

UNIVERSIDAD AUTÓNOMA DE SAN LUIS POTOSÍ
FACULTADES DE CIENCIAS QUÍMICAS, INGENIERÍA, MEDICINA
Y CIENCIAS SOCIALES Y HUMANIDADES
PROGRAMA MULTIDISCIPLINARIO DE POSGRADO EN CIENCIAS AMBIENTALES
AND
TH KÖLN - UNIVERSITY OF APPLIED SCIENCES
INSTITUTE FOR TECHNOLOGY AND RESOURCES MANAGEMENT IN THE TROPICS AND SUBTROPICS

**EFFECTS OF ECO-LABELS ON CONSUMER INTENTIONS TO PURCHASE SUSTAINABLE
FOOD WITHIN THE STUDENT COMMUNITY OF COLOGNE**

THESIS TO OBTAIN THE DEGREE OF
MAESTRÍA EN CIENCIAS AMBIENTALES
DEGREE AWARDED BY UNIVERSIDAD AUTÓNOMA DE SAN LUIS POTOSÍ
AND
MASTER OF SCIENCE
NATURAL RESOURCES MANAGEMENT AND DEVELOPMENT
DEGREE AWARDED BY TH KÖLN – UNIVERSITY OF APPLIED SCIENCES

PRESENTS:

TANIA BERENICE QUINTERO VARGAS

CO-DIRECTOR OF THESIS (ITT)
PROF. DR. SABINE SCHLÜTER
CO-DIRECTOR OF THESIS (PMPCA)
DR. LEONARDO ERNESTO MÁRQUEZ MIRELES
ASSESSOR (CIDE)
DR. DANIEL ZIZUMBO COLUNGA

COLOGNE, GERMANY

AUGUST 14th, 2020

PROYECTO REALIZADO EN:

ITT

TH KÖLN – COLOGNE UNIVERSITY OF APPLIED SCIENCES

CON EL APOYO DE:

CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA (CONACYT)

CVU/BECARIO: 840886

DEUTSCHER AKADEMISCHER AUSTAUSCH DIENST (DAAD)

CENTERS FOR NATURAL RESOURCES AND DEVELOPMENT (CNRD)

LA MAESTRÍA EN CIENCIAS AMBIENTALES RECIBE APOYO A TRAVÉS DEL PROGRAMA NACIONAL DE POSGRADOS DE CALIDAD (PNPC - CONACYT)



Effects of eco-labels on consumer intentions to purchase sustainable food within the student community of Cologne by Tania Berenice Quintero Vargas is licensed under a [Creative Commons Reconocimiento-NoComercial-SinObraDerivada 4.0 Internacional License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Declaration in lieu of oath/ Erklärung / Declaración

Name / Nombre: **TANIA BERENICE QUINTERO VARGAS**

Matrikel-Nr. / N° de matrícula: **11131787 (TH KÖLN), 302304 (UASLP)**

Ich versichere wahrheitsgemäß, dass ich die vorliegende Masterarbeit selbstständig verfasst und keine anderen als die von mir angegebenen Quellen und Hilfsmittel benutzt habe. Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten und nicht veröffentlichten Schriften entnommen sind, sind als solche kenntlich gemacht.

Aseguro que yo redacté la presente tesis de maestría independientemente y no utilicé referencias ni medios auxiliares fuera de los indicados. Todas las partes referidas a escritos o a textos publicados o no publicados son reconocidas como tales.

Die Arbeit ist in gleicher oder ähnlicher Form noch nicht als Prüfungsarbeit eingereicht worden.

Hasta la fecha, un trabajo como éste o similar no ha sido entregado como trabajo de tesis.

Köln / Colonia, den /el **14.08.2020**.

Unterschrift / Firma:



Ich erkläre mich mit einer späteren Veröffentlichung meiner Masterarbeit sowohl auszugsweise, als auch Gesamtwerk in der Institutsreihe oder zu Darstellungszwecken im Rahmen der Öffentlichkeitsarbeit des Institutes einverstanden.

Estoy de acuerdo con una publicación posterior de mi tesis de maestría en forma completa o parcial por las instituciones con la intención de exponerla en el contexto del trabajo de investigación de las mismas.

Unterschrift / Firma:



ACKNOWLEDGEMENTS

To my parents and sister, for the unconditional love and support. You might be miles away but you are always spiritually close. Thanks for always seeing the best in me and for helping me to believe in myself.

To Tobias, for the continuous encouragement and patience. Thank you for making me coffee, reaching me with your most needed sparks of joy, and translating to German.

To my Tutelary Committee, for receiving all my ideas with interest and openness.

Special recognition to Dr. Daniel Zizumbo for giving me use of the software where I collected all the data that made this analysis possible. Thanks for sharing your vast knowledge and being my mentor.

My appreciation to all the members of the student community of Cologne that shared their time with me when answering the survey, without whom this thesis would not have been achievable; and to the broader community of people who care about sustainability, of which I am happily part.

Finally, to the Scholarship Committee of Conacyt-Mexico, for supporting me financially to finish this project without worry. Thanks for believing in young researchers.

CONTENTS

LIST OF GRAPHS.....	8
LIST OF TABLES	9
LIST OF MAPS	11
LIST OF IMAGES	11
LIST OF ABBREVIATIONS AND ACRONYMS	12
KEY WORDS	13
ABSTRACT	13
PALABRAS CLAVE.....	14
RESUMEN.....	14
INTRODUCTION.....	15
Food sustainability: Global context	16
Problem identification.....	19
Justification and relevance of the thesis.....	21
Objectives	24
Research questions.....	24
Hypothesis.....	25
LITERATURE REVIEW	27
Conceptual framework.....	27
Types of agriculture and food systems	27
Organic food.....	28
Eco-labels	31
The Bio Label	31
The Fairtrade Label	33
Theoretical framework and previous studies	34
Sustainable consumption	36
The Theory of Planned Behavior.....	38
METHODOLOGY	42
Site description and target population.....	43
Sampling	46
Data collection technique.....	47
Survey design.....	49
The experiment	51
Statistical methods	52
Effects of eco-label treatments on consumer choices: Z-tests.....	53
Individual determinants of eco-label effects: Logistic regression models.....	55
ANALYSIS AND RESULTS	57
Sample description.....	58
Effects of eco-label treatments on consumer choices	62
Effect of Bio label on demand for organic pasta	62

Effect of Bio label on demand for organic meat.....	63
Effect of Bio label on demand for organic tomatoes	65
Effect of FT label on demand for Fairtrade juice	66
Group Balance	68
Individual determinants of eco-label effects	70
DISCUSSION	76
Limitations and scope	81
Recommendations and future studies	81
CONCLUSION	83
REFERENCES.....	85
ANNEXES	89
Questionnaire script	89

LIST OF GRAPHS

Graph 1. Share of environmental impact of food products17

Graph 2. The role of eco-labels in purchasing decisions20

Graph 3. Organic food market: from niche to mature market30

Graph 4. Sample by gender58

Graph 5. Sample by semester of study59

Graph 6. Vegetarians and vegans by nationality60

Graph 7. Monthly expenditure in food groceries61

Graph 8. Food expenditure as percentage of total monthly income.....61

LIST OF TABLES

Table 1. Global food system cost estimation.....	16
Table 2. Categorization of behavioral approaches.....	35
Table 3. TPB studies on food consumption.....	40
Table 4. Correlation and regression coefficients of the TPB model for purchasing sustainable dairy products	41
Table 5. Student population of Cologne per university	45
Table 6. Difference in choice for treatment (spaghetti)	63
Table 7. Z-test for result significance (spaghetti)	63
Table 8. Difference in choice for treatment (meat)	64
Table 9. Z-test for result significance (meat)	64
Table 10. Difference in choice for treatment (tomatoes)	65
Table 11. Z-test for result significance (tomatoes)	66
Table 12. Difference in choice for treatment (juice)	67
Table 13. Z-test for result significance (juice)	67
Table 14. Overall results of eco-label effects	67
Table 15. Distribution of baseline characteristics	69
Table 16. Reasons behind food consumption choices among participants.....	71
Table 17. Beliefs associated to Bio and FT labeled food	71
Table 18. Logistic regression of variables that explain intention to buy Bio (spaghetti)	73

Table 19. Logistic regression of variables that explain intention to buy Bio (meat)	74
Table 20. Logistic regression of variables that explain intention to buy Bio (tomatoes)	75
Table 21. Logistic regression of variables that explain intention to buy FT (juice)	75
Table 22. Overall results of the logistic regression analyses	76

LIST OF MAPS

Map 1. Location of Cologne	44
Map 2. Districts of Cologne.....	44
Map 3. Location of KSTW student dormitories	46

LIST OF IMAGES

Image 1. The Double Food and Environmental Pyramid	19
Image 2. The Bio (organic) labels for Germany and the EU	32
Image 3. The Fairtrade international label.....	34
Image 4. Model for the Theory of Planned Behavior	38
Image 5. Experiment example with orange juice	52

LIST OF ABBREVIATIONS AND ACRONYMS

BMEL	Federal Ministry of Food and Agriculture (<i>Bundesministeriums für Ernährung und Landwirtschaft</i>)
CAWI	Computer Assisted Web Interviewing
CAPI	Computer Assisted Personal Interviewing
EU	European Union
FAO	Food and Agriculture Organization
FiBL	Research Institute of Organic Agriculture (<i>Forschungsinstitut für Biologischen Landbau</i>)
FLO	Fairtrade Labelling Organization
FT	Fairtrade
GMO	Genetically Modified Organisms
GDPR	General Data Protection Regulation
IRB	Institutional Review Board
KSTW	Student Services of Cologne (<i>Kölner Studierendenwerk</i>)
LLW	Law of the Large Numbers
MLE	Maximum Likelihood Estimation
NRW	North Rhine-Westphalia
SDG	Sustainable Development Goals
TPB	Theory of Planned Behavior
UNCTAD	United Nations Conference on Trade and Development
WFTO	World Fair Trade Organization
WTP	Willingness to Pay

This thesis uses the feminine pronoun to write sentences in the third person singular tense.

KEY WORDS

Eco-labeling experiment, behavioral research, organic demand, Fairtrade demand, sustainable food consumption.

ABSTRACT

This research analyzes the effects that eco-labels have on the demand for organic (Bio) and Fairtrade (FT) food products. The thesis also discusses the individual determinants and motivations behind those effects. The analysis builds on data obtained from a self-programmed and self-conducted survey, with a sample of 869 students from different universities of Cologne, Germany. The Bio/FT preference is measured experimentally by randomly assigning individuals to treatment and control groups. The experiment simulates life decisions using actual pictures and prices of four products: packed and processed spaghetti, fresh tomatoes, packed raw meat, and packed orange juice.

The existence, size, and direction of statistically significant eco-label effects were obtained with two sample tests of proportions. The results prove that the FT label has a positive differential effect on consumer's demand. The presence of the FT label makes the purchase of this juice 9.1% higher than other juices not labeled as FT. This finding confirms the hypothesis that eco-labels have a positive effect on sustainable consumption. A surprising finding is that the presence of the Bio label lowers the purchase of organic pasta and tomatoes 7.7% and 9.4% respectively. This finding is interesting because it suggests that Bio labels are not driving the demand for sustainable tomatoes or pasta for this population. Regional and cheaper alternatives are preferred by consumers in this cases.

The motivations behind consumer choices of different options were thoroughly analyzed. Binomial logistic regressions and qualitative text analysis show that the variance in the intention to consume eco-labeled food is explained mainly by price concerns and attitudes about value for money, but also by the influence of life partners as shopping referents, and the perceived behavioral controls of time and ability to monitor compliance of label standards, thus trust them.

The final remarks support the use of the Fairtrade eco-label as a market-based instrument to guide sustainable food consumption among young adults in this context, and propose changes that could make the Bio label more attractive for the targeted population. The thesis demonstrates which individual factors should be inevitably considered when implementing labeling to foster sustainable consumption. Hence, it is useful for evaluations of public and private certification schemes, and for companies that support sustainable food markets. Projects looking to understand and drive sustainable production and consumption decisions should consider this reading.

PALABRAS CLAVE

Experimento con eco-etiquetas, estudio de comportamiento, demanda de comida orgánica, demanda de comercio justo, consumo sustentable de alimentos.

RESUMEN

Esta tesis analiza los efectos que las eco-etiquetas tienen en la demanda de productos alimenticios orgánicos (Bio) y de comercio justo (FT). La tesis también discute los determinantes individuales detrás de estos efectos. Los datos provienen de una encuesta diseñada y llevada al campo específicamente para esta investigación, con una muestra de 869 estudiantes de licenciatura y posgrado de diferentes universidades de Colonia, Alemania. El análisis de demanda y preferencia es experimental: los individuos se asignan de manera aleatoria a grupos de tratamiento o de control. Los experimentos simulan decisiones lo más cercanas posibles a experiencias cotidianas mediante el uso de fotografías y precios de productos reales. Los efectos son analizados para cuatro productos: spaghetti empaquetado y procesado, tomates frescos, carne de res cruda, molida y empaquetada, y jugo de naranja empaquetado.

La existencia de efectos significativos producidos solo por las etiquetas, así como la magnitud y la dirección de estos efectos, se obtienen mediante pruebas estadísticas de proporciones de dos muestras. Los resultados prueban que la etiqueta FT tiene un efecto diferencial positivo en la demanda. Su sola presencia logra que la compra de este jugo sea 9.1% mayor que la de otros jugos sin comercio justo. La etiqueta aumenta el valor agregado del producto y la demanda del mismo. No obstante, otro hallazgo de la tesis es que la etiqueta Bio reduce la demanda de pasta y tomates comparativamente con la competencia no etiquetada de esta manera; para los tomates en 7.7% y para la pasta en 9.4%. Este resultado es sorprendente, pues sugiere que las etiquetas Bio no contribuyen a incrementar la demanda de comida sustentable, al menos para esta población y estos productos. Por el contrario, alternativas más baratas y etiquetadas como regionales son las preferidas de los consumidores.

Las motivaciones de los participantes al elegir entre diferentes alternativas fueron analizadas a detalle. Al combinar regresiones logísticas binarias y análisis cualitativo de texto, la tesis encuentra que las diferencias en consumo responden mayoritariamente a la importancia que tiene la relación calidad-precio para los consumidores. Pero también a otras variables de teorías del comportamiento, como la socialización, las normas y los controles percibidos. Por ejemplo, la influencia que tiene la pareja como referente en las compras, la percepción de tiempo disponible, o la habilidad percibida para monitorear el cumplimiento de los estándares de las etiquetas ecológicas.

Los resultados finales resaltan la utilidad de la etiqueta FT como instrumento para guiar las decisiones de consumo sustentable entre jóvenes adultos en este contexto. Asimismo, proponen cambios para conseguir que la etiqueta Bio sea más atractiva para la población. La tesis demuestra qué factores deben considerarse al implementar el etiquetado ecológico para apoyar el consumo sustentable. Por tanto, es una investigación útil para evaluaciones de certificaciones públicas y privadas, así como para compañías que trabajan con mercados de comida sustentable. Una lectura de esta tesis se recomienda a proyectos que busquen entender y apoyar las decisiones de producción y consumo sustentable.

Consumers speak through what they buy. Shopping can voice then reward or rebellion.

INTRODUCTION

Food has many faces and meanings. Of course, food sustains all vital processes of an organism and because of that it is a basic universal need (Maslow, 1943). But going further from the basic material dictionary definition, humans have given food a lot other different meanings and values. Food systems are influenced by the social, political, economic and environmental conditions of the individuals participating in them. In some places, food is not only a need, but a movement, a political arena. Take for example, the “Slow Food Movement”, which started in Italy around year 1989 as a protest against fast food and disappearing food heritage (Meryment, 2016), and which now has grown to have 100,000 members in 132 countries. Food is also a ritual. Centuries of cultural combination and traditional ingredients gave birth to dishes of internationally recognized cuisines, as the Mexican. Food is a business. Take Monsanto as an example, “with 17,500 employees, a 2006 sales figure of 7.5 billion USD and operations in 46 countries, Monsanto is the world leader in genetically modified seeds, as well as one of the most controversial corporations in industrial history” (Robin, 2007). Most of all and directly delving to the field of this Master program, **food is a highly valued systemic resource.**

It is interesting to state that resources are not, they become. Which happens when people charge them of importance and value. That way, resources can be goods or substances valued by societies because they meet needs or desires. They are subject to human demand and it can be the case that they are not yet measured or economically viable¹. From the field to the table, a food system has been defined as “all the processes and infrastructure necessary to feed a population” (European Commission, 2019). Thinking of food as a systemic resource means that all inputs and outputs generated in the processes of growing, harvesting, transforming, packaging, transporting, marketing, consuming, and disposing are included. Both the FAO and the World Bank have tried to estimate the monetary value of the global food system at “8 trillion USD, or 10 percent of the 80 trillion USD global economy” (Van Nieuwkoop, 2019), which is probably less than the real value but gives an idea of its importance.

Returning to the different values attached to food system resources, what adds richness to the topic is that sometimes food is all of the above at the same time. This thesis is about sustainability-

¹ Natural Resources Economics and Governance module, ITT-winter term-2019.

related food labels and their impact on consumers. It researches a tiny piece of the huge food construct where all the edges come together. Food labels represent today some of the latest global food movements regarding sustainability and ethics. They also involve businesses and profits, political and economic interests, consumers and producers from different world regions and cultures. They have a small but very important role on the way food is grown, sold, allocated and managed in a society.

Food sustainability: Global context

When looking into details of management possibilities for any valuable resource, one must first consider the panorama that surrounds it. Today’s global context estimates the costs from the world’s food system almost as high as its own value: at 6 trillion USD. However, the costs associated with environmental losses are not completely accounted for in that calculation (see table 1). This is a common mistake. As currently organized, “the global food system imposes very high environmental and health costs, from greenhouse gas emissions, land degradation, water and air pollution, overdrawn aquifers, and biodiversity loss, to food borne diseases, growing anti-microbial resistance, persistent under- and malnourished children, and rising obesity” (Van Nieuwkoop, 2019).

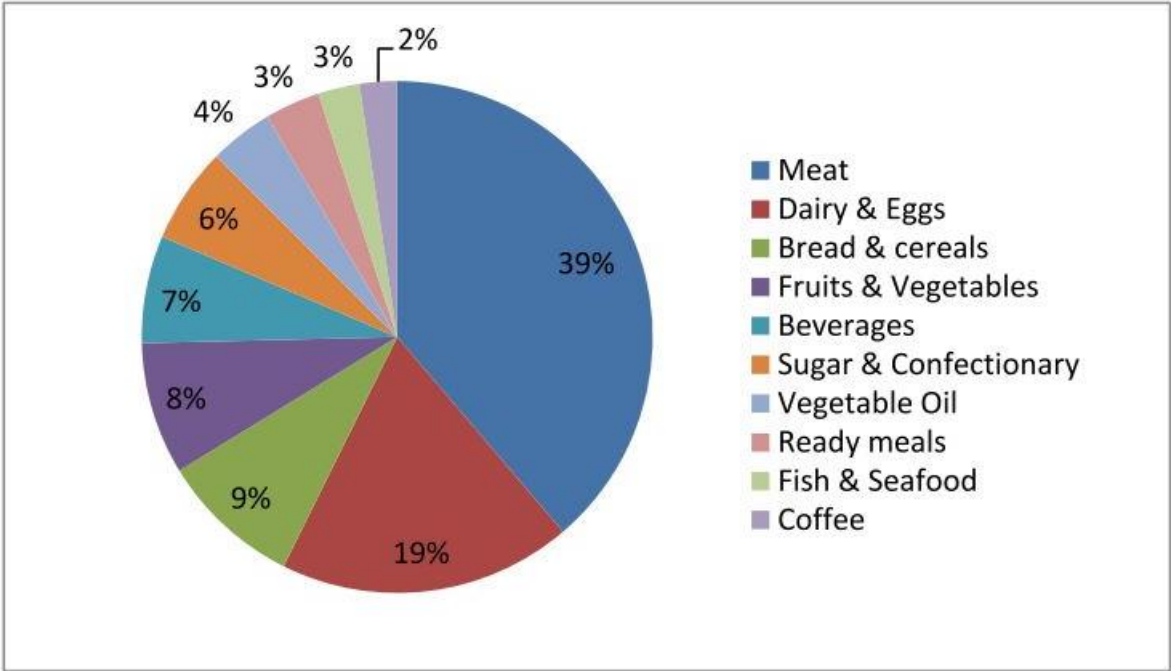
Table 1. Global food system cost estimation

Food System Problem	Annual Economic Costs (\$ trillions)
2 billion people under- and malnourished (3 percent 2018 global GDP)	2.43
2 billion people overweight and obese (2 percent of 2018 global GDP)	1.62
One third of agriculture production lost or wasted	1.07
Economic loss due to insufficient food safety	0.11
Economic loss due to land use and land cover change in terrestrial ecosystems (0.41 percent of 2018 global GDP)	0.33
25 percent of land degraded due to poor management practices (0.25 percent of 2018 global GDP)	0.20
13 percent global emissions from agriculture, other than from land use change (49.1 GT CO2 at \$ 40/ton)	0.27
Costs still to be accounted for	
Biodiversity loss other than losses due to land use change (e.g., loss of pollination services, degraded wetlands, etc.)	
Health costs due to chemical and pesticide use, including from deteriorating water quality	
Contribution to rising anti-microbial resistance and associated costs	
Total costs	6.03

Source: Van Nieuwkoop, 2019.

The environmental burdens of food are also differentiated, because some products have higher impacts than others, for instance, meat (see graph 1). Summing all food categories in the European Union (EU), it is estimated that “the environmental impacts of the production and processing of food, feed and drinks make up between 20% and 30% of the total environmental impacts of consumable goods” (Deegan, 2011, p. 1). The costs of these impacts are expected to rise exponentially with time, since food production becomes more difficult in damaged resource bases and ecosystems, eroded soils, and hostile climate conditions.

Graph 1. Share of environmental impact of food products



Source: Deegan, 2011, based on EIPRO study.

Apart from the costs of the global food system, the increasing population growth leads an increasing demand for food resources inside industrialized democracies that foster consumption. “The rate of growth is slowing somewhat, but world population is still projected to reach nine billion within a few decades. This population growth poses considerable challenges for resource and environmental management” (Sterner and Coria, 2012, p. 1). Meadows et al. (1972) used systemic analyses to predict the future development of food in this context of population growth. The link of growth with the overuse of scarce resources showed pessimistic results for humanity, with a considerable part of the world facing severe hunger problems. In addition to population growth, the increased biofuel production, the incrementing supply and value chain complexity, a tendency of urbanization —that leads to changing lifestyles and generational changes on dietary preferences—, and the increasing waste accumulation pose challenges to food systems and food security.

The FAO (1996) defines food security as “all people, at all times, having physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. This concept has four pillars: availability, access, utilization and stability. Availability refers to having sufficient quantities of food available on a consistent basis. Access means having sufficient resources to obtain appropriate food for a nutritious diet. Utilization is having the appropriate use based on knowledge of basic nutrition, food safety and adequate water/sanitation. Finally, stability means that the infrastructure and supply chains should not be subject to undesired or unplanned disruption.

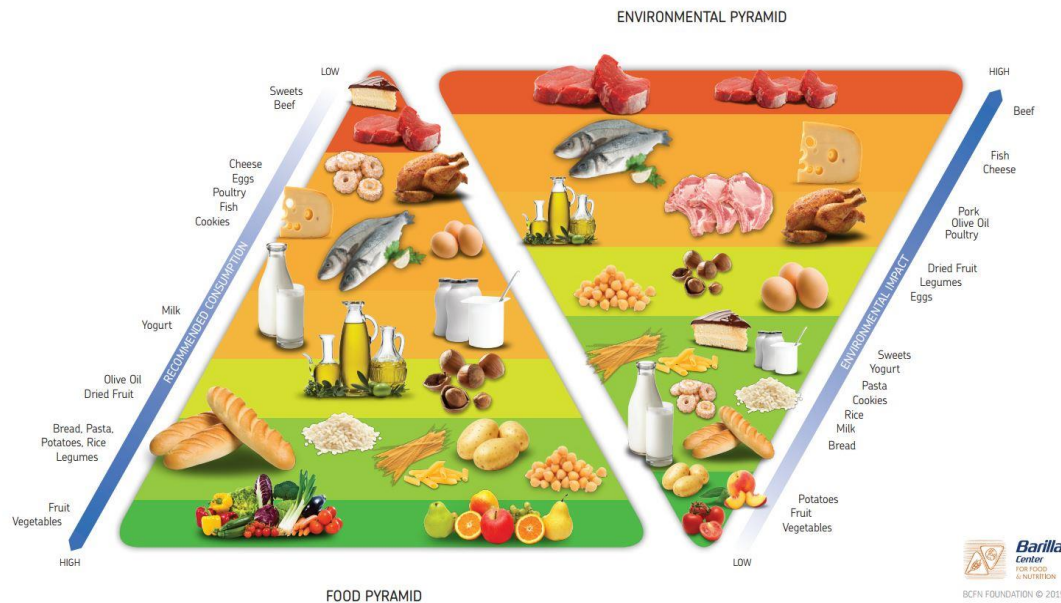
The above mentioned global trends suggest that access, availability, utilization and stability of food are being challenged. The livelihoods of present and future communities of people in different parts of the world are threatened. Nearly 800 million people suffer from hunger and about two billion people

have micronutrient deficiencies (BMZ, 2015). The Global Food Security Index (2013) maps countries according to their risk of hunger and starvation. The index portrays a world where food is unequally distributed. Food is allocated in ways that do not allow for feeding the complete world's population. Human-edible calories used for biofuel production increased fourfold between the years 2000 and 2010, representing a net reduction of available food globally. Of the total calories produced worldwide, already 36% are used for animal feed, and only 12% contribute to human diet (Cassidy et al., 2013).

