.

Finally, I am forever grateful to my parents Monika and Michael for providing me with the circumstances, the mindset, and the support without which I would never have been able to embark on this journey and complete the master's degree.

Table of Contents

Abstract VII
1. Introduction 1
2. Literature Review 2
2.1 Promoting the Consumption of Cultured Meat 2
2.2 The Promotion of Cultured Meat Across Countries 5
3. Research Objectives & Hypotheses 6
4. Methodology 8
4.1 Sampling Strategy 8
4.2 Design and Procedure 8
5. Results 11
5.1 Sample Description 11
5.2 Summary Statistics and Correlations 13
5.3 Manipulation Check 13
5.4 Hypotheses testing 15
5.4.1 Hypothesis 1 15
5.4.2 Hypothesis 2 17
5.4.3 Exploratory Analyses 20
7. Discussion 24
7.1 Theoretical Implications 26
7.2 Managerial Implications 27
8. Conclusions 28
Appendices 31
References 33
Annex 38

List of illustrations

List of Tables

Table 1 - Demographics of current sample compared to Brazilian National Data 12
Table 2 - Demographics of current sample compared to German National Data 12

List of Figures

Figure 1 - Hypothesis1 Effect sentiment towards cultured meat 16
Figure 2 - Hypothesis1 Effect willingness to purchase cultured meat 16
Figure 3 - Exploratory Analyses Sustainability Condition 22
Figure 4 - Exploratory Analyses Health/safety Condition 22
Figure 5 - Exploratory Analyses Taste Condition 23

List of symbols, Abbreviations and Acronyms

GHG = Greenhouse gas

i.e. = That is

E.g. = For example

DV = Dependent variable

USD = United States Dollar

M = Mean

SD = Standard deviation

SE = Standard error

β = Beta coefficient

p = P-value

Abstract

Purpose - Climate change marks one of the most crucial times in the history of our society and requires a shift in current patterns of consumption. Thus, it is imperative for companies to offer sustainable alternatives and for research to develop strategies to market these alternatives as successfully as possible on a global scale. In regard to this challenge, this study aims to formulate marketing strategies that will enable successful commercialization of cultured meat across developing and developed countries.

Methodology - I conducted an experiment to investigate consumer attitude towards cultured meat by manipulating the accessibility of different benefits of these meat alternatives (i.e., sustainable, health/safety and taste benefits). At the same time, the effect of these benefits on the perceived environmental friendliness, taste, and safety/health of cultured meat relative to traditional meat is measured. Differences between Brazilians and Germans are explored, and managerial recommendations and theoretical contributions are derived.

Findings - There was a positive effect of communication about sustainability on willingness to pay for cultured meat. However, highlighting information about taste or health/safety benefits could not influence more positive attitudes toward cultured meat. Significant differences between developing and developed countries could not be uncovered.

Research limitations - This study is limited by the size of the survey sample which is neither representative for the Brazilian nor for the German population. Also, the distribution of participants is imbalanced across countries, which compromised cross-country comparisons.

Originality/ Value - This study combines the investigation of demand-side factors that could influence consumers' acceptance of cultured meat with a consideration of cultural influencing factors in the process of opinion formation on cultivated meat.

Keywords: Cultured Meat, Consumer Behavior, Sustainability

Category: Master Thesis

Resumo

Objetivo - A mudança climática marca um dos momentos mais cruciais da história da nossa sociedade e exige uma mudança nos padrões atuais de consumo. Assim, é imperativo que as empresas ofereçam alternativas sustentáveis e que a pesquisa desenvolva estratégias para comercializar essas alternativas com o maior sucesso possível em escala global. Com relação a esse desafio, este estudo tem como objetivo formular estratégias de marketing que permitam a comercialização bem-sucedida de carne cultivada em países desenvolvidos e em desenvolvimento.

Metodologia - Realizei um experimento para investigar a atitude do consumidor em relação à carne de cultura, manipulando a acessibilidade de diferentes benefícios dessas alternativas de carne (ou seja, benefícios sustentáveis, de saúde/segurança e de sabor). Ao mesmo tempo, o efeito desses benefícios sobre a percepção de respeito ao meio ambiente, sabor e segurança/saúde da carne de cultura em relação à carne tradicional é medido. As diferenças entre brasileiros e alemães são exploradas, e recomendações gerenciais e contribuições teóricas são derivadas.

Resultados - Houve um efeito positivo da comunicação sobre sustentabilidade na disposição de pagar pela carne de cultura. Entretanto, destacar informações sobre o sabor ou os benefícios para a saúde/segurança não influenciou atitudes mais positivas em relação à carne de cultura. Não foi possível descobrir diferenças significativas entre países desenvolvidos e em desenvolvimento.

Limitações da pesquisa - Este estudo é limitado pelo tamanho da amostra da pesquisa, que não é representativa nem da população brasileira nem da alemã. Além disso, a distribuição dos participantes é desequilibrada entre os países, o que comprometeu as comparações entre os países.

Originalidade/valor - Este estudo combina a investigação dos fatores do lado da demanda que poderiam influenciar a aceitação da carne cultivada pelos consumidores com uma consideração dos fatores culturais que influenciam o processo de formação de opinião sobre a carne cultivada.

Palavras-chave: Carne cultivada, Comportamento do consumidor, Sustentabilidade

Categoria: Dissertação de Mestrado

1. Introduction

The food business is one of the largest contributors to worldwide greenhouse gas (GHG) emissions, accounting for nearly 30 percent of all human-caused GHG emissions (United Nations, 2022). One-third of the world's freshwater is used by the livestock industry, which also contributes to approximately 14 percent of all GHG emissions (UNFCCC, 2021). Thus, changing patterns of food consumption is at the center of the debate on how to promote a more sustainable future. In particular, reducing meat consumption is cornerstone to reducing GHG emissions worldwide. However, as the world's population continues to grow, there is a projected surge in the global demand for meat over the next years (OECD & FAO, 2022).

The popularity of meat substitutes has been identified as one of the means to address the issue of global warming and climate change (Verbeke et al., 2014). The demand for meat substitutes has significantly increased in recent years due to, among other factors, environmental awareness (Tziva et al., 2020). The growing acceptance of meat substitutes is noticeable. German businesses produced 97,900 tons of meat substitutes in 2021, reflecting an increase of 17 percent from 2020 and 62 percent from 2019 (Barkhausen, 2022). Developing economies such as Brazil also show a rising trend towards meat substitutes, with expected market growth rates of 23 percent annually from 2023 to 2027 (Statista, 2022).

One specific way to substitute traditional meat is cultured meat, which is meat that is generated by growing muscle tissue using animal cells in a lab, also known as lab-grown meat or cell-based meat (Tuomisto & Teixeira de Mattos, 2011). Cultured meat offers a distinct advantage over plant-based alternatives, which rely on plant proteins to mimic the taste and texture of meat (Bryant & Barnett, 2020). The market for cultured meat is still in its early stages of development but is projected to more than double by 2030, indicating significant potential for growth and development in the industry in the near future (Brennan et al., 2021). However, despite the increasing demand for this type of food, many consumers are still hesitant to incorporate meat alternatives into their diets (Brennan et al., 2021; Gómez-Luciano et al., 2019; Nezlek & Forestell, 2022; Ritchie et al., 2018). In this research, we examine the effectiveness of different communication strategies in promoting the consumption of cultured meat. Specifically, we investigate which of the following aspects increases consumers' acceptance of cultured meat the most: sustainability, taste, or healthiness and safety.

The current work contributes to different streams of research. First, it adds to the literature on how to encourage the consumption of meat alternatives in general (Nezlek & Forestell, 2022) and cultured meat in particular (Weinrich, 2018). Research on cultured meat is still very incipient, mostly focused on documenting consumers' baseline perceptions about this type of meat alternative (Rolland et al., 2020) and generally derived from developed countries (Neuhofer & Lusk, 2022; Ritchie et al., 2018). In this research, we extend previous findings by (a) investigating the relative effectiveness of different communication strategies in promoting cultured meat (rather than simply documenting baseline attitudes) and (b) examining samples from developed and developing economies within the scope of a single study. As cultured meat can help address the increasing climate change, this work also contributes to the fast-growing literature at the intersection of food decision-making and sustainability (Tilman & Clark, 2014; Tosun et al., 2021; Tziva et al., 2020).

Moreover, this research offers insightful information to marketers in the food industry, especially those seeking to expand into new markets and roll out cultured meat products. Companies can create focused marketing efforts to increase consumer acceptance and boost revenue by identifying the most effective marketing messages. It also provides guidance to governmental and non-governmental organizations seeking to promote more sustainable diets among the population at large. Finally, it offers valuable information to customers themselves, assisting them in better understanding the potential advantages of cultured meat and informing their dietary decisions.

2. Literature Review

2.1 Promoting the Consumption of Cultured Meat

Although cultured meat has gained popularity (Verbeke et al., 2014), the concept of cultured meat is still unappealing to a relevant share of customers (Nezlek & Forestell, 2022). Research has found that many consumers are more receptive to incorporating various types of alternative proteins into their diets than they are to eating cultured meat (Weinrich et al., 2020). On top of supply-side barriers such as the steep prices and the lack of widespread product availability, there are potential "demand-side" causes for this reluctance. Hence, encouraging the adoption

of cultured meat requires an awareness of the factors contributing to consumer opposition. By more deeply understanding the barriers to the adoption of this meat alternative, it is possible to develop strategies for convincing consumers to explore cultured meat and possibly boost its consumption.

A possible explanation for the resistance to cultured meat is that consumers simply fail to fully appreciate its environmental benefits. The production of traditional meat significantly contributes to greenhouse gas emissions, with livestock responsible for about 14 percent of global emissions (UNFCCC, 2021). In contrast, cultured meat production has the potential to reduce greenhouse gas emissions by up to 96 percent, according to Tuomisto and Mattos (2011). Additionally, traditional meat production requires extensive land use, including for grazing, feed crops, and processing facilities (United Nations, 2022). Cultured meat production can be conducted in a smaller space, freeing up land for other uses, such as reforestation (Newton & Blaustein-Rejto, 2021). Traditional meat production also uses a significant amount of freshwater, with estimates suggesting that producing one kilogram of beef can take up to 15,400 liters of water (UNESCO-IHE, 2010). In contrast, cultured meat production requires significantly less water than traditional meat production (Tuomisto & Teixeira de Mattos, 2011).

Given that cultured meat is a relatively new product in the market, many consumers may subconsciously be faced with the so called “Ethical Purchasing Gap” identified as the notable disparities that exist between consumers' expressed intentions to buy products based on ethical considerations, and their actual purchasing patterns (Bray et al., 2011). Therefore, while sustainable alternatives such as cultured meat may offer environmental benefits, consumers may not always perceive them as such. In fact, it is not clear how consumers would behave even when they know that this meat alternative is more sustainable. This is because green products are sometimes perceived as being of lower quality, a phenomenon known as sustainability liability effect (Bray et al., 2011; Luchs et al., 2010).

There are at least two other factors identified in the literature that may contribute to consumers' resistance to incorporating cultured meat into their diets: perceptions of taste and concerns regarding healthiness. When it comes to taste, research shows that customers often do not want to give up taste and flavor in favor of health or environmental benefits, as they worry that cultured meat may not taste or feel the same as traditional meat (Font-i-Furnols & Guerrero,

2014). Therefore, taste and texture play a vital role in consumers' acceptance of cultured meat. More closely related to the current research, previous findings have shown that consumers may be reluctant to try cultured meat if they believe it to be inferior in taste or texture to regular meat. Taste and texture are crucial elements in food adoption (Tosun et al., 2021). According to research, consumers prefer meat that is soft, juicy, and tasty, with texture being an important consideration in meat preference (Font-i-Furnols & Guerrero, 2014). Supporting this insight, Siegrist et al. (2018) demonstrated that cultured meat's lack of naturalness, may make it difficult for consumers to accept the innovative product. Their experiment shows that when cultured meat is viewed as unnatural and thus fails to fulfill their standard of meat taste, it not only has a low acceptance rate but is also viewed less favorably than regular meat overall. Another misconception is that because cultured meat lacks fat and connective tissue, it may have a different flavor (Laestadius & Caldwell, 2015).

