



ESCOLA UNIVERSITÁRIA VASCO DA GAMA

INTEGRATED MASTER'S DEGREE IN VETERINARY MEDICINE

**STUDY OF THE KNOWLEDGE AND PERCEPTIONS OF A SAMPLE OF PORTUGUESE AND
FRENCH CONSUMERS REGARDING ANIMAL WELFARE IN FOOD-PRODUCING ANIMALS**

Léa Marie Elise Tisseront

Coimbra, June 2023



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Dissertation of the Curricular Internship of the study cycle leading to the degree of Master of Veterinary Medicine of EUVG.

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List of acronyms and abbreviations

AW: Animal Welfare

CI: Confidence interval

FAO: Foodstuffs of animal origin

FR: French panel of respondents

PDO: Protected Designation of Origin

PT: Portuguese panel of respondents

TSG: Traditional speciality guaranteed

Study of the knowledge and the perceptions of a sample of Portuguese and French consumers regarding animal welfare in food-producing animals

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Abstract

In recent years, the growing interest of consumers in the quality of food of animal origin has allowed several advances regarding farm animal welfare (AW) with a real evolution in legislation. Through the different means of information and communication, consumers have become more demanding and critical of production systems and have begun to value products with greater respect for the environment and animals. In this way, new food challenges have emerged, with the evolution of food choices, and also the emergence of new diets.

In order to evaluate the attitudes and perceptions of Portuguese and French consumers regarding animal welfare in food-producing animals, two identical questionnaires, in Portuguese and French, were disseminated through the social networks. In total, 339 answers were collected. Univariate, bivariate and multivariate statistical analyses were used for the treatment of the data obtained. The Portuguese and French panels presented, in both cases, a majority of female respondents, under 31 years old, with a high education level (college). A high interest in obtaining more information on the production method and the welfare of livestock was observed. The participants recognised the importance of good practices and especially the sensitivity of animals in livestock farming. Most of them considered that new legislation and European harmonisation of the existing legislation was necessary to further protect animals. Participants also considered necessary to have a wider offer of certified products. Several socio-demographic characteristics were found to have a statistically significant influence on participants' perceptions and attitudes, such as gender on the willingness to pay more for the implementation of animal welfare-friendly practices ($p_{\text{Portugal}} = 0.001$; $p_{\text{France}} = 0.006$), as well as the diet on the level of knowledge ($p_{\text{Portugal}} = 0.005$; $p_{\text{France}} = 2e-07$). In both countries, consumers pointed out the quality and origin of products as the most important criteria. This study further highlighted correlations between socio-economic determinants and consumers' perceptions and attitudes. Thus, lower class participants seemed less sensible about AW, and less willing to pay more for certified products. Additionally, vegans and vegetarians declared to have more knowledge on farming conditions and were more likely to pay for AW certified products. Gender had an influence in both panels on the willingness to pay more for AW certified products.

These findings shed light on the changing attitudes and behaviours of French and Portuguese consumers towards their purchasing habits of foodstuffs of animal origin (FAO), indicating a growing emphasis on responsible consumption to address emerging food production challenges and environmental concerns.

Keywords

Animal production, animal welfare, consumer, foodstuffs of animal origin, knowledge, perception.

Resumo

Nos últimos anos, o crescente interesse dos consumidores sobre a qualidade dos produtos alimentares de origem animal permitiu vários avanços em termos de bem-estar dos animais (BEA) de produção com uma real evolução da legislação. Através dos diferentes meios de informação e comunicação, os consumidores tornaram-se mais exigentes e críticos relativamente aos sistemas de produção, e começaram a valorizar os produtos com maior respeito pelo ambiente e pelo animal. Desta forma, emergiram novos desafios alimentares, com a evolução das escolhas alimentares e também o surgimento de novos regimes alimentares.

No sentido de avaliar as atitudes e percepções dos consumidores portugueses e franceses relativamente ao BEA dos animais produtores de alimentos, foram divulgados dois questionários idênticos, em português e em francês, através das redes sociais. No total, foram obtidas 339 respostas. Foram usadas análises estatísticas univariadas, bivariadas e multivariadas para tratamento dos dados obtidos. Os painéis portugueses e franceses apresentaram, em ambos os casos, uma maioria de respondentes do género feminino, com menos de 31 anos, com um elevado nível de escolaridade (ensino superior). Observou-se um interesse elevado em obter mais informações sobre o modo de produção e o BEA dos animais de interesse pecuário. Os participantes reconheceram a importância das boas práticas e sobretudo a sensibilidade dos animais na pecuária. A maioria deles considerou necessário implementar novas legislações e uma harmonização europeia da legislação existente para continuar a proteger os animais, bem como dispor de uma maior oferta de produtos certificados. Verificou-se que várias características sociodemográficas tiveram uma influência estatisticamente significativa sobre as percepções e atitudes dos participantes, designadamente o género sobre a disponibilidade em pagar mais pela implementação de práticas respeitadoras do BEA ($p_{\text{Portugal}} = 0,001$; $p_{\text{França}} = 0,006$), ou o regime alimentar sobre o nível de conhecimento ($p_{\text{Portugal}} = 0,005$; $p_{\text{França}} = 2e-07$). Em ambos os países, os consumidores apontaram a qualidade e a origem dos produtos como os critérios mais importantes. Este estudo permitiu destacar adicionalmente algumas correlações entre determinantes socioeconómicos e percepções e atitudes dos consumidores. Assim, os participantes da classe social mais baixa pareciam menos sensíveis ao BEA, e não mostrou disponibilidade para pagar mais por produtos certificados. Além disso, vegans e vegetarianos declararam ter mais conhecimento sobre as práticas da produção animal e tinham maior disponibilidade em pagar por estes produtos certificados. O género teve influência em ambos os painéis na disponibilidade de pagar mais por alimentos certificados para BEA.

Os resultados obtidos permitem caracterizar as atitudes e comportamentos em mudança dos consumidores franceses e portugueses em relação aos seus hábitos de compra de alimentos de origem animal, sugerindo uma ênfase crescente no consumo responsável para enfrentar os desafios emergentes na produção de alimentos e preocupações ambientais.

Palavras-chave

Produção animal, bem-estar animal, consumidor, alimentos de origem animal; conhecimentos, percepção.

