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Consumer Choice Determinants in Context of Functional Food

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***Abstract*—**The aim of this study was to analyze and evaluate the consumption of functional food by consumers by: age, sex, formal education level, place of residence and diagnosed diseases. The study employed an ad hoc questionnaire in a group of 300 inhabitants of Upper Silesia voivodship. Knowledge of functional food among the group covered in the study was far from satisfactory. The choice of functional food was of intuitive character. In addition, the group covered was more likely to choose pharmacotherapy instead of diet-related prevention then, which can be associated with presumption of too distant effects and a long period of treatment.

***Keywords*—**Consumer choice, consumer knowledge, functional food, healthy lifestyle.

I. Introduction

FUNCTIONAL food is a relatively new and dynamically developing domain established within the last three decades. Rapid development of food sciences followed by lack of explicit and precise definitions and legal regulations have effected in the emergence of terms showing certain properties of functional food, however being not strictly considered as such. These include *designer food* i.e. processed food containing the ingredients that reduce the risk of certain diseases. *Nutraceutics* are all substances that have a positive effect human body and are commonly considered as food that occupy a space on the border of pharmaceuticals and nutrients. This domain might include *pharma food* or *super food* that is food or its component featuring health properties. According to certain authors, these terms may be applied interchangeably as the synonyms of functional food.

Due to a lack of explicit and precise criteria distinguishing functional food from its other types, Agget proposed the scientific evidence guidelines on the basis of which functional food may be defined or differentiated [1]. These guidelines include, primarily: correlation between functional food dose and effect, strict observance of the studied group to the study rules, and elimination of external factors which might falsify the outcomes. Biochemical markers determined in the course of a study should be validated.

Functional food may be produced by both conventional methods and using technological modifications. Production of functional food may include such activities as: elimination of compounds having a negative impact on the human body, adding a nutrient that is not present naturally in the product, increasing its concentration or enhancing its bioavailability [2]. Food fortification itself aims at correcting possible deficiencies in the population or societal groups and preventing diet-based diseases. Kwak and Jukes proposed to consider certain compounds of functional food as enriched food and dietary food, which is presented in Fig. 1 [3].

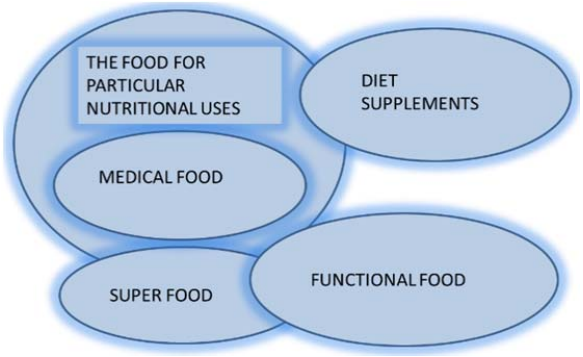

Fig. 1 The interrelationship of different types of food. Source: own work based on [3]

The other properties of functional food were pointed out by Pascal, who included natural food, modified natural foods, food with increased bioavailability and food with one or more nutrients removed or added using conventional or biotechnological methods and any possible combinations of these methods into natural food [4].

Multiplicity and diversity of the applied definitions translate also in different classifications of functional food, depending directly from the adopted and applied definition. These include among others: high fibre food, low cholesterol food, enriched food and probiotic food.

Functional food may be also classified for its effect or increasing the nutrients supply in the increased demand cases [5]-[7]. The effects of functional food on the human body include also better well-being and psycho-physical fitness. Functional food aims also at satisfying the specific needs of the human body by decreasing the risk of the following diseases: circulatory system, cancers, osteoporosis [8].

One should notice that functional food products have multi-directional effect and wide application, both for specific societal groups and the entire population.

To summarize, we must be aware that functional food emerged in the effect of confronting new scientific research results and a return to natural foods. It combines inter-disciplinary components, which followed by simultaneous lack of a clear and precise definition, arises frequent difficulties with straightforward and explicit differentiation of functional products. Internal breakdown of functional food in

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the context of its multiple applications and effect is very difficult. Considering the increasing societal awareness and pursuit towards a healthy life-style, functional food becomes an underlying component of everyday diets, both as a preventive measure (for sick persons or groups at increased risk) and as a health promotion measure (for society as a whole).