A second challenge is the safety concerns raised by consumers regarding the long-term health implications of consuming cultured meat, as well as the usage of antibiotics and hormones during the production process (Verbeke et al., 2015). Previous research has shown that consumers prioritize naturalness in their food selections, and they may be less likely to accept processed meals because of perceived hazards (Verbeke et al., 2006). Because of cultured meat being a relatively new product with limited research on its effects on health, consumers may also be concerned about the long-term health repercussions of consuming it (Verbeke et al., 2015).

In sum, the literature on consumers' acceptance of cultured meat has identified several barriers that may hinder its widespread adoption. However, if these barriers are adequately addressed and consumers are informed about the benefits of cultured meat, it may increase their willingness to consume it. In the context of promoting sustainable products like cultured meat, it is important to note that emphasizing sustainability may not always yield desired results and could potentially result in negative consequences. It might be more effective to educate consumers about the product’s benefits, addressing health or taste concerns (Verbeke et al., 2015). Thus, in our study, we examine the relative effectiveness of three different aspects in promoting consumer acceptance of cultured meat: sustainability, taste, and healthiness.

2.2 The Promotion of Cultured Meat Across Countries

The acceptance of cultured meat is a topic of growing interest, as it has the potential to address many of the environmental, ethical, and health concerns associated with conventional meat consumption (Brennan et al., 2021). However, research suggests that there may be differences in consumers' acceptance of cultured meat across different regions and countries (Verbeke et al., 2015). Some studies suggest that countries classified in higher economic groups tend to be more willing to substitute traditional meat (Gómez-Luciano et al., 2019). One possible reason for that observation might be that found that there is a differing linkage between income and meat consumption in developed and developing nations (Tilman & Clark 2014). In less economically developed countries, an increase in annual income leads to an increase in per capita daily demand for meat. Conversely, in highly developed nations, a greater willingness to substitute conventional meat for alternative protein sources and adopt low-meat diets was found across consumers with higher income. Based on these findings, it is important to consider the economic development level of an economy when examining the relationship between income and meat consumption.

The first and perhaps more obvious explanation for the discrepancy in consumption across regions relates to supply-side barriers. Infrastructure and supply chain constraints may make it more challenging for cultured meat to become popular in developing countries (Stoll-Kleemann & Schmidt, 2017). For instance, it is possible that many developing countries lack the infrastructure required to support the production and distribution of cultured meat, which could reduce availability and raise prices. Therefore, infrastructure factors, including food supply chain, distribution, and marketing, can also influence consumer acceptance of cultured meat. Pereira and colleagues (2020) propose that the limited awareness and availability of cultured meat in developing countries could impede its acceptance. Given the issue of high cost associated with cultured meat (Garrison et al., 2022), suggesting that the technology for cultured meat has not yet reached the stage of market promotion (Ding et al., 2021). These findings underscore the importance of considering supply-side factors when devising strategies to promote the acceptance of cultured meat in various regions.

However, it is also possible that sociocultural aspects shape consumption decisions. The process of socialization involves the internalization and compliance with cultural norms, which

are viewed as important values of society (Gintis, 2003). These internalized norms serve as an important guide for behavior (Cottrell & Neuberg, 2005). The literature on factors influencing consumer acceptance of cultured meat reveals that different cultures prioritize different aspects, such as health, environmental concerns, and taste. Therefore, it is important to consider the cultural differences between Brazil and Germany and how they may affect the acceptance of cultured meat. Specifically, different communication strategies may have different effects on consumers in Brazil and Germany, and exploring this possibility to adapt strategies to country specific factors could help identify effective ways to promote acceptance of cultured meat in each country. We will adopt an inductive approach to test this possibility as this approach allows for gathering observations and data to form a broader generalization on the effect of countries on consumers' acceptance of cultured meat (Alba, 2012).

3. Research Objectives & Hypotheses

The development of cultured meat has gained momentum in recent years as a potential solution to the environmental, ethical, and health problems associated with conventional meat production. Cultured meat, also known as cell-based meat, lab-grown meat, or clean meat, involves culturing animal cells in vitro to produce meat-like tissue without raising or slaughtering animals. Although the idea of cultured meat dates back to the 20th century, the recent advances in cell culture techniques, tissue engineering, and bioreactor design have enabled researchers to produce cultured meat that resembles conventional meat in terms of texture, taste, and nutritional composition.

However, despite the promising potential of cultured meat, many questions remain unanswered about its feasibility, acceptability, and scalability across different geographies. Therefore, understanding the barriers to consumer acceptance of the concept of cultured meat is an important area of research. The objectives of this research therefore are defined as follows:

1. To identify the most effective marketing communication strategies for promoting the acceptance of cultured meat in developed and developing countries.
2. To determine the relative importance of sustainability, taste, and healthiness in influencing consumer acceptance of cultured meat.

3. To examine whether there are any significant differences in the effectiveness of marketing communication strategies between developed and developing countries.

In addition, the primary research conducted as part of this study is based on the following hypotheses:

The first hypothesis addresses the three main reasons explored, namely taste, sustainability and health, which currently vouch for concerns rather than trust among consumers and thus reduce their acceptance of cultured meat.

> ***H1****: The use of specific communication strategies that inform consumers about benefits about cultured meat and address concerns of consumers will have a significant impact on the acceptance of cultured meat.*

In order to test the findings obtained in the first hypothesis, the second hypothesis is to investigate whether the increased trust in the respective benefits of cultured meat actually increases the baseline acceptance of the former.

> ***H2****: The perceived sustainability, taste, and healthiness of cultured meat will positively influence the acceptance of cultured meat among consumers.*

Based on the finding that different cultures prioritize different aspects such as health, environmental concerns, and taste, we will also exploratorily examine potential differences in the acceptance of cultured meat between Brazilian and German consumers based on the provided benefits of cultured meat.

Conducting an experimental survey with consumers in developed and developing nations will be used to test these research objectives and hypotheses. By carrying out such research, the study can address the difficulties in convincing customers to adopt this novel food product and offer insights into how to best promote cultured meat. The findings could be very helpful to food businesses looking to grow into new countries and create effective marketing plans for goods made from cultured meat, as well as to governmental and non-governmental organizations supporting more sustainable food consumption.

4. Methodology

4.1 Sampling Strategy

A convenience sampling method was used to compile the survey's participants. The survey was distributed online through social media platforms (LinkedIn and Instagram), as well as through email invitations to individuals who were known to the researcher. The survey was open to individuals who were 18 years or older and resided in either Germany or Brazil. Participation was voluntary and anonymous, and no compensation was offered for participation. The sample does not statistically represent the total population of any of the two nations.

The study's minimum participation goal was 100 participants, including 25 people in each of the four treatment groups and 50 participants in each nation. The target number of respondents was surpassed after two weeks of collecting responses. A total of 251 respondents were collected, with 54 respondents coming from Brazil and 197 from Germany. The participants were randomized to one of the four treatments within each nation.

4.2 Design and Procedure

Before conducting a survey, an extensive literature review was carried out in order to gain a profound understanding of cultured meat and consumer perception about the product. Based on this information prior, the survey was created on Qualtrics where data was collected for the final analysis of this research. The survey consisted of four different experimental conditions, each with different pieces of information about cultured meat, followed by 15 questions. The survey was estimated to take between 5 and 10 minutes to complete. Since cultured meat and the awareness of it has not yet reached the broad mass of consumers, this predicted ignorance was used to give participants one of four different pieces of information about cultured meat, each highlighting a different aspect, and to measure how these differing information influences their opinion about it.

The current study consists of a one-factor between subject design, meaning that each participant is assigned to only one of four possible treatments. This way it is possible to compare the outcomes of participants' perception of cultured meat which will be measured.

All participants were first given a short text with basic information about cultured meat, formulated with the utmost neutrality. This neutral information aimed to ensure that all participants knew the basic nature of cultured meat and its production and components. The information on cultured meat also represents the first of the four experimental conditions (i.e., the baseline condition). Therefore, participants assigned to the baseline condition only got to know the basic information about cultured meat. Following this neutral information, each of the remaining experimental conditions also contained information about cultured meat that would potentially increase the acceptance of cultured meat among consumers, namely sustainability, taste, and safety/health. Specifically, the condition highlighting sustainability benefits informed participants about the environmental advantages of cultured meat, including the reduced amount of water used to produce it as well as the lower greenhouse gas emissions and the elimination of need for antibiotics and other chemicals that are commonly used in animal agriculture. In the condition the highlighting taste benefits, participants were informed that the taste of cultured meat is reported to be very similar to that of traditional meat and the explanation for this laying in the use of muscle cells for its production, which are the same as those found in animal tissue, as well as the more consistent taste, texture, and nutritional content. Lastly, the condition highlighting safety and health benefits contained information regarding the elimination of antibiotics and hormones as well as the possibility to engineer cultured meat, which allows for less saturated fat and more beneficial nutrients. One of these four different conditions was shown to each participant in a randomized order ensuring an equal distribution among participants. The texts used in each experimental condition are described below:

> *Treatment 1: Baseline*
>
> *Cultured meat is meat produced by culturing animal cells in vitro. The manufacturing process begins with acquiring and banking stem cells from an animal. These cells are then grown in bioreactors at high densities and volumes. This production method eliminates the need to raise and farm animals for food. Cultivated meat is made of the same cell types that can be arranged in the same or similar structure as animal tissues.*
>
> *Treatment 2: Baseline + Sustainability*
>
> *Cultured meat has the potential to reduce the environmental impact of conventional meat production, as it requires significantly less land, water, and resources. It also*

produces lower greenhouse gas emissions and eliminates the need for antibiotics and other chemicals commonly used in animal agriculture.

Treatment 3: Baseline + Taste

The taste of cultured meat is reported to be very similar to traditional meat, as the muscle cells used in its production are the same as those found in animal tissue. Since it is produced without raising and slaughtering animals, it can be customized to have a consistent taste and texture.

Treatment 4: Baseline + Health/ Safety

Cultured meat has the potential to offer several benefits in terms of healthiness. Since it is produced in a controlled environment without the use of antibiotics or hormones, it may be a safer and healthier alternative to conventionally produced meat. Additionally, it may be possible to engineer cultured meat to contain less saturated fat and more beneficial nutrients such as omega-3 fatty acids.

Following these pieces of information, six questions regarding participants' perception of and opinion on cultured meat were indicated. The response choices for all six questions were in the form of a 5-point Likert scale. First, participants were asked about how they feel about cultured meat compared to traditional meat, with response choices ranging from very negative (1) to very positive (5). Second, participants indicated their willingness to purchase cultured meat, with response choices ranging from very unwilling (1) to very willing (5). These two questions were the main dependent variables of the current study.

In the following three questions, participants indicated their perception of how sustainable, tasty, and healthy cultured meat is compared to traditional meat. The possible answers ranged from the extreme negative, i.e., "much less sustainable/tasty/healthy" (1) to the opposite extreme positive i.e., "much more sustainable/tasty/healthy" (5). The sixth and last question specific to cultured meat, queried participants' familiarity with the concept of cultured meat from not familiar (1) to very familiar (5).

The subsequent questions asked for general information about participants' dietary preferences, including their type of diet, their frequency of meat consumption, as well as factors influencing their food choices. After an attention check, sociodemographic data was also

collected (gender, age, income, religiosity, education, political ideology, and environmental values). Whether participants used the Portuguese, or the German translation of the survey was a proxy to infer participants' nationality, which was used to explore potential differences in attitudes towards cultured meat across countries.

5. Results

5.1 Sample Description

This study was carried out in April 2023 and data was collected within three weeks of the launch of the survey on Monday April 10th, 2023. Two hundred and fifty-one people in total started the survey. Participants who failed an attention check or did not answer the main dependent variables were excluded from the sample, which led to a final sample of 214 participants.

