Sensory analysis of some meat products: Leberwurst – traditional recipe from Banat region

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Abstract

Sensory food analysis is practically as old as humanity itself, but progress has been made only in the past three decades by intensifying scientific research to objectify it.

The systematic researches in the last decades in the field of sensory have led to the accumulation of a rich material on how to apply sensory analysis to control and appreciate the quality of food commodities. Currently, interest in "sensory" issues continues to remain high; this is not accidental because the sensory properties of food commodities are constantly in the spotlight of consumer widespread publicity that responds sensitively and promptly to all the basic transformations occurring in some products and especially those related to sensory characteristics. By sensory analysis of food is understood the examination done with the help of sensory organs (sensation, smell, taste, smell) following a control of the analyst's real capacity and the accuracy of his reasoning, followed by an appreciation of sensory impressions recorded and the statistical processing of the data obtained.

In this study a sensory analysis of meat products on the market of Timişoara, type "- traditional recipes from Banat" was made

Keywords: meat by-product, sensory analysis, statistical analysis
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1. Introduction

There are many traditional meat products prepared in Romania, whose particularity often belongs to the area in which they are prepared. Due to the high impact of these products among Romanian consumers, many leading companies have started to produce such traditional products, especially since they are sold very well during the most important Christian holidays (such as Christmas and Easter Holidays) [1-6].

Leberwust products have been known for many years and prepared in Romanian households during the Christmas holiday season. In particular, meat and certain pigs which are immobilized in gelatine after long cooking of the specific parts and are introduced into natural or artificial membranes (in particular in the case of marketable products) are used. In particular, meat and other pig materials are used, but 'leberwust' products can also be prepared from turkeys or other animals or birds [1-6].

The purpose of this study was the sensory analysis of "leberwust" products marketed all over the country, as well as the multivariate statistical evaluation of sensory analysis data [1-6].

2. Materials and methods

Foodstuffs used for analysis The meat products and other "leberwust" animal raw materials used for sensory analysis were obtained from the shops and supermarkets in the western area of Romania (Timisoara), produced by companies and local companies [1-6].

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Table 1. The scores obtained from the sensory analysis for samples of "leberwust" meat products

Product doc	Ext. aspect	Color	Section aspect	Consistencz	Smell	Taste
L-P0	4	3	2	2	3	3
L-P0	4	3	2	2	4	4
L-P0	3	3	2	3	3	3
L-P0	2	3	3	3	2	3
L-P0	4	3	2	3	3	4
L-P0	3	2	2	2	3	2
L-P0	3	3	3	2	3	4
L-P0	3	2	3	2	3	2
L-P0	4	2	3	1	2	3
L-P0	3	4	3	2	1	3
L-P0	4	2	2	3	2	2
L-P0	4	3	3	2	1	3
L-P1	5	5	5	3	4	3
L-P1	3	3	3	4	3	3
L-P1	3	3	4	2	3	3
L-P1	4	4	4	3	3	2
L-P1	4	4	3	3	2	2
L-P1	4	3	5	3	3	3
L-P1	3	3	3	3	3	3
L-P1	3	4	3	4	3	3
L-P1	3	4	3	3	3	3
L-P1	3	2	4	4	3	3
L-P1	3	3	4	4	3	3
L-P1	3	2	4	5	3	4
L-P2	3	5	5	5	3	5
L-P2	4	3	4	5	5	4
L-P2	3	4	5	5	4	5
L-P2	5	5	3	5	5	5
L-P2	4	5	3	5	5	5
L-P2	5	4	5	3	5	5
L-P2	4	4	5	4	5	5
L-P2	5	5	5	5	5	5
L-P2	5	5	5	5	4	5
L-P2	4	5	5	3	5	5
L-P2	4	5	5	5	5	5
L-P2	3	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	4	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	4	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	5
L-P3	5	5	5	5	5	4
L-P3	5	5	5	4	5	5
L-rt	3	4	4	3	4	5
L-rt	4	4	3	4	4	4
L-rt	4	2	3	3	3	3
L-rt	3	2	2	3	2	4
L-rt	3	2	2	3	3	3
L-rt	4	3	2	2	3	3
L-rt	3	2	1	2	1	3
L-rt	3	2	2	3	3	3
L-rt	3	2	2	3	3	3
L-rt	2	3	2	4	2	3
L-rt	2	3	3	2	1	3
L-rt	2	2	2	2	1	3

Five such products have been selected as follows:
- "L-P0": leberwust with the head - P0;
- "L-P1": leberwust with tongue and spice mixture - 01;
- "L-P2": leberwust with tongue and spice mixture - 02;
- "L-P3": leberwust with tongue and spice mixture - 03;
- "L-rt": leberwust pork recipe.

