

## Research

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# Consumer Perceptions of Peanuts and Peanut Allergy: The EuroPrevall Results of Focus Groups in Poland

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## ABSTRACT

**Background:** Food allergies represent a growing public health concern worldwide. For many people, peanut is a considered one of the basic foods, while for food industry, groundnuts are the cheapest substitute for other nuts. They are added to many goods. The aim of the study is to portray the “peanut culture” in Poland, by reporting perceptions of an ordinary consumer as regards peanuts, peanut products and peanut allergies. The study tries to explore the role of peanuts and peanut products in diet and life of Polish consumers, as well as their awareness about peanut allergy and restrictions on peanut consumption.

**Methods:** Three focus groups sessions with consumers were carried out: C1 – 10 participants (part-time university students, recruited during their courses. It is important to note, however, that part-time studies in Poland are held during the weekends and consist primarily of people who work), C2 – 12 participants (participants were recruited through the advertisement in local/regional supermarkets) and C3 – 10 participants (a group of 12 people were recruited via regional newspaper (*Dziennik Polski*) in the vacancy announcement). The protocol was prepared as part of the EuroPrevall project, Work Package 2.3. All sessions lasted between 45 and 60 minutes. Each session was type-recorded and transcribed. Each transcript was coded using Atlas.ti (5.0) software for qualitative analysis.

**Results:** The current paper focuses at themes related directly to peanut consumption habits and awareness/perception of peanut allergy, specifically: personal preferences for peanuts; types, forms and place of peanut consumption; tradition of peanut consumption and its change over years; health issues and awareness of peanut allergy; early exposure to peanuts. Consumers in Poland can be divided into those who like peanuts and eat them, those who do not like peanuts for various reasons (i.e. lack of habit to eat peanuts) and never eat them and those who eat peanuts occasionally, i.e. in pubs, bars, at parties, but do not usually buy them. The latter category involves most participants.

**Conclusion:** The results described in this paper indicate that more information is needed as regards food and peanut allergy. Peanuts in hidden form require special attention and clearer labelling, which is important especially for children suffering from peanut allergy. Authorities need to publish guidelines as regards peanut consumption during pregnancy and breastfeeding, or at least doctors should inform patients about the risk of developing peanut allergy as a result of early exposure.

**KEYWORDS:** Focus groups; Peanut allergy; Peanut consumption; EuroPrevall.

## INTRODUCTION

With no doubt, food allergies represent a growing public health concern worldwide. Although an individual can be allergic to any food, there are several products that are responsible for 90% of all food-allergic reactions, specifically: milk, egg, peanuts, tree nuts, fish, shellfish, legumes, fruits and cereals.<sup>1</sup> Peanut allergy raises much concern due to the fact that it is responsible for the majority of severe food allergic reactions—anaphylaxis,<sup>2</sup> usually lasts for life

(only 20-25% children outgrow peanut allergy, as opposed to other allergies outgrown in 80%) and can be provoked by negligible quantities in sensitized individuals.<sup>3,4</sup> Peanut allergy affects 1-2% of the world's population, but it varies between countries. Experts have assessed that more than 1% of the North American and British schoolchildren is allergic to peanuts.<sup>5</sup> The highest prevalence is in the US, Canada and the UK (1-3%) and the lowest in France, Denmark and Israel (0.2-0.7%).<sup>6</sup> Several population-based studies, conducted several years ago, estimated that the prevalence of peanut allergy in developed countries was between 0.6% and 1.0%.<sup>7-10</sup> The follow-up studies demonstrated that the prevalence of peanut allergy has increased up to 1.5%,<sup>11</sup> indicating that the problem is growing.<sup>12</sup> It raises questions about immunologic, genetic, dietary and environmental aspects that may influence the frequency of peanut allergy.

For many people, peanut is considered one of the basic foods, while for food industry, groundnuts are the cheapest substitute for other nuts. They are added to many goods. Peanuts, traditionally perceived as food, are also used for non-food products. Many studies attempted to establish a link between peanut allergy prevalence in the populations and their tradition of peanut production, processing and consumption patterns. The majority of these efforts, for obvious reasons, concern the largest exporters of peanuts, notably China.<sup>13,14</sup> Except for accidental exposure to products containing peanuts, such relationship should be analyzed at epidemiological rather than at individual level, following the logic that individuals with peanut allergy avoid peanuts, and *vice versa*, peanut consumers do not suffer from peanut allergy. Boulay et al<sup>15</sup> aimed at identifying, based on literature review, factors influencing allergenicity of peanuts, starting from peanut sensitization and reviewing peanut production, processing and consumption patterns, including weaning practices, that may possibly contribute to growing prevalence of peanut allergy. The authors reported lack of sufficient evidence linking peanut allergy with the above factors and addressed this problem in a series of the research questions.