From the final sample of 214 respondents, 40 percent were male, 20% were from Brazil and 80% were from Germany. Among the Brazilian respondents, 57% were male with an average age of 35 years old. In the German sample, 36 percent of participants were male with an average age of 34 years. Tables 1 and 2 provide a summary of the sociodemographic characteristics of the sample along with comparisons to the demographics of the Brazilian and German population.

As can be seen, the sample roughly matched the population of Brazil and Germany in terms of the age and the income. Males were overrepresented in the Brazilian and underrepresented in the German sample. While vegetarians were underrepresented in the Brazilian sample, there was a surplus of vegetarians in the German sample. Nonetheless, it is significant to note that all analyses described in this research were carried out after accounting for demographics.

Table 1 - Demographics of current sample compared to Brazilian National Data

	Brazilian National Data	Sample Data
Age (mean years)	32.8[1]	35.4
Gender (percentage male)	49.1[2]	57.1
Household income (median USD 2021)	3,341.2 [3]	2,189.6
Percentage vegetarians	14[4]	7.1

Table 2 - Demographics of current sample compared to German National Data

	German National Data	Sample Data
Age (mean years)	44.9[1]	34.2
Gender (percentage male)	49.5[2]	25.7
Household income (median USD 2021)	6,408.0[5]	6,045.8
Percentage vegetarians	10[6]	16.8

Importantly, participants, on average, are not very familiar with and knowledgeable about cultured meat (M = 2.29, SD = .97). A one-sample proportions test comparing the mean familiarity with scale midpoint (3 = somewhat familiar) shows that the mean familiarity is significantly lower than the scale midpoint ($p < 0.001$).

[1] World Economics (2023) https://www.worldeconomics.com/Demographics/Median-Age/Brazil.aspx#:~:text=Brazil's%20median%20age%20is%2032.8,easy%20comparison%20with%20other%20countries.

[2] The UN World Population Prospect (2019) https://population.un.org/wpp/Download/Standard/Population/

[3] Brazilian Institute of Geography and Statistics (IBGE) in 2020, National Household Sample Survey (PNAD), https://www.globaldata.com/data-insights/macroeconomic/median-household-income-in-brazil/

[4] IBOPE/Sociedade Brasileira Vegetaria (2018) https://www.svb.org.br/2469-pesquisa-do-ibope-aponta-crescimento-historico-no-numero-de-vegetarianos-no-brasil

[5] German Federal Statistical Office (2023) https://www.destatis.de/EN/Themes/Society-Environment/Income-Consumption-Living-Conditions/Income-Receipts-Expenditure/_node.html

[6] Forsa Political and Social Research (2021) https://www.bmel.de/SharedDocs/Downloads/DE/_Ernaehrung/forsa-ernaehrungsreport-2021-tabellen.pdf;jsessionid=5DE8D7DAE201E80C0C1050F0995C3CE3.live841?__blob=publicationFile&v=2

5.2 Summary Statistics and Correlations

For the analysis of people's attitude towards cultured meat, participants of the survey were presented with two questions, one asking to rate their sentiments towards cultured meat from very positive (5) to very negative (1) and the other asking them to indicate their willingness to purchase cultured meat from very willing (5) to very unwilling (1).

Combining these two dependent variables reveals a positive tendency on consumers' attitudes towards cultured meat across the total sample: a one-sample proportions test shows that the mean of the combined variables ($M = 3.32$, $SD = 1.12$), is significantly higher than the scale midpoint (3; $p<0.001$). The same is true if we analyze each variable separately, with both sentiments towards cultured meat ($M = 3.31$, $SD = 1.11$) and willingness to purchase cultured meat ($M = 3.33$, $SD = 1.29$) being significantly higher than the scale midpoint (3 = neutral / neither willing nor unwilling, respectively; $p < 0.001$).

Separating between Brazilian and German means of both their sentiment and their willingness to purchase cultured meat indicates that German participants exhibited significantly more positive sentiments towards cultured meat ($M_{Germany} = 3.42$) as their Brazilian counterparts ($M_{Brazil} = 2.86$, $p < 0.05$), which supports existing research on cultural differences in perceptions of cultured meat. In terms of willingness to purchase, there was no significant difference among German participants ($M_{Germany} = 3.39$) and Brazilian participants ($M_{Brazil} = 3.09$, $p = 0.19$).

5.3 Manipulation Check

In the current study's experimental design, a baseline condition, a sustainability condition, a health/safety condition, and a taste condition were used. Before examining the effect of experimental conditions on attitudes and willingness to pay, we sought to investigate how the manipulations influenced consumer perceptions.

First, we looked at the sustainability condition. An independent-samples t-test indicated that those who learned about the benefits of cultured meat for the environment thought it was considerably more sustainable than those in the baseline condition ($M_{sustainable} = 4.45$,

$SE_{sustainable}$ = 0.10, $M_{baseline}$ = 3.98, $SE_{baseline}$ = 0.15, $p < 0.05$). This finding implies that participants' perception of cultured meat's sustainable benefits was positively changed by stressing the sustainability advantages of cultured meat. A more favorable opinion of this alternative may have been influenced by knowledge of the possible environmental benefits associated with the manufacturing of cultured meat.

We then conducted the same test for the safety/health condition. Participants who were confronted with the health and safety benefits of cultured meat perceived it to be considerably healthier than the baseline condition ($M_{health/safety}$ = 3.42, $SE_{health/safety}$ = 0.13, $M_{baseline}$ = 2.96, $SE_{baseline}$ = 0.15, $p < 0.05$). This finding suggests that it is possible to change people's perceptions of cultured meat's safety and healthiness by informing them of its possible lower health risks and improved safety requirements.

When analyzing the taste condition, there was no significant difference in taste perceptions between the taste manipulation condition and the baseline condition in terms of how people perceived its flavor compared to traditional meat (M_{taste} = 2.55, SE_{taste} = 0.10, $M_{baseline}$ = 2.37, $SE_{baseline}$ = 0.11, $p = 0.22$). This outcome indicates that there was little change in the participants' assessments of the taste of cultured meat following the taste-related information they received. It is conceivable that efforts to alter people's perceptions in this area were overshadowed by their deeply held beliefs and preferences for the flavor of traditional meat. These results emphasize how crucial it is to address taste issues while advocating for cultured meat as a healthy and more environmentally friendly substitute for traditional meat products.

In summary, these findings show that educating people about the benefits of cultured meat for sustainability and health and safety can have a significant impact on how they perceive it in terms of environmental and health/safety benefits. However, it is important to recognize the difficulties in changing participants' preconceived conceptions regarding the flavor of cultured meat compared to traditional meat, as these beliefs may be embedded in them.

5.4 Hypotheses testing

5.4.1 Hypothesis 1

To test Hypothesis 1, which posits that the use of specific communication strategies informing consumers about the benefits of cultured meat and addressing their concerns will significantly impact its acceptance, two key dependent variables were assessed: sentiment towards cultured meat (DV1) and willingness to purchase (DV2). With an independent-samples t-test, the mean values of DV1 and DV2 were compared between the baseline condition and the sustainability, health/safety, and taste conditions individually.

Sustainability Condition:

There was no significant difference in the mean sentiment towards cultured meat (DV1) between the sustainability condition ($M_{sustainable} = 3.55$, $SE_{sustainable} = 0.16$) and the baseline condition ($M_{baseline} = 3.17$, $SE_{baseline} = 0.17$, $p = 0.11$). However, the mean willingness to purchase cultured meat (DV2) was significantly higher in the sustainability condition ($M_{sustainable} = 3.59$, $SE_{sustainable} = 0.18$) compared to the baseline condition ($M_{baseline} = 3.06$, $SE_{baseline} = 0.18$, $p < 0.05$). This suggests that while participants' overall sentiment towards cultured meat did not change significantly, the provision of sustainability information positively influenced their willingness to consider purchasing it.

Health/Safety Condition:

Both the mean sentiment towards cultured meat (DV1) ($M_{health/safety} = 3.19$, $SE_{health/safety} = 0.14$, $M_{baseline} = 3.17$, $SE_{baseline} = 0.17$, $p = 0.92$) and the mean willingness to purchase (DV2) showed no significant difference between the health/safety condition and the baseline condition ($M_{health/safety} = 3.37$, $SE_{health/safety} = 0.17$, $M_{baseline} = 3.06$, $SE_{baseline} = 0.18$, $p = 0.21$). This indicates that the information regarding the health and safety advantages of cultured meat did not have a significant impact on participants' sentiment or willingness to purchase.

Taste Condition:

Similarly, there were no significant differences in the mean sentiment towards cultured meat (DV1) ($M_{taste} = 3.38$, $SE_{taste} = 0.15$, $M_{baseline} = 3.17$, $SE_{baseline} = 0.17$, $p = 0.36$) or the mean willingness to purchase (DV2) between the taste condition and the baseline condition ($M_{taste} =$

3.34, SE_{taste} = 0.17, $M_{baseline}$ = 3.06, $SE_{baseline}$ = 0.18, p = 0.26). These results suggest that the information provided regarding the taste of cultured meat did not significantly influence participants' sentiment or their willingness to purchase it.

Figure 1 - Hypothesis1 Effect sentiment towards cultured meat

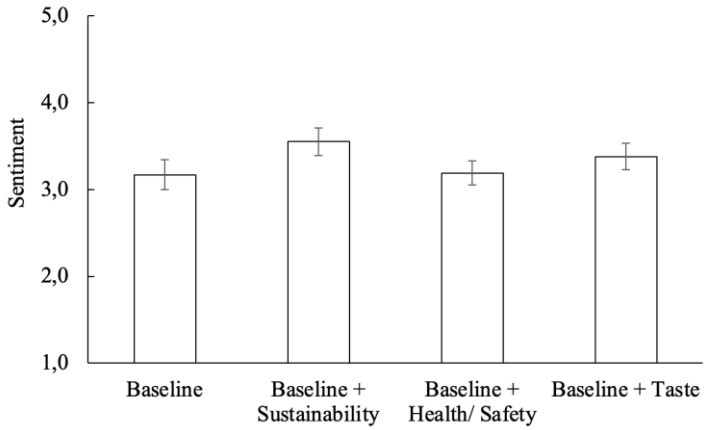
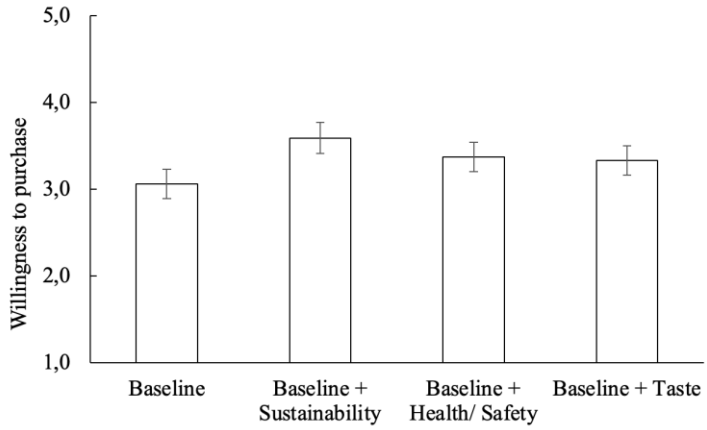


Figure 2 - Hypothesis1 Effect willingness to purchase cultured meat



Overall, our findings suggest that specific communication strategies can have varying effects on the acceptance of cultured meat. While sustainability information positively influenced willingness to purchase, health/safety information and taste information did not result in significant changes in sentiment or willingness to purchase. These results highlight the complexity of factors influencing consumer acceptance and emphasize the need for further research and innovative strategies to address taste perceptions and fully promote the adoption of cultured meat.

