

A Work Project, presented as part of the requirements for the Award of a Master's degree in
Management from the Nova School of Business and Economics.

**Sustainable Food Consumption in Portugal: Examining the Enablers and Barriers
towards the Consumption of Pulses**

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17-12-2021

Abstract

The sustainability of the food systems depends greatly on the gradual transition from animal to plant-based proteins. However, some plant-based proteins, like pulses, continue to be undervalued. This study aims to examine the reasons behind the low consumption of pulses in Portugal, by understanding the relationship between the barriers and enablers towards its consumption, mapped according to Capability, Opportunity, and Motivation, and the (1) consumers' choice of pulses in different real-life scenarios, (2) consumers' intake of pulses in a regular week, and (3) consumers' intention to consume pulses more often. An online questionnaire, that included a dish-composition experience, direct questions, and open questions, was distributed, and 398 valid answers were obtained. The results revealed that both Capability and Motivation seem to positively impact the frequency of choice of pulses in almost all the different scenarios and in a regular week. Moreover, results revealed that Capability, Opportunity, and Motivation were positively correlated with the consumers' intention to consume pulses more often. This study could serve as guidance for businesses that intend to reduce the existent barriers and develop strategies to increase the consumption of pulses in Portugal.

Keywords: Consumer Behavior; Capability; Opportunity; Motivation; Food choice intentions; Pulses; Plant-based proteins; Sustainable food consumption; Health

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. Introduction

Food is an elementary need for all human beings. Though, protecting the environment while responding to this need is still a challenge (Bakker & Dagevos, 2011; Florença et al., 2021). A considerable amount of evidence demonstrates that the production of animal-based products, mostly of meat and dairy products, has been contributing to the aggravation of climate change, deforestation, land degradation, and the depleting of natural resources and biodiversity, as a result of its significant levels of greenhouse gas (GHG) emissions and resource use (Clonan et al., 2015; Gravely & Fraser, 2018; Graça et al., 2019a; Grasso et al., 2019). Likewise, the overconsumption of animal-based proteins by humans is linked with an augmented risk of diseases, such as cancer, diabetes, heart diseases, and high cholesterol (Sinha et al., 2009; Martins, 2019; Fehér et al., 2020).

In comparison, plant-based proteins, like pulses, soy products, nuts, and seeds, are generally seen as a resource-efficient and healthier alternative to animal proteins (Graça et al., 2019b; Onwezen et al., 2020). Poore and Nemecek (2018) proved that plant-based protein sources have the lowest carbon footprint, by demonstrating that to produce 100 grams of protein from beans or peas, less than 1 kg of GHG is emitted into the atmosphere, while to produce 100 grams of protein from beef, around 50 kg of GHG is released. Moreover, the consumption of plant-based proteins is linked with a reduced contact with factors that are harmful to human health, such as saturated fats and cholesterol and, with an augmented interaction with protective factors, like fiber, antioxidants, phytochemicals, and carotenoids (Graça et al., 2015; Graça et al., 2019a).

With a fast-growing population, the sustainability of the food system depends greatly on the reduction of the demand for animal-based proteins, mostly of meat, and on the shift towards a greener, more sustainable diet (Gravely & Fraser, 2018; Grasso et al., 2019; Figueira et al., 2021). According to the Oslo Roundtable on Sustainable Production and Consumption

(1994), a Sustainable Food Consumption corresponds to the ingestion of food “that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials, and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations”, which can be attained with an increased inclusion of plant-based proteins in the diet of consumers.

The demand for plant-based proteins has been increasing in many developed Western countries, namely in Portugal, because of the rise of veganism, vegetarianism, and semi-vegetarianism, which lead companies to invest in this specific market (Tziva et al., 2019; Graça et al., 2019a; Franco, 2020). However, despite this increasing demand, some vegetable-based proteins continue to capture minor shares in the market of proteins and are greatly undervalued (Gravely & Fraser, 2018, Graça et al., 2019b), which is the case of pulses (FAO, 2016; Melendrez-Ruiz et al., 2019; Duarte et al., 2020). As a result, several Governments, governmental and non-governmental organizations worldwide have been making efforts to raise awareness on the nutritional and environmental benefits of pulses and have been improving their nutritional recommendations, to raise the consumption of these nutritious seeds (Heuvel, 2019). To illustrate, the Food and Agriculture Organization of the United Nations (FAO) announced the year 2016 as the International Year of Pulses, with the goal of increasing “awareness about the importance of these plants and highlight their role in healthy diets and family farmers’ livelihoods as well as their contribution to soil health and the environment” (Calles et al., 2019).

Nonetheless, Governments and organizations don’t have much research-based evidence to support their interventions and, international and local businesses don’t have much information on how to improve and implement strategies to increase the demand for pulses, because consumer research that solely focuses on the acceptance and on the consumption of pulses as an alternative to animal-based proteins remains limited and scarce. In Portugal,

Duarte et al. (2020) analyzed the intake of pulses by Portuguese adults and identified the barriers and enablers towards its consumption; thus this Work Project aims to extend this research, by (1) using the COM-B model components to map potential barriers and enablers that influence the consumption of pulses, (2) understanding how these three components relate to consumers' current intake of pulses in different real-life scenarios and on a weekly basis, (3) understanding how these three components relate to consumers' intention to consume pulses more often. In order to accomplish the mentioned objectives, an online questionnaire, that includes a dish-composition experience and, other direct questions will be conducted and the following research question: *“What is the relation between Capability, Opportunity, and Motivation, and the consumption of pulses by Portuguese consumers?”* will be answered.

The Work Project has the following structure: in the next section, the literature on the topic is reviewed and the theoretical framework is presented. Then the methodology succeeds, with a detailed description of the methods used to collect data for the study. Subsequently, the analyzed information is introduced and discussed, and, finally, the limitations and guidelines for future research are presented.

2. Literature Review and Theoretical Framework

2.1. The role of pulses towards a sustainable future

The consumption of pulses, such as dry and conserved beans, lentils, chickpeas, and peas, not only delivers significant health benefits to humans, but also represents a good substitute of animal proteins thus contributing to the protection of the environment, to the conservation of the biodiversity and, to the security of the food systems (FAO, 2016). Moreover, pulses are cheap and shelf-stable, which means that they can endure for a long period without losing their nutritional value, hence contributing to the reduction of food waste (McGee, 2004).

In terms of nutritional value, pulses represent a low-fat protein, naturally rich in nutrients, minerals, and vitamins. Pulses include key minerals, such as iron (i.e. prevents iron deficiency and anemia), magnesium (i.e. promotes bone health), potassium (i.e. contributes to lowering the blood pressure), and zinc (i.e. helps the immune system and metabolism). Likewise, they contain carbohydrates and fiber, namely soluble and insoluble fiber, that contribute to lower the blood cholesterol, decrease the blood sugar levels and, aid with digestion. Additionally, pulses are good sources of vitamins and, they are rich in bioactive properties, which helps to prevent breast and prostate cancer, cardiovascular diseases, cognitive deterioration, and menopausal symptoms (Heuvel, 2019; Acciani et al., 2020).

The production and consumption of pulses have an economic and environmental significance because pulses require less water than other crops to grow, so they can be cultivated in drylands or even, in marginal areas where other crops are unable to grow. Likewise, the cultivation of pulses combats soil erosion because they tend to initially grow slowly, which allows other crops to get the root and grow. In other words, when pulses are cultivated as an element of diverse crop systems, it can benefit the entire system, because there is an efficient use of resources and there is a reduced risk of crop failure. To finalize, the cultivation of pulses has low GHG emissions (i.e. pulses are self-sufficient in nitrogen fertilizer) and contributes to the improvement of soil's carbon sequestration (i.e. part of CO₂ emissions are absorbed by the earth) (FAO, 2016).