This paper aims to portray the "peanut culture" in Poland, by reporting perceptions of an ordinary consumer as regards peanuts, peanut products and peanut allergies. The study was not attempting to search for a relationship between peanut culture and peanut allergy, as it would require specific clinical and epidemiological data. It simply tries to explore the role of peanuts and peanut products in diet and life of Polish consumers, as well as their awareness about peanut allergy and restrictions on peanut consumption. The study has been motivated by the growing consumption of peanuts in Europe and in Poland, and at the same time, the increasing prevalence of food allergies. Nevertheless, the rate of peanut allergy is relatively low in European countries, in contrast to America. It was found that fried and boiled peanuts are less allergenic than roasted peanuts, due probably to high temperatures related to this processing method.<sup>13</sup> However, majority of products in Europe and in US are based on roasted peanuts. The only difference is associated with the

consumption of peanut butter, which is low in Europe and in Poland and high in America.<sup>16</sup> The current study was based on three focus groups conducted with the consumers sampled according to socio-economic and demographic factors. The aim was not to provide a representative study of the whole Polish population, but to gain views of perceptions, levels of knowledge about peanuts and attitudes towards peanut consumption in different social groups.

Peanuts are not cultivated in Poland. Domestic consumption of peanuts and peanut products is based entirely on imports. According to FAOSTAT data,<sup>17</sup> groundnuts were introduced to Poland in 1999, which makes them a relatively new product for the Polish consumer. However, peanut consumption in Poland systematically grows; for example, in 2009 peanut consumption was 37.2 tons. Prusak et al<sup>18,19</sup> attempted to outline experiences in peanut cultivation, trade and processing in Europe, focusing on four European countries with different peanut experiences, namely Poland, Bulgaria, Spain and the UK. Bulgaria and Spain are both peanut producers, UK is the largest peanut consumer and one of the leading European importers of peanuts, while Poland was described as a country with systematic growth of peanut supply over years. This work was based on documentary analysis and interviews with 32 experts involved in various stages of the peanut chain, such as peanut processors, peanut traders, retailers, market specialists, technologists and food manufacturers who use peanuts in the production. Finally they proposed a peanut chain diagram, illustrating each stage of processing in-shell and shelled peanuts. It shows thermal and mechanical processes and the resultant end peanut products available for the European consumer. It also demonstrated critical points in processing technologies that might be responsible for higher allergenicity of peanuts.

As regards peanut processing methods applied by Polish processors, Hozyasz<sup>20</sup> pointed out that due the introduction of new western technologies, determining the use of peanut flour in food industry, the increase in peanut consumption in Poland is to be expected (peanut flour is a cheap ingredient of various confectionary and bakery products, as well as sauces, dressings and giblets). Other peanut-based ingredients include fat and oil. Peanut fat is usually used in Chinese and Vietnamese restaurants, which are quite popular in Poland. Peanut oil is added to different milk blends and some medicines, i.e. oil solutions of vitamins D and A. Besides, peanut butter and almond butter containing peanut admixture are becoming more and more popular in Poland. The authors also examined labels of 83 snacks most popular among schoolchildren in Poland, revealing that 34 of them contain peanuts or peanut trace-traces. As regards studies on peanut consumption,<sup>21</sup> have already published the EuroPrevall paper on characterization of peanut consumption in Poland, Bulgaria, Spain and the UK, while Boulay et al<sup>22</sup> focused at peanut exposure in these countries during pregnancy, breastfeeding and complementary feeding. It was based on a series of focus groups with mothers and carers of young children. The present paper extends the study by Sora et al,<sup>21</sup> focusing solely on the

Polish consumers, and analyzing their perceptions and attitudes towards peanuts more thoroughly.