5.4.2 Hypothesis 2

To test Hypothesis 2, which suggests that the perceived sustainability, taste, and healthiness of cultured meat positively influence its acceptance among consumers, we conducted separate regression analyses. The dependent variables (DVs) were sentiment towards cultured meat (DV1) and willingness to purchase (DV2). The independent variables included participants' assessments of the sustainability, health/safety, and taste of cultured meat compared to traditional meat on a scale from 1 (much less sustainable/healthy/safe/tasty) to 5 (much more sustainable/healthy/safe/tasty). Additionally, participants' familiarity with cultured meat, diet and environmental values were included as covariates.

Sustainability Assessment:

For DV1 (sentiment towards cultured meat), each additional unit increase in sustainability assessment was associated with a significant average increase of the sentiment towards cultured meat ($\beta = 0.5$, $SE = 0.07$, $p < 0.001$). This implies that perceiving cultured meat as more sustainable compared to traditional meat positively influences individuals' sentiment towards it. Similarly, for DV2 (willingness to purchase), each unit increase in sustainability assessment also corresponded to an increase of the willingness to purchase ($\beta = 0.65$, $SE = 0.09$, $p < 0.001$). This suggests that perceiving cultured meat as more sustainable also positively impacts individuals' willingness to consider purchasing it.

Health/Safety Assessment:

Regarding DV1, each additional unit increase in health/safety assessment was associated with a significant increase of consumers' sentiment towards cultured meat ($\beta = 0.35$, $SE = 0.07$, $p < 0.001$). This implies that perceiving cultured meat as healthier and safer compared to traditional meat has a positive impact on individuals' sentiment towards cultured meat. However, for DV2, there was a slightly greater increase ($\beta = 0.48$, $SE = 0.09$, $p < 0.001$), as each positive change in the health/safety assessment was associated with a larger corresponding increase in willingness to purchase. This indicates that the perceived health and safety advantages of cultured meat have a stronger influence on individuals' willingness to consider purchasing it compared to their sentiment towards it.

Taste Assessment:

For DV1, perceiving cultured meat as tastier compared to traditional meat had a positive impact on individuals' sentiment towards it, although the effect size was relatively small ($\beta = 0.35$, SE = 0.08, $p < 0.001$). Likewise, for DV2, perceiving cultured meat as tastier had a slightly stronger influence on individuals' willingness to consider purchasing it compared to their sentiment towards it ($\beta = 0.42$, SE = 0.11, $p < 0.001$).

Overall, the results of the regression analysis support Hypothesis 2, indicating that the perceived sustainability, healthiness, and taste of cultured meat have a positive influence on its acceptance among consumers. Participants' assessments of these factors were associated with increases in both sentiment towards cultured meat and willingness to purchase. These findings suggest that finding communication strategies that successfully emphasize the sustainability, health, and taste advantages of cultured meat may also enhance its acceptance and adoption by consumers.

In addition to testing Hypothesis 2, our regression analysis also included several covariates to explore their impact on participants' sentiment (DV1) and willingness to purchase (DV2) cultured meat. These covariates were familiarity, diet, and environmental values.

Familiarity:

Familiarity was measured by participants' self-assessment of their knowledge and familiarity with the concept of cultured meat, ranging from 0 (not familiar at all) to 5 (very familiar). The results indicate that while familiarity had a significant positive impact on sentiment towards cultured meat (DV1) in the models with sustainability assessment ($\beta = 0.13$, SE = 0.06, $p < 0.05$) and health/safety assessment ($\beta = 0.14$, SE = 0.07, $p < 0.05$) as the independent variables, it only had a marginally significant effect on the model with taste assessment as the independent variable ($\beta = 0.12$, SE = 0.07, $p = 0.08$). This suggests that participants who were more familiar with cultured meat had a more positive sentiment towards it when considering its sustainability and health/safety aspects. However, familiarity did not significantly impact willingness to purchase (DV2) in any of the assessments.

Diet:

Participants' diet was categorized into different groups: non-vegetarian, vegetarian, vegan, pescatarian, and flexitarian. The results revealed significant effects of diet on sentiment

towards cultured meat (DV1) and, in some cases, on willingness to purchase (DV2). Specifically, in the model with sustainability assessment, vegetarians ($\beta = 0.63$, SE = 0.21, $p < 0.05$), vegans ($\beta = 0.87$, SE = 0.33, $p < 0.05$) and flexitarians ($\beta = 0.52$, SE = 0.14, $p < 0.001$) demonstrated significantly higher sentiment towards cultured meat compared to non-vegetarians. The same positive and significant pattern of diet (specifically vegetarians, vegans, and flexitarians) on the perception of cultured meat repeats when analyzing the effect of the health/ safety assessment on DV1. Therefore vegetarians ($\beta = 0.59$, SE = 0.22, $p < 0.05$), vegans ($\beta = 0.94$, SE = 0.34, $p < 0.05$) and flexitarians ($\beta = 0.39$, SE = 0.15, $p < 0.05$) perceived cultured meat as more positive in the health/ safety assessment of our study. The same also applies to the taste assessment with vegetarians ($\beta = 0.70$, SE = 0.22, $p < 0.05$), vegans ($\beta = 0.78$, SE = 0.35, $p < 0.05$) and flexitarians ($\beta = 0.47$, SE = 0.15, $p < 0.05$) showing a significant positive effect.

However, diet did not significantly influence sentiment or willingness to purchase (DV2) in the health/safety or taste assessments, except for a slight trend towards significance in the willingness to purchase among flexitarians in the model including sustainability assessment ($\beta = 0.35$, SE = 0.18, $p = 0.052$).

Environmental Values:

Environmental values were measured on a scale from 1 (not important at all) to 7 (very important). The results showed that environmental values did have a significant impact on sentiment (DV1) or willingness to purchase (DV2) of cultured meat in all of our assessments. Regarding participants sentiment towards cultured meat (DV1) under the sustainability assessment, we could analyze that for each additional unit of environmental values, the sentiment positively increases ($\beta = 0.14$, SE = 0.06, $p < 0.05$), whereas the effect of environmental values on the willingness to purchase was positive but only marginally significant (DV2) ($\beta = 0.14$, SE = 0.08, $p = 0.09$). For participants including the health/ safety assessment, both DV1 ($\beta = 0.18$, SE = 0.07, $p < 0.05$) and DV2 ($\beta = 0.18$, SE = 0.08, $p < 0.05$) were positively influenced by environmental values. Same applies to the taste assessment showing positive significant effects on DV1 ($\beta = 0.23$, SE = 0.06, $p < 0.001$) and DV2 ($\beta = 0.26$, SE = 0.08, $p < 0.05$).

In sum, our regression model tested Hypothesis 2, which proposed that the perceived sustainability, taste, and healthiness of cultured meat positively influence consumer

acceptance. The results revealed that sustainability, health/safety, and taste assessments significantly influenced participants' sentiment (DV1) and willingness to purchase (DV2) of cultured meat. Each unit increase in sustainability, health/safety, and taste assessment had a positive impact on sentiment and willingness to purchase, although the effect sizes varied. Covariates such as familiarity, diet, and environmental values were also examined. Familiarity with cultured meat positively influenced consumers' sentiment towards cultured meat, keeping sustainability and health/safety assessments constant, while vegetarian, vegan, and flexitarian diets were also associated with higher sentiments towards cultured meat. Environmental values also positively impacted sentiment and willingness to purchase cultured meat. These findings suggest that emphasizing the positive attributes of cultured meat and considering individual factors such as familiarity, dietary preferences, and importance of environmental values can enhance acceptance among consumers.

5.4.3 Exploratory Analyses

Differences Across Countries

We exploratorily analyzed whether there was a significant difference in the acceptance of cultured meat between Brazilian and German consumers based on the provided benefits of cultured meat.

First, we conducted two regression analyses aimed at documenting the baseline effect of country on the dependent variables for the entire sample. Each regression model included either sentiment towards cultured meat (DV1) or willingness to purchase (DV2) as the dependent variable and a country dummy variable (1 = Brazil, 0 = Germany) as the independent variable.

The regression analysis revealed a negative and significant effect of Brazil compared to Germany on DV1 ($\beta = -0.56$, $SE = 0.19$, $p < 0.05$). This implies that, on average, participants from Brazil exhibited lower sentiment towards cultured meat compared to participants from Germany. However, the effect of country on DV2 was not significant but showed a negative direction ($\beta = -0.29$, $SE = 0.22$, $p = 0.19$). This suggests that participants from Brazil tended to express lower willingness to purchase cultured meat compared to participants from Germany, although the difference was not statistically significant.

Next, we aimed to examine whether the difference between the baseline condition and each manipulation condition (sustainability, health/safety, and taste) varied between the two countries. To test this, we ran regression models that included an interaction between country (1 = Brazil, 0 = Germany) and experimental condition for both DV1 and DV2 for each treatment condition (vs. the baseline condition).

The results indicated that none of the interactions between country and experimental condition reached statistical significance in any of the analyses. The detailed results of our analysis can be found in the appendix. This suggests that there was no significant difference in the acceptance of cultured meat between Brazilian and German consumers across the different experimental conditions. However, all models showed the same tendency of a negative interaction between country and experimental condition such that the difference between the baseline and each experimental condition tended to be smaller in Brazil compared to Germany. It is worth noting that the smaller number of Brazilians in the sample may have limited the statistical possibility to detect significant differences. An overview of the analyses results is presented below:

