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**CONSUMER ATTITUDES TOWARDS FUNCTIONAL
FOOD PRODUCTS:
A SURVEY APPLIED IN IZMIR**

Bürke AKSULU

Danışman

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ÖZET

Yüksek Lisans Tezi

Fonksiyonel Gıda Ürünlerine Yönelik Tüketici Tutumları: İzmir’de bir Uygulama Bürke Aksulu

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Hastalıkların önlenmesi ve iyileştirilmesi için gıda ürünlerinin kullanılması bazı kültürler için yeni bir anlayış değildir. Ancak, gıda ürünlerinin sağlık faydalarının vurgulanarak pazarlanması tüm dünyada 1990’larda yeni bir eğilim haline gelmiştir. Bu eğilimin birbirini etkileyen iki bileşeni bulunmaktadır; birincisi gıda teknolojilerindeki gelişmeler, ikincisi tüketicilerin uzun ve sağlıklı yaşam beklentisidir. Tüketicilerin ekstra sağlık faydaları olan yeni ürünlere olan talebi ve gıda sektöründeki gelişmeler, “fonksiyonel gıdalar” adı verilen yeni bir gıda ürün kategorisi yaratmıştır. Bu yeni kategori ile beraber, pazarlamacılar yeni ürünler geliştirme ya da var olan ürünlerini bazı işlemlerden geçirerek yeniden pazara sunma şansı elde etmişlerdir.

Fonksiyonel gıda ürün kategorisi Türk tüketicisi için göreceli olarak yenidir ve potansiyel pazar başarısı, tüketici profili ve geleceği bilinmemektedir. Fonksiyonel gıdalara yönelik tüketici tutumlarının araştırılması bu pazar ile ilgili bilgi sağlaması açısından önemlidir. Bu bilgi, aynı zamanda pazarlamacıların tüketici ihtiyaçlarına nasıl cevap vereceği konusunda yardımcı olacaktır.

Bu araştırma demografik değişkenlerin fonksiyonel gıdalara yönelik tüketici tutumları üzerindeki etkilerini incelemeyi amaçlamaktadır. Araştırma, aynı zamanda cevaplandırıcıların fonksiyonel gıdalar ile ilgili

farkındalığını ortaya çıkarmaya çalışmaktadır. 269 cevaplandırıcı İzmir'in değişik bölgelerinde tesadüfi olmayan örnekleme yöntemi ile seçilmiş ve yüz yüze detaylı bir anket uygulanmıştır. Sonuç olarak, demografik faktörlerin fonksiyonel gıdalara yönelik tüketici tutumlarını kısmi olarak etkilediği bulunmuştur. Ancak, pazardaki esas engel bu ürün kategorisi ile ilgili farkındalık eksikliğidir.

Anahtar Kelimeler: Fonksiyonel Gıdalar, Tüketici Davranışı, Tutumlar

ABSTRACT

Master Thesis

Consumer Attitudes towards Functional Food Products: A Survey Applied in İzmir

Bürke Aksulu

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Master Program (with Thesis)

Using food products to prevent or to cure some diseases is not a new concept for some cultures. However, marketing some food products by emphasizing its health benefits has become a new trend all over the world especially in 1990s. This trend has two interactive components; one is the technological developments in nutrition science, second is the consumers' expectancy about long and healthy life. Consumers' demand for new food products which have extra health benefits and the improvements in food sector developed a new category of foods which are called "functional foods". With this new category, marketers have chance to develop new products or promote already existing products by applying some nutritional processes.

Functional food product category is relatively new for Turkish consumers and their potential market success, consumer profile and future is still unclear. Analyzing consumers' attitudes towards functional foods are important to gather some information about functional food market. This information may also help marketers in responding the consumer needs.

The aim of this study is to explore the effects of demographic variables over attitudes towards functional foods. Besides, study tries to explore the respondents' awareness of the functional food products. Detailed survey is

applied face-to-face to 269 respondents chosen by non-random sampling in different areas in İzmir. As a result, it is found that some of the demographic variables partially affect the attitudes towards functional foods. However, the main constraint in the market about this food category is the lack of awareness.

Key Words: Functional Foods, Consumer Behavior, Attitudes

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PRODUCTS: A SURVEY APPLIED IN IZMIR**

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ABBREVIATIONS

EU:	European Union
EU PASSCLAIM:	Process for the Assessment of Scientific Support for Claims on Food
FDA:	Food and Drug Administration (USA)
FF:	Functional Food
FOSHU:	Foods for Specified Health Use
FUFOSE:	Functional Food Science in Europe
GMO:	Genetically Modified Food
ILSI:	International Life Science Institute
PARNUTS:	Foods for Particular Nutritional Uses

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INTRODUCTION

Increase in health awareness and the new developments in the nutrition science orient consumers to seek for more healthy foods in recent years. Raising percentage of chronic illnesses such as cancer, heart and vein system and digestion system problems, health became one of the key motivations behind consumers' food choices. Consumers try to prevent or even cure these diseases by changing the food items in their daily diets.

It is a multi way affect process; in one way new improvements in the nutrition science give chance for manufacturers to produce more healthy foods and they try to promote them to the consumers. On the other hand, consumers tend to buy more healthy products and manufacturers try to satisfy them by developing new and healthy products or renewing their existing products by making them healthier through the application of some processes.

Consumers' increasing demands for new food products with extra health benefits developed a new category of foods which are called "functional foods". Although the extent of the concept is unclear in most of the countries, the products that have health benefits are increasingly marketed. According to Roberfroid (2000) functional food is a different concept, not a clear defined group of products. Basically functional foods can be defined as the food products that have health benefits beyond their nutritional value. In this study, functional foods are taken as 'the products that are in the conventional food form, consumed as a part of the normal diet and marketed with having health claims'. Thus, functional food extent used in this study is the food products that are marketed as functional.

Understanding consumers' expectations and experiences about the functional food category is very important for marketers (Childs and Poryzees, 1997; Poulsen, 1999; Urala and Lahteenmaki, 2003; Verbeke, 2006). A functional food with proven health benefits may not be attractive to consumers because it does not provide necessary sensory features that the consumers expect (Frewer, Scholderer and Lambert, 2003; 715). Attitude studies are generally applied to

predict consumer behavior as attitudes have been shown to explain individuals' intention (Ajzen and Fishbein, 1980).

Aim of this study is to explore the effects of demographic variables over attitudes towards functional foods. Besides, minor aims are to gather information about whether the respondents have any knowledge about the concept, which functional food products are familiar to them and which products they are willing to use.

This study consists of three chapters. In chapter 1, the functional food concept will be introduced. Besides, the information about the market, product development and the marketing issues will be discussed. In chapter 2, theoretical background about attitude theories and the literature review about attitudes towards functional foods will be given. In chapter 3, methodology of the field study will be explained. The results of the study and recommendations about the issue will be discussed.

CHAPTER 1

THE FUNCTIONAL FOOD CONCEPT

1.1. NUTRITION SCIENCE, HEALTH CONSCIOUSNESS AND THE FUNCTIONAL FOOD CONCEPT

Using foods or herbs for their health giving and curative properties is not a new concept. They are used for many centuries especially in the Eastern countries. Even in modern societies, people choose using drugs to treat or prevent diseases. Specific food items are being used traditionally for medical purposes in some cultures. In Asia, functional foods are regarded as an integral part of the culture for many years and there is a belief that foods and medicine originate from the same purpose; maintaining or recovering the body health. In contrast to Asia, foods that can be used for health purposes are relatively new to Europe and European consumers are more distant to the concept (Verschuren, 2002; 125). Detailed knowledge about healing properties of some food items are still being used at the present in Asian countries (Schröder, 2003; 45).

1.1.1. Advances in Nutrition Science

Nutrition refers to “components of food that are necessary for growth, normal functioning of the body and the maintenance of life which are proteins, minerals, carbohydrates, fats and vitamins” (Roberfroid, 2000; 9). Nutrition science also compromise artificial ingredients and nonnutritive food constituents that may be related to health. Examples of these food constituents are antioxidant vitamins and minerals, hydrogenated fats as sources of trans-fatty acids, phytochemicals, isothiocyanates, sulforaphanes, allylic sulfides and isoflavonoids which all have in general protective properties (Kumanyika, 2000; 87). Functional food science is mainly about the target functions and biological responses that these specific

nutrients and food components positively affect. These target functions are (Ashwell, 2002; 6):

- Early development and growth.
- Regulation of basic metabolic processes.
- Defence against oxidative stress.
- Cardiovascular physiology.
- Gastrointestinal physiology.
- Cognitive and mental performance.
- Physical performance and fitness.

Besides the physiological functions, using functional foods for improving behavioral and psychological functions focuses on foods that can influence appetite and satiety, vitality, stress, and other subjective states of mood and well-being and sleep (Verschuren, 2002; 127).

The discovery of nutrients and the increase in capability of molecular studies lead scientists to be more knowledgeable about biochemical structure-function relationships and developments make scientists to study on the effects of chemicals over human body in more detail (Labuza, 1994; xi).

Food represents an increasingly innovative, technological sector and during the first half of the twentieth century, essential nutrients have been discovered and nutritional standards, dietary guidelines and food guides are established with the aim of preventing deficiencies and supporting body growth, maintenance and development (Roberfroid, 1999; 1039). This conception is named as “traditional nutrition”.

Advances in this period are given below (Ashwell, 2002; 4, Roberfroid, 2000; 10):

- The average daily amounts of essential nutrients that would meet the physiological needs of a healthy person which are called recommended daily allowances (RDAs) and reference nutrition intakes (RDIs) are determined.

- Advices about consumption of foods or food components in relation to total diet are given in dietary guidelines. The qualitative terms, such as more / less / increased / reduced started to be used according to the scientific research findings related to diet and health.

- Food guides like food pyramids and food plates are developed based on the nutrient standards, food compositions, food intake patterns and food choice factors in order to provide a nutritionally satisfactory diet.

During the 21st century, nutrition scientists want to go further with these new challenges in nutrition science and developed the concept “optimal nutrition” which focuses on optimizing the quality of the daily diet in terms of its content of nutrients and non-nutrients as well as other food properties that help maintenance of health (Kumanyika, 2000; 90). In other words, the progress evolved from “adequate nutrition” to “optimum nutrition”.

Optimum nutrition concept aims to maximize the physiological functions of every individual, in order to ensure both maximum well-being and health but, at the same time, a minimum risk of disease throughout life (Diplock, Aggett, Ashwell, Bornet, Fern, Roberfroid, 1999; 5, Roberfroid, 2000; 10). Optimum nutrition is related to the chronic diseases rather than acute illnesses. Besides, influencing and controlling eating patterns is a health promotion and disease control strategy. However, the challenge of the nutrition science is putting these scientific findings into food advices or policies (Kumanyika, 2000; 87). Changes in causation of diseases affected the way of thinking about the linkage between diet and disease.

1.1.2. Increase in Consumers' Health Consciousness

In 1980s, average age of the society began to increase in many countries of the world and these societies started to be called as “ageing societies”. Age increase creates awareness about the lifestyle related diseases and this issue became a matter of public concern. The main illnesses that could be prevented or beat by changing eating habits are diabetes, arteriosclerosis, osteoporosis, allergies, cancer and some infectious diseases (Arai, 2002; 139).

In the twenty first century, the industrialized world faces new challenges beside the trend of increase in the numbers of elderly people. The changing concepts in nutrition also has particular importance in some significant trends in society (Diplock et al., 1999; 5):

- The increasing cost of health care and of days lost from work.
- The continuing increase in life expectancy.
- The desire of people for an improved quality of life.

With increased life expectancy, need for improved quality of life and greater media coverage of health care issues, consumers are becoming more interested in disease control or prevention by using the potential benefits of nutritional support (Hardy, 2000). Consumer interest in nutritional values, food choice and eating habits make them try to understand the relationship between diet and disease better (Jonas and Beckmann, 1998; 1). As consumers have the point of view that what they eat help them to improve and maintain their health, manufacturers try to develop and place new products in the market to satisfy this specific need (Gray, Armstrong and Farley, 2003; 213).

1.1.3. Brief History about Birth of the Concept

Japan is the first place where the concept “functional food” has been used. In the early 1980s, three large-scale programs were launched and funded by the Japanese government on ‘systematic analysis and development of food functions’,

‘analysis of physiological regulation of the function of food’ and ‘analysis of functional foods and molecular design’. A category of foods for potential benefits in a national effort for reducing the increasing cost of health care, Foods for Specified Health Use (FOSHU) was established in 1991 (Ashwell, 2002; 4, Roberfroid, 2000;12).

FOSHU was defined as “any food or ingredient that has a positive impact on an individual’s health, physical performance, or state of mind, in addition to its nutritional value” in 1980s (Shimizu, 2003; 243). This definition is still appropriate today, but Japanese regulatory authorities have highlighted three conditions that functional foods must satisfy (Hardy, 2000; 688):

- They should be naturally occurring ingredients, not capsules, tablets, or powders.
- They can be consumed as part of the daily diet.
- When ingested, they should enhance or regulate a particular biological process or mechanism to prevent or control a specific disease.

1.1.4. Definitions of Functional Foods

There is no clear, legally approved definition for functional foods in the world except in Japan. However, several food and health organizations define the concept similarly:

“Functional foods are foods that have health benefits beyond the nutrients they contain” (American Dietetic Association, 2005).

“Functional foods are foods or dietary components that may provide a health benefit beyond basic nutrition” (International Food Information Council, 2006).

“Functional foods are considered as those foods which are intended to be consumed as part of the normal diet and that contain biologically active components

which offer the potential of enhanced health or reduced risk of disease” (The European Food Information Council, 2006).

There are little differences between these definitions about the extent of the functional food concept. Moreover, disagreements in the whole literature come from if nutrients and non-nutrients, dietary supplements and even drugs are included in the extent of the concept. Besides, the confusion about the concept also comes from the terminology differences. In some texts and articles, terms like nutraceuticals, designer foods, medical foods, vitafoods, dietary supplements are used interchangeably with functional foods. In order to clarify the concept, three types of foods that are confused the most are given in Table 1.1.

Table 1.1.: Major Differences about the Types of Foods

Discriminative character	Functional Foods	Nutraceuticals	Medical foods
Purpose	Maintain good health	Improve health	Improve (cure) disease situation
Target population	Total population	Group dependent (age, genetic differences)	Patients
Mode of action	Influence on metabolism	Influence on metabolism	Influencing metabolism related to disease

Source: Pot, 2000; 4.

A medical food is a *“food that is specially formulated for the feeding of a patient who has a special medically determined nutrient requirement, the dietary management of which cannot be achieved by the modification of the normal diet alone and the food is labeled to be used under the supervision of a physician or medical supervision”* (Schmidl and Labuza, 2000; 56).

Nutraceuticals are described as *‘any substance that is a food or part of a food that provides medical or health benefits, including the prevention and treatment of disease’* or *‘a product produced from foods but sold in powders, pills, and other medicinal forms not generally associated with food and demonstrated to have the physiological benefits or provide protection against chronic disease’* (Childs and Poryzees, 1997; 436).

Although these terms are confused with functional foods, most of the authors (e.g. Ashwell, 2002, Diplock et.al., 1999, Doyon and Labrecque, 2005, Roberfroid, 2000) defend that “functional food” is a different concept than those mentioned above, since the functional foods have to be in conventional food form not in drugs or food substances and have to be consumed as part of a normal diet. Besides; their role regarding disease, in most cases, is reducing the risk of disease rather than preventing it.

The European Commission Concerted Action Science in Europe (FUFOSE) coordinated by International Life Science Institute (ILSI Europe) tried to develop a science-based approach towards functional foods in 1999. This commissions’ aim is to specify the nutrients and food components that positively affect body functions, to examine the food science in a functional perspective, to reach a consensus on method of food modifications and the specific food components within the consensus of the scientists came from different disciplines. Besides, the commission developed a working definition. According to this European consensus document (Diplock et al., 1999; 6):

“A food can be regarded as ‘functional’ if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects, in a way which is relevant to either the state of well-being and health or the reduction of the risk of a disease”. Thus, a functional food can be beneficial for all members of the society or even for a specific group of people.

Roberfroid (2000; 13) also states that this definition is supporting functional food is a different concept, not a well-defined group of products. Thus, it deserves a category of its own, different than the other terms like nutraceuticals, medifoods, designer or vitafoods. It is also a concept that belongs to nutrition and not to pharmacology. In summary, main features of a functional food product additional to FOSHU standards are:

- Composed of naturally occurring (not synthetic) components perhaps in unnatural concentration or present in foods that would not normally supply them,
- May enhance well-being and health and/or reduce the risk of disease or provide health benefits so as to improve the quality of life including physical, psychological and behavioral performances,
- Have authorized and scientifically based claims.

Although all foods can be considered as functional, the term “functional food” refers to a range of foods with certain common features. Besides, providing essential nutrients functional foods are designed for specific physiological functionality in maintaining health and increasing the performance (Schröder, 2003; 45). The functionality mentioned in most of the functional foods is to help preventing diseases like heart / vein system, nervous system and certain cancer types commonly seen in industrialized countries.

Doyon and Labrecque (2005) made a detailed study in order to unify functional food definitions. They found out 28 different definitions in literature which can be seen in Table 1.2. Authors evaluated these definitions through four criteria selected from the criteria developed by Roberfroid mentioned above:

1. ***Nature of the food:*** A functional food must be a traditional food or look like traditional foods, however, it can be modified or fortified.
2. ***Health benefits:*** Most of the definitions include this criterion. However, only two of them indicate that they should be proven.
3. ***Function:*** This criterion implies a functional food should have benefits beyond its basic nutrition functions.
4. ***Regular consumption:*** Few definitions imply regular consumption is necessary. This criterion changes from country to country. A food may not necessarily be considered as functional in every country.

Table 1.2.: Definitions of Functional Foods

	Authors	Definition	Criterion			
			Nature	Function	Regular consumption	Health benefit
1	CSIRO Human	"Foods that may be eaten regularly as part of a normal diet, that have been designed specifically to provide a physiological or medical benefit by regulating body functions to protect against or retard the progression of diseases such as coronary heart disease, cancer, hypertension, diabetes and osteoporosis"			X	X
2	Health Canada	"A functional food is a conventional food or a food similar in appearance to a conventional food, it is part of regular diet and has proven health related benefits and (or) reduces the risk of specific chronic diseases above its basic nutritional functions"	X	X	X	X
3	FOSHU, Japan	"Foods which are, based on the knowledge between foods or food components and health, expected to have certain health benefits, and have been licenced to bear a label claiming that a person using them for specified health use may expect to obtain the health use through the consumption thereof"				X
4	European Food Information Council	"Functional foods serves, naturally primarily the supply of nutrients, but they offer a special advantage for the health"		X		X
5	National Academy of Sciences, USA	"Foods that encompass potentially healthful products, including any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains"	X	X		X
6	Institute of Food Technologists, USA	"A conventional food with nutrient-content claims, pre-approved health claims, an authoritative statement such as the Food and Drug Administration Modernization Act, and structure-function claims without disclaimer"	X			
7	Jansen & Kriger	"Foodstuffs mostly similar in appearance to conventional food that fit daily in the diet and consumption pattern but that, in addition to their basic nutritional value, contain specific additives or properties achieved by processing or otherwise for which a physiological /health benefit beyond basic nutrition is claimed"	X	X	X	X
8	National Institute of Nutrition	"Foods or food components that may have health benefits that reduce the risk of specific diseases or other health concerns"	X			X
9	CSPI	"Foods with added ingredients that claim to provide a health benefit to consumers beyond the benefits provided by ordinary foods themselves"	X	X		X
10	Adelaja and Schilling	"Modified foods or food ingredients that provide health benefits beyond their traditional nutrients"	X	X		X
11	Clare Hasler	"Foods that, by virtue of physiologically active components, provide benefits beyond basic nutrition and may prevent disease or promote health"		X		X
12	Egg Nutrition Center	"Foods that, in addition to supplying known nutrients, can provide other health benefits as well"		X		X
13	Foundation for Innovation in Medicine	"Any substances that is a food or part of a food that provides medical and/or health benefits, including the prevention and treatment of disease"	X			X
14	M. Roberfroid, ILSI Europe	"A food component (being a nutrient or not) which affects one or a limited number of function(s) in the body in a targeted way so as to have positive effects that may justify health claims"	X			X

Table 1.2. (continued)

	Authors	Definition	Criterion			
			Nature	Function	Regular consumption	Health benefit
15	USA General Accounting Office (1)	"Functional foods are products formulated with naturally occurring chemicals (or combination of chemicals) -found in many fruits, vegetables, grains, herbs and spices- to provide a health benefit, lower the risk of certain diseases, or affect a particular body process. They go beyond correcting diseases such as pellagra and scurvy, caused by nutritional deficiencies. Functional foods are akin to novel macro ingredients in that their formulation is intended to provide a health benefit to consumers. However, functional foods are designed to lower the risk of specific diseases such as lung cancer by removing certain ingredients, by adding or combining ingredients normally found in a food product, or by concentrating substances in higher than usual quantities."	X			X
16	USA General Accounting Office (2)	"Food substances designed to lower the risk or delay the onset of certain diseases"	X			X
17	Iowa State University	"Foods that have been linked to health benefits"				X
18	Kleinschmidt	"A whole food (as opposed to pills, powders, or supplements) that is fortified, enriched with a component having a health benefit beyond basic nutrition"	X	X		
19	Westrate et al.	"Foods that make specific health claims"				X
20	IFIC Foundation	"Foods that may provide health benefits beyond basic nutrition"		X		X
21	Riemersma	"Foods or food products marketed with the message of the benefit to health"	X			X
22	Hillian	"Foods and drink products derived from naturally occurring substances consumed as part of the daily diet and possessing particular physiological benefits when ingested"	X		X	X
23	Smith et al.	"Foods derived from naturally occurring substances, which can and should be consumed as part of the daily diet and which serves to regulate or otherwise affect a particular body process when ingested"	X		X	X
24	Diplock et al	"A food can be regarded as functional if it is satisfactorily demonstrated to affect beneficially one or more target functions in the body, beyond adequate nutritional effects in a way that is relevant to either improved stage of health and well-being and/or reduction of risk of disease. A functional food must remain food and it must demonstrate its effects in amounts that can normally be expected to be consumed in the diet: it is not a pill or a capsule, but part of the normal food pattern"	X	X	X	X
25	International Life Sciences Institute	"Foods, that by virtue of physiologically active food components, provide health benefits beyond basic nutrition"		X		X
26	Lajolo, Brazil	"A food that is a food and not a drug, that is a part of a normal diet and that can produce benefits beyond basic nutrition"	X	X	X	X
27	Agriculture, Food and Rural Development, Alberta	"They are foods which can be part of our everyday diet but which have properties that provide an additional health benefit"			X	
28	Goldberg	"A food (not a capsule, tablet or powder) derived from naturally occurring ingredients; it can and should be consumed as part of the daily diet; it has a specific function when ingested, regulating a body process such as: enhancing biological defense mechanisms, preventing a specific disease, aiding recovery from a specific disease, controlling physical and mental conditions and slowing the aging process"	X		X	X

Source: Doyon and Labrecque, 2005; 6.