## METHODOLOGY

### Recruitment and Selection

Three focus groups sessions with consumers were carried out: C1 – 10 participants, and C2 – 12 participants, and C3 – 10 participants. Participants of C1 were part-time university students, recruited during their courses. It is important to note, however, that part-time studies in Poland are held during the weekends and consist primarily of people who work. Thus, besides the convenience of the recruitment procedure, there are many other advantages, such as diversity of age (part-time courses usually gather students from 18 up to no limits, in contrary to full-time courses consisting of people from 18 to 24 years on average), diversity of professional background and diversity of the place of living. Participants of C2 were recruited through the advertisement in local/regional supermarkets. Candidates were asked *via* short telephone interview about their age, education and living place, and finally a group of 12 people best matching the pre-specified profile were selected to participate in the discussion. All of them turned up at the session. Participants of C3 were recruited *via* regional newspaper (*Dziennik Polski*) in the vacancy announcement, which was placed for two days: Monday 28 April 2008 and Tuesday 29 April, 2008. Overall, we received 32 calls. Candidates were asked *via* short screening telephone interview about their age, education and living place, and finally a group of 12 people best matching the pre-specified profile were selected to participate in the discussion. However, only 10 of them turned up at the session. The socio-demographic characteristics of participants are described in Table 1. Individuals with peanut allergy were invited to other sessions.

### The Focus Group Protocol

The protocol was prepared as part of the EuroPrevall project, Work Package 2.3. It was based on the literature review conducted by Boulay et al<sup>15</sup> and was the same for four partner countries: Poland, Bulgaria, UK and Spain, who participated in this Work Package. The protocol was originally developed in English language – all the partners formulated a list of questions and provided their comments iteratively. After collective agreement on the final version of the protocol, it was translated into native languages. The protocol covers the following themes:

- General eating and snacking habits;
- Peanut consumption;
- Awareness of products containing peanut;
- Food and peanut allergy;
- Early exposure.

The order of the discussion was not prescribed and was up to the moderators, whose role was to ensure that all the above

issues have been addressed.

**Table 1:** Socio-Economic Profile of Focus Group Participants.

Parameters	C1	C2	C3
<b>No. of participants</b>	<b>10</b>	<b>12</b>	<b>10</b>
<b>Gender</b>			
Male	2	7	4
Female	8	5	6
<b>Age</b>			
18-25	7	2	0
26-35	0	3	2
36-45	2	1	3
46-55	1	6	4
>55	0	0	1
<i>Missing data</i>	-	-	-
<b>Education</b>			
Primary	0	0	0
Vocational	0	6	0
High school	9	3	4
Bachelor/Master	0	2	5
Doctoral	0	0	0
Other	1	0	0
<i>Missing data</i>	-	1 missing	1 missing
<b>Income in PLN/ per month*</b>			
<1000	4	6	1
1000-1500	4	3	3
1500-2000	0	2	2
2000-2500	0	0	1
2500-3000	0	0	1
3000-3500	0	1	0
3500-4000	0	0	0
4000-5000	0	0	1
>5000	0	0	0
<i>Missing data</i>	2 missing	-	1 missing
<b>Place of living</b>			
City (>200.000 citizens)	6	5	8
Town	1	0	1
Countryside	2	7	1
<i>Missing data</i>	1 missing	-	-
<b>Children</b>			
Yes	2	9	6
No	8	3	4
<i>Missing data</i>	-	-	-

\*The average salary in the dimension month was in 2006-2009 years 2477.23-3102.96 PLN. Considering the value of PLN to US dollars it was about 707.78-886.56 USD.<sup>22,23</sup>

## PROCESS

All focus groups were organized in Kraków, Poland (Jagiellonian University Medical College). Before each session, participants were informed about the purpose of the research, and

asked for permission to type-record the session, as well as they gave oral consent to take part in the session. Participants were informed about the possibility of resignation from participation in a focus group at any time, or the possibility of not answering questions. All sessions lasted between 45 and 60 minutes. At the end of each focus group, participants were asked to fill in a questionnaire. Each participant was rewarded for his/her participation in the focus group after the session. The value of the reward equivalent to the amount of 60 PLN (about 15 USD) and was equivalent to the hourly rate for the work of a person holding a higher education in this period in Poland. Each participant received a number code (1-12), which stayed the same during the discussion and in the questionnaire.

## DATA ANALYSIS

Each session was type-recorded and transcribed. Each transcript was coded using Atlas.ti (5.0) software for qualitative analysis. The researchers from four partner countries developed the coding framework jointly. Focus group transcripts were not translated into English, except for selected quotes used in this paper.

