

## CONSUMER BEHAVIOUR RELATED TO RABBIT MEAT AS FUNCTIONAL FOOD

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**Abstract:** Rabbit is one of the most versatile livestock species, responding successfully to bio-economic principles, which promote a clever use of resources and their conversion into added value products, such as functional foods (FFs). The excellent nutritive and dietetic properties of rabbit meat justify granting it the attributes of FFs. Based on the premise that it is the consumer who ultimately decides what kind of meat to buy, a consumer focus should be a core factor in private or public meat sector strategies. Following this assumption, the aim of this study is to contribute to understanding Romanian consumer behaviour related to rabbit meat as a functional food and to provide information on how to better market rabbit meat as FF in the domestic market. As far as the authors know, this study is the first one to assess and report on Romanian consumer perceptions, knowledge and behaviours related to rabbit meat. Consequently, the variables investigated reflect rabbit meat consumption habits. They also reveal preferences related to the acquisition of rabbit meat, perceptions on future rabbit meat consumption, perceptions of rabbit meat characteristics, perceptions of rabbit meat main characteristics compared to other types of meat, and rabbit meat consumption deterrents. The survey results show that rabbit meat is perceived as lean and low cholesterol, healthier and tastier than other meats, but more expensive, that its consumption is low, being 2.2 times lower than chicken and 1.8 times lower than pork, and that 29.6% of people surveyed have never eaten rabbit meat. The findings ascertain that the understanding of Romanian consumer behaviour related to rabbit meat as FF is an optimal tool for changing behaviour patterns towards a more sustainable market. The transfer of this knowledge towards marketers mainly focusing on how to increase consumer satisfaction for FFs, especially meat, is the leverage for designing successful businesses regarding market re-orientation, development or even reduction of health cost.

**Key Words:** consumer behaviour, rabbit meat, functional food, sustainability.

## INTRODUCTION

In recent decades, the concept of food quality has undergone important changes backed by market, cultural, and political globalisation. We are now dealing with consumers who face changes in their lifestyle and consumption habits (Dinu *et al.*, 2010) and who are more informed and concerned about what they eat or where their food comes from. They are the smart consumers, more committed to environmental protection, animal welfare or health concerns, which obviously has an impact on their perception of quality. The International Standardisation Organisation (ISO) provides one of the most popular definitions of quality, which is often taken for granted, but which bears an elusive meaning: "degree to which a set of inherent characteristics fulfils requirement" (International Standardisation Organisation, 2015). Despite the several definitions of quality, more or less accepted, one thing remains undeniable: quality is a term which largely depends on socio-economic and cultural factors, such as ethics, religious beliefs and traditions (Font-i-Furnols and Guerrero, 2014).

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Within the food sector, the term meat quality traditionally entails meat properties related to suitability of the meat for eating, further processing and storage, including retail display (Andersen *et al.*, 2005). More recently, fat and protein content, texture and even variety products (e.g., clams, insects), as Arnold (2009) called them, have increased their weighting in defining meat quality. The quality of meat and meat products varies according to intrinsic and extrinsic parameters that can sometimes be shaped to make a product more desirable (Font-i-Furnols and Guerrero, 2014). This becomes a mandatory requirement in an extremely competitive market. It is generally agreed that a market's competitive edge depends on the ability to develop new, differentiated products which are able to exploit and satisfy consumer preferences (Grunert *et al.*, 2004). This permanent search for food quality extends, among other concepts, to that of functional foods (FFs), a term coined in Japan in the 1980s. It refers to "food products fortified with special constituents that possess advantageous physiological effects" (Kubomura, 1998). On the one hand, meat and meat products in general are considered functional foods, as they contain numerous beneficial compounds such as proteins, amino acids or fatty acids (omega-3 fatty acids, GLA, CLA) (Dalle Zotte and Szendrő, 2011). On the other, consumption of red meat and processed meat, in particular, is often blamed for an increased risk of certain chronic diseases, such as cardiovascular disease and cancer, and scientific evidence has already revealed the risks of red meat consumption in cardiovascular disease (McAfee *et al.*, 2010). This is why consumers nowadays are increasingly asking for functional meat products which have reduced salt, nitrites and nitrates, cholesterol and fat contents (Khan *et al.*, 2011).

