71st ICoMST
GIRONA - CATALONIA - SPAIN
3rd-8th August - 2025

CONSUMER PERCEPTIONS OF MEAT *VS* PLANT-BASED ALTERNATIVE USING FREE WORD ASSOCIATION AND SEMANTIC SCALE

Zalama. Laura[1*], Olegario. Lary[1], Estévez. Mario[2], Ventanas. Sonia[1]

[1] Food Technology and Quality (TECAL group), Meat and Meat Products Research Institute (IProCar), University of Extremadura, Cáceres, Spain.

*Corresponding author email: laurazr@unex.es

I. INTRODUCTION

Nowadays, some consumers consciously reduce or eliminate foods from animal origin, and particularly meat and meat products. As a result, there is a growing consumer demand for plant-based alternatives that closely resemble foods of animal origin and can replace them in the diet, driven by different motivations [1]. This study focuses on comparing consumer perceptions of meat and its plant-based counterpart, seitan, using the free word association technique and semantic differential scaling. The aim of the study is to explore consumer attitudes and associations toward visual stimuli of meat and seitan, identifying the positive and negative connotations that these products evoke.

II. MATERIALS AND METHODS

Free word association technique, utilizing two visual stimuli (image and name of cooked meat and cooked seitan) was applied [2] in an online survey. Participants (n= 228, 85.10% omnivorous and 66.23% women) were asked to respond to the following question: “Please write 4 words, expressions or adjectives that spontaneously come to your mind after visualizing the image”. Finally, 7-point bidirectional semantic scales were included with 12 pairs of opposite adjectives (satiating-unsatiating, delicious-unappetizing, pleasure-duty, environmentally positive-environmentally negative, natural-processed, regional-imported, healthy-unhealthy, special occasion-everyday, cheap-expensive, ease to prepare-not easy to prepare, low protein-high protein, and male-female) [3].
A qualitative analysis through pseudo triangulation was performed to free word association data analysis. First, three researchers individually grouped the terms based on their meanings and synonyms, generating higher-ranking categories. A citation frequency of 5% was required to include a word in a category. A discussion session was conducted to reach a consensus on the categories generated for each evaluated product [4]. Finally, a word cloud was created using the frequencies obtained for each category in each product, utilizing the XLSTAT software (version 23). For the semantic differential scales, we calculated the mean values for each pair of adjectives for each product, creating profiles represented in a semantic differentiation graph using XLSTAT software. Product effect (meat vs meat analogue stimuli) on differential semantic scales for each pair of adjectives was evaluated using a non-parametric test (Mann-Whitney U) with SPSS software (v 27, IBM® SPSS® Statistics).

III. RESULTS AND DISCUSSION

Figure 1 shows the word clouds obtained for meat and seitan stimuli. For meat, the most frequently category was “nice”, while for seitan it was “pastries”. In general, the results showed that consumers usually associate meat with categories related to sensory characteristics such as “juicy” and “tender”, to hedonic component such as “pleasure”, “nice”, “appetizing” and “quality”, to culinary treatment such as “degree of cooking” and “barbecue”, to nutritional aspects such as “protein”, to consumption context such as “company” and to other indeterminate categories such as “red meat” or “food”. Additionally, participants associated the meat stimuli with categories having negative connotations such as “hunger”, “unhealthy” and “expensive”, although the citation frequency was low, not exceeding 7%. Word cloud of seitan shows that most relevant categories were related to sensory characteristics such as “consistent” and “sweet”, to the hedonic component such as “appetizing” and “nice”, to culinary treatment such as “pastries” and “slice”, to nutritional aspects such as “healthy”, to consumption context such as “analogue” and “trendy”, and to other indeterminate categories such as “meat”, “unknown” or “food”.