1. Introduction

The global concern for animal welfare (AW) has led to a significant evolution of European legislation. Since the first law in 1974, which allowed the obligation to stun the animal before slaughter, there has been continuous progress to reduce farm animal suffering (Council of the European Union, 1974). However, as early as 1965 in the United Kingdom, the Brambell report provided a definition of welfare and minimum standards to meet the basic needs of farm animals (Brambell, 1965). These standards were later refined by the Farm Animal Welfare Council and popularised under the name "Five freedoms" (FAWC, 1979, 2009). Today, they are recognised worldwide and have contributed to the improvement of AW. They congregated freedom from hunger, thirst, malnutrition, fear, distress, physical and/or thermal stress, pain, injury and disease, as well as the freedom to express the normal behaviour of their species. Later, in 1997, the Amsterdam treaty included Protocol 33 (12006/PRO/33) on the animals protection and welfare, and described them as sentient beings (European Communities, 1997). Subsequently, Council Directive 98/58/EC of 20 July 1998 implemented standards on the accommodation, feeding and care appropriate to their needs (European Communities, 1998). In 2009, the Treaty of Lisbon reinforced the ethical responsibility of the European Union (EU) and its member states to prevent the mistreatment, pain and suffering of animals, from birth to slaughter (European Council, 2007). Recently, in 2021/2022, a Europe-wide public consultation was held regarding the AW legislation. The vast majority of respondents (over 89%) considered necessary to implement new rules on production, transport and slaughter of livestock. This action was part of the European strategy "From farm to fork", which aims to promote healthier and more sustainable food, respecting AW and allowing consumers to make informed choices (European Commission, 2022a, 2022b).

It is noticeable that pressure from public opinion allowed the evolution of AW legislation. Thanks to the mass media (e.g., newspapers, television, social networks), consumers have acquired greater knowledge about the production of farm animals, which has triggered new expectations, but also new diets such as vegetarian, flexitarian and vegan. At the same time, a distrust towards the industry and large-scale distribution has arisen (Bozzo, Barrasso, Grimaldi, Tantillo, & Roma, 2019; Rice, Hemsworth, Hemsworth, & Coleman, 2020). Several food scandals publicised by the media have contributed to this shift in consumer perceptions. Recent studies (Eurobarometer, 2016; Fernandes et al., 2019) show that intensive production methods are more criticised by society. As consumers recognise the conditions under which farm animals are raised, they start to pay more attention to the origin and the production practices, becoming more demanding and critical. The evolution of food

choices has a direct impact on the lives of food-producing animals. As a result, an increasing number of consumers are choosing to buy products that are certified as originating from animals raised in higher AW standards. Thus, the new challenges for sustainable food production are foods produced with greater environment and AW respect, with growing consumer demand and appreciation (Doyle, Wieland, Saville, Grace, & Campbell, 2021; Fernandes et al., 2019).

In view of this growing interest on the AW respect of farm animals and the new challenges created for producers, with a continuously growing world population and changing mentalities, it is considered important and necessary to study consumers' perceptions on farm animal welfare (Bozzo et al., 2019). Thus, this study aimed to analyse the perceptions and knowledge of Portuguese and French consumers regarding AW in food-producing animals.

2. Materials and methods

2.1. Characterisation of the study

This cross-sectional study, which was approved by the EUVG Ethics Committee (Opinion No. 22/2022), was based on the individual and anonymous completion of an *online* questionnaire by the Portuguese and French populations. The inclusion criteria corresponded to adult individuals, of at least 18 years old, of Portuguese or French residents according to the panel considered. Initially, a bibliographic search was conducted on the construction and development of questionnaires, and also on consumer perceptions of animal welfare in livestock production for the construction of the questionnaire. The search included previous works in Europe and on other continents (Alonso, González-Montaña, & Lomillos, 2020; Bozzo et al., 2019; Eurobarometer, 2007, 2016; Miranda-de la Lama et al., 2017; Nocella, Hubbard, & Scarpa, 2010; Boynton & Greenhalgh, 2004).

The questionnaire was initially structured in Portuguese and later translated into French. In order to determine the sample size, and considering the similar studies previously published and the responses' number obtained in the first month, the minimum to be obtained was set as 100 in Portugal and 200 in France, as the French population is larger than the Portuguese (Nocella et al., 2010; Rice et al., 2020). A total of 30 consumers (10 Portuguese and 20 French) assessed the clarity, the comprehension, and the ease in answering to the questionnaire. The questionnaire (Annex I) was structured with a total of 44 questions organised into four sections. In the first section, multiple-choice and open-ended questions were used to characterise the participants from a sociodemographic point of view. Thus, questions on gender, age, region of residence, education level, family members working as livestock producers, profession, social class, responsibility for food purchases and diet were included. With regard to social class, data from the National Institute for Statistics and Economic Studies in France and the Organisation for Economic Cooperation and Development in Portugal were used. Thus, low, average and high classes were categorized by the following annual net incomes: below 8700€ in Portugal and 21600€ in France; likewise, between 8700€ and 23300€ and between

21600€ and 50090€; and above 23300€ and 50090€, respectively. The second section aimed to assess general knowledge and perceptions of the participants on AW, through multiple choice and open questions. In the third section, open-ended, multiple-choice and scaled questions regarding possible measures to promote AW in livestock farming were used. Finally, the last section aimed to assess the consumers' perception and attitude in the act of purchase, through the same types of questions.

The questionnaires were converted into the Google forms™ platform and disseminated through the social networks Facebook®, LinkedIn® and Surveycircle®.

2.2. Statistical analysis

Univariate, bivariate and multivariate analyses were employed, using Excel® software and R Statistical Software (R Core Team, 2022). Associations were analysed between the different sociodemographic criteria (section I) and the responses obtained in the remaining sections: II (knowledge about AW), III (measures to be implemented to improve BEA), IV (consumer perception and attitude in the act of purchase). For these bivariate analyses, Pearson's chi-square test was used (significance level was 0.05). In addition, to be able to analyse the open questions in section II, key words of the consumers' answers were defined. Subsequently, occurrences were calculated, to determine which were the advantages and disadvantages of extensive and intensive systems most cited.

During the statistical treatment, some difficulties were experienced, such as the open questions' use that hindered the analyses, or the poor completion of question 18 (Annex I) in Google forms™ that led to the exclusion of some responses (French respondent panel - FR: n=13; Portuguese respondent panel - PT: n=2). It was also decided not to interpret the questions 40 and 41 in the Portuguese questionnaire and 40; 41 and 42 in the French one, given the low distribution or extinction of some logos as the "*Démarche HAPPY*" and *Le Boeuf Ethique*, respectively.

3. Results and discussion

3.1. Limitations of the study

In this study, some limitations were noticed. First, the sample size in both panels was not big enough to be able to generalize to the countries' population. More, the representativeness of the study was limited, restraining the ability to generalize the findings. The analysis of the open-ended questions led to a measurement bias with the definition of keywords to turn qualitative data into quantitative one.

3.2. Socio-demographic characteristics of the panels

The defined response period, between January 22 and April 11 of 2023, allowed receiving a total number of 339 respondents, of which 100 corresponded to Portuguese consumers and 239 to French consumers. There was a difficulty in obtaining a higher number of answers, despite the dissemination in several social networks, as reported in previous studies (Bozzo et al., 2019; Carlucci, Monteleone, Braghieri, & Napolitano, 2009). A complete questionnaire completed by a French respondent was excluded for not respecting the inclusion criteria (person under 18 years old).

