

ARE CONSUMERS OPEN TO EATING CULTURED MEAT? CROSS-CULTURAL STUDY - BRAZIL, SPAIN AND TURKEY

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I. INTRODUCTION

The expected population growth result in a major impact on the demand for food in general and meat in particular. Scientific progress is opening the door to unprecedented food scenarios by providing new technologies, such as changes in production practices and animal genetics that increase efficiencies and may help to offset some of the potential land use and associated environmental impacts [1]. An example of a novel food is cultured meat, also known as in vitro, synthetic or clean meat, it is produced from animal cells taken from a living animal and then grown in a laboratory environment, stimulated, and nourished with a nutrient serum. Nevertheless, consumer perceptions are a potential barrier [2]. The product needs to be of sufficiently similar taste, texture, and appearance to meat for wide acceptance, and this is currently difficult to achieve. Despite both the health and environmental potential benefits, changing consumer preferences towards a diet is difficult because of cultural, social, and personal associations with meat consumption [1,3]. Therefore, the objective of this study was to know the expectations for consuming cultured meat by Brazilian, Spanish, and Turkish consumers.

II. MATERIALS AND METHODS

For this study, a quantitative analysis was carried out through the application of a disclosure questionnaire prepared with the help of Google docs software. The results came from a non-probabilistic sampling, as all participants were obligatorily consumers/buyers of beef. Consumers in Brazil (n=412), Spain (n=407), and Turkey (n=424) were sent a questionnaire asking about their expectations for consuming cultured meat, including beliefs about its quality, safety, and availability, among others. To determine the factors studied across countries, a descriptive analysis of the data was performed, using cross tables to determine the frequency of attributes when Pearson's chi-square was less than 5%, using the z-test. The ANOVA test, significance level ≤ 0.05 , was performed to compare the variances between the means of consumers from the three countries using the SPSS v28 software. This study was approved by the ethics committee under number CAAE: 46941121.3.0000.5422.

III. RESULTS AND DISCUSSION

As a result, consumers in the surveyed countries do not believe that cultured meat will have the same quality, colour, flavour and texture as beef or that it will be healthier (Table 1). Although Brazilians, in a greater percentage, than Spaniards and Turks find these assumptions to be true. On the safety of cultured meat, more Brazilians (21%) and Spaniards (23.1%) believe that it will be safe than 16% of Turks. However, most consumers say they don't know if this product will really be safe. Most consumers in the three countries say they do not know whether cultured meat will be available at the usual place where meat is bought. But, more Spaniards (30.7%), followed by Brazilians (25.2%) and finally Turks (19.8%) say yes, this product will be available for purchase easily, despite Brazilians, more than Spaniards and Turks, think it will be an expensive product, that is, out of the family budget.

Regarding the reduction of the environmental impact due to the production/consumption of cultured meat, consumers say they do not know, or that it will not be a good alternative, nevertheless, 30.8% of Brazilians, 22.9% of Spaniards and 12.5 % of Turks say it will be a good alternative, these results being significantly different from each other. Finally, regarding the intention to consume cultured meat, Turks (69.8%) and Spaniards (60.5%) are averse to consumption, against 25.7% of Brazilians. Studies show results that corroborate our findings, where they say that meat consumers were more positive about extrinsic attributes than they were about intrinsic attributes and despite the positive picture depicted for cultured meat, participants were quite cautious in assigning high scores to the statements [1,3]. Also, the production of cultured meat is still at an experimental level, and it is difficult now to forecast to what extent cultured meat will be able to gain consumer acceptance [2].

Table 1 Information on assumptions about cultured meat and consumption motivation

Assumptions about cultured meat		Country			P-value
		Brazil	Spain	Turkey	
It will have the same quality (colour, flavour, texture) as meat from animals	Yes	18.3a	7.1 b	8.3b	≤ 0.001
	No	48.6b	57.7a	60.8a	
	Do not know	33.2a.b	35.1a	30.9b	
It will be healthier than meat from animals	Yes	24.3a	13.8b	9.9b	≤ 0.001
	No	39.7c	50.1b	61.3a	
	Do not know	35.9a	36.1a	28.8b	
It will be safer than meat from animals	Yes	21.0a	23.1a	16.0b	≤ 0.001
	No	41.6a	28.0c	36.1b	
	Do not know	37.4b	48.9a	47.9a	
It will be available at usual meat shop	Yes	25.2b	30.7a	19.8c	≤ 0.001
	No	21.0b	19.9c	29.2a	
	Do not know	53.7a	49.4b	50.9a.b	
It will be an expensive food, out of budget	Yes	38.8a	31.7b	27.8b	≤ 0.001
	No	9.8b	35.9a	39.2a	
	Do not know	51.4a	32.4b	33.0b	
It will be a good alternative to reduce environment impact	Yes	30.8a	22.9b	12.5c	≤ 0.001
	No	40.6c	59.7b	69.8a	
	Do not know	30.8a	17.4b	17.7b	
Would you consume laboratory-grown meat?	Yes	39.7a	22.1b	12.5c	≤ 0.001
	No	25.7c	60.5b	69.8a	
	Do not know	34.6a	17.4b	17.7b	

Each letter indicates a subset of categories (country) whose column proportions do not differ significantly from each other at the 0.05 level. Sampling: Brazil (n = 412), Spain (n = 407), and Turkey (n = 424).

IV. CONCLUSION

According to this study, consumers need to be reassured about the product's quality and flavour. Cultured beef must also be subjected to a complete investigation about the consequences on the supply chain it may generate, making clear who will be able to use this technology and the advantages from it.

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