Aside of that problematic scenario portrait, the good news is that the challenges also present a major opportunity to promote food sustainability. Particularly, through production and consumption strategies at the global, national and local levels that improve food supply chains step by step (Scott, 2007). Germany, for example, ratified its compromise with the Sustainable Development Goals (SDG) and outlined the goal of “focusing on an inclusive rural development approach, fostering responsible investment and sustainable agriculture” as a national priority (BMZ, 2015). This national goal impacts the whole food sector, estimated to share a 6% value of the total German economy, with 5.8 million employees, and 700,000 businesses (Food Federation Germany, 2017). New efforts for tackling food challenges by connecting nutritional and environmental aspects rise every day. For example, the appearance of the Double Pyramid model (see image 1), which promotes a diet “healthy for people and sustainable for the planet” (BCFN, 2016). So does the development of several estimates for carbon, ecological, and water footprints of basic food products.

The past years also saw the rising of civil society led trends, movements, foundations, art, documentaries and all kinds of information sources that prioritize more and more network connections for environmental awareness. For example, the global movement *Fridays for Future*, the *Food Corps Organization*, the films *Food Inc.* or *In Organic We Trust*, and so on. Hand in hand with the appearance of these several environmental awareness campaigns, more people decide to shift every day from the cheapest options to the most ecological ones in every sector of consumption, including the food they buy (Andorfer, 2013; Die Bundesregierung, 2013). The European Commission (2009) reported that “eight in ten EU citizens felt that a product's impact on the environment is an important element when deciding which products to buy”. It is under this context that sustainability-related labels (from here on called eco-labels) appear on the map.

Image 1. The Double Food and Environmental Pyramid



Source: BCFN Foundation, 2015.

Problem identification

Even when consumers are becoming more aware of environmental issues, it is not always easy to take this awareness into practice. In most developed countries, consumers of food products are confronted with a wide array of decisions every day. “Not only must they choose among a selection of different brands, they must also consider basic issues in relation to their purchase decisions, like how much carbohydrates and fat to include in their diet; whether to buy organically or conventionally grown produce, avoid large fish with a high mercury content, accept the risks of genetically modified foods, give preference to local products; and so forth” (Ajzen, 2015, p. 121).

Eco-labels² are designed to make consumers’ life easier when transiting to sustainable shopping. They are market-based instruments introduced by public and private institutions to reduce market frictions and communicate sustainability-related reliable information about the products they are placed on. “The growing demand for more sustainable food due to individual consumers, private or public sector interests has encouraged competition within the global agri-food business. Consequently, the differentiation and communication of food products with regard to their sustainability is becoming crucial” (von Meyer-Höfer and Spiller, 2014, p. 2). Currently 463 eco-labels exist in 199 countries, on 25 different sectors. The 25% of all existing eco-labels are food-related (Eco-label Index, 2019).

The sudden spread of eco-labels around the world also brought forth a strong academic debate about the benefits and the drawbacks of eco-labels. On one side, eco-labels are created under regulations and standards that guide producers to follow them. That way, they are supposed to provide accurate and revised information to consumers. Which in turn, empowers people to choose the less hazardous products, both for the environment and their health. As stated by Grunert, Hieke and Wills (2014, p.

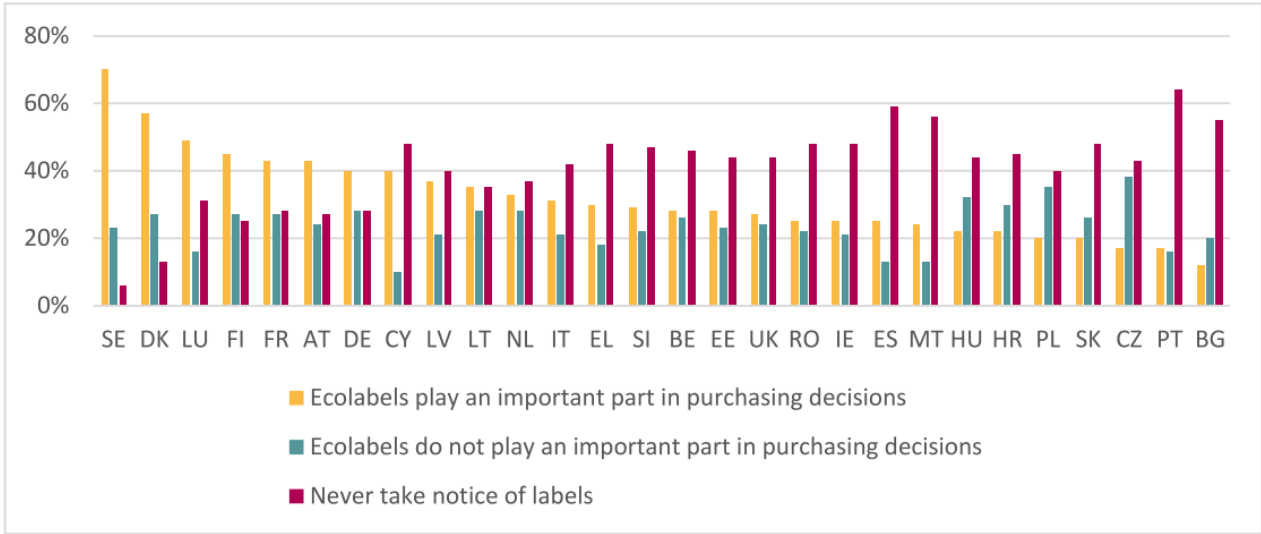
² To see more on the definition of eco-labels go to the *Conceptual Framework* chapter, p.30.

178), “sustainability labels give the opportunity to take into account environmental and ethical considerations when making food choices”. This also increases transparency along the food chain and gives incentives to sustainable production (Deegan, 2011; Grunert, Hieke and Wills, 2014; Global CAD, 2019). Eco-labels are supposed to drive a demand increase in those products with more ethical and environmental standards, thus, give incentives for that same supply. Representative studies made with European consumers state that “the most important reason for buying organic food was to contribute to climate and environmental protection” (Die Bundesregierung, 2013).

On the other side, eco-labels are not always easy to understand, sometimes they are not self-explanatory and require further research to really become useful for the user. For some consumers different eco-labels even compete with one another and with food attributes that are part of decision-making, like prices or taste. The great amount of labels in the market also makes consumers feel overwhelmed. Harm might result from labels that are designed to suit northern consumers (or producers) and come to act as trade barriers, because for some certifications, the costs may be too high for small-scale farmers. Finally, there is a degree of skepticism about the criteria and the procedures used to assign eco-labels (Beuchelt and Zeller, 2011; Global CAD, 2019).

So, the main problem is that the current research is not enough to understand if outside the theory and the good intentions, eco-labels are really working. And if they are not working, why? There is a gap in knowledge to answer if eco-labels are actually contributing to strengthen sustainable consumption decisions. The few studies that have researched the topic give ambivalent, inconclusive, or impartial results (Scalco *et al.*, 2017). For example, one of the biggest projects that researched this topic is the 2018 Eurobarometer, a survey conducted in 28 countries. The study concluded that for 32% of respondents eco-labels play a role in purchasing decisions, for 25% they are not important. 39% of the respondents said they never take any notice of labels. Differences are not significant (Fairtrade International, 2019, p. 2; Global CAD, 2019, p. 14).

Graph 2. The role of eco-labels in purchasing decisions



Source: Global CAD, 2019, from Eurobarometer 2018.

A problem arising from the Eurobarometer and other similar studies is that a survey which only asks people to state if eco-labels are or not important for them is too far from a real consumption situation. Of course every project has its own budget and time limitations. However, it would be at least important to differentiate between types of products and to include prices, which always make a difference when researching purchase behavior. This thesis seeks to solve that problem by simulating as much as possible the conditions for a real decision between real market products and their prices with the incorporation of experiments—a research method that has been used several times on marketing and labelling studies, but not yet linked to environmental studies on eco-label effects.

Another problem found in previous studies is the phrasing of the survey's questions, which should be particularly careful in market research. The use of the word "important" already makes people answer according to what they think is desirable, correct or "what the surveyor wants to hear". Finally, the findings on effects of eco-labels are hardly generalizable to every country or population segment. The answers are most probably dependent on a specific context and community. That is why this thesis focuses on the study of eco-labels contribution to sustainable food consumption only in the city of Cologne and within the student community.

Justification and relevance of the thesis

This thesis is relevant on today's context of consumer societies, where the individual consumer is in the center of decision-making processes everywhere. As stated in Kvale (2006, p. 494), in a consumer society "reality and personal identities are socially constructed and reconstructed through the act of purchase. [...] Purchases are directed less by the value of concrete use of the products than by the experiences, dreams, and lifestyles associated with the products." Because of this value of products associated to beliefs, lifestyles and attitudes, it becomes important for market-sensitive capitalisms to investigate carefully the meanings that some products have for the consumers (Kvale, 2006).

Consumers decide whether to reward activities in the food chain or not and thus exert market pull (Grunert, Hieke and Wills, 2014). The market pull that consumers exert when buying certain products and not others is necessary for innovating food systems. It justifies the allocation of economic resources, the introduction of new measures and the efforts of improvement. Therefore, the decisions a person makes regarding what she eats and buys are vital for either introducing or strengthening sustainability in the food sector.

Since this project analyzes the role of consumer pull in the market of organic and Fairtrade sustainable alternatives, it will give market knowledge to the food industry of Cologne. This is of particular interest for the university canteens that sell food products and prepared meals to students, and for supermarkets that sell labeled products. Having context-specific demand information for eco-labeled products might allow retailers in several supply chains to decide where to invest next, or to make some changes on their actual offers. This investigation of consumer attitudes and preferences regarding food products may serve to improve those products, as well as to understand and enrich consumer's choices. It will serve to increase economic returns and business profits by giving an insight on pathways to follow

for changing consumer behavior in the direction of more responsible and sustainable consumption options. The research will serve, more specifically, to evaluate the role of eco-labels on the redirection of consumer choices. However, it is necessary to clarify that this research includes the consumers' point of view and preferences not only as the last recipients of the food, but as a comprehensive segment of actors that can actually pressure for sustainable changes along the whole production and design of products in a supply chain.

The latter is important because eco-labels are only one of many solutions waiting out there to be implemented in favor of sustainability. It has been argued, for example, that “the policy focus of government and donors should move from certification schemes to investments in the farm and skills of producers as well as the establishment of public support for cooperatives, public extension and production support systems” (Beuchelt and Zeller, 2011). Conscious assessments of the effects and the usefulness of certification schemes—not in theory but in practice—need to be made in order to make that kind of decisions.

Every policy instrument, eco-labels included, incurs in costs and efforts. This one, in particular, needs to develop criteria, apply certification schemes, and monitor compliance (multi-criteria assessment and verification), which requires a high level of expertise in national competent bodies (Deegan, 2011). A careful evaluation of eco-labels usefulness or contribution is needed to justify whether the money, time, and effort invested in this instrument should continue in this specific context, be replaced, or be modified (and in which ways).

Academically, the research also contributes to the literature on sustainable behaviors by identifying the strengths and weaknesses of eco-labels linked with theories of consumer behavior, like the Theory of Planned Behavior (TPB). Previous studies (Fellows and Hilmi, 2011; Ajzen, 2015; BMZ, 2015; BLE, 2017) have also shown that it is highly relevant to study consumption decisions because they have an impact on the development of concepts like food safety, and can also translate to responsible consumption in other areas, such as clothing, urban mobility and tourism choices.

Why these specific labels?

This thesis studies the effects of two particular eco-labels: the Bio and the Fairtrade. As documented in other researches, these are “the two best known and widely used sustainability labels in Germany: organic (the ecological dimension of sustainability) and Fair Trade (the social dimension) [...] and the impact of both labels on the global food market has grown continuously” (von Meyer-Höfer, von der Wense and Spiller, 2013, p. 2).

Why Cologne?

One reason for choosing Cologne for the study is because it has a high multicultural dimension, which is one of the variables that might be related to the effects of eco-labels. Cologne is well known for being a symbol of multiculturalism. According to the German Census of 2009, approx. 17% of Cologne's residents come from foreign countries. This is without counting the German citizens with migration background and the community of foreign students.

Also, Germany —and specifically Cologne— has a reiterated compromise with the SDG. This thesis' topic is linked directly to SDG two and twelve. Goal number two aims to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. Goal number twelve seeks to ensure sustainable consumption and production patterns across the globe (UN, 2020). Cologne has developed partnerships and institutions that care for improving sustainability in food consumption and fulfilling the mentioned goals. For instance, a Nutrition Council (*Kölner Ernährungsrat*) that connects food policy done at the federal level to the regional and local levels. The Nutrition Council seeks to strengthen food awareness, nutrition education, regional marketing, and to spread more sustainable eating habits. It is made up of one third public authorities, one third business (agriculture, trade and gastronomy) members, and one third civil society (Ernährungsrat, 2018). In constant communication with the Nutrition Council, there is also a small stakeholder that supports the conduction of this thesis: the student initiative Green Canteen. The Green Canteen aims to facilitate a fundamental change in diet, image and action of the university canteens in Cologne. The project calls for sustainable, healthy and tasty food (Dekker, 2019).

Why students?

Same as the Green Canteen project of Cologne —and to collaborate with their own research— this thesis focuses on the student community. It is important to focus on the student community because they are the consumers of the future, the ones capable of making a difference in the next decades. Young students are on the final stage of forming their personal identity and developing their system of beliefs and values. So, changes in strategic variables have a good possibility of impacting those habits taken into their older age (Vermeir and Verbeke, 2008). University students already have a considerable spending power, and are expected to have an even higher one in the future, which can make them able to pay a price premium for sustainable products (Harms and Linton, 2015). They can also influence present food choices in their households, for example, when going back to their parent's house and asking for different, more sustainable alternatives of food (Leeuw *et al.*, 2015). Also, several studies about the social basis of environmental interest found positive and significant empirical evidence to confirm that young people have a higher environmental awareness in every consumption sphere, or at least knowledge on the concept of sustainability (Van Liere and Dunlap, 1980). This authors explain that young people are not yet fully integrated into the economic system or the dominant social order, so they tend to be more open to reformist discourses. In addition to being exposed to more events, movements and alarming information.

Finally, the most important part of conducting a research is to have access to the population. As well as the support of those authorities bridging the researcher with the population. In this case, student parity and contact with community members that can help to reach a big, representative student sample make the project feasible.

Objectives

The general objective of this research is to:

Analyze the effects that eco-labels have on the demand for organic and Fairtrade food products,
inside the market created by the students of Cologne (as consumers).

This thesis proposes the wording “eco-label effects”. Please understand for eco-label effects: a higher or lower demand for food products that are eco-labeled against those that are not. In other words, the effect on organic (Bio) and Fairtrade (FT) products’ demand caused by their labels. The plural *effects* is used in the title because there is not only one eco-label effect with the same intensity or direction, but different effects that vary for the different food products presented. For example, the presence of an eco-label might either encourage or discourage the purchase of the product. Eco-labels might also have different effects on people when buying packed spaghetti than when buying raw meat or fresh tomatoes.

The idea behind the general objective is then to find if eco-labels influence students’ intentions to buy those more sustainable alternatives. If eco-labels prove to influence the population’s consumption choices, the research seeks to measure the magnitude of this effects for each type of food. The thesis also extends to explain the reasons behind the eco-label effects on the consumer’s decisions. Which includes linking the influence of eco-labels with other variables related to food consumption choices apart from economic incentives, like attitudes, norms, perceived behavioral controls, and demographics, and to confirm their explanatory power. These variables have proved — in several previous studies (Ajzen, 2015) — to explain consumer behavior.

The specific objectives of this research are to:

- I. Find if there is a different demand for food products that are eco-labeled as Bio/FT against those that are not eco-labeled.
- II. Determine the direction and the magnitude of the eco-label effects, if found.
- III. Find the reasons that explain the effects of eco-labels on consumers’ intentions to buy sustainable food.

Research questions

Research questions are presented for each of the specific objectives considered. However, the main research question that guides this thesis is:

Do people buy organic and Fairtrade food (Y) because of the eco-labels (X_i) placed on the products?

Research Questions for Specific Objective 1

- I. Is there a higher demand for organic and Fairtrade sustainable food only indicated as so by eco-labels?

- II. Are the eco-label effects on demand for Bio/FT products different for different foods (pasta, meat, tomatoes, juice)?

Research Questions for Specific Objective 2

- III. How strong are these eco-label effects for each different food?

Research Questions for Specific Objective 3

- IV. What explains the existence or inexistence of Bio/FT label effects on consumer choices and its different strength levels, apart from economic incentives?
- V. Do *attitudes, norms, perceived behavioral controls* (TPB), and *demographic factors* explain the intention to buy Bio/FT products?

Hypothesis

The hypotheses presented are supported by theoretical elements included in the *Literature Review* section of the thesis. For broader information on each supporting background, please refer to that chapter. Nonetheless, this part summarizes what the thesis **expects** to find in line with each research question and objective, according to the results found in similar studies, the statistics retrieved from official government sources, and other indicated references.

Hypothesis for the General Research Question

Students buy more the food products that are eco-labeled as organic (Bio) and Fairtrade (FT).

Hypothesis for Specific Objective 1

Q.1: Is there a higher demand for organic and Fairtrade sustainable food only indicated as so by eco-labels (are there any eco-label effects)?

H.1: Yes, the thesis expects to see a general strong intention to purchase sustainable food options within the students of Cologne. This hypothesis states that between two options of a food product, whose only difference is the label, students prefer the Bio/FT one. That way, eco-labels have a positive influence on the intention to buy organic and Fairtrade products.

What supports this hypothesis is the recent importance of organic and Fairtrade options for consumers as a growing trend. The German Ecobarometer (*Ökobarometer*) of 2013, a representative survey of consumers conducted by the Federal Ministry of Food, Agriculture and Consumer Protection (*Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz*), counts the number of people consuming organic food in Germany at regular intervals. The Ecobarometer found that “more and more young people are paying attention to organic products when buying food. 23 percent of those under the age of 30 declared that they often choose organic food. That means an increase of nine percent within one year” (Die Bundesregierung, 2013). This agrees with the results of Van Liere and Dunlap (1980), who found positive and significant evidence to confirm that young people have nowadays a higher environmental awareness in every consumption sphere.

Q.2.: Is the demand for Bio/FT options different for different foods (pasta, meat, tomatoes, juice)?

H.2.: The hypothesis states that a Bio/FT preference exists indeed in a different way for each product. Since the products were chosen to be basic foods that almost every student would buy, but attention was directed to consumers that have different types of diets (vegetarian, meat lover, kosher, halal, etc.) for different reasons.

The products were also selected responding to differences in elasticity values, so the experiment could present variation in that attribute. A research based on 160 studies of elasticity values already obtained the mean elasticity for juice (0.76), beef (0.75), cereals (0.60) and vegetables (0.58) in that same order, from most elastic to less (Andreyeva, Long and Brownell, 2010, p. 219). Effect differences are also possible regarding the processed and packed level of the products. Fresher and unpacked products are expected to show eco-label effects with higher magnitude.

Hypothesis for Specific Objective 2

Q.3.: How strong are these eco-label effects for each different food?

H.3.: The hypothesis states that a Bio/FT preference exists with different strengths, the magnitude however is yet unknown, since no recorded attempts of findings these values were found in the literature search. The assumption is that the organic and Fairtrade products' market operate in the same way as other food markets. Which means that the effects of eco-labels might be lower on elastic products, such as juice. Because when the price rises—which normally happens with eco-labeled products—consumers might easily shift to other cheaper different labeled options, and lower the demand of the eco-labeled product. A study on elasticity of food products found that “a 10% increase in soft drink prices should reduce consumption by 8% to 10%” (Andreyeva, Long and Brownell, 2010, p. 216).

In contrast, for more inelastic products—as pasta—consumers might still buy the same eco-labeled product even if the price rises, because they think they really need it, or because they are already used to buying it. Slight movements on price hardly affect demand when dealing with inelastic products. People are used to buy these products no matter what the price difference is. It is interesting to note that in this realm, “consumer demand for meat, particularly beef and pork, has received substantially greater attention than demand for any other food. [...] Fewer studies provided estimates for cereal, cheese, and fruits or vegetables” (Andreyeva, Long and Brownell, 2010, p. 218).

Apart from product elasticity, the Bio/FT preference might be stronger in fresh products (tomatoes) where the skin is directly eaten, than in processed and packed products (pasta). As other studies found, “there is a particularly high demand for organically grown fruit and vegetables” (Die Bundesregierung, 2013). This is because organic and Fairtrade labels are focused on production standards, “in the field” practices. So it makes more sense to prefer having this labels on products that come directly from the fields and have not been processed afterwards.

Hypothesis for Specific Objective 3

Q.4.: What explains the existence or inexistence of Bio/FT label effects on consumer choices and its different strength levels, apart from economic incentives?

H.4.: Other explanations for the Bio/FT preference might also be the degree to which students recognize the labels and understand their meanings, the awareness and interest about the environmental impacts

of the food they buy, the trust they have on each label, even the label designs and colors. Because this is a broad question with many possible reasons for each participant, it is analyzed qualitatively through the open answers of consumers.

Q.5.: Do attitudes, norms, perceived behavioral controls (TPB), and demographic factors (like study program and nationality) explain the intention to buy Bio/FT products?

H.5.: The elements proposed on Ajzen's Theory of Planned Behavior: attitudes, norms and perceived behavioral controls have an explanatory value (strong and positive effect) on the students' intention to buy eco-labeled products. A research on 108 studies that used the TPB to explain consumer intentions to buy organic food found that the "results confirm the major role played by individual attitude in shaping buying intention, followed by subjective norms and perceived behavioral control" (Scalco *et al.*, 2017, p. 235).

Demographic factors like country of origin and nationality are also expected to make a difference on the intention to buy sustainable products. Students with German and other European nationalities might have a stronger preference for Bio/FT food because they are more exposed to the labels, since Europe has the most eco-labels for organic and Fairtrade products. Students of social-environmental related careers and students with higher income available also might have stronger Bio/FT preferences. "One explanation for this hypothesis is that the upper and middle classes have solved their basic material needs and thus are free to focus on other aspects of human existence [...]. It assumes that concern for environmental quality is something of a luxury which can be indulged only after other more material needs are met" (Van Liere and Dunlap, 1980, p. 183). The authors also suggest that middle and upper classes are normally the most politically and socially active members of society when concerning environmental awareness, in part because they have more time to engage in social issues.

LITERATURE REVIEW

As stated in Darnton (2008, p.5), "the literature on the factors influencing human behavior (thus consumption) is very extensive: it has been described as 'enormous' and 'bordering on the unmanageable'." The research flows from diverse social science disciplines, especially from economics, sociology, psychology, and politics. That is why the thesis presents only the necessary background to follow this particular research. The first sub-chapter comprises the concepts regarding food systems, organic and Fairtrade food, and eco-labels. The second sub-chapter reviews the theoretical constructs and the previous studies that support the research. Concepts related to particular theories, for example the variables from the TPB, are explained together with the theory itself.

Conceptual framework

Types of agriculture and food systems

Typically two major types of agriculture are distinguished: irrigated and rain-fed. The main difference is that rain-fed agriculture depends on a natural water supply. Both have problems that can lead farmers

to unsustainable practices. Irrigated agriculture is associated with fertilizers and pesticides that risk human health, high yielding varieties, and usually a high degree of mechanization. Rain-fed agriculture, on the other hand, is associated with higher poverty levels, discount rates, hillside deforestation, soil erosion and conservation as well as downstream effects, property rights, population pressure, and tenure.

Other problems can also lead farmers to unsustainable practices, especially in the world south countries, where farmers tend to be less supported. For example, high discount rates, credit rationing, and tenure insecurity, which, “together with other factors, may lead to lack of interest in soil conservation” (Sterner and Coria, 2012, p. 478). The selection of small or big scale, irrigated or rain-fed agriculture is a first step to determining which food system is preferred or available for each context.

The introductory chapter already defined a food system as “all the processes and infrastructure necessary to feed a population” (European Commission, 2019), which goes from the field to the table. Let’s just complement it by explaining that a food system can be divided according to different criteria at every level of the supply and demand chains it comprises. However, one useful division parts from the way food is grown. Food systems, then, can be divided into conventional, local, or organic food systems.

A conventional food system works within a production model that focuses on achieving maximum efficiency to increase production quantities and decrease consumption costs. A local food system aims to be geographically and economically accessible; it operates with less transportation and more direct marketing, which consequently leads to a minimization of intermediaries. An organic system is one defined by having less dependence on the use of chemical fertilizers and pesticides, and having a greater concern for transparency and information (European Commission, 2019).

Food system differences and basic agriculture economics relate to the origin of eco-labels, because these were originally introduced in order to counteract agriculture production problems and give incentives for engaging in sustainable production processes from a socio-economic approach. It is important to remind that different food production systems have different benefits and costs for producers. For example, “many producers in developing countries benefit from ecologically sensitive production partly because it is labor intensive and because it adds value to the food” (Sterner and Coria, 2012, p. 479).

Organic food

Even though one cannot say that organic is a synonym of “most sustainable”, it is this type of food system that concentrates the main amount of eco-labels for food in the European Union and the one that shows the highest environmental benefits so far (FiBL and IFOAM EU, 2016). Organic agriculture is defined by the IFOAM as “a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. [It] combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved”(von Meyer-Höfer and Spiller, 2014, pp. 3–4).

Food labeled as organic is expected to take into consideration energy consumption, water contamination, soil depletion, and human health issues. Some organic systems use certified seeds, practice water and soil conservation, implement state-of-the-art feeding and livestock management, rotate crops, use fertilizers from animal and plant residues, use internal resources such as wind or solar energy, control pests biologically, fixate nitrogen through biological methods, among others (Reganold, Papendick and Parr, 1990).