As shown in Table 1, in both panels there was a higher participation of women (72.0%), between 18 and 30 years old (61.9%), with a higher education level (85.3%), from the middle class (57.7%) and urban origin (92.9%). The majority of responses by female participants may be associated with the fact that women are generally responsible for grocery shopping, which may explain their greater representation in the study (Cerrato & Cifre, 2018). Thus, most of the respondents were always responsible for food purchases (PT: 42.0%; FR: 50.6%). It was also found that 14.0% of Portuguese respondents and 12.1% of French ones were direct relatives of livestock producers. Finally, a majority of consumers with omnivorous diets was observed (PT: 86.0%; FR: 84.1%).

Table 1: Socio-demographic characteristics of the panels

Consumer	Portugal (n; %)	France (n; %)	Both panels (n; %)
Gender			
Female	75; 75.0%	169; 70.7%	244; 72.0%
Male	24; 24.0%	69; 28.9%	93; 27.4%
Other (non-binary)	1; 1.0%	1; 0.4%	2; 0.6%
Age group (years)			
18-24	34; 34.0%	84; 35.1%	118; 34.8%
25-30	22; 22.0%	70; 29.3%	92; 27.1%
31-39	18; 18.0%	22; 9.2%	40; 11.8%
40-49	17; 17.0%	21; 8.8%	38; 11.2%
50-59	5; 5.0%	28; 11.7%	33; 9.7%
60-69	4; 4.0%	8; 3.3%	12; 3.5%
>70	0; 0.0%	6; 2.5%	6; 1.8%
Education level			
First cycle	0; 0.0%	0; 0.0%	0; 0.0%
Second cycle	0; 0.0%	0; 0.0%	0; 0.0%
Third cycle	4; 4.0%	4; 1.7%	8; 2.4%
High school	12; 12.0%	30; 12.6%	42; 12.4%
College	84; 84.0%	205; 85.8%	289; 85.3%
Social class			
Low ^a	18; 18.0%	60; 25.1%	78; 23.0%
Average ^b	63; 63.0%	138; 57.7%	201; 59.3%
High ^c	19; 19.0%	41; 17.2%	60; 17.7%
Residency			
Urban	79; 79.0%	168; 70.3%	247; 72.9%
Rural	21; 21.0%	71; 29.7%	92; 27.1%

^aAnnual family income below 8700€ in Portugal and 21600€ in France. ^bAnnual family income between 8700€ and 23300€ (PT) and between 21600€ and 50090€ (FR) ^cAnnual family income above 23300€ (PT) and 50090€ (FR)

3.3. Consumers' knowledge and perceptions of animal welfare in livestock farming

Regarding section II, there was an average level (PT: 39.0%; FR: 38.9%) of consumer knowledge, on a scale ranging between none and very high. However relevant proportions of low knowledge were noticed (PT: 31.0%; FR: 36.0%). These results were in agreement with the Mexican study by Miranda-de-la Lama and col. (2017). This lack of knowledge could result from distancing between consumers and animal production (Hepting, Jaffe, & Maciag, 2014; Miranda-de la Lama et al., 2017). In most cases, this knowledge was based on documentaries, conversations with colleagues or family members, television and social media (Table 2).

Table 2: Most frequent knowledge source of the respondents in both panels ^a

	Portugal (n; %)	France (n; %)	Both panels (n; %)
Documentaries	63; 63.0%	169; 70.7%	232; 68.4%
Conversations with colleagues or family members	53; 53.0%	132; 55.2%	185; 54.6%
Television	46; 46.0%	120; 50.2%	166; 49.0%
Social networks	36; 36.0%	137; 57.3%	173; 51.0%

^a In this question n°13 (Annex I), respondents had the possibility to choose several options, thus the percentages were calculated on the total numbers of respondents.

There was additionally a willingness to receive more information on AW in livestock (PT: 66.0%; FR: 62.3%). This result is convergent with the results of the 2016 European Commission study according to which 64.0% of Europeans also indicated wanting more information on AW (Eurobarometer, 2016). For a large proportion of participants of the present study, AW has increased in Portugal (50.0%) and France (44.8%), allowing to demonstrate consumer awareness for animal rearing conditions. A non-negligible proportion (PT: 24.0%; FR: 25.1%) considered that it remained the same. The need to improve AW in each country was also expressed by Portuguese (79.0%) and French (90.8%) respondents, similarly to the results of the Eurobarometer (2016; PT: 94.0%; FR: 88.0%) and other studies conducted in South America (Estévez-Moreno, Miranda-de la Lama, & Miguel-Pacheco, 2022), Mexico (Miranda-de la Lama et al., 2017), and Asia (Park, Koh, & Kim, 2022). However, contrary to the Eurobarometer (2016), the present study revealed no influence between gender and the need to improve AW (PT: $p=0.2$; FR: $p=0.3$) (Eurobarometer, 2016). In addition, a sensitivity score regarding livestock rearing conditions was defined as the sum of importance scores from 1 to 5 (1 - not at all important; 5 - Very important), surveyed in question 18 (Annex I) based on the Five freedoms. The lower and higher limit score were respectively 5 and 35. Both panels showed high sensitivity scores between 29 and 35 (PT: 86.7%; FR: 83.6%)(Table 3). These results demonstrated that the respondents of this study recognized livestock animals as sentient beings, and gave importance to their AW, in line with the findings of Miranda-de La lama and col. (2017).

Table 3: Distribution of panel responses regarding the sensitivity score

Sensitivity score	Portugal (n; %)	France (n; %)	Both panels (n; %)
5-14	6; 6.1%	6; 2.7%	12; 3.7%
15-21	6; 6.1%	20; 8.8%	26; 8.0%
22-28	1; 1.0%	11; 4.9%	12; 3.7%
29-35	85; 86.7%	189; 83.6%	274; 84.6%

In the part of the open-ended questions, the words that participants associated with AW were asked. A total of 645 words were obtained in the French questionnaires, and 242 in the Portuguese ones. In PT, the words "food" (n=42; 17.4%), "health" (n=23; 9.5%), "freedom" (n=12; 5.0%), "comfort" (n=11; 4.5%) and "respect" (n=10; 4.1%); in FR, the words "food" (n=67; 10.4%), "space" (n=63; 9.8%), "freedom" (n=48; 7.4%), "free air" (n=47; 7.3%) and "respect" (n=46; 7.1%). In relation to the production system that best safeguards AW in livestock, 58.0% of Portuguese respondents indicated the extensive system, justifying their choice by the freedom, living conditions, natural habitat, space and quality of life that this system represented. Of the French respondents, 75.7% chose this same system, indicating freedom, access to the outdoors and well-being as justifications. The semi-intensive system was indicated in second place, by 32.0% of Portuguese respondents and 20.9% of French respondents. Consumers in both countries explained that this system was a balance between extensive and intensive, allowing to take advantage of the benefits of both systems. They also indicated the freedom, quality, controlled and balanced food that they associate with the semi-intensive system. The most frequently mentioned advantages of the extensive system were systematised in Table 4. Similarities were observed between both countries, with emphasis on the advantages of natural management conditions, freedom, space, nature and quality of life. With regard to the disadvantages, adverse weather conditions and their consequences on feeding, the lack and/or difficulty in controlling the animals, among others, were observed in both countries. The proportion of Portuguese respondents who stated that there were no disadvantages associated with the extensive system is noteworthy. On the contrary, the French respondents mostly pointed out the higher cost and investment (Table 4).

