

Consumer attitudes to porcine blood and surplus protein in functional and high protein foods

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Abstract – Understanding consumers’ attitude towards porcine blood and protein hydrolysates is essential for development of high protein foods. Three studies survey consumers’ attitudes to new products with protein hydrolysates of porcine origin through on-line questionnaire and in hall tests. The results show that forty percent of the Danish consumers are willing to compromise on taste for health. The Danish consumers aged 65 years and older have a neutral perception of protein from porcine blood and have little knowledge and attention on protein in their diet. Several consumers are not aware that foods with high protein content exist. Informing consumers so they gain knowledge about protein quality, hydrolysed proteins and their benefit, should be an important part of the strategies when promoting hydrolysates in meat products.

Key Words – Blood, Consumer attitudes, Nutritional quality

I. INTRODUCTION

A combination of world demographics and changes of western dietary patterns has generally increased the awareness about protein nutrition. This gives an opportunity for the meat industry to make food innovation and culinary design of foods pointing new specific dietary and lifestyle requirements related to the future growing demand. Slaughterhouse blood and side streams are significant parts of the meat production food chain and represent a rich source of proteins which makes them favorable as natural nutrition with high amount of essential amino acids – especially important for elderly consumers to counteract sarcopenia [1]. However, blood and some meat parts are less familiar to many of the modern consumers and are for variety reasons perceived less esthetically pleasing ingredients or foods. To overcome this, hydrolysis of the blood and surplus meat is a possibility to utilize these animal proteins in new food products. Understanding consumers’ attitude towards foods based on these protein ingredients is essential. Especially elderly consumers are skeptical towards new products [2]. A study by Grunert et al. [3] demonstrates that the Nordic consumers mainly prefer familiar ingredients in functional foods. Three consumer studies were performed to assess consumer attitudes to new products with high protein. The first study investigated consumers’ attitudes towards functional and high protein meat products and the consumers’ willingness to compromise on taste for health; The second study examined elderly consumers’ attitudes towards addition of hydrolysed protein from porcine blood in wholegrain buns; And the third study surveyed attitudes and habits regarding protein supplement.

II. MATERIALS AND METHODS

Study 1: A total of 1499 (male n = 787, female n = 712) randomly recruited by Danish internet users answered an on-line questionnaire. The questions were related to 3 categories and separated in background, factual and attitude variables and analysed according to survey data studied by Partial least square regression (PLSR) method by Martens et al. [4].

Study 2: Agreement of 11 attitude statements on a 5-point Likert scale was rated by 106 elderly consumers in the age 65+ (male n = 25, female n = 81) in a hall test. All consumers were given the information about the beneficial quality of protein from porcine blood before. The data were explored in a Principal Component Analysis (PCA). The consumers as x-variables in a score plot and the data from the scaling of the 11 attitude statements as y-variables in a correlation loadings plot.

Study 3: In a hall test, 101 consumers in age of 65+ (male n = 21, female n = 80) completed a questionnaire about attitudes and habits regarding protein supplement. The test was performed without any introduction to

the aim or background of the study. Data were processed descriptively supplemented by a Chi square test. All three studies were performed in Danish with Danish consumers.

III. RESULTS AND DISCUSSION

Study 1: The Danish consumers can be divided into three groups: i) The health and environmental concerned, which see themselves as healthy. ii) Consumers who to some extent accept protein additives and show interest in functional meat products and iii) Consumers who compromise on taste for health and believe functional meat products are healthy. The key finding is that forty percent of the Danish consumers are willing to compromise on taste for health if they can feel that the food has a beneficial effect. Study 2: The average agreement scores of the 11 attitude statements are all equal to “Neither disagree nor agree” on the Likert scale which shows that the consumers have a neutral perception of wholegrain buns with protein from porcine blood. In addition, strong correlations are found between the attitudes of naturalness of wholegrain buns and choice of carrier product and acceptance of wholegrain buns and higher value perception of wholegrain buns with protein from porcine blood ($p < 0.01$). Study 3: Only 14 consumers responded that they eat foods with extra protein. To some extent these 14 consumers are characterized by paying attention to the protein content of the diet ($P = 0.02$). Some consumers ($n=36$) did not know that foods with extra high protein are available on the market and some ($n=24$) replied that foods with extra protein were not relevant to them. The findings show that Danish consumers’ attitudes are not identical and that porcine protein hydrolysates in functional and high protein foods will be accepted by the consumers if they perceive the benefit as a personal relevance. It seems that acceptance of functional meat products relate to the perception of naturalness of the ingredient in the food and that consumers’ decision to accept functional foods and high protein foods rely on health benefit belief. The main barrier is to link nutritional benefits to the consumers’ personal needs. This is consistent with the findings by van der Zanden et al. [2] and Grunert et al. [3].

IV. CONCLUSION

The findings have provided insight in Danish consumers’ attitude and acceptance of functional meat products. The perception of naturalness of the ingredient in the product and consumer’s decision to accept functional foods was influenced by health benefit belief. This result demonstrate that increasing awareness of the nutritional qualities porcine protein hydrolysate and link these to the consumers personal benefit, should be an important part of the strategies to combat the fact that these are perceived less esthetically by the modern consumer.

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