## RESULTS

This section presents findings in relation to the selected themes of the focus groups with consumers. The original material has therefore more information than is reported in this paper, especially with respect to general eating and snacking habits. The current paper focuses at themes related directly to peanut consumption habits and awareness/perception of peanut allergy, specifically: personal preferences for peanuts; types, forms and place of peanut consumption; tradition of peanut consumption and its change over years; health issues and awareness of peanut allergy; early exposure to peanuts. These themes are illustrated by the relevant quotes.

### Personal Preferences for Peanuts

Participants rarely made a direct reference of peanut consumption patterns to age, gender or life course (i.e. teenagers eat peanuts), however, it was mostly female participants who admit to like and regularly eat peanuts. Consumers in Poland can be divided into those who like peanuts and eat them frequently (1-2 person (s) per each focus group), those who do not like peanuts for various reasons (i.e. lack of habit to eat peanuts) and never eat them (1-2 person (s) per each focus group) and those who eat peanuts occasionally, i.e. in pubs, bars, at parties, but do not usually buy them. The latter category involves most participants. Those consumers who claimed to like/eat peanuts stated that peanuts are nice, improve one's mood or they are a convenient snack while talking to friends:

*"I eat hazelnuts, but peanuts too, I like peanuts, I feel good when I eat them, and they increase serotonin level".* (C1, female, 46-55-year-old, 1 child).

*"I must admit I love peanuts, I eat plenty of them, and I'm a*

*peanut-addict!"* (C2, female, 46-year-old, 3 children).

It is worthy to note that in all focus groups, people described peanuts as 'addictive', in the sense that it is difficult to stop eating them once a package/can is opened:

*"Once you start eating them, you can't stop till the last peanut is eaten".* (C2, male, 46-year-old, 4 children).

*"I can tell you from my own experience that peanuts are very addictive. Once you open a can or a package of peanuts you have to eat it all".* (C3, male, 26-35-year-old, no children).

*"I start to eat peanuts in hypermarket after buying them and I continue on a way home, usually I finish everything before I reach home".* (C3, male, 36-45-year-old, no children).

One participant suggested that eating peanuts is a way to combat stress:

*"We live faster, have more stress, so it is somewhat convenient to reach for a can of peanuts, and eat, and eat".* (C1, female, 18-25-year-old, 1 child).

The reasons for disliking/not eating peanuts varied from taste preferences, lack of habit to eat peanuts to risk perceptions related to health:

*"I do not like peanuts; I like other nuts, pistachios for example, but not peanuts".* (C1, male, 36-45-year-old, no children).

*"I like all snacks but peanuts, I eat crisps, salted sticks, fruits, but I can't eat peanuts. I just don't like them".* (C1, male, 18-25-year-old, no children).

*"I limited the amount of peanuts I used to eat because of the common opinion that peanuts are very heavy and harmful to health, although I don't know why, no one told me".* (C3, male, 26-35-year-old, no children).

Although the frequency of peanut consumption depends on individual, most people declared eating peanuts 'rarely' or 'sometimes', as often as they meet with friends and go to the pub or bar. Thus, those who like going out appear to consume peanuts more frequently, although often 'absentmindedly', it makes no difference to them whether they eat peanuts or whatever snacks offered with drink or beer:

*"I don't buy peanuts, so I eat them mostly in pubs or bars, when I'm out with my friends, but it really doesn't matter whether I eat peanuts or crisps though, I eat whatever is in sight".* (C1, female, 18-25-year-old, 1 child).

### Types, Forms and Place of Peanut Consumption

Types of peanut products consumed may be categorized as follows: Apparent form, hidden form, and peanuts accompanying

other products. In apparent form, peanuts in Poland are mostly eaten as snack; so snacking habits determine peanut consumption patterns. The discussion revealed that peanuts are mostly bought, consumed and regarded as “salted snack”, and primarily because of the sensory qualities. Consumers distinguish between peanuts in shell or shelled (salted), and peanuts in other forms i.e. pepper, chocolate-coated, honey-roasted. Peanuts in shell or shelled (salted) are the most popular form of groundnut products in Poland, known for a long time. In fact, people often seem to regard peanut with its salted or in-shell form. Some participants referred to themselves as ‘traditionalists’ because they used to eat only this sort of peanut:

*“Because we are traditionalists, we only eat simple peanuts without any additional processing”.* (C2, female, 46-55-year-old, 2 children).

Some disputants eat unprocessed (in shell) peanuts because of health issues (roasted peanuts have a lot of fat), some other because of the ‘pleasure’ from shelling peanuts before eating them:

*“I believe that only natural peanuts are best for us, not pepper-flavored; I would not eat them.”* (C2, male, 26-35-year-old, no children).