Doyon and Labrecque (2005) formed a new working definition after evaluating existing definitions regarding those four criteria as:

“A functional food is a conventional food or a food similar in appearance to a conventional food, it is a part of a regular diet and is consumed in normal quantities. It has proven health benefits and/or reduces risk of specific chronic diseases beyond its basic nutritional functions. Moreover, these benefits disappear when the consumption is interrupted”

In this study, the term ‘functional foods’ refers to ‘the products that are in the conventional food form, consumed as a part of the normal diet and marketed with having health claims’ as in compliance with the European consensus document (Diplock et al., 1999), evaluations of Doyon and Labrecque (2005) and the studies of Roberfroid (1999, 2000, 2002).

1.1.5. Aims of the Functional Food Science

Functional food science refers to finding new research fields in nutrition science and using these fields in order to develop new functional foods. Functional food development is a scientific challenge and should be based on scientific knowledge. It focuses on target functions and their possible betterment by food components. Aims of the functional food science are (Diplock et al., 1999; 7):

- To identify beneficial interactions between functional component within a food and the target functions in the body.
- To identify and validate markers relevant to these functions and their modulation by food components.
- To assess the safety of the amount of food or its components needed for the functionality. This will require scientific evidence in order to monitor if it is applicable to all major groups in the population.
- To formulate hypotheses to be tested in human intervention trials to prove relevant intake of specified food components is associated with the one or more target functions.

1.1.6. Categorization of Functional Foods

The variety of functional food products can be developed by processing convenient products as a base. Jonas and Beckmann (1998; 3) categorized functional foods as dividing into two: “modification” and “fortification”. In modification, the functional food is manufactured by using genetic engineering as modifying the genes by using biotechnology to reduce the harmful substances and/or increase nutrients within the food.

Functional foods can also be manufactured by fortifying the product with naturally occurring nutritional components (phytochemicals) in different types of fruit and vegetables and by adding fish oils, live cultures or nutritional components from grain. Most typical fortifications are: Vitamin and mineral fortification, antioxidant fortification, fibre fortification, live culture fortification and fat substitutes.

A more detailed categorization including Jonas and Beckmann’s categories is seen in the articles of Ashwell (2002), Roberfroid (2000, 2002) and Spence (2006). Functional foods can be developed with these processes and found in the marketplace in these forms:

- As a natural food in which one of the components has been naturally enhanced through special growing conditions (*Enhanced products*).
- A food to which a component has been added to provide benefits. In other words, adding new nutrients or components which are not normally found in a particular food (e.g. addition of selected probiotic bacteria to improve gut health, orange juice with added calcium) (*Enriched products*).
- A food from which a component has been removed so that food has less adverse health effects. In some cases, existing components can be replaced by the beneficial ones (e.g. spreads with reduced saturated fatty acids) (*Altered products*).

- A food in which the nature of one or more components has been chemically modified to improve health (e.g. grain products with folic acid and fruit juices fortified with vitamin C) (*Fortified products*).
- A food in which the bioavailability of one or more components has been modified.
- Any combinations of these possibilities.

1.1.7. Product Types of Functional Foods

Modification and fortification processes can be applied to many kinds of conventional products. Although the products differ from country to country, there are some common products that can become functional foods. Examples of functional foods include foods that contain vitamins, specific minerals, fatty acids, dietary fibre or foods with added biologically active substances like phytochemicals or antioxidants and probiotic bacterias that have beneficiary features (The European Food Information Council, 2006).

One of the most active areas of development has been that relating to the fortification of dairy products particularly yoghurts and other fermented milk products. These prebiotic and probiotic milk products offer consumer to improve gastrointestinal health and improvement of immune system (Hilliam, 1998; 351). Milk is another popular product that can be enriched with calcium or vitamins, or altered and become without lactose. Calcium fortification and vitaminization can also be applied to fruit juices and other soft drinks.

Another product type of functional food that is almost found in every country is cereals and bakery products. These products can be fortified with vitamin and minerals as well as enrichment with fibre. These kinds of products include bread, biscuits, crackers and pasta.

Functional margarines that altered from saturated fats and fortified with phytosterols and omega 3 become available in 1990s in UK and the US market and

more recently in Turkey. These products are marketed with “cholesterol-lowering” or “heart healthy” claims in the market.

The most frequently bought functional foods include cereals, sports and energy beverages, yoghurt and other dairy products, bread, biscuits, baby food. In Japan, beverages (enriched with antioxidants, dietary fibre or live cultures) constitute approximately 70% of the market, whereas cereals with a high content of dietary fibres and dairy products enriched with fish oils dominate the market for functional foods in the US. In Europe, most functional food products are either enriched with live cultures, fat substitutes, calcium or dietary fibre (Jonas and Beckmann, 1998; 6).

In Latin America, most important functional foods are spreads and milks with added phytosterols, milk containing fatty acids. The other kinds of functional foods appeared are milk and products with oligofructose, margarine and yoghurts containing fibre, cookies engineered to have low glycaemic index, milks fermented with selected *Lactobacillus* and *Bifidobacterium*, products containing soyabean proteins, low-cholesterol eggs, isotonic drinks containing caffeine (Lajolo, 2002; 149).

Some authors (Jonas and Beckmann, 1998; Poulsen, 1999; Van Kleef, Van Trijip, Luning and Jongen, 2005) suggested that the acceptance of functional foods depends on the basic product that serves as carrier for the functional ingredient. This is also related to the familiarity of the product, if the consumer finds the product familiar, it may be easy to accept it with its newly added features.

1.2. MARKET AND MARKETING OF FUNCTIONAL FOODS

1.2.1. The Functional Food Market

It is not easy to collect data about functional food market due to the definition and terminology differences. In 1990s, functional foods started to be considered as a distinct class of product in Japan. However, in the Western countries functional foods developed as differentiating existing products by adding new features that fits

developing scientific consensus about the positive influence of these foods over human health (Hilliam, 1998; 349). However, in recent studies done in Europe and the US, functional foods are also seen as a new product category. Lack of an official definition is the main constraint for analysis and monitoring of functional food markets (Menrad, 2003).

1.2.1.1. The Structure of the Functional Food Market

Many food products can be considered as “functional” in nature and some of them are in the market for years without health benefits being emphasized. With the consumer interest in health and dietary issues, the market positioning of many products has been changed to highlight the potential health benefits and inclusion of the functional ingredients.

The factors that affect food market also affect the functional food market in general. Besides, developments in the functional food market are being driven by these influences (Hilliam, 1998; 349):

- changing consumer attitudes and expectations
- growing understanding of the link between dietary constituents and physiological processes
- advances in food science and technology
- changes in the regulatory environment

The first two factors are directly linked to the consumer trends. Developments in the functional food market are mainly determined by the consumer tastes and interest in the subject. The key trends driving demand for functional foods are summarized in Table 1.3.:

Table 1.3.: Key Consumer Trends Driving Demand for Functional Foods

Consumer Trends	Implications
Ageing population	Increased life expectancy
Demand on health services	Increased economic burden
Awareness of diet / health relationship	Increased demand for healthier foods
	Increased interest in products that may reduce the symptoms of ageing
Proactive about health	Increased demand for products which will prevent disease

Source: Gray et al., 2003; 216.

These consumer trends can be evaluated as opportunities in the market; on the other hand there are also constraints in the market. According to Gray et.al. (2003; 214), there are two main constraints in the functional food market: The first constraint is the related regulations, especially in relation to product health claims. Secondly, consumers' awareness is very low in the market. Even if they know the product, they do not categorize it as functional food. Consumers may also have confusion about the complicated health messages and lack of knowledge about the beneficial ingredients in functional food products.

One of the major problems of the functional food manufacturers is the lack of consumer awareness of the existing products (Jonas and Beckmann, 1998; 11). Consumers should be oriented to see these products different from conventional food items, however knowing that they are consumed as a part of their daily diet and the curative and preventative components that they contain.

Consumer acceptance of various functional food products is different in different cultures and also among individuals. According to Frewer et al. (2003; 715); these differences may be related to nutritional knowledge levels and perceived seriousness of different diseases. Another issue about the consumer acceptance may be the attitudes towards the technology that is used when developing that product. For example, there are negative consumer attitudes towards genetically modified foods as a category.

Besides, since there is no universally accepted definition and consumers are not fully aware what the functional food is, they buy what they believe is functional. In other words, they have their own point of view about functional food concept. For example in the United States and Canada, 60% of the people select foods they believe are functional. The US population understands nutrients and non-nutrients as functional foods. Only the drugs are separated from this understanding by their use and presentation (Verschuren, 2002; 126).

1.2.1.2. Functional Food Market in the World

Statistics about the functional food market all over the world vary considerably depending on the source and in the extent of the “functional food” definition. The global markets for dietary supplements and functional foods in total reported 63.3 billion and 71.9 billion USD in sales in 2004 (Bagchi, 2006; 2).

According to Functional Foods Market Assessment (2008), the functional foods market grew 8.3% by value in the year 2007 globally. Compared to 2006, this shows a slowing of growth. In the year 2006, growth rate of functional food market was 22.1%. This can be explained by the decrease in sales of fermented milk drinks and stable sales of cholesterol lowering margarines. However, a growth of probiotic yoghurts and soya products is recorded. Fortified breakfast cereals, probiotic yoghurts and yoghurt drinks together represented a 76.6% share of the total market value in 2007 (<http://www.researchandmarkets.com/reports/c83055>, retrieved on 07.06.2009).

According to Leatherhead Food International 2004 report (As cited in Hilliam, 2004; 25), in Europe, France is the largest market which has a value of 715 million USD and 7.2% of the total functional food market share. French functional food market has strength in established probiotic dairy market and has a potential to grow in cholesterol-lowering yellow fats. The UK is the second largest market with 7.1%. Germany (4.9%) and Spain (5.5%) follow the UK.

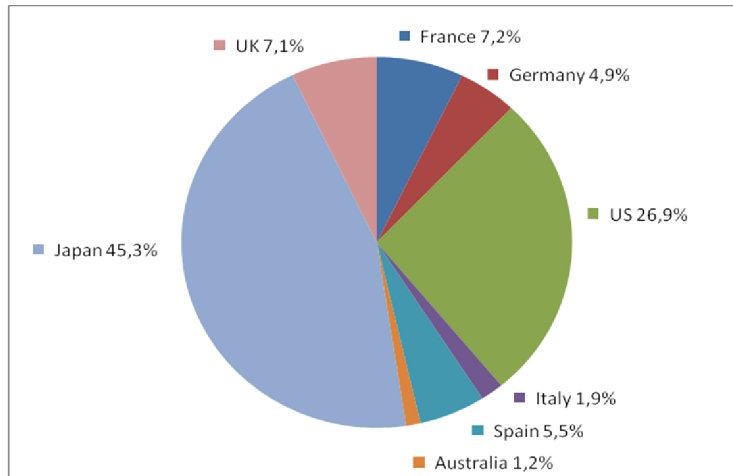


Figure 1.1.: Functional Food Sales Percentages by Country in 2004

Source: Hilliam, 2004; 2.

The market of functional foods has been very fragmented especially in Europe. One of the reasons for this is not launching every product in every country. The other reason is food companies mostly have introduced single products to the market, do not develop umbrella brands (Menrad, 2003; 185). In this respect, only the functional dairy products show more organized category within the functional food products. Dairy sector which includes probiotic yoghurt and drinks, functional milk products is the largest category in functional food products (2/3 of the total functional food market). Second largest category is cholesterol-lowering spreads and fats (Hilliam, 2004; 25).

According to MAPP report (Jonas and Beckmann, 1998; 6), most frequently bought functional foods include cereals, sports and energy beverages, yoghurt and other dairy products, bread, biscuits, baby food and pasta in general. In Japan, beverages (enriched with antioxidants, dietary fibre, or live cultures) constitute approximately 70 % of the market whereas cereals with high content of dietary fibre and dairy products enriched with fish oils dominate the market in the US. In Europe, most functional food products are either enriched with live cultures, fat substitutes, calcium or dietary fibre.

Table 1.4.: Selected International Functional Food Brands from World, 2003-04

Brand	Supplier	Category	Countries
Actimel	Danone	Dairy	Europe, US (1)
Alpro	Alpro	Soya Products	Europe
Benecol	McNeil (2)	Yellow fats/dairy	Europe, US
Bio Activia	Danone	Dairy	Europe, Australia (3)
Columbus	Belovo (4)	Eggs	Europe, US
LC1	Nestle (5)	Dairy	Europe
Pro.activ (6)	Unilever	Yellow fats/dairy	Europe, US (7) , Japan, Australia
So Good	Sanitarium	Soya Products	Europe, Australia
Tropicana (8)	PepsiCo	Soft drinks	Europe, US
Yakult	Yakult	Dairy	Europe, US, Japan, Australia

(1) renamed *DanActive* in the US in early 2004; (2) under licence to Raisio, which still markets the brand in Scandinavia; (3) sold under *Danone Daily* name; (4) sold under licence by egg companies in selected countries; (5) but made and sold under licence by Muller in Germany; (6) sold under existing healthy margarine brand according to country, e.g. Flora pro active, Becel, Fruit d'Or, Rama; (7) sold under Take Control name; (8) sold as sub brands, like Tropicana Pure Premium Healthy in the UK, Tropicana Essentials in US.

Source: Hilliam, 2004; 26.

According to a recent evaluation of Angus (2008; 1), most successful functional foods focus on major health issues like high cholesterol and poor immune system, gut and bone health and these present dominant sectors in the global market estimated at 16.1 billion USD. UK market accounts for around a 10% share in 2007. Gut health products dominate globally with a sector worth 6.8 billion USD, heart health products 5.8 billion USD and immune function products 2.6 billion USD.

The market for functional foods reached 24.5 billion USD in the US. Besides, dietary supplements reported 20.5 billion USD in sales in 2004 which is more than double the amount spent in 1994 (Bagchi, 2006; 2).

Jones and Jew (2007; 388) reviewed the functional food market by dividing the market according to the functional ingredients that the products include. According to this division:

- The worldwide market for *omega 3 fatty acid ingredients* (which can be added to the products like milk, bread, spreads, juices, yoghurt, eggs with the health claim of protection for potential heart problems) was valued 700 million USD in 2005.

- European markets for *plant sterols* (used for lowering the blood cholesterol mostly in spreads and yoghurt) were valued 184.6 million USD in 2005 and estimated to reach 395.2 million USD by the year 2012.

- *Probiotics* is another category of functional food compounds with the claim of being beneficial for gut health, and immune system. Probiotics market is included in the fresh dairy market and is one of the fastest growing markets all over the world with a retail growth about 12%.

According to IFIC Report (2007), nine out of 10 Americans are able to name a specific food or component and it is associated with its health benefit. This indicates a significant increase compared to 84% in 2002, 82% in 2000, and 77% in 1998. Besides, the level of interest in functional foods, 41% of the people interviewed is highly interested and 42% is somewhat interested in the subject.

Japan is the global leader in regulating the functional food industry. The Japanese market for functional foods reached \$16.7 billion, while the size of the more regulated FOSHU (Foods for Specific Health Use) market is \$5.7 billion in 2006. Since the introduction of FOSHU in 1991, the sales of FOSHU approved products have increased at a surprisingly high rate. The Japanese spend \$134 per person annually on functional foods, compared to \$72.2 per person in the US, \$54.4 per person for Europeans, and an estimated \$3.40 per person in other Asian countries (Yamaguchi, 2007, http://www.ats.agr.gc.ca/asia/4090_e.htm, retrieved on 07.06.2009).

1.2.1.3. Functional Food Market in Turkey

In Turkey, habit of eating healthy food becomes more important each day. Functional food category is new to the Turkish market and consumers, however it

shows a great potential to grow. Largest companies in the food sector like Ülker, Unilever, Pınar, Süttaş, Dimes are allocating their budgets for the promotion of this food category as well as trying to develop new products that can be accepted by the Turkish consumers.

According to Radikal newspaper on 04.06.2006, chairman of Turkish Food Association Federation (TGFD) Şemsi Kopuz estimated a 5 billion USD volume for functional food market after the approval of the labeling notification (<http://www.radikal.com.tr/haber.php?haberno=189248>, retrieved on 07.06.2009).

According to the General Manager of Danone Tikveşli, Serpil Timuray, the functional food market in Turkey is currently at the “puberty” stage. The market size is about 150 million dollars and of this total, approximately 42.5 million dollars belong to the functional dairy products. The functional dairy products have a growth rate of 30-35% annually and are expected to reach 150 million dollars sales volume by the year 2012 (<http://www.kobifinans.com.tr/en/sector/0109/15921>, <http://arama.hurriyet.com.tr/arsivnews.aspx?id=6291147>, retrieved on 07.06.2009).

Out of the total food and drink purchase that is approximately worth 33 billion TL, 420 million TL is composed of functional and diet products (Ipsos KMG Research 2007, Report on Functional and Diet Products). In 2007, functional food market, which reached approximately 330 million TL, realized a growth rate of 17.9%. This market growth is observed in every socioeconomic status groups however the highest rate has been observed in the lowest income group with 24% (<http://perakende.org/haber.php?hid=1208325490>, retrieved on 07.06.2009). The percentage of the households that buy functional food is 46% (http://www.tgdf.org.tr/tr/index.php?option=com_content&task=view&id=127&Itemid=92, retrieved on 07.06.2009).

The most popular products following the functional dairy products in Turkey are heart healthy spreads, child foods and herbal teas. According to HTP data; in last 9 months of 2005 Turkish consumers’ functional food expenditure reached 55

million TL. In the same period, functional foods get a share of 0.3% of the total food and beverage expenditure (www.capital.com.tr/haberaspx?HBR_KOD3316, retrieved on 07.06.2009). Some selected companies, their brands and functional food products can be reviewed in Table 1.5 on the next page. Turkish functional food market is composed mostly from milk and dairy products in compliance with the general trend in other countries. Danone(sa), Pinar, Nestle, Ülker and Süttaş are the largest companies in dairy market. Besides, cholesterol lowering margarines, enriched juices, herbal teas and some crackers and kid products can be mentioned in functional food products in Turkish market.

With the newly developed products and advertising campaigns that get the attention about healthy eating, Turkish consumers become more conscious and aware of the concept. Besides, the manufacturers also establish associations such as “Diabetic and Functional Food Manufacturers Association” in order to work collectively on awareness. On the other side, functional food manufacturers are struggling with legislation and other application problems. Even if there is scientific evidence about the benefits of using the product, manufacturers cannot emphasize the difference of their products in advertisements and on the packages because of the legislative barriers (<http://www.pazarlamaturkiye.com/content/view/218/116/>, retrieved on 07.06.2009).

According to Levent Duray (personal interview, 2008), Unilever Aegean Region Manager, Turkey has been seen as a good investment area about functional foods with its young, dynamic population which can easily adapt to new developments. However, functional foods are still not seen as a category, products are evaluated according to their base products like yoghurt, fruit juice by the consumers in Turkey. Especially the health claims of probiotic yoghurts are very clear and this is the main reason that they are the leading products in the category.

Unilever predicts that in the following 12 years, the functional juices that emphasize the naturalness with its functionality will be a trend and distinctive growth

in this product category may be seen. Besides, private labels started to enter into the functional food market which has already been observed in Europe and the US.

Table 1.5.: Selected Companies and Their Functional Food Products in Turkish Market

COMPANY	BRAND	FUNCTIONAL FOOD PRODUCT
Danone(sa)	Activia	Probiotic / gut friendly yoghurt
		Kefir
	Danino	Fresh cheese enriched with vitamins (For kids)
Dimes	Dimes Life	Enriched juices
Pınar	Pınar Denge	Probiotic milk
		Probiotic yoghurt
		Milk with omega 3
		Milk with extra calcium
		Milk without lactose
Sütaş	Yovita	Probiotic / gut friendly yoghurt
	Büyümix	Fresh cheese enriched with vitamins (For kids)
	Babymix	Probiotic baby yoghurt (For babies)
Doğadan	Doğadan	Herbal teas
Gıdasa	Deren	Herbal teas
Unilever	Algida	Amaze - snack that help brain and nervous system development with DHA and omega 3 (For kids)
		Amaze - milk that help brain and nervous system development with DHA and omega 3 (For kids)
	Lipton	Herbal Teas
	Becel	Cholesterol lowering margarine
Ülker	Kalbim Benecol	Cholesterol lowering margarine
	İçim Smart	Kefir
		Fresh cheese with omega 3 and DHA (For kids)
Otacı	Otacı	Soya meat
Nestle	Nestle Çocuk	Growing milk (For kids)

Source: http://www.capital.com.tr/haber.aspx?HBR_KOD=3316,

<http://www.unilever.com.tr/ourbrands/foods/default.asp>,

http://www.pinar.com.tr/product/product_group.asp?productgroupID=1&navID=9,

<http://www.danone.com.tr/B.html>, <http://www.dogadan.com.tr/main.html>, <http://www.sutas.com.tr/urun.php>,

<http://dimes.com.tr/urunler.htm>, <http://www.derencay.com/>, <http://www.otaci.com.tr/products/>,

<http://www.nestle.com.tr/nestlehtml/content.asp?cntID=0004>, retrieved on 07.06.2009.