According to these authors, organic systems have many benefits: They reduce the risk of chemical contamination of food. They have proved to increment the yield between 10 and 15% higher than monoculture. They increase the efficiency of the nutrient cycle due to crop rotation, which decreases dependence on chemical fertilizers and involves crop seasonality. Also, the organic material improves soil structure, water retention capacity, and fertility; as a result of better physical soil conditions the germination conditions increase. Green manures function as biological pest and weed control, which prevent soil erosion and produce forage for livestock. This is important because having a variety of crops and livestock diversifies some economic risks of agriculture. However, food produced in organic farming systems is usually more expensive than food produced with conventional methods. This happens because organic farming requires more labor. Also, organic farming can need between 16 and 100% more surface area and inputs than conventional farming (Leifeld, 2012).

Germany has the largest market for organic food in Europe, which accounts for 10 billion euros (FiBL and IFOAM EU, 2016). The Research Institute of Organic Agriculture (2016) reported that 2.9% of Europe's farmland is organic. Over half of this farmland area corresponds to four countries: Spain, Italy, France, and Germany. Germany comprises 1.6 million hectares of the organic farmland, among 35 thousand producers. 6% of the total organic farmed hectares in Germany are located in the region targeted by this thesis: North Rhine-Westphalia (NRW). Most organic farms are part of associations. In Germany, the largest and oldest associations are Bioland and Demeter. Some other associations are Naturland, Biokreis, Bundesverband Ökologischer Weinbau, Gäa, Ecoland, Biopark and Verbund Ökohöfe.

To officially be classified as organic, farmers must be certified (officially recognized or approved). This means that they must follow strict rules and regulations to ensure that their products and their growing and processing practices really are organic. The European Union's legislation governing organic farming and labeling consists of the Council Regulation No 834/2007/EC of June 28th, 2007, repealing Regulation No 2092/91/EEC, and the detailed implementing rules on Commission Regulation (EC) No 889/2008.

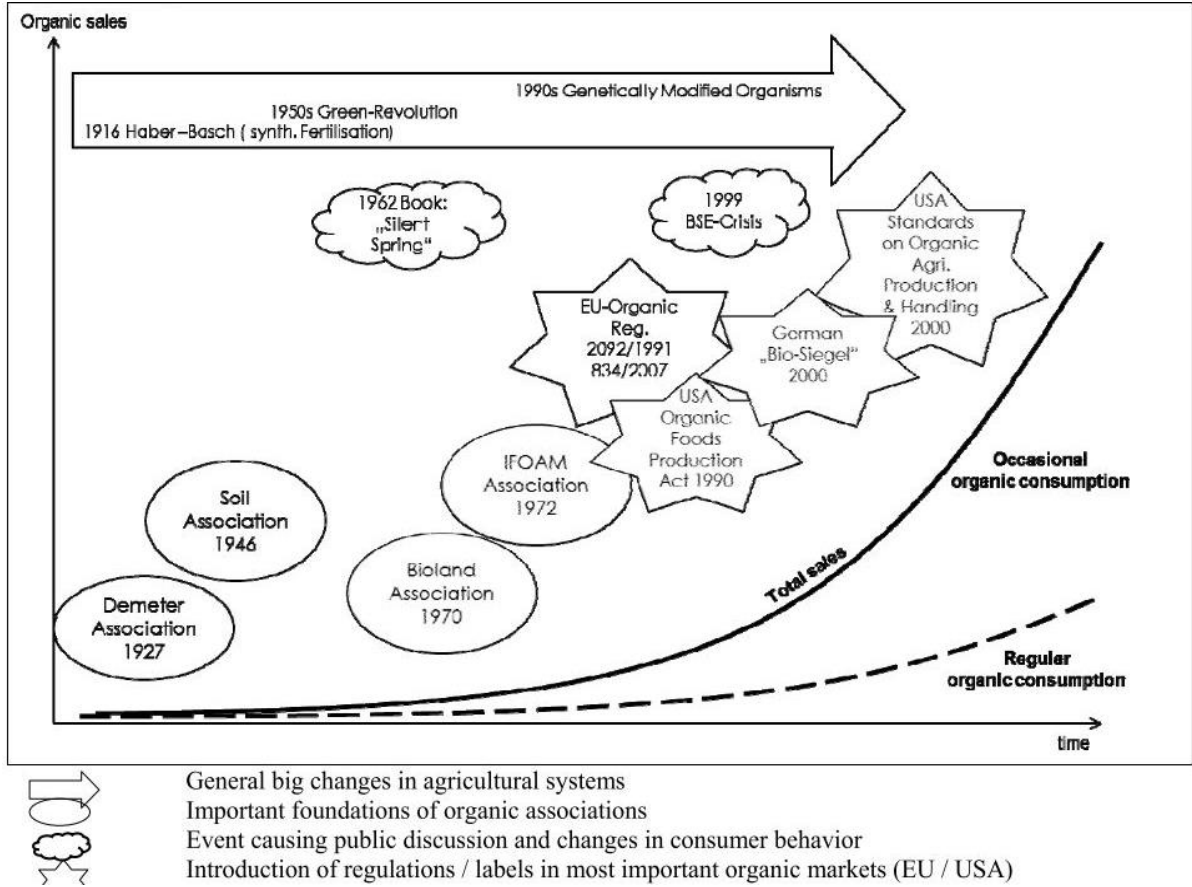
The major criteria (BMEL, 2019) for farmers to be certified as organic is that food should be as natural as possible. That is why, in addition to production, the processing of organic raw materials into food is regulated: at least 95 percent by weight of the agricultural ingredients must come from organic farming, using methods as crop rotation, humus economy (soil loosening and green manuring), strengthening the plant's own defenses with correct sowing times, location and variety selection, and chemical-free weed control. Regarding additives, it is prohibited that organic food uses sweeteners, with

the exception of erythritol and stabilizers, as well as synthetic colors, preservatives and flavor enhancers. For animals, organic requirements mandate sufficient space, exercise, fresh air, daylight, and contact with people.

Generally, organic markets are classified according to development stages. The German organic market has been several times classified in previous studies as “mature” (Deegan, 2011; von Meyer-Höfer *et al.*, 2013; von Meyer-Höfer and Spiller, 2014). The maturity of organic markets has been studied through path dependency analysis over time and key milestones have been associated with that development (see graph 3).

For instance, the introduction and establishment of organic farming techniques (as changes in agricultural systems); the growth of a consumer activism and environmental awareness (with the appearance of large organizations, as the IFOAM); the incidence of consumer distrust in conventional production techniques (due to events that cause public discussion, as scandals and diseases); and the final adoption of organic food products by large distributors (accompanied by the introduction of eco-labels and proper market establishment). “The available body of literature suggests that two major organic food consumer segments, occasional and committed or regular consumers, dominate the current organic market [...] Furthermore, most organic food sales come from consumers who switch between conventional and organic food alternatives” (von Meyer-Höfer *et al.*, 2013, p. 4).

Graph 3. Organic food market: from niche to mature market



Source: von Meyer-Höfer *et al.*, 2013.

Eco-labels

There are several policy instruments for environmental and natural resources management with different classifications, depending on the author. Some of the most common classifications are: “market based” versus “command and control” instruments; carrots, sticks and sermons (Bemelmans-Videc et al., 1998); physical, organizational, legal, economic, and informative categories (Lundqvist, 2000), and the four categories presented by Sterner and Coria (2012) and the World Bank (1997): 1) policy instruments using markets, 2) creating markets, 3) environmental regulations, and 4) engaging the public. This thesis understands eco-labels principally as part of the fourth category of the latter classification.

The first category —policy instruments that use markets— includes subsidies; environmental charges on emissions, inputs, or products; user charges (taxes or fees), performance bonds, deposit–refund systems; refunded emissions payments and subsidized credits. The second category includes the creation of private property rights; tradable emission and catch permits or rights; and international offset systems in general. The third category includes standards, bans, non-tradable permits or quotas, and regulations that concern the temporal or spatial extent of an activity (zoning); licenses; liability bonds, performance bonds, and other enforcement policies and penalties. The last category includes information disclosure, **labeling**; community participation; dialogue and collaboration among the environmental protection agency, the public, and polluters (Sterner and Coria, 2012).

According to the mentioned authors, eco-labels are market-based instruments for environmental policy introduced by public and private institutions to reduce market frictions and communicate reliable information about the products they are placed on. They are a representation of social, political, economic and environmental intersections, because they involve actors, interests and resources from all spheres. The OECD (1991) also defines eco-labels as “seals of approval given to products that are deemed to have fewer impacts on the environment than functionally or competitively similar products”. They are based on standards and certification schemes. They are tools to guide consumers’ purchase choices. “Labels can refer to a wide range of criteria and standards, including both social and environmental aspects as well as origin, product quality, and health dimensions. They can refer to a certification of either an entire supply chain or only of a component in a product, for example organically grown cotton in a T-shirt” (Global CAD, 2019, p. 8).

Currently 463 eco-labels exist in 199 countries, on 25 different sectors. The 25% of all existing eco-labels are food-related (Eco-label Index, 2019). However, this thesis focus is on two particular eco-labels: the Bio-Organic and the Fairtrade.

The Bio Label

The thesis analyses outcomes for two labels of organic production: the label for the EU and the one for Germany (see image 2). Most of the times they appear together in the products, since they refer to basically the same rules. In the EU, the organic production method is regulated by the Council Regulation (EC) 834/2007. All foods produced accordingly are labelled with the green flag, which is the common European organic label (von Meyer-Höfer, Nitzko and Spiller, 2013). The EU organic label was established in 1992, as a voluntary ISO I environmental label (Deegan, 2011).

The German Bio label also refers to the same European Council regulation as the EU label, following the same implementing rules. In addition, food that uses the German Bio label must have passed a control procedure conducted by an approved inspection body that supervises compliance with the standards, on the basis of the Eco-labelling Law in its version published on 20 January 2009 (BMEL, 2017). Imported products that comply with the EU legislation standards on organic farming can also be labelled with the German *Bio-Siegel*.

The German Bio label was “introduced in September 2001 by the Federal Ministry of Food and Agriculture (BMEL) as a voluntary label for organic foods and has since then become one of the most widely-known and most frequently used logos in food labelling” (BMEL, 2017, p. 1). Based on the results of a study made by the Göttingen University in 2013, the BMEL (2017) affirms that “over 90% of consumers in Germany know the German *Bio-Siegel*, and more than 50% trust its message”.

The Bio label represents standards for animal welfare, no use of chemical pesticides, no artificial or synthetic fertilizers, no GMO, and a low number of additives. Farmers are also encouraged to employ agricultural methods that improve soil fertility and nutrient cycles, such as intercropping, crop rotation, legume cultivation, and the use of organic fertilizers (Meemken, Spielman and Qaim, 2017). Unlike Fairtrade labels, organic labels do not guarantee a “fair price” or price premium for producers.

The products that may be labelled as Bio are: non-processed agricultural products (or agricultural products processed for human consumption or feedstuffs which fall within the scope of EC regulations), fish from pond farming, algae and other aquaculture products, vegetative propagation material and seeds. Wine can also bare a Bio label (since 2012). The products that may not be labelled as Bio are: products from hunting or wildlife fishing, medical, drugs and cosmetic products not subject to EU legislation on organic farming, food enriched with vitamins and minerals, or agricultural products produced during the transition period to organic farming (BMEL, 2019).

Any food labeled as organic in Germany needs to be registered with the Bio-Siegel Information Service at the Federal Ministry for Agriculture and Food (BMEL). According to data from this agency, companies currently use the Bio label on more than 80 thousand products (BMEL, 2019). If any company gets caught using the label unlawfully the products may be withdrawn from the market and the administrative fines may be of up to 30,000 euros (BMEL, 2017).

Image 2. The Bio (organic) labels for Germany and the EU



European Union



Germany

Source: *Oekolandbau*, 2020.

The Fairtrade Label

To clarify, Fairtrade written as one word is a registered international trademark for labeled products of the Fairtrade Labelling Organization (FLO), while Fair Trade separated is the name of a global movement. It is also a concept agreed by the World Fair Trade Organization (WFTO) and Fairtrade Labelling Organizations International in 2009.

Fair Trade, then, is defined as “a trading partnership, based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers – especially in the global South” (Global CAD, 2019, p. 8). It campaigns for changes in the conventional international trade system, and it guarantees payment of a higher price premium for producers than the international market prices for commodities.

Some of the principles of the Fairtrade label are: creating opportunities for economically disadvantaged producers; paying a fair price; pre-financing and giving advanced payments; transparency and accountability; capacity building; respect for the environment, long-term commitment; and gender equity (Beuchelt and Zeller, 2011). The key standards of the Fairtrade label are a Fairtrade minimum price and a Fairtrade premium. “The Fairtrade minimum price is a floor price that becomes relevant whenever the world market price falls below a certain threshold. The Fairtrade premium is an additional amount of money paid to certified farmer organizations as an incentive for continued participation”. This extra premium was of approx. 70 USD per member in 2014 and it is typically reinvested in agricultural capacity development and social community projects in the field of health and education (Meemken, Spielman and Qaim, 2017, p. 8). Fairtrade also bans children labor.

The first Fairtrade organization was established in 1964 in the UK, as a religious inspired charity trade model for selling handcrafts. Politically, Fairtrade became part of a “strategy for promoting development on a ‘Trade not Aid’ basis, first supported by the UNCTAD in 1968” (Vande Velde, 2012). Currently, there are more than 1,400 Fairtrade certified producer organizations in nearly 73 countries, which accounts for more than 1.66 million farmers and workers in the Fairtrade umbrella (Fairtrade International, 2011).

As happens with other eco-labels, studies have highlighted both positive and negative (or null) impacts rising from the Fairtrade label, for the environment and the producers. This impacts are context-specific. On one side, it has been stated that Fairtrade labels have a positive impact on smallholder farmers and plantation workers, because they provide opportunities for higher and more stable income and living standards. The extra bonuses and premiums they receive allow for small investments and savings, which makes farmers and workers less vulnerable to poverty and external conditions. The premiums received are also often invested in social projects of housing, education and health (Fairtrade International, 2011; Vande Velde, 2012).

On the other side, some studies have found that Fairtrade labels are not really useful to alleviate poverty (Claar and Haight, 2015). The arguments are mainly five: 1) that it is quite expensive to join the Fairtrade network. To be a member costs initially around 600 USD, plus annual inspection fees of 300-

4000 USD, depending on how large the production is. 2) That once inside the network there is no guaranteed buyer. Sometimes Fairtrade certified farmers need to search up to eight years to find a buyer. 3) That there is still not sufficient demand. So a Fairtrade grower might be inclined to produce “unfair” products too. 4) That it may exacerbate income inequalities between already poor regions, because retailers tend to buy products from already established producers. So a region in Peru might sell 25% of all Fairtrade coffee, while a region in Tanzania where producers are poorer sells only 4%. 5) That results have not always proved to be inspiring. The critic is that sometimes the label is not enough and that prices for certified products cannot compensate for low productivity, land or labor constraints.

A study with certified Fairtrade coffee cooperatives in Nicaragua found that over a period of ten years, certified producers are more often found below the absolute poverty line than conventional producers, and that net coffee incomes are insufficient to cover the basic needs of these households (Beuchelt and Zeller, 2011). Another study made with small-scale coffee producers in Uganda compares the effects of both Fairtrade and organic labels on welfare (household expenditures, child education, and nutrition). The results show that both labels have positive effects on household expenditure. However, the organic labels have a positive effect on nutrition but not in education. And Fairtrade labels have an effect in education but not in nutrition (Meemken, Spielman and Qaim, 2017), which means there could be a trade-off situation between this two labels.

Image 3. The Fairtrade international label



Source: Fairtrade Deutschland, 2020.

Theoretical framework and previous studies

Why do people act the way they act? Researchers believe that this question can be answered through the scientific method. That is the aim of a vast field of behavioral approaches and theories, which are useful to yield public policy and marketing recommendations for stimulating sustainable choices among groups of people (Darnton, 2008; Akintunde, 2017).

Behavioral approaches aim to understand human decisions and its determinants, in order to design effective interventions to strengthen, challenge, or change future behaviors. Behavioral

approaches include both *behavioral theories* and *behavioral change theories*. Behavioral theories are diagnostic; they understand specific behaviors by identifying the underlying factors that determine them. By contrast, theories of change are pragmatic; they show the mechanisms under which behaviors can change over time. They were developed in order to support policy interventions for challenging current behaviors or encouraging the adoption of new ones (Darnton, 2008). In spite of the different scopes of each body of theories, they are complementary. Some of these theories are presented in table 2.

Table 2. Categorization of behavioral approaches

		Explanatory Power		
		Individual level	Higher levels scale	Behavior Change
Strong dimension	Models and Theories			
Values, Beliefs, Attitudes	Theory of Planned Behavior			
	Health Belief Model			
	Protection Motivation Theory			
	Values, Beliefs, Norms Theory			
	Elaboration Likelihood Model of Persuasion			
Economics	Expected Utility Theory			
	Bounded Rationality			
	Judgment Heuristics			
	Prospect Theory			
Role of information	Information Deficit Model			
	Awareness Interest Decision Action			
	Value Action Gap			
Agency and Efficacy	Fogg Behavior Model			
	Theory of Fear Appeals			
	Theory of Self Efficacy			
External factors	Theory of Consumption as Social Practices			
	Theory of Structuration			
	Main Determinants of Health Model			
	Needs, Opportunities, Abilities Model			
Networks	Diffusion of Innovations			
	Network Theory			
	Social Capital			
Learning	Double Loop Learning			
	IMB Model			
	Organisational Culture			

Source: Self-created based on Darnton, 2008.

Although the behavioral models apply mostly to individual level analyses, they are also related to community-based approaches, because aggregate social behavior results from the sum of choices made by individuals (Darnton, 2008). Several individual action predictors are learned, diffused, and enforced in the community level; for example, interaction and social learning have a direct impact with the process of an individual’s shaping of beliefs, attitudes, and normative system (Ajzen, 1991). For instance, the individual norms are usually transmitted, experienced, and learned from the community. Also, individual interactions within the common space are the precedent for building social capital and understanding collective action, community functioning, community-based management, and finally,

co-management. Next section delves into the framework that explains human behavior, with a focus on ethical consumption and one of the most used theories in the field of behavioral explanations: the Theory of Planned Behavior (TPB). The TPB's level of analysis is the individual. It is useful to understand current behaviors and predict future ones.

Sustainable consumption

Many terms have been used to describe the awareness of consumers buying one product over the others because of environmental and/or social reasons. Some authors have named this as “pro-environmental behavior”, others as “ethical consumption”, “ethical consumerism”, “green consumption”, “environmentally conscious consumption” or “sustainable consumption”. There is no definition better than the others, because they all part from the same constructs. One difference might be that some concepts refer only to environmental aspects and not social, or vice versa. But for the uses of this thesis the semantics will take both impacts into consideration, preferring to call it sustainable consumption. The wide diffusion of the term makes it a perfect example of a bridging concept (von Meyer-Höfer and Spiller, 2014).

The Global Center for Development Alliances (Global CAD, 2019) defines *ethical consumption* as:

The consumption of goods made with special concern for environmental and social impact. This includes the impact of production in terms of resource extraction, pollution and waste disposal as well as the social impact on the people involved in the production process, their families and communities. It also includes the impact on human rights of workers, and smallholder farmers, working conditions and payments, and the effect on the local economy.

This institution (Global CAD, 2019) also distinguishes ethical consumption from *ethical consumerism* in that the latter is “a type of consumer activism based on the concept of dollar voting through 'positive buying' that favors ethical products, or 'moral boycott', in that some companies or products are rejected”. Also about ethical consumption, the Eurobarometer from 2018 measured the amount of people stating that they are “involved by making ethical choices when buying food or clothes”, which makes a total of 21% of all respondents. For Germany this amount is 30% (Global CAD, 2019, p. 13).

For other authors, *conscious consumption* is:

An alternative way of differentiating products, namely according to [environmental and ethical] process characteristics or credence attributes. These cannot be proven by the consumer himself. Instead, third-party certification and labelling is needed in order to transfer the credence attributes into search attributes and to make them visible and considerable to consumers (Jahn et al., 2005; Mc Cluskey, 2000, cited by von Meyer-Höfer and Spiller, 2014, p. 3).

Narrowing these terms to food consumption decisions, a definition for *sustainable food consumption* has been proposed as:

Safe and healthy food consumption in amount and quality; realized through means that are economically, socially, culturally and environmentally sustainable – minimizing waste and pollution and not jeopardizing the needs of others. [...] Labelling is one of the most popular instruments to communicate

the sustainability of food products, as a credence attribute, to consumers (Reisch, 2010 cited by von Meyer-Höfer, von der Wense and Spiller, 2013, p. 2).

All of these constructs act as the conceptual base of various empirical studies that aim to understand and analyze environmental and socially concerned consumption. According to Scalco *et al.* (2017), there are two main types of studies emanating from the interest on sustainable consumption: those that seek to understand the motivations of consumers (market-based), and those interested on the environmental and social impacts or outcomes of that behavior (ecology-based). The first line of studies is somehow the root of the second.

As for the first type of research, there are studies seeking to profile or segment ethical consumption according to socio-demographic characteristics of individuals. The majority of these studies conclude that “the influences of socio-demographic features on consumption behavior are either insignificant or contradictory” (Anderson and Cunningham, 1972; Gil *et al.*, 2000; Dickson, 2001; Loureiro and Lotado, 2005; Jain and Kaur, 2006; Doran, 2009; Verain *et al.*, 2012, cited by von Meyer-Höfer, von der Wense and Spiller, 2013, p. 3). Other studies use socio-demographic factors in combination with other variables, such as psychographic characteristics, beliefs, related preferences, and so on. A number of papers following the Theory of Planned Behavior ascribe to this line of work (Ajzen, Rosenthal and Brown, 2000; Sirieix, Grolleau and Schaer, 2008; Vermeir and Verbeke, 2008; Schnettler *et al.*, 2012; Grunert, Hieke and Wills, 2014; Leeuw *et al.*, 2015; Raygor, 2016a; Scalco *et al.*, 2017).

The same applies for the studies on how consumers are willing to pay more for certified products with a sustainability label (Hoogland, Boer, and Boersema 2007; Grunert, Hieke, and Wills 2014; ITC 2015, cited by Meemken, Spielman and Qaim, 2017, p. 4). “Experimental research in both laboratory and intervention settings shows that lowering the price of healthier foods and raising the price of less healthy alternatives shift purchases toward healthier food options” (Andreyeva, Long and Brownell, 2010, p. 216). So, instead of healthiness of the products, a line of work seeks to prove if this also works with their environmental impact degree. Which means that lowering the price of products with less environmental impact might shift purchases towards these options.

For the second line of research mentioned, about the effects of ethical and sustainable consumption, there is a growing literature on the impacts of sustainability standards on smallholder farmers in global South countries (Bolwig, Gibbon, and Jones 2009; Méndez *et al.* 2010; Jena *et al.* 2012; Chiputwa, Spielman, and Qaim 2015, cited by Meemken, Spielman and Qaim, 2017). From these studies, “the results are fairly diverse, without conclusive evidence on whether or not sustainability standards actually promote rural development” (Meemken, Spielman and Qaim, 2017, p. 4). There is also a whole line of studies interested on the economic impacts and revenues raised through sustainable consumption. For example, it has been stated that “consumers are willing to pay a price premium of 2% to 10% [more] for certified products” (Harrison and Seiler 2011; Aguilar and Vlosky 2007, cited by Harms and Linton, 2015, p. 893).

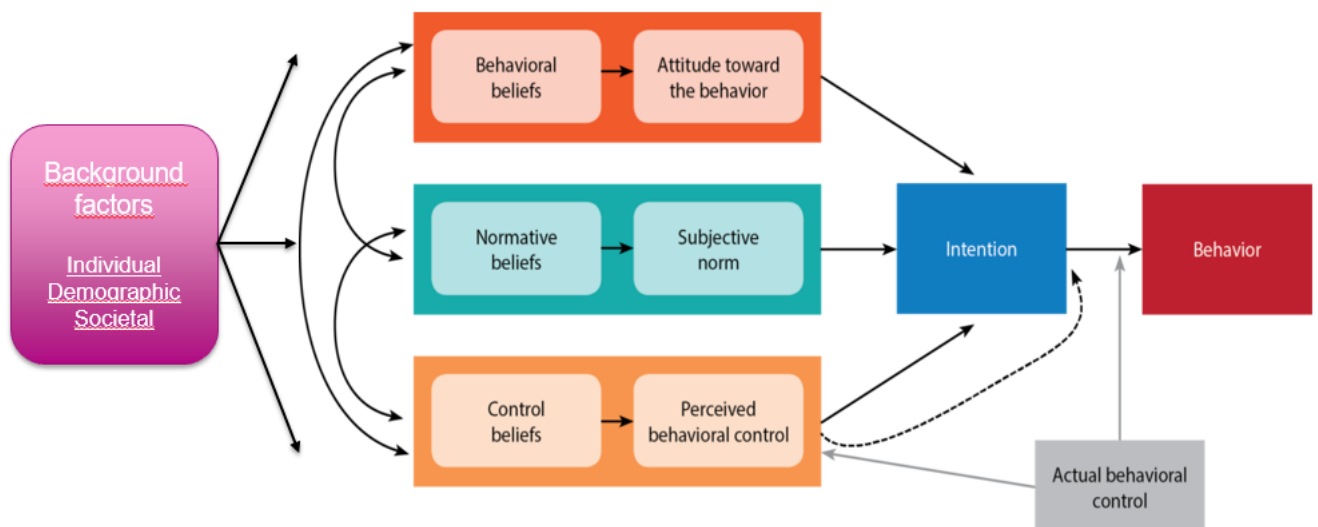
The Theory of Planned Behavior

One theory (attention, not a *behavioral change* theory, but just behavioral) that belongs to the field of behavioral approaches is the Theory of Planned Behavior (TPB). This theory has been widely used for understanding the basic consumer decision-making in various fields, one of them being food consumption, where the levels of behavior prediction are outstanding (Vermeir and Verbeke, 2008; Ajzen, 2015; Raygor, 2016b).

