

Food safety knowledge and awareness of primary school children

Keywords: food safety, food hygiene, risk perception, awareness raising, attitude

1. Summary

The National Food Chain Safety Office (NFCSSO) is working to ensure the highest possible level of food safety from farm to table. As an integral part of this, particular attention is paid to minimizing risks that result from the potential lack of knowledge or from the misconceptions of consumers by its awareness raising programs, and emphasis is put on this even in the case of young children who are most receptive to these ideas. In our paper, the results of the survey intended to form the basis of this activity and investigating the knowledge level and awareness of the children are presented. Our research experience indicates that the sometimes incomplete food safety knowledge of children and, in addition, the fact that risks are perceived to be less than actual levels in certain cases justify the coordinated work of teachers and authority experts to instill the necessary knowledge in children already in primary schools.

1. Introduction

Research results demonstrate that the average consumer thinks that he or she is less responsible for the safety of the foods consumed by them than the other stakeholders of the food chain or the authority responsible for food chain supervision [1], [2]. According to the 2016 report of EFSA (the European Food Safety Authority) on food-borne diseases, based on feedback from 27 EU member states, nearly 70% of the cases caused by the most commonly registered bacterial pathogen, *Salmonella*, can be traced back to households. This frequency exceeds the number of cases originating from the catering industry [3].

Food industry enterprises seeking to maintain food chain safety risks at the lowest possible levels through adopting technological innovations and running risk-based quality assurance systems. However, the expected risk reduction did not manifest itself in the number of food-borne cases [4]. The reason for this lies in improper hygiene practices of households [5], [6], [7]. These include, among other things, incorrectly ingrained habits related to the storage and preparation of foods, as well as to the handling

of leftovers, and sometimes a real lack of knowledge [8], [9], [10].

Just as our routine everyday activities, incorrect food preparation and eating behavior patterns become habitual, and these can only be altered in adults with significant effort [11]. Recognizing this, the subject of several studies has been to determine which stage of life is best suited to acquire knowledge related to home food safety, and they unanimously found the early stages of life, early childhood and adolescence to be the most effective [12]. The food safety knowledge of the above-mentioned age groups and the related attitudes have been assessed by numerous international studies, which showed that their knowledge of food hygiene and food handling was fundamentally adequate, but there were areas where deficiencies needed to be addressed [13], [14], [15]. In a survey of 11-12 year old children (n=1,272) by Ovca et al., in addition to questions aimed at their knowledge, it was also examined how children see their role in maintaining home food safety. In terms of individual responsibility, there was an interesting consistency between the results obtained and the attitude of the adult age group. 74.3% of children think that food poisoning is more likely to occur at

¹ National Food Chain Safety Office

² Szent István University, Faculty of Food Science

a restaurant than at home [15]. Underestimating their own responsibility has a negative impact on consumers' perception of risk, which may develop into a significant risk factor by the time they reach adulthood when combined with a lack of knowledge.

Domestically, there is little information available that would provide a comprehensive picture of the awareness, food safety knowledge and risk perception of children as prospective buyers [16]. The objective of the present research is to expand the information that serves as the basis for future awareness raising activities. This article processes primarily the results of questions focusing on consumer awareness, risk perception and knowledge levels.

2. Research methodology

In accordance with the Food Chain Safety Strategy, NFCSO plans and implements communication campaigns and awareness raising programs aimed at the public on the basis of repeated consumer surveys, and the age group of young children is no exception to this [16]. Following the 2014 survey of NFCSO of 267 fourth grade (10-11 years old) students [15], this time the mapping of the expertise of schoolchildren in food safety issues was continued with more children (n=662) covering a wider age group (grades 5 to 8, 10-14 years of age), in collaboration with the Faculty of Food Science of Szent István University. Our survey was realized through parental consent ensuring the participation of the children and with the involvement of the teachers.

The composition of the sample according to gender and grade is shown in **Table 1**. Our questionnaire contained open-ended questions that could be answered by the children freely, while in the case of closed-ended questions, opinions could be expressed with the help of a five-point Likert scale or in a multiple choice format. Statistical analysis of the data was carried out with the IBM SPSS Statistics 22.0 software package.