1.2.2. Marketing of Functional Foods

1.2.2.1. Functional Food Development

Foods with additional health value offer growth opportunities for the food industry. However, there are always complexities and challenges in development of any kind of product. The differentiation of the products is costly and risky, especially there are high failure rates in the food products. In order to decrease the level of failures, there has been a considerable interest in methods and concepts for consumer-oriented product development. Thus, for understanding the needs, the consumers have to be integrated in to the production process (Grunert, 2005; 386).

It is important to develop functional food products which have clear health benefits. The key success for functional food manufacturers is to develop products that the benefits can be understood and evaluated positively by consumers within the existing culture. Novelty and complexity are the two main reasons of mistrust and rejection in this food category (Sibbel, 2007; 558). Consumer participation in the process of developing a new product may be one way of building this trust.

Functional food innovation is highly risky. There are two sources of risk in strategic decision making in product development. First, resources that are invested in a product can fail in the marketplace. Second, a potential successful functional food product idea may be eliminated at the beginning. It is hard to predict which new product opportunity should be invested to build a marketable consumer product (Van Kleef et.al, 2002; 94). Thus, it is important to apply consumer research in the area to develop more effective products. The success process of functional food products can be summarized in the Figure 1.2.:

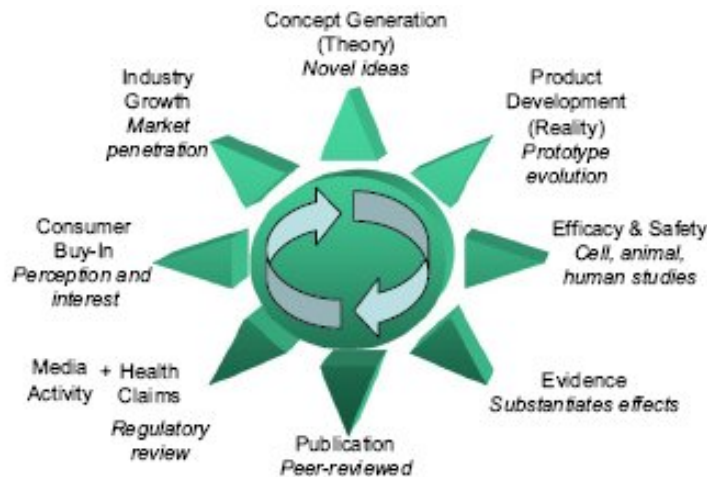


Figure 1.2.: Functional foods and health promotion: Cycle of Success

Source: Jones and Jew, 2007; 388.

This cycle can start at any point however usually development of a functional food product starts with the novel idea in diet-disease relationship. These novel ideas can come from the industry as well as academic researches. Academic researchers and the industry have to work closely in order to develop marketable food products. Most of the ideas in this stage are screened out and cannot complete this cycle.

In product development stage, the novel idea turns into a real, marketable product which is a considerable challenge. There are a lot of difficulties when formulating the product that have acceptable hedonic qualities. Product development stage has to be followed by verification of the product which is to ensure the scientific proof of the safety of the product. Evidence also needs to be provided by parallel studies by both academic and private laboratories and published in peer-reviewed journals. The aim of the health claims and regulatory review stage is to communicate the health messages generated through active research and regulatory review of a specific product to the general public (Jones and Jew, 2007; 388-390). The last two steps approve the marketing success of a functional food product. Consumers' interest and positive evaluation in this stage leads to market penetration of the product. It is important that the consumer has the latest information about the product with the developed communication strategies which takes the consumer

concerns into account (Frewer et al., 2003; 726). Lastly, increase in the market share will promote further concepts and theories.

Functional food product segment is characterized by a high rate of product failures. In order for a product to find a place in the market, familiarity and acceptance of the product, knowledge about the beneficial substances in food products are important because consumers are usually conservative about changing their eating patterns (Menrad, 2003; 185). Besides, it is also important that how well and clear the product is presented to the consumer. In this respect, there are strong needs for specific information and communication activities about the health effects of newly developed functional products.

1.2.2.2. Critical Points in Marketing Applications

Food is a universal and indispensable human need and the eating habits are deeply rooted in cultural beliefs and practices. Thus, the study findings could only be a suggestion to change dietary pattern for the consumers. Besides these studies and clinical proofs about a food product, social acceptability of these studies and media interest and emphasis are also important in adaptation of these food products (Kumanyika, 2000; 87). Product categories may change with the consumers' changing perceptions. New food categories are introduced to sell a concept. Providing the right kinds of choices for consumers is a major challenge for food suppliers, but satisfying the consumer choices also requires skills (Schröder, 2003; 55).

According to Menrad (2003; 186-187), success of the functional food products depend on several factors. These factors and their explanations can be reviewed in Table 1.6. Firstly, the success factors for the marketing of food products in general are also valid for the functional foods. These are basically; taste, convenience, product variety and packaging volumes. Taste is generally the primarily important factor in food choice. It is also one of the main conditions for consumer acceptance. Consumers' expectations and experiences about the functional food category is very

important (Childs and Poryzees, 1997, Poulsen, 1999, Urala and Lahteenmaki, 2003, Verbeke, 2006). Besides, even a functional food with proven health benefits may not be attractive to consumers because of its sensory features that do not meet with the consumer expectations (Frewer et al., 2003; 716).

Table 1.6.: Marketing Success of Functional Foods

Success factors	Explanation
Success factors for food products in general	Taste, convenience, product variety, packaging volumes
Successful information campaigns	Indicating the message of the health effect of a specific product, understandable by consumers
Regulatory situation	Should be in compliance with regulatory environment of the country
Acceptance of the price premium	Price premium could only be accepted if they have proved health effects related to a disease
High volume distribution channels	Like supermarkets, general retail stores or discount retailers

Source: Menrad, 2003; 186

Secondly; there should be successful information campaigns that can transfer health message of a specific product. The message has to be transferred relatively simple in order to be understood by the consumers. Investing in the development of functional foods may be a sustainable practice if these products can demonstrate a measurable and distinct nutritional advantage for consumers. There must be a nutritional advantage for the consumers and this advantage can be quantified by comparing effects of the functional food product with the conventional alternatives (Sibbel, 2007; 556).

Another challenge is regulatory situation within the country that the functional food product is represented. Another one is the price premium for this type of food in comparison to conventional food products. Price premium for the functional foods is accepted only if the functional food has proven health effects related to a disease. The last point for the success of the functional food marketing is the high-volume distribution channels. Network of the distribution channels have to be strong for

consumers to reach the products easily in supermarkets, general retail stores or discount retailers.

Jonas and Beckmann (1998; 5) stated that society may benefit from successful functional foods in three different ways:

- 1. *Consumer Perspective:*** prolonging a healthy and active life
- 2. *Perspective of the state:*** lowering health expenses in the long run and as a result redirecting resources to different areas
- 3. *Food manufacturer perspective:*** high value-added products

Food represents an increasingly innovative and technological industrial sector. If the food is placed in the market for the first time, buyer and the potential consumer has to have knowledge at least about the nature of the product. Exploring further knowledge about the novelty of the product depends on the personal and contextual factors. Consumer adaptation to unfamiliar products is a complex mechanism directly related to perceived consumer-value (Schröder, 2003; 43).

Perceived added value is important for the consumer acceptance of a newly launched product or a new idea. If the product is highly innovative, consumer acceptance is more difficult to gain. Added value for the functional food products is presented by the added functions or the positive health effects (Horska and Sparke 2007; 351).

Finding new ways of value adding based on technological development is the one way of getting competitive advantage. Value-adding process represents a technological upgrading process that requires the working of different fields such as research and development, manufacturing and regulatory field together (Mark-Herbert, 2004; 713). Research into functional ingredients was showing promising prospects for the use of such ingredients in food products, creating added value for manufacturers and benefits for consumer health (Coppens, Fernandes and Pettman,

2006; 60). Besides, research to understand the consumer needs and media activities are important in value adding process.

On the consumer side, the success of functional foods relies on a number of inter-relating factors; level of concern about health and medical conditions, the belief about the influence on one's own health and awareness and knowledge about beneficial foods/ingredients (Hilliam, 1998; 350). Understanding the relationship between diet and health is the driving demand for added value food products that provide health benefit.

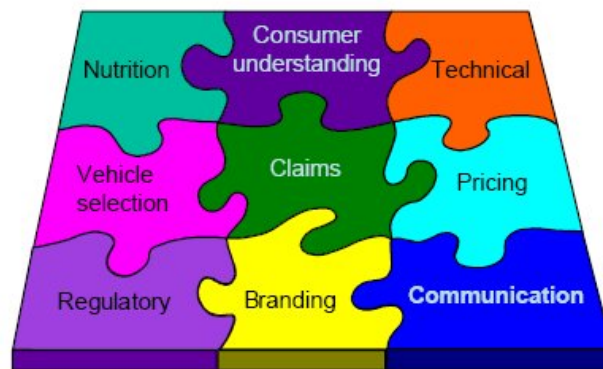


Figure 1.3.: Fitting Factors in Success of Functional Food Marketing

Source: Verschuren, 2001; 4.

Verschuren (2001) also covered the factors of the successful functional food marketing in Figure 1.3. According to the figure, all pieces are integrated with each other. Claims are in the center of the successful functional food marketing which is the way of the consumer and product communication. Providing so much detailed information about functional foods may not be the best solution for promoting them to consumers. Consumer's reasoning is different from science-based thinking, information itself may be interpreted in a simple manner that masks the product-specific content of the message (Urala, Arvola and Lahteenmaki, 2003; 825). Thus, claims should be brief and understandable by the consumer. Consumer understanding is critical also for the technical, research and development (R&D) activities about the new functional foods. Vehicle selection is the selection of the base product (carrier) of the nutrition which is integrated also with the regulations and claims directly.

Pricing is directly related to the technical issues however it should not exceed the level of the consumer which they are prepared to pay. Functional foods should also be in compliance with the regulatory environment which they are marketed. Lastly, as for all of the products, building trustable brands is an important factor for successful functional food marketing.

1.3. SAFETY, HEALTH CLAIMS AND REGULATIONS ON FUNCTIONAL FOODS

1.3.1. Safety of Functional Foods

In narrow sense, food safety is defined as the opposite of food risk, the probability of not contracting a disease as a consequence of consuming a certain food. In broad sense, food safety can be defined as “*consumers’ concerns about the properties of unfamiliar foods*”(Coppens et al., 2006; 60). Safety can be reviewed as one of the food quality dimensions. However, Grunert (2005; 381) stated that every consumer has its own perceptions of the food quality and accordingly safety and it affect consumers’ food choices.

Safety of functional foods is one of the success factors. If the claims are supported with science, labeled correctly and clearly, in compliance with the legal regulations in the country where the product is marketed, the trust of the consumers to the product will be higher (Sheehy and Morissey, 1998).

Safety perceptions can play a role predominantly in two ways. First, in situations where major safety problems are perceived, risk perceptions can come to dominate all other considerations in food choice and lead consumers to avoid certain categories or brands for some time. Second, consumers apply safety considerations to certain production technologies (eg. Genetically Modified Foods - GMOs). In such cases consumers perceive the use of these technologies as unsafe and develop negative attitudes towards the use of these technologies. These negative attitudes can

be powerful forces in the marketplace, which both industry and regulators have to take seriously (Grunert, 2005; 381).

The level of scientific evidence needed to support claims on foods and how they communicated to the consumer is a critical issue for the safety perception of the functional foods. Secondly, the extent to which nutritionists understand the barriers to changing eating patterns has to be addressed (Verschuren, 2002; 129).

1.3.2. Importance of Health Claims

Information about the health effects of food products and the way of communicating this information to consumers is the main factor in the success of the functional food marketing, because the health effect cannot be perceived directly from the product itself. Products with differentiated qualities need to be promoted to consumers, and consumers need to make positive evaluations before purchasing and using the product. Otherwise, consumers will not buy the product marketed as quality-differentiated, or their demand may be limited to only trying the product. (Grunert, 2005; 378). Information about these differentiated qualities may assist consumers in making appropriate food choices. The information also can have an impact on the willingness to use (Urala et.al., 2003; 816). The development of health claims is mainly related to the development of functional foods.

Wansink, Westgren and Cheney (2005; 266) suggested that knowledge about a food product cannot influence consumers' attitudes but can influence their consumption intentions. Having knowledge may be related to preference but it may not be related to consumption. According to Van Kleef et al. (2005; 299), the main reason of poor market acceptance of most of the functional food products with high scientific evidence is the lack of developing effective persuasive health claims.

The scientific support of health claims may derive from experimental studies. The EU PASSCLAIM project (Process for the Assessment of Scientific Support for Claims on Food) aims the industry, academicians, consumer groups and regulator

actors to evaluate the scientific basis for health claims. Although there is increasing demand for healthier foods in Europe, few functional food products can reach the shelves of a market place. According to Verschuren (2002; 125), the reason behind this is the developing scientific support for health claims can be expensive and takes time.

Putting the health-claim on the label or mentioning it in advertising, the language choice is another critical point. The label on the product should be clearly understandable by consumers, not be misleading and inform the customer appropriately. Consumers may feel uncomfortable to make choices if the information is not enough, too complex or too much information on the label is given (Sibbel, 2007; 558).

Health claims also have to be in compliance with public health policies. In some specific cases, products should clearly inform restriction of their use for specific groups or individuals with specific physiological conditions (Lajolo, 2002; 149). This rule should also be applied to marketing and advertising materials.

According to a study done by Urala et al. (2003), women had more positive responses to claims than men, which may be due to women's more positive attitude towards a healthy diet. Age had no impact on perception of health claims. Besides, the results of the study done by Van Kleef et al. (2005) shows that physiology based health benefits are preferred over the 'softer' psychology/behavior based benefits. Besides, claims are best received when attached to the products which have positive health image.

1.3.3. Types of Health Claims on Functional Foods

Consumer knowledge about a food product can be divided into two: 1) knowledge related to the attributes of the food and 2) knowledge related to consequences of consuming the food (Wansink et al., 2005; 265). People who have no knowledge of a particular food product are unlikely to purchase and consume it. If

the nutritional knowledge about a food increases, consumers are more likely to purchase the product. Besides, consumer acceptance of functional foods is more likely to occur when people link their knowledge about the food attributes to the personal benefits of consuming it. Food labels usually inform about the benefits of the food and assist consumers in their healthy food choices. There are 3 kinds of nutritional claims that can be found on the functional foods (Agarwal, Hordvik and Morar, 2006):

- ***Nutrient Content Claims:*** Gives information about the level of the nutrient that exists in the product (e.g. “good source of calcium”)
- ***Structure/Function Claims:*** Describes the nutrient’s role in health maintenance. (e.g. “calcium helps build strong bones”)
- ***Health Claims:*** Describes nutrient’s role in disease risk reduction (e.g. “calcium may reduce risk of osteoporosis”)

In addition to the division of nutritional claims; according to Codex Alimentarius Guidelines of health claims (Hawkes, 2004), the health claims can be divided into three categories:

- ***Nutrition Function Claims:*** Describes the physiological role of the nutrient in growth, development and normal functions of the body.
- ***Other Function Claims:*** Concerns the specific beneficial effects of consumption of foods and their constituents. Such claims relate to a positive contribution to health or the improvement of a function or preserving health. These claims can also be named as “enhanced function claims” in some authors’ studies.
- ***Reduction of Disease Claims:*** Informs about consumption of foods that have such claims as helping to reduce the risk of developing a disease or health related condition.

Claims are not allowed to include statements regarding the curing, treating, or prevention of diseases but statements about reduce risk of disease and improved state

of health or well-being are allowed (Urala et.al., 2003; 816). However, a fourth type of claim is “disease prevention” or “disease treatment” or “disease cure” claim which is not always defined as health claims. In fact, these kinds of claims that mention a food can play an effective role in treating or curing a disease are prohibited to be used on foods by Codex Alimentarius guidelines as well as in regulations of many countries (Hawkes, 2004; 4).

Health claims are regulated by the standards of Turkish Food Codex in Turkey and statements that specifically indicate preventing, curing or treating a disease is also not allowed to be used by the manufacturers. Table 1.7 is a list of some health claim examples from the Turkish functional food market. As the table shows, in Turkey most of the statements are nutrition-function claims that emphasize the functional nutrient in the product and give information about the health effect of this specific nutrient.

According to the results of the study done by Van Kleef et al. (2005), consumers tend to prefer functional food concepts that primarily communicate disease-related health benefits in carriers (products) with a healthy image or positioning history in healthiness. Also, enhanced function claim format are most communicated to the consumers about preferred energy levels whereas reduced risk reduction formats are preferred for heart disease.

Table 1.7.: Functional Food Health Claim Examples from Turkey

BRAND	PRODUCT	HEALTH CLAIM
Yovita	Prebiotic yoghurt	"Helps to regulate digestive system and support immune system with prebiotic fibre"
Activia	Prebiotic yoghurt	"Helps digestive system in two weeks" "If consumed regularly every day, helps to regulate your digestive system in two weeks"
İçim	Kefir	"Probiotic bacterias helps to support digestive system. Prebiotic dissolved fiber supports the life and development of bacterias that regulates digestive and immune system"
Danino	Fresh cheese	"Contains high amount of calcium. Calcium helps to develop bones"
Becel Pro-aktiv	Margarine	"Plant stanol helps to lower cholesterol level" "Proved that lower the bad cholesterol within 2-3 weeks" + extra information booklet
Kalbim Benecol	Margarine	"Plant stanol helps to lower cholesterol level" "Low cholesterol helps to keep heart and vascular system health"
Keskinoğlu	DHA Egg	"This food that contains omega 3 fatty acids and DHA, helps normal development of brain, helps development of eye and nervous system"
Keskinoğlu	Omega 3 Egg	"Helps physical and mental development"
Güres	Omega 3 Egg	"Contains omega 3 EPA/DHA fatty acids. EPA /DHA helps to keep health of heart and vein system. DHA helps normal development of brain, helps development of eye and nervous system"
Amaze	DHA drink with milk / cracker	"Contains DHA. DHA helps the development of brain, eye and nervous system"
İçim Smartt	Milk	"This food contains omega 3 - DHA. DHA helps the development of brain, eye and nervous system"
Pınar Denge	Milk without lactose	"For the adults that cannot digest lactose in milk + extra information about digestion of lactose"
	Light milk with calcium	"Calcium, helps development of bones and teeth and keep bone health"
	Omega 3 light milk	"Omega 3 EPA/DHA helps to keep health of heart and vein system"
Kalbim Benecol	Skimmed yoghurt/fermented milk drink with plant stanol	" Helps to lower the cholesterol level" "low cholesterol helps to keep the health of heart and vein system"
Otaç	Light prepared Soup	"Contains high amount of fibre. Probiotic, helps digestive and immune system"
Soyet	Minced soya meat	"Soya protein helps to lower the cholesterol level"
Otaç	Diabetic cracker/Light stick cracker	"High fibre helps to work intestines properly and balance the fat in blood" "Glycemic index is low, glucose and insulin in blood stays low" "Supports digestive and immune system"
Doğa	Prebiotic Muesli / Muesli	"Low sodium helps to keep health of heart - vein system"
		"High prebiotic fibre helps to work nervous system properly"
Dimes Life	Quince Juice	"Contains high fibre. Fibre help the digestive system to work properly"
Cappy Yaşam Aktif	Fruit juices	Long information about phyto products

1.3.4. Regulations on Functional Foods

Food safety is a major topic for public policy. Regulatory responses can be viewed in two categories. First refers to the enforcement of common standards for food safety. This has no immediate impact on consumers' food choice but it is debatable in terms of economic efficiency because the consumer preferences for safety are not homogenous. The second refers to attempts to provide transparency and encourage consumers to form their own judgments on food safety, supported by the mechanisms of public participation, consumer education and consumer information instruments such as labeling (Grunert, 2005; 382).

Since there is no legal definition, it is difficult to create legislation for the functional foods. Functional foods have to be in compliance with the general regulations about food products. However, other than the general regulations there are some regulations which may especially be related to functional food products such as health-claim regulations. Besides, if a product is marketed as having therapeutic effects then it must be approved by medical experts rather than food-related regulatory bodies (Frewer et al, 2003; 715). Use of health claims in marketing foods and relatedly the regulations about them has not been clarified yet because it is not clear which products belong to the functional food category (Jonas and Beckmann, 1998; 8).

There is no harmonized legislation on health claims in European Union. Even the word "health claim" can be understood differently in different European countries. As a result of "Functional Food Science in Europe (FUFOSE)" project, important general guidelines concerning the definitions and use of different nutrition and health-related statements in European practice have been published (Diplock et al., 1999). According to this report, claims should have compliance to the national nutrition policies.

1.3.4.1. Codex Guidelines Related to Functional Foods

Codex Alimentarius Committee developed standards and guidelines on food labeling and health claims. Even if the committee does not refer to the term “functional foods” in their standards, some of the standards are directly related and important for functional food products. These standards and guidelines are affected from the national regulations and policies in many countries.