Based on rabbit meat's excellent nutritive and dietetic properties, it can be successfully included in the FFs category. Worldwide, rabbit meat is valued for its high nutritional properties, with a lower-fat content, less saturated fatty acids and lower cholesterol contents than other meats (Dalle Zotte and Szendrő, 2011). Compared to other meat types (chicken, beef, and pork), it was found that rabbit meat was richer in calcium (21.4 mg/100 g) and phosphorus (347 mg/100 g) and lower in fat (9.2 g/100 g) and cholesterol (56.4 mg/100 g) (Nistor *et al.*, 2013; Grădinaru, 2017). Unfortunately, rabbit meat consumption has less tradition in Romanian food culture. However, this drawback can become an opportunity for the domestic market by reorienting the offer towards rabbit meat and rabbit meat products as "new products", "new entry", or FFs (Petracci *et al.*, 2018). The authors are realists and acknowledge that product development is risky, and that launching new products requires constant input from the market, especially from consumers (Grunert *et al.*, 2004). Therefore, the aim of this study is to contribute to understanding Romanian consumer behaviour related to rabbit meat as FF and consequently to provide information on how to manage better delivery of rabbit meat as FF in the domestic market. To the best of our knowledge, this study is the first one to assess and report on Romanian consumer perceptions, knowledge and behaviours related to rabbit meat. A better understanding of consumer behaviour is recognised as a *sine qua non* condition for developing successful businesses regarding market re-orientation, development (Annunziata and Vecchio, 2010) and even public health cost reduction. The authors' review of the international literature found a dearth of data on consumers' attitudes to rabbit meat, mainly for Europe (Bodnar and Horvath, 2008a; Szakaly *et al.*, 2009; Wang *et al.*, 2013; Bodnar and Bodnar Skobra, 2014; Buitrago-Vera *et al.*, 2016).

## MATERIAL AND METHODS

The research is based on a survey using a sample of 216 persons from Cluj-Napoca and from its surrounding localities (belonging to Cluj county, North-West of Romania), both from rural and urban areas, interviewed face-to-face. The limit of 216 interviews was determined by time and budget constraints. The interviews were held with people who went shopping at hypermarkets and supermarkets (Carrefour, Lidl, Kaufland, and Profi), five small neighbourhood stores and peasant markets. Rural areas were selected at random from a list of Cluj-Napoca neighbouring localities. Weekdays and interview starting times throughout day were also selected at random and every fourth person who came out of the shop/market was asked for an interview. A filter question was asked at the beginning of the questionnaire, asking if they have an influence on what type of food is bought for at least 25% of the food eaten by them and the people who live with them (either because they buy at least 25% of the food they eat or because they influence those who buy it). Answer options were "Yes" and "No". The positive response rate was 17%, which means that 17% of contacted persons agreed to answer, they had an influence on at least 25% of the food bought by their family, and they finalised the questionnaire. Considering that the sampling procedure ensured the selection of a random sample, for a sample of this size (216 persons, out of a population of around 350 000 inhabitants), the

confidence level was 95% and the sample error was 6.65%. Even though the usually accepted error in social science is 4%-5%, higher levels are used and accepted as long as their level is acknowledged. Thus, there are numerous studies in social sciences, focused on food or other topics, with results associated to higher error. For example, an error of 7% was accepted in a study on consumers' willingness to pay for nutritional claims (Rhormens *et al.*, 2017); an investigation on perceptions regarding Community Based Marine Ecotourism relied on results with an error of 7% (De-Magistris and Lopéz-Galán, 2016); in a study by Pérez López *et al.* (2005) on organisational learning, an error of 6.9% was used. The structure of the sample by gender and living environment was: 53% men, 47% women, 84% people from urban areas and 26% people from rural areas. Considering age and education, sample shares were: 28% between 18-25 yr old, 19% between 26-45 yr old, 53% over 45 yr old; moreover, 58% had a higher education (faculty, master, PhD, ongoing or finished) and 42% had a lower level of education. It should be mentioned that Cluj-Napoca is a university city, with over 60000 students and with 46% of its stable population holding a higher education degree (based on 2011 census; INSSE, 2018, *apud* Ecoduri, 2018). Data analysis was carried out using Excel software and SPSS version 21. For comparison of differences regarding an ordinal variable between two groups, we ran the Mann-Whitney U test. Wilcoxon signed-rank test was used to compare two repeated measurements on a single sample to assess whether their mean ranks differed. The level of statistical significance was set at  $P < 0.05$ .

The variables investigated in this study were selected in order to create a complex image of the rabbit meat consumer behaviour and focused on purchasing habits, buying preferences and perceptions of rabbit meat characteristics. They include the following: 1. Rabbit meat consumption habits (frequency, adoption of consumption by others in the family, location, type of meat from the processing point of view); 2. Preferences related to the acquisition of rabbit meat; 3. Perceptions on future rabbit meat consumption; 4. Perceptions of rabbit meat characteristics; 5. Perceptions of main rabbit meat characteristics (healthiness, taste, and price) compared to other types of meat; 6. Rabbit meat consumption deterrents (more details are included in Annex 1).

The questionnaire was structured as follows. Firstly, a short introduction was presented: greetings, presentation of the study and request to participate. Secondly, the filter question was asked and the interview continued with people who answered "yes". Thirdly, the questionnaire set of questions followed, grouped in six chapters as described in the previous paragraph and in Annex 1.

The selected variables are key points both for sustainable production and marketing by the meat sector and for consumer information-education measures by public decision makers. As it is the consumer who ultimately decides what kind of meat to buy, a consumer focus should be at the core of private or public meat sector strategies.