The theory was first proposed by Fishbein and Ajzen, under the name of the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), and it was one of the first behavioral theories that allowed for predictions to be tested with empirical methods. Hence its great success. The first contribution this theory made was to state that intentions are the best predictors of actual behavior, because if someone plans to do something, then she is more likely to do it; or at least that is the closest proxy one could have.

The TRA was revised several times, until it gave birth to its successor: The TPB. In a nutshell, the TPB helps to predict reasoned actions through pre-existent attitudes and norms shaped by individual beliefs, when behavioral controls are in place. As a general rule, the more favorable the attitude and subjective norm with respect to engaging in the behavior, and the greater the perceived control, the more likely it is that a person will form an intention to perform the behavior in question.

Image 4. Model for the Theory of Planned Behavior



Source: Self-created based on Ajzen, 2019.

The key concepts that the theory uses are: behavior, intention, perceived and actual behavioral controls, beliefs, subjective norms, attitude, and background factors. This sub-chapter will briefly explain each of these concepts building (creating nothing new but adding pieces already stated) on several articles written by the theory's author (Ajzen, 1991, 2005, 2012, 2015, 2019).

The biggest concept—the one the theory aims to predict—is **behavior**. It can be defined as the manifest observable response in a given situation with respect to a given target. According to the TPB, behavior is a function of compatible intentions and perceptions of behavioral control. An **intention** is defined as a person's readiness to perform a given behavior.

Behavioral control is the extent to which a person has the skills, resources, capacities, and other prerequisites needed to perform the behavior (e.g. money, access, time). Intentions are expected to lead to performance of the behavior to the extent that people are in fact capable of doing so. Actual behavioral control is thus expected to moderate the effect of intention on behavior. However, in many applications of the TPB it would be difficult or impossible to identify all the factors that influence actual control over performance of the behavior. For this reason, investigators typically use the measure of perceived behavioral control as a proxy for actual control under the assumption that perceptions of control reflect actual control reasonably well (Ajzen, 2015; Leeuw *et al.*, 2015). **Perceived behavioral control** is the extent to which a person feels capable and confident to execute the behavior and overcome potential barriers and challenges. It is expected to moderate the effect of intention on behavior, such that a favorable intention produces the behavior only when perceived behavioral control is strong (Ajzen, 2019).

Then, an intention is assumed to be determined by **beliefs**, which are personal convictions associated with true or false ideas and concepts. The model presents three kinds of beliefs: behavioral, normative, and control. The first refer to the perceived positive or negative consequences of performing the behavior and the subjective values or evaluations of these consequences. The second, normative beliefs, have to do with the perceived expectations and behaviors of important referent individuals or groups, combined with the person's motivation to comply with the referents in question. The third type, control beliefs, is concerned with the perceived presence of factors that can influence a person's ability to perform the behavior. Together with the perceived power of these factors to facilitate or interfere with behavioral performance, readily accessible control beliefs produce a certain level of perceived behavioral control or self-efficacy in relation to the behavior (Ajzen, 2015, p. 125).

In their aggregate, beliefs that are readily accessible in memory lead to the formation of a positive or negative attitude toward the behavior (behavioral beliefs), and a perceived social pressure or subjective norm with respect to performing the behavior (normative beliefs). The **attitude** toward the behavior consist on the expectations and evaluations of the outcome of the behavior. In other words, it is how a person thinks and feels about the behavior. There are two types of attitudes: affective and instrumental. The first answers whether the behavior is enjoyable or not for the person; the latter tells whether it is beneficial or harmful.

Subjective norms are the concern for the expectations of important referents; the perceived social pressure to engage or not in a behavior according to the support given by significant others. Important referents or significant others can be family members, love partners, friends, colleagues, influencers, idols, or even a teacher, a doctor, or a priest. There are two types of subjective norms: injunctive and descriptive. The first ones refer to whether the significant others encourage a person's behavior (in word). The second shows the actual engagement of that significant others in the behavior (in action).

Finally, the model recognizes the role of **background factors**, which influence behavior only indirectly by their effects on beliefs. Background factors can be individual (personality, emotions,

intelligence, values, past experiences); demographic (education, age, sex, income, religion, race, ethnicity); and societal (culture, economy, political context, laws, geography, media influence) (Leeuw *et al.*, 2015). Demographic characteristics influence individuals' beliefs and attitudes towards the environment, positively or negatively (Akintunde, 2017).

Application to food consumption decisions

Food consumers are posed several decisions every day, from price selection to attribute alternatives (organic, fair trade, genetically modified, fat and carbohydrates content, local...). Their everyday choices have different impacts on markets, but also on ecological footprints and social standards, like wages for the people working along the food chain (Vermeir and Verbeke, 2008). Therefore, understanding what motivates sustainable consumption of food products is one important component for reaching sustainable development. One gap identified in this enterprise is that “research relying on revealed preferences to infer decision-making processes typically confronts participants with artificial choices among products defined in terms of a selective set of attribute dimensions. Little information is gained about the considerations that actually guide the consumer’s behavior” (Ajzen, 2015, pp. 124–5). The TPB helps to fill that gap.

The theory has been applied successfully to study food consumption decisions in many cases (Schnettler *et al.*, 2012; Ajzen, 2015; Raygor, 2016a). The results presented on a sample study of five papers on this domain (see table 3) show that the variables from the theory afforded “good prediction of various food-related intentions, including intentions to consume soft drinks, fish, and dairy products” (Ajzen, 2015, p. 131). In most cases, attitude was the strongest predictor of intentions, except for the study on healthy diet choices, where perceived behavioral controls have the strongest contribution. The explaining power of every model (R squared) is also high. However, the author does not explain how and why he chose this particular studies.

Table 3. TPB studies on food consumption

Behavior	Regression coefficients				Regression coefficients		
	ATT	SN	PBC	R ²	PBC	INT	R ²
Consume soft drinks (Kassem & Lee, 2004)	.52	.19	.28	.61	—	—	—
East sustainable dairy products (Vermeir & Verbeke, 2008)	.54	.37	.39	.50	—	—	—
Consume fish (Verbeke & Vackier, 2005)	.21	.18	.27	.31	.21	.52	.42
Consume dairy products (Kim, Reicks, & Sjoberg, 2003)	.38	.11*	.30	.42	.22	.49	.39
Eat a healthy diet (Conner <i>et al.</i> , 2002)	.31	.02*	.47	.43	.03*	.27	.09

Notes: ATT = attitude toward the behavior, SN = subjective norm, PBC = perceived behavioral control, INT = intention. *not significant; all other coefficients significant at $p < .05$.

Source: Ajzen, 2015.

When looking into a more specific case, for example the consumption of sustainable dairy products in Belgium (Vermeir and Verbeke, 2008), it is possible to better understand how the TPB is

translated into empirical research. This authors conducted a survey with a sample of 456 young adults using a questionnaire and showing an advertisement for hypothetical sustainable dairy products. With the collected data, they ran two multiple regression models, and obtained the percentage of variance in intention due to attitudes, norms, and behavioral controls, which accounted for more than 50% (see graphic 3). This study supports the idea of using the TPB to evaluate sustainable consumption choices. The objectives match with the objective four of this thesis, as well as the targeted population.

Table 4. Correlation and regression coefficients of the TPB model for purchasing sustainable dairy products

	Pearson correlation ^a	Estimate	p-value	Model R ²
Attitude towards purchasing	0.666	0.542	<0.001	0.501
Social norms	0.371	0.108	0.004	
Perceived consumer effectiveness	0.389	0.161	<0.001	
Perceived availability	0.266	0.150	<0.001	

^a Pearson correlation coefficient with behavioural intention.

Source: Vermeir and Verbeke, 2008.

Strengths, weaknesses, and complementary theories

The predicting power of the TPB for consumer behavior has already being stated as its principal strength based on the cases presented. Other strengths of this theory are: 1) its ability to describe specific behaviors and not solely generic processes. 2) Its definition and consideration of beliefs that people hold towards some issue as part of the behavior. This consideration points on a specific mechanism for behavioral change, through either the challenge, strengthen, or facilitation of new beliefs that promote a desired action. 3) Its applicability to empirical research. 4) Its bridge of the gap between attitudes and behavioral outcomes by inserting the construct of intentions. 5) The recognition of the background factors that affect beliefs. Most importantly, the TPB is used in these kind of studies because it “provides a foundation for the understanding of why people may not act in favor of the environment, despite having good intentions either due to their lack of confidence or for the reason that they feel they lack control above the behavior” (Akintunde, 2017, p. 127).

Nonetheless, no theory is absolutely complete and sufficient to explain the complex reality. The TPB also presents some weaknesses: 1) as many behavioral models, it gives a linear explanation; it shows the relationships between influencing factors as a series of arrows. However, most processes would be better represented with circling feedback loops (Darnton, 2008). For instance, the consideration that repeated behaviors become routines, and are later performed without much attention. 2) The TPB lacks a time dimension. It focuses on particular events and not on evolving and learning processes. 3) Though it considers background factors, these are only seen as indirect influences, but not main drivers of behavior, which could also be a possibility in some cases. 4) The theory stays at the

individual level; fails to bridge higher levels of scale. 5) It relies too much on people's answers, as it is based on a questionnaire, which could have design mistakes leading to over or underestimations. 6) Knowledge, or correct factual information, plays no direct role in the TPB. Although information in the form of behavior-relevant beliefs is a central component of the theory, whether that information is correct or incorrect appears to be immaterial. 7) Finally, the core assumption that intentions precede behavior could be contested, as some studies demonstrate the gap between ethical concerns—or environmental support—and actual action (Vermeir and Verbeke, 2008).

Because of its explanatory power, ease of application, and solid assumptions, this chapter concludes that the TPB can be used as a good framework to study student food choices in Cologne. However, some gaps or weaknesses of the theory need to be accounted for. Fortunately, the vast field of behavioral approaches offers other theories with variables that can be helpful. For example, behavioral change theories are usually complementary to behavioral understanding theories. Inspiration drawn from those theories could be used in addition to the TPB to generate positive interventions.

METHODOLOGY

As stated before, the aim of this thesis is to confirm whether —and in which magnitude— eco-labels influence students' consumption intentions to purchase sustainable food alternatives (organic or Fairtrade) within different basic food options provided in the market of Cologne. In order to understand the origin of the effects of eco-labels on consumers, other variables already associated with sustainable food consumption in previous studies were included: attitudes, subjective norms, and perceived behavioral controls. These variables were retrieved from the Theory of Planned Behavior (2019).

After the research objectives were identified, it was clear that the level of analysis on this study should remain individual. The methodology selected then, needed to be the best alternative to respond the research questions:

- I. Are there any eco-label effects in this market (higher demand for organic and Fairtrade sustainable food only indicated as so by eco-labels)?
- II. Are the eco-label effects on demand for Bio/FT products different for different foods (pasta, meat, tomatoes, juice)?
- III. How strong are this eco-label effects for each different food?
- IV. What explains the existence or inexistence of Bio/FT label effects on consumer choices and its different strength levels, apart from economic incentives?
- V. Do attitudes, norms, perceived behavioral controls (TPB), and demographic factors explain the intention to buy Bio/FT products?

Among the different research methods available, the individual survey was selected as the appropriate for this case, since the survey method roots itself on the dialogical culture of the student communities, and gives the possibility to incorporate qualitative and quantitative techniques to the analysis. Kvale (2006, p. 494) explains that this method was “introduced in consumer research in the 1930s, half a century before the general expansion of qualitative interviews in the social sciences [...]

Today, the most extensive application of research interviews probably takes place within consumer research.” Along with qualitative questions, surveys allow to obtain big numbers of responses to be analyzed with quantitative equations. The objectives were then translated into a well-conceptualized and methodologically sound questionnaire (Warwick and Lininger, 1975).

This chapter discusses the selection of variables, describes the site where the data collection took place, introduces the target population and the sampling procedure. It explains the data collection techniques and its limitations, delves into the survey design, and finally, explains the analytical procedures, and the statistical models utilized.

Site description and target population

The research takes place in the city of Cologne (*Köln*). Though the unit of study is the individual, the population considered for this research is the entire student community of Cologne, which is 100,706 students, according to the latest official statistic available (Statistik, 2019). This sub-chapter contains the geographical and demographical (social and economic) description of the site, followed by the specifications of the target population. A distribution of the target population along the site is also presented on a map, at least for the students living in dormitories.

Cologne is the largest city of the federal state North Rhine-Westfalia (NRW), and the fourth most populated city in Germany. The total population of Cologne is of 1,089,984 inhabitants (Statistik, 2019). Even though the average age of the Cologne citizen is of 42 years, the young population between 18-34 years old sums 273,436 people. Half of this population is currently enrolled in a university as an undergraduate or graduate student.

Geographically, Cologne’s city area encompasses 40,489 ha, from which seven thousand are forest areas, nearly two thousand are water areas, and six thousand six hundred are agricultural and garden areas. The city has an elevation of 37 m, and it is divided into 9 boroughs or municipal districts (*Stadtbezirke*) and 86 districts (*Stadtteile*). Cologne is crossed by the Rhine River. According to the Köppen classification, it has a temperate-oceanic climate, and is one of the warmest cities in Germany.

Maps 1 and 2. Location and districts of Cologne



Source: Geographical division of Cologne, Statistik, 2019 (based on Division Géographique de la Direction des Archives du Ministère des Affaires Etrangères, 2004).

Already mentioned on the justification chapter, Cologne hosts a high number of people with migration backgrounds, with 184 different nationalities represented. The main countries of origin registered are Turkey and Italy, as well as other European Union citizens. The first religion of the city is the Catholic, followed by the Protestant. The economy of Cologne encompasses insurance and media companies, as well as research centers. The largest employer in Cologne is Ford Europe. The total tax revenue per year is around 2,300 million euros (Statistik, 2019).

As mentioned above, the population considered for this research is the entire student community of Cologne: 100,706 students (Statistik, 2019). This population is mainly distributed within the eight principal universities in the city: the University of Cologne, the Technical University of Applied

Sciences Cologne (TH Köln), the Private University of Applied Sciences, the German Sport University Cologne, the Catholic University of Cologne, the CBS International Business School, the University of Music and Dance Cologne, and the Academy of Media Arts Cologne.

Table 5. Student population of Cologne per university

University	Number of Students
University of Cologne <i>(Universität zu Köln)</i>	51,481
Technical University of Applied Sciences Cologne <i>(Technische Hochschule Köln)</i>	19,931
Private University of Applied Sciences <i>(Rheinische Fachhochschule Köln)</i>	6,073
German Sport University Cologne <i>(Deutsche Sporthochschule Köln)</i>	5,222
Catholic University of North Rhine - Westphalia <i>(Katholische Hochschule Nordrhein-Westfalen)</i>	2,008
CBS International Business School <i>(Cologne Business School)</i>	1,900
University of Music and Dance Cologne <i>(Hochschule für Musik und Tanz Köln)</i>	1,168
Academy of Media Arts Cologne <i>(Kunsthochschule für Medien Köln)</i>	389

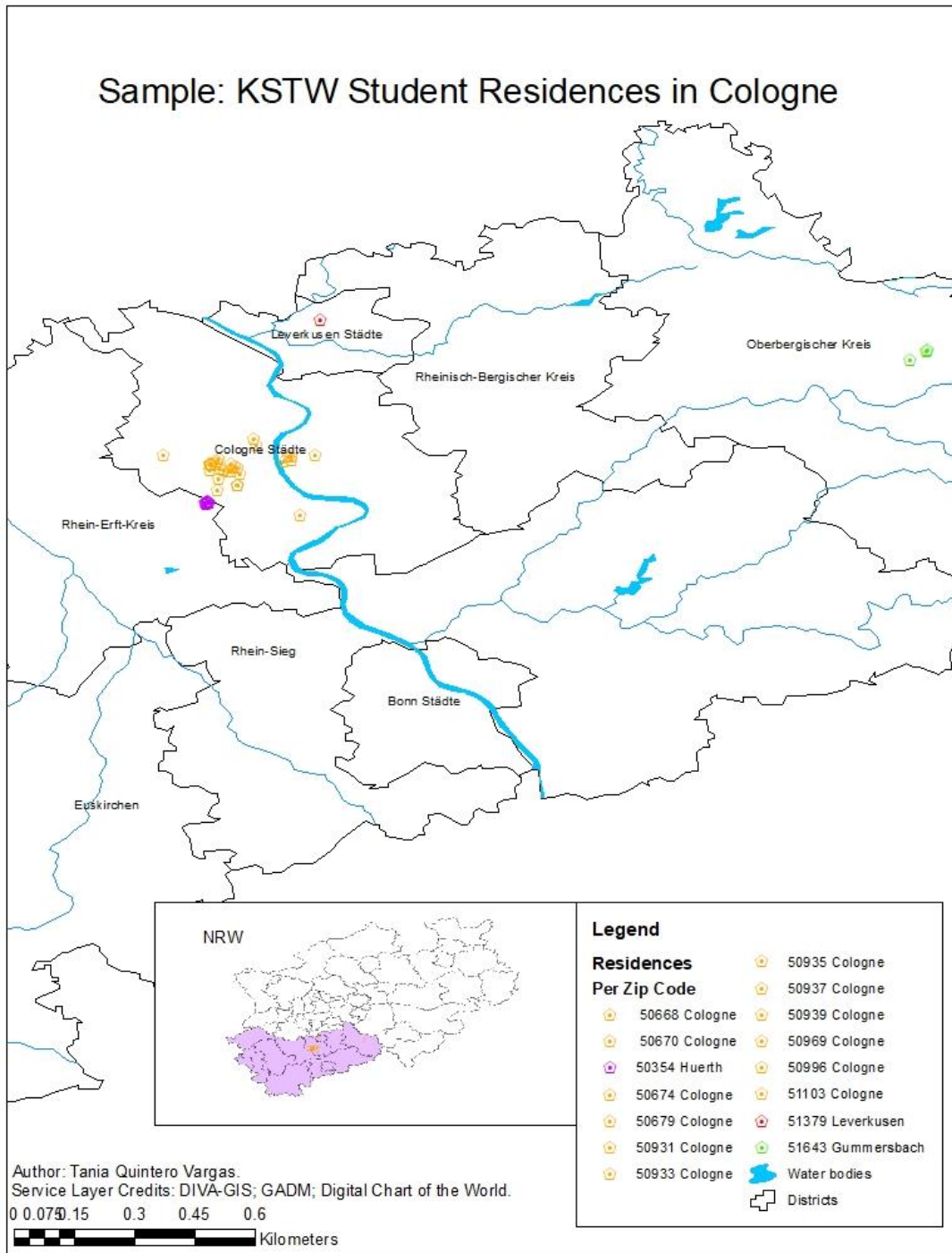
Source: Statistik, 2019.

The institution in charge of providing housing and social infrastructure for the students of Cologne is the *Kölner Studierendenwerk* (KSTW). The KSTW, with 640 employees, runs not only the student residences, but also the cafeteria services in every university, the daycare centers or *kitas*, and various consultation services like social and psychological counseling, learning advice, workshops, and financial support options for students.

The KSTW has provided a total of 90 dormitories throughout NRW with around 5000 rooms available for students of Cologne. However, only 49 of those are inside the area surrounding the main universities mentioned: 34 inside the city of Cologne, one in Leverkusen, three in Gummersbach, and 11 in Hürth (Kölner Studierendenwerk AöR, 2019). Because this study has decided to focus inside the borders of the city of Cologne, only those 34 student dormitories are considered as part of the actual site to sample. That means a total available of around 1800 rooms and the same amount of students.

Some general characteristics of the student residences in Cologne are that the rents offered range from 141 to 361 euros per month. The design varies from dorm to dorm, some offer corridor rooms with shared kitchen and bathrooms, some offer also shared rooms or complete apartments. There are even family apartments for students with children and barrier-free living spaces. Half of the total offered rooms are already furnished, and every dorm includes washing rooms and Internet access, as well as some other amenities that can be offered like study rooms, chill or party rooms. The students eligible for the dormitories should always be enrolled in one of the mentioned universities of Cologne.

Map 3. Location of KSTW student dormitories



Source: Self-created based on KSTW database, 2019.

Sampling

As previously said, the unit of observation is the individual student. It is possible to consider the total capacity of the KSTW student residences (1800 students) as a self-generated sample of the general population, because the residences' managers assign the dormitories regardless of any distinguishing factor (nationality, distance to campus, or any other). Students cannot apply for specific dormitories. The dormitories are allocated, and the only requirement is to be a student enrolled on one of the

universities of Cologne. Those 1800 students with a room, then, are already a randomized sample of the overall population (the student community of Cologne).

However, due to the logistic limitations of time and resources available to conduct this research, to survey the complete self-generated sample of 1800 students is not attainable. In a more realistic calculation, with a 95% confidence level and 5% margin of error, an ideal sample size would be of around 300-400 university students, either from undergraduate or graduate programs.

To select which students to interview, a random sample method was used: each room on each residence was given a number (1, 2, 3...). On average, each residence is supposed to have around 53 rooms. So, numbers 1 to 53 were randomly generated online at the time of conducting the survey. This is an easy task using randomizer software available online, for example, Google's own random number generator. The desired sample size of students divided into the 34 possible residences indicated that approx. 9-12 answered surveys were needed from each residence, in order to still be representative of the whole student community of Cologne.

The previous random sample method was designed for surveys made face-to-face. However, a sudden external and global event that could not be predicted changed the initial sampling plans: the Covid-19 pandemic. The data collection limitations that emerged with this event will be better explained in the next sub-chapter. The sampling impact that the Covid-19 had for this thesis was that the majority of students in the randomized rooms were now unreachable. They were either gone—most students left the residences because university attendance was cancelled—or did not want to meet with the surveyor to prevent the spread of the virus—which was totally encouraged and supported.

In order to overcome this drawback, the sampling method was adjusted. The sampling then was extended to any students of Cologne able to respond the survey online (in addition to the ones reachable face-to-face in the KSTW residences). This modification did not affect the results, because the survey experiments were still shown randomly to every respondent engaging in the survey, and the balance of treatment and control groups was carefully supervised. Data concerning the names and other personal information of the students was not asked for or saved in any way. However, the effect of relaxing the sampling method was having a higher total sample than previously expected. Instead of the intended 300-400 students, the study was able to sample 891 students.

Data collection technique

The individual survey was designed and programmed on the software *SurveyToGo* from the company Dooblo Data Collection. This software was chosen among several options in the market because it allows the creation of questionnaires with high levels of logic complexity destined for scientific research. To include an experimental part on the survey, the software needed to be able to randomize and rotate questions and answers, but also to skip, branch, filter, loop, or pipe some parts of the survey according to the respondent choices. The used software also works either online or offline, which was a great advantage when surveying without Wi-Fi at the different student residences. It permits the inclusion of images, audio and video content, and GPS location tracking. The survey needed to be

programmed in two languages: English and German, because the targeted population comprised both German and international students. *SurveyToGo* allows interviewers to switch between both languages easily at any time during the survey. Finally, the software was chosen because of the privacy and security measures that it gives to projects, were all the data collected is password protected and not shared with anyone else.

The survey was piloted several times and discussed on the basis of which questions will allow for a better understanding of the relevant demand panorama for sustainable food. As stated in Iarossi (2006, p. 11), “the pilot test in the field is a critical component of questionnaire design [...] because it often helps to identify problems with wording and translation”, as well as programming and specification errors. Piloting was useful to prevent questions leading to straight lining answers. The basic aspects monitored in the pilots were the detection of possible leading, vague, difficult, or sensitive questions. The guide was that “too many answers at one extreme may indicate a leading question; too many “don’t knows” indicate vague questions or questions going outside the respondent’s experience. If many refuse to answer or answer in the same way, the question must be reworded, repositioned, or cut out altogether” (Moser and Kalton, 1971 in Iarossi, 2006, p. 90). The checklist proposed by Iarossi (2006, p. 91) was also considered. It remarks that respondents should understand what the survey is about, feel comfortable answering the questions, not have to think too hard to be able to answer, not be biased by the questions. It also was important to test for variability on the answers received, among others. Some questions were then cut and reformulated after the pre-test phase.

When finally ready, the survey was conducted during April and May, parallel to the start of the summer semester in Cologne. The survey was first designed to be conducted on a Computer Assisted Personal Interviewing (CAPI) mode, which is the face-to-face data collection technique. An interviewer administers the questionnaire to the respondent and marks down the answers on a smartphone, tablet or computer. Data are then synchronized with the server and made available for analysis. This collection technique is more personal. In line with the CAPI method, it was planned that the researcher would knock on the door of each selected room from the dormitory and introduce herself. Then, she would briefly mention the objectives of the study and ask for the individual to complete the survey.

The CAPI method requires a considerable amount of time and effort, especially when there is only one interviewer in charge of the whole data collection process, and is thus more expensive than conducting online surveys. However, it has many advantages: it allows for better control because the question-answer occurs directly and with the full attention of the respondent. “The way the survey is presented, how difficult the questionnaire is, and how sensitive questions are addressed influences the willingness of a prospective respondent to participate (Iarossi, 2006, p. 28).” The eye contact might reveal better if a respondent’s answers are truthful, and respondent’s reactions can be noted. The interviewer can also help in questionnaire comprehension.

