

CONSUMERS' PERCEPTION OF FRANKFURTER SAUSAGES WITH DIFFERENT HEALTHINESS ATTRIBUTES

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Abstract – The objective of this study was to evaluate the consumers' perception regarding frankfurter sausages with different healthiness attributes. Descriptions of different frankfurter sausages were used (traditional, with natural antioxidants, with sodium reduction, with fat reduction, source of dietary fiber and with omega 3) as stimuli. The category Healthiness was the most frequent attribute mentioned for the stimuli with healthier attributes. The negative associations related to the traditional frankfurter sausages were: Not healthy, Fat/calorie and High blood pressure. For the present study, it is concluded that different kinds of frankfurter sausages provoked distinctive associations when considered the most recurring categories suggesting that all the particularities obtained by the consumers' perceptions about this kind of product should be considered in its development.

Key Words – meat products, word association, projective technique.

I. INTRODUCTION

Consumers in general have become more aware of the advantages of a healthy diet due to advances in comprehending the relation between diet and health [1]. Thus, there is an increasing interest in developing meat products with healthier attributes [2, 3].

To better understand the consumers' choices, several studies have been reporting the use of indirect research methods since the analysis of consumers' behavior regarding a certain product may provide information about the factors that may influence those choices [4, 5]. As far as the concept is concerned, the qualitative methods are shown as adequate tools to reveal the consumers' view and perception of the concept. [6, 7, 8]. The projective technique is an indirect investigative method considered adequate for marketing that reports abstract values and necessities influencing consumers' behavior [9].

Word association is one of the projective techniques most used to analyze conceptual structures, to study beliefs, and attitudes in psychology and sociology and it has been proven to be useful also in research about food [10, 11, 12].

In dealing with food products, the associations that first come to the mind are considered the most relevant for the consumers and are related to purchasing the product [8, 13, 14, 15]. The ideas shown within the application of the technique of word association are produced spontaneously and the participants are submitted to fewer constraints than generally it is required in personal interviews, besides being less demanding than other qualitative methods [16, 6]. Therefore, this qualitative technique has been reported in literature as being fast, simple and useful to explore the reasons behind the choices for purchasing certain food, since it provides relevant information about consumers behavior and perceptions, including ones about new nutritional concepts [6, 8]. With this in mind, the objective of this study was to evaluate the perception of consumers regarding frankfurter sausages with different healthiness attributes using the word association method.

II. MATERIALS AND METHODS

A. Consumers

The present study was carried out in the laboratory of sensory analysis of Faculty of Animal Science and Food Engineering of the University of São Paulo (Pirassununga, Brazil). One hundred twenty participants were recruited by e-mail through an on-line questionnaire. The questionnaire for the recruitment constituted in questions related to the frequency of consumption of different meat products (hamburger, nuggets, frankfurter sausage, and mortadella), with the objective of not providing any information about the target product in the study. The criteria of recruitment applied to the selection of participants was to consume frankfurter sausage at least every 15 days, at home or not.

B. Stimuli

The stimuli used in this study were descriptions of different kinds of frankfurter sausages, as follows: traditional frankfurter (stimulus A), frankfurter with natural antioxidants (stimulus B), frankfurter with sodium reduction (stimulus

C), frankfurter with fat reduction (stimulus D), frankfurter source of dietary fiber (stimulus E) and frankfurter with omega 3 (stimulus F).

C. Word Association

The technique of word association was applied according to what was proposed in studies carried out by Ares et al. [8] and Menezes et al. [17]. The consumers were requested to analyse the six stimuli and write their four first impressions, images, associations or feelings that crossed their minds. The consumers received the sheets with the instructions of the test, and with the description of the product. The sheets were presented to the consumers in a monadic way through casualised complete blocks and analysed in individual booths.

D. Statistical Analysis

The associations obtained were analysed qualitatively. All the associations provided by the participants were considered, and the analysis started through the search for recurring terms within each type of frankfurter. The categorization was performed in a way that terms with similar meanings were grouped in the same category. This classification was performed manually in an independent way by three researchers that considered personal interpretation of the meanings and synonymic of the words. After the individual evaluation of the data, a meeting was carried out by the three researchers to discuss among the classifications independently made in which the final categories and their names were determined in consensus by the three researchers. The categories that were considered for posterior analysis presented terms mentioned by more than 10% of the participants. This technique of triangulation was reported by other authors who carried out studies with qualitative techniques [18, 19, 12, 5]. Chi-square was calculated for evaluating statistical differences in consumers' perception of the different types of frankfurter sausages.