## BACKGROUND

### ***Clever use of resources and the rabbit meat market***

The domestic rabbit (*Oryctolagus cuniculus*) is recognised as one of the most suitable animals for sustainable farming for a multitude of reasons. One is its capacity to use various cheap vegetal matters, including cellulose from wood, or sundry scraps from industry or agriculture which are poor in macronutrients (Ibrahim *et al.*, 2011; Petrescu-Mag *et al.*, 2014; Sima and Sim, 2015), so its competition with humans or other domestic animals for food is limited. Others refer to its high rate of reproduction, early maturity, rapid growth rate, high genetic selection potential and efficient land space utilisation (Cheeke, 1980). Moreover, rabbit manure can be used as a garden fertiliser and compost ingredient, due to its high content in nitrogen, phosphorus, and potassium ((Lukéfah *et al.*, 1998), or it can be converted into methane gas for household fuel needs (Lukéfah and Cheeke, 1990). Arguments put forward by Lukéfah (1998) reveal the opportunity for rabbit production to become an instrument for fostering human development through alleviation of poverty. Additionally, evidence from western countries, such as Spain, indicates that various farming alternative can be successful, from wild rabbit game farms to intensive meat rabbit farms (González-Redondo and Sánchez-Martínez, 2014). All these make rabbit a versatile livestock species (Lukéfah and Cheeke, 1990), able to respond successfully to the principles of bio-economy, which promotes a clever use of resources and their conversion into value added products (European Commission, 2012), such as FFs.

Starting from the fact that meat intake per capita is a relevant indicator for the economic welfare of a population (Stanciu *et al.*, 2015), a study by Petrescu *et al.* (2017) revealed that meat is dominant in Romanian food culture (but at much lower levels compared to Western countries), as it is frequently (at least 4 d/wk) consumed by two thirds of the people surveyed and very frequently consumed (6-7 d/wk) by almost one third. The meat consumption behaviour of Romanians citizen is still oriented towards pork and chicken, and the local rabbit production in Romania is supported only by small farms which are not competitive (Blaga and Burny, 2014). Lack of tradition of rabbit meat consumption, a dearth of local rabbit breeds or the high price of rabbit meat are among the main obstacles for rabbit meat consumption in Romania (Petrescu *et al.*, 2013). According to Blaga and Burny (2014), the price varies between 4.48-9.01 €/kg, which is similar to the price in France, where in 2015 the average price per kg was 9.31 € (STATISTA, 2108a), while in Spain the average price per kg was 5.11 Euros (STATISTA, 2018b), but it can also be bought at lower prices (from 3.99 €/kg) if the consumer resorts to traditional purchasing places (e.g. street markets), an aspect highlighted in a study by Baviera-Puig *et al.* (2017) through commercial observation at point of sale.

Based on empirical observation and analysis of available data (e.g. FAO, Romanian National Institute of Statistics), there are no reliable statistics and reports for Romania on rabbit production and/or consumption (Petrescu *et al.*, 2013). National statistics worldwide do not generally include rabbit production. Even the European Union meat production statistics include data only for beef and veal, sheep meat and goat meat, poultry meat and pig meat (EUROSTAT, 2015). This is because, globally, per capita consumption of these meats is the highest: in 2013 the average person consumed around 16 kg of pig meat, followed by 15 kg of poultry; 9 kg of beef/buffalo meat, 2 kg of mutton & goat; and only a fraction of other meat types (among which is rabbit meat) (Ritchie and Roser, 2018). Worldwide, more than 1.2 billion rabbits are slaughtered for meat every year and China accounts for 40% of global production, while EU-27 is responsible only for 28% of global production, with Italy, France and Spain leading the field (FAOSTAT, 2012).

### **Consumer behaviour related to FFs**

The meaning of food behaviour accepted in this paper is that of a set of reactions to internal and external factors that stimulate or hinder food intake (Popescu *et al.*, 2015). Understanding the factors that influence consumer behaviour in buying FFs, in general, is a current concern for academic research. Thus, poring over the most relevant studies dedicated to FFs will contribute to a better understanding of consumer choice and behaviour.

Health consciousness was among the most frequently mentioned motives for consuming FFs. Thus, Verbeke (2005) found that the acceptance of FFs is higher within families with an ill member. Socio-cultural determinants are also on the list of the factors that influence FF consumer behaviour. For example, a study in Malaysia examined how three ethnic groups manage their values in terms of FF consumption and it was observed that participants started to pay attention to their food choices only when these were inconsistent with cultural or physical characteristics that were familiar to them (Hasnah Hassan, 2011). Pappalardo and Lusk (2016) utilised food values in conjunction with willingness to pay (WTP) measures to identify Italian consumers' subjective beliefs about FFs. The results indicated that the surveyed consumers' WTP for FFs varied with food features related to origin, naturalness, or price, which revealed that those consumers had different subjective beliefs about FFs and non-FFs. Different studies argue that gender, age, education, marital status and health situation are the main predictors of FF consumption (Annunziata and Vecchio 2010; Hung *et al.*, 2016; Vecchio *et al.*, 2016).