*“I eat peanuts in shell, because it is a pleasure for me to shell them before eating, even though my fingers hurt”.* (C3, female, 46-55-year-old, 3 children).

Peanuts in other forms are relatively new in Poland, although some consumers acknowledged their growing assortment in the marketplace and like their sweet forms:

*“When I tried honey-roasted peanuts for the first time, I developed a craving for them”.* (C2, male, 26-35-year-old, 1 child).

*“I only eat peanuts chocolate coated or in Snickers, I don’t eat those in shell”.* (C3, female, 36-45-year-old, 1 child).

Apart from snacks, peanuts can be used in cooking. However, in Poland peanuts are not yet widely used as a culinary ingredient. Only a few participants admitted that they use peanuts in cooking (in salads, in chicken), and that this is determined by new cuisine trends including ethnic (Chinese) food. Even though some respondents agreed that peanuts can be used in the restaurants, especially in ethnic ones, they would still disregard this factor as influencing the level of peanut consumption:

*“Ok, provided that Chinese add peanuts to the meals, it does not influence peanut consumption significantly”.* (C1, female, 36-45-year-old, no children).

Consumption of peanuts in hidden form means that the consumers eat peanuts accidentally, just because they are present in other products, such as crisps or instant puddings. Most participants, however, did not have knowledge on foods possibly containing

peanuts or traces of peanuts, unless it is obvious:

*“I cannot think of any product with peanuts, maybe some chocolate if I can see peanuts”.* (C1, female, 18-25-year-old, 1 child).

and despite labelling requirements:

*“Even if it is obligatory to provide such information on the label, we would not expect that certain products may contain peanuts”.* (C1, male, 18-25-year-old, no children).

Besides, participants claimed that they rarely read labels (except for expiry date), but not at all in terms of peanuts:

*“I’d never thought to look at whether the product contains peanuts”.* (C1, female, 18-25-year-old, 1 child).

It has been observed that sometimes people fail to realize that they actually consume peanuts with various products, i.e. M & M, Snickers. It can be dangerous for those who have allergy to peanuts, especially for children. As regards peanuts accompanying other products, ‘beer’ was pointed out most frequently as a product with which “peanuts go well”:

*“I like peanuts and other snacks, like crisps. I am a beer lover and peanuts go well with beer”.* (C3, male, 36-45-year-old, no children).

*“People go out more often, they meet in clubs and pubs, where they serve salty sticks, crisps and peanuts, because it is easy to serve, and people eat them with beer”.* (C3, female, 46-55-year-old, 3 children).

Thus, peanuts are consumed wherever people have beer, i.e. pubs, bars, parties, at home in front of TV:

*“TV, football and peanuts”.* (C2, male, 36-45-year-old, 1 child).

*“I eat peanuts at home, in front of TV, it is so convenient to eat peanuts when you watch something!”* (C2, female, 46-65-year-old).

One consumer admitted to have peanuts as appetizer (Taco restaurant). Another participant claimed that she would not eat peanuts alone. Peanuts are purchased in supermarkets, green markets and in vending machines at schools (by children). Most participants did not know that non-food products might also include peanuts:

*“I agree that different confectionary may contain peanuts or peanut oil, but not the non-food products”.* (C1, female, 36-45-year-old, no children).

Those who were aware of the presence of peanuts in non-food

products (only 3 consumers) came up with a correct suggestion of a product (peeling creams).

### Tradition of Peanut Consumption and Its Change over Years

Participants in all groups noted that Polish consumers are not used to eating peanuts because they are not cultivated in Poland:

*“I’ve heard somewhere on TV that we Poles, our organisms, are not used to eating peanuts, because we don’t cultivate peanuts in this country, we have to import them, it is not like walnuts that we got used to have for years”.* (C2, female, 46-55-year-old, 2 children).

However, they all agreed that peanut consumption in Poland had increased considerably over the past 10 years, and this change can be attributed to factors such as higher availability, lower price, wider selection of peanut products and increasing number of ethnic (especially oriental) restaurants in Poland (they add peanuts to food), as well as to TV programs promoting the use of peanuts in salads or chicken:

*“Price is very important, more people can afford peanuts”.* (C2, male, 26-35-year-old, no children).