General Standards for labeling of prepackaged foods (1985, revised in 1991, 2001) can be applied to every packaged food product, not only to functional food products. This standard includes the regulations about false and misleading and/or deceptive labeling. There is also a General Standard for labeling of foods for special dietary use (1985) which underlies that these foods have to display a nutrition label.

According to Codex Guidelines on Nutrition Labelling (1993); nutrition labeling should be voluntary unless a nutrition claim is made. If a nutrition claim is made, declaration of four nutrients (energy, protein, carbohydrates, fat) plus any other nutrient is mandatory. Any other nutrient deemed by national legislation to be important for maintaining good nutritional status may also be listed. Nutrients should be listed per 100g or per portion. Countries go beyond these guidelines if national legislation of their own requires.

Codex Alimentarius Committee that permits health claims (2003) which is directly related with functional food products, health claims should be supported by scientific evidence and consistent with national health policy and support such policies where applicable. The presentation of risk-reduction claims must ensure by the use of appropriate language and reference to other risk factors, that consumers do not interpret them as prevention claims. Health claims must be made in the context of the total diet and must not encourage bad dietary practices. The claimed benefit should only arise from the consumption of a reasonable amount of the labeled food. Claims that are related to “healthy diets” should remain true to dietary guidelines and foods should not be described as “healthy” implying that they will impart health.

1.3.4.2. Regulations on Functional Foods in Some Countries

Codex Alimentarius guidelines are the base of the legal regulations in most of the countries. However, some countries also determined and published their own guidelines about health claims or safety of foods. Japan is the place that first regulations directly related to functional foods are developed. Japan Ministry of Health and Welfare in 1991 initiated the world's first policy of legally permitting the commercialization of selected functional foods in terms of FOSHU. The new policy is defined by the new legislation and also characterized by approving the presentation of a health claim for each FOSHU product (Shimizu, 2003, 242). Such legal framework also prevents the presentation of wrong defined and misleading advertisements in commercial products. Thus, since 1993, some selected food products have been approved to claim a certain degree of medical representation never before permitted for any food (Arai, 2002; 140).

In China, there are also policies for functional foods and Chinese functional foods are legally approved, with the logo issued by the Ministry of Public Health. The functions to be considered include 24 items; immune regulation, postponement of senility, memory improvement, promotion of growth and development, anti-fatigue, body weight reduction, oxygen deficit tolerance, radiation protection, anti-mutation, anti-tumor, blood lipid regulation, gastrointestinal function improvement, sleep improvement, improvement of nutritional anemia, protection of liver from chemical damage, lactation improvement, improvement for beauty, vision improvement, promotion of lead removal, removal of "intense heat" from throat and moistening the throat, blood pressure regulation, enhancement of bone calcification (Arai, 2002; 140).

European legislation does not consider "functional foods" or "nutraceuticals" as specific food categories. Thus, there is not a clear regulatory framework for functional foods or nutraceuticals in EU Food Law. The rules to be applied for these products depend on the nature of the food stuff. Regulatory frameworks for dietetic foods and food supplements may be applicable to some functional foods. Besides,

“The Novel Food Regulation” will be applicable to new functional foods (Coppens et. al, 2006). In EU, there is one category of products that has a firmly established legal framework, which is “Foods for Particular Nutritional Uses” (PARNUTS). This legal framework is mainly about scientific risk assessment, consumer protection, manufacturer responsibility and market innovation. The 1997 Green Paper on Food Law and 2000 White Paper on Food Safety also made new revisions on the European Food Law especially in respect to ensure a high level of protection of public health, safety of the consumer (<http://www.foodlaw.rdg.ac.uk/>, retrieved on 07.06.2009).

Only UK, Belgium and the Netherlands have their own guidelines for determining functional foods and use of related health claims. In Finland, according to Finnish Food Legislation, it is acceptable to mention the improved health and general well-being in the claims if the statement has been proved by two independent scientific studies. The Finnish regulations are in compliance with the EU guidelines (Urala et.al, 2003; 817).

In the US, Food and Drug Administration (FDA), which is the part of Department of Health and Human Services, has the authority to approve or deny -if there is no significant scientific agreement on the benefit- a proposed health claim. Until 1993, FDA regulations prevented any food label from showing a disease-specific/disease-prevention or health-related claim. If the product has these claims, it is considered to be a drug. On January 1993, FDA approved to use these claims if it is based on publicly available scientific evidence (Hutt, 1993; 132).

According to the FDA Modernization Act (1997), claim shows the authoritative statement and enables the public to see the information provided in the claim and to understand the relative significance of such information. Thus, health claim may not be false or misleading. Besides, detailed nutrition information will be given on the package only if the food contains a nutrient in a level that increases the risk of a disease. This will reduce the label confusion and increase the incentive for useful nutrition information in labeling (Schmidl and Labuza, 2000). Structure-function claims have been allowed for foods under the US Federal Food, Drug and

Cosmetic Act, however, they are allowed differently for dietary supplements and conventional foods (Milner, 2002; 126). Canada has also undertaken initiatives to establish nutrient and health claims regulations similar to those in the US (Verschuren, 2002; 126).

Latin America has very few legal regulations concerning functional foods and health claims. In almost all countries, functional or health claims are not prohibited or regulated. In general, basic nutrient or function claims are allowed. Subject to some norms, only few countries have norms for health claims. Health authorities have allowed product claims on a case-by-case basis in several countries (Lajolo, 2002; 148). Brazil is the only country that is in progress of developing well-defined regulation for health claims and safety. Regulations are basically on safety and efficacy of novel foods and foods/ingredients that have a claim in the label (Verschuren, 2002; 125).

1.4. TRENDS AND OPPORTUNITIES IN FUNCTIONAL FOOD SECTOR

The global potential for functional foods can be attributed to two trends. First is the increasing health consciousness and self care trends among ageing populations which are proactive about their health and follow newly developed products in order to prevent diseases through daily diet. Secondly, younger individuals that work in longer hours and interested in leisure activities which makes them short in time to prepare healthy foods (Gray et.al, 2003, Sibbel, 2007; 554, Verschuren, 2002).

Functional food market is a rapidly expanding market which has characteristics of a changing market. Thus, flexible strategies are reflected in strategic collaborative development. Development of a new functional food product requires a multi-disciplinary effort among scientists in research and development activities and a skilled, experienced managers have to build this network of experts (Mark-Herbert, 2004; 718, Milner, 2002; 156). In fact, the success of functional foods depends on the specific efforts of the different actor groups such as scientists, food ingredient

suppliers, food industry manufacturers and food retailers (Menrad, 2003, Van Kleef et.al, 2002).

According to Mark-Herbert (2004), if the businesses want to succeed in this market, they have to build internal skills, employing innovative external sourcing, developing new markets, establishing alliances, developing packaging, building strong brands and finding venture capital for new developments.

Developing scientific based new featured products is not always enough for getting the consumer acceptance. In order to get the consumer acceptance, consumers have to be included in the development process. The success of functional foods is dependent on the ability of the food industry to develop efficient products that meet consumer needs. Taste, convenience, trust and credibility are the main factors for consumers to accept the product in the market (Gray et. al, 2003, Verschuren, 2002; 129).

Taste and convenience are the primary reasons for choosing specific foods. Functional food industry has to respond consumers with tasty solutions in order to maintain its current stars and future cash cows (Verbeke, 2006; 130). Understanding consumers' risk perception and needed information about the safety of the functional food they used, relatedly developing technologies, scientific innovations about the food market is also important for the marketing success of the functional foods (Frewel et.al, 2003; 727). Health messages need to be communicated transparent, credible and in an understandable manner to different people. Developing clear health claims about the product and the way of communicating it to the consumer also contributed growth of this sector (Sibbel, 2007; 554).

In developed countries small and medium-sized companies started to enter the market however there are only limited opportunities for them due to the specific challenges in this segment. According to Menrad (2003), potential future strategies for this group of companies are: Producing and marketing of functional "me too" products if the original functional product is not protected by patents, development of

functional ingredients that have been discovered in public research institutions, development and marketing of specific functional niche products since small and medium-sized companies are in general faster and more flexible than the multinationals, production of functional private labels brands.

One of the major difficulties in the potential of functional foods is the lack of a universally accepted understanding and legal interpretation of the concept (Sibbel, 2007; 555, Roberfroid, 2002). Besides this main constraint, people do not tend to change their habitual eating easily. Thus, health benefits demonstrated in a scientific basis and in a way of communicating persuasive health messages encouraging the diversity of food choice. This is the main chance of sustainability of the functional foods in the market (Gray et.al, 2003, Sibbel, 2003; 556).

In order to be successful in functional food sector manufacturers have to be aware of the consumer needs. Thus, consumer behavior studies that will be applied in the field are crucial. For the new products or new categories, attitude studies are usually applied to the consumers at first to understand the possible success of the product and potential consumer profile.

CHAPTER 2

CONSUMER ATTITUDES AND FUNCTIONAL FOODS

2.1. CONSUMER BEHAVIOR AND ATTITUDES

Consumer behavior is simply defined as “*the study of psychological, social and physical actions of the individuals when they purchase, use and dispose products, services, ideas or practices in order to satisfy their needs and desires*” (Blackwell, Miniard and Engel, 2001; 12). “*Consumer behavior is a dynamic and changing process because of the changes in ideas, perceptions and activities of consumers*” (Olson and Peter, 2008; 6). In order to understand consumer behavior, it is necessary to define who the consumer is for the specific product/service/category/brand. Thus, the aim of the consumer research is to understand the reasons of buying behavior.

Attitude studies are one of the critical areas of consumer research because of attitudes’ believed role in decision making and behavior. Attitudes are usually as antecedents of consumers’ purchase intention. Attitudes usually play a key role in deciding buying a specific brand, shopping from a specific store. Attitudes help to reach relevant information held in mind and with these links people make decisions/choices easier and quicker (Sanbonmatsu and Fazio, 1990; 619). However, this does not mean that behaviors are always controlled by or in compliance with the attitudes. A range of intervening factors may affect attitudes as well as behavior like situational factors (economic circumstances, mood, physical or social context) and other factors such as strength or depth of the attitude or its connection with other attitudes (McGivern, 2003; 188).

2.2. DEFINITIONS OF ATTITUDES

Attitude is defined in many different ways in books and articles however it can be basically defined as “*negative or positive evaluations of people, objects or ideas*” (Aronson, Wilson, Akert, 2004; 217). In one of the first studies about attitudes,

Allport (1935) defined attitudes as the “*cognitive and psychological readiness that orients the person’s behaviors towards a related object or situation*” (As cited in Freedman, Sears and Carlsmith, 2003; 338). According to this definition, attitude is the preparation or tendency to behave in a way. On the other hand, Doob (1947; 138) defined attitudes as “*the covered and motivated reactions that is important in the society*”. This definition considers attitudes like a hidden behavior.

Recently attitude is defined in social psychology and consumer behavior studies as “*a permanent system or a context that has cognitive and affective components and they include behavioral tendency*” (Freedman et al., 2003; 339).

There are two key features that are highlighted in all attitude definitions: attitudes are long lasting; they tend to endure over time and they are general; they can be applied to more than one situation or an event (Solomon, Bamossy and Askegaard, 2002; 127).

2.3. COMPONENTS OF ATTITUDES

There are three components of attitudes which are called as “ABC of attitudes” in some texts: affect, cognition and behavior. Affective component consist of the emotions, positive and negative evaluations towards an attitude object. Cognitive component consists of knowledge, experiences, thoughts and beliefs about the attitude object. Behavioral or conative component is the tendency or likelihood of specific actions and observable behaviors towards the object (Aronson et al., 2004; 217, Schiffman and Kanuk., 2004; 256, Solomon et al. 2002; 128, Taylor, Peplau and Sears, 2003; 134).

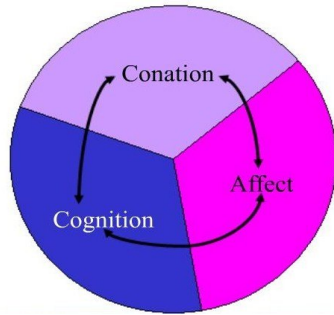


Figure 2.1. Three Components of Attitudes

Source: Schiffman and Kanuk, 2004; 256.

Components of attitudes emphasize the relationship between knowing, feeling and doing. In consumer research behavioral or conative component is mostly considered as an expression of intention to buy (Schiffman and Kanuk, 2004; 259). However, consumer attitudes towards a product or a service can only be explained by all three of the components however the dominance of one component depends on consumer's motivation level (Solomon, 2004; 227).

In standard learning hierarchy, person forms belief by the previous knowledge, then forms a feeling towards the attitude object and finally behaves in a way. According to standard learning hierarchy, while taking a purchase decision, consumer is highly involved in the process (Solomon, 2002; 130). In low involvement hierarchy, person behaves towards object with a limited knowledge, then forms an evaluation about it. Consumer does not have strong preference between brands or products, evaluation about it is formed in post-purchase stage. Experiential hierarchy assumes that consumers act with their emotions. This hierarchy defends that consumer attitudes are strongly influenced by the intangible product attributes.

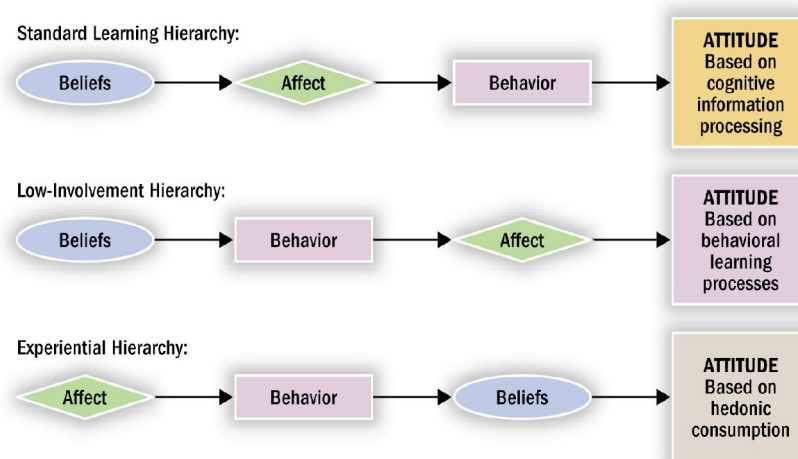


Figure 2.2. Three Hierarcies of Effects

Source: Solomon, 2004; 227.

2.4. FEATURES OF ATTITUDES

Attitudes have different features as a whole and one by one. The reason of the differences between people's reactions is rooted in differences of these features. Besides, the influence degree of an attitude over a behavior comes from its features (Odabaşı and Gülfidan, 2002; 164, Taylor et al., 2003; 159). Features of attitudes are listed below under 6 titles:

- 1. Consistency of attitudes:** It is not necessary to have uniformity for all attitudes of a person. However, people tend to have harmony among their thoughts and feelings and this harmony defends the person to have conflict (Solomon et al., 2002; 135). In fact, people do not develop attitudes one by one, they form attitudes as a whole.
- 2. Complexity of attitudes:** Attitudes may be complex due to its components' complexity. Sometimes the ideas may conflict with the emotions, thus the attitude become complex (Odabaşı and Gülfidan, 2002; 165).
- 3. Strength of the Attitude:** The strength of an attitude may be seen as the strength of the three components of an attitude. Strong attitudes are more tend

to be stable and hard to be changed, have personal implications. Thus, strength of the attitudes affects the attitude-behavior relationship (Taylor et.al, 2003; 161).

4. *Attitudes are learned:* Information gathered from the family, mass media and other people, experiences with the object and social relationships influence the development of attitudes (Odabaşı and Gülfidan, 2002; 165).

5. *Attitudes occur within a situation:* Events or circumstances at a particular time influence the relationship between attitude and behavior. If the situational pressures are high, it may cause people to act inconsistently with their attitudes. Besides, people can have more than one attitude towards an object where each can occur in a particular situation (Schiffmann and Kanuk, 1997; 237, Taylor et al., 2003; 163).

6. *Attitudes may change:* Since the attitudes are learned, influenced by personal experience or with the information gathered, they can change over time. Attitude change occurs only if the new attitude is more incentive than maintaining the old attitude. The marketers may risk high expenditures on promotion strategies because of this feature of attitudes (Freedman et al., 2003; 347, Odabaşı and Gülfidan, 2002; 166).

2.5. DEVELOPMENT OF ATTITUDES

Formation of consumer attitudes is strongly influenced by personal experience, influence of family and friends, direct marketing, and mass media (Schiffman and Kanuk, 2004; 267). Personal experience is developed by trying and evaluating the product/service. Family is also an important source of influence on attitudes. Basic values of individuals come from their families. Direct marketing is also another way of affecting consumer attitudes especially for defined target segments. Lastly, newspapers, radio and tv programmes expose new ideas, products and opinions to consumers continuously and these communications influence the formation of attitudes.

Attitudes can also be named as “opinions” if they are more superficial and more likely to change; “values” if they are deeply-rooted and more immutable. Data collection in marketing research includes the data on any kind of ‘attitudes’ besides the related issues such as value systems, social and political issues, personality and lifestyles. Attitudes can be classified according to their sources or the influences on them (McGivern, 2003; 187):

- ***Physiological and psychological:*** Biogenic, psychogenic and learned needs and wants and the motivation to satisfy them
- ***Sociological:*** From the culture and the society with traditions, myths and folklore
- ***Social psychological influences:*** From the groups that the person belongs such as family, society, interest group or political party.

Personality factors are also critical for attitude development. For example, people who have high need for cognition are tend to form more positive attitudes towards the products which their ads include high product related information (Schiffman and Kanuk, 2004; 269).

Level of commitment to an attitude depends on the individual’s involvement with the attitude object. An attitude can be developed because of its rewarding effects or avoiding punishment effects at the lowest level of involvement called as compliance. These kinds of attitudes can be changed depending on the situation. Attitudes sometimes occurred to be similar to a group or a person. Some advertisements use this model of commitment by showing celebrities using their brand/product to make identification of consumers themselves. Highest level of involvement leads internalization and these kind of deeply rooted attitudes become a part of value system of the individual and very difficult to change (Solomon et al., 2002; 134, Solomon, 2004; 232).

2.6. FUNCTIONS OF ATTITUDES

Determining the functions of attitudes also helps to understand why people develop attitudes because attitudes exist to serve a function for the person. In other words, it is also important for marketers to have an idea about why consumers have attitudes in developing market strategies. According to Katz (1960) there are five functions of attitudes:

- ***Knowledge function*** help the person to organize and simplify the experiences and stimuli,
- ***Utilitarian function*** help to act in a way towards self-interest by seeking rewards and avoiding punishment,
- ***Value-expressive function*** provides means for expressing personal values and other aspects of self concept,
- ***Ego-defensive function*** provides a defense for internal and external threats to self-concept,
- ***Social-adjustment function*** serves to facilitate, maintain and disrupt social relationships.

An attitude can serve more than one function or an attitude object may be related to more than one function, however generally one function will dominate. If the marketers can understand these dominant functions, they can create brands, develop products and design effective promotional campaigns (Solomon et al., 2002; 129).

Attitude functions also vary among cultures. For example, social adjustment function is important in collectivist cultures whereas value-expression is more important in individualistic cultures (Arnould, Price and Zinkhan, 2004; 632).

2.7. THEORIES ABOUT ATTITUDES

Attitude theories may help us to understand the complex processes about how attitudes are formed, strengthened, changed and the attitude-behavior relationship. However, explanations of these theories may change according to the individual characteristics, involvement about the object, situational factors and decisional aspects. The theories that are mostly used in order to explain consumer behavior are cognitive dissonance theory, elaboration likelihood model, theory of the reasoned action and theory of the planned behavior.

2.7.1. Cognitive Dissonance Theory

Cognitive dissonance theory, proposed by John Festinger in 1957, is mainly about inconsistencies between the people's attitudes and behaviors. People feel dissonance when they act in contrast with their attitudes or act that threatens their image of themselves such as kindness, honesty etc. (Taylor et al., 2003; 139, Aronson et al., 2004; 223).

Consumers often change their beliefs and attitudes or undo the behavior if possible in order to reduce discomfort that they feel. However, these changes depend on the level of need for consistency, whether they feel responsible for the behavior or the importance of the behavior for the person (Arnould et al., 2004; 638; Freedman et.al, 2003; 355).

2.7.2. Elaboration Likelihood Model

Elaboration likelihood model, raised by Petty and Cacioppo in 1986, is about the strength of the attitudes and the processes that leads to attitude change. Model defends that persuasive communications can change attitudes. According to this model, there are two kinds of persuasion processes: In central route to persuasion, people evaluate the information about the attitude object with their previous knowledge and then they form an attitude. In peripheral route to persuasion, people

change their attitudes depending on the situational factors (Arnould et al., 2004; 639, Aronson et al., 2004; 225.).

Detailed information processing and evaluation occurs in central route to persuasion. People are more tend to use this route when they are involved in the issue and concern about being accurate thus, they are motivated to get the information. Peripheral route to persuasion occurs when the person is uninvolved in the issue, affected by the context or overloaded with other information (Taylor et al; 2003; 145).

2.7.3. Theory of the Reasoned Action

This theory that is developed by Fishbein and Ajzen in 1975 aims to determine the factors that lead to attitude-behavior consistency. This theory defends that best predictor of a behavior is the behavioral intentions and the model aims to measure salient beliefs and evaluation of the outcomes. However, in order to understand the intention, subjective norms are also needed (Arnould et al., 2004; 644, Schiffman and Kanuk, 2004; 261).

According to Figure 2.3., which is the simplified version of theory of the reasoned action model, intentions that lead to behaviors are affected by attitudes and subjective norms. Attitudes towards a behavior consist of beliefs and evaluation of certain outcomes, whereas subjective norms consist of belief about specific referents and persons' motivation to comply with these referents.