Regarding the factors affecting rabbit meat consumption, there is scant scientific knowledge. In our neighbouring country, a research on 1274 Hungarians showed that those who refused consumption were vegetarian or that their attitude was caused by emotional reasons; another obstacle in rabbit meat consumption was the lack of rabbit meat and rabbit meat products in supermarkets (Bodnar and Horvath, 2008a). In an investigation carried out with 304 South African consumers, it was shown that 47% of the respondents had eaten rabbit meat prior to the study; this experience in rabbit meat consumption contributed positively to the desire to eat it again; they declared that they preferred to purchase rabbit meat in portions; 49% of respondents who consumed rabbit meat would definitely have considered price when making their purchase choice; 8% indicated that price would not influence their purchase; 61% of respondents who had already consumed rabbit meat would have liked to pay less for it than for chicken (Hoffman *et al.*, 2004). Indeed, in many cases, one of the major obstacles to higher rabbit meat consumption was the

price, and Dalle Zotte (2002) argued that the higher production cost of rabbit meat in developed countries compared to other meats was prohibitive. Catalans consumers revealed the importance of the Catalonian identity in food consumer behaviour, as they preferred rabbit meat of local origin to other sources of production (Kallas and Gil, 2012).

## RESULTS AND DISCUSSION

### *Rabbit meat consumption habits*

As expected, according to the present study, rabbit meat consumption in a comparative context is low, being 2.2 times lower than chicken and 1.8 times lower than pork (Table 1). Among the people surveyed, 29.6% have never eaten rabbit meat, which is a very high percentage, but understandable given the fact that its availability is limited to self-production, small producers and to some of the supermarkets located in big cities. A similar share of respondents (31%) declared that other members of their family also did not eat rabbit meat. The dominant consumption frequency was “less than one day per month” (56% of the sample), followed at a long distance by “between 1 and 3 d per month” (12.5% of the sample), while only extremely low shares declared frequencies “between 1 and 4 d per week” (1.4%) and “between 5 and 7 d per week” (0.5%). Similarly, in Hungary, 46% of the interviewees bought rabbit meat only once or twice a year (Bodnar and Horvath, 2008b).

Fresh meat is the most frequently purchased type, probably due to its greater availability (compared to frozen or semi-cooked meats). The fact that 23.1% of those surveyed purchased/received cooked rabbit meat is explained by its consumption location –at friends’ house or restaurants. However, the most common consumption place remains “at home” (Table 2). In this context, it is very important to stimulate restaurants to include rabbit in their menus and to diversify their recipes in order to promote rabbit meat consumption and make it attractive for consumers.

### *Consumer preferences on the acquisition of rabbit meat*

There may be a difference between what one desires to do and what he/she is allowed/able to do, for instance a consumer may want to buy rabbit meat but cannot because it is not for sale on the market or because the price is too high for their budget. In this context, where current behaviour is shaped not only by preference, but also by restrictions (for example, lack of availability of a preferred purchasing location would force the consumer to use a source which he/she does not like), in order to highlight what they want, it was necessary to investigate consumer preferences regarding rabbit meat along with their current practices. Preferences regarding rabbit meat type, supplier, purchasing location and producer’s country of origin are the main variables to characterise consumer behaviour in the case of meat, providing marketers with reference points for their strategies. Romanians prefer to buy already slaughtered animals, whole, from small Romanian producers (Table 3). However, most of them prefer to buy it from supermarkets (32.9%), thus revealing supermarkets as a suitable vector for the promotion of FFs, rabbit meat in particular (Table 3). Unlike Romanian people, in Hungary, consumers prefer to buy rabbit directly from the farmer (70% of Hungarians surveyed), as they consider it to be fresher and not so expensive as it is in supermarkets and because they declare themselves unsatisfied with the distribution of rabbit meat in supermarkets (Bodnar and Horvath, 2008b).

### *Consumer perceptions on their future rabbit meat consumption*

The survey disclosed a relatively reduced self-estimated future consumption, with 32.4% believing they would not eat rabbit meat in the near future, 44% considering they would eat it less than 1 d per month, 19.9% estimating a consumption frequency between 1 and 3 d per month, 3.7% between 1 and 4 d per week, and nobody envisaging

Table 1: Consumption frequency of different meat types (average scores for the sample).

	Chicken	Pork	Beef/Veal	Sheep	Rabbit	Fish	Other
Score*	4.0	3.3	2.6	1.6	1.9	2.9	1.2

\* Average sample score, calculated using the individual estimations provided by consumers, coded on the scale: 1=never (minimum level), 2=less than 1 d per month, 3=between 1 and 3 d per month, 4=between 1 and 4 d per week, 5=between 5 and 7 d per week (maximum level).