Table 4: Distribution of panel responses regarding the advantages and disadvantages of the extensive system

Advantages		Disadvantages	
Portugal (n; %)	France (n; %)	Portugal (n; %)	France (n; %)
▪ Making the most of natural resources and living conditions more natural (29; 16.3%) ▪ Freedom (28; 15.7%) ▪ Space (12; 6.7%) ▪ Quality of life (12; 6.7%) ▪ Better quality food (11; 6.2%)	▪ More natural living conditions (70; 16.5%) ▪ Freedom (55; 13.0%) ▪ Well-being (31; 7.3%) ▪ Less stress (25; 5.9%) ▪ Free air (18; 4.2%)	▪ Dependence on nature resources (food) (16; 10.5%) ▪ Adverse climatic conditions (thermal comfort) (15; 9.8%) ▪ Less control (hindered) (15; 9.8%) ▪ No disadvantage (12; 7.8%) ▪ Parasitism and pathologies (11; 7.2%)	▪ Higher cost and investment (40; 11.8%) ▪ Need for space (34; 10.1%) ▪ Adverse climatic conditions (17; 5.0%) ▪ Lack of food control (climate dependence) (16; 4.7%) ▪ Reduced and hindered surveillance (16; 4.7%)

Subsequently, the main advantages and disadvantages of the intensive system were addressed (Table 5). In the PT, the best and greater control of the animals, higher production, faster breeding and production, lower investment and production cost were pointed out. However, 12.0% of respondents pointed out absence of advantages in this type of system. Similarly, French respondents opted for the absence of advantages first, followed by higher production, higher productivity, lower cost and higher yield. Finally, the main disadvantages pointed out by the PT were confinement, lack of well-being, space and freedom, as well as lower “living” conditions (lower life quality). In the French respondent panel, reduced well-being, stress, maltreatment, pathologies and confinement were indicated as disadvantages.

Table 5: Distribution of panel responses regarding the advantages and disadvantages of the intensive system

Advantages		Disadvantages	
Portugal (n; %)	France (n; %)	Portugal (n; %)	France (n; %)
▪ Greater and better control (16; 12.8%) ▪ Higher production (16; 12.8%) ▪ None (15; 12.0%) ▪ Faster breeding (13; 10.4%) ▪ Lower cost and investment (9; 7.2%)	▪ None (46; 14.5%) ▪ Higher production (29; 9.1%) ▪ Higher productivity (25; 7.9%) ▪ Lower cost (24; 7.6%) ▪ Higher income (24; 7.6%)	▪ Confined (19; 12.6%) ▪ Lack of well-being (12; 7.9%) ▪ Lack of space (11; 7.3%) ▪ Lack of freedom (11; 7.3%) ▪ Lower living conditions (lower quality of life) (9; 6.0%)	▪ Lack of well-being (52; 12.7%) ▪ Stress (34; 8.3%) ▪ Maltreatment (28; 6.8%) ▪ Pathologies (20; 4.9%) ▪ Confinement (19; 4.6%)

3.4. Measures to promote animal welfare

Education of children (PT: 57.0%; FR: 64.4%), development of new laws/regulations (PT: 74.0%; FR: 81.6%), training and awareness formations for producers (PT: 83.0%; FR: 79.5%), consumer information (PT: 55.0%; FR: 69.0%), and finally, public vigilance (PT: 25.0%; FR: 46.4%) were chosen as the axes for improving AW in livestock farming. Regarding children's education, several studies show that consumers agree with integrating AW on primary school program (Mazas, Fernández Manzanal, Zarza, & María, 2013; Miranda-de la Lama et al., 2017; Toma, Stott, Revoredo-Giha, & Kupiec-Teahan, 2012). The majority of Portuguese respondents (54.0%) considered that AW allowed an increase in production, while the French (40.6%) considered the opposite. In both panels, respondents indicated the importance of additional regulations to prevent a decrease in AW and implementing economic support/reward measures for producers (Table 6), in agreement with previous studies (Eurobarometer, 2007, 2016; Miranda-de la Lama et al., 2017). Additionally, respondents recognised that stress during transport could affect the foodstuffs of animal origin (FAO) quality (PT:87.0% and FR:84.5%).

Table 6: Distribution of responses from panels of respondents regarding measures to promote animal welfare

	Portugal (n; %)	France (n; %)	Both panels (n; %)
Additional regulations	85; 85.0%	193; 80.8%	278; 82.0%
Harmonisation of European legislation	93; 93.0%	205; 85.8%	298; 87.9%
Economic support/reward measures	83; 83.0%	211; 88.3%	294; 86.7%

3.5. Perceptions and attitudes at the time of purchase

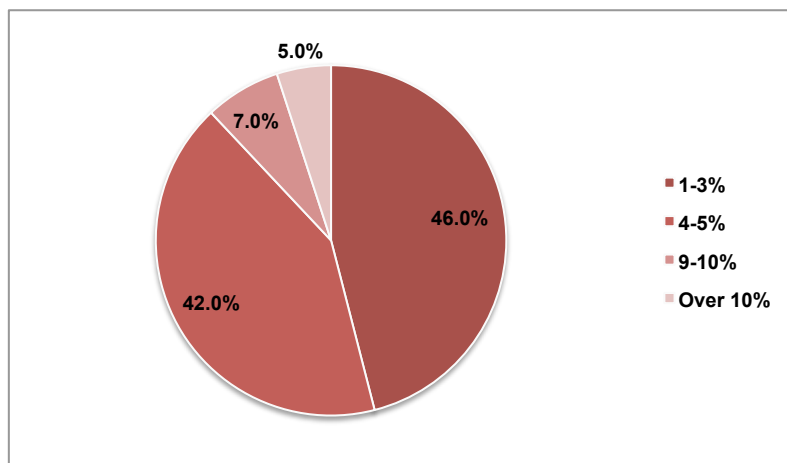
Participants from both panels revealed importance to the origin and the quality when purchasing (Importance score ≥ 4 ; PT: 91.0%; FR: 50.0%). Price and convenience were more noticeable among Portuguese respondents. Finally, brand was not identified as having much importance. The majority of Portuguese (76.0%) and French (70.3%) respondents expressed a willingness to switch shops to have access to AW-certified foodstuffs, in agreement with the Mexican's study results (Miranda-de la Lama et al., 2017). The majority of French respondents (57.7%) considered that there is no correct identification of AW certified food products in supermarkets and other retails. Contrarily, most of the Portuguese (57.0%) considered that these products are well identified in the commercial surfaces. However, in a convergent manner, it was pointed out by the majority of both panels (PT: 89.0%; FR: 93.3%) the need to have a greater number of foodstuffs originating from good AW practices, in agreement with results of previous studies (Eurobarometer, 2016). Most respondents expressed willingness to pay more for organic production mode, protected designation of origin (PDO), and traditional speciality guaranteed (TSG) (Table 7). A large number of consumers did not know how to indicate whether they wanted to pay for products from on-farm slaughter (PT: 38.0%; FR: 30.5%).