*“Peanuts are very cheap. You can get the whole can for 3-4 zlotys, while pistachios are expensive, so if one wants to eat nuts, peanuts are the cheapest choice”.* (C2, male, 26-35-year-old, no children).

*“The consumption of peanuts in Poland definitely increased over recent years, we use peanuts in salads, we mix them with different products, with chicken for example”.* (C2, male, 36-45-year-old, 1 child).

*“There are lots of TV commercials with peanuts, like peanuts with honey, salted, not salted, and some other. We have a wide choice”.* (C3, female, 36-45-year-old, 1 child).

Two consumers noted that the new forms of peanuts at the market also indicate this change:

*“Now, we can see honey roasted peanuts or spicy pepper peanuts, while years ago peanuts were only available as salted snacks, or in shell”.* (C1, male, 36-45-year-old, no children).

*“There are lots of flavours available now, peanuts with honey, spicy peanuts”.* (C1, female, 36-45-year-old, no children).

A consumer who observed that, because of peanuts being widely available and cheap, people do not value them as they used to 20 years ago made an interesting remark:

*“Twenty years ago peanuts was a luxury, because they were expensive and difficult to get, now we can buy them everywhere so it is not the same enjoyment”.* (C2, male, 36-45-year-

old, 1 child).

At individual level, changes in peanut consumption refer to individual preferences that altered over time (i.e. eating a lot of peanut butter in childhood) or perceived change of flavour of certain products (i.e. peanut butter now hasn’t the same taste as it used to have in the past).

### Health Issues and Awareness of Peanut Allergy

Consumers with certain health problems – other than allergies – admitted that they avoid peanuts. Groundnuts are perceived as ‘heavy’ to digest (should not be eaten before bedtime), ‘fattening’ (cause obesity), hard to munch (one consumer broke a tooth while eating peanuts), and causing gallstones (should not be eaten by pregnant women):

*“I like peanuts, they are very nice, but I can’t eat them, they are fattening”.* (C2, female, 46-55-year-old, 2 children).

To reduce the health risk, a consumer stated that he eats only unprocessed peanuts:

*“I try to consume only simple, unprocessed peanuts, not roasted in oil, not salted, due to health reasons”.* (C3, female, 46-55-year-old).

Since the groups consisted of non-allergic consumers, all of them were rather unconcerned about food allergies, or developing food or peanut allergy. Most consumers admitted that they do not think about this problem simply because it does not concern them directly. They asked themselves why to worry about peanut allergy since it does not concern them directly. Thus, they would rarely pay attention whether or not a product contains peanuts. However, some consumers were allergic to other products but not peanuts (i.e. carrot, pollen, and aspirin) and it was easy for them to imagine the symptoms and risk of peanut allergy:

*“I didn’t know that peanuts may be allergenic, but I’ll have to think about it. I’m allergic to aspirin, I swell a lot. Once I was in the hospital, and there was aspirin in the drip, and I swelled. Since then I always inform doctors about my allergy”.* (C3, male, 36-45-year-old, no children).

*“I am allergic to pollen, and my throat itching when I’m exposed to pollen. I can imagine that people may react similarly to peanuts”.* (C2, male, 26-35-year-old, no children).

Knowledge and awareness about peanut allergy differed between the groups. In the first group (C1), participants were well rather well informed about peanut allergies, they were able to describe symptoms of peanut allergy (i.e. swelling). Knowledge on peanut allergies came mainly from their workplaces (i.e. restaurant). One disputant was able to provide a peanut-allergy example from her own job experience, where peanut allergy cus-

tomers asked for menu without peanuts:

*“In a restaurant, where I work, it happens quite frequently that, before making an order, clients suffering from peanut allergy inform me about it and ask for meals not containing peanuts”.* (C1, female, 18-25-year-old, no children).

This participant also concluded that it is up to allergy sufferers to be careful with their diet. Another respondent brought up a remarkable change in peanut consumption policy on airplanes:

*“Some time ago, peanuts were the main snack on the airplanes, while now LOT catering<sup>footnote1</sup> has the first HACCP (Hazard Analysis and Critical Control Points - method of ensuring food safety, which is based primarily on risk prevention) principle that no peanuts and peanut products should be allowed on board”.* (C1, male, 36-45-year-old, no children).

However, in this group there were also people who heard about peanut allergy for the first time and admitted that having information about peanut allergy would make them stop eating peanuts:

*“If I knew that peanuts might be really allergenic I would stop eating them”.* (C1, female, 18-25-year-old, no children).