2.1. Sensory analysis: The sensory analysis of "leberwust" products was done using the scaled ladder method on 1-5, with the following characteristics required to be scored by the selected consumer panel (12 people aged 20 to 24 and a F: M ratio of 5: 1):

      1 - unacceptable product for consumption
      2 - low acceptability for consumption
      3 - average acceptability for consumption
      4 - good acceptability for consumption
      5 - very good acceptability for consumption.

Members of the consumer panel filled out a questionnaire on the acceptability of the products analyzed based on the appearance, color, sectional appearance, consistency, smell and taste of the "leberwust" product. The results obtained from the sensory analysis (Table 1) were then used for multivariate statistical processing [1-6].

3.Results and discussions

From the PC2 versus PC1 score graph obtained from the PCA multivariate statistical analysis of the sensory analysis data for the second set of leberwurst samples (Figure 1), it can be seen that the L-P2 and L-P3 samples are similar and the better-accepted by the consumer, swaying to the right of the graph. L-rt, L-P0 and L-P1 samples were less acceptable. These classifications are mainly determined by the odor, color and section variables for PC1 and in particular PC2 consistency (load graph, Figure 2). A similar classification for these samples is also observed after PC3, with particular emphasis on smell and section (Figures 3 and 4). The total explanation for the three main components studied (see Figure 5 with the residual variance graph) is 78%, with 74% for PC1 and 4% for PC2 and PC3. Therefore, PC1 is sufficient for the classification of leberwurst samples in set 2. This can also be seen from the representation of PC2, PC3 depending on PC1 in the score graph (Figure 6), respectively the influence of independence parameters for this classification (Figure 7).
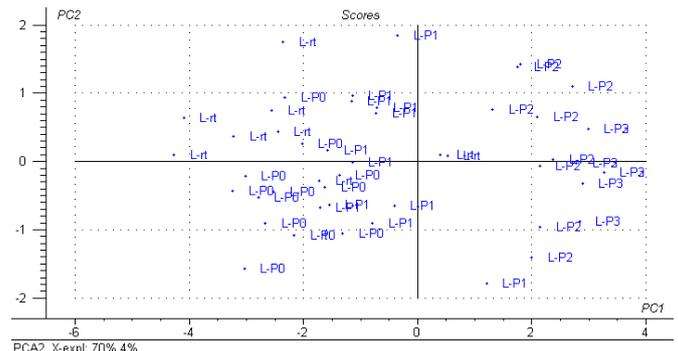

Figure 1. PC2 scores versus PC1 scores in PCA analysis of sensory analysis data for leberwurst samples in set 2
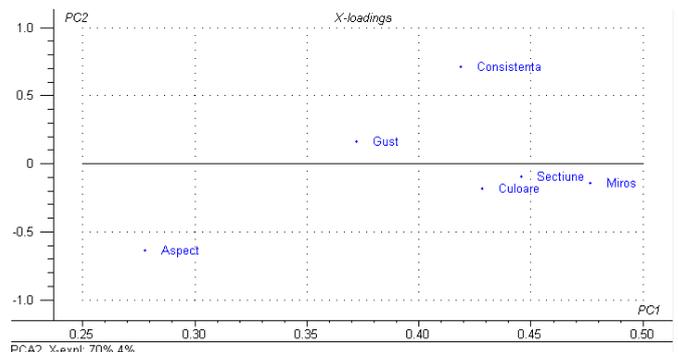