Figure 3 - Exploratory Analyses Sustainability Condition

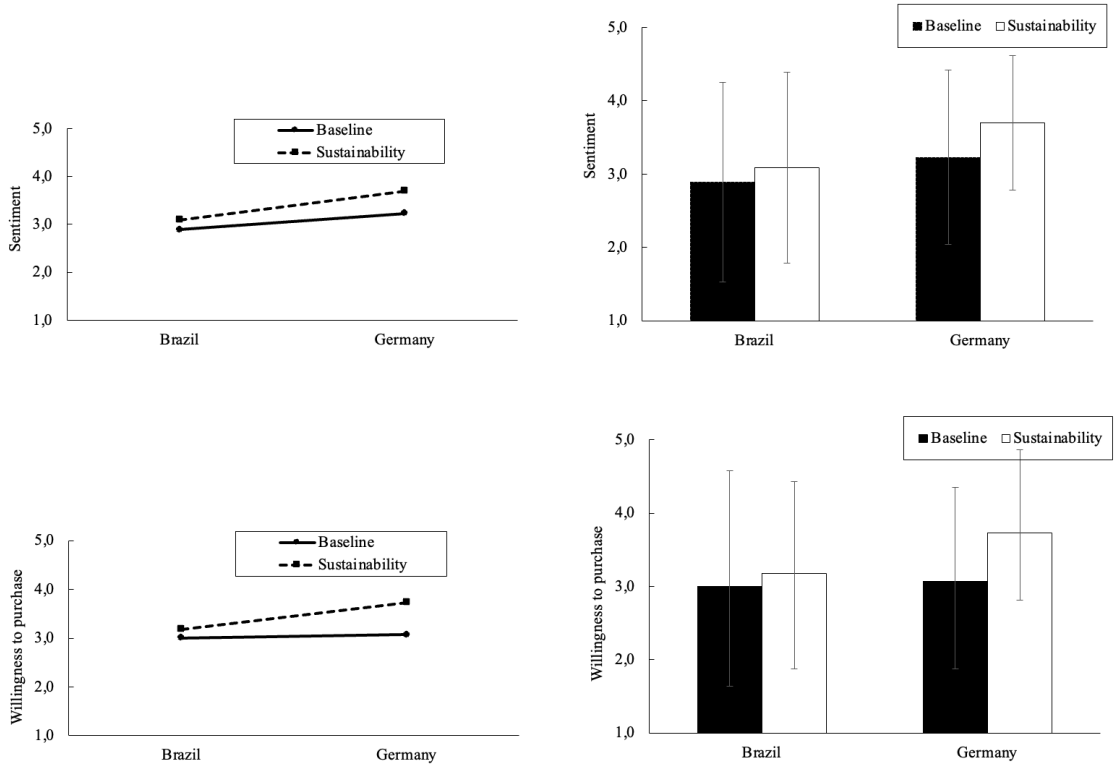


Figure 4 - Exploratory Analyses Health/safety Condition

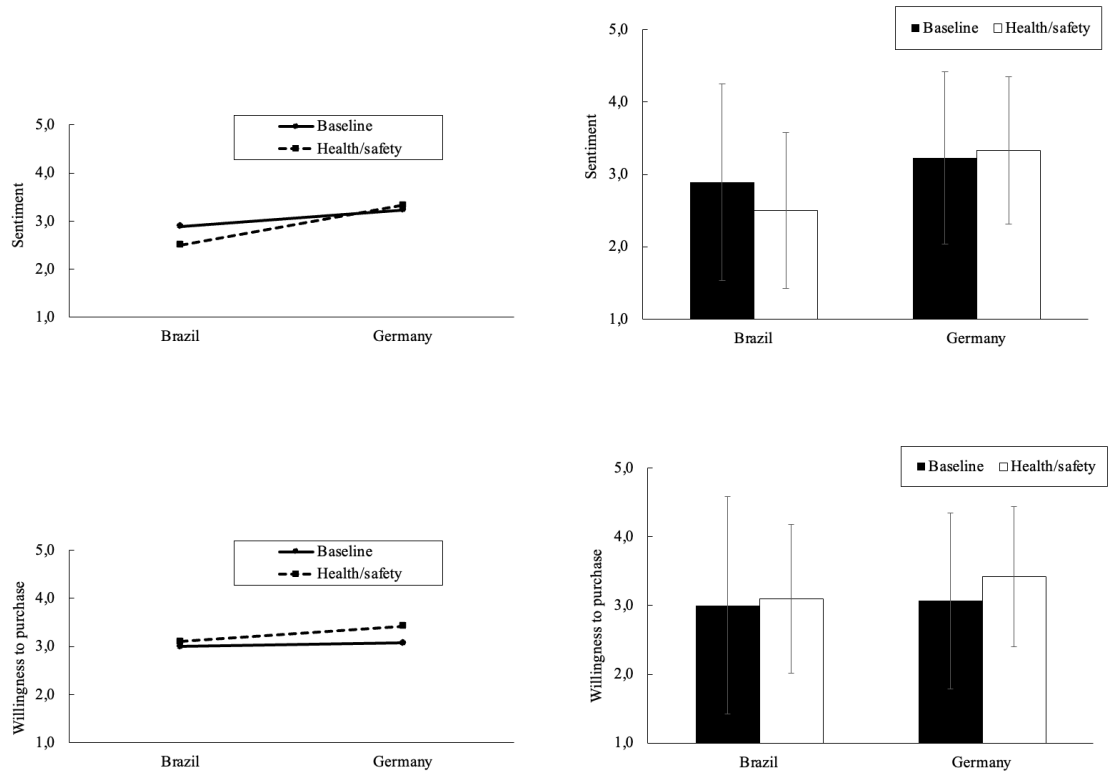
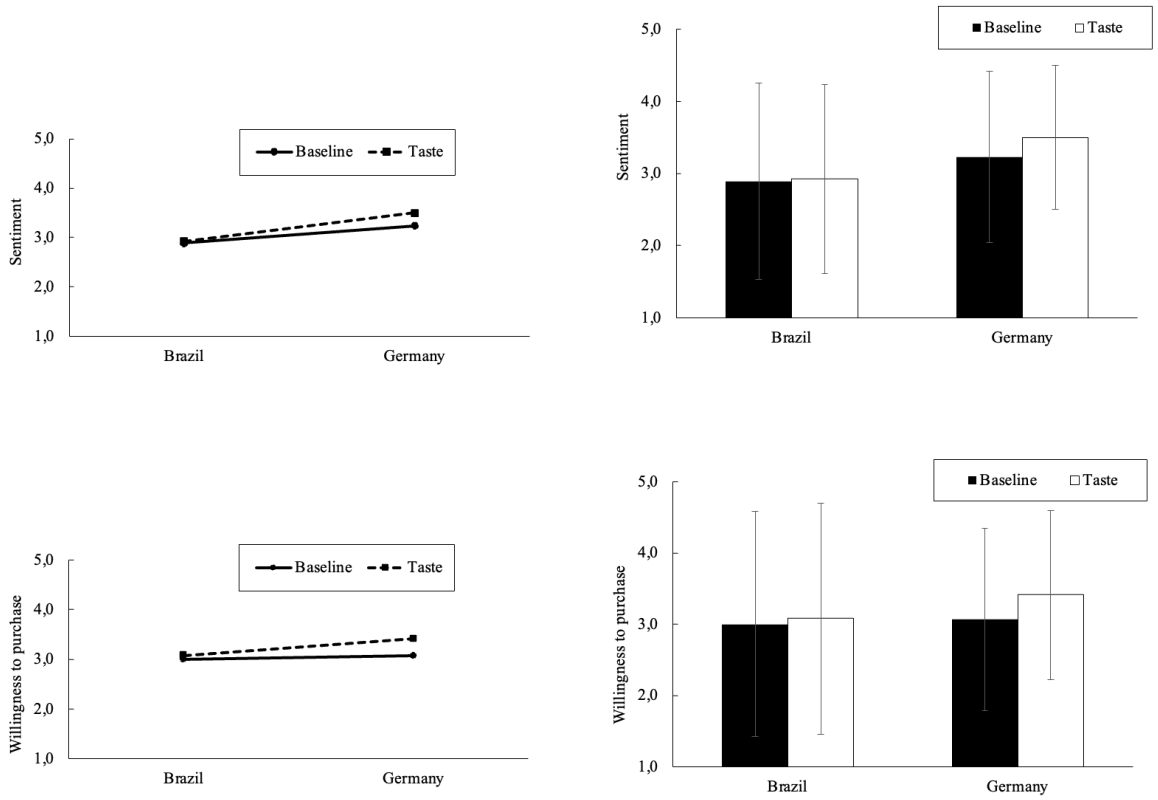


Figure 5 - Exploratory Analyses Taste Condition



Overall, the findings indicate that there was a significant difference in sentiment towards cultured meat between Brazilian and German participants, with Brazilians showing a more negative sentiment. However, the difference in willingness to purchase between the two countries was not statistically significant. Additionally, no significant differences in acceptance were found between the two countries across the different experimental conditions. This suggests that the provided benefits of cultured meat had a similar impact on the acceptance of cultured meat among Brazilian and German consumers.

It is important to consider the limitations of the study, such as the sample size of Brazilians, which may have affected the ability to detect significant differences. Further research with a larger and more balanced sample from both countries could provide more robust insights into the acceptance of cultured meat among Brazilian and German consumers and potentially uncover any country-specific factors that influence acceptance.

7. Discussion

The results of the survey analysis provide valuable insights into participants' attitudes towards cultured meat and the impact of specific communication strategies on its acceptance. Comparing these findings with the existing literature on consumers' acceptance of cultured meat, several interesting points can be highlighted.

Firstly, the literature review identified various barriers to the widespread adoption of cultured meat (Brennan et al., 2021), including consumer resistance due to factors such as lack of awareness (Pereira et al., 2020), taste concerns (Font-i-Furnols & Guerrero, 2014), health-related worries (Verbeke et al., 2015), and perceptions of inferior quality compared to traditional meat (Siegrist et al., 2018). The survey results confirm some of these findings. Participants exhibited, overall, a moderate to positive attitude towards cultured meat, indicating a certain level of openness to the concept. This aligns with the literature's observation that cultured meat still faces opposition from a significant share or customers.

The survey revealed that taste-related information had limited impact on participants' perception of cultured meat's taste compared to traditional meat. This finding is consistent with the literature, which highlighted that customers often prioritize taste and texture when making food choices (Tosun et al., 2021). It suggests that while sustainability and health/safety information influenced participants' evaluations of cultured meat on these attributes, taste preferences for traditional meat may be deeply ingrained, making it challenging to manipulate the taste of cultured meat and to shift consumer perceptions solely through taste-related messaging.

Survey results also indicated that highlighting sustainability benefits positively influenced participants' willingness to purchase cultured meat. This finding aligns with the literature, providing evidence about the positive impact of cultured meat on the environment (Tuomisto & Teixeira de Mattos, 2011) but contradicts the "sustainability liability effect" found in the literature research (Bray et al., 2011; Luchs et al., 2010). This effect has been shown to separate the societal contribution of potential sustainable consumption and the actual behavior of consumers expressed in food consumption, due to the perception of inferior quality of sustainable products. Rather, our survey's findings suggest that providing information on

sustainability will positively impact consumer's acceptance and willingness to purchase cultured meat.

Furthermore, the regression analysis confirmed the positive influence of perceived sustainability, healthiness, and taste on the acceptance of cultured meat. This finding supports the literature's assertion that consumer perceptions of these factors play a significant role in determining their attitudes towards cultured meat (Bray et al., 2011; Font-i-Furnols & Guerrero, 2014; Verbeke et al., 2015). It indicates that consumers who perceive cultured meat as more sustainable, healthy, and tasty compared to traditional meat are more likely to have a positive sentiment and higher willingness to purchase.

Additionally, it is important to note that the survey analysis revealed certain nuances that were not extensively discussed in the literature. For instance, the survey found that familiarity, type of diet, and importance of environmental values positively influenced consumers sentiment and willingness to purchase cultured meat. This suggests that increasing consumer awareness and exposure to cultured meat as well as targeted marketing strategies can enhance their acceptance of its sustainability and health benefits.

Nevertheless, the survey analysis did not find significant differences in the impact of our manipulation between Brazil and Germany on participants at the 95 percent confidence level. This finding suggests that the specific communication strategies employed in the survey, namely providing information on sustainability, health/ safety, and taste, worked similarly on participants' attitudes across both cultures. However, our results suggest a baseline difference between these two countries such that Germany is, on average, more likely to have positive feelings towards cultured meat compared to Brazil. While the literature highlighted the potential influence of sociocultural factors on acceptance (Verbeke et al., 2015), the survey results did not indicate substantial variations between the two countries. Future research should further explore these potential differences with more balanced sample sizes across the two countries.

In conclusion, the survey analysis provides valuable insights that align with the existing literature on consumer's acceptance of cultured meat. It confirms the importance of addressing sustainability concerns to promote acceptance, while also highlighting the limited impact of taste and health related communication strategies. The findings further emphasize the role of

familiarity, diet, and environmental values in shaping consumer attitudes towards cultured meat. Overall, the survey analysis adds to the existing body of knowledge and can guide future interventions and messaging strategies to promote the adoption of cultured meat as a sustainable and viable alternative to traditional meat products.

7.1 Theoretical Implications

As the first theoretical implication, we can highlight the importance of perceived sustainability when it comes to the acceptance of alternative and innovative food products. Our results suggest that highlighting the sustainable benefits of cultured meat can enhance consumers' willingness to pay for the product. This finding supports and extends existing theories that highlight the significance of this factor in shaping consumer attitudes towards novel food products.

However, providing participants with health and taste-related messaging had no significant impact on participants' acceptance of cultured meat in terms of how they feel about and their willingness to purchase it. This challenges the assumption that communication strategies regarding the taste of cultured meat alone, might be effective in driving consumers' acceptance. Rather, the study results highlight that additional factors and content in communication such as sustainability should be emphasized alongside taste to effectively impact the adoption of cultured meat in society.

Moreover, our study indicates that familiarity with cultured meat is a relevant factor in its acceptance among consumers. Specifically, the survey results suggest that familiarity with cultured meat positively influences consumers' sentiment towards cultured in several models. This finding extends the literature by emphasizing the role of familiarity and exposure in shaping consumer attitudes towards new food technologies and demands for efforts to raise awareness of cultured meat in society. Future research can support these dynamics by delving deeper into the mechanisms behind familiarity and its impact on acceptance of sustainable alternatives in the category of food and more specifically meat.