**Table 2:** Type of rabbit meat purchased and type of consumption location (percentage of total sample).

Type of processing of purchased/received rabbit meat						
Fresh	Frozen	Semi-cooked	Cooked	In the form of meat products (sausages, salami, ham, pastrami etc.)	None, because I do not consume / consume it rarely	None, because I get / grow my own rabbits
38.4%	14.4%	0.5%	23.1%	6.5%	36.6%	3.7
Type of consumption location						
At home		At the restaurant		At friends' house		I did not eat/ I do not remember
51.9%		8.3%		31.0%		32.4%

a consumption between 5 and 7 d per week. However, a statistically significant difference was found between the two consumption frequencies – current and future, with a higher frequency of intended rabbit meat consumption compared to past consumption frequency ( $Z=-2.068$ ,  $P=0.039$ ) (Table 4).

**Consumer perceptions of rabbit meat characteristics**

The list of information used to investigate consumer perceptions on rabbit meat characteristics had 24 components (see section 3. Research methodology and Annex 1, point 4). To test the reliability of the scale, the internal consistency was measured using the Cronbach's coefficient alpha. The average correlation among all the items that made up the scale was 0.696, lower than the recommended level of 0.7. One item was removed –the habit of eating rabbit meat in the first part of life (as a child and teenager)– and the new value of the Cronbach's coefficient alpha was 0.725, an acceptable one.

Taste was rewarded with the highest score among all tested characteristics, which is a very good and important result, as taste is the main driver of food consumption. Through various studies, taste was proven to be a very important factor for food choice, dietary behaviours and intake; for example, 82% of tested Australian consumers rated taste as very/extremely important factor for food choice (Kourouniotis *et al.*, 2016). In Spain, also, consumers nominated good taste (72.4%), healthiness (35.9%) and having low fat content (14.6%) as the 3 main reasons for eating rabbit meat (Buitrago-Vera *et al.*, 2016). In the described survey herein, 64.4% of people consider taste is good and very good, thus revealing that the fundamental requirement for the consumption of a food item is already fulfilled. In second place was texture, which received good and very good ratings from 58.5% of interviewees. Texture in food preferences has recently gained remarkable importance as a consequence of its intensive promotion for a variety of foods (e.g., crunchy, creamy and soft) (Jeltema *et al.*, 2015). On the one hand, the fact that the next best scores were

**Table 3:** Consumer preferences regarding rabbit meat (percentage of total sample).

Preferred type of meat								
From animal bought alive and cut by our family	Whole animal, already slaughtered	Certain parts	Indifferent	I do not want to buy because I do not eat it often	I do not want to buy at all because I receive it or I grow the rabbits			
20.8%	32.1%	18.5%	7.4%	35.2%	9.3%			
Preferred type of supplier								
Small producers	Large farms	From wilderness	Indifferent	None				
36.6%	2.8%	23.6%	15.7%	32.9%				
Preferred purchasing location								
Supermarket	Specialised shops	Peasant market	Directly from farms	Hunting	Self- production	Restaurant	Indifferent	None because I do not eat it often
32.9%	21.3%	6.0%	19.9%	5.1%	5.6%	0.5%	8.8%	0%
Preferred producer country of origin								
Romania	Other EU countries			Non- EU		Indifferent		
67.6%	1.4%			0%		31.0%		

**Table 4:** Results of Wilcoxon signed-rank test concerning the difference between the mean ranks of the current frequency consumption of rabbit meat and the future one.

		Ranks			Test Statistics <sup>d</sup>	
Future consumption -		N	Mean Rank	Sum of Ranks	Z	-2.068 <sup>e</sup>
Current consumption	Negative Ranks	21 <sup>a</sup>	30.38	638.00	Asymp. Sig. (2-tailed)	0.039
	Positive Ranks	38 <sup>b</sup>	29.79	1132.00		
	Ties	157 <sup>c</sup>				
	Total	216				

N: Number of cases

<sup>a</sup>Future consumption < Current consumption.

<sup>b</sup>Future consumption > Current consumption.

<sup>c</sup>Future consumption = Current consumption.

<sup>d</sup>Wilcoxon Signed Ranks Test.

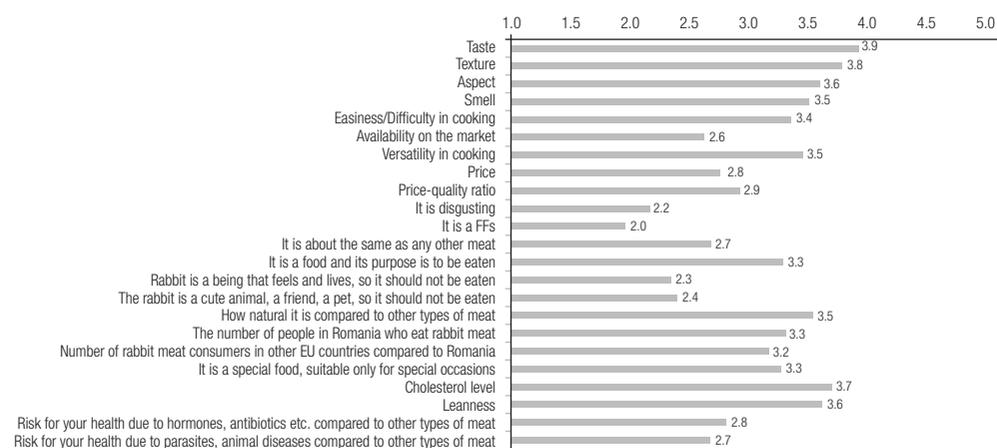
<sup>e</sup>Based on negative ranks.