This model is important for marketers, because they wanted consumers to make choices voluntarily. Marketers try to create intention by emphasizing a core benefit of a product or increasing a positive evaluation of a belief (Arnould et al., 2004; 643).

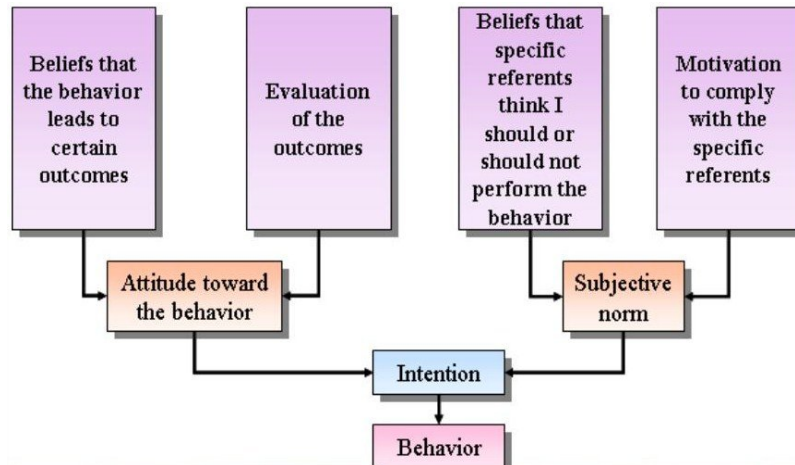


Figure 2.3. Simplified Version of Theory of the Reasoned Action

Source: Schiffman and Kanuk; 261

2.7.4. Theory of the Planned Behavior

Theory of the planned behavior is the revision of theory of the reasoned action by Fishbein and Ajzen in 1985. In compliance with the theory of the reasoned action, best predictors of people's planned behaviors are the behavioral intentions. There are three factors affecting behavioral intentions; attitude toward the behavior, subjective norms and different from the previous theory; perceived behavioral control. Perceived behavioral control refers to ease of the behavior that people think that they can perform it, thus, they feel more intention to do it (Ajzen and Doll, 1992).

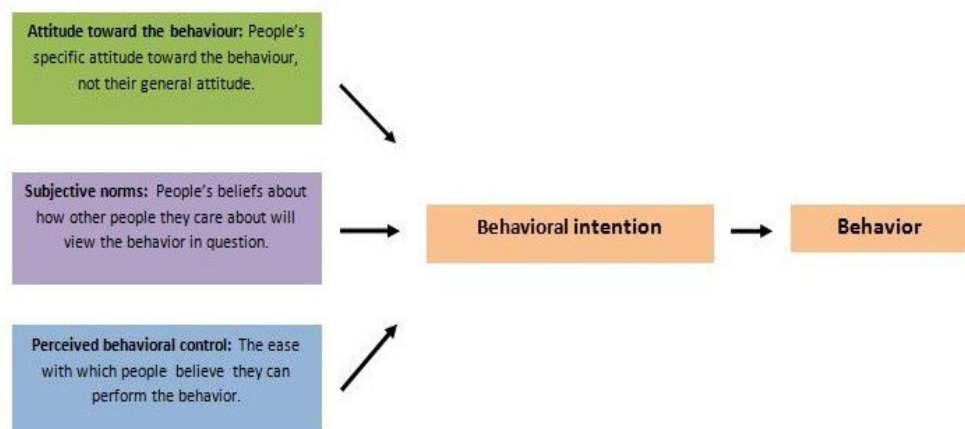


Figure 2.4. The Theory of the Planned Behavior

Source: Aronson et al.; 239.

Theory helps to clarify the role that attitudes play in determining a behavior. Attitudes are more successful in predicting behavioral intentions than in predicting actual behavior. However, there are two factors that are neglected in this model, attitudes about the desirability of a behavior do not always control our actions, people mostly choose to be stick to their habits and it is sometimes difficult to obtain measures of behavioral intention that are truly independent of attitudes toward the behavior (Taylor et al., 2003; 165).

2.8. CONSUMER ATTITUDES AND MARKETING APPLICATIONS

Attitudes cannot predict how the consumers behave in the future. However, they can help to understand what they tend to do in a defined situation towards a product or a service (Chisnall, 1995; 312, McGivern, 2003; 186). Even if attitudes are hard to be measured, studies on attitudes are necessary for understanding how marketing strategies and advertisements are influencing people.

In addition, marketers can determine target consumer profile for a novel product and develop strategies towards them. Besides, measuring attitudes can give an idea for prediction about the success of the new products in the market and future demand for existing products (Blackwell et al., 2001; 138). Many companies conduct consumer attitude questionnaires in the market in order to develop strategies for increasing consumer portfolio (Peter and Olson, 2008; 237).

Attitudes are shaped to compromise consumer needs and could be changed by external effects such as joining a community, gaining more knowledge and environment of a person (Chisnall, 1995, 315). The areas that the consumer attitudes studies can be used in the marketing strategies are given below (Engel, Blackwell and Miniard 1995; 362, Odabaşı and Gülfidan 2002, Schiffmann and Kanuk, 2004, Solomon et al., 2002; 142,):

- **Attitude change strategies:** The change in one component of attitudes leads to a change in attitude. Thus, the marketers may focus on changing the components of attitudes. Strategies may aim to change the cognitive component by changing beliefs about the features of a brand or product, changing the relative importance of the beliefs, adding new beliefs, changing the beliefs about the ideal brand or product. Strategies may also focus on changing affective component. The most effective method is classical conditioning by matching the product with a favorite music, celebrity etc.

- **Market segmentation based on attitudes:** In order to know the needs of the consumers in the market, attitude studies may be applied. Thus it is possible to develop a strategy as defining a target group or expressing different features of a product to different target groups of consumers. Besides, it is critical to know the importance level of product features evaluated by the consumers.

- **New product strategy:** Application of attitude studies is important to identify the market segment for a new product. Knowledge about the ideas of consumers, which features they like about the new product also gives idea about marketing success and the future of that product.

- **Promotion strategies:** Determining the consumer attitudes makes valuable contributions to advertisement and promotion strategies of the product. These studies also show which components are targeted in order to realize an attitude change. These attitude studies are important to see if the products reach the target consumers and permanence and effects of the advertisement campaigns.

Attitudes can also be used to evaluate the effectiveness of the marketing applications such as an advertising campaign's effect over consumers' positive reactions towards a product. This is basically the advertising campaigns' effect over attitude change. Besides, attitude studies may help to evaluate the marketing actions

before they are implemented (Engel et al., 1995; 363). For example, changes in the package design, new product development etc.

2.9. CONSUMER ATTITUDES TOWARDS FUNCTIONAL FOODS

Attitude studies are usually a starting point of explaining consumer behavior. Since the attitudes strongly affect food choice behavior, they can be used to explain consumer choices. One of the big trends in the developed countries is the change of eating habits. Most of the societies start to choose more healthy diets such as balanced nutritional meals. This health awareness trend has boomed the demand for the foods that are marketed emphasizing health features (Peter and Olson, 2008; 239). Verbeke (2005) indicates that consumers show a rational/cognitive decision-making process for functional foods.

According to Saher, Arvola and Lindeman (2004; 86), impressions of buyers of functional foods are different from the buyers of similar conventional foods. Buying functional foods may be seen as a new way of expressing healthiness in food choices. Since functional food is relatively a new concept, its users are perceived to be innovative and open-minded consumers. Thus, researches that include demographic variables may help to explain the attitudes of different groups and the potential consumer profile. Besides, cultural differences and product attributes are important points that are expected to have effect over consumers' attitudes, since they have effect over other food choices.

2.9.1. Attitudes towards Functional Foods and Demographics

Demographic backgrounds may have some influence on food choice behavior and functional food acceptance. However, Dagevos (2005; 36) defends that their power of explaining these relationships are decreasing in developed countries.

The contradictory findings of various studies show that there is not a clear demographic profile of functional food consumers. However, there are some

tendencies found about the consumers of this product category which can also be changed by consuming different kinds of functional food products. Urala (2005) found that demographic characteristics are only partially correlated with the acceptance of functional foods. In support of this finding, Verbeke (2005; 54) mentions that consumer attitudes towards functional foods do not totally depend on the socio-demographics of the consumers.

2.9.1.1. Effects of Gender

Urala (2005) states that female consumers have more potential to become functional food users compared to males. The reason for that may be the female consumers' interest in healthy food consumption and general health interest. According to the study of Verbeke (2005; 50), there is a higher probability of functional food acceptance among female consumers. Verbeke focused on the taste issue and found that female consumers' acceptance of functional foods is higher when there is some loss of taste. Similarly, Roininen Lahteenmaki, Tuorila (1999; 80) and Saher et al. (2004; 88) defends that women are more familiar with and interested in food products so they can build more positive attitudes. Besides, females are more likely to believe the health benefits of functional foods compared to males (Childs and Poryzees, 1998; 441).

There are differences found in the perception of healthiness and willingness to try between males and females; thus different products might be attractive for one gender and not for the other (Ares and Gambaro, 2007; 153).

2.9.1.2. Effects of Age

According to the study done by Childs and Poryzees (1998; 443), younger adults are more interested in preventive effects of eating behavior while older consumers see a little link between food and disease. This may show that older people have to be interested in more remedial solutions than preventive issues. However, in the studies of Poulsen (1999) and Verbeke (2005; 52), it is found that

older consumers show greater intention to buy functional foods and tend they to accept functional foods more. In compliance with these studies, Bhaskaran and Hardley (2002; 597) suggested that younger age consumers are unlikely to switch their choices to functional foods as a major disease prevention. Urala (2005) also supports that elder consumers show more interest to disease preventive food consumption compared to younger consumers.

Saher et al. (2004; 80) states that general interest towards health related matters increases with age, as people gets older they put more value on the healthiness besides they become more reluctant to try novel foods. Thus, it is not easy to predict older people's attitudes towards functional foods.

According to a study done by Krystallis, Maglaras, Mamalis (2007; 12), both younger and older adult groups mention similar attributes that affect their purchasing decisions of functional foods such as pureness, healthiness, safety and high quality. Krystallis et al. also found that younger consumers are interested more in enhancement of their health status whereas older consumers concern more about the prevention of health risks. Bhaskaran and Hardley (2002; 597) found that younger age consumers are not affected by the health related characteristics of functional foods, they are more affected by the attributes like taste and price. In support of Bhaskaran and Hardley, Labrecque et al. (2006; 657) found that functional foods are not seen as a part of the daily diet by young consumers.

2.9.1.3. Effects of Education

Functional food consumers found to be often more educated (Anttolainen, Luoto, Uutela, Boice, Blot, McLaughlin, Puska, 2001). The reason of this result could be education's positive relation with nutritional promise found by Childs and Poryzees (1998). Krystallis et al. (2007; 16) found that highly educated young adult and early-middle age groups' attention are different to different marketing elements. Young adults make their choices usually concerning common product attributes

whereas early middle age group consumers perceive functional foods more in between food and medicine.

2.9.2. Attitudes towards Functional Foods and Belief in Health Benefits

Jayanti and Burns (1998; 12) found health knowledge, motivation and consciousness are the antecedents of preventative health behavior, however, this does not mean that better knowledge about the product always lead to purchasing behavior.

Verbeke (2005; 54) also found that belief in health benefits correlates positively with acceptance of functional foods. However, there is a need for scientifically valid and reliable researches that supports nutraceutical promise of functional foods and respected media to spread this information in order for consumers to believe and develop positive attitudes towards functional food category (Bhaskaran and Hardley 2002, Childs and Poryzees, 1998). According to Urala et al. (2003; 823), respondents display more trust in authorities and television than food manufacturers and retailers about getting information about the functional foods. Trust in information is not directly related with strength of the claim however it may define the level of perceived advantage among respondents.

Van Kleef et al. (2005; 302) found that there is a relation between the consumers' health condition and the type of health claim of a product which affects the intention to buy the product. Besides, Verbeke (2005; 54) also found that existence of an ill family member affects acceptance of functional foods positively.

Van Kleef et al. (2005; 303) also found that the credibility perception of a functional food product positively correlates with the intention to purchase. Besides, uniqueness of the product increases the intention to buy but in a lesser extent. The lack of significant interaction between health claim, base product and trial intention indicates those value perceptions about health claims and base products are independent.

According to the findings of Labrecque et al. (2006), young consumers do not have confidence in the available information sources about functional foods. Thus, they should be convinced that these products have health benefits, sending clear messages via trustful communication sources.

2.9.3. Attitudes towards Functional Foods and Culture

Food products differ from country to country with the globalization of the industry. In order to market functional foods efficiently, manufacturers have to consider cross cultural differences in acceptance of functional foods. Functional food attitudes are also affected by the cultural and regional differences. For example, US and EU consumers are different in safety perceptions and trust in information sources (like industry, government). In the study of Verbeke (2005; 53), US consumers show more trust in industrial and government sources whereas the European consumers are more critical towards novel foods, novel food technologies and food related information.

According to the results of the study done by Jonas and Beckmann (1998; 28), cultural differences affect perception of food and diet relationship. Danish consumers expressed strong reluctance towards modification and fortification of foods. These processes seem unnatural to them. On the other hand, English consumers perceive functional foods as a convenient way of maintaining a healthy diet and most of them perceive positively.

Influence of family preferences also differs among countries. For example, Finland found to have the lowest effect of family preferences over functional food choices among other EU countries (Lappalainen, Kearney and Gibney, 1998; 476).

In the study done by Bech-Larsen, Grunert and Poulsen (2001; 11), Finnish consumers are more likely to accept functional foods compared to Danish and American consumers. Bech-Larsen and Grunert (2003; 12) studied Danish, Finnish

and American consumers' attitudes toward functional foods and found Finnish consumers have more positive attitudes and acceptance of healthiness of these products whereas Danish consumers have the most negative attitudes.

According to the study done by Lappalainen et al. (1998; 475), "healthiness" found to be the most important factor mentioned by European consumers. However, Jong, Ocke, Marga, Branderhost and Friele (2003) found that less than 40% of the Dutch participants in the study believe consuming functional foods is an easy way of preserving their health.

Finnish consumers accept functional foods more readily than Danish and American consumers. However, this does not mean that functional foods are seen as a homogeneous group over different product categories. They seem to be as a part of a particular product category (Urala and Lahteenmaki, 2003; 7). According to the study of Sparke (2006; 8) very limited people know the term "functional foods" in Germany, Poland, UK and Spain. When the term is defined to the consumers, they can give appropriate examples of this category.

In the study done among French, American and French Canadian students (Labrecque et al., 2006; 659), French students reported less favorable attitudes toward functional foods since they trust less to the information sources compared to the French Canadian and American students. However, it is recorded that there are minor differences between attitudinal and belief scores about functional foods between the cultures which shows that this category of foods is not limited by the local markets, it becomes a global market.

2.9.4. Attitudes towards Functional Foods and Product Attributes

Functional foods have new attributes or marketed with emphasizing their healthiness which can influence impressions of consumers. According to Urala (2005), functional product characteristics such as naturalness, quality image are the most important criteria of functional food acceptance.

The study of Krystallis et al. (2007; 12) shows that functional foods are evaluated as foods even if they are perceived as a special food category. However, the exploratory results of the studies can be found in the functionality-related attributes.

Taste has a key role in accepting novel foods. Consumers tend to accept pleasant tasting functional foods (Childs and Poryzees, 1998, Verbeke, 2005, Urala and Lahteenmaki, 2003). The younger participants in Bhaskaran and Hardley's study (2002) indicated that price, taste and promotional offers affect their buying decision and they buy functional foods as a health product. In other words, 'functionality' is only important for the shoppers who are seeking for it and functional foods also have to satisfy consumer with other attributes.

Urala and Lahteenmaki (2003; 4) noted that familiarity of the product, price, taste and sensory quality, healthiness, convenience and package size are the attributes mostly mentioned by the consumers. Taste and convenience are the most important choice reasons behind functional foods. Bech-Larsen et al. (2001) also found that consumers' buying intentions are mostly affected by convenience, taste and wholesomeness.

Bech-Larsen and Grunert (2003), Urala (2005), Van Kleef et al. (2005) commonly state that the health perception depends on the base-product of a functional food. Van Kleef et al. (2005; 306) also found that consumers tend to trust health claims when the base-product image is positive. Similarly, Ares and Gambaro (2007; 157) found that attitudes towards functional food concepts depend on the base-product and type of the enrichment. Depending on these results, functional foods may be designed not for the whole consumers but for specific groups.

According to Wansink, Westgren and Cheney (2005; 266), a person's knowledge of features of a functional food is not enough to stimulate consumption. Purchasing probability increases when the consumer combines the functional characteristics with the results of their consumption. Thus, the study shows that

consequence related knowledge increases the consumption likelihood of a functional food product more than the attribute related knowledge.

According to the results of a research done by Verbeke (2006; 129), market segment of the consumers that are ready to accept worse taste for the health benefits of a functional food product has been decreased between the years 2001 and 2005 regardless of the socio-demographic factors.

2.9.5. Scales Used to Measure Attitudes towards Functional Foods

Since the functional foods are different from conventional products, existing scales about consumers' food choices are not enough to explain or predict why consumers choose functional foods. Urala and Lahteenmaki (2003, 2004, 2007), made consecutive studies in order to develop attitude scales for this product category. These studies are done in Finland where the consumers have rather positive attitudes.

The first study (2003) consists of in depth interviews with 50 consumers and aim of this study is to find out consumers reasons of using functional foods. Different functional food products have shown to the consumers and asked if they are the user of these products, interview goes with detail questions why they choose to use this product. The responses of the consumers grouped such as product attributes, consequences and values. In almost all products reasons of using functional foods are referred to healthiness, taste, pleasure, security, familiarity, convenience and price. These references are also in compliance with the previous studies done in the field.

The statements asked in the second study (2004) are formulated from the results of the first study (2003). After several pilot studies 53 functional food statements are developed the final questionnaire. These statements are grouped under 7 dimensions: Perceived reward from using functional foods (FF REW), the necessity for functional foods (FF NEC), functional foods as medicines (FF MED), the taste of functional foods (FF TAST), confidence in information given about functional foods (FF CON), functional foods as part of a healthy diet (FF PART), the

absence of nutritional risks (FF RISK). The statements under these dimensions are evaluated in a 7 point scale. Attitude scales were formulated according to the factor loadings extracted from factor analysis.

According to the study findings of Urala and Lahteenmaki (2004; 798-802), females scored lower on functional foods as part of a healthy diet and taste of functional food scales which indicates that females tend to think that they cannot repair the absence of healthy diet by using functional foods. Besides, they did not perceive functional foods as a part of a healthy diet. However, males perceive functional foods as a part of a healthy diet. Females are also not ready compromise taste for health effects whereas males are ready to compromise.

Besides, younger consumers do not believe that functional foods can repair the effects of an unhealthy diet. They are also not ready to compromise taste of the functional foods for the health benefits and their perceived reward from using functional foods is lower than the older groups. Respondents who had university degree, scored higher on functional foods as medicines and lower on functional foods as part of a healthy diet scales. Even if there are differences found in attitudes of different socio-demographic groups, type of the product affected willingness to use of functional foods the most.

In the third research (2007), Urala and Lahteenmaki revised their study and eliminated some of the statements which had lower factor loadings and strong inter correlations. With the new instrument, they extracted 4 dimensions with 26 statements which are taken as a basis in this study. These 4 dimensions are perceived reward (FF REW), necessity for functional foods (FF NEC), confidence in functional foods (FF CON), safety of functional foods (FF SAF).

The main aim of the FF REW dimension is to make respondents to evaluate if health, mood and general well-being can be promoted by using functional foods. Besides, this dimension aims to analyze the point of view of the respondents, if they see using functional food is a way of taking care of themselves and if they feel

pleasure by using these products. FF NEC measures the perceived necessity for functional foods in society. FF CON dimension is about the person's confidence in using these products. FF SAF dimension mainly measures the safety and credibility of the functional foods.

According to the results of this study (2007; 8), perceived reward scale is the best predictor of willingness to use of functional foods and older respondents perceived reward from using functional foods are higher than the younger respondents. Besides, more educated respondents scored higher on necessity for functional foods scale.

Urala and Lahteenmaki (2007) suggested that functional food scales are a new way of monitoring attitudes of consumers. Besides, it is useful tool in predicting the success of the functional food product in the early stages of the new product development.

CHAPTER 3
CONSUMER ATTITUDES TOWARDS FUNCTIONAL FOOD
PRODUCTS: A SURVEY APPLIED IN IZMIR

3.1. THE PURPOSE OF THE STUDY

Functional foods are relatively new to the Turkish consumers. There are very few researches done on this subject in the field. Thus, the general aim of the study is to analyze the effects of demographic variables over functional food attitudes of the respondents. For this purpose, respondents who had some knowledge about functional foods were considered. Minor aim of the study is to explore which certain functional food products –even if they are not known as functional foods- are selected with respect to familiarity and willingness to use. In addition, study aims to analyze the relationships between demographic factors and willingness to use, familiarity of the functional foods.

3.2. RESEARCH QUESTIONS AND HYPOTHESES

This study is basically try to explore the answers of the questions such as “Which functional food products are familiar to respondents?”, “Which functional food products are willing to be used by the respondents?”, “Is there a specific profile of the users of functional foods?”, “Is there an awareness about the term ‘functional food’?”.

In respect to the aim of the study and the previous research done in the field given in part 2.9 demographic variables may have some effects over familiarity, willingness to use and attitudes towards functional food products. Three main hypotheses are developed:

H₁: Familiarity of the selected functional food products is related to the demographic factors.

H2: Willingness to use of the selected functional food products differ due to the demographic factors.

H3: Attitudes towards functional food dimensions are differ due to the demographic factors.