The scientific studies evidenced that many diseases are based on improper diets; some 25% – 70% of them may be prevented by a properly balanced diet containing full-value nutrients [8].

Considering the above, one should agree that functional food is a rediscovered, rather than new domain. Therefore, the general objective of the study was determination of the way the consumer awareness on functional food is formed and its practical application when purchasing food products.

II. Material and Methods

The tool used for data collection was an original questionnaire composed of closed-ended questions (single-choice) and distributed among random inhabitants of the Silesian Voivodeship using snowball sampling (300 respondents). Participation in the study was voluntary. The questionnaire started with particulars enabling classification of the respondents in terms of sex (male/female), education (basic/secondary/vocational/higher) and history of disease. Persons suffering from chronic diseases constitute a special group of consumers of food having a positive impact on health.

The questionnaire listed the diseases strictly connected with dietary profile (type 2 diabetes, hypertension, obesity, food intolerance, allergies, digestive system disorders (diarrhoea, constipation), cancer and hypercholesterolemia).

The questions included the 'other' response (to be completed by respondents) and 'not applicable' – for those declaring no history of bad health or disease.

The subjective part of the questionnaire was divided by subject matter. The questions were mixed to obtain a true and non-schematic response.

The collected material was analysed statistically. Frequency tables and assumptions of $\chi 2$ statistics were primarily used.

III. Results

The studied group was divided into two main subgroups: healthy subjects (n=174, 58%) and subjects with diseases (n=126, 42%).

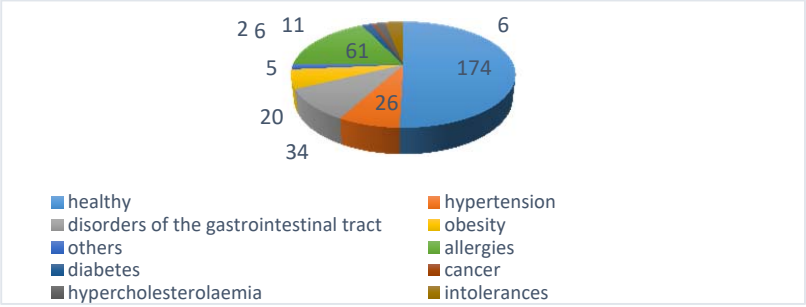

Fig. 2 Characteristics of respondents due to their present condition

The number of subjects with diseases is higher compared to the number of respondents, since the question on suffered diseases was a multi-choice question.

A vast majority of healthy subjects choose food products for their flavour (n=58, 33.3%) or spontaneously (n=56, 32.18%). Only a minority pay attention to the healthy nutrient content (n=32, 18.39%) and price of a given product (n=28, 16.09%) (Fig. 3).

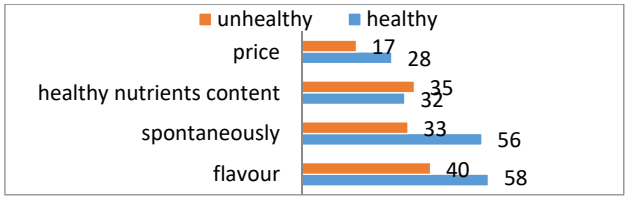

Fig. 3 Characteristics of preferences for choice of food products

Subject with diseases follow the other properties, for the most flavour (n=40, 31.75%) and nutrient content (n=35, 27.78%). The $\chi 2$ test also showed a statistically significant association (α <0.05) between the occurrence of allergy in the person and the preferences for product selection (Fig. 3).

Both groups pay attention to preservative content (healthy subjects: n=55 31.6%, subjects with diseases n=40 31.75%, respectively). The only exception to the observed trend are subject with food intolerance, most of which point to lactic acid bacteria during product selection (Fig. 4). Such preferences may result from the preferred information sources. Popular press and mass-media are ranked at the top position among the distinguished groups. The only exception are healthy subjects who follow the knowledge from family traditions and folk (natural) medicine (n=58, 33.33%); however, the prevalence over the subjects drawing information from radio or TV is insignificant (n=56, 32.18%) (Fig. 5).