3. Results

4.1. Investigating awareness

In order to assess the awareness of future consumers during the selection and consumption of foodstuffs, they were asked what the information was, in their opinion, that should be absolutely included on the packaging of a food item (**Table 2**). In terms of spontaneous mentions, the expiration date was mentioned by most of them (489 children), closely followed by the list of ingredients (477 mentions). In addition, 180 students thought it mandatory to indicate the place of origin, 131 would require nutrition information and energy content on the label, and 128 would like to see information on product weight and volume and on the amount of product in the packaging. It is interesting to note that information

that would help us identify the products accurately in the case of a possible food safety hazard, such as the name of the product, the manufacturer, the distributor, the date of manufacture or the bar code, were mentioned significantly less frequently. It makes one think that only 37 students considered it important to indicate storage and use recommendations for the product on the packaging. This is surprising, because in order for the product manufactured by the producer and bought by us in the stores to be safe when it reaches our table, storage and use recommendations indicated on the packaging have to be taken into consideration, therefore, a conscious consumer strives to get to know this information.

4.2. Risk perception

Understanding consumers' evaluation of the severity of risks is also essential for the development of educational elements. In our questionnaire, we tried to find the answer to the question of how children decide if a food can be consumed safely or not, how spoiled food can be recognized. As an answer to our open-ended question, unpleasant smell as a characteristic of spoiled food was mentioned by 521 respondents. The consumability of foods was evaluated on the basis of the appearance of mold by 356 students. A significant number of people (303) based their decision that a food was unfit for consumption on an unpleasant taste when trying the food. Other changes visible to the naked eye that were mentioned by several respondents included color change (245) and changed texture (197). A significant proportion of those filling out the questionnaire (103) considered foods to be spoiled after the expiration date (**Table 3**).

Certain foods, by their nature, are associated with a higher risk factor that must be taken into account during their storage, preparation and handling as a prepared food. Therefore, consumers need to know which foods they should pay particular attention to, regarding the above aspects. Foods listed in the questionnaire had to be graded by the children on a five-point Likert scale according to the risk attributed to them. The highest average scores were given to coke (3.55) and chips (3.37), while ground meat was thought to be less risky (3.08). Chocolate (2.81) was followed by eggs, which were judged to be moderately risky (2.48). French salad (2.03), bread (1.99) and apples (1.57) are believed to be low risk foods (**Figure 1**).

4.3. Knowledge level

In our question about the optimal operating temperature range of a refrigerator, 65.57% of students responded correctly, but 19.22% of them thought that refrigerators should be operated at temperatures between -4 °C and 0 °C, while 15.31% thought is satisfactory if the inside temperature of the refrigerator does not exceed 15 °C (**Figure 2**).

It is a priority issue not only during the preparation of foods, but also during the consumption of leftovers of prepared foods to be aware of the methods suitable for the efficient destruction of pathogens that may be present in the food. Roasting/baking was chosen, correctly, as the most effective method by 2/3 (66.87%) of the respondents, however, the remaining, not insignificant part of respondents found other methods, in addition to heat treatment, suitable for making foods safe, such as washing (22.92%), freezing (7.91%) or cooling (2.30%) (**Figure 3**).

4. Conclusions and recommendations

During the evaluation of the results, the interesting thing was found that the boundary separating the concepts of nutrition science and food safety had not been perceived by the children, which is clearly reflected by the fact that foods generally considered unhealthy from a nutrition point of view (coke, chips, chocolate) were believed to be more of a food safety risk than foods really posing a food safety risk (ground meat, eggs). Due to the blurring of the line that separates the fields, the risks assigned to meat and eggs may be underestimated, even though, according to the report of EFSA, the source of foodborne illnesses is linked to meat and other meat products in 44.8% and to eggs and other egg products in 9.0% of the cases [3].

In light of the responses to the questions assessing the food safety knowledge of the 5th to 8th grade age group, the focus of our research, many of them exhibited deficiencies in connection with the storage and handling of foods. In addition, it must be kept in mind that the existing risk which is due to a lack of knowledge can be significantly increased by the fact that the knowledge is not always put into practice [18].

For example, such a case may be if the consumer knows the optimal temperature range of the refrigerator, but attention is not paid to its regular checking. That is why we must strive to eliminate the identified deficiencies and, by placing emphasis on the critical points uncovered by our research, incorporate the theoretical and practical knowledge to be learned in the school curriculum. As the two essential elements of a successful knowledge transfer, the involvement of teachers highly qualified in the field of food safety [13], [19], and the development of an effective educational toolkit [20], [21] could be highlighted, the effectiveness of which can be monitored by further consumer surveys after its launch.

6. References

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