Regarding cross-cultural differences in the acceptance of cultured meat, although we could not identify any significant differences in consumer acceptance between Brazil and Germany

across experimental conditions, we found a significant baseline difference between these two countries. Specifically, German consumers are more likely to display positive sentiments towards cultured meat compared to Brazilian consumers. These results add to the literature on the understanding of cross-cultural acceptance of cultured meat. Still, the limitation of this research due to a small Brazilian sample must be mentioned, which highlights the need for further and more elaborate research to explore cultural variables and conduct representative comparative studies in different countries to gain a deeper understanding of the dynamics in consumer acceptance of cultured meat in developing and developed countries.

7.2 Managerial Implications

Through the insights gained from our analysis, we can say that companies seeking to promote cultured meat can benefit from focusing on highlighting its sustainability and health benefits primarily. Marketing campaigns that emphasize the reduced environmental impact and potential health advantages can positively influence consumers' sustainability and safety/health perceptions of cultured meat compared to traditional meat. However, our results show that only information about sustainability had a direct and positive effect on willingness to purchase cultured meat, which indicates that highlighting sustainability benefits could be an effective strategy in changing consumer behavior. Moreover, we can derive from our study that addressing concerns regarding health is imperative to successful marketing of cultured meat. Only by actively targeting the concerns of consumers can a sustainable understanding and acceptance of cultured meat be ensured in society and a first trial of it be encouraged.

Next to that, the kind of positioning of the product cultured meat that companies choose to be settled in in consumers' minds is crucial to ensure acceptance in society. Therefore, positioning cultured meat as a sustainable and healthy alternative to traditional meat might appeal to environmentally conscious and health-conscious consumers. To ensure authenticity and acceptance among these groups of consumers, a differentiation to traditional meat products through product messaging and labelling is important. At the same time, our study results show that although consumers are not yet too familiar with and convinced by cultured meat, they show a moderate willingness to purchase it. To build on this existing willingness to purchase, marketing strategies of cultured meat products should be designed to be non-judgmental. While

highlighting sustainability and health benefits and addressing taste concerns, practices should not include extreme positioning in any way.

As another learning from our study, we highlight the importance of awareness campaigns to foster the widespread acceptance and understanding of cultured meat in society. As familiarity was a relevant variable in the acceptance of cultured meat among consumers, increasing consumer familiarity and awareness of cultured meat could, in turn, positively impact its acceptance. Companies and organizations should invest in educational campaigns with the goal to inform the public about the production process, safety measures, and potential benefits of cultured meat. Especially the support of public organizations and institutions would be promising in raising awareness as consumers might trust official institutions more than economically motivated organizations regarding topics that raise serious concerns about healthiness and the environment. Also, the joint effort of the public and private sectors to create awareness about cultured meat should allow for mutual benefits and ease the burden on both sides, which, in turn, could bring both economic benefits for businesses and social progress for the public sector.

Lastly, cultural differences did not have a significant impact on consumers' acceptance of cultured meat under neither of our experimental treatments. Nevertheless, as existing research confirms (Gómez-Luciano et al., 2019; Tilman & Clark, 2014; Verbeke et al., 2015), companies planning to enter different markets should consider tailoring their communication strategies to the cultural context and investigate the preferences for meat consumption in their target markets. Conducting further research specific to cultural differences can help identify messaging approaches to maximize the acceptance of cultured meat in different regions.

8. Conclusions

Combining the fact that climate change is one of the most important topics of our time and that the food industry's greenhouse gas emissions and freshwater consumption is massive, highlights the need to change food consumption patterns. Meat substitutes, including cultured meat, are popular for their environmental benefits. However, consumer hesitation persists.

Existing research found that cultured meat faces consumer resistance due to limited availability, high prices, and preferences for alternative proteins. The environmental benefits of cultured meat, such as reduced greenhouse gas emissions, land use, and water consumption, may be underappreciated. Consumers' intentions to buy ethical products may not align with their actual behavior, creating an "Ethical Purchasing Gap." Taste and health concerns, including perceived differences in flavor and potential long-term health effects, also contribute to resistance. Adding to the complexity, the acceptance of cultured meat varies across countries due to economic development, infrastructure, and sociocultural factors. An understanding of these barriers will enable managers and researchers to formulate strategies that promote the adoption of cultured meat globally and pave the way towards a more sustainable food consumption.

Therefore, this research aimed to investigate effective marketing strategies to foster consumer acceptance of cultured meat. Specifically, the current research seeks to examine the influence of communication about sustainability, taste, and healthiness on acceptance of cultured meat, and exploring potential differences between developed and developing countries. The study hypothesized that addressing consumer concerns and highlighting the benefits of cultured meat would increase acceptance.

The conducted analysis provides valuable insights into consumers attitudes towards cultured meat as an innovative food product and sheds light on the impact of specific communication strategies on its acceptance. Findings suggest that highlighting sustainability and health benefits can increase consumers' perceived sustainability and healthiness of cultured meat, however, only the sustainability manipulation was effective in promoting its acceptance. Our research also addresses the limited impact of taste-related communication strategies on both perceived taste and acceptance of cultured meat, which indicates that reducing the concerns regarding the taste of cultured meat is a strategy that needs to be further perfected. Moreover, our results emphasize the role of familiarity, diet, and environmental values in shaping consumers sentiment towards and willingness to purchase cultured meat, suggesting the need to increase awareness of cultured meat among consumers in general. Companies should focus on marketing cultured meat's sustainability and health, addressing taste concerns, and collaborating with public sectors for awareness campaigns.

Overall, this study provides valuable insights for both academia and industry, offering a comprehensive understanding of the factors that share consumers' acceptance of cultured meat. These results contribute to the existing knowledge about cultured meat and can guide future interventions and messaging strategies to promote the adoption of cultured meat as a sustainable and viable alternative to traditional meat.

Appendices

Exploratory Analyses of Country Differences

Documenting the baseline effect including all experimental conditional of the full sample with Germany as baseline

	β	SE	p
DV1	-0.56	0.19	0.003
DV2	-0.29	0.22	0.18

Testing whether the difference between the baseline condition and each manipulation condition is larger in one country compared to the other by running regression models including interaction between country and experimental condition.

Baseline vs. Sustainability

DV1

	β	SE	p
Country Brazil	-0.34	0.42	0.41
Condition Sustainability	0.46	0.26	0.08
Country*Condition Brazil*Sustainability	-0.26	0.57	0.65

DV2

	β	SE	p
Country Brazil	-0.07	0.46	0.88
Condition Sustainability	0.66	0.29	0.02
Country*Condition Brazil*Sustainability	-0.48	0.63	0.46

Baseline vs. Health/safety

DV1

	β	SE	p
Country Brazil	-0.34	0.41	0.41
Condition Health/safety	0.09	0.23	0.68
Country*Condition Brazil*Health/safety	-0.48	0.57	0.39

DV2

	β	SE	p
Country Brazil	-0.07	0.49	0.89
Condition Health/safety	0.35	0.28	0.21
Country*Condition Brazil*Health/safety	-0.25	0.68	0.71

Baseline vs. Taste

DV1

	β	SE	p
Country Brazil	-0.34	0.42	0.41
Condition Taste	0.27	0.25	0.28
Country*Condition Brazil*Taste	-0.24	0.56	0.67

DV2

	β	SE	p
Country Brazil	-0.07	0.48	0.89
Condition Taste	0.34	0.28	0.23
Country*Condition Brazil*Taste	-0.26	0.64	0.69

References

Alba, J. W. (2012). In Defense of Bumbling. *Journal of Consumer Research*, *38*(6), 981–987. https://doi.org/10.1086/661230

Barkhausen, B. (2022, September 8). Plant-based options taking root in meat-loving Germany. *Just Food*. https://www.just-food.com/features/plant-based-options-taking-root-in-meat-loving-germany/

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices* (Second edition). Anol Bhattacherjee.

Bray, J., Johns, N., & Kilburn, D. (2011). An Exploratory Study into the Factors Impeding Ethical Consumption. *Journal of Business Ethics*, *98*(4), 597–608. https://doi.org/10.1007/s10551-010-0640-9

Brennan, T., Katz, J., Quint, Y., & Spencer, B. (2021). *Cultivated meat: Out of the lab, into the frying pan*. https://www.mckinsey.com/~/media/mckinsey/industries/agriculture/our%20insights/cultivated%20meat%20out%20of%20the%20lab%20into%20the%20frying%20pan/cultivated-meat-out-of-the-lab-into-the-frying-pan-vf.pdf?shouldIndex=false

Bryant, C., & Barnett, J. (2018). Consumer acceptance of cultured meat: A systematic review. *Meat Science*, *143*, 8–17. https://doi.org/10.1016/j.meatsci.2018.04.008

Bryant, C., & Barnett, J. (2020). Consumer Acceptance of Cultured Meat: An Updated Review (2018–2020). *Applied Sciences*, *10*(15), 5201. https://doi.org/10.3390/app10155201

Cottrell, C. A., & Neuberg, S. L. (2005). Different Emotional Reactions to Different Groups: A Sociofunctional Threat-Based Approach to "Prejudice." *Journal of Personality and Social Psychology*, *88*, 770–789. https://doi.org/10.1037/0022-3514.88.5.770

de Area Leão Pereira, E. J., de Santana Ribeiro, L. C., da Silva Freitas, L. F., & de Barros Pereira, H. B. (2020). Brazilian policy and agribusiness damage the Amazon rainforest. *Land Use Policy, 92*, 104491. https://doi.org/10.1016/j.landusepol.2020.104491

Ding, S., Post, M. J., Zhou, G., Ding, S., Post, M. J., & Zhou, G. (2021). Perspectives on cultured meat. *Food Materials Research, 1*(1), Article FMR-2021-0003. https://doi.org/10.48130/FMR-2021-0003

Font-i-Furnols, M., & Guerrero, L. (2014). Consumer preference, behavior and perception about meat and meat products: An overview. *Meat Science, 98*(3), 361–371. https://doi.org/10.1016/j.meatsci.2014.06.025

Garrison, G., Biermacher, J., & Brorsen, W. (2022). *How much will large-scale production of cell-cultured meat cost?* https://doi.org/10.1016/j.jafr.2022.100358

Gintis, H. (2003). The Hitchhiker's Guide to Altruism: Gene-culture Coevolution, and the Internalization of Norms. *Journal of Theoretical Biology, 220*(4), 407–418. https://doi.org/10.1006/jtbi.2003.3104

Gómez-Luciano, C. A., de Aguiar, L. K., Vriesekoop, F., & Urbano, B. (2019). Consumers' willingness to purchase three alternatives to meat proteins in the United Kingdom, Spain, Brazil and the Dominican Republic. *Food Quality and Preference, 78*, 103732. https://doi.org/10.1016/j.foodqual.2019.103732

Laestadius, L. I., & Caldwell, M. A. (2015). Is the future of meat palatable? Perceptions of in vitro meat as evidenced by online news comments. *Public Health Nutrition, 18*(13), 2457–2467. https://doi.org/10.1017/S1368980015000622

Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010). The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference. *Journal of Marketing, 74*(5), 18–31. https://doi.org/10.1509/jmkg.74.5.018

Neuhofer, Z. T., & Lusk, J. L. (2022). Most plant-based meat alternative buyers also buy meat: An analysis of household demographics, habit formation, and buying behavior among meat alternative buyers. *Scientific Reports*, *12*(1), Article 1. https://doi.org/10.1038/s41598-022-16996-5

Newton, P., & Blaustein-Rejto, D. (2021). Social and Economic Opportunities and Challenges of Plant-Based and Cultured Meat for Rural Producers in the US. *Frontiers in Sustainable Food Systems*, *5*. https://www.frontiersin.org/articles/10.3389/fsufs.2021.624270

Nezlek, J. B., & Forestell, C. A. (2022). Meat substitutes: Current status, potential benefits, and remaining challenges. *Current Opinion in Food Science*, *47*, 100890. https://doi.org/10.1016/j.cofs.2022.100890

OECD & FAO. (2022). *OECD-FAO Agricultural Outlook 2022-2031*. OECD. https://doi.org/10.1787/f1b0b29c-en