Both healthy and unhealthy subjects rely on specialists; although, people with obesity are influenced by the opinion of friends, but also by advertising.

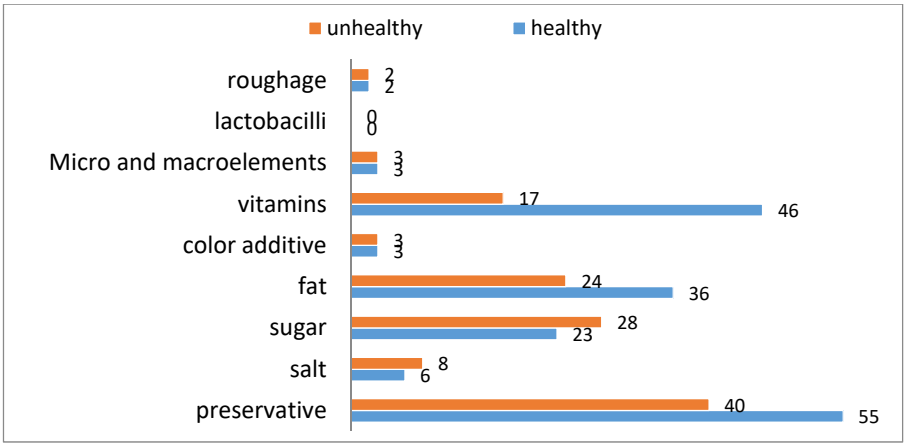

Fig. 4 Characteristics of preferences for choice of food products

Conversely, people with hypertension listen to their friends' advice, but they also pay attention to the price of the product.

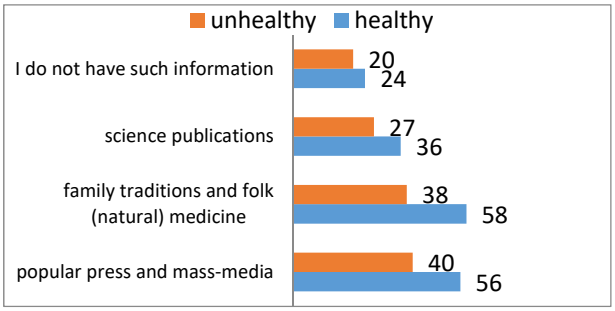

Fig. 5 Preferred information sources

Both healthy subjects and subjects with diseases declared that they have never heard of functional food or heard this term however do not know what it means.

The $\chi 2$ test demonstrated a statistically significant ($\alpha < 0.05$) correlation between the definition of functional food and the gender of respondents.

The fact that the subjects with diseases do not exclude the presence of functional products on the Polish market and would look for them in the grocery or healthy food stores is worth noticing. At the same time, however, the majority of respondents admit that they have no knowledge as to the volume of functional products available on the Polish market (n=105, 83.33%).

The most strongly associated functional product are probiotic yogurts (both, healthy n=104, 88.97%, unhealthy n=87, 69,6%), while the least - isotonic drinks.

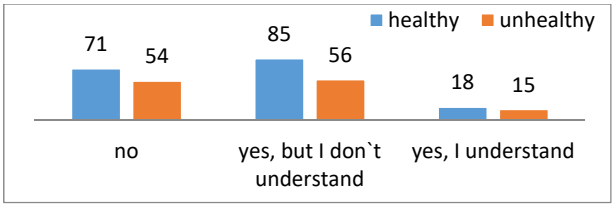

Fig. 6 Understand the concept of functional foods taking into account existing medical conditions

Dietary fibre is most strongly associated with functional food (healthy n=114, 90,48%, unhealthy n= 97, 77,6%), followed by essential fatty acids (EFAs) and antioxidants, and the least - lycopene.

The $\chi 2$ test has demonstrated the presence of a statistically significant relationship ($\alpha < 0,05$) between indicating antioxidants and the education level of the respondent. On the other hand, in the case of dietary fibre and lycopene, a relationship regarding the gender of the respondent has been demonstrated.