In another group (C3), consumer seemed to have all knowledge about peanut allergy from the media (movies) and some educational programs. It was interesting to see how participants get the information about peanut allergy, i.e. from a movie:

*“I recently watched a movie about a girl with peanut allergy. Someone put peanuts into her food and she swelled, the day before her wedding. I initially thought it was a fiction, but I browsed the Internet and I found that it can happen for real”.* (C3, female, 46-55-year-old, 3 children).

*“I got interested in peanut allergy after I saw a movie about a woman who was allergic to peanuts. She could eat just a little bit of peanuts and her face was swelling as a balloon”.* (C3, male, 26-35-year-old, no children).

In C2 group, a majority of the responses indicated the lack knowledge about food and peanut allergy. Some consumers in this group were able to list some examples of allergies (i.e. dairy products, carrots, fur), but not peanuts and they had no idea that peanuts may be allergenic:

*“How did they come up that it is risky? Has anyone died from peanuts”?* (C2, male, 46-55-year-old, 4 children).

*“No one has ever told me about peanut allergy. This is the first time I heard that peanuts may be allergenic”.* (C2, male, 26-35-year-old, 2 children).

Some consumers acknowledged that peanut allergy might be a health issue, but expressed lack of concern over the scale of the problem:

*“Even if it is a problem, the percentage of sufferers in the population is insignificant to be concerned with”.* (C2, male, 36-45-year-old, 1 child).

*“If such allergies exist, they don't have to be so dangerous”.* (C2, female, 18-25-year-old, no children).

They also thought that no reliable scientific data exists on this issue, or at least it has not been publicized, so they did not believe that peanut allergy could be a problem:

*“If I knew the clinical research carried out on 1000 patients, revealing that peanuts are risky, then I would be concerned, but I don't know such studies”.* (C2, male, 36-45-year-old, 1 child).

It was also observed that peanut allergy is not a popular topic in mass-media, and that if they had been more sensitized towards this health problem, they would have been more concerned about it:

*I would be perhaps more attentive to the problem if it was communicated by the media”.* (C2, female, 18-25-year-old, no children).

### Early Exposure (Pregnancy and Breastfeeding)

At the end of the session, consumers were asked to comment upon the statement: “Pregnant and breastfeeding women should not eat peanuts”. Due probably to the fact that they were not concerned about peanut allergies prior to this task, almost all of them disagreed with this statement, adding that it sounds unreasonable:

*“If we follow this way of thinking, then pregnant women would have to eliminate many foods from their diet, since so many products can be potentially allergenic”.* (C1, female, 18-25-year-old, 1 child).

They had never thought that eating peanuts may be risky during pregnancy or breastfeeding and confirmed that this session was the first time they ever heard about it. A vast majority of the respondents in all groups collectively believed that in normal circumstances, pregnancy should not restrict a woman from eating peanuts, or any other product she wants to have. Moreover, it has been suggested that avoiding certain products, including peanuts, can be more dangerous than eating them:

*“Avoiding something your body needs is more dangerous”.* (C2, female, 18-25-year-old, no children).

Two females from different groups (C2 and C3) made a similar

<sup>1</sup>LOT catering is the company providing food for Polish Airlines LOT.

remark that it is not clear whether avoiding potentially allergenic product in pregnancy may contribute to lower or higher allergy prevalence. They would personally let the children be exposed to different allergens as early as possible, so they become more resistant:

*“A pregnant woman should get used to eat various products; whatever she eats her child eats as well, and is resistant later to different factors”*. (C2, female, 46-55-year-old, 2 children).

Two female participants from two different sessions pointed out that pregnant women might even have an increased appetite for peanuts:

*“When I was pregnant I had a huge appetite for peanuts, I ate a lot of them. I like peanuts in general; they are so delightful and crunchy”*. (C1, female, 46-55-year-old, 1 child).

*“Now you’re saying you wouldn’t eat peanuts in pregnancy, but wait till you get pregnant so you’ll see how it is when you have cravings for different stuff”*. (C2, female, 46-55-year-old).

In many cases pregnant women might not know that they eat peanuts in hidden form, e.g. in sweets. Another person noted that doctors should inform women about risks concerning peanut consumption. Most participants who agreed with the above statement were more concerned about other hazards from peanuts, not allergy, i.e. digestion problems, especially during breastfeeding:

*“Breastfeeding mothers should not eat a lot of peanuts because they are heavy to digest”*. (C2, female, 46-55-year-old, 3 children).