3.3. METHODOLOGY

This is an exploratory type of field study since the concept is new to the market and there is not much known about the Turkish consumer attitudes towards functional foods. Besides, it is also a causal study because it aims to analyze the relationship between demographics and familiarity, willingness to use and attitude dimensions of the functional food products.

3.3.1. Questionnaire Design

The questionnaire is comprised of four sections. In the first section, there are two questions. First question tries to find out whether the respondents are familiar with the selected functional food products. Second question aims to make respondents evaluate these selected products in the extent of how willingly to use the selected functional food products.

10 functional food products are chosen from the Turkish market, which are conveniently found in hypermarkets and supermarkets. Due to the difficulty in defining functional food concept and lack of consumer knowledge about these products, only the products which have a clear health claim or beneficial difference on the package are chosen. These health claims or beneficial differences are noted on the questionnaire next to the related products to prevent a possible confusion with the conventional alternatives. Besides; for each product, one or two brand name examples are given in order to remind the products to the consumers. Since the study is done with adults (18 and over) children or baby products are not included. The selected products in the study are:

- Yoghurt that helps the digestive system / probiotic yoghurt
- Cholesterol lowering / heart-healthy margarine
- Probiotic / immune system strengthening kefir
- Milk with extra calcium / without lactose / with omega 3
- Cholesterol lowering / with plant sterol yoghurt
- Cholesterol lowering / with plant sterol milk drink
- Cholesterol lowering soya meat / minced soya meat
- Cracker, muesli etc. that helps the digestive system
- Juice that have extra vitamins
- Egg with DHA / Omega 3

Familiarity with the products given above are asked to the respondents to be evaluated on a 5-point scale (1= I do not recognize this product, 2= I recognize this product but I never tried it, 3= I have tried this product but I do not use it, 4= I use this product occasionally, 5= I use this product frequently) in the first question.

In the second question, respondents are asked to evaluate how willing they are to use these products mentioned above on a 5-point scale as 1= I am strongly not willing to use this product, 2= I am not willing to use this product, 3= I am not sure, 4= I am willing to use this product, 5= I am strongly willing to use this product.

This section is put into the questionnaire thinking that some respondents may be familiar with certain types of functional food products however they may not really know that these products are categorized as “functional foods”.

The second section starts with the question about awareness and the information level of respondents about the term “functional food”. Respondents are asked to answer this question on a 5-point Likert scale as 1= I didn’t hear this term before, 2= I heard this term before but I don’t know what it is, 3= I heard this term before but I am not sure what it is, 4= I heard this term before and I have limited information about it, 5= I heard this term before and I have detailed information about it.

A detailed definition and information about functional foods followed this question for the respondents to understand the subject clearly. This information is also a basis for the third section for respondents to evaluate these food products as a category.

The information given is:

“Functional foods are consumed as a part of the daily diet. However, they are marketed as they have health benefits beyond their basic nutrition. For example; lowering cholesterol, supporting to regulate digestive system etc. Although they have health benefits, they are not pills or vitamins. The food products that you have evaluated above for familiarity and willingness to use are all examples of functional foods.”

A question about the respondent's health situation (1= Very good, 2= Good, 3= Average, 4= Bad, 5= Very bad) is asked after this information. This question's aim is to make the respondent to evaluate his/her own health. In other words, how he/she feels about his/her health situation. This kind of health situation or chronic illness questions was asked in most of the functional food studies. Because people who have health problems is thought to be more involved in health issues, hence, the probability of having more knowledge about functional foods might increase.

The third section which is designed to measure the attitudes is mainly based on the researches done by Urala and Lahteenmaki (2003, 2004, 2007) which are explained detailed in part 2.9.5. In these studies, Urala and Lahteenmaki took this product category and with the statements asked, they developed dimensions in order to evaluate functional foods. The dimensions and statements that are implemented in this study are given in Table 3.1. below.

Table 3.1.: Dimensions and Statements Used in the Study

FF REW: Reward from using functional foods
Functional foods help to improve my mood
My performance improves when I eat functional foods
Functional foods make it easier to follow a healthy life style
I can prevent disease by eating functional foods regularly
The idea that I can take care of my health by eating functional foods gives me pleasure
Functional foods can repair the damage caused by an unhealthy diet
I am prepared to compromise on the taste of a food if the product is functional
I actively seek out information about functional foods
FF NEC: Necessity for functional foods
Functional foods are completely unnecessary
Functional foods are a total sham
The growing number of functional foods on the market is a bad trend for the future
For a healthy person it is worthless to use functional foods
It is great that modern technology allows the development of functional food
I only want to eat foods that do not have any medicine-like effects
Health effects are not appropriate in delicacies
Functional foods are consumed mostly by people who have no need for them
It is pointless to add health effects are not to otherwise unhealthy foods
FF CON: Confidence in functional foods
Functional foods promote my well-being
The safety of functional foods has been very thoroughly studied
I believe that functional foods fulfill their promises
Functional foods are science-based top products
FF SAF: Safety of functional foods
If used in excess, functional foods can be harmful to health
In some cases functional foods may be harmful for healthy people
Using functional foods is completely safe
The new properties of functional foods carry unforeseen risks
Exaggerated information is given about health effects

These 26 statements are translated into Turkish and some small explanations are added where necessary in order to make them more meaningful in Turkish language. “Functional foods are a total sham” statement is translated as “Functional foods are a total lie”. In the translation of the statement, “Health effects are not appropriate in delicacies” like allergy” note is added. “It is pointless to add health

effects to otherwise unhealthy foods” statement is translated into Turkish and “cholesterol lowering margarines” is added as an example. Respondents are asked to evaluate these statements on a 5-point Likert scale as 1= I completely do not agree, 2= I do not agree, 3= I am not sure, 4= I agree, 5= I completely agree.

Fourth section includes the demographic information about the respondents. Gender, age, marital status, education and monthly household income are asked. Since the study is conducted only with adults, age criterion is started with 18 and goes till 58 and over. People can make their choices (specifically for this study: food choices) more consciously after the age of 18 in general. In order to keep the intervals, age variable divided in to five parts as 18-27, 28-37, 38-47, 48-57, 58 and over. Education started with literate, goes on with primary school, secondary school, high school or equivalent, university until masters/doctorate. Income factor started with 500 YTL which is nearly the minimum wage in Turkey and with increasing by 500 YTL goes until 4000 YTL and over.

3.3.2. Sampling and Data Collection

Non-random sampling method is used in selecting the respondents. Questionnaires are personally administered and applied by face-to-face interviewing in front of the supermarkets in different areas in İzmir. Survey is applied in May-June 2008 and in 6 weeks period. In order to get different consumer profiles, questionnaires are applied in front of the supermarkets in different hours of the weekdays and weekends and in different parts of the city. The areas that this survey is applied are: Göztepe, Altındağ, Balçova, Eşrefpaşa, Bornova, Karşıyaka, Egekent, Alsancak, Basinsitesi and Urla. Maximum attention is given to choose equivalent number of respondents from each area to prevent bias due to the differences in social class.

Data is collected from 269 respondents in total. Among these respondents, the ones who have used one of the functional food products at least once continued to answer the attitude questions. Otherwise, the respondents skipped to the attitude

questions and answered demographics, health status and awareness questions. The reason for this condition about answering the functional food attitude questions is the necessity of familiarity about the product examples given in the first two questions. The respondent has to be familiar enough to evaluate the attitudes towards this category of foods.

3.4. DATA ANALYSIS

SPSS 16.0 statistical computer program is used to analyze the data from the 269 respondents. The tests used are reliability, frequency, mean, chi-square, t test and ANOVA.

3.4.1. Reliability Analysis of the Study

For reliability analysis of the attitude dimensions of the sample, Cronbach's alpha values have been examined. Both general and the dimension-by-dimension values were given in the Table 3.2. below.

Table 3.2.: Reliability Analysis of the Attitude Dimensions

	Number of questions	Cronbach's alpha scores
Functional food related attitudes (overall)	26	0,91
FF REW	8	0,87
FFNEC	9	0,79
FF CON	4	0,76
FFSAF	5	0,71

According to the results of this analysis overall reliability score of the functional food related attitude statements is 0,91. Perceived reward from using functional foods (FF REW) dimension has the highest Cronbach's alpha score of 0,87 among four dimensions. This dimension is followed by necessity for functional foods (FFNEC) dimension with 0,79. The values for confidence in functional foods (FFCON) and safety in functional foods (FFSAF) are 0,76 and 0,71. In general,

reliability scores 0,70 or more are considered as good (Nunnally, 1967). Thus, these scores are above acceptable level.

3.4.2. Demographic Profile and Health Status of the Respondents

Survey is applied to 269 people in total. In order to find out the demographic features of these 269 people, frequency analysis is used and the results are shown in Table 3.3. According to gender, nearly 60% of the respondents are females and it is as expected since the females are usually responsible for shopping for the household.

When age is analyzed, highest percentages are in the 28-37 and 38-47 age groups which together make up nearly 60% of the total respondents.

In the extent of marital status; when divorced/separated and widowed respondents are also considered as single, the number of single respondents are approximately the half of the total sample. Thus, single and married respondents are relatively balanced.

Education is another important demographic factor. The percentage of the respondents who had higher education (university and masters/doctorate) is slightly higher than the other education categories with 51%. When the secondary and high school or equivalent education levels are considered as middle education, the percentage altogether makes up 30. Literate and primary school may be considered as lower education and its percentage is about 18. This distribution shows that the sample is relatively well educated.

Monthly household income is another demographic factor that may affect the respondents' functional food attitudes. Since the functional foods have relatively higher prices than their conventional alternatives in Turkey, income may be a significant factor for becoming familiar and having positive attitudes. First three groups (500YTL and lower to 1500 YTL) can be considered as lower income group and their percentage in total is 46. Respondents having income from 1500 YTL to

3000 YTL can be taken as the middle income group and it is 33% of the sample. 3000YTL and over income group can be considered as higher income group and it is approximately is 30%. The distribution shows that the distribution of the respondents with lower income is slightly more than the other groups in the sample.

Table 3.3.: Demographic features of the respondents

DEMOGRAPHICS		n	%
Gender	Female	157	58,4
	Male	112	41,6
Age	18-27	47	17,5
	28-37	90	33,5
	38-47	68	25,2
	48-57	36	13,4
	58 and over	28	10,4
Marital Status	Single	101	37,5
	Married	145	53,9
	Divorced/Separated	15	5,6
	Widowed	8	3
Education	Literate	9	3,3
	Primary school	39	14,5
	Secondary school	18	6,7
	High school and equal	65	24,2
	University	92	34,2
	Masters/Doctorate	46	17,1
Monthly Household Income	500 YTL and lower	14	5,2
	501-1000 YTL	55	20,4
	1001-1500 YTL	55	20,4
	1501-2000 YTL	37	13,8
	2001-2500 YTL	32	11,9
	2501-3000 YTL	23	8,6
	3001-3500 YTL	15	5,6
	3501-4000 YTL	10	3,7
	4001 YTL and over	28	10,4

Frequency analysis results of the respondents' health situation can be reviewed in Table 3.4. Most of the respondents (56%) evaluated their health as "good". This is the respondent's own evaluation of their health, so it is common to answer these kinds of questions as "good". In compliance, mean value is 3,76 and the standard deviation is low. Only 3 people evaluate their health as very bad and 9 people as bad.

Table 3.4.: Frequencies and Mean Value Related to Health Status

health status	1		2		3		4		5		mean	stdev
	n	%	n	%	n	%	n	%	n	%		
	3	1,1	9	3,3	1	26,4	52	6,5	4	2,6		

1=Very bad, 2= Bad, 3= Average, 4=Good, 5= Very Good

In summary, the distribution of gender and marital status are relatively balanced within the sample. However; respondents in middle ages, with higher education and with lower income are slightly more than the other demographic groups in the sample.

3.4.3. Respondents' Awareness of the Concept "Functional Foods"

The frequency distribution and mean value of the answers related to the awareness of the respondents about the concept "functional foods" is given in Table 3.8. Nearly half of the respondents didn't hear this term before. This seems to be contradicting to the results of the first question of familiarity, all of the products were known by more than half of the respondents. Although the respondents are quite familiar with the functional food examples, the term is not familiar to them. Two points are important; the term is so new to the consumers and it is not commonly used or seen in shelf arrangement in the markets. In other words, these products are not separately placed in the shelves in the markets as "functional foods" whereas organic and diabetic foods are. Secondly, some of the products are already in the market before they were categorized as functional foods.

21% of the respondents have information about functional foods and among this 21% only 3,3% (which makes up 9 respondents) mentioned that they have detailed information about this term and product category.

Table 3.5.: Frequencies Related to Awareness

awareness of the functional food term	1		2		3		4		5		mean	stdev
	n	%	n	%	n	%	n	%	n	%		
	156	58	29	10,8	26	9,7	49	18,2	9	3,3		

1= I didn't heard this term before, 2= I heard this term, but I don't know what it is, 3= I heard this term, but I am not sure what it is, 4= I heard this term and I have limited information about it, 5= I heard this term and I have detailed information about it

3.4.4. Respondents' Familiarity with the Functional Foods

In order to evaluate the respondents' familiarity with the functional foods, frequency and mean analysis are conducted in SPSS. The results of this analysis can be seen in the Table 3.5. In fact, the answer intervals are not the same, but in order to see the tendency, the mean scores are examined.

Looking at the frequencies, the least known product is cholesterol lowering soya meat. Nearly half of the respondents do not recognize this product in the market. Egg with DHA/Omega 3 (33,5%) and milk with extra calcium/without lactose/omega 3 (26,8%) follows this product. These products seem to be not very familiar to the consumers. On the other hand, the most frequent used product is eggs with DHA/Omega 3, however percentage of the frequent users are approximately 11.

According to the mean scores, cholesterol lowering soya meat has the lowest mean 1,76, cholesterol lowering milk drink and yoghurt comes after soya meat as in compliance with the frequencies. The standard deviations are also low in these products. Heart-healthy margarine has the highest mean 2,65 which is slightly over the mid-point.

Table 3.6.: Frequencies and means of the selected functional foods related to familiarity

FAMILIARITY Products	1		2		3		4		5		Mean	Stdev
	n	%	n	%	n	%	n	%	n	%		
Probiotic yoghurt	14	5,2	154	57,2	59	21,9	28	10,4	14	5,2	2,53	0,94
Heart-healthy margarine	12	4,5	146	54,3	52	19,3	41	15,2	18	6,7	2,65	1,01
Kefir	41	15,2	110	40,9	60	22,3	50	18,6	8	3,0	2,53	1,05
Milk with extra benefits	72	26,8	139	51,7	32	11,9	20	7,4	6	2,2	2,07	0,94
Cholesterol lowering yoghurt	71	26,4	171	63,6	22	8,2	5	1,9	0	0,0	1,86	0,63
Cholesterol lowering milk	65	24,2	179	66,5	21	7,8	4	1,5	0	0,0	1,87	0,60
Cholesterol lowering soya meat	123	45,7	102	37,9	31	11,5	11	4,1	2	0,7	1,76	0,87
Cracker, muesli that help digestive system	47	17,5	99	36,8	56	20,8	46	17,1	21	7,8	2,61	1,18
Juice with extra vitamins	55	20,4	116	43,1	35	13,0	44	16,4	19	7,1	2,46	1,19
Egg with DHA/Omega 3	90	33,5	78	29,0	21	7,8	52	19,3	28	10,4	2,44	1,39

1= I do not recognize this product, 2= I recognize this product but I never tried it, 3= I have tried this product but I do not use it, 4= I use this product occasionally, 5= I use this product frequently.

In order to interpret these results better, Table 3.6 is developed from the information given in table 3.5. The response categories are combined to make the results more meaningful. The respondents who answered 1 (I do not recognize this product) and 2 (I recognize this product but I never tried it) are grouped together as respondents who have “not even tried once” in the table. Respondents who said 4 (I use this product occasionally) and 5 (I use this product frequently) are categorized as “users” of the functional food products. The respondents who chose categories 3 (I have tried this product but I do not use it), 4 and 5 are grouped together, since these were the respondents who have used functional food products “at least once”. In addition, respondents answered other than 1 (I do not recognize this product) for the selected functional food product were categorized as the respondents who “knows” the product.

According to these evaluations; the most known product is heart-healthy margarine, nearly all of the respondents know this product. Stomach

friendly/Probiotic yoghurt follows heart-healthy margarine with 95%. These two products are the ones that are seen most in the advertisements and that could be the reason of the familiarity to the consumers. The third most known product is kefir with 85%.

Table 3.7.: Grouped answers of the respondents related to familiarity variable

FAMILIARITY Products	not even tried once (1+2)		users (4+5)		used at least once (3+4+5)		knows (2+3+4+5)	
	n	%	N	%	n	%	n	%
Probiotic yoghurt	168	62,5	42	15,6	101	37,5	255	94,8
Heart-healthy margarine	158	58,7	59	21,9	111	41,3	257	95,5
Kefir	151	56,1	58	21,6	118	43,9	228	84,8
Milk with extra benefits	211	78,4	26	9,7	58	21,6	197	73,2
Cholesterol lowering yoghurt	242	90,0	5	1,9	27	10,0	198	73,6
Cholesterol lowering milk	244	90,7	4	1,5	25	9,3	204	75,8
Cholesterol lowering soya meat	225	83,6	13	4,8	44	16,4	146	54,3
Cracker, muesli that help digestive system	146	54,3	67	24,9	123	45,7	222	82,5
Juice with extra vitamins	171	63,6	63	23,4	98	36,4	214	79,6
Egg with DHA/Omega 3	168	62,5	80	29,7	101	37,5	179	66,5

1= I do not recognize this product, 2= I recognize this product but I never tried it, 3= I have tried this product but I do not use it, 4= I use this product occasionally, 5= I use this product frequently.

Nearly the half of the respondents used cracker, muesli that helps digestive system and kefir at least once. 90 percent of the respondents have not even tried the cholesterol lowering yoghurt and cholesterol lowering milk drink once. Besides, none of the 269 respondents are the frequent users of these two products. Cholesterol lowering soya meat is also one of the never-tried-once products with nearly 84%.

In the extent of the users; approximately 30% of the respondents are the users of egg with dha/omega 3 and cracker, muesli that helps digest system. Very few people (less than 2%) are the users of cholesterol lowering/with plant stenol yoghurt and milk drink.

All in all, some functional food products seem very familiar to the respondents like heart-healthy margarine, probiotic yoghurt however users of these products are low. Percentages related to trying at least once are also low in general for the selected functional food products. The reason of this result may be the safety issues or the belief about health effects. Recognition of these products is not enough for the respondents to make them users. Besides, some products need to be promoted more in order to be recognized by the respondents in the market.

3.4.5. Respondents' Willingness to use of Functional Foods

According to the results of this section (Table 3.7.); respondents are not distinctively willing to use a specific product in general. The mean scores are slightly higher than the mid-point, however standard deviations are over 1 for all of the products. Cholesterol lowering soya meat has the lowest mean score 2,49 and juice with extra vitamins has the highest mean score of 3,13.

When the answers 1 and 2 are combined as “not willing”; nearly half of the respondents are not willing to use cholesterol lowering milk drink, cholesterol lowering soya meat and cholesterol lowering yoghurt. This is in compliance with the familiarity results. These products also found to be “not familiar” to the respondents and when the product is not familiar they are not willing to use it. When the “strongly not willing to use” products are reviewed; cholesterol lowering/heart-healthy margarine is the one that has the highest percentage. The reason for this response may be the belief that margarine is not a healthy product. Approximately 22% of the respondents are strongly not willing to use this product. The cholesterol lowering soya meat comes after heart-healthy margarine with 19%. The product that the respondents are most strongly willing to use is fruit juice with extra vitamins with 11%. If “strongly willing” and “willing” answers are combined nearly 50% of the respondents are “willing to use” this product. The reason for this answer may be the consumers' view about the fruit juice as a healthy product.

Table 3.8.: Frequencies and means of the selected functional foods related to willingness to use

WILLINGNESS TO USE Products	1		2		3		4		5		Mean	Stdev
	n	%	n	%	n	%	n	%	n	%		
Probiotic yoghurt	46	17,1	81	30,1	45	16,7	79	29,4	18	6,7	2,78	1,23
Heart-healthy margarine	58	21,6	76	28,3	33	12,3	79	29,4	23	8,6	2,75	1,31
Kefir	44	16,4	66	24,5	72	26,8	69	25,7	18	6,7	2,82	1,18
Milk with extra benefits	34	12,6	76	28,3	53	19,7	98	36,4	8	3,0	2,89	1,12
Cholesterol lowering yoghurt	36	13,4	103	38,3	48	17,8	75	27,9	7	2,6	2,68	1,10
Cholesterol lowering milk	39	14,5	102	37,9	52	19,3	71	26,4	5	1,9	2,63	1,08
Cholesterol lowering soya meat	51	19,0	89	33,1	78	29,0	47	17,5	4	1,5	2,49	1,04
Cracker, muesli that help digestive system	39	14,5	79	29,4	40	14,9	95	35,3	16	5,9	2,89	1,21
Juice with extra vitamins	31	11,5	66	24,5	39	14,5	103	38,3	30	11,2	3,13	1,23
Egg with DHA/Omega 3	28	10,4	74	27,5	43	16,0	104	38,7	20	7,4	3,05	1,17

1= I am strongly not willing to use this product, 2= I am not willing to use this product, 3= I am not sure, 4= I am willing to use this product, 5= I am strongly willing to use this product

Nearly 30% of the respondents are not sure that they are willing or not willing to use cholesterol lowering soya meat/minced soya meat and kefir. The reason may be the lack of knowledge about these products. Especially the soya meat is found to be not very familiar to the consumers. Besides, in personal interviews some consumers indicate that they know that kefir is a healthy product but they do not like the taste.