Pharmacotherapy supplemented with proper diet was the most preferred form of therapy in both groups.

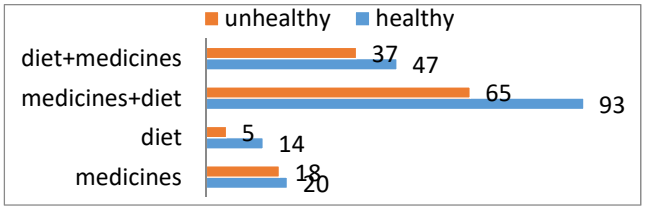

Fig. 7 Preferred form of therapy by respondents

At the same time, diet therapy alone is not popular among the subjects with diseases – only 31 (24.6%) subjects is convinced of its effectiveness. The subjects with diseases are however open to new forms of prevention/therapy – as many as 72 (57.14%) said they were willing to apply them.

Healthy people use "home remedies", while people complaining about various ailments, in particular allergy and food intolerance sufferers, choose medicine-based therapy.

The $\chi 2$ test showed a statistically significant ($\alpha < 0.05$) relationship between preferred therapy and gender.

Insufficient knowledge on functional food translates also on its limited use by consumers, the vast majority of which remains unaware whether it uses functional products (healthy subjects n=75 43.1%, subjects with diseases n=68 53.97%). According to healthy subjects, functional food is a measure to maintain health, whereas the remaining ones state that it is an interesting and worth to follow trend.

The $\chi 2$ test showed a statistically significant relationship ($\alpha < 0.05$) between functional food and hypertension.

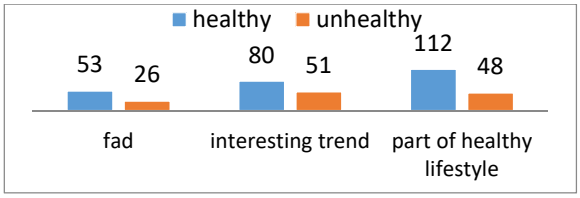

Fig. 8 The opinion of respondents on functional foods

For people suffering from gastrointestinal tract disorders and allergy sufferers, functional food is just a sign of caring for one's body, not prevention or treatment, although it must be underlined that the functional ingredients play a major role in the highlighted items. Only people suffering from hypertension or obesity use functional food as a form of preventive healthcare.

IV. Discussion

Functional food underlies diet prophylaxis and diet therapy. Diet prophylaxis is the least expensive, the simplest and most common method of maintaining good healthy condition. Functional products should act as a basis for a well-balanced diet and a subject of aware choice. According to the obtained results, knowledge on functional food is insufficient and its application is more intuitive rather than aware. On one hand, it is positively accepted by society; however, on the other, there is a clear lack of faith in the effectiveness of such therapy observed.

This study demonstrated a low level of knowledge on functional foods. A similar case is demonstrated in the studies of Childs [9], and Maynard and Franklin [10] emphasizing that the level of knowledge and awareness and use of functional food is higher in subjects with diet-based diseases or worse health condition. Stewart-Konx et al. [11] demonstrated the significant role of consumer education in aware choice of functional products in their research.

As demonstrated in this study, the respondents, regardless of their health condition, follow primarily flavour when choosing the products. Identical conclusions were raised by Hilliam, who emphasized that flavour is the most valued feature in functional products for the consumers [12].

The own study showed that the subjects with diseases are not convinced of and do not believe in diet prophylaxis effects, however vast majority of them would be willing to introduce the functional products to their diet. Analogical conclusions were presented by Nynke de Yong [13], who explains the will to use healthy products by the respondents with a certain compensation of unhealthy life style.

V. Conclusions

Knowledge of the respondents on functional food is insufficient and the functional food itself is sparsely consumed in an aware manner as a component of a balanced and healthy nutrition model.

Popular press and mass-media remain the main source of nutritional information on functional food for the respondents, who additionally rely on information on healthy products provided by experts.

A vast majority of the studied subjects are unaware and everyday consumers of functional food.

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