Table 7: Specific production practices for which the consumer is willing to pay more according to the respondent panels

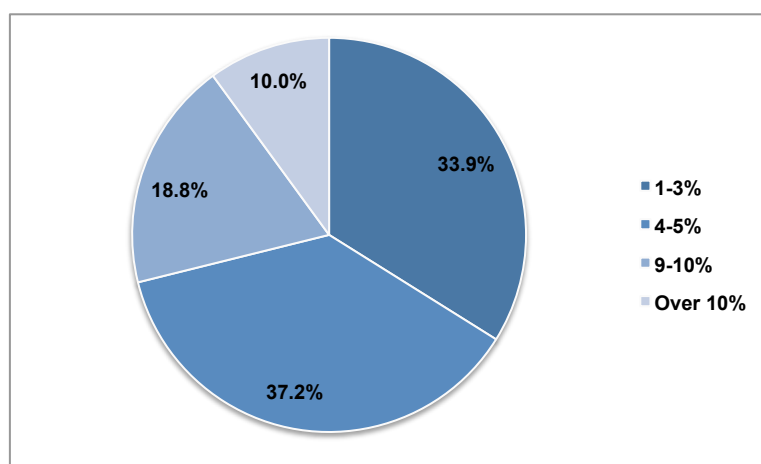
	Portugal (n; %)	France (n; %)	Both panels (n; %)
Organic farming	66; 66.0%	155; 64.9%	221; 65.2%
On-farm slaughterhouse	36; 36.0%	129; 54.0%	165; 48.7%
Protected Designation of Origin (PDO)	61; 61.0%	185; 77.4%	246; 72.6%
Traditional speciality guaranteed (TSG)	52; 52.0%	161; 67.4%	213; 62.8%

As depicted in Graphs 1 and 2, most respondents (PT: 88.0%; FR: 71.1%) were willing to increase the price of FAO by 1 to 5% to promote AW. Only a small proportion indicated willingness to increase more than 10% (PT: 5.0%; FR: 10.0%). In the study of Miranda-de la Lama and col. (2017), 10.4% of

participants indicated accepting an increase of more than 10%, which was close to the result in the French panel. For the remaining categories, the results obtained were not coincident with participants of the Mexican study, that were equally distributed between 1 and 10% increment to the price (Miranda-de la Lama et al., 2017).



Graph 1: Distribution of the Portuguese panel results regarding the available price increment for animal welfare certified products

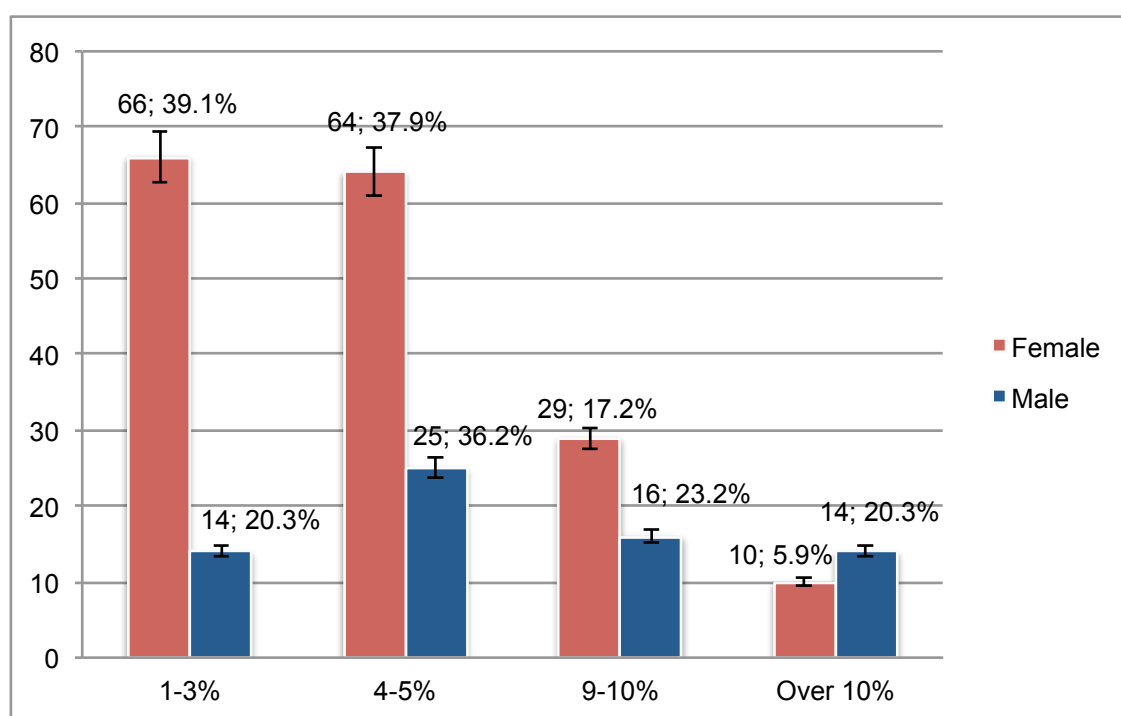


Graph 2: Distribution of the French panel results regarding the price increment available for animal welfare certified products

3.6. Bivariate and multivariate analysis

In the PT, there was an influence of sociodemographic characteristics on perceptions and attitudes towards AW in livestock farming. Thus, female respondents opted more for the extensive production system (65.3%; Confidence interval (CI) = 47 [37.04 – 57.20]; $p < 0.05$) to ensure animal welfare. On the other hand, male respondents were more divided between the extensive (47.8%) and semi-intensive (47.8%; CI= 11 [5.89 – 19.22]) systems. These same consumers consider that

economic support measures should not be implemented for producers respecting AW practices ($p=0.004$; CI = 6 [2.46 – 13.12]). In addition, gender ($p=0.001$) and diet of consumers ($p=0.001$) statistically influenced the percentage increment to be added to the price of FAO from specific production practices. Thus, women opted more for the 1-3% increase (50.7%; CI = 38 [28.64 – 48.29]) and men for the 4-5% increase (54.2%; CI = 13 [7.38 – 21.56]). Additionally, consumers with a vegan regime chose an increase of more than 10% (6.7%; CI = 2 [0.35 – 7.74]), vegetarians between 4-5% (55.6%; CI = 5 [1.86 – 11.83]), while most omnivores were split between 1-3% (4.1%; CI = 41[31.40 – 51.30]) and 4-5% (43.0%; 37 [27.73 – 47.29]). In the French panel, an association was also observed between gender and the percentage to be added to the price ($p=0.006$). Men accepted higher price increments compared to women (Graph 3). Contrary to similar previous studies (Bozzo et al., 2019; Miranda-de la Lama et al., 2017), gender did not demonstrate a statistically significant influence on the importance of AW in both panels (PT: $p=0.3$; FR: $p=0.4$).