3.4.6. Attitudes towards Functional Foods

The respondents who have tried any of the functional food products at least once are included in the evaluation of the attitudes. 229 respondents answered functional food related attitude statements and their answers are evaluated in this part.

When overall mean scores of the functional food attitude dimensions are compared, necessity for functional foods (FFNEC) dimension has the highest mean score with 3,18. This may be evaluated as respondents have more favorable attitudes towards the necessity of the functional foods. Confidence in functional foods (FFCON), perceived reward from functional foods (FFREW) dimensions come after with 2,83 and 2,78 mean score. Respectively, safety of functional foods (FFSAF) dimension has the lowest mean score with 2,57 which signals that respondents have the least favorable attitudes towards safety of these products.

Within the perceived reward from using functional foods (FFREW) dimension; “functional foods make it easier to follow a healthy lifestyle” statement has the highest mean with 3,07 and “I actively seek out information about functional foods” statement has the lowest mean with 2,55. Within the necessity for functional foods (FFNEC) dimension “Functional foods are completely unnecessary” negative statement has the highest mean with 3,70. This is also the highest mean of the all statements. These negative statements are reversed before the analysis in SPSS, thus, it means that most of the respondents –even if they have some suspicions of using these foods- tend to think that functional foods are necessary. The lowest mean within this dimension belongs to “Health effects are not appropriate in delicacies” negative statement with 2,63 which is reversed before analysis.

Within the confidence in functional foods (FFCON) dimension, “The safety of functional foods has been very thoroughly studied” has the highest mean score 2,99. The lowest mean score belongs to the statement “Functional foods are science-based top products” with 2,66. Within the safety of functional foods (FFSAF) “The new properties of functional foods carry unforeseen risks” negative statement has the highest mean 2,74 which is also reversed before the analysis. The lowest mean is 2,52 for “Exaggerated information is given about health effects” negative statement. This is also the lowest mean of all statements. Thus, the respondents tend to believe that exaggerated information is given about these products.

Table 3.9.: Descriptives Related to Functional Food Dimensions

FUNCTIONAL FOOD DIMENSIONS	N	Mean	Stdev.
FFREW	229	2,78	0,82
Functional foods help to improve my mood	229	2,81	1,12
My performance improves when I eat functional foods	229	2,68	1,02
Functional foods make it easier to follow a healthy lifestyle	228	3,07	1,07
I can prevent disease by eating functional foods regularly	229	2,72	1,09
The idea that I can take care of my health by eating functional foods gives me pleasure	229	2,90	1,13
Functional foods can repair the damage caused by an unhealthy diet	230	2,91	1,17
I am prepared to compromise on taste of a food if the product is functional	230	2,59	1,26
I actively seek out information about functional foods	229	2,55	1,24
FFNEC	229	3,18	0,66
Functional foods are completely unnecessary (R)	229	3,70	0,95
Functional foods are a total sham (R)	229	3,57	0,99
The growing number of functional foods on the market is a bad trend for the future (R)	229	3,38	1,07
For a healthy person it is worthless to use functional foods (R)	229	3,21	1,15
It is great that modern technology allows the development of functional foods	229	3,30	1,08
I only want to eat foods that do not have any medicine-like effects (R)	227	2,74	1,17
Health effects are not appropriate in delicacies (R)	229	2,63	1,04
Functional foods are consumed mostly by people who have no need for them (R)	229	3,17	0,96
It is pointless to add health effects to otherwise unhealthy foods (R)	229	2,94	1,34
FFCON	229	2,83	0,81
Functional foods promote my well-being	229	2,83	1,13
The safety of functional foods has been very thoroughly studied	229	2,99	1,02
I believe that functional foods fulfill their promises	229	2,84	1,05
Functional foods are science-based top products	229	2,66	1,07
FFSAF	229	2,57	0,69
If used in excess, functional foods can be harmful to health (R)	229	2,33	1,03
In some cases functional foods may be harmful for healthy people (R)	229	2,54	0,98
Using functional foods are completely safe	229	2,73	0,95
The new properties of functional foods carry unforeseen risks (R)	229	2,74	0,94
Exaggerated information is given about health effects (R)	229	2,52	1,15

*Statements marked with (R) are the negative statements and before the analysis they are reversed in SPSS.

** The scale for attitudes is 1= I completely do not agree, 2= I do not agree, 3= I am not sure, 4= I agree, 5= I completely agree.

3.4.7. Effect of Demographic Variables

In order to evaluate the relationship between familiarity and demographics, chi-square is applied in SPSS. To test the relationship with willingness to use, functional food dimensions and demographics t-test and ANOVA analysis are applied. To have more meaningful results, some of the demographic categories are reorganized.

Age is grouped as 18-27, 28-37, 38-47 and 48 and over. Marital status grouped as single and married by adding the divorced/separated and widowed categories into single. Education is grouped into 3 categories; low education includes literate and primary school graduates, middle education includes secondary school and high school/equivalent graduates and high education category includes university, masters/doctorate graduates. Income is also grouped into 3 categories as lower, medium and higher income. Lower income group includes respondents with 500 YTL and lower, 501-1000 YTL and 1001-1500 YTL income. Medium income respondents are having 1501-3000 YTL income. Higher income group is composed of the respondents who have 3001 YTL and above income.

3.4.7.1. Effect of Demographic Variables on Familiarity

H₀: Familiarity of the selected functional food products is not related to the demographic factors

H₁: Familiarity of the selected functional food products is related to the demographic factors

In order to test the general hypothesis chi-square test applied for familiarity, because the interval in the scale that was used is not appropriate to take mean values. The results are interpreted in 2 significance levels. The chi-square values that have $P < 0,05$ is interpreted as very significant and $0,05 < P < 0,1$ is interpreted as significant. The crosstabs of the products that are found significant and very significant are given in appendix 2. Chi-square test results for familiarity and demographics are given in Table 3.10

According to these results, gender is significantly related to being familiar with or not familiar with probiotic yoghurt, kefir, milk with extra benefits, juice that have extra vitamins. When the crosstab tables are examined for the probiotic yoghurt, more males are found not recognizing this product and more females found trying this product. The advertisements of probiotic yoghurt mostly targets women so that women may tend to try this product more than men. For kefir, although female respondents' percentage is higher in trying this product, males are higher in using. Kefir is a specific product which most of the respondents mention about its taste when applying the questionnaire. The female respondents may not be compromising taste for health issues in their food choices.

For milk with extra benefits, although there are more males who try this product, there are more female respondents who use it. Osteoporosis is a health issue for women so that this could be a reason for women to use this product more than men do. According to the crosstab table for gender and juice with extra vitamins, more males are using the product although more females are recognizing and trying the product.

In summary, males mostly do not recognize the functional food products, but when it comes to trying and using the functional food products and gender may have different relationships with respect to the functional food product type.

Age is only significantly related to only familiarity with the juice with extra vitamins. Thus, for the other products there is no significant relation between age and familiarity. When the crosstab table is examined, recognition of this product is increasing as the age increases. But in contrast, using this product is decreasing as the age increases. This may be due to the fact that as people become older, they become more sensitive to health issues. So it is probable that older people recognize these kinds of products more. The reason of more usage in younger respondents may be that the younger people might need more of these kind of energy giving products and older people might be not believe in these effects and they might choose more natural products.

Table 3.10.: Chi-square test results of familiarity of the selected functional food products and demographics

FAMILIARITY PRODUCTS	Gender		Age		Marital Status		Education		Income	
	Chi-square	P	Chi-square	P	Chi-square	P	Chi-square	P	Chi-square	P
Probiotic yoghurt	9,084	0,059**	17,698	0,125	6,364	0,174	7,492	0,485	14,671	0,066**
Heart-healthy margarine	2,701	0,609	13,863	0,310	3,691	0,449	15,650	0,048*	11,671	0,167
Kefir	15,716	0,003*	10,267	0,593	3,021	0,554	54,556	0,000*	23,926	0,002*
Milk with extra benefits	10,550	0,032*	11,117	0,519	4,834	0,305	13,431	0,098**	6,212	0,624
Cholesterol lowering yoghurt	4,496	0,213	2,283	0,986	2,363	0,501	4,752	0,576	4,126	0,660
Cholesterol lowering milk	4,382	0,223	4,273	0,893	1,608	0,658	3,052	0,802	4,252	0,643
Cholesterol lowering soya meat	3,468	0,483	12,216	0,429	3,699	0,448	38,026	0,000*	27,190	0,001*
Cracker, muesli that help digestive system	3,368	0,483	8,420	0,752	3,595	0,464	12,933	0,114	13,584	0,093**
Juice with extra vitamins	13,472	0,009**	26,482	0,009**	7,411	0,116	23,951	0,002*	6,509	0,590
Egg with DHA/Omega 3	7,183	0,127	11,371	0,497	2,090	0,719	29,554	0,000*	14,565	0,068**

*very significant

**significant

Marital status does not have any significant relationship with familiarity of any the functional food products. It means that it is not important to be married or single to be familiar with the selected functional food products.

Education is found to be related to the familiarity of most of the products. Education is very significant in heart-healthy margarine, kefir, cholesterol lowering soya meat, juice with extra vitamins and egg with DHA/omega 3. Besides, it is slightly significant for milk with extra benefits.

According to the crosstab table results, recognition of the heart-healthy margarine is increasing as the education level increases. However, usage of this product is not increasing as the education level increases. Within medium level of education group the percentage of the users are higher than the rest of the education groups.

Usage of kefir is increasing as the education level increase. Approximately 28% of the respondents in higher education are using this product whereas only 8% of the lower education respondents are using it.

According to the crosstab table for milk with extra benefits, recognition increases as the education increases. Besides, usage this product is higher in middle and high education groups compared to the lower education. Although half of the respondents do not recognize cholesterol lowering soya meat, recognition and usage increases with the education.

The crosstab table of the juice with extra vitamins shows that medium education level respondents are the users of this product and lower educated people mostly do not recognize or have not tried this product yet.

For the egg with DHA/Omega 3, high education group of respondents recognize and use this product more. 37% of the higher educated people are the users and as the education increase, usage of the product is increases.

In general, education is parallel with the familiarity of functional food products. However, this familiarity may not always lead to the usage of the product. The reason for this could be the misbelief of the higher educated people about the health claims of these products. Medium educated respondents tend to use the functional food products more in general.

Income is found to be very significant for kefir and cholesterol lowering soya meat and significant for probiotic yoghurt and cracker, muesli etc. that helps the digestive system. Thus familiarity of these products is related to the income level.

According to the crosstab of the income and familiarity with probiotic yoghurt, recognition is higher in medium and high income groups, besides percentage of using this product is getting higher with the income. Probiotic yoghurt is higher in price

compared to the conventional yoghurt. This may be a reason for the increase in usage as income level increases.

Income is also a significant factor for familiarity with kefir. Recognition is increasing with the income level. Usage of this product is approximately the same percentage (26%) within the medium and the higher income respondents which is more than the lower income respondents.

Familiarity of cholesterol lowering soya meat is also related to the income factor. Recognition of the product and trial is clearly getting higher with the income level. However, usage of this product is related to the income factor. Middle income respondents are the users of this product.

Income is somehow significant for cracker, muesli etc. that helps the digestive system. When the crosstab table is reviewed; trial and usage of this product increases with the income level. Lower income respondents know the product the least.

Familiarity of egg with dha/omega 3 is also related to income, recognition of the product increases as the income increases. However, usage of this product is not changing much with the increase in the income level. Medium and higher income level respondents' age percentages are about the same but they are higher than that of the lower income level respondents.

In general, recognition and trial of functional food products are increasing with the income level. However, usage levels within the medium and higher income groups are usually similar and clearly higher than the lower income group.

In conclusion, general hypothesis of ***“Familiarity of the selected functional food products is related to the demographic factors”*** is partially accepted. Marital status has no relation with the familiarity of the selected functional food products. Age is related to the familiarity of only one functional food product. However;

gender, education and income are found to be effective over the selected functional food products.

The above analyses are conducted for the whole sample. Same analysis also conducted to the respondents who have tried at least one of the functional food products (n=229). The chi-square table for these 229 people can be reviewed in appendix 3. Most of the products' results for the demographics that are found significant for 269 respondents are also in compliance for the results of these 229 respondents.

3.4.7.2. Effect of Demographic Variables on Willingness to Use

H₀: Willingness to use of the selected functional food products do not differ due to the demographic factors

H₂: Willingness to use of the selected functional food products differ due to the demographic factors

In order to test the general hypothesis for willingness to use, t test and ANOVA analysis are applied and the results are also interpreted in 2 levels of significance. The significance values that have $P < 0,05$ is interpreted as very significant and $0,05 < P < 0,1$ is interpreted as significant.

According to the results given in Table 3.11; age and education are found to create significant effect, and gender and income is found to create significant effect on willingness to use of the selected functional food products. Marital status has no effect over this variable.

Gender is found significant and when the mean values are examined, both males and females are over the mid-point in the willingness scale however, females scored higher. It means that women tend to be more willing to use functional food products.

Table 3.11.: Independent samples t test and one-way ANOVA results for willingness to use related to demographics

DEMOGRAPHICS		Mean	t/F Value	P
Gender	Female	2,84	t= 0,858	0,0939**
	Male	2,76		
Age	18-27	2,84	F= 5,352	0,001*
	28-37	2,81		
	38-47	3,04		
	48 and over	2,52		
Marital Status	Single	2,81	t= -0,008	0,994
	Married	2,81		
Education	Lower	3,03	F= 6,682	0,001*
	Middle	2,94		
	Higher	2,65		
Income	Lower	2,92	F=2,717	0,068**
	Medium	2,70		
	Higher	2,72		

*very significant

**significant

Age is found very significant and according to the mean values, 38-47 age group scored higher than the other age groups. It means that this age group tends to be more willing to use these products. 48 and over age group has scored the lowest mean value. Functional food products are relatively new to the consumers and older people generally tend to keep their behaviors and less willing to try new things.

Education is also found very significant and lower education respondents' mean value is the highest and as the education increases willingness to use of these products decreases. Higher education respondents may have some concerns about the health claims of these products so that they do not want to use these products. This result is also supporting the familiarity results, higher education respondents have awareness about functional food products however they do not use them.

Income demographic is found significant and lower income group respondents scored highest, the medium and higher income groups are scored nearly the same. Comparing with the familiarity results, the users of the functional food products are

generally the medium or high income groups however, lower income group's "willingness to use" these products is higher than the user groups. This may be due to the higher prices of the functional food products compared to the prices of conventional ones.

As a result, the general hypothesis of "*Willingness to use of the selected functional food products differ due to the demographic factors*" is partially accepted. Marital status has no effect over willingness to use of the selected functional food products. However; gender, age, education and income has significant effects over willingness to use. Middle age group, females, lower education and lower income respondents tend to be more willing to use these selected functional food products.

3.4.7.3. Effect of Demographic Variables on Attitudes towards Functional Foods

H₀: Attitudes towards functional food dimensions do not differ due to the demographic factors

H₃: Attitudes towards functional food dimensions differ due to the demographic factors

In order to test the general hypothesis for functional food attitudes, independent samples t test for gender and marital status, and one-way ANOVA tests are applied in SPSS. The results are evaluated in two significance levels. The significance values that have $P < 0,05$ is interpreted as very significant and $0,05 < P < 0,1$ is interpreted as significant.

According to the results given in Table 3.12, gender is found very significant only for necessity for functional foods (FFNEC) dimension. Females' mean score is higher than that of males for this dimension. Thus, females have more positive attitudes towards functional foods in the extent of necessity.

Age is very significant for reward from using functional foods (FFREW) dimension and safety in functional foods (FFSAF) dimension. 38-47 age group has

the highest mean score for reward from using functional foods dimension. Thus, it means middle age respondents have positive attitudes towards functional foods thinking that they get rewarding outcomes by using functional foods and their health is being promoted. On the other hand, in safety issues younger respondents (18-27) have the highest mean scores whereas older respondents (48 and over) have the lowest mean score. Younger age group believes that using functional foods is safe compared to other age groups. Older respondents may have suspicions about the safety of this food category.

Marital status is not a very significant factor neither of the attitude dimensions but, it is found somewhat significant for safety in functional foods (FFSAF). According to the mean values, single respondents have positive attitudes towards the safety of these products. This result may be related to having children or feeling the responsibility of others for the married respondents. Single respondents may not have concerns about the safety of the functional foods.

Education is found very significant for reward from functional foods (FFREW), necessity for functional foods (FFNEC) and safety in functional foods (FFSAF). In reward from functional foods (FFREW) dimension, lower and middle educated respondents have higher mean scores than the respondents with higher education. These education groups tend to believe in the benefits of using functional foods. Respondents with middle education have positive attitudes towards the necessity of the functional foods. For the same education group, functional foods are safe to use and they are credible.

Monthly household income is a significant factor for reward from using functional foods (FFREW) and safety in functional foods (FFSAF) dimensions. When the mean scores are observed, lower income respondents have more positive attitudes towards functional foods believing their rewards and safety.

In summary, marital status is the least effective demographic factor on functional foods dimensions compared to other demographic features. Besides,

confidence in functional foods (FFCON) dimension is not affected by any of the demographic features. This dimension is about the person's confidence in functional foods and the perceived safety of functional foods so that it may mean even if the respondents have some concerns about the confidence in using these foods, these concerns are independent from the demographic factors. The most affected dimensions from the demographic factors are reward from using functional foods (FF REW) and safety in functional foods (FF SAF).

For the reward from using functional foods (FF REW) dimension, 38-47 age group respondents, respondents with lower education and respondents with lower income have positive attitudes. For necessity for functional foods (FFNEC) dimension, female respondents and middle educated respondents have positive attitudes. For safety in functional foods (FF SAF) dimension younger (18-27 age group), single, middle educated and lower-income respondents have positive attitudes. Thus, the general hypothesis of "*Attitudes towards functional food dimensions differ due to the demographic factors*" is partially accepted.

Table 3.12.: Independent samples t test and one-way ANOVA results for functional food dimensions related to demographics

DIMENSIONS		FFREW (Reward from using functional foods)			FFNEC (Necessity for functional foods)			FFCON (Confidence in functional foods)			FFSAF (Safety in functional foods)		
DEMOGRAPHICS		Mean	t/F Value	P	Mean	t/F Value	P	Mean	t/F Value	P	Mean	t/F Value	P
Gender	Female	2,79	t= 0,226	0,821	3,27	t= 2,471	0,014*	2,86	t= 0,739	0,460	2,59	t= 0,551	0,582
	Male	2,76			3,06			2,78			2,54		
Age	18-27	2,80	F= 2,762	0,043*	3,24	F= 1,894	0,131	2,94	F= 0,687	0,561	2,89	F= 4,792	0,003*
	28-37	2,65			3,08			2,75			2,42		
	38-47	3,01			3,32			2,89			2,60		
	48 and over	2,64			3,10			2,77			2,50		
Marital Status	Single	2,77	t= -0,081	0,935	3,18	t= -0,010	0,992	2,82	t= -0,049	0,961	2,66	t= 1,850	0,066**
	Married	2,78			3,18			2,83			2,49		
Education	Lower	2,97	F= 4,436	0,013*	3,22	F= 7,529	0,001*	2,97	F= 2,279	0,105	2,62	F= 4,371	0,014*
	Middle	2,93			3,40			2,94			2,75		
	Higher	2,63			3,04			2,72			2,45		
Income	Lower	2,92	F= 3,305	0,038*	3,25	F= 1,156	0,317	2,90	F= 0,964	0,383	2,67	F= 2,995	0,052**
	Medium	2,62			3,11			2,73			2,57		
	Higher	2,72			3,15			2,83			2,37		

*very significant

**significant

3.5. CONCLUSION AND RECOMMENDATIONS

“Functional food” concept is new to the Turkish consumers even if some of the products are already in the market before the term exists. According to the literature review, functional foods are lack of clear and legal description in most of the countries. So that, it is normal to expect Turkish consumers have little knowledge about this food category. This study is applied to 269 respondents in 10 different districts in İzmir. Female-male respondents are relatively balanced in the sample, however, middle aged, higher educated and lower-incomed respondents are slightly higher than the other demographic groups. Respondents evaluated their health status as “good” in general.

In total 269 respondents, 21% of them have some knowledge about “functional food” concept. In order to increase this knowledge, some publicity activities and advertisement campaigns can be organized. Besides, shelf arrangements in the markets can be reorganized as it is done in the “diet products” or “organic products”. This reorganization may orient consumers to perceive functional foods as a category in the market.

Consumers usually perceive functional food products individually. They usually tend to evaluate these products with their reference/base products like yoghurt, margarine or cracker. According to the study results, within the 10 selected functional food products the most known ones by the respondents are heart-healthy margarine and probiotic yoghurt. These two products are the ones that are most advertised and most promoted to the consumers. Thus, advertisement campaigns can be said to be successful about creating awareness. However, awareness does not always lead to usage. The percentage of the respondents that use probiotic yoghurt and heart-healthy margarine is not as high as the percentage for egg with DHA/omega 3, cracker, muesli that helps digestive system or juice with extra vitamins.

Education is the demographic variable which is found to be related to the familiarity of most of the functional food products. 6 out of 10 selected products (heart-healthy margarine, kefir, milk with extra benefits, cholesterol lowering soya meat, juice with extra vitamins, egg with DHA/omega 3) are found to be related to education. In general, recognition of the products increase with the education however, respondents with medium education tend to use functional food products more.

In general, recognition and trial of functional food products are getting higher with the income level. However, users of these products are generally the respondents with medium and high income. Recognition is also low within the male respondents. However, trial and usage differ from product to product for male and female respondents.

According to the willingness to use results, more than half of the respondents are not willing to use cholesterol lowering yoghurt, milk drink and soya meat. These products are also found not very familiar to the consumers. Besides, even though the probiotic yoghurt and heart-healthy margarine are familiar to the respondents, nearly half of the respondents are not willing to use these products. They might not believe the health effects of these products. The products that the respondents most willing to use are juice with extra vitamins, egg with DHA/Omega 3. Nearly half of the respondents are willing to use these products.