*“Apart from allergy risk, peanuts like other nuts induce gallstones. Pregnant women have a natural tendency to develop gallstones, for this reason they should not eat a lot of peanuts”*. (C3, female, 36-45-year-old, 1 child).

A few respondents expressed some worry about eating peanuts during pregnancy due to the allergy, and one of them declared that if she were aware that peanuts might harm her child, she would not eat them. However, such attitude could have been developed due to discussions concerning food and peanut allergy, not by the prior awareness. Only one participant expressed opinion that pregnant women should not consume peanuts, because allergens may cross placenta, which can be dangerous if a child is allergic to peanuts.

## DISCUSSION AND CONCLUSIONS

Peanut consumption in Poland is systematically growing. Food containing peanuts can be divided into four general categories: Healthy and morning snacks, salted snacks, sweets, and meal additive. Each category may include peanuts as a deliberate

component (apparent or hidden) or peanut traces. Peanuts as apparent component are usually whole (salted or coated with chocolate, honey, starch etc.), chopped or ground, but easily identifiable by the consumer. Peanut as hidden ingredient is not easily recognizable, and its presence is known mainly from the label. It usually involves food prepared of peanut paste or pulp. Many products contain peanut traces, a possibility of the presence of small quantity of peanuts or peanut pulp, as a result of contact with the same production line as for peanut products.

This paper extends the publication by Sora et al<sup>21</sup> by presenting a more detailed information regarding Polish consumers. The results reported in this paper are based on three focus groups carried out with the consumers in Poland. The results were reported according to the following themes: Personal preferences for peanuts; types, forms and place of peanut consumption; tradition of peanut consumption and its change over years; health issues and awareness of peanut allergy; early exposure to peanuts. Consumers in Poland can be divided into those who like peanuts and eat them frequently, those who don’t like peanuts for various reasons such as lack of habit to eat peanuts, and never eat them, as well as those who eat peanuts occasionally, i.e. in pubs, bars, at parties, but do not usually buy them. Peanut consumption in Poland is clearly associated with social life, as indicated by the place and time where peanuts are consumed. The consumers associated peanuts mainly as salted snack. In this category, peanuts can be fried or roasted with salt, pepper or in starch (spicy or otherwise flavoured). They also admitted that the assortment of peanuts has increased over years, so consumers have now a large choice of peanuts and peanut products. However, only a few of them knew that peanuts might be present also in non-food products, such as cosmetics. The consumer knowledge about peanut allergy differed between the focus groups. In one of them, participants were unaware about peanut allergy and the associated risk. As regards early exposure to peanuts during pregnancy and breastfeeding, almost all of them disagreed with the statement that pregnant and breastfeeding mothers should not eat peanuts. It indicates that the risk of developing peanut allergy by a child is perceived very low. Moreover, many respondents thought that early contact with an allergen is a factor reducing the risk of allergy.

The results described in this paper indicate that more information is needed as regards food and peanut allergy. Peanuts in hidden form require special attention and clearer labelling, which is important especially for children suffering from peanut allergy. Authorities need to publish guidelines as regards peanut consumption during pregnancy and breastfeeding, or at least doctors should inform patients about the risk of developing peanut allergy as a result of early exposure.

## LIMITATIONS

The main limitation of the study stems from the fact that it was based on the common protocol and guidelines, prepared for several European countries and accepted by bioethical committee



at international level. Consequently, certain aspects might not be relevant to all the countries due to cultural differences. For example, peanuts and peanut allergy – the leading subject in this study – are perceived and consumed differently in Poland and in the UK. Such differences are explained in the abovementioned paper by Sora et al.<sup>21</sup> Other limitations are typical for qualitative research, which is often criticized as being small-scale, biased, and subjective and lacking enough rigor. However, when it is carried out properly, the qualitative studies have many advantages, for example:

- Issues are examined in depth and in detailed.
- Interviews are not restricted to specific questions – they can be redirected by the researcher in real time.
- Data which is based on human experience is powerful and sometimes more compelling than quantitative data.
- In spite of the fact that data are usually collected from a few cases or individuals, so findings cannot be generalized to a larger population, they are universal and can be transferable to other settings.<sup>24</sup>

The focus group study presented in this paper was the first stage of the larger international research on peanut allergy and the basis to formulate questionnaire for the quantitative survey. The results of this quantitative research were published separately.<sup>19</sup>

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#### CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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