gained by cholesterol level and leanness supports rabbit meat promotion as a FF (Figure 1). On the other, when the characteristic of rabbit meat being a FF was specifically tested, the average score was low, as only 6% agreed (totally or mostly with this fact) and 30.6% did not have an opinion. In other words, most people recognised certain attributes of rabbit meat, but they were not able to connect them with a positive impact on their health.

The influence of gender on rabbit meat consumption frequency variables -past and future- and the perception of rabbit meat characteristics was investigated and significant differences ( $P > 0.05$ ) between men and women were observed in some cases (Table 5). The results indicated that men seemed to appreciate rabbit meat more than women. For the latter category, disgust and ethical concerns were stronger. Similarly, women in a Spanish study, had stronger perception of rabbit as a companion animal compared to men (González-Redondo and Contreras-Chacón, 2012). French women also mentioned disgust as a generator of low meat consumption, regardless of its type (Rousset *et al.*, 2005).

### Perceptions of rabbit meat main characteristics (healthiness, taste, and price) compared to other types of meat

Healthiness, taste, and price were indicated by the consumers surveyed as the most important attributes that influence meat choice. Therefore, rabbit meat was compared with the most commonly consumed types of meat on



**Figure 1:** Consumer evaluation of rabbit meat characteristics (average scores of the sample) behaviour. Source: Prepared by the authors. (To interpret the scores, see the explanations for answer options for each question in section Material and Methods).

**Table 5:** Man-Whitney U test results for differences between women and men regarding rabbit meat frequency consumption (past and future) and perception of rabbit meat characteristics.

Variable	P-value (for significant difference)	Higher frequency/ Stronger agreement	
		Men	Women
Frequency of past rabbit meat consumption	P=0.008	X	
Frequency of future intended rabbit meat consumption	P=0.006	X	
Perception: taste	P=0.001	X	
Perception: texture	P=0.003	X	
Perception: smell	P=0.017	X	
Perception: easiness to cook	P=0.010	X	
Perception: versatility in cooking	P=0.013	X	
Perception: it is disgusting	P=0.035		X
Perception: rabbit is a living creature that feels and has its own life, so it should not be eaten	P=0.006		X
Perception: rabbit is a cute animal, a friend, a pet, so it should not be eaten	P=0.004		X
Perception: it is more natural than then types of meat	P=0.024	X	
Perception: it presents a lower risk for your health due to hormones, antibiotics etc. than other types of meat	P=0.006		X
Perception: it presents a lower risk for your health due to parasites, rabbit diseases than other types of meat	P=0.015		X

these characteristics. The fact that interviewed consumers perceived rabbit meat as healthier than all tested meats and fish supports its promotion as a FF. Also, its evaluation as tastier than all the rest is an encouraging finding for producers and sellers considering bringing it into the market (Table 6). The perception of rabbit meat price as more expensive than the most popular meats in Romania –chicken and pig meat– is a real obstacle in increasing its consumption (Table 6). Accordingly, the weight of other advantages, such as being a FF (healthy) and tasty, must be potentiated to overcome the hindering effect of a high price.

**Hindering factors in front of rabbit meat consumption**

The most important obstacles to rabbit meat consumption stated by the interviewees were high price and disgust (each named by 31.9% of sample), lack of availability on the market (mentioned by 30.6% of sample), empathy with another living creature which is deprived of freedom and slaughtered (mentioned by 26.4% of the sample) and the fact that the rabbit is perceived as a pet, and as a cute animal (nominated by 25.5% of the sample). An ethical obstacle to meat eating was also mentioned by Bastian *et al.* (2012) for Australian consumers, who showed that many people liked eating meat and, in order to maintain their eating habits, they denied that the animals they consumed had

**Table 6:** Comparative perceptions (average scores of the sample).

Healthiness* Rabbit compared to:				
Chicken	Pork	Beef	Sheep	Fish
2.3	2.5	2.3	2.2	2.3
Taste** Rabbit compared to:				
Chicken	Pork	Beef	Sheep	Fish
2.1	2.3	2.1	2.2	2.2
Price*** Rabbit compared to:				
Chicken	Pork	Beef	Sheep	Fish
1.5	1.6	2.0	2.2	2.3

\*1=rabbit meat is less healthy than..., 2=rabbit meat is equally healthy as..., 3=rabbit meat is healthier than...