III. RESULTS AND DISCUSSION

The total number of valid words obtained was 2,720, corresponding to an average of 3.78 associations per participant. These words were grouped in 24 categories, which are presented in Table 1, with examples of individual associations and the frequency in which each category was mentioned in each kind of frankfurter. Consumers associations were significantly different for the different kinds of frankfurter sausages evaluated ($X^2 = 2445$, $p < 0.0001$), suggesting that the different stimuli significantly affected and caused distinct consumer perceptions.

The category healthiness was most frequently mentioned for the stimuli (kinds of frankfurter) with healthier attributes. The second most cited category was the consumption mode, in other words, usual ways of consuming the product in study, in which the associations of this category were related only to the traditional frankfurter.

Tobin et al. [20] found that most of 548 consumers of meat products confirmed that they do not consider frankfurters healthy products, mainly because the high quantity of harmful chemical substances, fat, and salt. The results obtained by Dean et al [21], by evaluating the influence and perception of consumers regarding nutritional claims, suggested the hypothesis that when people are motivated by these claims, they are susceptible to be influenced, and tend to prefer claims that lead to reduction of risk of common diseases related to lifestyle rather than claims that can promote benefits to their health. Based on the above and taking into consideration the negative associations regarding the traditional frankfurter (unhealthy, fat/calorie and high blood pressure), and that the category light/low caloric was the second mostly mentioned for the stimulus frankfurter with fat reduction, it is possible to consider that this result showed that the category healthiness is relevant for the consumer. In addition, the high number of associations for this category compared to frankfurter with fat reduction, with sodium reduction and natural antioxidants respectively may be related to the negative perception of the consumer on the high quantity of harmful chemical substances, fat and salt in this kind of product and the connection between these substances and health problems.

The consumers associations related to the sensory characteristics of the stimulus traditional frankfurter referred to the attributes flavor, (category: good flavor), as the second most frequent cited for this stimulus followed by the categories appearance (colour), and tender/juiciness. For the products with healthy attributes, associations related to the sensory characteristics occurred less frequently compared to the category healthiness, however, the consumers related these stimuli to sensory defects, referred to flavor, and texture. The frankfurter with omega 3 was associated to the sensory attribute fish flavor, and the category negative perception (does not suit, did not like). For several categories of food, it is not clear if the consumers are willing to compromise the sensory characteristics, especially the healthiness rather than the flavor [22, 23].

Convenience, affordable price, and occasion of use were also categories connected only to the traditional frankfurter, however in less number of associations when compared to the sensory characteristics. Possibly these categories are related to the factors that justify the purchase and product consumption.

More expensive prices were associated to the frankfurter with natural antioxidants and with omega 3. The price has an impact in the consumers' choice related to healthier products [24, 25, 26]. Carrillo et al. [27], investigated the factors affecting the choice of food by the consumers and their attitudes, and concluded that the sensory characteristics are considered more important for the consumers, and these were followed in importance by non-sensory factors as price, and convenience. Such results were compatible to the categories of associations obtained in this study for the traditional frankfurter.

Table 1: Categories obtained with the word association method, examples of individual associations and frequencies of the mentioned categories for frankfurter sausages with different healthiness attributes.