Graph 3: Distribution of price increase by gender in the French panel

In Portugal, the age group showed a statistically significant association ($p=0.001$) on the importance of the origin of food products during shopping. Thus, participants of 18-24 years old showed more importance (70.6% with an importance score of 4 over 5) than participants aged 25-30 years (72.7% with a score between 2 and 3). Participants in the 31-39 and 40-49 age groups were more divided. In France, age statistically influenced perceptions about sensitivity ($p=0.007$), the need for additional regulations ($p=0.01$), the importance of the price of FAO ($p=2e-04$), and the increment on the percentage added to the price of FAO derived from specific production practices ($p=0.007$). Thus, this study revealed that in people aged between 18 and 69 years, the lower the age, the higher

the sensitivity. Additionally, it revealed that younger participants considered additional regulations necessary to prevent a decrease in AW. The price importance also seemed to evolve with age, being more important for the 18-24. Finally, the study revealed that older respondents were willing to add a higher value to price than young people (Table 8), contrary to the results of the 2016 Eurobarometer.

Table 8: Distribution of responses from the French panel of respondents dependent on age group (years old)

	Sensitivity Note $\geq$ 30 (n; %)	Need for additional regulations (Yes)	Importance of FAO pricing* (n; %)	Percentage to be added to the price
18-24	65; 85.5%	77; 91.7%	4 $\rightarrow$ 41.7%	1-3 % $\rightarrow$ 50.0% IC = 42 [31.28 – 55.28]
25-30	56; 83.6%	55; 78.6%	4 $\rightarrow$ 35.7%	4-5% $\rightarrow$ 47.1% IC = 33 [23.48 – 45.38]
31-39	17; 80.9%	16; 72.7%	3 $\rightarrow$ 50.0%	4-5% $\rightarrow$ 31.8% IC = 7 [3.08 – 14.80]
40-49	16; 76.1%	14; 66.7%	4 $\rightarrow$ 42.9%	9-10% $\rightarrow$ 42.9% IC = 9 [4.42 – 17.37]
50-59	20; 74.0%	22; 78.6%	3 $\rightarrow$ 60.7%	1-3% $\rightarrow$ 35.7% IC = 10 [5.11 – 18.62]
60-69	5; 62.5%	5; 62.5%	3 $\rightarrow$ 50.0%	4-5% $\rightarrow$ 50.0% IC = 4 [1.28 – 10.79]
70 and more	5; 83.4%	4; 66.7%	4 $\rightarrow$ 50.0%	4-5% $\rightarrow$ 50.0% IC = 3 [0.78 – 9.39]

* N.B.: results derived from the scale of 1 to 5 (question 31 from part IV of the questionnaire where 3 = more or less important and 4 = important)

In addition to the age group, the results of the FR revealed that the social class of the respondents also had an influence on the importance of price ($p=0.003$). Thus, upper-class consumers attributed lower importance to price than middle- and lower-class consumers. Similarly, dependence was observed between the percentages to add to price with the social class ($p=4e-05$), with higher the class, the higher the percentage to be willing to add for AW practices.

The origin of the Portuguese respondent influenced on the perception of the AW evolution in their own country ($p=0.02$). Thus, more respondents from a rural background considered that AW had increased (71.4%; CI = 15 [8.91 – 23.85]). The origin of French respondents was associated with willingness to pay for the organic mode of production ($p=0.003$) with a majority of participants from urban backgrounds wanting to pay more (69.0%; CI = 37 [26.92 – 49.81]). Contrary to previous studies (Miranda-de la Lama et al., 2017), origin had no influence on the sensitivity score or the importance of AW (PT: $p=0.3$; FR : $p=0.2$), or on the level of knowledge (PT: $p=0.3$; FR: $p=0.1478$).

Among Portuguese consumers, the sensitivity perception was statistically significantly dependent on various socio-demographic characteristics such as education level, existence of direct family members in livestock farming and diet (Table 9). Thus, it was observed that perception of animal sensitivity increased with the education level, for respondents without direct family members in livestock farming, as well as for vegans and vegetarians.

Table 9: Breakdown of Portuguese data regarding the dependence of some socio-demographic characteristics on the sensitivity score

Variable	p-value	Confidence interval
Education level	0.03	CI college, score of 35 = 44 [34.20 – 54.26]
Direct family members in livestock farming	0.03	CI Without, score of 35 = 49 [38.94 – 59.13]
Diet	2e-05	CI vegans, score of 35 = 3 [0.78 – 9.15]
		CI vegetarians, score of 35 = 5 [1.86 – 11.83]

In the French respondent panel, education level ($p=0.01$) as well as social class ($p=0.003$) had a statistically significant dependence on the importance of FAO quality. Thus, respondents of higher education level tended to give more importance (Importance score ≥ 4 : Third cycle with 75.0%, high school with 96.7% and college with 89.3%). It was also found that French consumers with college level tended to consider that their own country's AW needed to be improved ($p=0.05$; CI 3^{e} ciclo = 3 [0.78 – 9.39]; CI high school = 27 [18.42 – 38.66]; CI college = 187 [172.95 – 198.83]). Similarly, responsibility for grocery shopping had an impact on the importance of FAO quality ($p=0.002$). From the French respondents who rarely shopped more than one third (36.4%) attributed less importance to the quality (Score of 2 and 3, FR:). In the Portuguese panel, the responsibility for purchases did not have a statistically significant influence ($p>0.05$).

Portuguese respondents without direct family members in livestock farming showed less interest in the products' brand compared to those who have, with 75.6% with an importance score of 3 or less ($p=0.02$; CI Not at all important = 21 [13.75 – 30.53]; CI Not very important = 12 [6.63 – 20.40]; CI Neutral = 32 [23.22 – 42.18]). On the other hand, the social class of Portuguese consumers had a statistically significant influence on the association between AW and productive performance. Thus, the middle and lower classes considered that AW increased production ($p=0.006$; CI Low = 9 [4.46 – 16.83]; CI Average = 38 [28.64 – 48.29]). Among French respondents interested in getting more information on AW in livestock, 66.2% were relatives of livestock producers against 34.5% without any relatives in this area (CI with relatives in livestock farming = 10 [5.11 – 18.62]; CI without = 139 [123.36 – 154.00]). It was observed 31.0% of those without family relatives in livestock farming did not want information against 13.8% of those with family members in livestock farming (CI with relatives in livestock farming = 9 [4.42 – 17.37]; CI without = 29 [20.09 – 40.91]).