2.2. The Consumption of Pulses in Portugal

Portugal is the Mediterranean country with the greatest food-print per capita, as a result of its high consumption of animal-based products, great reliance on other countries, significant food waste, and high urbanization (Galli et al., 2020). The same study highlighted that a slight transition from consumers towards a sustainable food consumption, through the decrease of

fish and meat intake could lead up to a 19% decrease in the ecological deficit in Portugal, which emphasizes the fact, that a transformation of the Portuguese food systems is very important.

The majority of the Portuguese population continues to follow an omnivorous diet and to consume animal-based proteins above the recommended consumption. A study conducted by Instituto Nacional de Estatística (INE) about the Portuguese Food Balance Sheet between 2016 and 2020, claimed that, in 2020, the consumption of the food group “Meat, fish, and eggs” had an 11.9% deviation from the Food Wheel recommended consumption. The same study claimed that the meat daily average caloric contribution per inhabitant was four times greater than the total calories recommended and that the consumption of eggs had an average annual growth rate of about 4%.

Nonetheless, it is important to consider that there are also increasingly more Portuguese consumers shifting towards a semi-vegetarian diet, or more drastically towards a vegetarian or vegan diet, mostly for health motives, but also for environmental and ethical reasons (Fernandes, 2019; Franco, 2020). According to the Spanish innovation consultant Lantern (2019), 1.6% of the adult population in Portugal is vegan or vegetarian and 7.4% are semi-vegetarians and, these percentages are expected to grow even further in the next years. Furthermore, a survey conducted in Portugal in 2016 presented that 45% of consumers were willing to substitute meat consumption with plant-based proteins (Primeiro Grande Inquérito Sustentabilidade em Portugal, 2016). These results demonstrate that an increasing percentage of consumers are willing to pursue a sustainable diet and to, accept plant-based proteins, namely pulses. In fact, the daily consumption of pulses in Portugal has been increasing in the past few years. To demonstrate, the daily quantities of dried pulses available for consumption in 2016 corresponded to 11.2 g/inhab/day, while in 2020 they corresponded to 12.7 g/inhab/day (Instituto Nacional de Estatística, 2021). However, the consumption of pulses remains 3.3% below the recommended one by the Portuguese Food Wheel.

2.3. Applying the COM-B model

To study the main barriers and enablers that influence the consumption of pulses and, to produce an advance in the evidence that helps marketers and businesses increase the demand for pulses, the COM-B model will be used. The COM-B model is a model of behavior associated with the fourteen domains of the Theoretical Domains Framework, that theorizes that its three components, Capability, Opportunity, and Motivation, must be aligned to influence and be influenced by behavior, and that Capability and Opportunity influence Motivation (Michie et al., 2011; Michie et al., 2014; Atkins et al., 2017; Graça et al., 2019a) (Appendix, Figure 1). Hence, to accomplish and sustain behavior change, interventions need to target one or more of those three components.

Furthermore, according to the COM-B model, each target behavior may face some enablers (i.e. factors that pull individuals closer to the target behavior) and barriers (i.e. factors that keep individuals away from the behavior or prevent progress) in each component and that should be acknowledged and evaluated to understand the corresponding system of behavior (Michie et al., 2011; Graça et al., 2019b).

2.3.1. Capability

Capability has as main components, the psychological capability (i.e. individual's psychological strength or skills) and the physical capability (i.e. individual's physical strength or skills) (Michie et al., 2011; Martins, 2019). Concerning the psychological capability component, previous studies highlighted that the lack of information, the lack of cooking skills (Haverstock & Forrays, 2012; Graça et al., 2019a) the preparation difficulty (Melendrez-Ruiz et al., 2019), and the significant amount of time needed to cook pulses (Figueira et al., 2019; Onwezen et al., 2020) represented main barriers in the consumption of pulses. Another study identified as both an enabler and a barrier, the great variety of sources of information available, such as the internet, books, newspapers or magazines, food stores and, family members or

friends (Heuvel, 2019). In terms of physical capability, some studies presented that individuals with larger receptiveness to bitter tastes tended to avoid plant-based dishes (Graça et al., 2019a; Clicerì et al., 2018). Furthermore, the gastrointestinal effects of pulses, like flatulence or abdominal discomfort, are also seen as a physical barrier to many consumers (Heuvel, 2019; Duarte et al., 2020).

2.3.2. Opportunity

Opportunity includes the components of physical opportunity (i.e. opportunities that are connected with the surrounding environment, such as location, time, or resources) and social opportunity (i.e. opportunities that are connected with social factors, such as social cues or cultural norms) (Michie et al., 2011; Martins, 2019).

In terms of social opportunity, previous literature identified that close others, such as family and friends, can be both barriers and enablers towards a greater consumption of pulses, because, on one hand, the unwillingness to change or the lack of support of household members was identified as a barrier to change individual behavior while, on the other hand, the support and encouragement of family members, friends, co-workers, medical doctors, or exposure to media contents represented an enabler to pursue the target behavior (Graça et al., 2019a; Figueira et al., 2019; Heuvel, 2019; Onwezen et al., 2020). Furthermore, Graça et al. (2019a) reinforced as barriers, the social prejudice, and the social representation of animal-based proteins as the center of the plate protein, while pulses as a side-dish ingredient.

Concerning the physical opportunity, the higher price of animal-based proteins when compared to pulses can be seen as both a barrier and enabler, because many times pulses are seen as the “food for the poor” given its affordable prices (Heuvel, 2019; Duarte et al., 2020). Moreover, a study conducted by Gravely and Fraser (2018) identified that even though, there was a greater variety and quality of plant-based proteins available, as well as a greater amount of shelf space allocated to it, there was still some unwillingness to change the food product

range and the location of the items on the shelves of supermarkets because meat and other animal-based proteins continued to be perceived as strategic product categories.

2.3.3. Motivation

Motivation has as main components the reflective motivation (i.e. reflective practices, like creating plans and examining things that have happened in the past) and the automatic motivation (i.e. automatic practices, like impulses and desires) (Michie et al., 2011).

Reflective motivation includes health, environmental, and animal welfare motivations (Janssen et al., 2016; Fernandes, 2019). Concerning health motivations, various studies presented that individuals who have unhealthy habits or a sedentary lifestyle were less willing to consume plant-based proteins, while individuals with a healthier lifestyle and who practiced regular physical activity were more likely to consume plant-based products (Heiss & Hormes, 2017; Mullee et al., 2017; Graça et al., 2019a; Fernandes, 2019; Onwezen et al., 2020). In terms of environmental motivations, consumers who already had environmentally-friendly behaviors and habits, tended to have a greater intention to reduce the consumption of animal proteins, substituting it with plant-based proteins, whereas individuals who didn't believe or care about climate change or about environmental protection were less disposed to consume plant-based proteins (Mullee et al., 2017; Figueira et al., 2019). In addition, concerning animal-welfare motivations, previous studies found that individuals who have or had pets or who had closer affections to animals were also more likely to consume plant-based proteins more often (Rothgerber & Mican, 2014; Heiss & Hormes, 2017; Graça et al., 2019a).

Concerning automatic motivation, several studies identified that individuals who had a high meat attachment, who derived more pleasure from eating meat or other animal-based proteins, and who carried positive attitudes towards its consumption, whilst assessing plant-based proteins as unfulfilling and incomplete, were less willing to consume more sustainably. On the other hand, consumers who already consumed animal-based proteins substitutes and

who carried negative feelings towards the consumption of animal-based products were associated with a greater willingness to follow more plant-based diets (Graça et al., 2015; Mullee et al., 2017; Onwezen et al., 2020). Previous literature also found that individuals who had conservative and traditional beliefs or values were less probable to accept plant-based alternatives (Graça et al., 2019a).