Category	Examples	A ¹	B ²	C ³	D ⁴	E ⁵	F ⁶
Consumption mode	Hot dog	98	4	10	1	7	5
Positive impact on the organism	Good functioning of the intestine	0	0	2	0	19	0
High blood pressure	Hypertension, high blood pressure	22	0	0	0	0	0
Appearance (colour)	Strong pigmentation, vibrant colour	29	0	0	0	0	0
Good flavor	Delicious, savoury	74	21	9	6	0	0
Healthiness	Healthy, healthiness	0	90	99	100	74	85
Price (cheap)	Cheap	14	0	0	0	0	0
Occasions of use	Dinner with friends. on Sundays	13	0	4	3	0	0
Price (expensive)	More expensive, higher price	0	15	7	11	4	19
Unhealthy	Not healthy, not healthy at all	31	0	0	0	0	0
Fat/Calories	Caloric, a lot of fat	24	0	0	0	0	0
Hungry	Hungry	14	0	4	0	0	0
Convenience	Fast/easy to prepare	15	0	0	0	0	0
Tender/juiciness	Tender, juiciness	13	0	0	0	0	0
Flavor defects	Less intense flavour, tasteless	0	13	46	45	21	3
Texture defects	Modified texture, not succulent, dry	0	3	31	2	58	11
Fish flavor	Fish flavour and taste	0	0	0	0	0	26
Negative perception	Does not suit, did not like	0	2	0	0	33	19
Light/ Low calorie	Light, low calorie	0	9	50	12	8	0
Fish	Fish, seafood	0	0	0	0	0	33
Interest/ willingness to taste	Interesting, would try	0	27	39	50	21	39
Natural	No preservatives, free additives	48	0	0	3	0	0
Innovation	Innovation, Innovative product	0	13	6	6	8	9
Colour change	Strange colour, white colour	0	10	6	9	17	0

¹Traditional frankfurter; ²Frankfurter with natural antioxidants; ³Frankfurter with sodium reduction; ⁴Frankfurter with fat reduction; ⁵Frankfurter with source of dietary fiber; ⁶Frankfurter with omega 3.

Frankfurters with natural antioxidant presented a relevant number of associations related to no preservatives/additives, preservatives/additives free (category: natural). Positive effects for health were connected to the frankfurter with source of dietary fiber, and this product was associated to the good functioning of the intestine. Ares et al. [8] reported equivalent results, by studying the perception of consumers on conventional yogurt and functional yogurt using the technique of word association. The results showed that yogurt rich in fiber was related to positive effects on health, in which the participants consider this yogurt a product for people with gastrointestinal disorders.

IV. CONCLUSION

It is concluded by this study that the different kinds of frankfurter provoked distinctive associations when considered the recurring categories, suggesting that in the development and promotion of this kind of products all the particularities obtained through the consumers' perception must be considered.