However, this research did not expect the changes coming with the sudden Covid-19. The first complication occurred when the semester start date was delayed and many students living in the KSTW residences decided to stay in their parent’s home or in other places. Then, it was announced that the

semester would be taught online, which led to a number of students deciding not to come back to the city's residences at all. Finally, the city authorities recommended distance and to stay home whenever possible. This made the CAPI method more difficult. So, on top of the CAPI interviews that were possible, the research decided to integrate a Computer Assisted Web Interviewing (CAWI) technique too. This means that the respondent autonomously answers the interview on its own computer, tablet, smartphone or any other device with a browser. The survey is made available through a web link that can be shared with the population and lowers the costs of time and effort.

The general disadvantage of the CAWI method is that answers might be inaccurate due to distracting factors; the survey conduction is difficult to control. This method also normally gets lower response rates. Finally, there was no way to continue using the random room numbers sampling with the CAWI method, at least not without relating names to those room numbers, but it was decided from the start not to collect personal data. In the end, because of the advantages and limitations of both CAPI and CAWI methods on this new Covid-19 context, the researcher decided to use both, preferring the CAPI method whenever physically possible.

About ethics, every research project involving humans and behavior analysis is subject to special ethical concerns. The methods implemented must assure the supreme wellbeing and care for the health of the participant and the protection of her rights, which is why many of these projects are subject to the approval of an Institutional Review Board (IRB). An IRB is a committee that monitors the risks and benefits of research involving individuals and determines if the research should be conducted or not. After investigating, it was determined that this particular thesis project did not need to be presented to any academic IRB because it involved no physical or psychological treatment at all, nor incurred in any kind of risk for the participants. Also, the university that hosts this thesis does not have a proper IRB Committee for the purposes.

However, due to the strict data privacy regulations for the European Union citizens, the research must make sure that the data collection and storage techniques aligned with the General Data Protection Regulation (GDPR) applicable as of May 25th, 2018 in all member states of Europe. The compliance was not too complicated because the survey did not collect any personal data, not even participants' names. However, an informed consent following the European GDPR was included and read before every participant started the survey. As stated in the GDPR law, this consent "must be freely given, specific, informed and unambiguous, the data subject must be notified about the controller's identity, what kind of data will be processed, how it will be used and the purpose of the processing operations. The data subject must also be informed about his or her right to withdraw consent anytime. The withdrawal must be as easy as giving consent. The consent must be bound to one or several specified purposes which must then be sufficiently explained" (GDPR, 2020, article 7).

Survey design

The survey was structured into five sections: Opening message/Informed consent; Demographics; Eco-label choice experiment (shopping situations); Follow-up questions on awareness and understanding of

labels; Theory of Planned Behavior variables (attitudes and beliefs, subjective norms and perceived behavioral controls); and Disclosure.

The survey instrument was entered a total of 105 entries or questions, with a maximum of 42 items showed to each participant (nine demographic questions, four shopping situations, a maximum of 16 discount situations, two awareness and understanding questions, four belief-attitudes questions, three for subjective norms, and four perceived behavioral controls).³ This might seem like too many questions, because sometimes the length of the survey is important for students to decide whether to answer or not a survey. However, the survey was designed dynamically to last no more than 15 minutes.

The question-selecting method was based on questionnaires applied in previous studies with similar research objectives, particularly the thesis research of Raygor (2016) and the guidelines suggested by Ajzen (2019) for TPB questionnaire construction. Some questions were modified considering rules suggested in survey design handbooks. For example, according to Iarossi (2006, p. 27), “two basic rules make a good question: relevance and accuracy”. A question is relevant when the information it generates is compatible with the purpose of the study. Only a clear objective in each question justifies the words to be used and decides whether or not the question should be included. It is accurate if the answer obtained is reliable and valid, which happens only when the respondent really understands the meaning of the question and when the respondent is well informed about the matter. Sometimes accurate responses can be achieved asking similar questions in different parts of the survey to check for consistency on the answers (Iarossi, 2006, p. 28).

The writing style was decided to be as natural as possible and appropriate for undergraduate and graduate students living in Germany. The basic rule *BOSS* for question wording was followed: “the best questions are brief, objective, simple, and specific” (Iarossi, 2006, p. 30). Short questions are less complex and confusing for the respondent. According to the cited source, a question should not exceed 20 words and should not have more than three commas. The survey designed asks one question at a time, avoiding to use hidden questions. As well, leading questions were avoided on the survey, to prevent pushing the respondents on a certain direction.

The images included were taken from real products sold in big supermarket chains such as *Rewe*, *Lidl* or *Aldi* —which are popular and well-known by every student. The pictures of the products were framed in a white background and edited with the software *Canva* to add the prices. The eco-labels included were two: the bio-organic label (from the European Union and Germany) and the International Fairtrade seal.⁴

For future comparisons of the data presented in this research, it is also important to note who is asking the questions and how the questions are asked. This survey was entirely planned, organized and conducted by one researcher: female, student, Mexican. However impartial one wishes to be in the design and conduction of any survey, factors inherent to the interviewer’s personality, history and background (cultural and psychological) will always be present. It would be naïve to not consider, or at

³ See Annex 1 for the complete survey version.

⁴ See the *Conceptual Framework* chapter for more information and pictures of the labels.

least mention, that these factors may hide or indirectly affect the survey design and data collection. In the end, this adds richness to the research.

The experiment

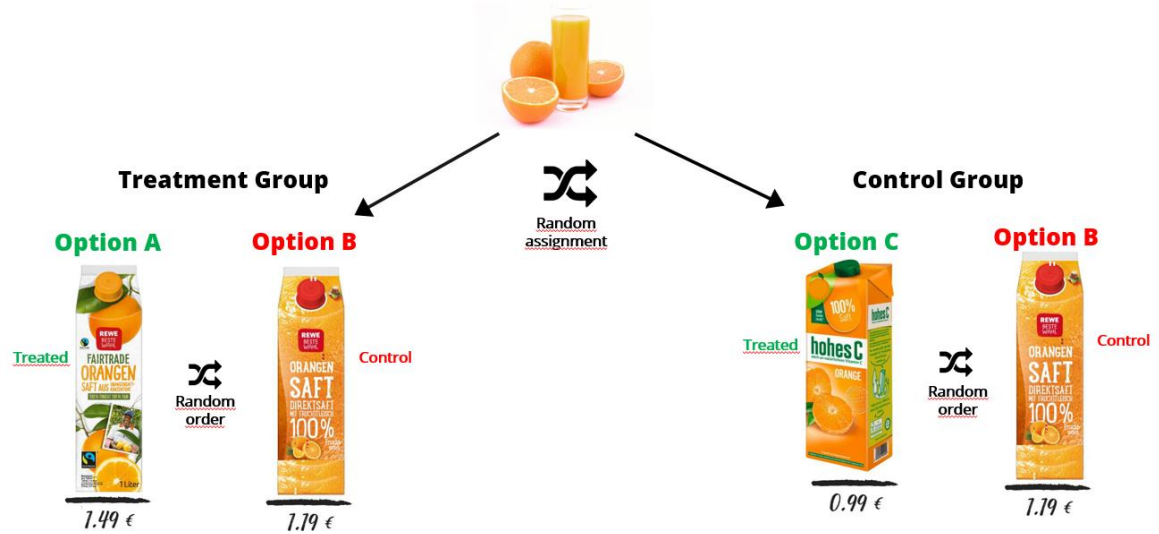
An experiment in social sciences is the method of “systematically tracking the effects of a research-induced intervention by comparing outcomes in treatment groups to outcomes in one or more control groups” (Gerber and Green, 2012, p. 5). Experiments with random assignment ensure that there is no tendency for either of the groups to have an advantage. They are reproducible and transparent. This thesis integrates an experiment as part of the data collection method, instead of asking a simple preference question, because experiments are the best way to unveil causal effects within variables (Angrist and Pischke, 2008, p. 12).

The experiment was included in the survey to investigate if the labels Bio and Fairtrade raise the intention to buy food products labeled with them within students in Germany. Also, to give an insight on the strength of the expected student preference for more sustainable options in the market. So the experiment is divided into those two parts: consumption statement (preference) and strength of it.

The first part of the survey asked participants to choose their preferred package of spaghetti, tomatoes, beef meat, and orange juice, by selecting only one from two options showed for each food. As mentioned several times throughout the thesis, the experiment includes these four products because they have all different elasticity, and that could make the eco-label effects vary. The orange juice is mostly elastic among students, whereas the pasta is supposed to be an inelastic product, as well as the meat, for those who are not vegan or vegetarian (Andreyeva, Long and Brownell, 2010).

For each choice, participants were assigned randomly into a treatment group or a control group. **Participants in the treatment group** were asked to choose one from two packages (A or B) that were equal on all basic characteristics (quantity of product, expiration date, etc.) but different in that one option (A) had the bio or the FT label, and the second option (B) had a brand label only. **Participants in the control group** were also asked to choose one from two packages (B or C), both with their own brand labels and none of them with the Bio or Fairtrade label. The option (B) shown to both the treatment and the control groups for each food product served as the “control option”. The options (A) and (C) were the “treated options” for the treatment and control groups respectively. Below is an example of how the experiment worked with the possible options a participant could see.

Image 5. Experiment example with orange juice



Source: Self-created, 2020.

The image shows how a participant could be randomly assigned to the treatment or the control group. Then, which two options would be shown to her, including images and a prices. The order (left or right side) in which the two options could be presented inside each group was also randomized to avoid biases. In other words, the answers were always shown in different order so that the respondent's possible preference between left and right did not affect the outcome.

The example shows the orange juice experiment, which carries the Fairtrade label. However, the orange juice was the only product were a second question group was introduced, apart from the treatment and the control group. This does not show in the picture, because the case was not part of the proper experiment anymore. That second group was asked to choose between a Bio versus a FT juice. This was only possible with the orange juice because it is the only product among the four (juice, spaghetti, meat and tomatoes) where Bio and FT variants actually compete, where both can be found in the same supermarket.

Finally, the participants were asked to briefly explain why they chose the products they chose. After the experiment, the participants were asked questions on the understanding of the bio and FT labels, and questions that measure important variables when taking any consumption decision, such as their attitudes and values according to that specific behavior, the subjective norms or influence from significant persons, and their perceived behavioral controls.

Statistical methods

The answers collected were statistically analyzed on the software *Stata (version 14)* from the company *StataCorp*. This statistical software for data science allows data manipulation, visualization, statistics, and reproducible reporting. The survey was coded from the start, which means that a specific name was assigned to each variable in the questionnaire corresponding to a field in the future data set, to facilitate the further analysis. This sub-chapter will present the statistical methods used divided in two parts: the first one is linked to the specific objectives I and II of this thesis; the second is linked to the specific

objective III. All the statistical methods and models used for the thesis analyses are reproducible using the database as retrieved from *SurveytoGo* and the coding saved on *Stata* do-files.

Effects of eco-label treatments on consumer choices: Z-tests

The methods presented in this sub-chapter are used to unveil three core aspects about eco-label effects that were posed as initial objectives (I and II) of the thesis: **existence, direction and magnitude** of the effects. The dependent variable (Y) for this study is the consumer intention to buy sustainable food (labeled as organic or Fairtrade). The outcome data feeding the variable came from individual responses gathered through an experiment included in the survey, which were grouped and analyzed statistically. The effects of eco-labels (X_i) in the dependent variable were analyzed in four products: spaghetti, meat (only for “meat lovers” and people who stated to “eat a bit of everything”), tomatoes, and orange juice. As stated before, this research works with the core assumption that the more sustainable option on each choice presented to the consumer is the one with the eco-label.

The first quantitative statistical measure associated with the dependent variable is the *Z-test*, a test commonly used to analyze outcomes on experiments. In order to find if there is a higher demand for products due to their eco-labels, the *Z-test* compares proportion differences between the results of the treatment and the control groups. This mean comparison is regarding choice of the treated versus choice of the controlled option for each product. In *Stata 14*, the measure is called two-sample test of proportions.

The *Z-test* is the hypothesis test used to identify statistically significant differences between two proportions. It applies for data that meets at least four conditions: 1) samples randomly selected from the population; 2) samples that are independent; 3) samples including at least ten successes and ten failures; 4) a population at least 20 times bigger as its sample (StatTrek, 2020). Another reason to use the *Z-test* for this data set is that the variables analyzed are dichotomous (they only accept two outcome values [0, 1]). If the dependent variables were continuous, one would need to use the statistic measure of two-group mean comparison Student’s *T-test*, instead of the *Z-test*.

The Student’s independent-samples *t-test* (simply referred to as *t-test*) is a method for testing hypothesis of mean differences between sample groups when the standard deviation of the population is unknown. It was proposed around 1908 by William Sealy Gosset (whose pseudonym was Student). As stated before, the *t-test* is a measure to “determine whether the mean of a continuous dependent variable is the same in two unrelated independent groups. Specifically, [...] to determine whether the mean difference between two groups is statistically significantly different to zero” (Lund Research, 2018b).

As any other hypothesis tests, the *T* and *Z*-tests consider null and alternative hypotheses, as well as significance values. Usually, the null hypothesis states that there is no difference between the two proportions (or that they are equal), and the alternative hypothesis states the exact opposite. The significance values selected can be any between 0 and 1; however, similar research projects tend to use 0.01 error (99% confidence), 0.05 (95% confidence), or 0.10 (90% confidence). Being 0.05 the most common.

The tests work with a score or ratio. For example, the Z-score is determined by the following equation, where $p1$ is the proportion from sample one, $p2$ is the proportion from sample two, and s is the standard error of the sampling distribution:

$$z = \frac{p1 - p2}{s}$$

The probability of observing a sample statistic outcome as extreme as the z-score is called the *p-value*, and it is calculated with the Z-tables and Z-distribution, which are given. When the *p-value* is lower than the significance level selected for the analysis—for example 0.05—the null hypothesis can be rejected. This means that the proportion difference observed in the experiment is statistically significant (true) for the whole population.

Group Balance

Right before analyzing the effects of eco-label treatments on choices, it is uttermost important to make sure that the groups for the experiment (treatments and controls) were effectively balanced. For this purpose, one can also use the statistical methods mentioned above: Z-test (hypothesis test for proportion differences) and T-test (hypothesis test for mean differences). Only that in this case, the outcomes will seek not to be statistically significant. In that case, the p-value would be higher than the significance level selected, and there would not be enough statistical evidence to reject the null hypothesis of equal means or proportions. That would prove the groups are really equal, as proposed and observed after the random assignment.

As noted by Angrist and Pischke (2008, p. 12), “the goal of most empirical economic research is to overcome selection bias, and therefore to say something about the causal effect of a treatment/control variable”. Selection bias occurs when the sample of participants that see the experiment or each of the treatments and controls are not representative, not equally distributed, or different in both groups. The selection bias problem is present, for example, when people with certain characteristics are picked only to see certain treatment and not distributed equally among all treatments and control groups, either intentionally or because of a design problem in the experiment. Making sure that the experiment works with correctly balanced groups is fundamental for any serious research. Sometimes, selection biases can be so large that they mask treatment effects (Angrist and Pischke, 2008), this way interfering with interesting causal effects of treatment variables.

Because empirical research is often haunted by the problem of selection bias, one of the first and most important considerations when conducting one—particularly an experiment—is to make sure that all the treatment and control groups are statistically equal. This not necessarily means having the same number of participants, but having groups of participants with the same characteristics. A correct experiment must separate individuals into groups that are equal in all core aspects or characteristics that could not be affected by any of the treatments used. For example, consider two groups (group that saw the treatment [I] and group that saw the control [II]). The percent of individuals that saw I and are women should be statistically equal to the percent of individuals that saw II and are also women. The person’s gender identification, which is normally noted at the beginning of the survey, could not have been

modified by any of the later introduced treatments of the experiment. Same happens with other participant characteristics that are not affected throughout the experiment in any way, like nationality, residence, career or study program, dietary preference, and so on.

There are two basic ways of making sure that an experiment actually divides participants into equal groups: random assignment and balance tables, based on the Law of the Large Numbers (LLN). Randomizing the assignment of participants eliminates the problem of selection bias because it makes the binary treatment-control variable independent of potential outcomes.

Random assignment implies that the observed and unobserved factors that affect outcomes are equally likely to be present in the treatment and control groups. Any given experiment may overestimate or underestimate the effect of the treatment, but if the experiment were conducted repeatedly under similar conditions, the average experimental result would accurately reflect the true treatment effect (Gerber and Green, 2012, pp. 7–8).

Currently, “the most credible and influential research designs use random assignment” (Angrist and Pischke, 2008, p. 9). This thesis’ survey and experiment also used the software tools from *SurveytoGo* to ensure random assignment of participants to each treatment or control group. However, randomizations are not bullet-proof. They help solving selection problems, but there is no guarantee that they assure perfectly equal well-balanced groups. That is why the experiment also used the Law of the Large Numbers (LLN).

The LLN is based on a mathematical theorem which predicts that in a sequence of independent trials, “the frequency of occurrence of a random event tends to become equal to its probability as the number of trials increases” (Prohorov, 2010). This means one will have closer and closer average estimates for the outcomes of an event the larger the number of observations or times the event is repeated. In this matter, having more than 800 participants in the survey was a great advantage.

Individual determinants of eco-label effects: Logistic regression models

The research goes further than just measuring the existence of eco-label effects. It also attempts to explore what motivates or explains the effects, by understanding the consumer’s beliefs related to the labels. The methods presented in this sub-chapter correspond to the third and last objective of the thesis: the reasons behind eco-label effects from the consumer side.

So far, the methods used for objectives I and II were quantitative. The analyses were purely statistical. The first qualitative method used, which makes this a mixed methods research, is the text analysis of an open-ended question included in the survey. The variables that explain the motives behind the effects of eco-labels on consumer intentions are numerous. They are not only economical or pragmatic, but also related to beliefs and experiences. That is why the survey asked participants: “*Could you briefly explain why you chose the products you chose?*” The text was unconditioned, and freely answered by the participants. All the responses were read and divided into categories. In a similar analysis, answers were classified in five categories only: health, quality, price, environment, and community’s wellbeing (Raygor, 2016). However, those categories proved to be insufficient for the

spectrum of this thesis. Then, taking Raygor's categories as a base but also using an inductive method, new categories were derived from the answers observed.

The final categories used for this text analysis of reasons behind food consumption choices among participants were:

- 1) Health
- 2) Quality, taste, or brand preference
- 3) Price and discount offers
- 4) Environmental awareness (better for soil or animals, sustainable, no plastic, seasonality)
- 5) Socio-ethical concerns (better for the community, fair, supports producers)
- 6) Importance of Bio
- 7) Importance of Fairtrade
- 8) Importance of regional/local
- 9) Habits (routines, stick to known products)
- 10) Other

One point was assigned to each category mentioned as important for the participant's purchase decision. That way, several categories (or motives) could be present on each answer. Which normally happened, because—as previously written—consumption choices involve many considerations. However, some participants stated an order of the aspects they mentioned as important. In that case, only the most important aspect was classified.

The total points for each category were added in order to identify the most mentioned important aspects for the consumers. The total of points per respondent were also added in order to identify frequent combinations of the same aspects, as well as the highest and lowest number of aspects involved in one decision.

On a separate question, the participants were also asked about their beliefs related to Bio and Fairtrade labeled products. Particularly if they think these products are *healthier, better for the environment, better for the society's wellbeing, better in quality, better tasting, better looking, more expensive for consumers, more natural, fresher, better for producers, more trustable (in knowing how the food was produced or grown)* than not Bio or Fairtrade alternatives. Their responses to this items were coded in a dichotomous way (*yes or no*), and compared to their answer for the first question about the reasons of their choice. Thus, the answers were used to reinforce or challenge the open-ended explanation.

A possible control for the determinants shaping individual preferences is the exposure, recognition, or familiarity to the label. So the survey also asked: "*Have you ever seen these labels why buying your food?*" The level of recognition was noted by the surveyor.

Finally, the variables contained in the TPB (Fishbein and Ajzen, 1975; Ajzen, 1991) were introduced and measured through several question items: three questions were for the attitudes towards sustainable labeled products, measured on a 5-point "Strongly Agree-Strongly Disagree" Likert scale. Two questions were about subjective norms, one for injunctive and one for descriptive, on seven

referents: parents, friends, partner, flat mates, colleagues, professors, and influencers; measured with a 4-point “Very influential-Not at all influential” scale. Finally, three questions were about the perceived behavioral controls: time, access, and money; measured on a 5-point “Strongly Agree-Strongly Disagree” Likert scale. These TPB variables were analyzed in the same way as Raygor (2016) did: with a binary (or binomial) logistic regression —again a last quantitative analysis.

A binomial logistic regression “is used to predict a dichotomous dependent variable based on one or more continuous or nominal independent variables. It is the most common type of logistic regression” (Lund Research, 2018a). This method is very similar to a multiple linear regression, instead it uses dichotomous dependent variables and not continuous. It is important that the independent variables do not show a high multicollinearity between them. Logistic regressions use maximum likelihood estimation (MLE) and do not assume normality in the data distribution.

Other variables that might make a difference on the consumer intention to buy sustainable food are the demographic factor. The survey includes eleven demographic questions: gender, university, study program, grade, semester, nationality, time living in Germany, type of diet, monthly expense for food groceries, percentage of expense for food groceries related to monthly total income, and days that the person eats outside home. This variables were also included in the regression analysis.

The binomial logistic equation was predicted using the following equation, where \ln is the natural logarithm, P is the predictor, E is expected probability, β_0 is the intercept, and β_{att} , β_{norms} , β_{pbc} , and β_{dem} are the regression coefficients for the TPB and demographic independent variables in the model.

$$L = \ln \left(\frac{P_i = E(y_i = \frac{1}{Z_i})}{1 - P_i = 1 - E(y_i = \frac{1}{Z_i})} \right) = \beta_0 + \beta_{att} + \beta_{norms} + \beta_{pbc} + \beta_{dem}$$

ANALYSIS AND RESULTS

This chapter presents the proper analyses and outcomes from the methods described, hand in hand with the results of the thesis. It describes whether the initial hypothesis were met or challenged. The first remark about the results obtained is that the survey’s response rate was way better than expected. Considering the Covid-19 limitations already discussed, it was still possible to reach nearly 150 students with the face-to-face CAPI method. The total number of students asked to engage in the survey, combining the CAPI and CAWI methods, was of 891. The total number of effective respondents, however, was of 869 students. This number exceeded the maximum expected of 400 students on a 117.25%. It means that the non-response rate due to refusal was of around 2.5% only.

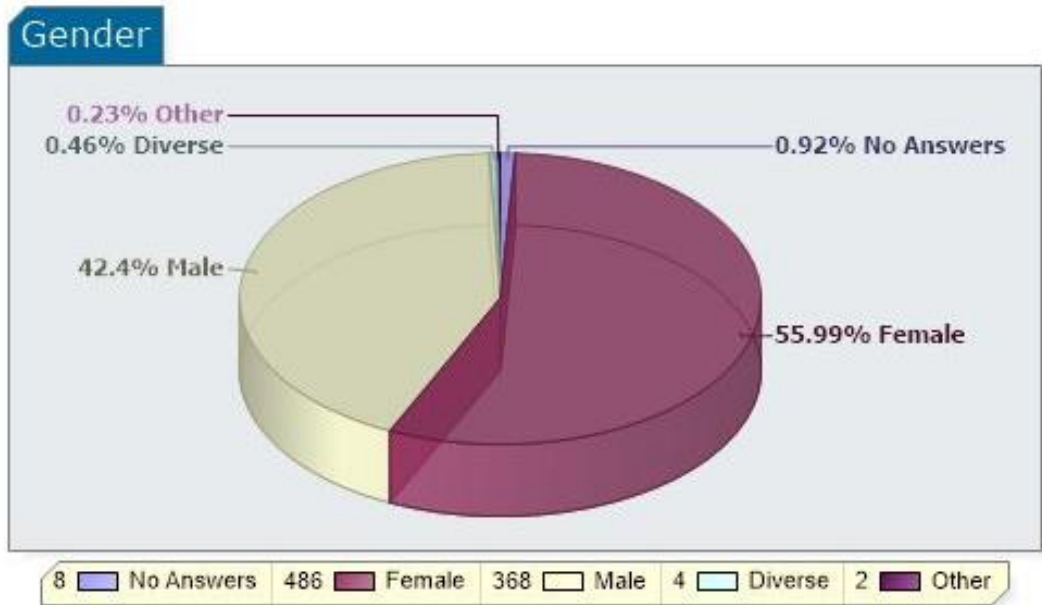
Few published studies with similar research objectives and without institutional funding, needless to mention similar master thesis, have reached this number of responses. The projects that manage to gather that many responses normally have a complete surveyor team or work with partner institutions. The purpose of mentioning this is not to brag, but to make a first note of the amount of people interested in participating or making their voices present in sustainability topics. It is worth remembering that the participation on the study was completely voluntary and unrewarded, not with

gifts, extra notes, etc. It was not even encouraged by any course professor, but only asked by the researcher/surveyor and a member of the International Network Coordination at the TH Köln University. The duration of the survey responses ranged from 2:13 to 40:49 minutes, with an average duration of 11:38 minutes.

Sample description

As mentioned above, the sample obtained was of 869 students. This number comprised 487 persons self-identified as female (56%) and 368 as male (42.3%), as well as 6 persons with diverse/other gender (0.7%).