2.4. Research Hypotheses

Overall, the purpose of this study is to understand the relationship between the barriers and enablers towards the consumption of pulses, mapped according to the COM-B model components, and the Portuguese consumers' intake of pulses. As a result, the first objective of this study is to understand whether Capability, Opportunity, and Motivation impact the consumers' frequency of choice of pulses in the four different scenarios. Accordingly, the first hypotheses of this study is:

Hypotheses 1 (H1): The higher the Capability, Opportunity, and Motivation of consumers towards pulses, the greater the choice of pulses in the scenarios of the dish-composition experience.

The second objective of this Work Project is to study the impact that Capability, Opportunity, and Motivation have on the consumption of pulses in a regular week, such that the second hypotheses is:

Hypotheses 2 (H2): The higher the Capability, Opportunity, and Motivation of consumers towards pulses, the greater the weekly consumption frequency of pulses.

Finally, the last objective of this study is to comprehend whether those barriers and enablers are positively correlated with the consumers' intention to consume pulses more often. Thus, the third and final hypotheses is:

Hypotheses 3 (H3): Capability, Opportunity, and Motivation are positively correlated with consumers' willingness to increase their consumption of pulses.

3. Method

3.1. Data Collection

The data for this study was collected with a structured survey conducted online by Qualtrics. The link of the survey was shared online via publications and messages on social media, but also on Facebook groups and by email. Likewise, family members and friends also helped distribute the questionnaire by sharing it on their own social media accounts. The survey was open from the 7th until the 15th of October.

The questionnaire was divided into several Sections. In Section 1, there was a presentation and an explanation of the survey, where participants were informed about the procedures and approximate filling duration, they were ensured that the participation was deliberate and anonymous and, they had to assent to participate in the study. The inclusion criteria for participation were Portuguese citizens, aged at least 18 years old and, with no food allergies or intolerances. The Section 2 was a dish-composition task, that evoked real-life situations and required participants to compose three different dishes, with different animal or plant-based proteins. The Section 3 incorporated questions related to the current eating habits of the respondents and their willingness to pursue a more sustainable food consumption. The Sections 4, 5, and 6 contained the main barriers and enablers towards the consumption of pulses, in terms of the COM-B model components and, Section 7 included two optional open questions. Finally, Section 8 comprised demographic information (Appendix, Questionnaire).

3.2. Instruments

Dish-Composition Task. For the dish-composition task, a set of images with different raw animal and plant-based proteins were presented. All food images were downloaded from the website “freepick” and they were selected if they satisfied the conditions of being a raw food ingredient in the center of a white background, with a similar angle of shooting and lighting conditions. (Appendix, Figure 2).

The dish-composition task included four questions, that evoked four different real-life scenarios and that required participants to choose three food ingredients, as the main protein of three different dishes. The Everyday scenario was developed as the control scenario and it suggested a context in which participants had to prepare and cook their own meal. The Friends scenario evoked a condition in which participants had to cook a meal for their friends. The Affordable scenario placed participants in a context in which they needed to prepare a cheap meal. Finally, the Restaurant scenario intended to understand the behavior of participants in situations in which they didn't need to cook or spend money, only choose the desired meal. The aim of this task was to get a more spontaneous response from participants concerning their animal or plant-based protein choices in different real-life scenarios.

Weekly Eating Habits. Participants were requested to indicate what was their regular weekly consumption of (1) red meat, (2) white meat, (3) fish and seafood, (4) pulses, (5) eggs, (6) soy products, using a 5-point Likert-type scale (1 = none; 2 = 1 to 2 times per week; 3 = 3 to 4 times a week; 4 = 5 to 7 times a week; 5 = 1 or more than 1 time per day).

Willingness to Change. Participants had to indicate to what extent they agreed with the following actions (1. "I intend to reduce my consumption of red meat"; 2. "I intend to reduce my consumption of meat"; option 3. "I intend to reduce my consumption of animal-based proteins"; option 4. "I intend to increase my consumption of pulses"; option 5. "I intend to increase my consumption of soy products"; option 6. I don't intend to change my eating habits"), by using a 5-point Likert-type scale (1 = don't agree at all to 5 = entirely agree).

COM-B Components. To measure which barriers and enablers participants identified as the most important towards the consumption of pulses, respondents were given in total 19 items based on the COM-B model framework and were asked to specify to what degree they agreed with those options in a 5-point Likert-type scale. To measure *Capability*, participants were given six options (e.g. "Pulses are sources of protein, that provide us in numerous benefits"; "I

know how to prepare and cook tasty recipes with pulses as the main protein”), for *Opportunity*, they were given seven options (e.g. “It’s easy for me to find pulses in supermarkets/mini markets”; “Pulses are cheaper than other animal proteins”) and for *Motivation*, respondents were given six options (e.g. “I consume pulses for environmental and ecological reasons”; “I enjoy eating pulses”).

3.3. Sample

In total, 436 responses were recorded, however, 38 were removed from the sample, as they represented participants who had food intolerances or allergies. Given this, 398 responses were used for analysis (see Table 1), of which 236 (59.3%) represented females and 162 (40.7%) were males. Most participants surveyed belonged to Generation Z (30.4%), followed by Millennials (28.6%) and Generation X (23.4%). Concerning education, 242 participants had a University degree (60.8%), while 108 participants completed up high school (27.1%). The majority of participants lived in an urban area (n=205, 51.5%), while 114 lived in the rural area (28.6%). Moreover, 275 participants claimed to follow an omnivorous diet (69.1%) and 43 followed a flexitarian diet (10.8%).

Table 1: Characterization of the sample (n=398)

Variables	Categories	N (%)
Gender	Female	236 (59.3%)
	Male	162 (40.7%)
Age	Generation Z	121 (30.4%)
	Millennials	114 (28.6%)
	Generation X	93 (23.4%)
	Baby Bombers	46 (11.6%)
	Silent Generation	24 (6.0%)
Education	1st Cycle of Basic Education	21 (5.3%)
	2nd Cycle of Basic Education	4 (1.0%)
	3rd Cycle of Basic Education	23 (5.8%)
	High School	108 (27.1%)
	University education	242 (60.8%)
Area of Residence	Urban Area	205 (51.5%)
	Suburban Area	79 (19.8%)
	Rural Area	114 (28.6%)
Type of Diet	Omnivorous	275 (69.1%)
	Flexitarian	43 (10.8%)
	Pesco-Vegetarian	25 (6.3%)
	Vegetarian	35 (8.8%)
	Vegan	20 (5.0%)

3.4. Procedure

In order to analyze the data collected through the survey, the software IBM SPSS Statistics was used. The variables considered were the consumption of pulses in the Everyday, Friends, Affordable and Restaurant Scenarios, the Pulses Consumption Frequency, the Willingness to increase the consumption of pulses, and Capability, Opportunity, and Motivation. To prepare the data for analysis, some of the previously mentioned variables were recoded and created: the frequency in which pulses were chosen by each participant in the different scenarios was converted into four rankings, one for each scenario (i.e. if the participant chose pulses in the first dish, it would sum 3 points, if the respondent chose pulses in the second or third dish, it would sum 2 and 1 points, respectively. Else, it would be 0); the weekly consumption frequency of pulses was transformed into a scale variable, by doing an arithmetic mean of each option (i.e. 1 to 2 times a week, corresponding to 1.5, 3 to 4 times a week, corresponding to 3.5, and so on); and the variables, Capability, Opportunity, and Motivation were created based on an arithmetic mean of the respective items.

With the aim of assessing the predictive ability of Capability, Opportunity, and Motivation in support of the rank of pulses in each scenario and of the weekly consumption frequency of pulses, several Multiple Linear Regressions analyses were performed. Moreover, a Pearson's correlation test was conducted to comprehend the correlation between COM-B variables and the consumers' intention to consume pulses more often.