\*\*1=rabbit meat is less tasty than..., 2=rabbit meat is equally tasty as..., 3=rabbit meat is more tasty than...

\*\*\*1=rabbit meat is more expensive than..., 2=rabbit meat is the same price as..., 3=rabbit meat is less expensive than...

minds, thus reducing dissonance between loving eating meat and caring about animals. According to Buitrago-Vera *et al.* (2016), a similar situation is present among Spanish consumers, who declared that the main obstacles facing rabbit meat consumption were the fact that they were not used to it (28.3%) and that they disliked the taste (26.7%).

A balanced perspective on the current study requires mentioning its limitations. Thus, it should be observed that a more in-depth investigation of each of the 6 sections of the questionnaire (Rabbit meat consumption habits; Consumer preferences regarding the acquisition of rabbit meat; Consumer perceptions on their future rabbit meat consumption; Consumer perceptions of rabbit meat characteristics; Perceptions of rabbit meat main characteristics compared to other types of meat; and Hindering factors in front of rabbit meat consumption) is possible in a follow-up study considering additional variables and perspectives. Thus, differences not only according to demographics (e.g., gender), but also within them, can be explored and variables such as lifestyle can be added (e.g., health and environmental concerns, social influences on consumption). The fact that the error was slightly higher than the habitually used level of 4-5% for Social Sciences, reaching 6.65% is a limitation that must be considered in terms of practical use of the results. Moreover, the sample can be extended beyond the local area to national level and its representativeness can be increased.

## CONCLUSIONS

Population growth, urban expansion and increasing standards of living in the developing world are responsible for dietary transformation and rapid growth in human consumption of animal proteins (Boland *et al.*, 2013). In the context of human preference for healthy and high-quality meat, and the current trend towards reducing captures in the wild (Petrescu-Mag *et al.*, 2014), rabbit meat production should be valued as an optimal tool for endorsing sustainable food consumption. Thus, rabbit meat may contribute to a "balanced diet" with possible preventive effects on non-communicable diseases (e.g., cardiovascular diseases, cancer and diabetes) (Corpet, 2011). Similar to poultry, the nutritional profile and technological traits of rabbit meat make it suitable for inclusion in added value products which respond both to modern consumer demands for healthy food and to industry requirements in terms of flexibility (Petracci and Cavani, 2013).

Rabbit meat production and consumption is a possible solution worldwide, where economic growth is mandatory to sustain human progress by reducing poverty, hunger and malnutrition and providing safety and affordable food. Raising awareness of what we eat and how the food arrived on our plate is not only a matter of being informed, but also of ethics. It also has to do with environmental protection, animal welfare and food equity.

The contribution of this study is the creation of the Romanian rabbit meat consumer profile. From a practical perspective, the information presented here can guide decision makers towards developing new marketing strategies to raise consumer interest in meat quality in general and in rabbit meat as FF in particular. The consumers surveyed ate rabbit meat less than once a month and appreciated its taste, texture, leanness and low cholesterol content the most among all rabbit meat characteristics. Compared to chicken, pork, beef, sheep meat and fish, rabbit meat was perceived as healthier, highlighting the existence of the premises for its promotion as FF. The main deterrents to rabbit meat consumption were price, disgust, lack of availability and ethical concerns. The results of this study shed light on the chance to evolve towards a market richer in FFs, thus revealing opportunities for marketers to adjust their interest to consumers' needs and, at the same time, to respond to economic efficiency and environmental protection needs.

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## ANNEX 1. VARIABLES USED IN THE STUDY

### 1. Rabbit meat consumption habits (frequency, adoption of consumption by others in the family, location, type of meat from the processing point of view)

1.1. Consumption frequency in a comparative context: 1.a. Consumption frequency: chicken; 1.b. Consumption frequency: pork; 1.c. Consumption frequency: beef/veal; 1.d. Consumption frequency: sheep; 1.e. Consumption frequency: rabbit; 1.f. Consumption frequency: fish; 1.g. Consumption frequency: other. Answer options: Never; Less than one day per month; Between 1 and 3 d per month; Between 1 and 4 d per week; Between 5 and 7 d per week.

1.2. Rabbit meat consumption by other family members. Answer options: Yes; No.

1.3. Type of location for rabbit meat consumption. Answer options: At home; At the restaurant; At friends' house; I did not eat/ I do not remember.

1.4. Rabbit meat purchasing habits:

1.4.a. Type of processing of purchased/received rabbit meat. Answer options: Fresh; Frozen; Semi-cooked; Cooked; In the form of meat products (sausages, salami, ham, pastrami, etc.); None, because I do not consume/ consume it rarely; None, because I get / grow my own rabbits.

## 2. Preferences related to the acquisition of rabbit meat

2.1. Preferred type of meat. Answer options: From animals bought alive and cut by our family; Whole animal, already slaughtered; Certain parts; Indifferent; I do not want to buy because I do not eat it often; I do not want to buy because I receive it or I grow the rabbits.