Graph 4. Sample by gender

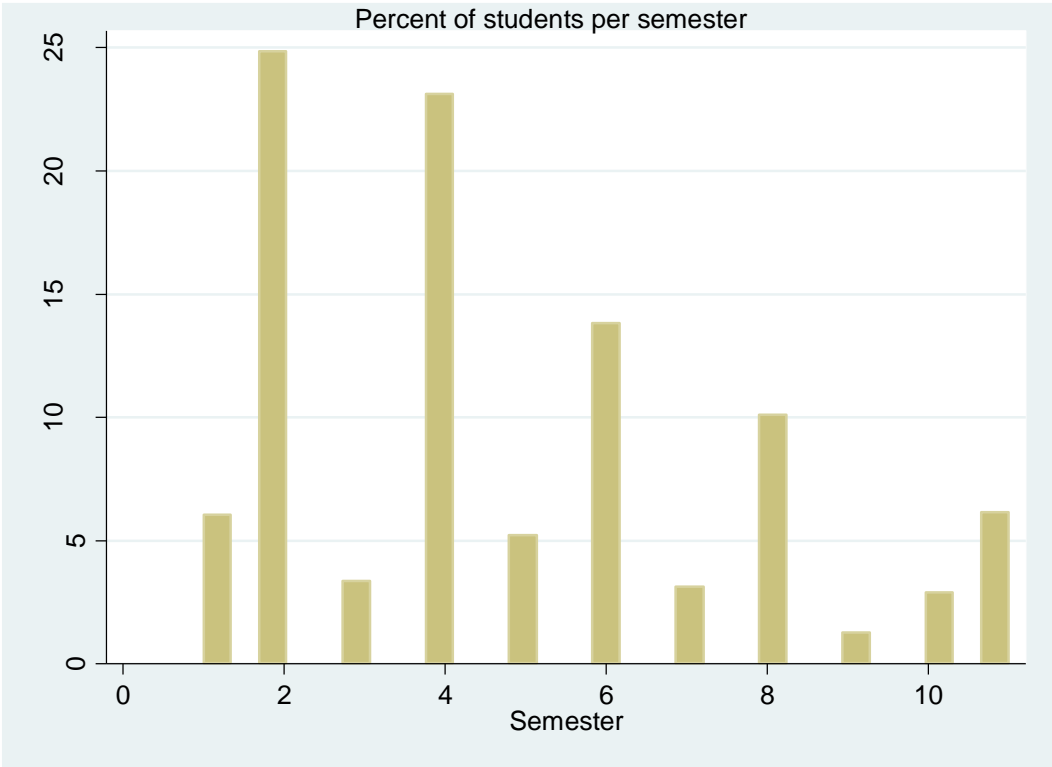


Source: Self-created on SurveytoGo, 2020.

84% of the respondents study at the TH Köln, which proves that the predominant sample method was the CAWI online link distribution. The study programs, however, showed high variation, so it was decided to group the careers into six clusters that allowed to make comparisons: 1) Natural Resources and Agriculture, 2) Human and Social Sciences, 3) Technology, Industry and Engineering, 4) Arts and Communication, 5) Business and Administration, and 6) the “Other career” cluster. The respective percentage of students per category was of: 10.5% first cluster, 17.9% second, 30.5% third, 21.3% fourth cluster, 10.6% fifth, and 15.3% sixth. The largest cluster was the one for Technology, Industry and Engineering study programs. This coincides with the university (TH Köln) —a technical one— that concentrated the higher number of responses.

About grade and semester of the students in the sample, the majority were bachelor (60.9%) and master (36.2%) students. Few are doctoral candidates (1.5%). The sample is distributed mainly on the second, fourth, sixth, and eight semesters, which is also consistent with the semester time (summer semester).

Graph 5. Sample by semester of study

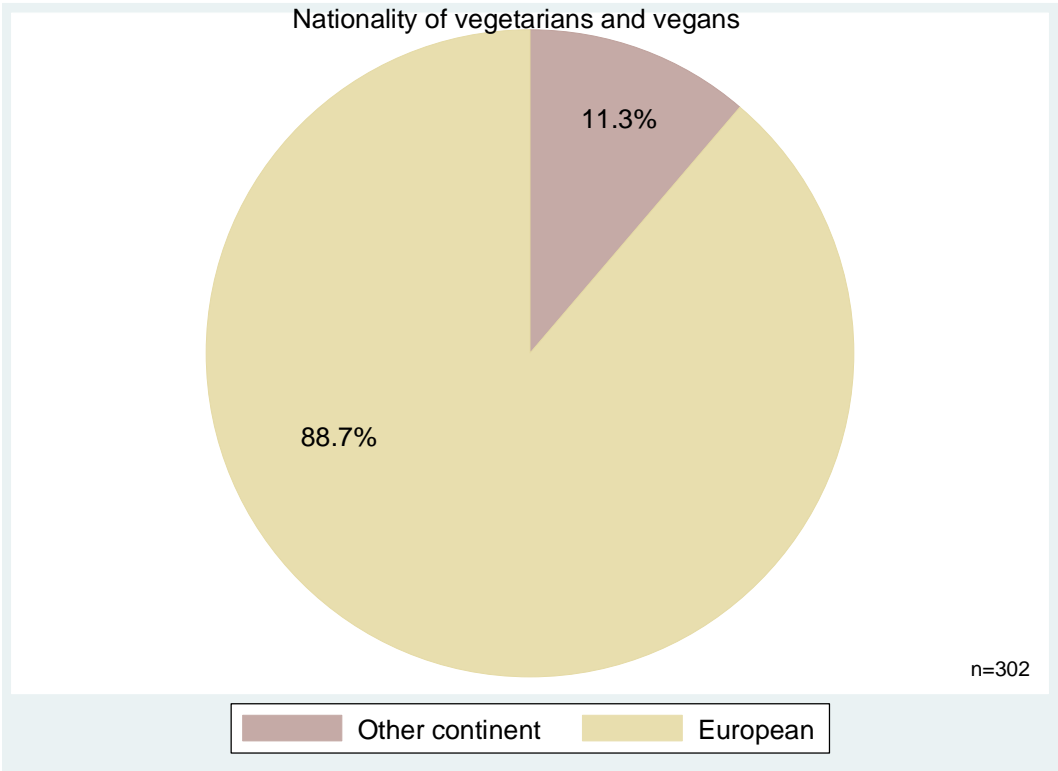


Source: Self-created on Stata, 2020.

Student nationalities were also very varied. However, as expected, the predominant respondents were German (74.4%), or European (81.2%). The rest of the sample was composed of people from 64 different countries, with more representation of people from Mexico, India, Turkey, and Colombia. Also, the majority of respondents (79.1%) have been living in Germany already for more than five years.

Regarding type of diet, the survey registered vegetarians, vegans, pescetarians, meat lovers, people that eat kosher, halal, and people that eat a bit of everything. Interestingly, 34.7% of the respondents were vegetarian, vegan or pescetarians. This confirms the statistics shared by the manager of the KSTW’s canteens (*Mensa*) in one interview (Durst, 2020 in Cañas *et al.*, 2020). He stated that five years ago, 25% of the *Mensa*’s consumers were vegetarian or vegan, and that currently 35-40% of the students have this type of diet, retrieved from the number of vegan/vegetarian meals sold every day in the canteens. This number was also confirmed on a previous survey made to TH Köln’s canteen consumers, as part of Project III “The Green Canteen: A Supply Chain Analysis from the Field to the Table”. That project registered a 39% of vegetarian and vegan consumers (Cañas *et al.*, 2020). In addition to the number of vegetarians, vegans, pescetarians, 20.1% of the sample stated to be meat lovers, and 6.8% eat kosher or halal diets. Most of the vegetarians and vegans are European citizens.

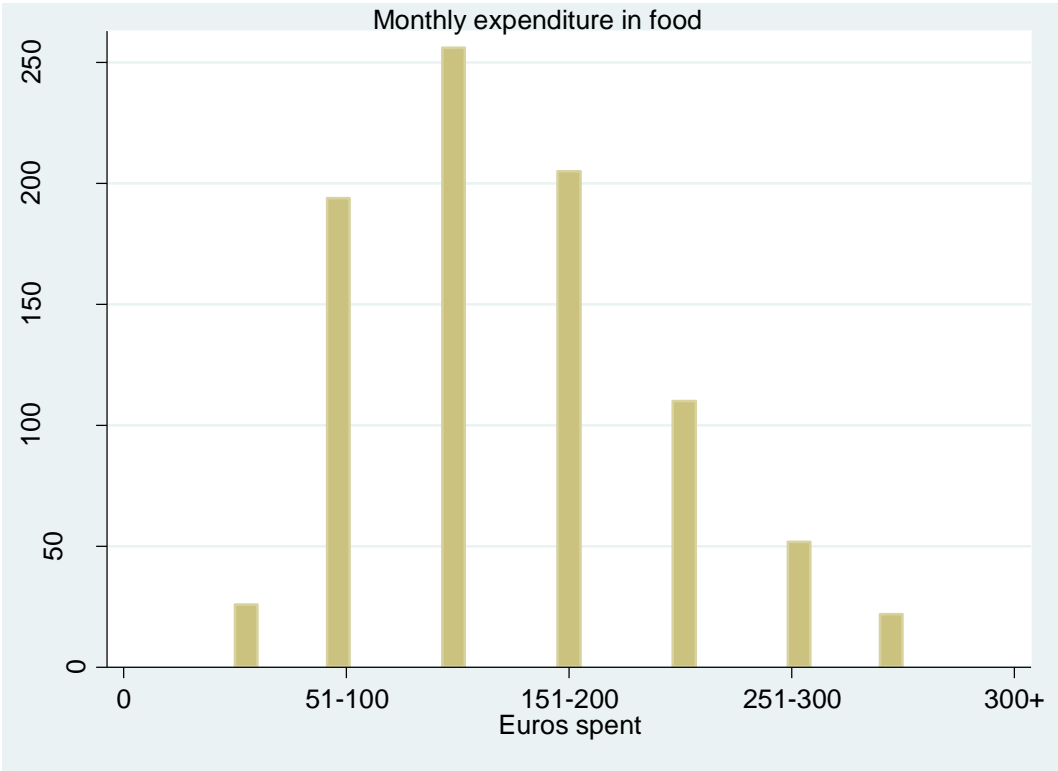
Graph 6. Vegetarians and vegans by nationality



Source: Self-created on Stata, 2020.

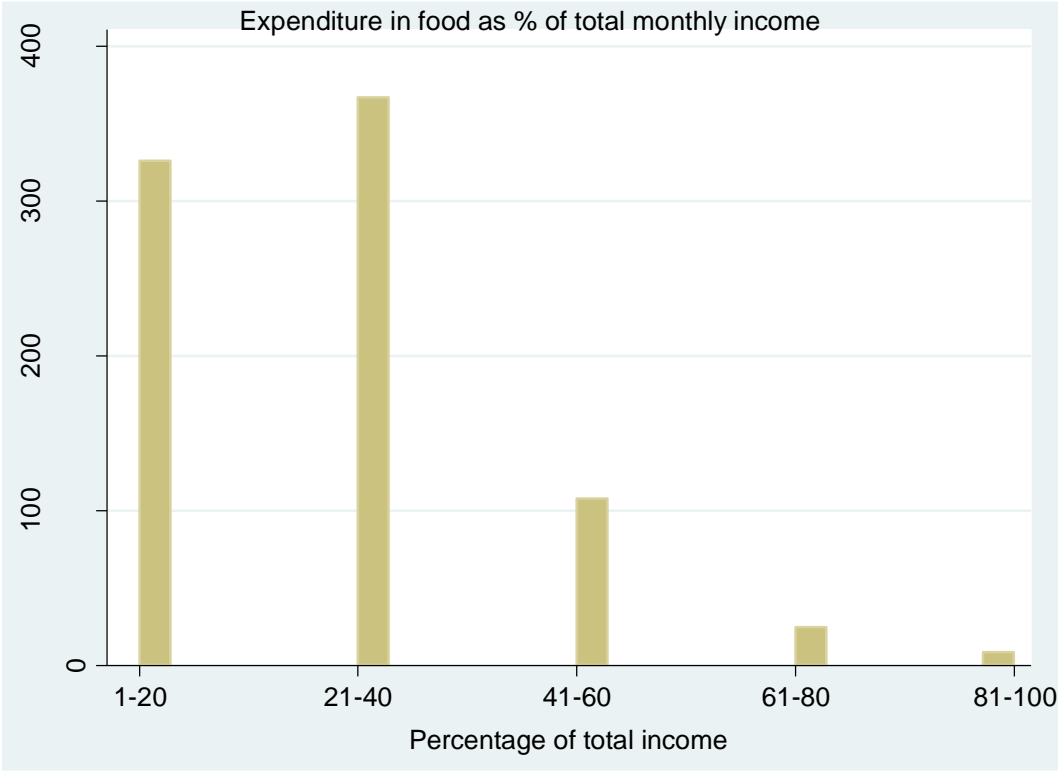
The survey did not measure rough income, because it is known to be a sensitive question for many persons. However, the participants were asked to report how much money they spend monthly buying food groceries. The majority of respondents spend between 51-250 euros per month in food groceries. The answers follow a normal distribution. Also, students were asked to report how much of their total monthly income does that food expenditure represents. For most students it represents between the 1-60% of the total income. Strong outliers were revised, in the assumption that no person spending less than 50 euros monthly for food could be spending the 81-100% of their income —unless they did not understand the question, or someone else buys the food for them, or they have a very low income. Six answers were dismissed because of this reason. Finally, most of the students eat only between 1-3 days outside of their homes. This question was asked according to their routine before the Covid-19 restrictions.

Graph 7. Monthly expenditure in food groceries



Source: Self-created on Stata, 2020.

Graph 8. Food expenditure as percentage of total monthly income



Source: Self-created on Stata, 2020.

Effects of eco-label treatments on consumer choices

This sub-chapter presents the analysis and results for the shopping situation experiments. This corresponds to the analysis for objectives number one and two: find if there are any eco-label effects, their direction and magnitude. The main outcome variables used in the questionnaire are two: 1) what the participant **saw** as a treated option (either the Bio/FT label or the label not Bio/FT but different to the control option anyhow), and 2) what the participant **chose** (either the treated or the controlled option). A total of three varieties of spaghetti, meat, and tomatoes, and 4 varieties of orange juice found in the food markets available for students of Cologne were included in the survey. Each one of the experiment variables (*saw and chose*) is dichotomous (composed of two values=1 and 0).

A statistically significant difference within people selecting the treated options on different groups (treated option on group 1 is the labeled more sustainable food, and treated option on group 2 is a regular unlabeled option), indicates that the presence of a Bio/FT eco-label influences consumer intentions to buy the more sustainable product. This happens because the only characteristic that differs in the products is the presence or absence of the eco-label, *ceteris paribus*.

Effect of Bio label on demand for organic pasta

For this analysis, the variable *treatedspr* indicates which treated option did the participant see. In other words, it shows if the participant was assigned to the treatment or the control group. Participants assigned to the treatment group saw the *Bio Spaghetti* option. Participants assigned to the control group saw the option *Barilla Spaghetti* instead of the Bio. Both groups also saw the control option *Ja Spaghetti*. The variable *choicesp* shows what the participants chose, either the treatment option (Bio or Barilla Spaghetti, according to the group they were placed on) or the control option (Ja Spaghetti).

Then, the outcome that interests the experiment is the comparison between people that saw the Bio treatment and chose it, versus people that saw the Barilla treatment and chose it. Since the only attribute being modified was the label, testing if there is a difference between this number of people will tell if the eco-label had an effect or not, and in which direction. The results are presented on table 6. They show that 109 (27.2%) participants chose the Bio treatment, and 172 (36.7%) participants chose the Barilla treatment. This means that there is a 9.5% difference between both groups, explained by the labels. The results indicate that there is actually an eco-label effect. However, the hypothesis of this thesis was that the eco-label would increase consumer demand. Well, in fact the opposite is observed. Participants preferred the product not eco-labeled. The initial hypothesis presented then is half met: **The eco-label effect exists, however it is negative, and its size is of 9.4%.**

The difference tested is not significant, not even at a 90% confidence level. The p-value obtained is too high. The interpretation is: there is not enough statistical evidence to reject the null hypothesis that the preference for the Bio labeled meat is the same than the preference for the not eco-labeled meat, at least for the students of Cologne. The discussion chapter will present some ideas on why an eco-label effect was not found for meat.

Effect of Bio label on demand for organic tomatoes

The variable *treatedtomr* indicates which treated option the participant saw. Participants assigned to the treatment group saw the *Bio package of tomatoes*. Participants assigned to the control group saw the *Beste Wahl tomatoes* instead of the Bio. Both groups also saw the control option *Regional tomatoes*. The variable *choicetom* shows what the participants chose, the treatment option (Bio or Beste Wahl, according to the group they were placed on) or the control option (Regional).

The comparison is between people that saw the Bio treatment and chose it, versus people that saw the Beste Wahl treatment and chose it. The results are presented on table 10: 122 (27.8%) participants that saw the Bio treatment also chose it, and 153 (35.5%) participants that saw the Beste Wahl treatment chose it. This retrieves a 7.7% difference between both groups, explained by their labels. The results indicate an eco-label effect that contradicts the hypothesis of the thesis. In this experiment, participants preferred the product that was not Bio labeled. The initial hypothesis is half met: **The eco-label effect exists, however, it is negative with a size of 7.7%.**

Table 10. Difference in choice for treatment (tomatoes)

choicetom	treatedtomr		Total
	Saw Bio	Saw Beste	
chose control	316 72.15	278 64.50	594 68.35
chose treated	122 27.85	153 35.50	275 31.65
Total	438 100.00	431 100.00	869 100.00

Source: Self-created on Stata, 2020.

Group Balance

To show the reliability of the experiment, the results of the LLN theorem applied to the survey's experiment groups are presented in form of a balance table. The balance table proves that the randomization of participants actually worked. As table 15 shows, the experiment separated individuals correctly into two groups that are equal in every characteristic existing *a priori*. The table compares seven pre-treatment outcomes across the treatment group and the control for every food product used in the experiment (spaghetti *in yellow*, meat *in light orange*, tomatoes *in red*, and juice *in blue*). The seven pre-treatment variables are mostly demographics that could not have been influenced or manipulated in any way during the experiment. This variables were selected because of the high number of observations they include and because they seem interesting, but other pre-treatment variables may also serve to prove balance.

The table divides the pre-treatment variables into six general groups marked with letters A-G (gender, nationality, German exposure, career, diet, eat at home, and money for food). For gender, the indicator shown is percent of women. For nationality, the chosen variable is percent of Europeans. German exposure presents the percent of people living in Germany already more than five years. Career is percent of students from the cluster of Human and Social Sciences. Diet is percent of people that identify themselves as vegetarians, vegans or pescetarians. For eat home, percent of people that cook their own meals more than five days a week (before Coronavirus, of course). Finally, money available presents the continuous variable of euros that people can spend in food groceries per month (it is divided in categories).

That way, the column with the first outcomes shows the percent of individuals that saw the treatment (*bio/FT treated label vs. control label*) and are women; for spaghetti, meat, tomatoes, and juice. The second column presents the number of individuals that saw the control (*not Bio/FT treated label vs. control label*) and are women. The third column shows the difference of individuals that are women between both groups and the percent that this represents. And the same for every pre-treatment variable included. Columns one, two, and three from the balance table are a visual balance test. They allow to compare the percentages and read into the numbers. Column four (Diff. p-value) is the real test. It shows whether the difference values are statistically significant or not, meaning if they really exist in the sample groups or are just random. The outcomes presented in this column come from two-sample test of proportions (Z-test) for dummy variables, and two-sample test of mean differences for continuous variables (T-test). In this table, the desirable outcome is having p-values that are not statistically significant, because then it is not possible to reject the null hypothesis (that the compared proportions or means are equal), and that is exactly what the balance table seeks: to prove that both groups are actually equal.

Table 15. Distribution of baseline characteristics

		Treatment Group	Control Group	Difference	Diff. p-value
A. Gender					
Women <i>Percent</i>	<i>Sp.</i>	56.20%	56.87%	0.67%	0.8446
	<i>Meat</i>	49.28%	53.07%	3.79%	0.4287
	<i>Tom.</i>	56.35%	56.78%	0.43%	0.9000
	<i>Juice</i>	55.17%	54.84%	0.33%	0.9362
B. Nationality					
Europeans <i>Percent</i>	<i>Sp.</i>	80.25%	82.09%	1.84%	0.4887
	<i>Meat</i>	76.67%	75.11%	1.56%	0.7033
	<i>Tom.</i>	79.68%	82.83%	3.15%	0.2343
	<i>Juice</i>	82.37%	81.36%	1.01%	0.7533
C. German Exposure					
People in Germany > than five years <i>Percent</i>	<i>Sp.</i>	78.64%	79.49%	0.85%	0.7608
	<i>Meat</i>	78.47%	71.18%	7.29%	0.0798 (*)
	<i>Tom.</i>	76.78%	81.44%	4.66%	0.0919 (*)
	<i>Juice</i>	81.36%	78.06%	3.30%	0.3261
D. Career					
Students of Humanities <i>Percent</i>	<i>Sp.</i>	19.50%	16.63%	2.87%	0.2721
	<i>Meat</i>	19.52%	18.34%	1.18%	0.7518
	<i>Tom.</i>	17.12%	18.79%	1.67%	0.5212
	<i>Juice</i>	15.59%	16.85%	1.26%	0.6839
E. Diet					
Vegetarians, vegans and pescetarians <i>Percent</i>	<i>Sp.</i>	35.50%	34.12%	1.38%	0.6692
	<i>Meat</i>	7.14%	6.99%	0.15%	0.9492
	<i>Tom.</i>	34.70%	34.80%	0.10%	0.9754
	<i>Juice</i>	35.59%	35.48%	0.11%	0.9782
F. Eat home					
People that eat home > than five days a week <i>Percent</i>	<i>Sp.</i>	61.20%	65.25%	4.05%	0.2632
	<i>Meat</i>	64.50%	59.28%	5.22%	0.3076
	<i>Tom.</i>	60.16%	66.86%	6.7%	0.0629 (*)
	<i>Juice</i>	62.60%	63.79%	1.19%	0.7851
G. Money (in a month)					
Money for food <i>Category average</i>	<i>Sp.</i>	3.54	3.44	0.10	0.2557
	<i>Meat</i>	3.37	3.47	0.10	0.4212
	<i>Tom.</i>	3.47	3.49	0.02	0.9511
	<i>Juice</i>	3.39	3.54	0.15	0.2062

Significance levels: * = p < 0.1, ** = p < 0.05, *** = p < 0.01

Source: self-created based on Stata outcomes, 2020.

As can be observed, none of the values obtained in column four are significant at a 95% confidence value, which is the standard value used in this kind of research. However, people living in Germany for more than five years (for tomatoes and meat), and people that cook and eat home more than five days a week (for tomatoes) are significant at a 90% confidence level.

This means there is a slight chance (10% margin of error probability) of selection bias in those three cases, which could mean: 1) more people that eat home more than five days a week in the control group of the experiment with tomatoes than in the treatment group; 2) more people that have lived more than five years in Germany in the treatment group than in the control group for the meat experiment; 3) more people that have lived more than five years in Germany in the control group for the tomatoes experiment. The extent to which this slightly probable differences between groups might affect the thesis is undetermined but must be disclosed and taken into account when discussing the results.

Individual determinants of eco-label effects

This sub-chapter presents the analysis and results for the questions that followed the shopping situation experiments, which corresponds to the analysis of objective number three: find the reasons behind the eco-label effects observed. The first part consisted on a text analysis. The thoughts and beliefs mentioned by the participants as important when buying food products were assigned to ten categories. A total of 699 responses were obtained. Which means that around 170 participants did not want to elaborate on the reasons behind their choices and skipped the question. The length of the answers is diverse: from one-word responses to five or six paragraphs.

The most mentioned reasons behind food purchase decisions are: the price (considering discounts, available money, etc.), the quality, taste or brand preference, the importance of buying regional and local food, and the importance of buying Bio; in that order. The maximum number of categories or reasons included in one single answer is of seven (out of ten). This answer with the most number of categories is presented as an example of the high complexity and weights of factors that influence a person's decision to buy or not certain product:

“When it comes to meat products, I've always opted for the more expensive product. On the one hand, due to the fact that the packaging looks more valuable to me, and on the other hand, because a low price for meat quickly gives the impression that it is not high-quality meat. When it comes to noodles, I prefer the Barilla as they are packed with less plastic. I didn't pay too much attention to the price here. If I were to pay closer attention to the prices in the supermarket, I would probably still have reached for the cheaper Ja! noodles at some point. When it comes to pasta, the quality can't really vary much. When it comes to tomatoes, I think it's important to support regional products. If the price is higher, I prefer to use organic. The question of organic or regional is always difficult to answer because I actually want both. With the orange juices I chose the organic juice. If I take a closer look at the prices, I choose the

cheaper version. Sustainable does not mean organic, but the FairTrade logo gives me the feeling of doing something good for someone else".⁵

Table 16. Reasons behind food consumption choices among participants

Reason	n=699	
	Times mentioned as important	Percent from total answers
<i>Health</i>	31	4.4%
<i>Quality, taste, or brand preference</i>	243	34.8%
<i>Price and discounts</i>	406	58.1%
<i>Environmental awareness</i>	109	15.6%
<i>Socio-ethical concerns</i>	52	7.44%
<i>Importance of Bio</i>	195	27.9%
<i>Importance of Fairtrade</i>	78	11.2%
<i>Importance of regional/local</i>	212	30.3%
<i>Habits or routines</i>	31	4.4%
<i>Other</i>	31	4.4%

Source: Self-created based on survey results, 2020.

Also, when asked with a closed and more guided question about their beliefs regarding Bio and FT labeled food compared to unlabeled food, participants answered similarly to the previous question, though representing more the ethical reasons (*community's wellbeing* and *better for producers*) than what stated in the open-ended question. More than 60% of the participants think that Bio and FT labeled food is more expensive than unlabeled food, but also that it has better quality, it is better for the environment, better for the community's wellbeing in general, more natural, better for producers, and more trustable (in knowing how the food was produced or grown). This all makes sense. The answers and beliefs behave as expected.