In the Portuguese panel, a statistically significant dependence between diet and level of knowledge was observed ($p=0.005$). A higher level of knowledge was acknowledged by vegans (66.7%) and vegetarians (77.8%). The diet also seemed to influence the answers about the need for AW's improvement ($p=3e-06$) and the importance of FAO's price ($p=0.03$). Thus, all vegans and vegetarians considered that AW needed to be improved (CI vegans = 3 [0.78 – 9.15]; CI vegetarians = 9 [4.46 – 16.83]). Vegans gave less importance to price (66.7%). In the French panel ($p=2e-07$), 66.7% of vegans acknowledged a very high level of knowledge (CI = 2 [0.35 – 7.93]), 50.0% of vegetarians

with a high level, and omnivores between a small and medium level of knowledge. In French consumers, diet also provided statistically significant importance for price ($p=6e-10$), with most of flexitarians giving less importance to price (36.4% more or less important and 27.3% not very important), compared to omnivores (39.4% important).

4. Conclusions

Based on the survey conducted among Portuguese and French consumers, an awareness of the importance of ethical treatment of farm animals and of good husbandry practices was revealed. The answers obtained confirmed the growing concern of consumers about AW, and consequently a willingness to obtain more information, to have a wider range of certified products on the market, and to pay more for such products. Furthermore, it was observed that some socio-demographic characteristics had an influence on various opinions. Thus, it was noticeable that lower class consumers seemed less sensible about AW and therefore was not willing to pay more for certified products. This fact could be related to economic issues (buying power), but also to lower education level. On the other hand, diets such as vegans and vegetarians declared to have more knowledge on farming conditions and were more likely to pay for such products. Gender had an influence in both panels on the willingness to pay more for AW certified FAO, with men accepting higher price increment, whereas women had a higher level of sensitivity for farm animals. Moreover, French respondents between 18-69 years old showed that lower was the age, higher was the sensibility. In this same country, younger participants also seemed to give a greater importance to the price of animal-derived food products whereas in Portugal, it was for their origin. Results also pointed out new expectations and the evolution of the purchasing habits of French and Portuguese consumers, in terms of more responsible consumption in the face of new food challenges and environmental concerns. Obtained results highlight that livestock sector must be aware of market and consumer demands and implement practices that promote animal welfare in their operations, whether in production, transport or slaughter.

Acknowledgements

First, I would like to acknowledge and give my warmest thanks to my internal supervisor, Professora Sofia Cancela Duarte, for her support during this work, and during my academic years. Thank you for accepting to be my supervisor, and having held such a position with dedication.

Also, I would like to give a special thanks to Professora Gisele Margatho, for her collaboration and valuable help in this work, and for my academic year. Thank you for accepting to be my co-supervisor on this project.

Moreover, I am grateful to Mestre Ricardo Cabeças for his precious help with the statistical analysis of this work. Thank you for accepting to be my co-supervisor on this project.

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ANNEXES

Annex I: Portuguese version of the questionnaire

O bem-estar animal nos animais de produção

No âmbito de uma Dissertação do Mestrado Integrado de Medicina Veterinária da Escola Universitária Vasco da Gama (Coimbra, Portugal), foi realizado este questionário para avaliar os conhecimentos e as percepções dos Portugueses relativamente ao bem-estar animal dos animais de produção.

Não existem respostas certas ou erradas e pede-se a todos os participantes que leiam as questões com atenção e cuidado e que assinalem a resposta que melhor se adequa à sua percepção.

Este questionário dirige-se para adultos (com pelo menos 18 anos) residentes em Portugal, e demora cerca de 10-15 minutos a responder.

Toda a informação adquirida é confidencial. Em nenhuma circunstância serão fornecidos os dados pessoais dos participantes. Este estudo obteve a aprovação da Comissão de Ética da Escola Universitária Vasco da Gama (Parecer nº 22/2022).

Contacto para questões e/ou dúvidas: Léa Tisseront (leamarie.tiss@gmail.com)

Agradece-se desde já a sua participação.

~~* Indique une question obligatoire~~

Parte I : Informações sobre os participantes

Para as perguntas seguintes, por favor, escolha a opção que corresponde a sua situação.

1. Género: *

Une seule réponse possible.

☐ Masculino

☐ Feminino

☐ Outro

2. Idade: *

3. Região de residência: *

Une seule réponse possible.

- ☐ Norte
- ☐ Centro
- ☐ Área metropolitana de Lisboa
- ☐ Alentejo
- ☐ Algarve
- ☐ Região Autónoma da Madeira
- ☐ Região Autónoma dos Açores
- ☐ Autre : _____

4. Concelho de residência: *

5. Nível de escolaridade: *

Une seule réponse possible.

- ☐ 1º ciclo (i.e. educação primária)
- ☐ 2º ciclo (5º-6º ano)
- ☐ 3º ciclo (7º, 8º, 9º ano)
- ☐ Ensino secundário (10º, 11º, 12º ano)
- ☐ Ensino Superior (Licenciatura, Mestrado, Doutoramento, outro)
- ☐ Autre : _____

6. Possui familiares diretos (cônjuges, pais, avós, filhos) produtores de animais de interesse pecuário?

Une seule réponse possible.

☐ Sim

☐ Não

7. Se sim, por favor indique o grau de parentesco:

8. Indique a sua profissão: *

9. Considera que pertence à classe: *

Une seule réponse possible.

☐ Baixa (rendimento anual inferior aos 8700€)

☐ Média (rendimento anual entre 8700€ e 23 300€)

☐ Alta (rendimento anual superior aos 23 300€)

10. É responsável por comprar alimentos para casa? *

Une seule réponse possible.

☐ Sempre

☐ Quase sempre

☐ Por vezes

☐ Quase nunca

☐ Nunca

11. Indique o seu regime alimentar: *

Une seule réponse possible.

- ☐ Omnívoro (Sem restrição)
- ☐ Vegetariano
- ☐ Vegan
- ☐ Religioso (precisar em "outro")
- ☐ Autre : _____

Parte II - Percepção e conhecimento sobre bem-estar animal em espécies de interesse pecuário

12. Na sua opinião, qual é o seu nível de conhecimento sobre as condições de produção dos animais de interesse pecuário?

Une seule réponse possible.

- ☐ Nenhum
- ☐ Pequeno
- ☐ Médio
- ☐ Elevado
- ☐ Muito elevado

13. O seu conhecimento sobre o bem-estar animal baseia-se em: *

Plusieurs réponses possibles.

- ☐ Artigos científicos
- ☐ Jornais
- ☐ Conversações com colegas ou familiares
- ☐ Internet (pesquisa própria)
- ☐ Redes sociais
- ☐ Televisão
- ☐ Documentários
- ☐ Associações
- ☐ Autre : _____

14. Gostaria de obter mais informações sobre o modo de produção e o bem-estar dos animais de interesse pecuário que são criados em Portugal?

Une seule réponse possible.

- ☐ Sim
- ☐ Não
- ☐ Não sei

15. Na sua opinião, o bem-estar animal em Portugal tem: *

Une seule réponse possible.