2.2. Preferred type of purchasing location. Answer options: Supermarket; Specialised shops; Peasant market; Directly from the farm; Hunting; Self-production; Restaurant; Indifferent; No preference because I do not buy it often.

2.3. Preferred type of supplier. Answer options: Small producers; Large farms; From wilderness; Indifferent; No preference because I do not buy it often.

2.4. Preferred producer country of origin. Answer options: Romania; Other EU countries; Non-EU countries; Indifferent.

## 3. Perception on future rabbit meat consumption

3.1. Perception of near future (next 12 months) rabbit meat consumption frequency. Answer options: Never; Less than one day per month; Between 1 and 3 d per month; Between 1 and 4 d per week; Between 5 and 7 d per week.

## 4. Perception of rabbit meat characteristics

4.1. Taste; 4.2. Texture; 4.3. Aspect; 4.4. Smell. Answer options: Very good (coded 5); Good; Average; Bad; Very bad (coded 1). 4.5. Easiness/Difficulty in cooking. Answer options: Very easy (coded 5); Easy; Average easiness; Difficult; Very difficult (coded 1). 4.6. Availability on the market. Answer options: Very good (coded 5); Good; Average; Bad; Very bad (coded 1). 4.7. Versatility in cooking (it can be prepared in many ways). Answer options: Very good (coded 5); Good; Average; Bad; Very bad (coded 1). 4.8. Price (compared to your budget). Answer options: Very cheap (coded 5); Cheap; Average price; Expensive; Very expensive (coded 1). 4.9. Price-quality ratio. Answer options: Very good (coded 5); Good; Average; Bad; Very bad (coded 1). 4.10. It is disgusting (it makes you sick if you eat it). Answer options: Very disgusting (coded 1); Disgusting; Indifferent; Appetising; Very appetising (coded 5). 4.11. It is a FF (food that claims to improve health or well-being by providing benefits beyond that of the traditional nutrients it contains); 4.12. It is about the same as any other meat; 4.13. Rabbit is a food source and its purpose is to be eaten; 4.14. Respect for the life of another creature (rabbit feels and it has its own life) and empathy with a living creature which is deprived of freedom and slaughtered, leading to the conclusion that rabbit should not be eaten; 4.15. Rabbit is a cute animal, a friend, a pet, so it should not be eaten; Answer options: Total agreement (coded 5); Mostly agreement; Not agreement, nor disagreement; Mostly disagreement; Total disagreement (coded 1); 4.16. How natural it is compared to other types of meat (the animals received more natural feed and lived in more natural conditions). Answer options: Much more natural (coded 5); More natural; The same; Less natural; Much less natural (coded 1). 4.17. The number of people in Romania who eat rabbit meat. Answer options: Very high number of people (coded 5); High number of people; Moderate number; few people; Very few people (coded 1). 4.18. Number of rabbit meat consumers in other EU countries compared to Romania. Answer options: Much more people compared to Romania (coded 5); More people compared to Romania; The same as in Romania; Fewer people compared to Romania; Much fewer people compared to Romania (coded 1). 4.19. It is a special food, suitable only for special occasions. Answer options: Total agreement (coded 5); Mostly agreement; Not agreement, nor disagreement; Mostly disagreement; Total disagreement (coded 1); 4.20. Cholesterol level. Answer options: Very low (coded 5); Low; Average; High; Very high (coded 1). 4.21. Leanness. Answer options: Very lean (coded 5); Lean; Average; Fat; Very fat (coded 1). 4.22. Risk for your health due to the use of hormones, antibiotics etc. compared to other types of meat; 4.23. Risk for your health due to parasites, animal diseases compared to other types of meat. Answer options: Very low (coded 5); Low; Average; High; Very high (coded 1). 4.24. How used you are to eating rabbit meat (based on how much you eat it as a child or teenager).

Answer options: Not at all used to eating it (coded 1); Mostly not used to eating it; Average level of habit to eat it; Mostly used to eating it; Very used to eating it (coded 5).

**5. Perceptions of rabbit meat main characteristics (healthiness, taste, and price) compared to other types of meat**

5.1. Healthiness of rabbit meat: a. compared to chicken meat; b. compared to pork; c. compared to beef/veal meat; d. compared to sheep meat; e. compared to fish. Answer options: Less healthy; The same; Healthier. 5.2. How tasty is rabbit meat: a. compared to chicken meat; b. compared to pork; c. compared to beef/veal meat; d. compared to sheep meat; e. compared to fish. Answer options: Less tasty; The same; Tastier. 5.3. How is the price of rabbit meat: a. compared to chicken meat; b. compared to pork; c. compared to beef/veal meat; d. compared to sheep meat; e. compared to fish. Answer options: More expensive; The same; Cheaper.

**6. Rabbit meat consumption deterrents**

All variables listed at point 4 above were tested as consumption deterrents. People were asked about their effect as rabbit meat consumption deterrents and the effect was presented on a 3-point scale (strong effect, average effect, and weak effect).