Figure 2. Graph of PC2 vs. PC1 uploads in PCA analysis of sensory analysis data for leberwurst samples in set 2
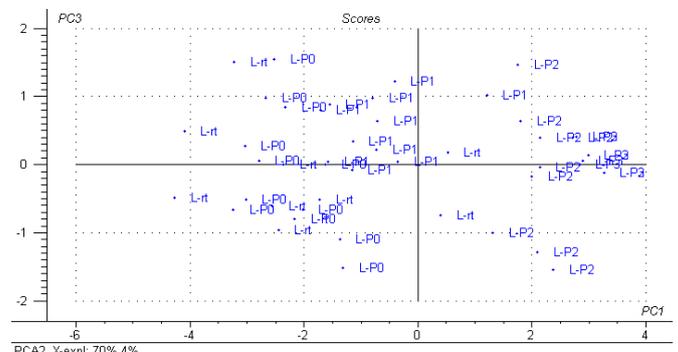

Figure 3. PC3 vs. PC1 scores graph in PCA analysis of sensory analysis data for leberwurst samples in set 2
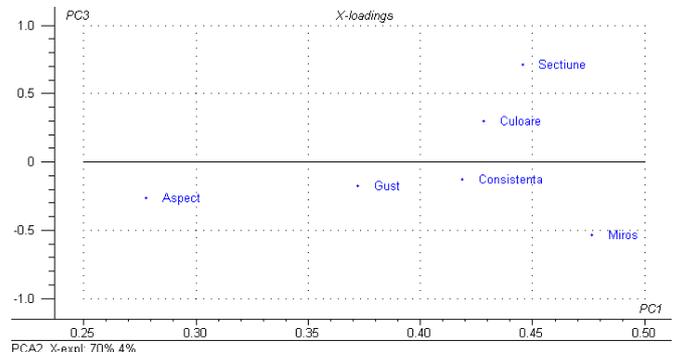

Figure 4. Graph of PC3 vs. PC1 uploads in PCA analysis of sensory analysis data for leberwurst samples in set 2
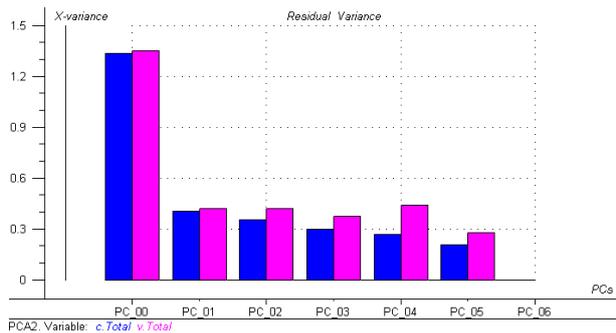
Figure 5. Residual variants of the main components of PCA analysis of sensory analysis data for leberwurst samples from set 2
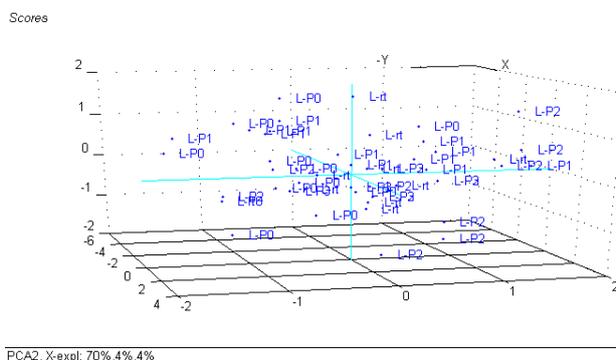

Figure 6. PC2, PC3 versus PC1 scores graph in PCA analysis of sensory analysis data for leberwurst samples in set *2*
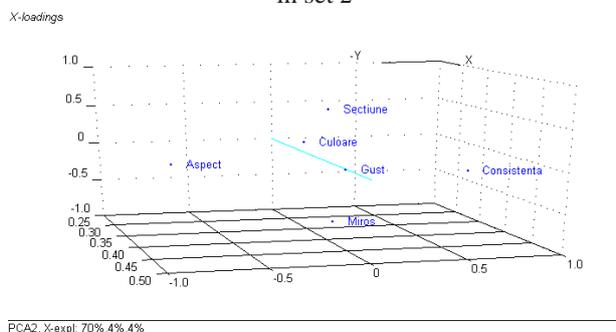

Figure 7. PC2, PC3 vs. PC1 load graphs in PCA analysis of sensory analysis data for leberwurst samples in set 2

4.Conclusions

PCA analysis of sensory analysis data from leberwurst samples (set 2) led to the following main conclusions:

- Leberwurst samples L-P2 and L-P3 are best accepted by the consumer through odor, section, color and consistency as significant parameters.

Compliance with Ethics Requirements. Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

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