Ritchie, H., Reay, D. S., & Higgins, P. (2018). Potential of Meat Substitutes for Climate Change Mitigation and Improved Human Health in High-Income Markets. *Frontiers in Sustainable Food Systems*, *2*. https://www.frontiersin.org/articles/10.3389/fsufs.2018.00016

Rolland, N. C. M., Markus, C. R., & Post, M. J. (2020). The effect of information content on acceptance of cultured meat in a tasting context. *PLOS ONE*, *15*(4), e0231176. https://doi.org/10.1371/journal.pone.0231176

Siegrist, M., Sütterlin, B., & Hartmann, C. (2018). Perceived naturalness and evoked disgust influence acceptance of cultured meat. *Meat Science*, *139*, 213–219. https://doi.org/10.1016/j.meatsci.2018.02.007

Statista. (2022). *Meat Substitutes—Brazil | Statista Market Forecast*. Statista. https://www.statista.com/outlook/cmo/food/meat/meat-substitutes/brazil

Stoll-Kleemann, S., & Schmidt, U. J. (2017). Reducing meat consumption in developed and transition countries to counter climate change and biodiversity loss: A review of influence factors. *Regional Environmental Change*, *17*(5), 1261–1277. https://doi.org/10.1007/s10113-016-1057-5

Tilman, D., & Clark, M. (2014). Global diets link environmental sustainability and human health. *Nature*, *515*(7528), Article 7528. https://doi.org/10.1038/nature13959

Tosun, P., Yanar, M., Sezgin, S., & Uray, N. (2021). Meat Substitutes in Sustainability Context: A Content Analysis of Consumer Attitudes. *Journal of International Food & Agribusiness Marketing*, *33*(5), 541–563. https://doi.org/10.1080/08974438.2020.1840475

Tuomisto, H. L., & Teixeira de Mattos, M. J. (2011). Environmental Impacts of Cultured Meat Production. *Environmental Science & Technology*, *45*(14), 6117–6123. https://doi.org/10.1021/es200130u

Tziva, M., Negro, S. O., Kalfagianni, A., & Hekkert, M. P. (2020). Understanding the protein transition: The rise of plant-based meat substitutes. *Environmental Innovation and Societal Transitions*, *35*, 217–231. https://doi.org/10.1016/j.eist.2019.09.004

UNESCO-IHE. (2010). *The green, blue and grey water footprint of farm animals and animal products*. https://www.waterfootprint.org/resources/Report-48-WaterFootprint-AnimalProducts-Vol1.pdf

UNFCCC. (2021). *We Need to Talk About Meat | UNFCCC*. https://unfccc.int/blog/we-need-to-talk-about-meat?gclid=CjwKCAiA5Y6eBhAbEiwA_2ZWIZ-otJaqTaiNiFhB0yQrGUzd7bdINzKVcr_TWZMllr4_bE5o7vF3lRoC8FAQAvD_BwE

United Nations. (2022). *Food and Climate Change: Healthy diets for a healthier planet*. United Nations; United Nations. https://www.un.org/en/climatechange/science/climate-issues/food

Verbeke, W., Frewer, L., Scholderer, J., & De Brabander, H. (2006). *Why consumers behave as they do with respect to food safety and risk information*. https://doi.org/10.1016/j.aca.2006.07.065

Verbeke, W., Marcu, A., Rutsaert, P., Gaspar, R., Seibt, B., Fletcher, D., & Barnett, J. (2015). 'Would you eat cultured meat?': Consumers' reactions and attitude formation in Belgium, Portugal and the United Kingdom. *Meat Science*, *102*, 49–58. https://doi.org/10.1016/j.meatsci.2014.11.013

Verbeke, W., Sans, P., & Van Loo, E. J. (2014). *Challenges and prospects for consumer acceptance of cultured meat | Elsevier Enhanced Reader*. https://doi.org/10.1016/S2095-3119(14)60884-4

Weinrich, R. (2018). Cross-Cultural Comparison between German, French and Dutch Consumer Preferences for Meat Substitutes. *Sustainability*, *10*(6), Article 6. https://doi.org/10.3390/su10061819

Weinrich, R., Strack, M., & Neugebauer, F. (2020). Consumer acceptance of cultured meat in Germany. *Meat Science*, *162*, 107924. https://doi.org/10.1016/j.meatsci.2019.107924

Annex

Annex 1: Survey Questions

Portuguese Version

Consent form

Olá,

Neste estudo, você será solicitado a preencher algumas perguntas sobre o comportamento do consumidor e as escolhas alimentares. O estudo levará cerca de 5 a 10 minutos para ser concluído. Sua participação no estudo é totalmente voluntária. Você pode optar por não participar ou pode retirar seu consentimento a qualquer momento sem consequências.

O que você pode esperar da participação neste estudo é uma oportunidade de contribuir para uma pesquisa científica. Não há nenhum risco importante em relação ao seu envolvimento neste estudo. As perguntas exigem apenas um esforço deliberativo.

As informações que você fornecerá a seu respeito serão completamente anônimas e confidenciais. Apenas médias e padrões gerais entre as variáveis serão mostrados em publicações. Abaixo você pode encontrar as informações de contato do pesquisadora envolvido neste projeto:

Lea Doepkens - e-mail: lea.doepkens@web.de

Ao clicar na seta abaixo, você confirma que entendeu os objetivos, riscos e benefícios de sua participação nesta pesquisa, e que concorda em participar.

Introduction

Na página seguinte você encontrará informações sobre a carne cultivada. Por favor leia o texto com atenção, lhe faremos algumas perguntas a respeito de suas opiniões e percepções sobre o assunto.

Manipulation and DV’s

Baseline

Carne cultivada é a carne produzida pelo cultivo de células animais in vitro (em um tubo de ensaio). O processo de produção começa com a coleta e armazenamento de células-tronco de um animal. Estas células são então cultivadas em bioreatores em altas densidades e quantidades. Este método de produção elimina a necessidade de criar e manter animais para alimentação. A carne cultivada consiste em tipos de células que são encontradas em uma estrutura idêntica ou similar no tecido animal.

Sustainability

Carne cultivada é a carne produzida pelo cultivo de células animais in vitro (em um tubo de ensaio). O processo de produção começa com a coleta e armazenamento de células-tronco de um animal. Estas células são então cultivadas em bioreatores em altas densidades e quantidades. Este método de produção elimina a necessidade de criar e manter animais para alimentação. A carne cultivada consiste em tipos de células que são encontradas em uma estrutura idêntica ou similar no tecido animal.

A carne cultivada tem o potencial de reduzir o impacto ambiental da produção convencional de carne, já que requer significativamente menos terra, água e recursos. Ela também produz menos emissões de gases de efeito estufa e elimina a necessidade de antibióticos e outros produtos químicos comumente usados na agricultura animal.

Taste

Carne cultivada é a carne produzida pelo cultivo de células animais in vitro (em um tubo de ensaio). O processo de produção começa com a coleta e armazenamento de células-tronco de um animal. Estas células são então cultivadas em bioreatores em altas densidades e quantidades. Este método de produção elimina a necessidade de criar e manter animais para alimentação. A carne cultivada consiste em tipos de células que são encontradas em uma estrutura idêntica ou similar no tecido animal.

O sabor da carne cultivada é relatado como muito semelhante à carne tradicional, pois as células musculares utilizadas em sua produção são as mesmas encontradas no tecido animal. Como é produzida sem criação e abate de animais, ela pode ser personalizada para ter um sabor, textura e conteúdo nutricional consistente.

Healthy/ Safety

Carne cultivada é a carne produzida pelo cultivo de células animais in vitro (em um tubo de ensaio). O processo de produção começa com a coleta e armazenamento de células-tronco de um animal. Estas células são então cultivadas em bioreatores em altas densidades e quantidades. Este método de produção elimina a necessidade de criar e manter animais para alimentação. A carne cultivada consiste em tipos de células que são encontradas em uma estrutura idêntica ou similar no tecido animal.

A carne cultivada tem o potencial de oferecer vários benefícios em termos de saúde. Como é produzida em um ambiente controlado sem o uso de antibióticos ou hormônios, ela pode ser uma alternativa mais segura e saudável à carne produzida convencionalmente. Além disso, pode ser possível elaborar carne cultivada para conter menos gordura saturada e mais nutrientes benéficos como os ácidos graxos ômega-3.

DV's

Agora, por favor, responda as seguintes perguntas:

Como você se sente sobre este tipo de carne em comparação com a carne tradicional?

- Mutio negative/a
- Negativo/a
- Neutro
- Positivo/a
- Muito positivo/a

Até que ponto você estaria disposto a comprar carne cultivada?

- Muito relutante
- Um pouco relutante
- Não disposto/a ou relutante
- Umpouco disposto/a
- Muito disposto/a

Comparada à carne tradicional, quão **sustentável** você considera ser a carne cultivada?

- Muito menos sustentável
- Menos sustentável
- Não mais nem menos sustentável

- Mais sustentável
- Muito mais sustentável

Comparada à carne tradicional, quão **saborosa** você considera a carne cultivada?

- Muito menos saborosa
- Menos saborosa
- Não mais nem menos saborosa
- Mais saborosa
- Muito mais saborosa

Comparada à carne tradicional, quão **saudável** você considera ser a carne cultivada?

- Muito menos saudável
- Menos saudável
- Não mais nem menos saudável
- Mais saudável
- Muito mais saudável

O quanto você estava familiarizado/a com o conceito de carne cultivada?

- Nunca tinha ouvido falar
- Já tinha ouvido falar, mas não sabia muito sobre o assunto
- Era um pouco familarizado/a
- Era bastante familarizado/a
- Era muito familarizado/a

Diet Preferences

Que tipo de dieta você segue principalmente?

- Não-vegetariana (não tenho restrições para a carne de origem animal)
- Vegetariana (não como carne, mas consumo laticínios e/ou ovos)
- Vegana (não como nenhum produto animal, incluindo carne, laticínios, ovos e mel)
- Pescetariana (não como carne, mas como peixe e/ou frutos do mar)
- Flexitariana (como carne apenas ocasionalmente)
- Outro, por favor especifique:

E com que frequência você come carne tradicional?

- Uma vez por mês
- Uma vez por semana
- Várias vezes por semana
- Várias vezes por semana
- Todos os dias
- Várias vezes ao dia

Ao experimentar um novo produto alimentar, quais são os fatores que mais determinam se você gosta ou não do produto? Você pode selecionar até três.

- Sabor
- Valor nutrivo/Saúde
- Preço
- Marca
- Embalagem/Design
- Ingredientes
- Conveniência
- Durabilidade (por exemplo data de validade)
- Outro, por favor especifique:

Attention check

Agora, responda a seguinte pergunta: Para demonstrar que você está respondendo este questionário cuidadosamente, selecione apenas a opção "Segurança" entre as oito opções abaixo.

- Preço
- Qualidade
- Marca
- Disponibilidade
- Estilo
- Segurança
- Coveniência
- Valor

Demographics

Com que gênero você se identifica?

- Masculio
- Feminino
- Outro, por favor especifique:
- Prefiro não dizer

Quantos anos você tem?

Qual é sua renda familiar mensal antes de impostos e deduções? (ou seja, a renda que você e as outras pessoas que vivem em sua casa recebem mensalmente de todas as fontes, incluindo salários, programas de assistência social, juros, dividendos, bônus, etc., antes dos impostos):

- Menos de R$500
- R$501-1000
- R$1001-2000
- R$2001-3000
- R$3001-4000
- R$4001-5000
- R$5001-6000
- R$6001-7000
- R$7001-8000
- R$8001-9000
- R$9001-10000
- R$10001-15000
- R$15001-20000
- R$20001-30000
- R$30001-40000
- R$40001-50000
- R$50001-60000
- Acima de R$60001
- Nã0 sei/não quero responder

Quão religioso/a você se considera?

- Não religioso/a
- Um pouco religioso/a
- Neutro/a

- Um pouco religioso/a
- Muito religioso/a

Qual é o nível mais alto de educação que você completou?