Some problems of multicollinearity were identified in the multiple regression analyses, as the VIF was greater than 2 (VIF range: 2.057 to 2.575; Tolerance range: .388 to .486), which suggested a strong relationship between the independent variables. Given this, some items were removed from each component of the COM-B model and the three variables were re-computed. To illustrate, the first two items of Capability were removed, as they were aligned with the first two items of Motivation and, the fifth item was also removed because it was in line with the

previous two items of Capability. Furthermore, items six and seven of Opportunity and item six of Motivation were also removed. After these changes were made, no further problems of multicollinearity were identified (VIF range: 1.580 to 1.686; Tolerance range: .593 to .633).

4. Results

In order to test H1, several multiple linear regressions were conducted, in which the dependent variables used were the rank of the choice of pulses in the four scenarios and, the independent variables used were Capability, Opportunity, and Motivation (Table 2).

In the Everyday scenario, the results suggest that a higher Capability, Opportunity, and Motivation are associated with an increased choice of pulses. However, Opportunity is not a significant variable from a statistical point of view, as it has a $p > .05$, but both Capability and Motivation are. This model explains 26.5% ($R^2 = .265$) of the rank of the choice of pulses in a daily scenario and, $F(3, 394) = 47.329$, $p < .001$. Similar results were obtained in the Friends scenario, as a greater Capability, Opportunity, and Motivation were linked with an increased choice of pulses. Accordingly, the variable Opportunity is not significant from a statistical point of view, but Capability and Motivation are. Furthermore, the model explains 24.2% ($R^2 = .242$) of the choice of pulses and, $F(3, 394) = 41.952$, $p < .001$.

Just like in the previous two scenarios, in the Affordable and Restaurant scenarios, the greater the Capability, Opportunity, and Motivation, the greater the choice of pulses. Likewise, in both models, the variable Opportunity is not statistically significant, as it has a $p > .05$. However, the variable Capability is not statistically significant in the Restaurant scenario, as it has a $p > .05$. In the Affordable scenario, the model explains 34.1% ($R^2 = .341$) of the choice of pulses and, $F(3, 394) = 67.881$, $p < .001$, and in the Restaurant scenario, the model explains 15.9% ($R^2 = .159$) of the choice of pulses and, $F(3, 394) = 24.854$, $p < .001$.

Given these results, Hypotheses 1, which claims that the higher the Capability, Opportunity, and Motivation of consumers towards pulses, the greater the choice of pulses in

the different scenarios, is verified and supported in all the scenarios. However, it is important to notice that the variable Motivation may be the strongest predictor of the frequency of choice of pulses, as it is the only variable with $p < .001$, in all the different scenarios.

Table 2: Capability, Opportunity and Motivation and the frequency of choice of pulses in the different scenarios

Variables	B	SE	β	R^2	F	Dfs
<i>EVERYDAY SCENARIO</i>						
				0.265***	47.329	3,394
Capability	0.235	0.096	0.134*			
Opportunity	0.127	0.146	0.047			
Motivation	0.659	0.093	0.398***			
<i>FRIENDS SCENARIO</i>						
				0.242***	41.952	3,394
Capability	0.258	0.084	0.170**			
Opportunity	0.068	0.128	0.029			
Motivation	0.510	0.081	0.358***			
<i>AFFORDABLE SCENARIO</i>						
				0.341***	67.881	3,394
Capability	0.250	0.124	0.104*			
Opportunity	0.345	0.189	0.094			
Motivation	1.037	0.120	0.459***			
<i>RESTAURANT SCENARIO</i>						
				0.159***	24.854	3,394
Capability	0.154	0.086	0.104			
Opportunity	0.086	0.131	0.038			
Motivation	0.425	0.083	0.307***			

* $p < .05$ ** $p < .01$ *** $p < .001$

To test H2, a multiple linear regression was conducted, in which the dependent variable used was the weekly consumption of pulses and, the independent variables were Capability, Opportunity, and Motivation (see Table 3). According to the results, a higher Capability, Opportunity, and Motivation towards pulses are associated with an increased consumption of pulses in a regular week. However, while Capability and Motivation are statistically significant variables, with $p < .01$, Opportunity is not. Furthermore, the model explains 30.6% ($R^2 = .306$) of the weekly consumption frequency of pulses and, $F(3,394) = 57.840$, $p < .001$. This finding reveals that the model has a significant unique explanatory capacity of the consumption frequency of pulses in a regular week.

In light of the previous results, evidence suggests that Hypotheses 2 is supported. Nonetheless, it is important to notice that like in Hypotheses 1, Motivation is the only variable with a $p < .001$, suggesting that it may be the strongest predictor of the consumption frequency of pulses in a regular week.

Table 3. COM-B model variables and the weekly consumption frequency of pulses

Variables	B	SE	β	R^2	F	Dfs
				0.306***	57.840	3,394
Capability	0.547	0.176	0.164**			
Opportunity	0.499	0.269	0.098			
Motivation	1.188	0.171	0.379***			

* $p < .05$ ** $p < .01$ *** $p < .001$

Finally, the consumers' intention to consume pulses more often is positively correlated with Capability ($r_p = .389$, $p = .000$, $N = 398$), Opportunity ($r_p = .366$, $p = .000$, $N = 398$) and Motivation ($r_p = .616$, $p = .000$, $N = 398$), which indicates that the higher Capability, Opportunity and Motivation, the greater the consumer's intention to increase their consumption of pulses (see Table 4). Given this, Hypotheses 3, which claims that Capability, Opportunity, and Motivation are positively correlated with consumers' willingness to increase their consumption of pulses, is supported. It is important to notice that Motivation may be the strongest predictor, as it has the correlation coefficient closest to one.

Gender and Age were added, in order to test whether there was any sort of correlation between those demographic variables and the intention to consume pulses more often. According to the results, Gender ($r_p = -.217$, $p = .000$, $N = 398$) and Age ($r_p = -.120$, $p = .017$, $N = 398$) are negatively correlated with the consumers' intention to consume pulses more often. These results suggest that Males have a lower intention to increase their consumption of pulses, while Females have a higher intention. Moreover, the greater the age of consumers, the lower the intention to consume pulses more often (Table 4).

Table 4. COM-B model variables, Gender, Age and the intention to increase the consumption of pulses: Pearson's correlations

	Intention to consume pulses more often
Gender	-0.217***
Age	-0.120*
Capability	0.389***
Opportunity	0.366***
Motivation	0.616***

*p<.05 **p<.01 ***p<.001

4.1. Customer Insights on the low consumption of pulses in Portugal

Section 7 of the survey included two optional open questions, in which the first question asked participants their opinion concerning the barriers that justified a low consumption of pulses in Portugal, and the second one asked for possible recommendations to increase the consumption of pulses. Concerning the first question, the main barriers that participants identified were related to historical and cultural reasons ($n=72$), the current eating habits ($n=70$), the lack of knowledge on the benefits of pulses ($n=66$), the lack of knowledge on how to prepare and cook pulses ($n=34$), the high price ($n=17$), the taste ($n=14$), the lack of innovation and attractiveness of pulses ($n=9$), and, the fact that pulses are seen as a side-dish product ($n = 9$) (Appendix, Table 2).

Regarding the second question, the majority of participants provided as a recommendation, a greater education on the benefits of pulses (e.g., schools, universities, and hospitals, but also by influencers, celebrities, documentaries) ($n=106$). Likewise, many respondents recommended a greater inclusion of meals with pulses in canteens of schools, universities, hospitals, and companies, but also in restaurants, and greater dissemination of recipes with pulses on television, magazines, social media, and blogs ($n=87$). Other recommendations were a greater promotion of pulses ($n=47$), a lower price of pulses ($n=14$), a greater availability and variety of pulses in supermarkets ($n=10$), a greater attractiveness of pulses ($n=7$), a higher price of animal-based proteins ($n=4$), greater inclusion of options with

pulses in fast-food restaurants ($n=2$), nudges ($n=2$) and, tips on how to reduce abdominal discomfort caused by pulses ($n=1$) (Appendix, Table 3).

