COMMUNICATION

Consumer satisfaction with Slavonian Kulen from Black Slavonian or modern pigs

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ABSTRACT

The goal of this research was to determine the consumers sensory acceptance of kulen made from Black Slavonian pigs and kulen of modern pig crosses and to find out how much particular sensory attributes influence overall satisfaction with kulen. The results showed that the consumer satisfaction with kulen from Black Slavonian pigs was the lowest compared to the satisfaction with kulen of modern pig crosses. The satisfaction with kulen taste had the greatest influence on overall satisfaction followed by its odour, colour and appearance.

Key words: Slavonian kulen, Consumers, Satisfaction, Sensory test

Introduction

One of the best-known original Croatian food products is Slavonian kulen - a dry sausage produced traditionally by many pig-breeding families in the region of Slavonia, east Croatia. It is produced from a mixture of minced lean pork from the most valuable cuts (ham, back, shoulder and neck), salt and spices such as minced pepper and garlic, and it is stuffed in pork blind gut. The sausage is naturally fermented, mildly smoked, slowly dried and left to mature for five months or more. The final product has high nutritive value and specific sensory characteristics concerning colour, odour and taste. Kulen is very appreciated and demanded in the Croatian market and it has high export potential (Kovačić et al., 2003). In the past, Slavonian kulen was made principally from the local Black Slavonian pig. Nowadays it is produced mainly from the meat of more productive modern pigs and various crosses. However, with the current trends of protection of traditional foods the issue of originality of Slavonian kulen is of increasing concern. This actuated research of technological (Karolyi et al., 2004) and economical (Juračak, 2004) comparison of Black Slavonian pigs with modern pigs used in the production of Slavonian kulen. Another important aspect in product development is consumer acceptance of a certain product. Many authors stated the importance of the sensory properties on food choice (Bogue and Ritson, 2003; Roeber et al., 2002; Steenkamp, 1997). Sensory properties have a considerable impact in determining perceived quality (Caporale and Monteleone, 2003) and are very important factors which influence the liking or disliking of a product. The goal of this research was to compare the consumer sensory preferences towards kulen made from Black Slavonian pigs and kulen of modern pig crosses and to determine how much particular sensory attributes influence overall satisfaction with kulen.
Material and methods

The kulen sausages used for consumer testing were made at a meat product plant in Slavonia (PZ “Kulen Šokac”, Drenovci, Croatia) following traditional manufacturing procedure. All batches of sausages were made by same recipe but each one with the meat from pigs with different genotypes. In total, batches of 104, 101, 129 and 116 kulens were manufactured from 10 Black Slavonian (BS), 10 Large White x Swedish Landrace (LWxSL), 8 Large White x Swedish Landrace sired with Duroc (LWxSLxD) and 12 Large White x Swedish Landrace sired with Black Slavonian pig (LWxSLxB, respectively. All pigs were raised on the same family farm under the similar housing and feeding regime and were between 16 and 18 months of age at the time of slaughter. During the manufacturing, sausages pass through same processing steps under the similar environmental conditions. At the time of testing all kulen samples were well matured (about 10 months). Consumers’ preferences towards kulen were collected by means of a blind sensory test. The test was performed in September 2004, at two different manifestations; The “Kulen festival” that took place in Vinkovci (Slavonia) and the “Croatian farmers’ products” in Zagreb. The overall satisfaction as well as satisfaction with 4 attributes (colour, taste, odour, and appearance) were measured on a 5-point Likert scale where 1 meant not satisfied at all, and 5 - very satisfied. Every respondent evaluated 2 different kulens which included 6 different sub-samples. The order of the first sample tasted was altered within sub-samples. Kulen samples denoted as A, B, C and D originated from (LWxSL)xD, BS, LWxSL and (LWxSL)xBS pigs, respectively. Sample A was tasted by 120 respondents, sample B 123 respondents, sample C 121 respondents and sample D 124 respondents. Tested kulens were cut into small cubes (approximately 1x1x1cm) and served on a white plate. Additionally, the kulen half with its cross section was presented to the respondents for the evaluation of sausage colour and appearance. Respondents were asked to look, smell and finally to taste the kulen. They were allowed to take as many cubes as needed to make their judgements.

Results and conclusions

Out of 248 respondents, 155 were males. The average respondents’ age was 45.65 (±14.0) years. The average evaluation of overall satisfaction and the average satisfaction with kulen attributes was calculated for each kulen sample (A-D). As it can be noticed from figure 1, kulen C and kulen D gained the same evaluation regarding overall satisfaction (4.13). The average value for kulen A was 3.80 and for kulen B only 3.41. Mann-Whitney test showed that the overall satisfaction with kulen C and D was significantly higher than the satisfaction with kulen samples A and B (P<0.01).

Regarding satisfaction with the tested kulen attributes, sample D achieved the highest scores for colour, odour and appearance, and it had the same score for taste as sample C. The less liked kulen for majority of respondents was kulen B produced from Black Slavonian pigs. No significant differences were found between consumers’ satisfaction with kulen C and kulen D attributes. However, they are statistically significant different from kulen samples A and B (P<0.05). Sample A was also significantly higher evaluated than sample B regarding colour, odour and appearance.

Relationship between overall satisfaction and satisfaction with single kulen attributes

Overall satisfaction ($S_{overall}$) with kulen could be explained from partial satisfaction with their attributes. Using stepwise selection method all attributes were entered in the regression model: colour, taste, odour and appearance. Performed model explained 75% of variability in overall sat-
isfaction. Using regression coefficients we could formulate the model as follows:

\[ S_{\text{overall}} = 0.302 + 0.387 S_{\text{taste}} + 0.198 S_{\text{odour}} + 0.168 S_{\text{colour}} + 0.165 S_{\text{appearance}} \]

As expected the relationship between overall satisfaction and partial satisfactions was positive. Satisfaction with kulen taste had the greatest influence on overall satisfaction. The second most important attribute was sausage odour. Kulen colour and appearance had very similar impact on the overall satisfaction. The acceptance of the kulen produced from Black Slavonian pigs by consumers was the lowest in the present research. However, at the present the quality of traditionally produced Slavonian kulen is not standardised and hence the sensory characteristics of final products may differ among producers, localities and seasons. Therefore, the present research should be repeated with more kulen samples from different producers in order to have more reliable indications about consumers' preferences. The results of this research give a first insight into consumer preferences regarding sensory characteristics of kulen sausage and the importance of different kulen attributes. Apart from the sensory properties of a product, food choice is also influenced by the other information such as identity, origin, safety and nutritional properties (Caporale and Monteleone, 2004), as well as product name, package or label (Bárčenas et al., 2001). Therefore, it is necessary not only to satisfy consumers’ expectations regarding kulen sensory properties but also their expectations regarding other relevant kulen characteristics.

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