- ☐ Tem diminuído
- ☐ Tem aumentado
- ☐ Mantém-se igual
- ☐ Não sei

16. Acha que o bem-estar animal precisa de ser melhorado em Portugal? *

Une seule réponse possible.

- ☐ Sim
- ☐ Não
- ☐ Não sei

17. Indique 3 palavras que associa ao bem-estar animal

18. De acordo com a seguinte escala (1 - nada importante, 5 - muito importante) considera que os animais de produção devem:

Plusieurs réponses possibles.

	1 - nada importante	2	3	4	5 - muito important
Ter sempre água fresca e limpa disponível	☐	☐	☐	☐	☐
Ter acesso a comida adequada à espécie e à quantidade necessária para se manter saudável	☐	☐	☐	☐	☐
Ter espaço suficiente e instalações adequadas que permitam a expressão de comportamentos característicos da espécie.	☐	☐	☐	☐	☐
Ter sempre acesso ao ar livre.	☐	☐	☐	☐	☐
Estar livre de medo e angústia	☐	☐	☐	☐	☐
Ter acesso a cuidados veterinários sempre que possível, no caso de estarem doentes ou feridos.	☐	☐	☐	☐	☐
Dispor de um abrigo, espaço/oportunidade para se exercitar e um local confortável para descansar e se esconder (conforto físico-térmico).	☐	☐	☐	☐	☐

Algumas definições

Sistemas intensivos: Os animais são criados em confinamento (parques ou cercas), sendo que os alimentos (forragem, ração e concentrado) e a água são fornecidos em comedouros e bebedouros.

Sistema extensivo: Os animais são criados exclusivamente a campo, com um aproveitamento máximo dos recursos naturais e um mínimo de equipamentos agrícolas, instalações ou mão de obra. A alimentação baseia-se nas pastagens naturais.

Sistema semi-intensivo: Este tipo de sistema é intermédio relativamente aos outros dois. Os animais são confinados em parques (confinamento) onde são alimentados em comedouros. Depois são libertados para pastagens.

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19. Na sua opinião, qual dos seguintes sistemas de produção assegura um bem-estar superior nos animais de interesse pecuário?

Une seule réponse possible.

- ☐ Sistema intensivo
- ☐ Sistema extensivo
- ☐ Sistema semi-intensivo
- ☐ Autre : _____

20. Porquê? *

21. Quais são, na sua perspectiva, as vantagens dos sistemas extensivos? *

22. Quais são, na sua perspectiva, as suas desvantagens? *

23. Quais são, na sua perspectiva, as vantagens dos sistemas intensivos? *

24. Quais são, na sua perspectiva, as desvantagens? *

Parte III - Medidas para promoção do bem-estar animal em espécies de interesse pecuário

25. Na sua opinião, como poderia ser melhorado o bem-estar animal na produção animal (i.e. quais os eixos de melhoria)?

Plusieurs réponses possibles.

- ☐ Educação das crianças
- ☐ Elaboração de novas leis/regulamentações
- ☐ Formação e sensibilização dos criadores
- ☐ Vigilância dos cidadãos
- ☐ Informação dos consumidores
- ☐ Autre : _____

26. Na sua opinião, qual a associação entre o bem-estar animal e o desempenho de produção animal?

Une seule réponse possible.

- ☐ Aumenta a produção
- ☐ Diminui a produção
- ☐ Não tem influência
- ☐ Não sei

27. Considera importante haver regulamentações adicionais para evitar uma diminuição do bem-estar animal durante as operações nas explorações?

Une seule réponse possible.

- ☐ Sim
- ☐ Não
- ☐ Não sei

28. Considera importante existir uma harmonização europeia das regulamentações sobre o bem-estar animal (na produção, transporte, abate)?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

29. Considera que deveriam ser implementadas, medidas económicas de apoio/ recompensa para os criadores que respeitam boas práticas de bem-estar animal?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

30. O stress durante o transporte dos animais de produção pode afetar a qualidade dos alimentos de origem animal (p.e. carne, leite)?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

Parte IV - Percepção e atitude dos consumidores no ato de compra

O que pesquisa primeiro nas suas compras?

Por favor, considere a escala de 1 a 5, sendo o [1] nada importante e o [5] muito importante

31. Preço *

Une seule réponse possible.

	1	2	3	4	5	
Nad	☐	☐	☐	☐	☐	Muito importante

32. Origem *

Une seule réponse possible.

	1	2	3	4	5	
Nad	☐	☐	☐	☐	☐	Muito importante

33. Qualidade *

Une seule réponse possible.

	1	2	3	4	5	
Nad	☐	☐	☐	☐	☐	Muito importante

34. Conveniência *

Une seule réponse possible.

	1	2	3	4	5	
Nad	☐	☐	☐	☐	☐	Muito importante

35. Marca *

Une seule réponse possible.

	1	2	3	4	5	
Nad	☐	☐	☐	☐	☐	Muito importante

36. Estaria de acordo em trocar de loja para ter acesso a produtos alimentares com certificação de bem-estar animal?

Une seule réponse possible.

- ☐ Sim
- ☐ Não
- ☐ Não sei

37. Nos supermercados, mercearias, e outros estabelecimentos onde compra alimentos de origem animal, estes estão bem identificados?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

38. Existem vários produtos alimentares com uma certificação de bem-estar animal onde faz as suas compras?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

39. Considera que deve existir maior número de géneros alimentícios com origem em boas práticas de bem-estar animal?

Une seule réponse possible.

- ☐ Sim
☐ Não
☐ Não sei

40. Conhece ou já encontrou este logotipo? *



Une seule réponse possible.

☐ Sim

☐ Não

41. E este ? *



CERTIFICADO POR:



Une seule réponse possible.

☐ Sim

☐ Não

42. Estaria disponível para pagar pela utilização de práticas de produção específicas ? *

Une seule réponse possible par ligne.

	Sim	Não	Não sei
Modo de produção biológico	☐	☐	☐
Matadouro na exploração	☐	☐	☐
Denominação de origem protegida	☐	☐	☐
Especialidade tradicional garantida	☐	☐	☐

43. Se sim, indique, por favor, até quanto aceitaria acrescentar no preço, pela observação das práticas indicadas anteriormente:

Une seule réponse possible.

- ☐ 1-3% do preço
- ☐ 4-5%
- ☐ 9-10%
- ☐ Mais de 10%

Annex II: Questions on logos that are different between both questionnaires

40. Connaissez-vous ou avez-vous déjà vu ce label ? *



Une seule réponse possible.

- ☐ Oui
- ☐ Non

41. Connaissez-vous Le Boeuf Ethique ? *



Une seule réponse possible.

- ☐ Oui
- ☐ Non

42. Connaissez-vous la démarche HAPPY ? *



HAPPY
BIEN PLUS QU'UNE DÉMARCHE

Une seule réponse possible.

☐ Oui

☐ Non