Table 17. Beliefs associated to Bio and FT labeled food

Belief	Times confirmed	Percent
<i>I believe that Bio/FT labeled food is _____ than food unlabeled as so.</i>		
<i>Healthier</i>	402	47.4%
<i>Better in quality</i>	533	62.7%
<i>More expensive for consumers</i>	742	87.4%
<i>Better for the environment</i>	767	89.2%
<i>Better for the community's wellbeing</i>	630	74.2%
<i>Better tasting</i>	221	26.3%
<i>Better looking</i>	101	12%
<i>More natural</i>	685	80.3%
<i>Fresher</i>	229	27.3%

⁵ Some responses obtained from the survey are quoted because they are illustrative and representative examples for different arguments about food choices. Consent was given, but participants are always anonymous. This kind of quotes are written in cursive letters.

<i>Better for producers</i>	655	77.1%
<i>More trustable</i>	612	72%

Source: Self-created based on survey results, 2020.

A control question for exposure and recognition of the labels was introduced in the survey as *Have you ever seen these labels why buying your food?* From the 869 participants, only five have not seen the Bio or the FT labels before. 799 (92% of respondents) have seen both labels, 63 have only seen the Bio, and 2 have only seen the FT.

Returning to quantitative analysis, the variables from the TPB: attitudes, norms, and perceived behavioral controls were analyzed with the binomial logistic regression, which also included important demographic aspects. However, before including all independent variables in the final model —too many—, they were tested against the dependent variables at univariate level (one at a time). Only the variables with a significant p-value in simple logistic regressions were included in the multivariate binomial logistic regression.

The dependent variables for the logistic regression analysis are: intention to purchase Bio spaghetti (*treatsp*), Bio meat (*treatmeat*), Bio tomatoes (*treattom*), and FT juice (*treatjuice*). The significant independent variables at univariate analysis —with 95% confidence level— from the TPB resulted to be two from attitudes, three from norms, and two for perceived behavioral control: *att1* (having labels that certify food as organic or FT makes the choosing of products more enjoyable and easy); *att2* (when I go shopping I am considering the best value for money choice. I am not thinking if a product is sustainable or not); *parentsbuy* (how often do you think your parents buy organic or FT food?); *partnerbuy* (how often do you think your partner buys organic or FT food?); *influencerbuy* (how often do you think the people you follow on social networks [influencers, cooking, health or fitness accounts] buy organic or FT food?); *pbctime* (I have enough time to make sure that the food I buy is organically farmed or fair traded); *pbcmoney* (I can afford to buy the organic or the fair traded variants of the products I want).

Also, the demographic variables univariately significant at 95% confidence level are: gender, time living in Germany, vegan diet, meat lover diet, money to buy food. Interesting that nationality did not make any statistically significant difference on intention to buy sustainable food, only the time living in Germany did. Neither the study program was significant on the purchase variance. Also interesting, vegetarian and pescetarians diets did not make a difference, only vegan and meat lover. The final model equation has, then, 12 explanatory variables:

L (purchase of sustainable food)

$$\begin{aligned}
&= \ln \left(\frac{P_i = E(y_i = \frac{1}{Z_i})}{1 - P_i = 1 - E(y_i = \frac{1}{Z_i})} \right) \\
&= \beta_0 + \beta_{att1} + \beta_{att2} + \beta_{parentsbuy} + \beta_{partnerbuy} + \beta_{influencerbuy} + \beta_{pbctime} \\
&+ \beta_{pbcmoney} + \beta_{female} + \beta_{timeliv} + \beta_{vegan} + \beta_{meatlover} + \beta_{moneyfood}
\end{aligned}$$

Table 18. Logistic regression of variables that explain intention to buy Bio (spaghetti)

Logistic regression	Number of obs	=	242
	LR chi2(12)	=	32.75
	Prob > chi2	=	0.0011
Log likelihood = -109.54658	Pseudo R2	=	0.1301

treatsp	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
att1	1.366858	.2962998	1.44	0.149	.8937268 2.090461
att2	.7110183	.135559	-1.79	0.074	.4893225 1.033157
parentsbuy	.8285204	.1550035	-1.01	0.315	.574191 1.195501
partnerbuy	.9337566	.1313447	-0.49	0.626	.7087636 1.230172
influencerbuy	1.075204	.1483025	0.53	0.599	.8205116 1.408953
pbctime	1.167144	.2239928	0.81	0.421	.8012458 1.700134
pbcmoney	1.10136	.1850571	0.57	0.566	.7923286 1.530923
female	1.602061	.5717632	1.32	0.187	.7959611 3.224529
timeliv	1.167972	.2280891	0.80	0.427	.7965342 1.712618
vegan	1.426367	.9049352	0.56	0.576	.4113397 4.946091
meatlover	.777228	.391682	-0.50	0.617	.2894594 2.086936
moneyfood	1.473465	.2007262	2.85	0.004	1.128191 1.924406
_cons	.0119571	.0236956	-2.23	0.026	.0002459 .5813856

Source: Self-created on Stata, 2020.

From the results presented, the interpretation is that only two variables (*att2* and *moneyfood*) are finally significant as reasons that explain variance in the intention to buy organic pasta. However, only the amount of money available to buy food groceries is significant at a 95% confidence level. The outcome indicates that more money to buy food then means a higher probability of buying sustainable pasta.

The attitude variable about considering the best value for money choice or thinking about the sustainability of a product is also significant, but only at a 90% confidence level, since the p-value is higher than 0.05 but lower than 0.1, and the confidence interval does not include the zero. This indicates that students that agree more on the statement prioritizing the value for money, tend to buy more sustainable pasta. The overall explanatory value shows that only around 13% of the variance in intention to buy organic pasta is explained by the model.

The same model was used to analyze the power of the TPB and demographic variables explaining consumption of organic meat. The only variable removed from the model was the vegan diet, since vegans did not see the meat questions. The outcomes suggest that the independent variables explain at least 29% of the variance in the dependent variable. This model has then a greater explanatory power than the one for pasta.

Table 19. Logistic regression of variables that explain intention to buy Bio (meat)

Logistic regression	Number of obs	=	129
	LR chi2(11)	=	49.31
	Prob > chi2	=	0.0000
Log likelihood = -58.770831	Pseudo R2	=	0.2955

treatmeat	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
att1	2.863228	.8529888	3.53	0.000	1.596883 5.133797
att2	.4458057	.1026823	-3.51	0.000	.2838498 .7001686
parentsbuy	1.2624	.3661042	0.80	0.422	.7150609 2.228696
partnerbuy	.6539473	.1302667	-2.13	0.033	.4425709 .9662792
influencerbuy	1.348745	.2505622	1.61	0.107	.9371266 1.941159
pbctime	1.035047	.2483348	0.14	0.886	.6467469 1.656477
pbcmoney	1.077213	.2520807	0.32	0.751	.6809418 1.704091
female	2.180901	1.082929	1.57	0.116	.8240825 5.771666
timeliv	1.206735	.2707416	0.84	0.402	.7773872 1.87321
meatlover	.9212421	.6709563	-0.11	0.910	.2210188 3.839886
moneyfood	.933909	.1938426	-0.33	0.742	.6217685 1.40275
_cons	.1051806	.2527565	-0.94	0.349	.0009472 11.67976

Source: Self-created on Stata, 2020.

Both attitude variables are significant to a 99% confidence level, explaining much of the reasons to buy organic meat. The variable *partnerbuy* is also significant in this model, at a 95% confidence level, which confirms the hypothesis of subjective norms influencing consumer behavior. Students that think their partners would rather buy organic food, tend to buy it too. Interesting is that the money available to buy food was not significant for meat, as it was for spaghetti. Which is in line with the open responses of most students, who are okay with spending more money on meat, since it is believed to be related with higher quality and safety. Quoting one of the responses that is representative, “*I would never buy meat that is very cheap, as I think it’s cheap for a reason, maybe it is old, or with a lot of fat, or just not in good state*”.

The model for intentions to buy organic tomatoes only explains a 9.4% variance of the dependent variable, which is not too high. The attitude variable of prioritizing money value for food and not sustainability (*att2*) is significant at a 95% confidence level, and two new variables have also proven to be significant, which is different to the meat and spaghetti outcomes. This time, the perceived behavioral control of time (having enough time to make sure that the product bought is organic) is significant to a 95% confidence level. Also the demographic variable of gender. Being female increases the probability of buying organic tomatoes.

Table 22. Overall results of the logistic regression analyses

	Code	Explanation	p-value
Independent explanatory variables			
<i>Spaghetti</i>	Att2	Considering best value for money choice, not sustainability	0.074*
	Moneyfood	Available euros to buy food groceries per month	0.004***
<i>Meat</i>	Att1	Having Bio labels makes the choosing of products more enjoyable and easy	0.000***
	Att2	Considering best value for money choice, not sustainability	0.000***
	Partnerbuy	Thinking that the partner buys Bio food	0.033**
<i>Tomatoes</i>	Att2	Considering best value for money choice, not sustainability	0.015**
	Pbctime	Having enough time to make sure the food is Bio	0.049**
	Female	Self-assigned as female	0.019**
<i>Juice</i>	Att1	Having FT labels makes the choosing of products more enjoyable and easy	0.002***
	Att2	Considering best value for money choice, not sustainability	0.021**
	Partnerbuy	Thinking that the partner buys FT food	0.002***
	Moneyfood	Available euros to buy food groceries per month	0.052*

Significance levels: * = $p < 0.1$, ** = $p < 0.05$, *** = $p < 0.01$

Source: Self-created based on survey results, 2020.

DISCUSSION

The introductory part of the thesis discussed that the decisions a person makes regarding what she buys and eats are vital for introducing or strengthening sustainability in the food sector. Consumers have the power of exerting market pull when rewarding or penalizing activities in the food chain (Grunert, Hieke and Wills, 2014). Hence, it is important to investigate the effects that eco-labels have on effectively

communicating activities that improve sustainability along food chains and increasing consumer's demand for those products. As well, there is a need to understand which beliefs and thoughts are normally attached to food consumption decisions, to know where exactly are eco-labels working or not, why, and what can they target or change in order to be more functional. After all, eco-labels are market-based environmental policy instruments that, though simple in appearance, also incur in costs and trade-offs.

The present research was guided by one general and three specific objectives:

Analyze the effects that eco-labels have on the demand for organic and Fairtrade food products, inside the market created by the students of Cologne (the consumers).

- I. Find if there is a different demand for food products that are eco-labeled as Bio/FT against those that are not eco-labeled.
- II. Determine the direction and the magnitude of the eco-label effects, if found.
- III. Find the reasons that explain the effects of eco-labels on consumers' intentions to buy sustainable food.

The **first finding** shows that:

I. A different demand for eco-labeled products versus those that are not eco-labeled was observed in all cases (pasta, meat, tomatoes, and juice). This finding suggests that eco-labels do make a difference in consumer's aggregate choices, which is in the overall market demand. However, does this mean that eco-labels work in favor or against the products that wear them?

The answer could seem easy at first, since the eco-label seems to aggregate value to the products that account for environmental and social impacts. The initial hypothesis, following the eco-label's creation arguments and the trends and theories of ethical consumption that the reader can find in the Literature Review section, was that eco-labels work in favor of the products. In other words, that all eco-labeled products would have a higher demand. However, a deeper and careful research reveals that the answer is actually not obvious but misleading. Consumers might still be unconvinced about the usefulness or trustworthiness of eco-labels, they could be deceived by the higher prices, or decide guided by different principles and reasons.

The **second finding** proves that:

II. Sometimes the demand for eco-labeled products was higher: with the meat and the juice. And sometimes the demand for eco-labeled products was actually lower: in the pasta and the tomatoes. This means that eco-labels have a positive impact on consumer's intention to buy organic meat and Fairtrade juice. 4.3% more of consumers prefer to buy organic meat than non-organic meat, and 9.1% more of consumers would rather buy Fairtrade than non FT juice. The difference observed for the meat, nevertheless, is not statistically significant. So, for the purpose of extending the findings to the overall student population of Cologne, the hypothesis was only met by the orange juice with the Fairtrade label.

Unexpectedly, eco-labels have a negative impact on consumer's intention to buy organic spaghetti and organic tomatoes. This means that 9.4% more of consumers would rather buy spaghetti

that is not Bio, and 7.7% more of consumers would rather buy tomatoes that are not Bio. Now, the hypothesis was that the size of the effects might be higher for fresh, unprocessed and inelastic products. So, the juice for example, was expected to have the smallest effect size since it is packed, processed and highly elastic. This did not happen: the juice had a size effect of 9.1%, the second highest. Surprisingly, the meat had the lowest effect, one that was not even statistically significant.

This effects, however, have a large scope if considered that the total population targeted by the thesis is of 100,706 university students. Then, the effects could be translated as: 9,164 more persons approximately would rather buy Fairtrade juice than other juices. This finding should be of interest not only for Fairtrade Germany, but also for supermarkets, companies that certify juice, brands that compete, decision-makers, etc. Because it means the Fairtrade label is working in the desired way, at least to what refers to the market of juice.

Also important to consider is that approximately 9,466 more persons would buy spaghetti that is not Bio labeled. And that 7,754 more persons in Cologne would rather buy the alternatives of tomato that are not Bio. In that matter, the Bio label only for this two products is selling 17% less than competing labels. Which means that the Bio label efforts are not working, at least for selling tomatoes and pasta. That is a warning alert for everyone involved in the Bio labeling, from producers, to certifiers and marketers. So, the interesting question to discuss is: why is the Fairtrade label working for juice and the Bio label not working for pasta and tomatoes?

The **third and last finding** indicates that:

The spectrum of attributes that people consider when buying food is very diverse. Some persons shop guided by the solely comparison of prices. Others, however, struggle to decide between what is more ethical, or healthier, has better quality, better price, seems more familiar, and has an environmental advantage as well. Most of the people try to reach a balance between all important aspects, but some feel they do not have the sufficient input to make such thoroughly informed decisions. Sometimes they also lack control aspects, like money or time, which are important when buying food. The sample did not seem to have access difficulties to Bio and FT products, though. Sometimes consumers are socialized from what they've heard from family members, partners, friends, or even the news about products and company scandals.

All of the above mentioned aspects and beliefs were read as the participants freely expressed them and classified qualitatively into categories of importance for consumption decisions. They were then quantitatively enriched with participants' answers about attitudes, norms and perceived behavioral controls. The influence of demographic factors in deciding what to buy and eat was also statistically tested.

Apparently, what works about the Fairtrade label on the juice is: first, that it makes consumers feel the choosing of products more enjoyable and easy. Second, that it speaks to consumers concerned about the price and the value for money of the product. Third, that it gets easily socialized and encouraged among couples. The results also show that having a higher budget available to buy food groceries increases the probability of buying Fairtrade juice.

The reasons why consumers feel the choosing of Fairtrade products more enjoyable and easy is not so clear. It might be because generally the Fairtrade label is accompanied by a short text or a picture explaining directly how the consumer is helping someone when buying the product. For example, a participant stated: *“I bought the juice which has the Fair-trade label and a picture of the farmer. It feels like I am supporting the farmer when I purchase it”*. This might make participants feel good.

About socialization and subjective norms, it is interesting how only the influence of the partner was significant, both for the juice and the meat. Not the influence of the parents, which one could also think to be high for students, or that of friends. Some examples that support the statistical findings are: *“I pay attention to organic, otherwise my wife wants to complain about the pesticides”*. Or *“I rarely buy something, usually my girlfriend takes over”*.

One can also discuss about the possible reasons behind the failure of the Bio label increasing demand for organic tomatoes and pasta. According to the predicting values of the variables, money and price have a large presence on consumer's mind when choosing between different food options. Money seems to be a great deal for most students, and a recurrent reason for opting out of the Bio products, even when they “wish they could buy them”. For example, statements like *“I usually try to buy organic but if the organic stuff is almost double the non-organic stuff price-wise, then no way José - I just don't have enough money to always make the 'good' or 'right' choice”*, or *“even though I care for the environment and my health, and I would like to buy organic, fair trade, environmentally friendly products, at this point in my life, I can't afford to always buy them, just when it doesn't represent a big price difference”*, or even promises for the future like *“I don't want to spend so much money on food as I'm still a student and don't earn that much. I would like to save some money. If I have a steady job and get a good salary, I would probably buy more organic food, or rather, better quality food”*, were commonly observed.

There is also people that only care about the price and not at all about sustainability: *“I don't care whether it is bio or not. I just wanna eat something I want while considering the cost”*. Second example: *“Being a student leading my life on a tight monthly budget I would not prefer to spend that extra euros just because of a few eco labeling over the packets or in some case just a different popular brand!”* Third example: *“I don't care about brand or if it's Bio or not...I just see price and whatever is cheap, I buy them”*.

Most consumers stated that the Bio pasta was too expensive considering that they could not see a great difference between buying Bio or normal pasta. For some consumers, the organic attributes are not so important on pasta or grains, because they are already somewhat processed. In contrary to fresh vegetables or fruits, were the pesticides and chemical fertilizers seem more dangerous. Also important is to note that there is a special brand of pasta in the markets of Cologne that has undeniably the lowest prices. And the price difference between this brand's products and pasta labeled as Bio is at least of two euros, if not more. Also, some people inferred that the Bio spaghetti was made with dinkel wheat, or spelt. Even though nothing was modified in order to give that impression. However, some people do not choose Bio spaghetti because of that simple reason.

In the case of tomatoes, some consumers feel that attributes like quality, appearance, and taste are more important than being organic: *“The product looks better. I don't like Bio products. I do have knowledge about the Bio industry and it is not better than conventional products”*. Example two: *“The Bio type of tomatoes usually loses quality a lot faster than the other types”*. Example three: *“I'm not really impressed with the taste of Bio tomatoes, so I'd stick to the regional ones”*.

Some people, nevertheless, consider that buying Bio tomatoes is more important than what concerns to pasta. However, people rate even higher the attribute of being regional or local for this particular vegetable/fruit: *“I chose the regional tomatoes because I think it's better to support local businesses. Same thinking for the other products. Except for the pasta, I just want the cheapest ones”*. Some people consider that regionality is an important aspect regarding sustainability as well, and that it is also an attribute that can be better controlled by consumers than compliance with Bio standards, since all the fruits and vegetables sold in Cologne's supermarkets must state their origin, either country or state. Then again some consumers have trouble differentiating the meanings of the regional and the Bio labels, which speaks directly to marketing possibilities for the Bio label. Quoting two answers, *“I choose the regional products, because I prefer products from Germany. I was not sure if regional and bio is the same”*. And *“I think bio and regional are almost equal, so I try to go with bio but if regional is a lot cheaper, I buy regional”*.

It is true that some consumers are very fond of sustainability standards and are environmentally aware when buying food. For those consumers eco-labels are important, but also other aspects regarding sustainability, like food sharing, use of plastic, and CO₂ levels emitted when transported:

“I usually consume: 1) products that I received through dumpster-diving, foodsharing or the left-overs from the Tafel (which in turn are the left-overs from supermarkets), and in this case I don't have high standards for quality or brand. I feel good about consuming them because otherwise they would be thrown away. 2) Products that I personally need to buy (because they are not usually thrown or given away, or because I don't have the time). In this case I do check for quality, regionality and organic production. Fairtrade labels if I buy stuff produced overseas, which I usually don't. Because right now I have the money, and also because I spend so little on option 1), I am willing to pay higher prices for products whose production is closer to my ideals (ecology, variety, circular economy, regionality, fair income, small producers)”.

However, the study also found consumers that simply do not believe or trust in this kind of labels. Quoting other responses, *“by now, many labels just lie. For example, I don't buy eggs AT ALL because even if it says they're organic the chickens often don't have a life anyone would consider worth living. “Tierwohl”? My ass”*. Or *“I don't really believe even if they have bio/fair trade certificate”*. Finally, it is important to note that some people buy Bio or FT not because of environmental awareness or ethical concerns, but because of quality or taste beliefs attached to them. That is why the categories “Importance of Bio” and “Environmental awareness” were separated, as well as “Importance of Fairtrade” and “Socio-ethical Concerns”.

Limitations and scope

As stated before, the first important and contestable assumption that this research makes is that the products labeled with the Bio and Fairtrade seals are more sustainable options compared to the other products presented to the consumer sample. This might be problematic because products with different labels could also be more sustainable than Fairtrade or Bio, according to the criteria used. For example, one could argue that case for regional/local products. Those products travel shorter distances, thus they have a lower CO₂ footprint. For the purposes of this paper, however, both Fairtrade and Bio labels are considered sufficiently robust to indicate a solid degree of sustainability (social, environmental and economic). This assumption comes not so much from the results but from the standards that both certification schemes follow (animal welfare, avoidance of pesticides and additives, labor standards, fair prices, and so on).

A second limitation of this thesis was that participation in the survey was voluntary, which could have led to overrepresentation of beliefs and attitudes towards sustainability. Maybe the students more interested in expressing their opinion about sustainability food issues were the ones engaging in the study. Then again, the results show high variation in opinions. The fact that participation was voluntary, also unrewarded and unconditioned, as well as anonymous, invalidates the socially desirable bias on responses, which is a greater gain.

The third limitation was already mentioned in the Data Collection Technique subchapter of the Methodology section: the unexpected spread of the Covid-19 virus. This made the CAPI face-to-face survey technique more difficult. The desired sample was completed, however, through the CAWI online method. Finally, both techniques complemented each other.

The scope of the results is limited to four basic food products: pasta, meat, tomatoes, and juice. The results are also limited to the student population of Cologne, indeed a numerous one. The findings might be generalizable to other student communities outside of the city or the country, however, with a prior thorough analysis of similar demographic characteristics. Please do not forget that the costs and benefits of certifications are often highly context-specific (Meemken, Spielman and Qaim, 2017). An advantage is that Cologne has a highly multicultural student environment, as discussed in the experiment, with around 65 different nationalities present in the survey.

Recommendations and future studies

The findings of this research regarding the Bio label are unexpected. They do not correspond to what the theoretical background about ethical consumption and the trends of organic consumption preach. Does this mean that the Bio label should be abandoned and that farmers should focus on different strategies? Of course not. It means there is an opportunity area of aspects that can be amended in order to work better. This thesis closes with a brainstorm of ideas about what could be changed to help the Bio and the Fairtrade labels reach more people.

The findings made evident that consumers have a strong preference and beliefs about regional food. This aspect is often forgotten by the Bio label, which focuses only in the production stage, way

farther from the consumers. Since consumers do not have a role monitoring the compliance of those standards that happen in the production level, they also do not trust or engage much. However, they feel more involved when being presented the information about place of origin, since that is something easy they can check and reward. Deegan (2011, p. 2) already noted this failure on some labels: “Even though environmental impacts may vary between product categories and lifecycle stages, most labels currently only concentrate on the environmental impacts of primary production and not, or only to a limited extent, the processing lifecycle stage”. The eco-labels that currently exist do not say much about the environmental impacts of processing, transport and consumption. So, focusing on these stages, that are also important on every supply chain analysis, could interest the most engaged consumers and spark the interest of new ones.

A strong recommendation would be introducing a label that combines both the regional and the organic standards of sustainability. Around 30% of the participants find important that a product is Bio, and other 30% find important that it is regional. Currently both labels compete in the markets most of the times. Then, placing them together could be a game changer. Same as analyzing the results scientifically.

To combine Bio and Fairtrade labels might also have positive results enhancing both eco-label effects. The combination of Bio and Fairtrade labels actually already exists for some products. The recommendation then is to prove the effectiveness of this through experimental research, as done in this thesis. The combination effects of the labels have not yet been studied. The competition between them, however, was briefly analyzed in this thesis, for the case of the juice only —where the Fairtrade label already proved to have strong positive effects. The results showed that 68% of consumers prefer to buy the Fairtrade juice, while only 32% chose the Bio.

Another recommendation about the reach of eco-labels is to include the most factors possible that interest engaged consumers. For many, an eco-label for food is expected to cover not only environmental issues but also social and ethical issues, such as fair remuneration for producers and animal welfare (Deegan, 2011, p. 3). Particularly the concern for animal friendliness is an aspect that recurrently appeared on participants’ answers. So did the use of plastic to wrap most of the Bio products, which many consumers find contradictory given that the label fights for environmental standards. People get sometimes annoyed by small facts that can be easily modified. For example, single fruits or vegetables, like tomatoes and cucumbers are often found in German supermarkets with a Bio label sticker pasted on their skins. The sticker is hard to remove and most of the times leaves traces on the product, which is eaten raw by the consumers. The simplest detail of not being able to fully remove this plastic sticker makes some consumers avoid buying the product, since Bio labels are supposed to be against ingesting chemicals. This kind of small modifications can make a great difference when selling a sustainable product. Finding solutions to avoid consumer confusion is also vital when it comes to marketing strategies. Ideas like consumer information campaigns should be considered.

Future studies should also include other population cohorts, since variables like the money available to buy food and the price of products is especially important for students —they reported

several times their tight budgets— but might not be the case for older people with better paid jobs, or for seniors. Other products should also be studied. The findings of this thesis can be used as a base to explore eco-label effects on more foods and even other products from different sectors, for example, clothes. There is a vast opportunity field for studying eco-label effects, since almost every product has different markets, characteristics, and competitors that might be appealing to analyze.

Also, further studies of the supply chains of each product (labeled and unlabeled options) would demonstrate whether they are indeed more sustainable or not than other alternatives. Those suggested studies should include distance traveled, water and carbon footprints, means of production, regionality, seasonality, among other environmental impacts that are more difficult to measure, such as amount of biodiversity loss, landscape pollution, and soil fertility indicators. Another interesting topic connected to eco-label effects is to measure if those demand increases really translate into better conditions for producers. For that, it would be necessary to partner with other institutions in charge of the labeling and in direct contact with farmers.

Finally, future research on the economic incentives needed to move consumers of unsustainable products to the more sustainable alternatives is desirable and recommended. This could be done analyzing willingness to pay, loyalty scales, and differentiating among consumers that are normally guided by the prices and those that are guided by ethical or environmental principles. But this is work intended for another project.