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REFERENCES

1. López-López, I., Cofrades, S., Yakan, A., Solas, M. T., & Jiménez-Colmenero, F. (2010). Frozen storage characteristics of low-salt and low-fat beef patties as affected by Wakame addition and replacing pork backfat with olive oil-in-water emulsion. *Food Research International* 43(5): 1244-1254.
2. Decker, E. A., & Park, Y. (2010). Healthier meat products as functional foods. *Meat science* 86(1): 49-55.
3. Weiss, J., Gibis, M., Schuh, V., & Salminen, H. (2010). Advances in ingredient and processing systems for meat and meat products. *Meat science* 86: 196-213.
4. Garber, L. L., Hyatt, E. M., & Starr, R. G. (2003). Measuring consumer response to food products. *Food Quality and Preference* 14(1): 3-15.
5. Viana, M. M., dos Santos Silva, V. L., & Trindade, M. A. (2014). Consumers' perception of beef burgers with different healthy attributes. *LWT-Food Science and Technology* 59(2): 1227-1232.
6. Roininen, K., Arvola, A., & Lähteenmäki, L. (2006). Exploring consumers' perceptions of local food with two different qualitative techniques: Laddering and word association. *Food quality and preference* 17(1): 20-30.
7. Loureiro, M. L., & Umberger, W. J. (2007). A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country-of-origin labeling and traceability. *Food policy* 32(4): 496-514.
8. Ares, G., Giménez, A., & Gámbaro, A. (2008). Understanding consumers' perception of conventional and functional yogurts using word association and hard laddering. *Food Quality and Preference* 19(7): 636-643.
9. Van Kleef, E., van Trijp, H. C., & Luning, P. (2005). Consumer research in the early stages of new product development: a critical review of methods and techniques. *Food quality and preference* 16(3): 181-201.
10. Ross, T. P. (2003). The reliability of cluster and switch scores for the Controlled Oral Word Association Test. *Archives of Clinical Neuropsychology* 18(2): 153-164.
11. Hovardas, T., & Korfiatis, K. J. (2006). Word associations as a tool for assessing conceptual change in science education. *Learning and Instruction* 16(5): 416-432.
12. Guerrero, L., Guàrdia, M. D., Xicola, J., Verbeke, W., Vanhonacker, F., Zakowska-Biemans, S., ... & Scalvedi, M. L. (2009). Consumer-driven definition of traditional food products and innovation in traditional foods. A qualitative cross-cultural study. *Appetite* 52(2): 345-354.
13. Ares, G., & Deliza, R. (2010). Studying the influence of package shape and colour on consumer expectations of milk desserts using word association and conjoint analysis. *Food Quality and Preference* 21(8): 930-937.
14. Mitterer-Daltoé, M. L., Carrillo, E., Queiroz, M. I., Fiszman, S., & Varela, P. (2013). Structural equation modelling and word association as tools for a better understanding of low fish consumption. *Food research international* 52(1): 56-63.
15. Piqueras-Fiszman, B., Velasco, C., Salgado-Montejo, A., & Spence, C. (2013). Using combined eye tracking and word association in order to assess novel packaging solutions: A case study involving jam jars. *Food Quality and Preference* 28(1): 328-338.
16. Wagner, W., Valencia, J., & Elejabarrieta, F. (1996). Relevance, discourse and the 'hot' stable core social representations—A structural analysis of word associations. *British journal of social psychology* 35(3): 331-351.
17. Menezes, E., Deliza, R., Chan, H. L., & Guinard, J. X. (2011). Preferences and attitudes towards açai-based products among North American consumers. *Food Research International* 44(7): 1997-2008.
18. Wadsworth, G. (2000, October). Hearing midlife voices: Assessing different methods for researching women's experiences of menopause and midlife. In *Women's Studies International Forum* (Vol. 23, No. 5, pp. 645-654). Pergamon.
19. Modell, S. (2005). Triangulation between case study and survey methods in management accounting research: An assessment of validity implications. *Management accounting research* 16(2): 231-254.
20. Tobin, B. D., O'Sullivan, M. G., Hamill, R., & Kerry, J. P. (2014). European consumer attitudes on the associated health benefits of neutraceutical-containing processed meats using Co-enzyme Q10 as a sample functional ingredient. *Meat science* 97(2): 207-213.
21. Dean, M., Lampila, P., Shepherd, R., Arvola, A., Saba, A., Vassallo, M., ... & Lähteenmäki, L. (2012). Perceived relevance and foods with health-related claims. *Food Quality and Preference* 24: 129-135.
22. Verbeke, W. (2005). Consumer acceptance of functional foods: socio-demographic, cognitive and attitudinal determinants. *Food quality and preference* 16: 45-57.
23. Lyly, M., Roininen, K., Honkapää, K., Poutanen, K., & Lähteenmäki, L. (2007). Factors influencing consumers' willingness to use beverages and ready-to-eat frozen soups containing oat β -glucan in Finland, France and Sweden. *Food Quality and Preference* 18(2): 242-255.
24. i Furnols, M. F., Realini, C., Montossi, F., Sañudo, C., Campo, M. M., Oliver, M. A., ... & Guerrero, L. (2011). Consumer's purchasing intention for lamb meat affected by country of origin, feeding system and meat price: A conjoint study in Spain, France and United Kingdom. *Food Quality and Preference* 22(5): 443-451.
25. Kopalle, P. K., Kannan, P. K., Boldt, L. B., & Arora, N. (2012). The impact of household level heterogeneity in reference price effects on optimal retailer pricing policies. *Journal of Retailing* 88(1): 102-114.
26. Leick, C. M., Behrends, J. M., Schmidt, T. B., & Schilling, M. W. (2012). Impact of price and thickness on consumer selection of ribeye, sirloin, and top loin steaks. *Meat science* 91: 8-13.
27. Carrillo, E., Varela, P., Salvador, A., & Fiszman, S. (2011). Main factors underlying consumers' food choice: a first step for the understanding of attitudes toward "Healthy eating". *Journal of Sensory Studies* 26(2): 85-95.