According to the demographics, females are more willing to use selected functional food products. 38-47 age group is more willing to use these products compared to the other age groups whereas 48 and over respondents are least willing. Functional food products are new to the consumers, thus, this could be the reason for 48 and over age group being least willing to use these products. Older consumers usually change their habits harder and willing to try new products is less for this group than the other groups. On the other side, younger respondents face health problems less so that they may be less willing to use these kinds of health products compared to the 38-47 age group.

In general, when the education level increases willingness to use of these products decreases. The trust in the health claims and the information sources may be less for the higher education groups. Familiarity results are also supporting this result, awareness about the products are higher in higher education group however usage of the products are less compared to the respondents with lower education.

Respondents with lower income are more willing to use these products. In general, higher income respondents are the users of these products however lower income respondents are more willing to use.

The respondents have the highest mean score on necessity for functional foods (FFNEC) dimension whereas they have the lowest mean score on safety in functional foods (FF SAF) dimension. Thus, these 229 respondents who have at least tried one of the functional food products tend to believe that functional foods are necessary for their daily diet but not very safe to use. “Functional foods are completely unnecessary” statement which was reversed before the analysis has the highest mean score within all statements. This is also supporting that respondents tend to believe the necessity of these products.

38-47 middle age respondents, respondents with lower education and respondents with lower income found that it is rewarding to use functional food products and they have positive attitudes towards getting reward from using functional foods (FF REW) dimension. Female respondents and middle educated respondents tend to think that functional foods are necessary to be consumed. 18-37 age group, single, middle educated and lower-incomed respondents have positive attitudes towards the safety in functional foods.

Functional food dimensions are also analyzed with health status of the respondents and awareness of the term due to not finding any significant results it is not given in the analysis part of the study. This result may show that the respondents feelings about their health status or having some knowledge about the term

“functional food” does not lead them to found these products rewarding, necessary or safe.

Functional foods –if they are evaluated as a category- are still in the beginning of the product life cycle in the market. Awareness and primary demand have to be created about this product category. Advertising campaigns about health issues (e.g. “protect your heart, wear red”) are increased in recent years in Turkey which can create a demand for healthy products as well as functional food products. Information booklets about these foods are also necessary for consumers to have more knowledge about these products. Some other promotions are done in the market however on product or brand base. These marketing activities may be applied in category base; general information about these products and the technologies that used for developing these products may be more emphasized in order to gain the trust of the consumers. Functional food category is confused with genetically modified foods in some countries and there are negative attitudes towards genetically modified food products. The differences between these two categories have to be emphasized in order to prevent the reflection of these negative attitudes to the functional food products.

There is also no clear user profile of functional foods. In general; females are more aware of the product samples; middle aged, middle educated and medium or high income respondents tend to use functional foods however lower education and lower income groups are more willing to use. Females are generally responsible of shopping or choosing the food products for the household, thus it is normal to be found as having more knowledge about functional food products. However, this knowledge is not always turned into usage. The reasons of this should be analyzed and trust about these products should be increased. Usually lower income respondents willing to use but they are not the users of these products, the reason of this result may be the relatively high prices of functional foods compared to their convenient alternatives. It seems to be there are potential users of these products and if the prices are balanced there could be expand in market penetration.

Perceived safety of using these products should also be increased. Health claims should be clear, understandable by the consumer and proved by the trustable sources. Differentiated qualities have to be communicated to the consumer clearly, so that the consumer feel buying quality differentiated products. Besides, functional food development should be done with the cooperation of the scientists, manufacturers and consumer in order to develop demandable products with health benefits.

For further research, sample size can be increased in order to get more significant results. Besides, demographics can be broadened in order to find out more detailed results about the lifestyle, personality and demographics of the respondents. Because of the concept is not very familiar to the respondents, it has to be explained, thus, the questionnaires that will be applied in the field should be done by face-to-face interviews.

3.6. LIMITATIONS OF THE STUDY

This study is conducted on selected functional food products. Therefore, the results cannot be generalized to all functional food products that exist in the market. The sampling method that is applied in the study is non-random/convenience sampling thus these results may not be reflecting the attitudes of all consumers in İzmir. Functional foods are taken as a product category in the study. However, attitudes may differ from product to product.

Because of the time limitation to apply the questionnaire in front of the supermarkets demographic factors considered in the study is limited. Some demographic factors like marriage, having children, income can be examined in more detail. Besides, these demographics do not always show the lifestyle and consumption patterns of the respondents.

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APPENDICES

APPENDIX 1

QUESTIONNAIRE OF THE STUDY

Dear Participant;

Enclosed questionnaire is designed to analyze consumer attitudes towards functional foods in the extent of a thesis in Dokuz Eylül University, Master of Business Administration. The data gathered from your answers will not be used in any other platform. Your honest answers will help this project to reach accurate results.

Thank you for your participation.

Bürke Aksulu
Dokuz Eylül University
Social Sciences Institute
Master of Business Administration Student

A RESEARCH ON CONSUMER ATTITUDES TOWARDS FUNCTIONAL FOOD PRODUCTS

Q1. Please give points to the below food products according to your familiarity.

- 1- I do not recognize this product
 2- I recognize this product but I never tried it
 3- I have tried this product but I do not use it
 4- I use this product occasionally
 5- I use this product frequently

PRODUCTS	1	2	3	4	5
Yoghurt that helps digestive system / probiotic yoghurt (e.g.: Danone/Activia, Sütaş/Yovita)					
Cholesterol lowering / heart-healthy margarine (e.g.: Becel Pro-aktiv, Kalbim Benecol)					
Probiotic / immune system strengthening kefir (e.g.: İçim, Eker, Altıncılıç)					
Milk with extra calcium / without lactose / with Omega 3 (e.g.: Pınar Denge products)					
Cholesterol lowering / with plant sterol yoghurt (e.g.: Kalbim Benecol)					
Cholesterol lowering / with plant sterol milk drink (e.g.: Kalbim Benecol)					
Cholesterol lowering soya meat / minced soya meat (e.g.: Ülker /Soyet, Otacı /Soya Eti)					
Cracker, muesli etc. that helps the digestive system (e.g.: Doğa Muesli, Otacı cracker)					
Juice that have extra vitamins (e.g.: Cappy Yaşam Aktif, Dimes Life)					
Egg with DHA ve /veya Omega 3 (e.g.: Keskinöglü, Güres)					

Q2. Please give points to the below food products according to your willingness to use.

- 1- I am strongly not willing to use this product
 2- I am not willing to use this product
 3- I am not sure
 4- I am willing to use this product
 5- I am strongly willing to use this product

PRODUCTS	1	2	3	4	5
Yoghurt that helps digestive system / probiotic yoghurt (e.g.: Danone/Activia, Sütaş/Yovita)					
Cholesterol lowering / heart-healthy margarine (e.g.: Becel Pro-aktiv, Kalbim Benecol)					
Probiotic / immune system strengthening kefir (e.g.: İçim, Eker, Altıncılıç)					
Milk with extra calcium / without lactose / with Omega 3 (e.g.: Pınar Denge products)					
Cholesterol lowering / with plant sterol yoghurt (e.g.: Kalbim Benecol)					
Cholesterol lowering / with plant sterol milk drink (e.g.: Kalbim Benecol)					
Cholesterol lowering soya meat / minced soya meat (e.g.: Ülker /Soyet, Otacı /Soya Eti)					
Cracker, muesli etc. that helps the digestive system (e.g.: Doğa Muesli, Otacı cracker)					
Fruit juice that have extra vitamins (e.g.: Cappy Yaşam Aktif, Dimes Life)					
Egg with DHA ve /veya Omega 3 (e.g.: Keskinöglü, Güres)					

Q3. Have you ever heard the term “functional foods”?

I didn't hear this term before	
I heard this term before but I don't know what it is	
I heard this term but I am not sure what it is	
I heard this term before and I have limited information about it	
I heard this term before and I have detailed information about it	

DEFINITION OF FUNCTIONAL FOODS:

“Functional foods are consumed as a part of the daily diet. However, they are marketed as they have health benefits beyond their basic nutrition. For example; lowering cholesterol, supporting to regulate digestive system etc. Although they have health benefits they are not pills or vitamins. The food products that you have evaluated above for familiarity and willingness to use are all examples of functional foods.”

Q4. How do you evaluate your health situation?

Very bad	
Bad	
Average	
Good	
Very good	

Q5. Give points 1 to 5 for the statements below in the extent of the functional foods that you use or try.

- 1- I completely do not agree
- 2- I do not agree
- 3- I am not sure
- 4- I agree
- 5- I completely agree

STATEMENTS	1	2	3	4	5
Functional foods help to improve my mood					
My performance improves when I eat functional foods					
Functional foods make it easier to follow a healthy life style					
I can prevent disease by eating functional foods regularly					
The idea that I can take care of my health by eating functional foods gives me pleasure					
Functional foods can repair the damage caused by an unhealthy diet					
I am prepared to compromise on the taste of a food if the product is functional					
I actively seek out information about functional foods					
Functional foods are completely unnecessary					
Functional foods are a total lie					
The growing number of functional foods on the market is a bad trend for the future					
For a healthy person it is worthless to use functional foods					
It is great that modern technology allows the development of functional food					
I only want to eat foods that do not have any medicine-like effects					
Health effects are not appropriate in delicacies (like allergy)					
Functional foods are consumed mostly by people who have no need for them					
It is pointless to add health effects are not to otherwise unhealthy foods (e.g. cholesterol lowering margarines)					
Functional foods promote my well-being					
The safety of functional foods has been very thoroughly studied					
I believe that functional foods fulfill their promises					
Functional foods are science-based top products					
If used in excess, functional foods can be harmful to health					
In some cases functional foods may be harmful for healthy people					
Using functional foods is completely safe					
The new properties of functional foods carry unforeseen risks					
Exaggerated information is given about health effects					

Q6. The questions below aimed to get demographics about you. Please mark the box that is best suitable for you.

Gender:

Female	
Male	

Age:

18-27	
28-37	
38-47	
48-57	
58 and over	

Marital Status:

Single	
Married	
Divorced/Separated	
Widowed	

Education:

Literate	
Primary School	
Secondary School	
High School or equivalent	
University	
Masters / Doctorate	

Monthly household income:

500 YTL and lower	
501 - 1000 YTL	
1001 - 1500 YTL	
1501 - 2000 YTL	
2001 - 2500 YTL	
2501 - 3000 YTL	
3001 - 3500 YTL	
3501 – 4000 YTL	
4001 YTL and over	

Thank you for your participation...

APPENDIX 2

CROSSTABS OF THE SIGNIFICANT FAMILIARITY RESULTS

gender & familiarity-probiotic yoghurt								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
gender	female	count	4	89	40	14	10	157
		% within gender	2,5%	56,7%	25,5%	8,9%	6,4%	100,0%
	male	count	10	65	19	14	4	112
		% within gender	8,9%	58,0%	17,0%	12,5%	12,5%	100,0%
	total	count	14	154	59	28	14	269
	% within gender	5,2%	57,2%	21,9%	10,4%	5,2%	100,0%	

gender & familiarity-kefir								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
gender	female	count	32	62	39	22	2	157
		% within gender	20,4%	39,5%	24,8%	14,0%	1,3%	100,0%
	male	count	9	48	21	28	6	112
		% within gender	8,0%	42,9%	18,8%	25,0%	5,4%	100,0%
	total	count	41	110	60	50	8	269
	% within gender	15,2%	40,9%	22,3%	18,6%	3,0%	100,0%	

gender & familiarity-milk with extra benefits								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
gender	female	count	38	90	12	12	5	157
		% within gender	24,2%	57,3%	7,6%	7,6%	3,2%	100,0%
	male	count	34	49	20	8	1	112
		% within gender	30,4%	43,8%	17,9%	7,1%	0,9%	100,0%
	total	count	72	139	32	20	6	269
	% within gender	26,8%	51,7%	11,9%	7,4%	2,2%	100,0%	

gender & familiarity-juice with extra vitamins								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
gender	female	count	25	77	25	19	11	157
		% within gender	15,9%	49,0%	15,9%	12,1%	7,0%	100,0%
	male	count	30	39	10	25	8	112
		% within gender	26,8%	34,8%	8,9%	22,3%	7,1%	100,0%
	total	count	55	116	35	44	19	269
	% within gender	20,4%	43,1%	13,0%	16,4%	7,1%	100,0%	

age & familiarity-juice with extra vitamins								
			I do not	I recognize this	I have tried this	I use this product	I use this product	Total
			recognize this	product, but I	product but I do	occasionally	frequently	
			product	never tried it	not use it			
age	18-27	count	5	16	9	12	5	47
		% within age	10,6%	34,0%	19,1%	25,5%	10,6%	100,0%
	28-37	count	24	34	11	11	10	90
		% within age	26,7%	37,8%	12,2%	12,2%	11,1%	100,0%
	38-47	count	12	28	9	16	3	68
		% within age	17,6%	41,2%	13,2%	23,5%	4,4%	100,0%
	48 and over	count	14	38	6	5	1	64
		% within age	21,9%	59,4%	9,4%	7,8%	1,6%	100,0%
	total	count	55	116	35	44	19	269
		% within age	20,4%	43,1%	13,0%	16,4%	7,1%	100,0%

education & familiarity-heart healthy margarine									
			I do not	I recognize this	I have tried this	I use this product	I use this product	Total	
			recognize this	product, but I	product but I do	occasionally	frequently		
			product	never tried it	not use it				
education	lower edu.	count	6	24	11	5	2	48	
		% within age	12,5%	50,0%	22,9%	10,4%	4,2%	100,0%	
	medium edu.	count	4	38	17	17	7	83	
		% within age	4,8%	45,8%	20,5%	20,5%	8,4%	100,0%	
	higher edu.	count	2	83	25	19	9	138	
		% within age	1,4%	60,1%	18,1%	13,8%	6,5%	100,0%	
		total	count	12	145	53	41	18	269
			% within age	4,5%	53,9%	19,7%	15,2%	6,7%	100,0%

education & familiarity-kefir									
			I do not	I recognize this	I have tried this	I use this product	I use this product	Total	
			recognize this	product, but I	product but I do	occasionally	frequently		
			product	never tried it	not use it				
education	lower edu.	count	23	10	11	4	0	48	
		% within age	47,9%	20,8%	22,9%	8,3%	0,0%	100,0%	
	medium edu.	count	9	40	18	13	3	83	
		% within age	10,8%	48,2%	21,7%	15,7%	3,6%	100,0%	
	higher edu.	count	9	60	31	33	5	138	
		% within age	6,5%	43,5%	22,5%	23,9%	3,6%	100,0%	
		total	count	41	110	60	50	8	269
			% within age	15,2%	40,9%	22,3%	18,6%	3,0%	100,0%

education & familiarity-milk with extra benefits								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
education	lower edu.	count	19	23	4	0	2	48
		% within age	39,6%	47,9%	8,3%	0,0%	4,2%	100,0%
	medium edu.	count	23	40	11	6	3	83
		% within age	27,7%	48,2%	13,3%	7,2%	3,6%	100,0%
	higher edu.	count	30	76	17	14	1	138
		% within age	21,7%	55,1%	12,3%	10,1%	0,7%	100,0%
	total	count	72	139	32	20	6	269
		% within age	26,8%	51,7%	11,9%	7,4%	2,2%	100,0%

education & familiarity-cholesterol lowering soya meat								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
education	lower edu.	count	39	8	0	1	0	48
		% within age	81,3%	16,7%	0,0%	2,1%	0,0%	100,0%
	medium edu.	count	36	37	9	1	0	83
		% within age	43,4%	44,6%	10,8%	1,2%	0,0%	100,0%
	higher edu.	count	48	57	22	9	2	138
		% within age	34,8%	41,3%	15,9%	6,5%	1,4%	100,0%
	total	count	123	102	31	11	2	269
		% within age	45,7%	37,9%	11,5%	4,1%	0,7%	100,0%

education & familiarity-juice with extra vitamins								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
education	lower edu.	count	11	28	6	2	1	48
		% within age	22,9%	58,3%	12,5%	4,2%	2,1%	100,0%
	medium edu.	count	15	24	13	19	12	83
		% within age	18,1%	28,9%	15,7%	22,9%	14,5%	100,0%
	higher edu.	count	29	64	16	23	6	138
		% within age	21,0%	46,4%	11,6%	16,7%	4,3%	100,0%
	total	count	55	116	35	44	19	269
		% within age	20,4%	43,1%	13,0%	16,4%	7,1%	100,0%

education & familiarity-egg with dha/omega 3								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
education	lower edu.	count	30	12	3	2	1	48
		% within age	62,5%	25,0%	6,3%	4,2%	2,1%	100,0%
	medium edu.	count	27	25	5	15	11	83
		% within age	32,5%	30,1%	6,0%	18,1%	13,3%	100,0%
	higher edu.	count	33	41	13	35	16	138
		% within age	23,9%	29,7%	9,4%	25,4%	11,6%	100,0%
	total	count	90	78	21	52	28	269
		% within age	33,5%	29,0%	7,8%	19,3%	10,4%	100,0%

income & familiarity-probiotic yoghurt								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
income	lower	count	10	74	26	9	5	124
		% within income	8,1%	59,7%	21,0%	7,3%	4,0%	100,0%
	medium	count	3	56	21	8	4	92
		% within income	3,3%	60,9%	22,8%	8,7%	4,3%	100,0%
	higher	count	1	24	12	11	5	53
		% within income	1,9%	45,3%	22,6%	20,8%	9,4%	100,0%
	total	count	14	154	59	28	14	269
		% within income	5,2%	57,2%	21,9%	10,4%	5,2%	100,0%

income & familiarity-kefir								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
income	lower	count	32	46	26	17	3	124
		% within income	25,8%	37,1%	21,0%	13,7%	2,4%	100,0%
	medium	count	7	42	19	22	2	92
		% within income	7,6%	45,7%	20,7%	23,9%	2,2%	100,0%
	higher	count	2	22	15	11	3	53
		% within income	3,8%	41,5%	28,3%	20,8%	5,7%	100,0%
	total	count	41	110	60	50	8	269
		% within income	15,2%	40,9%	22,3%	18,6%	3,0%	100,0%

income & familiarity-cholesterol lowering soya meat								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
income	lower	count	73	40	8	3	0	124
		% within income	58,9%	32,3%	6,5%	2,4%	0,0%	100,0%
	medium	count	35	36	12	7	2	92
		% within income	38,0%	39,1%	13,0%	7,6%	2,2%	100,0%
	higher	count	15	26	11	1	0	53
		% within income	28,3%	49,1%	20,8%	1,9%	0,0%	100,0%
	total	count	123	102	31	11	2	269
		% within income	45,7%	37,9%	11,5%	4,1%	0,7%	100,0%

income & familiarity-cracker, muesli that help digestive system								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
income	lower	count	27	50	22	21	4	124
		% within income	21,8%	40,3%	17,7%	16,9%	3,2%	100,0%
	medium	count	14	34	19	16	9	92
		% within income	15,2%	37,0%	20,7%	17,4%	9,8%	100,0%
	higher	count	6	15	15	9	8	53
		% within income	11,3%	28,3%	28,3%	17,0%	15,1%	100,0%
	total	count	47	99	56	46	21	269
		% within income	17,5%	36,8%	20,8%	17,1%	7,8%	100,0%

income & familiarity-egg with dha/omega 3								
			I do not recognize this product	I recognize this product, but I never tried it	I have tried this product but I do not use it	I use this product occasionally	I use this product frequently	Total
income	lower	count	51	32	8	21	12	124
		% within income	41,1%	25,8%	6,5%	16,9%	9,7%	100,0%
	medium	count	30	27	5	18	12	92
		% within income	32,6%	29,3%	5,4%	19,6%	13,0%	100,0%
	higher	count	9	19	8	13	4	53
		% within income	17,0%	35,8%	15,1%	24,5%	7,5%	100,0%
	total	count	90	78	21	52	28	269
		% within income	33,5%	29,0%	7,8%	19,3%	10,4%	100,0%

APPENDIX 3

CHI-SQUARE TEST RESULTS OF FAMILIARITY OF THE SELECTED FUNCTIONAL FOOD PRODUCTS RELATED TO DEMOGRAPHICS (N=229)

FAMILIARITY PRODUCTS	Gender		Age		Marital Status		Education		Income	
	Chi-square	P	Chi-square	P	Chi-square	P	Chi-square	P	Chi-square	P
probiotic yogurt	9,482	0,050	15,430	0,219	4,012	0,404	7,101	0,526	10,115	0,257
heart-healthy margarine	3,608	0,462	13,439	0,338	2,825	0,588	10,856	0,210	7,964	0,437
kefir	11,671	0,020	11,887	0,455	3,006	0,557	27,481	0,001	13,839	0,086
extra milk	8,345	0,080	10,369	0,584	2,957	0,565	10,577	0,227	4,376	0,822
cholesterol lowering yoghurt	4,288	0,232	2,240	0,987	2,221	0,528	4,169	0,654	2,861	0,826
cholesterol lowering milk	4,441	0,218	5,837	0,756	1,188	0,756	2,801	0,833	2,997	0,809
cholesterol lowering soya meat	2,371	0,668	13,364	0,343	3,221	0,522	24,685	0,002	19,524	0,012
gut friendly cracker-musli	6,777	0,148	7,901	0,793	2,973	0,562	9,917	0,271	10,372	0,240
extra vitamined juice	13,486	0,009	25,340	0,013	4,448	0,349	22,501	0,004	8,975	0,344
dha,omega 3 eggs	6,181	0,186	11,378	0,497	1,615	0,806	27,309	0,001	13,953	0,083