5. Discussion

The Mediterranean diet is the predominant diet in Portugal, and it is characterized by the consumption of legumes, vegetables, pulses, fruits, grains, nuts, cereals, fish, and olive oil. However, while the Mediterranean diet doesn't typically include a lot of meat and of dairy, the Portuguese traditional cuisine has many dishes that include red and white meat. Besides, in the past decades, as a result of the globalization and of the increase of the standard of living, the consumption of animal-based proteins and of processed food increased significantly, while the consumption of plant-based proteins, such as pulses, decreased tremendously in Portugal (Duarte et al., 2020). The present study aimed to understand the reasons behind the low consumption of pulses in Portugal, by studying how the main barriers and enablers towards its consumption, classified according to the COM-B model components, related to the frequency of choice of pulses in diverse scenarios, the weekly consumption of pulses and the consumer intention to increase the pulse intake.

5.1. Theoretical Contributions

The first contribution that this study provided was identifying how Capability, Opportunity, and Motivation related with the frequency of choice of pulses in three different dishes, in four different scenarios. In all scenarios, a greater Capability, Opportunity, and Motivation were associated with an increased frequency of choice of pulses, supporting H1. Nonetheless, the variable Motivation was the only one that was considered significant, from a statistical point of view, in all four scenarios.

In the Everyday scenario, both Capability and Motivation had a significant unique explanatory capacity of the frequency of choice of pulses, but Opportunity hadn't. This result suggests that consumers who have the knowledge on how to prepare and cook meals with pulses

and on where to find recipes (Capability), tend to be encouraged to choose those nutritious seeds as the main protein for their meals. Also, consumers who have health, environmental, and animal welfare motivations, and who like the taste of pulses or to try new recipes (Motivation), tend to choose pulses more often for their everyday meals. Contrastingly, external factors like the availability and variety of pulses and of meals with pulses, the price and, the consumption habits of family and friends (Opportunity), do not seem to uniquely explain the frequency of choice of pulses in an everyday context, which may be connected with the fact that possibly there are external factors linked with eating habits that may have a greater impact than the ones used to measure Opportunity in this scenario, like for example the support of friends, family, doctors, or co-workers (Graça et al., 2019a; Figueira et al., 2019; Onwezen et al., 2020), or perhaps consumers already had a high opportunity to consume pulses and didn't need to make further changes.

Similarly, in the Friends scenario, Opportunity was the only variable that was not statistically significant. The frequency of choice of pulses in the three dishes was slightly lower in this scenario than in the Everyday scenario (Appendix, Graphic 1), which reveals that participants tend to disregard pulses in social contexts. Former studies underlined that healthy food ingredients tended to be less consumed in social contexts (Melendrez-Ruiz et al., 2019) and that, the foods eaten in social scenarios tended to be influenced by peers (Pachucki et al., 2011). Furthermore, 37.2% of the participants claimed that their friends didn't consume pulses frequently, while only 18.1% claimed otherwise (Appendix, Table 1). These findings suggest that external factors like social pressure or social conformity (Martins, 2019) may have a larger influence, than the ones used to measure Opportunity in this study.

The Affordable scenario represents the scenario with the highest frequency of choice of pulses (Appendix, Graphic 1), which may be explained by the fact that 68,8% of participants consider pulses cheaper than other animal-based proteins (Appendix, Table 1). Surprisingly,

despite the apparent influence of price in this scenario, the variable Opportunity is the only variable that was not significant from a statistical point of view, which can be misleading and inconclusive. A possible reason for this finding is that consumers may not be fully reliable when questioned about the price of food and of its significance when they need to decide what to consume (Melendrez-Ruiz et al., 2019). In fact, in this study, ingredients that tend to be considered as expensive were chosen in all the scenarios, namely in the Affordable scenario.

In the Restaurant Scenario, the variables Capability and Opportunity didn't have a significant unique explanatory capacity of the frequency of choice of pulses, which may be related with the fact that participants don't need to be capable or to have the opportunity to perform the behavior, as it represents a no-cooking, no-payment context, where they can choose ingredients that they typically do not consume on a daily basis, that are more difficult or take more time to prepare, and that are more costly. In this scenario, pulses were only chosen by 13.1% of participants, less than in the remaining scenarios (Appendix, Graph 1), however, when asked whether they would like to try new recipes with pulses, 66.58% answered positively (Appendix, Table 1). Hence, the low frequency of choice of pulses may be explained by the presence of an attitude-behavior gap, as consumers do not "walk their talk" (Carrington et al., 2010). In other words, consumers may have the intention to try new recipes with pulses, however, only a small fraction actually pursues it. Besides, it may be explained by the lack of novelty and appeal of pulses, the status quo, and by the fact that pulses are typically seen as a "food for poor", such that in a Restaurant context, pulses may not be the most desirable option.

The second main contribution of this study was understanding how the COM-B model components related to the weekly consumption frequency of pulses. The results suggest that the higher the Capability, Opportunity, and Motivation towards pulses, the greater the weekly consumption of pulses, supporting H2. However, Opportunity was not considered as a statistically significant variable, which is in line with the findings obtained in the Everyday

Scenario. In fact, the results obtained in the Everyday scenario are positively correlated with the results of the weekly consumption of pulses ($r_p=.559$, $p=.000$, $N=398$) (Appendix, Table 5), which demonstrates that participants' choices in the dish-composition task sincerely reflected their consumption habits.

The lack of statistical significance of the variable Opportunity may be justified by the fact that possibly there are external factors linked with eating habits that may have a greater impact than the ones used in this scenario or perhaps Portuguese consumers already have a significant Opportunity to consume pulses and no further significant changes are required. As a matter of fact, in the past years, the Opportunity to consume plant-based proteins, such as pulses, in Portugal, has been increasing significantly. To illustrate, in 2017, Portugal became the first country that made it illegal not to offer plant-based meals in canteens, schools, universities, prisons, hospitals, and in other public structures, to motivate consumers to consume plant-based proteins and promote sustainable eating habits (Murray-Ragg, 2018). As a result of this law, more vegan/vegetarian restaurants and plant-based options in the menus of restaurants were created (Kirk, 2021). Furthermore, brands have been offering a wider range of vegan/vegetarian products in supermarkets (Franco, 2020).

The third contribution that this study provided was investigating whether Capability, Opportunity, and Motivation were positively correlated with the consumers' intention to consume pulses more often. The findings supported H3, suggesting that the greater the Capability, Opportunity, and Motivation, the greater the consumers' intention to increase the pulses intake. Furthermore, by also analyzing the influence of the variable Gender on the consumers' intention to consume pulses more often, it was found that males have a lower intention to increase their consumption of pulses, while females have a higher intention. This finding is consistent with prior studies, that highlighted that males tend to consume meat more often, and are typically unwilling to eat more plant-based options, while females tend to have

the opposite behavior (de Boer & Aiking, 2011; Graça et al., 2015; Brough et al., 2016). Besides, the greater the age of consumers, the lower the intention to consume pulses more often, which is in accordance with some previous studies, that claimed that younger generations tended to have a greater willingness to accept plant-based meals (Graça et al., 2019a).

5.2. Managerial Contributions

The presented findings might be of potential interest to Governments, (non-) governmental organizations, and international and local companies, who intend to increase awareness towards the overall benefits of pulses and who intend to incentivize a greater consumption of pulses in Portugal, because by knowing the barriers and enablers that impact its consumption (mapped in terms of Capability, Opportunity, and Motivation), innovative and revised strategies may be developed and implemented (Appendix, Table 4).