- Ensino médio
- Formação professional
- Graduação/Bacharelado
- Pós-graduação/Mestrado
- Programa de doutorado
- Outro, por favor especifique:

Como você descreveria sua ideologia política?

- Muito à esquerda
- Esquerda
- Centro
- Direita
- Muito à direita

Por favor, indique a importância dos seguintes valores como princípios orientadores em sua vida:

- Nem um pouco importante 1
- Muito importante 7

- Prevenção da poluição: proteger os recursos naturais
- Respeito pela terra: harmonia com outras espécies
- Unidade com a natureza: adaptação à natureza
- Proteção ao meio ambiente: preservação da natureza

German Version

Consent Form

Hallo,

in dieser Studie möchten wir dich bitten, einige Fragen zu deinem Verhalten als

Verbraucher*in und zur Auswahl von Lebensmitteln zu beantworten. Die Umfrage dauert etwa 5-10 Minuten. Deine Teilnahme an der Studie ist freiwillig, du kannst dich jederzeit dazu entscheiden, deine Teilnahme abzubrechen oder deine Zustimmung ohne Konsequenzen zu widerrufen.

Der Vorteil, den du von deiner Teilnahme an dieser Studie erwarten kannst, ist die Möglichkeit, einen Beitrag zur wissenschaftlichen Forschung zu leisten. Es gibt keine wesentlichen Risiken in Bezug auf deine Teilnahme an dieser Studie. Die Fragen erfordern lediglich bewusste Entscheidungen.

Die Informationen, die du über dich zur Verfügung stellst, werden anonym und vertraulich behandelt. In Veröffentlichungen werden nur Durchschnittswerte und allgemeine Muster gezeigt. Nachfolgend findest du die Kontaktinformation der an diesem Projekt beteiligten Forscherin:

Lea Döpkens - E-Mail: lea.doepkens@web.de

Mit einem Klick auf den Pfeil unten bestätigst du, dass du die Ziele, Risiken und Vorteile deiner Teilnahme an dieser Studie verstanden hast und dass du der Teilnahme zustimmst.

Introduction
Auf der nächsten Seite findest du Informationen zu kultiviertem Fleisch. Bitte lies den Text sorgfältig durch, da wir dir einige Fragen bezüglich deiner Meinung und Wahrnehmung zu diesem Thema stellen werden.

Baseline
Kultiviertes Fleisch ist Fleisch, das durch die Kultivierung von Tierzellen in vitro (im Reagenzglas) hergestellt wird. Der Herstellungsprozess beginnt mit der Gewinnung und Lagerung von Stammzellen eines Tieres. Diese Zellen werden dann in Bioreaktoren in hohen Dichten und Mengen gezüchtet. Diese Produktionsmethode macht die Aufzucht und Haltung von Tieren zur Lebensmittelgewinnung überflüssig. Kultiviertes Fleisch besteht aus Zelltypen, die in einer gleichen oder ähnlichen Struktur in tierischem Gewebe vorzufinden sind.

Sustainability

Kultiviertes Fleisch ist Fleisch, das durch die Kultivierung von Tierzellen in vitro (im Reagenzglas) hergestellt wird. Der Herstellungsprozess beginnt mit der Gewinnung und Lagerung von Stammzellen eines Tieres. Diese Zellen werden dann in Bioreaktoren in hohen Dichten und Mengen gezüchtet. Diese Produktionsmethode macht die Aufzucht und Haltung von Tieren zur Lebensmittelgewinnung überflüssig. Kultiviertes Fleisch besteht aus Zelltypen, die in einer gleichen oder ähnlichen Struktur in tierischem Gewebe vorzufinden sind.

Kultiviertes Fleisch hat das Potenzial, die negativen Auswirkungen der herkömmlichen Fleischproduktion auf die Umwelt zu reduzieren, da dessen Produktion deutlich weniger Land, Wasser und Ressourcen benötigt. Es verursacht außerdem weniger Treibhausgasemissionen und macht Antibiotika und andere Chemikalien, die üblicherweise in der Tierhaltung verwendet werden, überflüssig.

Taste

Kultiviertes Fleisch ist Fleisch, das durch die Kultivierung von Tierzellen in vitro (im Reagenzglas) hergestellt wird. Der Herstellungsprozess beginnt mit der Gewinnung und Lagerung von Stammzellen eines Tieres. Diese Zellen werden dann in Bioreaktoren in hohen Dichten und Mengen gezüchtet. Diese Produktionsmethode macht die Aufzucht und Haltung von Tieren zur Lebensmittelgewinnung überflüssig. Kultiviertes Fleisch besteht aus Zelltypen, die in einer gleichen oder ähnlichen Struktur in tierischem Gewebe vorzufinden sind.

Der Geschmack von kultiviertem Fleisch soll dem von herkömmlichem Fleisch sehr ähnlich sein, weil die bei der Herstellung verwendeten Muskelzellen die gleichen sind, wie die in tierischem Gewebe. Da kultiviertes Fleisch ohne Aufzucht und Schlachtung von Tieren hergestellt wird, kann die Produktion individuell angepasst werden, um Konsistenz im Geschmack, in der Textur und im Nährstoffgehalt zu garantieren.

Health/Safety

Kultiviertes Fleisch ist Fleisch, das durch die Kultivierung von Tierzellen in vitro (im Reagenzglas) hergestellt wird. Der Herstellungsprozess beginnt mit der Gewinnung und Lagerung von Stammzellen eines Tieres. Diese Zellen werden dann in Bioreaktoren in hohen Dichten und Mengen gezüchtet. Diese Produktionsmethode macht die Aufzucht und Haltung von Tieren zur Lebensmittelgewinnung überflüssig. Kultiviertes Fleisch besteht aus Zelltypen, die in einer gleichen oder ähnlichen Struktur in tierischem Gewebe vorzufinden sind.

Kultiviertes Fleisch hat das Potenzial, mehrere Vorteile in Bezug auf die Gesundheit zu bieten. Da es in einer kontrollierten Umgebung ohne den Einsatz von Antibiotika oder Hormonen produziert wird, kann es eine sicherere und gesündere Alternative zu herkömmlich produziertem Fleisch sein. Darüber hinaus könnte es möglich sein, kultiviertes Fleisch so zu produzieren, dass es weniger gesättigtes Fett und nützlichere Nährstoffe wie Omega-3-Fettsäuren enthält.

Bitte beantworte nun die folgenden Fragen:

Wie denkst du über kultiviertes Fleisch im Vergleich zu herkömmlichem Fleisch?

- Sehr negativ
- Negativ
- Neutral
- Positiv
- Sehr positiv

Wie bereit wärst du, kultiviertes Fleisch zu kaufen?

- Gar nicht bereit
- Eher nicht bereit
- Neutral
- Eher bereit
- Auf jeden Fall bereit

Im Vergleich zu herkömmlichem Fleisch, wie **nachhaltig** schätzt du kultiviertes Fleisch ein?

- Viel weniger nachhaltig
- Etwas weniger nachhaltig

- Weder nachhaltiger noch weniger nachhaltig
- Etwas nachhaltiger
- Viel nachhaltiger

Im Vergleich zu herkömmlichem Fleisch, wie **lecker** schätzt du kultiviertes Fleisch ein?

- Viel weniger lecker
- Etwas weniger lecker
- Weder leckerer noch weniger lecker
- Etwas leckerer
- Viel leckerer

Im Vergleich zu herkömmlichem Fleisch, wie **gesund** schätzt du kultiviertes Fleisch ein?

- Viel ungesünder
- Etwas ungesünder
- Weder gesünder noch ungesünder
- Etwas gesünder
- Viel gesünder

Wie vertraut warst du mit dem Konzept von kultiviertem Fleisch?

- Noch nie gehört
- Gehört, aber nicht viel Wissen
- Grundlegendes Verständnis
- Gut informiert
- Sehr vertraut

Welche Art von Ernährung verfolgst du hauptsächlich?

- Nicht-Vegetarisch (ich habe keine Einschränkungen für tierisches Fleisch)
- Vegetarisch (ich esse kein Fleisch, aber ich konsumiere Milchprodukte und/oder Eier)
- Vegan (ich esse keine tierischen Produkte, einschließlich Fleisch, Milchprodukte, Eier und Honig)
- Pescetarier*in (ich esse kein Fleisch, aber ich esse Fisch und/oder Meeresfrüchte)
- Flexitarier*in (ich esse nur gelegentlich Fleisch)
- Sonstiges, bitte angeben:

Und wie oft isst du herkömmliches Fleisch?

- Einmal pro Monat
- Einmal pro Woche
- Mehrmals pro Woche
- Täglich
- Mehrmals am Tag

Wenn du ein neues Lebensmittel ausprobierst, welche Faktoren bestimmen am meisten, ob du das Produkt magst oder nicht? Du kannst bis zu drei auswählen.

- Geschmack
- Nährwert/Gesundheit
- Preis
- Marke
- Verpackung/Design
- Inhaltsstoffe
- Einfachheit
- Haltbarkeit (7.B. Verfallsdatum)
- Sonstiges, bitte angeben:

Attention check

Beantworte bitte nun die folgende Frage: Um zu zeigen, dass du diesen Fragebogen sorgfältig beantwortest, wähle bitte nur die Option „Sicherheit“ aus den folgenden acht Optionen aus.

- Preis
- Qualität
- Marke
- Verfügbarkeit
- Stil
- Sicherheit
- Einfachheit
- Wert

Mit welchem Geschlecht identifizierst du dich?

- Männlich
- Weiblich

- Sonstiges, bitte angeben:
- Ich bevorzuge es, keine Angabe zu machen

Wie alt bist du?

Wie hoch ist dein monatliches Haushaltseinkommen vor Steuern und Abgaben? (d. h. Einkommen, das du und die anderen in deinem Haushalt lebenden Personen monatlich aus allen Quellen erhalten, einschließlich Löhne, Sozialhilfeprogramme, Zinsen, Dividenden, Prämien usw., vor Steuern):

- €o (kein Einkommen)
- €1 - €4,999
- €5,000 - €9,999
- €10,000 - €14,999
- €15,000 - €19,999
- €20,000 - €24,999
- €25,000 - €29,999
- €30,000 - €34,999
- €35,000 - €39,999
- €40,000 - €44,999
- €45,000 - €49,999
- €50,000 - €54,999
- €55,000 - €59,999
- €60,000 - €64,999
- €65,000 - €69,999
- €70,000 - €74,999
- €75,000 - €79,999
- €80,000 - €84,999
- €85,000 - €89,999
- €90,000 - €94,999
- €95,000 - €99,999
- €100,000 - €109,999
- €110,000 - €119,999
- €120,000 - €129,999
- €130,000 - €139,999

- €140,000 - €149,999
- €150,000 - €159,999
- €160,000 - €169,999
- €170,000 - €179,999
- €180,000 - €189,999
- €190,000 - €199,999
- €200,000 oder mehr
- Ich weiß es nicht/ bevorzuge keine Angabe zu machen

Wie religiös betrachtest du dich selbst?

- Überhaupt nicht religiös
- Weniger religiös
- Weder noch/Neutral
- Religiös
- Sehr religiös

Was ist deine höchste abgeschlossene Ausbildung?

- Sekundarstufe
- Berufsausbildung
- Bachelor oder Äquivalent (z.B. Meister, Fachwirt)
- Master oder Äquivalent (z.B. Diplom)
- Promotion
- Sonstiges, bitte angeben:

Wie würdest du deine politische Ideologie beschreiben?

- Sehr links
- Links
- Center
- Rechts
- Sehr rechts

Bitte gib an, wie wichtig dir die folgenden Werte als Leitprinzipien in deinem Leben sind:

- Überhaupt nicht wichtig 1 - Sehr wichtig 7

- Vermeidung von Umweltverschmutzung: Natürliche Ressourcen sparen
- Respekt für die Erde: In Harmonie mit anderen Arten leben
- Einheit mit der Natur: Sich in die Natur einfügen
- Schutz der Umwelt: Natur schützen