CONCLUSION

This research is useful for the scientific study of food management and sustainable development. One of its major contributions is the use of the experimental method to analyze the topic, which had so far been unattempted in similar research. The experiments allowed to simulate scenarios that were the closest to real-life decisions, using real products and real prices. The effects that different labels have in the consumption of a product were measured and compared through statistical tests of proportions (Z-tests), modifying the labels but keeping constant other attributes, such as quantity, background, expiration date, or nutritional value.

The findings confirm that there is a statistically significant preference for juice with the Fairtrade label among the student community in Germany. But also that Bio labeled pasta and tomatoes do not sell as much as the unlabeled ones. The latter is explained through the attributes and the beliefs that consumers associate to Bio and FT labels, as well as beliefs and attributes they recognize from the competitors. For the majority of consumers (58.1%) the price is still a decisive factor when choosing food, even more important than the environmental or ethical benefits attached to a product. The rest of factors with a role were also discussed in the last chapter.

What remains to be highlighted is the robust participation level observed. That was a plus. As well as the reception of highly elaborated responses from the participants. It is possible to conclude that in the context surrounding this thesis, consumers are well informed to a general degree. This might be because of the education sphere where the research took place, or because regulations for transparency

and consumer protection are more and more present nowadays. Either way, once people know what they are buying, it is only a matter of what they choose to do with that information.

Most of the individuals that participated were highly engaged and eager to share their opinions, either favorable or not about the labels present on what they buy. This indicates that consumers know why they decide for one or the other option. Their behaviors are reasoned and planned. The research attempts to record those voices in the most honest and scientific way possible. Nonetheless, those voices speak by themselves through the collected purchase decisions. This research channels through the scientific method what young consumers are currently voicing with both their opinions and their food selections.

REFERENCES

- Ajzen, I. (1991) 'The Theory of Planned Behavior', *Organizational Behavior and Human Decision Processes*, 50(2), pp. 179–211.
- Ajzen, I. (2005) *Attitudes, personality, and behavior*. Second edi. Maidenhead, U.K.: Open University Press.
- Ajzen, I. (2012) 'The Theory of Planned Behavior', in Lange, P., Kruglanski, A., and Higgins, T. (eds) *Handbook of theories of social psychology*. London: Sage, pp. 438–459.
- Ajzen, I. (2015) 'Consumer attitudes and behavior: the Theory of Planned Behavior applied to food consumption decisions', *Rivista di Economia Agraria*, LXX(2), pp. 121–138. doi: 10.13128/REA-18003.
- Ajzen, I. (2019) *Theory of Planned Behavior Website*. Available at: <https://people.umass.edu/aizen/tpb.html>.
- Ajzen, I., Rosenthal, L. and Brown, T. (2000) 'Effects of Perceived Fairness on Willingness to Pay', *Journal of Applied Social Psychology*, 30(12), pp. 2439–2450.
- Akintunde, E. A. (2017) 'Theories and Concepts for Human Behavior in Environmental Preservation', *Journal of Environmental Science and Public Health*, 1(2), pp. 120–133. doi: 10.26502/JESPH.012.
- Andorfer, V. A. (2013) 'Ethical Consumption in Germany', *Zeitschrift für Soziologie*, 42(15), pp. 424–443.
- Andreyeva, T., Long, M. and Brownell, K. (2010) 'The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food', 100(2), pp. 874–877. doi: 10.2105/AJPH.2008.151415.
- Angrist, J. and Pischke, J.-S. (2008) *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton: Princeton University Press.
- BCFN (2016) *Double Pyramid 2016, Science, People, Environment, Economy*. Milan: BCFN
- Beuchelt, T. and Zeller, M. (2011) 'Profits and poverty: Certification's troubled link for Nicaragua's organic and fairtrade coffee producers', *Ecological Economics*, 70, pp. 1316–1324. doi: 10.1016/j.ecolecon.2011.01.005.
- BMEL (2017) *The German Bio-Siegel*. Bonn: BMEL.
- BMEL (2019) *Organic Farming in Germany*. Bonn: BMEL.
- BMZ (2015) *Food Security, BMZ G7 Germany*. Available at: https://www.bmz.de/g7/en/Entwicklungspolitische_Schwerpunkte/Ernaehrung_sichern/index.html.
- Cañas, J. et al. (2020) *The Green Canteen: A Supply Chain Analysis from the Field to the Table*. Cologne: ITT-TH Köln.
- Claar, V. and Haight, C. (2015) 'Fair Trade Coffee', *Journal of Economic Perspectives*, 29(1), pp. 215–216.
- Darnton, A. (2008) *An overview of behaviour change models and their uses*. Westminster: Centre for Sustainable Development, University of Westminster.

- Deegan, K. (2011) *EU Ecolabel for Food and Feed Products – Feasibility Study*. London: OakdeneHollins; European Commission.
- Die Bundesregierung (2013) *Bio liegt im Trend, Ernährung*. Available at: <https://archiv.bundesregierung.de/archiv-de/bio-liegt-im-trend-400242>.
- European Commission (2019) *Sustainable Food, Sustainable Consumption and Production*. Available at: <https://ec.europa.eu/environment/archives/eussd/food.htm>.
- Fairtrade International (2011) *Impact of Fairtrade Bananas*. UK: University of Sussex.
- Fairtrade International (2019) *Consumer Attitudes and Policy-maker Views on Sustainable Consumption and Production: a Baseline Evaluation*. UK: Fairtrade International.
- Fellows, P. and Hilmi, M. (2011) *Selling street and snack foods*. Rome: FAO.
- FiBL and IFOAM EU (2016) *Organic in Europe: Prospects and Developments 2016*. Edited by S. Meredith and H. Willer. Brussels: IFOAM EU Group.
- Fishbein, M. and Ajzen, I. (1975) *Belief, attitude, intention, and behavior: An introduction to theory and research*. MA: Addison-Wesley.
- Food Federation Germany (2017) *The German Food Sector, Food Federation Germany*. Berlin: Lebensmittelverband Deutschland.
- Gerber, A. and Green, D. (2012) *Field Experiments: Design, Analysis, and Interpretation*. New York: W.W. Norton.
- Global CAD (2019) *Literature Review on Public Attitudes to Fair Trade and Ethical Consumption*. Berlin: Global CAD.
- Grunert, K., Hieke, S. and Wills, J. (2014) ‘Sustainability labels on food products: Consumer motivation, understanding and use’, *Food Policy*. Elsevier Ltd, 44, pp. 177–189. doi: 10.1016/j.foodpol.2013.12.001.
- Harms, R. and Linton, J. D. (2015) ‘Willingness to Pay for Eco-Certified Refurbished Products: The Effects of Environmental Attitudes and Knowledge’, *Journal of Industrial Ecology*, 20(4), pp. 893–904. doi: 10.1111/jiec.12301.
- Iarossi, G. (2006) *The Power of Survey Design*. Washington, D.C.: The World Bank.
- Kölner Studierendenwerk AöR (2019) *Wohnen*. Available at: <https://www.kstw.de/wohnen>.
- Kvale, S. (2006) ‘Dominance Through Interviews and Dialogues’, *Qualitative Inquiry*, 12, pp. 480–500. doi: 10.1177/1077800406286235.
- Leeuw, A. et al. (2015) ‘Using the Theory of Planned Behavior to identify key beliefs underlying pro-environmental behavior in high-school students: Implications for educational interventions’, *Journal of Environmental Psychology*. Elsevier Ltd, 42, pp. 128–138. doi: 10.1016/j.jenvp.2015.03.005.
- Leifeld, J. (2012) ‘How sustainable is organic farming?’, *Agriculture, Ecosystems and Environment*, 150, pp. 121–122.
- Lund Research (2018a) *Binomial Logistic Regression Analysis using Stata, Stata tutorials*. Available at: <https://statistics.laerd.com/stata-tutorials/binomial-logistic-regression-using-stata.php>.

- Lund Research (2018b) *Independent t-test using Stata, Stata tutorials*. Available at: <https://statistics.laerd.com/stata-tutorials/independent-t-test-using-stata.php>.
- Maslow, A. H. (1943) 'A Theory of Human Motivation', *Psychological Review*, 50, pp. 370–396.
- Meadows, D. *et al.* (1972) *The Limits to Growth*. New York: Universe Books.
- Meemken, E.-M., Spielman, D. and Qaim, M. (2017) *Trading off nutrition and education? A panel data analysis of the dissimilar welfare effects of Organic and Fairtrade standards*, *GlobalFood Discussion Paper 90*, University of Göttingen.
- Meryment, E. (2016) *Emerging Food Movements*, *Nutrition Australia*. Available at: <https://www.bodyandsoul.com.au/nutrition/nutrition-tips/emerging-food-movements/news-story/54011f3ffbb3c41bd63a7ce2c5166d0b>.
- von Meyer-Höfer, M. *et al.* (2013) *Mature and Emerging Organic Markets: Modelling Consumer Attitude and Behaviour with Partial Least Square Approach*, *GlobalFood Discussion Paper 26*, University of Göttingen.
- von Meyer-Höfer, M., Nitzko, S. and Spiller, A. (2013) *Expectation Gaps and Halo-Effects in Organic Food Positioning: Characteristics of Organic Food from a Consumer's Point of View*, *GlobalFood Discussion Paper 25*, University of Göttingen.
- von Meyer-Höfer, M. and Spiller, A. (2014) "Sustainability" a semi-globalisable concept for international food marketing consumer expectations regarding sustainable food – An explorative survey in industrialised and emerging countries, *GlobalFood Discussion Paper 44*, University of Göttingen.
- von Meyer-Höfer, M., von der Wense, V. and Spiller, A. (2013) *Characterising convinced sustainable food consumers*, *GlobalFood Discussion Paper 28*, University of Göttingen.
- Van Nieuwkoop, M. (2019) *Do the costs of the global food system outweigh its monetary value?*, *World Bank Blogs*. Available at: <https://blogs.worldbank.org/voices/do-costs-global-food-system-outweigh-its-monetary-value#:~:text=Since the post-farm to,the %2480 trillion global economy>.
- OECD (1991) *Environmental Labelling in OECD Countries*. Michigan: University of Michigan, OECD.
- Prohorov, Y. (2010) *Law of Large Numbers*, *Encyclopedia of Mathematics*. Available at: https://encyclopediaofmath.org/wiki/Law_of_large_numbers.
- Raygor, A. (2016) *The Theory of Planned Behavior: Understanding Consumer Intentions to Purchase Local Food in Iowa*. Master thesis. Iowa State University.
- Reganold, J., Papendick, R. and Parr, J. (1990) 'Sustainable Agriculture', *Scientific American*, 262(6), pp. 112–121.
- Robin, M.-M. (2007) *The World According to Monsanto*. France: The National Film Board of Canada.
- Scalco, A. *et al.* (2017) 'Predicting organic food consumption: A meta-analytic structural equation model based on the theory of planned behavior', *Appetite*. Elsevier Ltd, 112, pp. 235–248. doi: 10.1016/j.appet.2017.02.007.
- Schnettler, B. *et al.* (2012) 'Consumer typology according to food-related lifestyle: an exploratory

- study in southern Chile’, *Rev Chil Nutr*, 39(6), pp. 165–172.
- Scott, S. (2007) *Promises and challenges of the informal food sector in developing countries*. Rome: FAO.
- Sirieux, L., Grolleau, G. and Schaer, B. (2008) ‘Do consumers care about food miles? An empirical analysis in France’, *Int. J. Consum. Stud.*, 32, pp. 508–515.
- Statistik Amt. (2019) *Cologne Facts and Figures*. Köln: Amt für Stadtentwicklung und Statistik.
- StatTrek (2020) *Difference Between Proportions, Hypothesis tests*. Available at: stattrek.com/hypothesis-test/difference-in-proportions.aspx
- Sterner, T. and Coria, J. (2012) *Policy Instruments for Environmental and Natural Resource Management*. Second edi. New York: RFF Press.
- Van Liere, K. and Dunlap, R. (1980) ‘The Social Bases of Environmental Concern: a Review of Hypotheses, Explanations, and Empirical Evidence’, *The Public Opinion Quarterly*, 44(2), pp. 181–197.
- Vande Velde, K. (2012) *Fairtrade as an Instrument for Development. The case of rice in Benin*. Master thesis. Faculty of Social Sciences, Katholieke Universiteit Leuven.
- Vermeir, I. and Verbeke, W. (2008) ‘Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values’, *Ecological Economics*, 64, pp. 542–553. doi: 10.1016/j.ecolecon.2007.03.007.
- Warwick, D. P. and Lininger, C. A. (1975) *The Sample Survey: Theory and Practice*. New York: McGraw-Hill.

ANNEXES

Questionnaire script

Eco-labels (Cologne) retrieved from SurveytoGo

English version

Question ID	Question	Answer
1	[language] Choose a preferred language	<1> English <2> German
2	[consentexplain] INFORMED CONSENT The purpose of this survey is to better understand your consumer preferences and perceptions regarding some food options that are available in Cologne. Your participation is completely voluntary and anonymous. Your responses will be stored on password-protected computers accessible only to me and my research supervisors. There are no penalties if you decide that you do not wish to participate. You may exit the survey at any time and you may also skip any question you do not wish to answer. There are no foreseeable risks to you, and the only cost from participating is the time it takes to complete the survey (no more than 15 minutes). I appreciate your time and commitment to giving honest responses. Click Next.	
3	[consent] Do you agree to participate in this study?	<1> Yes <2> No

Demographics

Question ID	Question	Answer
4	[gender] Gender	<1> Female <2> Male <3> Diverse <4> Other
5	[uni] University	<1> University of Cologne / Universität zu Köln <2> German Sport University of Cologne / Deutsche Sporthochschule Köln <3> Cologne University of Applied Sciences / Technische Hochschule Köln <4> Köln University of Applied Sciences / Rheinische Fachhochschule Köln <5> Catholic University of Applied Sciences NRW / Katholische Hochschule Nordrhein-Westfalen <6> Cologne Business School <7> The Cologne University of Music / Hochschule für Musik Köln <8> Other

6	[study] Study programme	<1> Agriculture, Food, Sustainability and Natural Resources <2> Architecture and Construction <3> Arts <4> Information, Technology and Communications <5> Engineering, Mathematics, Physics and Chemistry <6> Education <7> Finance and Business Administration <8> Health Science <9> Hospitality and Tourism <10> Government and Public Administration <11> Law and Security <12> Human services and other Social Sciences <13> Manufacturing <14> Marketing, Sales and Logistics <15> Sports <16> Other
7	[grade] Grade	<1> Bachelor <2> Master <3> Doctoral/Grad <4> Other
8	[sem] Semester	<1> 1 <2> 2 <3> 3 <4> 4 <5> 5 <6> 6 <7> 7 <8> 8 <9> 9 <10> 10 <11> Other
9	[country] Country of Origin	<64> Germany <1> Afghanistan <2> Albania <3> Algeria <4> Andorra <5> Angola <6> Antigua & Deps <7> Argentina <8> Armenia <9> Australia <10> Austria <11> Azerbaijan <12> Bahamas <13> Bahrain <14> Bangladesh <15> Barbados <16> Belarus <17> Belgium <18> Belize <19> Benin <20> Bhutan <21> Bolivia <22> Bosnia Herzegovina <23> Botswana <24> Brazil <25> Brunei

		<26> Bulgaria <27> Burkina <28> Burundi <29> Cambodia <30> Cameroon <31> Canada <32> Cape Verde <33> Central African Rep <34> Chad <35> Chile <36> China <37> Colombia <38> Comoros <39> Congo <40> Congo {Democratic Rep} <41> Costa Rica <42> Croatia <43> Cuba <44> Cyprus <45> Czech Republic <46> Denmark <47> Djibouti <48> Dominica <49> Dominican Republic <50> East Timor <51> Ecuador <52> Egypt <53> El Salvador <54> Equatorial Guinea <55> Eritrea <56> Estonia <57> Ethiopia <58> Fiji <59> Finland <60> France <61> Gabon <62> Gambia <63> Georgia <65> Ghana <66> Greece <67> Grenada <68> Guatemala <69> Guinea <70> Guinea-Bissau <71> Guyana <72> Haiti <73> Honduras <74> Hungary <75> Iceland <76> India <77> Indonesia <78> Iran <79> Iraq <80> Ireland {Republic} <81> Israel <82> Italy <83> Ivory Coast <84> Jamaica <85> Japan <86> Jordan <87> Kazakhstan <88> Kenya <89> Kiribati
--	--	---

		<p> <90> Korea North <91> Korea South <92> Kosovo <93> Kuwait <94> Kyrgyzstan <95> Laos <96> Latvia <97> Lebanon <98> Lesotho <99> Liberia <100> Libya <101> Liechtenstein <102> Lithuania <103> Luxembourg <104> Macedonia <105> Madagascar <106> Malawi <107> Malaysia <108> Maldives <109> Mali <110> Malta <111> Marshall Islands <112> Mauritania <113> Mauritius <114> Mexico <115> Micronesia <116> Moldova <117> Monaco <118> Mongolia <119> Montenegro <120> Morocco <121> Mozambique <122> Myanmar, {Burma} <123> Namibia <124> Nauru <125> Nepal <126> Netherlands <127> New Zealand <128> Nicaragua <129> Niger <130> Nigeria <131> Norway <132> Oman <133> Pakistan <134> Palau <135> Panama <136> Papua New Guinea <137> Paraguay <138> Peru <139> Philippines <140> Poland <141> Portugal <142> Qatar <143> Romania <144> Russian Federation <145> Rwanda <146> St Kitts & Nevis <147> St Lucia <148> Saint Vincent & the Grenadines <149> Samoa <150> San Marino <151> Sao Tome & Principe <152> Saudi Arabia </p>
--	--	--

		<153> Senegal <154> Serbia <155> Seychelles <156> Sierra Leone <157> Singapore <158> Slovakia <159> Slovenia <160> Solomon Islands <161> Somalia <162> South Africa <163> South Sudan <164> Spain <165> Sri Lanka <166> Sudan <167> Suriname <168> Swaziland <169> Sweden <170> Switzerland <171> Syria <172> Taiwan <173> Tajikistan <174> Tanzania <175> Thailand <176> Togo <177> Tonga <178> Trinidad & Tobago <179> Tunisia <180> Turkey <181> Turkmenistan <182> Tuvalu <183> Uganda <184> Ukraine <185> United Arab Emirates <186> United Kingdom <187> United States <188> Uruguay <189> Uzbekistan <190> Vanuatu <191> Vatican City <192> Venezuela <193> Vietnam <194> Yemen <195> Zambia <196> Zimbabwe <197> Other
10	[timeliv] How long have you lived in Germany?	<1> Less than one month <2> 1-6 months <3> 7-12 months <4> 13 months-3 years <5> 3-5 years <6> more than 5 years
11	[diet] How would you classify your dietary preference?	<1> Vegetarian <2> Vegan <3> Meat lover <4> Kosher <6> I eat a bit of everything <5> Halal <7> Other <8> Pescetarian
12	[budget] How much money do you spend in food groceries per month?	<1> Less than €50 <3> €51-100 <4> €101-150 <5> €151-200

		<6> €201-250 <7> €251-300 <8> more than €300
13	[budgetperc] That budget to buy food is equivalent to what percentage of your total monthly income?	<1> 1-20% <2> 21-40% <3> 41-60% <4> 61-80% <5> 81-100%

Shopping Situation - Spaghetti

Question ID	Question	Answer
14	[treatsp] Which one of these two would you buy?	<1> Spaghetti 500 gr. Bio <2> Spaghetti 500 gr. Ja
15	[controlsp] Which one of these two would you buy?	<1> Spaghetti 500 gr. Ja <2> Spaghetti 500 gr. Barilla

Shopping Situation - Meat

Question ID	Question	Answer
16	[treatmeat] Which one of these two would you buy?	<1> Rinderhackfleisch Bio <2> Rinderhackfleisch Wilhelm Brandenburg
17	[controlmeat] Which one of these two would you buy?	<1> Rinderhackfleisch Wilhelm Brandenburg <2> Rinderhackfleisch Landjunker

Shopping Situation - Tomatoes

Question ID	Question	Answer
18	[treattom] Which one of these two would you buy?	<1> Bio Rispentomate <2> Regional Rispentomate
19	[controltom] Which one of these two would you buy?	<2> Regional Rispentomate <3> Beste Wahl Rispentomate

Shopping Situation - Orange Juice

Question ID	Question	Answer
20	[treatjuice1] Finally, the orange juice. Which one of these two would you buy?	<2> FT Orangensaft <3> Hohes C Orangensaft
21	[controljuice] Finally, the orange juice. Which one of these two would you buy?	<3> Hohes C Orangensaft <2> Direktsaft Orangensaft
22	[treatjuice2] Finally, the orange juice. Which one of these two would you buy?	<1> Bio Orangensaft <2> FT Orangensaft

Understanding

Question ID	Question	Answer
95	[openexplan] Could you briefly explain why did you choose the products you choose?	<Open answer>
96	[seenlabel] Have you ever seen these labels while buying your food?	<1> Yes, I have seen all of them before <2> No, I haven't seen any of them before <3> I have only seen the Bio before <4> I have only seen the Fairtrade before

Attitudes

Question ID	Question	Answer
97	I believe that food with these labels is _____ than food without them.	
	<i>[healthy] More nutritious or healthier</i>	<1> Yes <2> No <3> I don't know
	<i>[env] Better for the environment</i>	<1> Yes <2> No <3> I don't know
	<i>[comm] Better for the society's wellbeing</i>	<1> Yes <2> No <3> I don't know
	<i>[quality] Better in quality</i>	<1> Yes <2> No <3> I don't know
	<i>[taste] Better tasting</i>	<1> Yes <2> No <3> I don't know
	<i>[look] Better looking</i>	<1> Yes <2> No <3> I don't know
	<i>[highprice] More expensive for consumers</i>	<1> Yes <2> No <3> I don't know
	<i>[natural] More natural</i>	<1> Yes <2> No <3> I don't know
	<i>[fresh] Fresher</i>	<1> Yes <2> No <3> I don't know
	<i>[producer] Better for producers (working conditions, paid more)</i>	<1> Yes <2> No <3> I don't know
	<i>[trust] More trustable (in knowing how the food was produced or grown)</i>	<1> Yes <2> No <3> I don't know
98	[att1] Having labels that certify food as organic or fair traded makes the choosing of products more enjoyable and easy.	<1> Strongly Disagree <2> Disagree <3> Neutral <4> Agree <5> Strongly Agree
99	[att2] When I go shopping I am considering the best value for money choice. I am not thinking if a product is sustainable or not.	<1> Strongly Disagree <2> Disagree <3> Neutral <4> Agree <5> Strongly Agree
100	[att3] I think that 'green' consumption is just temporarily on fashion.	<1> Strongly Disagree <2> Disagree <3> Neutral <4> Agree <5> Strongly Agree

Subjective Norms

Question ID	Question	Answer
101	How influential do you think the following people are on your decisions to buy food?	
	<i>[parents] Parents</i>	<1> Very influential

		<2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[friends] Friends</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[partner] Partner</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[flatmates] Flatmates</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[colleagues] Colleagues</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[prof] Professors</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
	<i>[influencer] People you follow on social networks (influencers, cooking, health or fitness accounts)</i>	<1> Very influential <2> Somewhat influential <3> Slightly influential <4> Not at all influential <5> Not applicable
102	How often do you think the following people buy organic or fair traded food?	
	<i>[T_referentbuy_1] Parents</i>	<1> Always <2> Most of the times <3> Sometimes <4> Never <5> Not applicable
	<i>[T_referentbuy_2] Friends</i>	<1> Always <2> Most of the times <3> Sometimes <4> Never <5> Not applicable
	<i>[T_referentbuy_7] Partner</i>	<1> Always <2> Most of the times <3> Sometimes <4> Never <5> Not applicable
	<i>[T_referentbuy_3] Flatmates</i>	<1> Always <2> Most of the times <3> Sometimes <4> Never <5> Not applicable
	<i>[T_referentbuy_4] Colleagues</i>	<1> Always <2> Most of the times <3> Sometimes <4> Never <5> Not applicable
	<i>[T_referentbuy_5] Professors</i>	<1> Always

		<2> <i>Most of the times</i> <3> <i>Sometimes</i> <4> <i>Never</i> <5> <i>Not applicable</i>
	<i>[T_referentbuy_6] People you follow on social networks (influencers, cooking, health or fitness accounts)</i>	<1> <i>Always</i> <2> <i>Most of the times</i> <3> <i>Sometimes</i> <4> <i>Never</i> <5> <i>Not applicable</i>

PBC

Question ID	Question	Answer
103	[pbctime] Typically, I have enough time to make sure that the food I buy is organically farmed or fair traded.	<1> <i>Strongly Disagree</i> <2> <i>Disagree</i> <3> <i>Neutral</i> <4> <i>Agree</i> <5> <i>Strongly Agree</i>
104	[pbcaccess] Typically, I have access to organic or fair traded variants of the products I want to buy.	<1> <i>Strongly Disagree</i> <2> <i>Disagree</i> <3> <i>Neutral</i> <4> <i>Agree</i> <5> <i>Strongly Agree</i>
105	[pbcmoney] Typically, I can afford to purchase the organic or fair traded variants of the products I want.	<1> <i>Strongly Disagree</i> <2> <i>Disagree</i> <3> <i>Neutral</i> <4> <i>Agree</i> <5> <i>Strongly Agree</i>
106	[eatout] Typically, how many days in a week do you eat outside of your house (food that you don't cook yourself)?	<1> <i>Strongly Disagree</i> <2> <i>Disagree</i> <3> <i>Neutral</i> <4> <i>Agree</i> <5> <i>Strongly Agree</i>

Disclosure

Question ID	Question	Answer
107	[email] If you would like to receive a copy of the study's results, you can give me your e-mail. I will not send you anything more than that. Thanks again for your time and patience! E-mail	<Open answer>

