



International 58th Meat Industry Conference “Meat Safety and Quality: Where it goes?”

Soybean and gluten in meat products - consumer protection strategy

Vesna Jankovic^{a,*}, Vesna Matekalo-Sverak^a, Brankica Lakicevic^a, Danka Spiric^a, Radivoj Petronijevic^a

^a*Institute of Meat Hygiene and Technology, Kacanskog 13, 11000 Belgrade, Serbia*

Abstract

Soybean and gluten belong to the group of basic food allergens and thus they are potentially hazardous. This work gives an overview of the analysis of meat products from retail shops for the presence of soybean and gluten, by using an ELISA method, not only because of the quality and authenticity but also in order to *protect consumers' health*. According to the results, control is necessary, because in 29.6% cases the presence of these allergens was identified in meat products but not indicated in their declarations.

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1. Introduction

Statistics in developed countries clearly show that up to 20% of people suffer from a type of food sensitivity. Reactions to foodstuffs which contain chemical or microbiological contaminants or pharmacologically active substances are provoked in all individuals who consume such foodstuffs in sufficiently big quantities¹. Reactions provoked only in sensitized individuals, who make up a small proportion of the population, can be divided into reactions of psychological intolerance (aversion, etc.) and reactions of true physiological hypersensitivity to certain

* Corresponding author. Tel.: +381-11-2650-655; fax: +381-11-2651-825.

E-mail address: vessna@inmesbgd.com

foodstuffs or food ingredients^{1,2,3}.

Because of the complexity of the issue, nowadays the manufacturers of foodstuffs are obligated to properly indicate possible presence of potential allergens, and to have in place good systems of control and traceability so that they can adequately inform all categories of consumers, particularly hypersensitized individuals who often have to keep to restrictive diets as their lifelong treatment^{1,2}. Use of ingredients of plant origin in production of meat products is topical and attractive both for the producers and consumers. Soybean protein products are widely used in the meat industry because of their high nutritive value, favourable technological and organoleptic characteristics and low price as well^{3,4}. Wheat gluten is used in preparation of various meat and fish products because of its unique adhesive, cohesive and film forming characteristics. Gluten is very effective and it is used for binding meat chunks or trimmings together (to form steaks or chops) and it may be also applied simply by dusting meat pieces with dry gluten. It is also used as an emulsifier in producing sausages and other meat products.

Therefore, considering consumers' health, it is necessary to conduct adequate controls and to use appropriate analytical methods for detection of soybean and gluten in meat products^{4,5,6}.

2. Materials and methods

For allergen detection, the following commercial ELISA kits were used: Tepnel and Romer Lab - AgraQuant Soy (for soybean) and the Biokits-Tepnel ELISA and the Immunolab ELISA (for gluten). Altogether, 100 samples of meat products from retail shops were tested. Statistical analysis was performed by using Statistica 9.1 for Windows, Stat Soft, Tulsa, Oklahoma, USA.

3. Results and discussion

Summary of comparative analysis for soybean and gluten protein in meat product samples ($n = 100$) is presented in Table 1. Test results showed that of 100 samples of meat products, the presence of soybean was detected in 29%, gluten in 4%, while in 67% of samples, these allergens were not detected. Fig. 1 presents a review of the detected presence of allergens in products without the indicated presence in the declaration. The detected concentration of soybean for the Tepnel kit ranged from 1.2% (fermented sausages and meat sausages), to 9.6% (boiled meat sausages), while the values for the Agra Quant were outside the quantification range of 1000 ppb (Table 1). As regards gluten, almost equal concentrations were detected by both kits (Table 1). Out of the 27 samples of meat products with declarations that did not indicate that they contain soybean or gluten, 8 (29.6%) showed the presence of these allergens (Fig. 1). The results were in conformity with other research^{9,10,11,12}.

Based on the ANOVA analysis, there was no statistically relevant ($p \geq 0.05$) difference between the Tepnel and Immunolab kits ($F(5, 32) = 0.008$, $p = 0.93$). Also, based on the parameters of regression statistics, there was a high level of correlation (96.6%), which was in conformity with the data obtained by the ANOVA and t-test. The results for soybean were not compared and statistically processed because the results obtained by the Agra Quant kit were beyond the limit of detection (>1000 ppb) and therefore could not be quantified.

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