With the aim of tackling the barriers identified according to Capability, namely the lack of knowledge on how to prepare and cook pulses, and the lack of knowledge of its benefits, pulses' companies should expand their online presence, to ensure a greater interaction with consumers. A recommendation would be the creation of a website page or social media platforms, to provide not only a greater information on the products, but also on the overall benefits of pulses and on easy, quick, and appealing recipes (e.g. Portuguese brand "BeatRoot"). Likewise, companies could create partnerships with chefs, influencers, food bloggers or youtubers to share delicious and appealing recipes with pulses on their social media or blogs, or even on television programs. Moreover, companies could invest in engaging advertising campaigns that clearly emphasize the benefits of pulses, through the use of concepts related to health, sustainability, and animal welfare, and the appeal of pulses. Those campaigns could be posted on both social media and television, to attract different generations.

Concerning Opportunity, in order to tackle the barrier of the lack of promotion, the recommendations provided for Capability could also be applied. Furthermore, to solve the

barriers of the lack of social support and of the social representation of pulses as a side-dish ingredient, nudge interventions could be pursued. A suggestion would be to expose consumers to social norms that underline the consumption of pulses by other consumers (Gonçalves et al., 2021). Another suggestion would be to place pulses in tactical locations with greater visibility or to present pulses with a decorated stand, to increase their appeal. A previous study revealed that allocating vegetables and fruits at the entry of supermarkets, increased sales by 8% compared to those who didn't (Wilson et al., 2016).

Regarding Motivation, in order to tackle the barriers of the unappealing taste and of the lack of innovation of pulses, companies and pulse manufactures could develop pre-cooked, ready-to-eat meals and plant-based proteins that include pulses as an ingredient (e.g., lentil or chickpea hamburgers or bean croquets). Some brands, like “Green Cuisine” by Iglo, already produce these vegan/vegetarian alternatives to the traditional, unattractive pulses. Moreover, to solve the barrier of the endorsement of historical and cultural values and of the prevalence of animal-based proteins in the Portuguese cuisine, restaurants, canteens, food bloggers or chefs could re-create traditional Portuguese dishes with pulses as the center of the protein plate, in order to increase the appeal of pulses and, consequently, encourage consumers to increase its consumption. Finally, to tackle the barrier of the status quo towards current eating habits, a possible recommendation would be to expose individuals to messages that accentuate the negative impacts of the consumption of animal-based proteins (e.g., impact on health, environment, animal welfare and food systems) (Graça et al., 2019a), or that highlight the positive impact of pulses.

5.3. Limitations and future research

This study has certain limitations, that should be mentioned so that future research can address them. The first limitation is related to the fact that a non-probabilistic sampling method, more precisely, a convenience sample, was used, which might imply less representativeness

and the existence of selection bias, constraining the results obtained and affecting the external validity of the analysis. The second limitation corresponds to the small sample size and the predominance of participants that belong to Generation Z, Millennials, and Generation X, meaning that the percentage of older individuals is low, which limited a fair comparison between the different generation groups. The third limitation represents the exclusive use of a quantitative method for the data collection and, the fact that the questionnaire is quite extensive, which could have compromised the level of attention of participants throughout the process and led to social desirability bias. The fourth limitation corresponds to the fact that the dish-composition task was not conducted in real life and hence, it is likely that the ingredients chosen in each scenario, might not be chosen in real life. Furthermore, the fifth limitation is that some participants may not be able to effectively define their weekly consumption frequency of pulses, which might lead to information bias.

With that in mind, future studies should use a probabilistic sampling method to ensure randomization and avoid selection bias. Likewise, further research could use different methodological designs, such as longitudinal or methodological design, to extend the current findings, and could adopt different methods for the data collection, such as qualitative methods or a mix of quantitative and qualitative methods, to guarantee more reliable and authentic results. For example, the dish-composition task could have been conducted with a qualitative approach, to deliver a better level of involvement to participants and mimic real-life contexts. Moreover, future studies could develop the models that were tested, by evaluating whether including more barriers and enablers to Capability, Opportunity, and Motivation would increase the explanatory capacity. To finalize, it would be interesting for upcoming research to measure how the current variables related with demographic variables, such as Age or Gender, in order to study possible dissimilarities and similarities within contexts.

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Appendix

Figure 1: The COM-B system for understanding behaviour change (Michie et al., 2011).

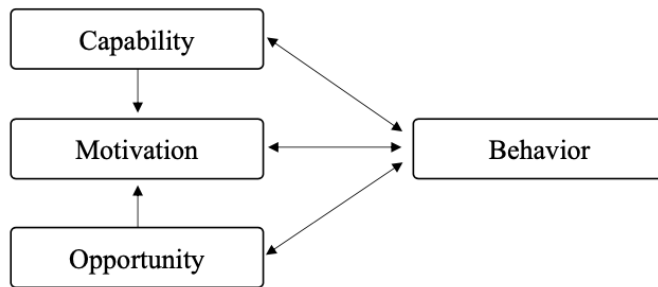


Figure 2. Animal and plant-based proteins used in the Dish-Composition task



Graphic 1. Frequency of choice for pulses in each scenario.

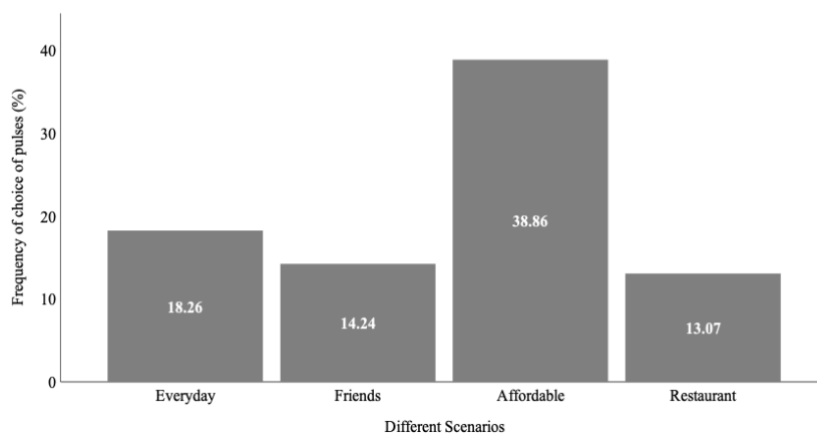


Table 1. Capability, Opportunity, and Motivation and, the respective barriers and enablers

		Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
		%	%	%	%	%
Capability	I know how to prepare and cook tasty recipes with pulses as the main protein.	11.6%	17.6%	17.6%	31.7%	21.6%
	I know where to find easy and convenient recipes with pulses as the main protein.	9.0%	14.8%	15.1%	35.4%	25.6%
	Consuming pulses causes me abdominal discomfort.	21.9%	36.2%	23.6%	14.8%	3.5%
Opportunity	It's easy for me to find pulses in supermarkets/mini markets.	0.3%	2.0%	5.0%	47.7%	45.0%
	There are more and more meal options with pulses as the main protein available (e.g. restaurants, supermarkets, cafeterias, etc).	1.3%	12.6%	16.8%	48.7%	20.6%
	Pulses are cheaper than other animal-based proteins.	1.3%	8.5%	21.4%	45.2%	23.6%
	My family consumes pulses regularly.	5.5%	21.1%	16.8%	41.7%	14.8%
	My friends consume pulses regularly.	11.6%	25.6%	44.7%	14.3%	3.8%
Motivation	I consume pulses for reasons of health and personal well-being.	1.8%	10.1%	10.8%	51.3%	26.1%
	I consume pulses for environmental and ecological reasons.	9.8%	24.9%	23.1%	26.1%	16.1%
	I consume pulses because I care about the welfare of animals used in the food industry.	7.8%	18.8%	26.9%	23.1%	23.4%
	I like to eat pulses.	9.5%	7.3%	18.3%	39.2%	25.6%
	I like to try new recipes that include pulses.	10.6%	4.8%	18.1%	40.2%	26.4%