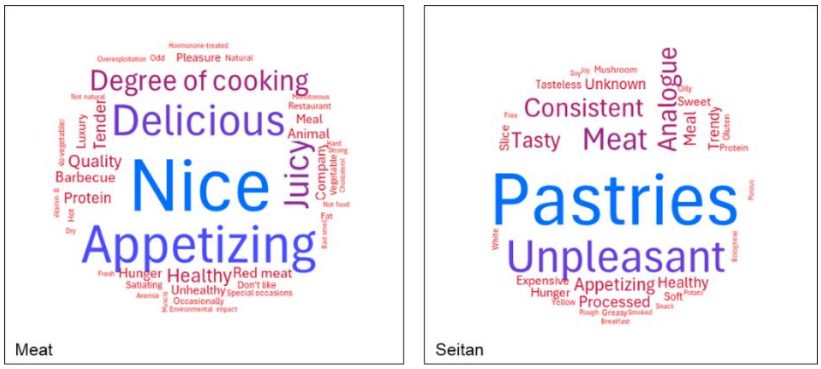


Figure 1. Word cloud of meat and seitan.

Significant differences ($p \leq 0.05$) were found between meat and seitan for all pairs of opposite adjectives evaluated using bidirectional semantic scales (Figure 2) except for special occasion/everyday, where both products were located toward special occasion. Compared to meat, seitan was significantly associated with a more positive environmental impact, processed, imported, less healthy, more difficult to prepare, less protein content and was perceived as masculine (associated with predominantly male consumption). In contrast, meat stimulus was significantly oriented toward adjectives with more positive or pleasant connotations compared to seitan.

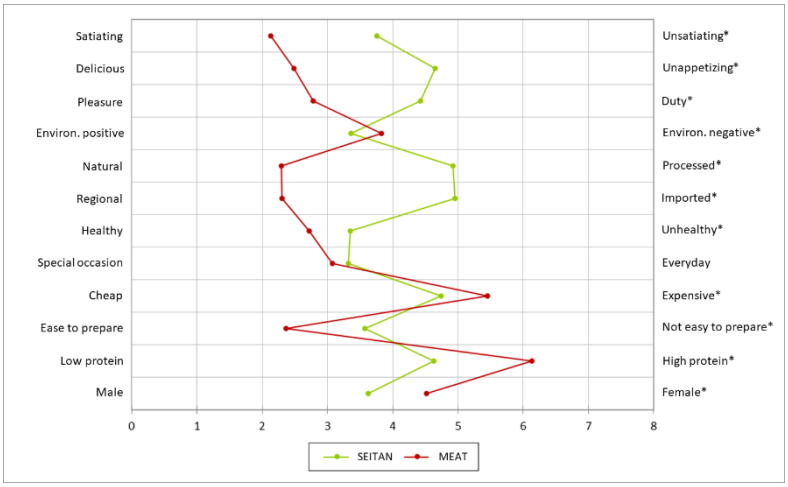


Figure 2. Differential semantic graph of meat and seitan.

IV. CONCLUSION

In general, consumers' associations and attitudes toward visual stimuli of meat include spontaneously generated terms (free word association) or adjectives (semantic scales with opposite adjectives) with more positive connotations compared to seitan stimulus. Plant-base meat analogue is perceived as more processed, imported, and less healthy than meat, indicating a potential barrier to acceptance of plant-based products due to concerns about their processing and origin.

ACKNOWLEDGEMENTS

These results are part of the project PID2021-126193OB-I00, funded by MICIU/AEI/10.13039/501100011033 and by FEDER, EU. And of the grant PRE2022-104480, funded by MICIU/AEI/10.13039/501100011033 and by ESF+.

REFERENCES

Papers:

1. Faber, I. et al. (2024). The mediating role of barriers and trust on the intentions to consume plant-based foods in Europe. Food Quality and Preference, 114.
2. Rojas-Rivas, E. et al. (2022). More than words! A narrative review of the use of the projective technique of word association in the studies of food consumer behavior: Methodological and theoretical implications. Food Research International, 156.
3. Graça, J. et al. (2015). Attached to meat? (Un) Willingness and intentions to adopt a more plant-based diet. Appetite, 95, 113–125.
4. Gambaro, A. (2018). Projective techniques to study consumer perception of food. Current Opinion in Food Science, 21.