Table 2. Participants insights on the low consumption of pulses in Portugal

	N	%
Historical and Cultural Factors	72	23.8
- "The consumption of meat is embedded in the culture. Our parents and grandparents don't know how to prepare food without animal protein so children don't learn."		
- "Gastronomic culture that emphasizes fish/meat as a source of protein. Portuguese palate adapted to foods that "taste good" and "are bad"		
- "Society still associates the consumption of legumes with a disadvantaged social status, poverty, while the consumption of red meat is associated with a higher social status. We live in a world in which image weighs more and more on people's attitudes."		
Abdominal discomfort	8	2.6
- "Lack of habit and possibly some intestinal discomfort."		
- "Abdominal Discomfort"		
- "It is a food that causes abdominal discomfort."		
Habits	70	23.1
- "nowadays people are very turned towards fast food dishes that do not include pulses"		
- "For convenience. It's easier to stop at a pizza or McDonald's. Fill more eating potatoes with meat"		
- Lack of information and the fear of most people to try something different, being present and fixed on the idea of "I won't like it"		
Lack of innovation	9	3.0
- "Pulses' lack of innovation."		
- "Pulses' lack of innovation. Unattractive."		
Lack of knowledge on how to prepare and cook pulses	34	11.2
- "In my opinion, the main reason for the low consumption of legumes is due to their poor preparation."		
- "People are not aware of tasty recipes involving legumes"		
- "Lack of imagination for pulses consumption"		
Lack of knowledge on the benefits of pulses	66	21.8
- "Lack of information about protein value and environmental benefits"		
- "The lack of knowledge regarding the environmental and health benefits of pulses."		
- "Because people are ill-formed about its benefits and for years it has been instilled that a meal to be complete has to include meat or fish"		
Lack of Promotion	3	1.0
- "Marketing around the meat and processed food industry."		
- "Little promotion of pulses"		
Lack of social support	1	0.3
- "Discrimination by friends and family not to consume animal proteins. Feeling that we don't get all the necessary nutrients from pulses"		
Price	17	5.6
- "It's expensive and we're used to eating a few pulses"		
- "To satiate it is necessary to eat a larger amount, the more expensive the meal becomes"		
- The price is sometimes more expensive, you don't always find quality products, little knowledge in terms of tasty recipes with these foods.		
Pulses seen as a side-dish ingredient	9	3.0
- "Pulses seen as an accompaniment and not a main protein."		
- "Most people don't see pulses as a meat or fish substitute but rather as a complement."		
Taste	14	4.6
- "Lack of flavor by the legume itself"		
- "The flavor and texture are not the best"		
Total	303	100.0

Table 3. Participants recommendations to increase pulse consumption in Portugal

	N	%
Greater dissemination of meals and recipes with pulses	87	30.0
- "Pulses have to be worked in another way. As a normal food on restaurant menus and be privileged in schools"		
- "Greater promotion of pulses in restaurants, canteens..."		
- Demystify vegetarianism and promote vegetarian meals in typical Portuguese restaurants"		
Greater availability and variety of pulses in supermarkets	10	3.5
- "Ready-made mixes with easy-to-cook and tasty pulses"		
- "...more options in the shopping store"		
Greater education on the benefits of pulses	106	37.6
- "Raise people's awareness of the harm that meat does to the human body, the environment and animals"		
- "Inform people. Pass the information between friends and family. Teach doctors the benefits of this type of food so they can educate their patients, do free online or face-to-face workshops about this food..."		
- "More information in the media, comparing the nutritional value of pulses vs meat and the health benefits"		
Greater promotion (e.g. marketing)	47	16.7
- "More advertising"		
- "Improvements in the marketing of pulses confection"		
- "More advertising, make known the benefits and explain how important it is to reduce the consumption of animal proteins, both for the environment and for our health"		
Include options with pulses in fast-food restaurants	2	0.7
- "In fast food chains include pulses"		
- "Make delicious dishes for fast food restaurants"		
Increase Prices of animal-based proteins	4	1.4
- "Raise the prices of animal protein sources"		
- "Teach from childhood that there are vegetable alternatives to obtain protein, as well as encourage more consumption of them at the expense of meat, fish or eggs. As for adults, increase the price of meat and fish, at the same time create awareness actions by doctors and nurses to explain that one does not get sick by following a vegetarian or vegan diet."		
Lower Prices of pulses	14	5.0
- "Reduction of the price"		
- "Encouraging increased production of pulses and selling cheaper"		
Increase the attractiveness of pulses	7	2.5
- "Produce legume burgers with more attractive flavors"		
- "Make Pulses More Attractive"		
Nudges	2	0.4
- "Nudges"		
Provide tips on how to reduce abdominal discomfort	1	0.7
- "Promote consumption from an early age, promote tips to avoid abdominal discomfort"		
Reduce the availability of animal-based products	2	0.7
- "Reduce meat/fish availability"		
- "Decrease the availability of animal-based food products"		
Total	282	100.0

Table 4. Barriers towards the consumption of pulses and possible recommendations emphasized by the participants

	Capability	Opportunity	Motivation
Barriers	- Abdominal Discomfort - Lack of knowledge on how to prepare and cook pulses - Lack of knowledge on the benefits of pulses	- Lack of Promotion - Lack of Social Support - Price - Pulses seen as a side-dish ingredient	- Historical and Cultural Factors - Status quo towards current eating habits - Taste - Lack of innovation
Recommendations	- Greater dissemination of meals and recipes with pulses - Greater education on the benefits of pulses - Provide tips on how to reduce abdominal discomfort	- Greater availability and variety of pulses in supermarkets - Greater promotion (e.g. marketing) - Include options with pulses in fast-food restaurants - Increase Prices of animal-based proteins - Lower Prices of pulses - Nudges - Reduce the availability of animal-based products	- Increase the attractiveness of pulses - Greater education on the benefits of pulses

Table 5. The frequency of choice of pulses in the Everyday scenario and the weekly consumption frequency of pulses: Pearson's correlations

	Everyday scenario
Weekly consumption frequency of pulses	0.559***

*p<.05 **p<.01 ***p<.001

Table 6. Consumers' intention to change their current eating habits

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
	%	%	%	%	%
I intend to reduce my consumption of red meat.	4.1%	11.5%	15.2%	49.1%	20.1%
I intend to reduce my consumption of meat (red meat and white meat).	12.0%	19.1%	24.6%	30.5%	13.8%
I intend to reduce my consumption of animal-based proteins (meat, fish and eggs)	18.1%	27.1%	19.7%	22.9%	12.2%
I intend to increase my consumption of pulses.	3.8%	9.8%	18.8%	42.0%	25.6%
I intend to increase my consumption of soy products.	17.6%	25.4%	26.1%	19.6%	11.3%
I don't intend to change my eating habits.	16.3%	31.4%	20.9%	23.1%	8.3%

Questionnaire

Secção 1. Apresentação e Explicação do Questionário

Caro participante,

Eu sou uma aluna do Mestrado de Gestão da Nova School of Business and Economics (Nova SBE) e, estou a desenvolver uma tese de Mestrado, cujo objetivo é estudar o **consumo alimentar sustentável em Portugal**. Eu agradeceria se me pudesse ajudar ao responder a algumas perguntas que demoram cerca de 5 minutos a preencher.

A sua participação é voluntária e as suas respostas serão anónimas. Caso decida terminar a sua participação antes de concluir o questionário, pode interromper em qualquer momento ao fechar a janela do seu browser e as suas respostas não serão gravadas. Sinta-se livre de me contactar diretamente caso tenha alguma dúvida ou comentário sobre o estudo (Catarina Botelho, 31979@novasbe.pt).

Antes de iniciar, por favor confirme a seguinte informação:

1. A minha participação é voluntária e posso interromper em qualquer momento;
2. As minhas respostas serão anónimas;
3. Os meus dados serão utilizadas exclusivamente para o projeto;
4. Tenho idade superior a 18 anos;
5. Tenho nacionalidade Portuguesa.

Estou disposto/a a participar neste estudo voluntariamente e permito que as minhas respostas sejam processadas para o propósito do estudo subjacente.

☐ Concordo

1) Tem algum tipo de alergia ou intolerância alimentar (e.g. alergia ao marisco, intolerância ao glúten, etc)?

☐ Sim

☐ Não

2) Tipo de Dieta?

☐ Omnívora (consumo regular de proteínas animais, nomeadamente carne, peixe e ovos)

☐ Flexitariana (consumo maioritário de proteínas vegetais, como leguminosas ou derivados de soja, mas ocasionalmente consomem proteínas animais).

☐ Pesco-Vegetariana (consumo de proteínas vegetais e animais, com exceção da carne)

☐ Vegetariana (consumo de proteínas vegetais e consumo de certos produtos de origem animal, como os ovos, mel, entre outros)

☐ Vegana (consumo exclusivo de produtos de origem vegetal)

Secção 2. Tarefa de composição de refeições em diferentes cenários

Observe atentamente as seguintes imagens de alimentos de origem animal e vegetal ricos em proteína.

1) Imagine que se encontra no conforto de sua casa e tem que cozinhar um almoço/jantar **para si**. Ao abrir o seu frigorífico e armário de cozinha depara-se com os seguintes alimentos ricos em proteína. Qual deles escolheria como alimento principal do seu prato (escolha um alimento para 3 refeições distintas)?

	Carne de Vaca	Carne de Porco	Carne de Frango	Tofu	Pescada	Salmão	Camarão	Feijão	Grão	Lentilhas	Ovo
Refeição 1											
Refeição 2											
Refeição 3											

2) Imagine um cenário em que tem que cozinhar um almoço/jantar para **os seus amigos**. Ao abrir o seu frigorífico e armário de cozinha depara-se com os seguintes alimentos ricos em proteína. Qual deles escolheria como alimento principal da sua receita (escolha um alimento para 3 refeições distintas)?

	Carne de Vaca	Carne de Porco	Carne de Frango	Tofu	Pescada	Salmão	Camarão	Feijão	Grão	Lentilhas	Ovo
Refeição 1											
Refeição 2											
Refeição 3											

3) Imagine um cenário em que tem que cozinhar um almoço/jantar para si, no entanto é final do mês e já não tem muito dinheiro para gastar no supermercado, logo tem que preparar uma **refeição barata**. Qual dos alimentos presentes na fotografia acima escolheria como alimento principal da sua receita (escolha um alimento para 3 refeições distintas)?

	Carne de Vaca	Carne de Porco	Carne de Frango	Tofu	Pescada	Salmão	Camarão	Feijão	Grão	Lentilhas	Ovo
Refeição 1											
Refeição 2											
Refeição 3											

4) Imagine um cenário em que vai almoçar/jantar a um restaurante com uma Estrela Michelin, após ter ganho uma competição. Na ementa, cada prato principal inclui como fonte de proteína apenas um dos alimentos presentes na fotografia. Qual deles escolheria como alimento principal do seu prato (escolha um alimento para 3 refeições distintas)?

	Carne de Vaca	Carne de Porco	Carne de Frango	Tofu	Pescada	Salmão	Camarão	Feijão	Grão	Lentilhas	Ovo
Refeição 1											
Refeição 2											
Refeição 3											

Secção 3. Comportamentos Alimentares Habituais

1) Em média, qual a sua frequência semanal de consumo dos seguintes alimentos como fonte de proteína principal da refeição?

	Nunca	1-2 vezes por semana	3-4 vezes por semana	5-7 vezes por semana	1 ou mais que uma vez por dia
Carnes vermelhas					
Carnes brancas					
Peixe e Marisco					
Leguminosas					
Ovos					
Derivados de soja					

2) Responda às seguintes afirmações?

	Discordo Totalmente	Discordo	Neutro	Concordo	Concordo Totalmente
Procuro reduzir o meu consumo de carnes vermelhas.					
Procuro reduzir o meu consumo de carne (carne vermelha e branca).					
Procuro reduzir o meu consumo de proteínas de origem animal .					
Pretendo aumentar o meu consumo de leguminosas, como substituto a proteínas animais.					
Pretendo aumentar o meu consumo de derivados de soja, como substituto a proteínas animais.					
Não pretendo mudar os meus hábitos alimentares presentes.					

Secção 4. Capacidade/Competências [COM-B, C]

Por favor indique em que medida concorda com as seguintes afirmações:

	Discordo Totalmente	Discordo	Neutro	Concordo	Concordo Totalmente
Leguminosas são fontes de proteínas, que nos proporcionam inúmeros benefícios para a saúde.					
Leguminosas são alternativas sustentáveis ao consumo de proteínas animais, principalmente de carne.					
Sei como preparar e cozinhar receitas saborosas com leguminosas como proteína principal.					
Sei onde encontrar receitas fáceis e convenientes com leguminosas como proteína principal.					
Cozinhar leguminosas é rápido e eficaz.					
Consumir leguminosas causa-me desconforto abdominal.					

Secção 5. Oportunidade [COM-B, O]

Por favor indique em que medida concorda com as seguintes afirmações:

	Discordo Totalmente	Discordo	Neutro	Concordo	Concordo Totalmente
É fácil para mim encontrar nos supermercados/mini-mercados leguminosas.					
Há cada vez mais opções de refeições com leguminosas como proteína principal disponíveis (e.g. restaurantes, supermercados, cantinas, etc).					
Leguminosas são mais baratas que outras proteínas animais.					
A minha família costuma consumir leguminosas regularmente.					
Os meus amigos costumam consumir leguminosas regularmente.					
Sinto que se substituir proteínas animais por leguminosas vou ser aceite socialmente (e.g. família, amigos, etc).					
A "trend" do veganismo, vegetarianismo e flexitarianismo, presente nas redes sociais em Portugal, incentiva-me a consumir mais proteínas vegetais, nomeadamente leguminosas.					

Secção 6. Motivação [COM-B, M]

Por favor indique em que medida concorda com as seguintes afirmações:

	Discordo Totalmente	Discordo	Neutro	Concordo	Concordo Totalmente
Consumo leguminosas por motivos ambientais e ecológicos.					
Consumo leguminosas por motivos de saúde e bem-estar pessoal.					
Consumo leguminosas porque preocupo-me com o bem-estar dos animais utilizados na indústria alimentar.					
Sinto prazer ao consumir leguminosas.					
Gosto de experimentar receitas novas que incluem leguminosas.					
É fácil para mim substituir proteínas de base animal por leguminosas numa refeição.					

Secção 7. Opinião Pessoal

1) Na sua opinião, quais são as principais razões que justificam o baixo consumo de leguminosas em Portugal?

2) Na sua opinião, o que poderia ser feito para aumentar o consumo de leguminosas em Portugal?

Secção 8. Caracterização Demográfica e Pessoal

1) Género

☐ Feminino

☐ Masculino

☐ Outro

2) Qual a sua idade?

☐ de 18 a 26 anos

☐ de 27 a 41 anos

☐ de 42 a 56 anos

☐ de 57 a 75 anos

☐ => 76 anos

3) Qual o seu grau de escolaridade?

☐ 1º Ciclo do Ensino Básico (4º ano)

☐ 2º Ciclo do Ensino Básico (6º ano)

☐ 3º Ciclo do Ensino Básico (9º ano)

☐ Ensino Secundário (12º ano)

☐ Ensino Superior

4) Zona de Residência

☐ Zona Urbana

☐ Zona Suburbana

☐ Zona Rural