



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Cross- European and Functional Food related Consumer Segmentation for New Product Development

Kai Sparke¹ and Klaus Menrad¹

¹Straubing Centre of Science, Chair of Marketing and Management,
Straubing, Germany
k.sparke@wz-straubing.de



**Paper prepared for presentation at the 98th EAAE Seminar ‘Marketing Dynamics within the Global Trading System: New Perspectives’,
Chania, Crete, Greece as in: 29 June – 2 July, 2006**

Copyright 2006 by [Kai Sparke and Klaus Menrad]. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Cross- European and Functional Food related Consumer Segmentation for New Product Development

Kai Sparke¹ and Klaus Menrad¹

¹Straubing Centre of Science, Chair of Marketing and Management,
Straubing, Germany
k.sparke@wz-straubing.de

Abstract. *Functional Food emerged as a constant segment in the European food market and offer potential for product innovations which make them attractive for the food industry in nearly stagnating markets. Target group research is one key factor for successful innovative food products. The aim of this project was to develop and test a Functional Food related consumer segmentation model. For this purpose a survey was conducted in Germany, the United Kingdom, Poland and Spain with a total of 590 respondents. Factor analysis revealed consumers' motivation to buy or to refuse Functional Food. Motives, consumers' knowledge about Functional Food, their trust towards diverse actors in the context of nutrition and their purchase pattern were used in a cluster analysis and resulted in eight consumer segments. These groups differ significantly regarding socio-demographic characteristics. A conjoint study examined consumers' preferences towards a new type of orange juice enriched with functional ingredients recombined with different health claims. Aggregated preferences for single consumer segments provide indications for target group specific product development. Cross-country comparison of consumer segments showed distinct shifts of segments' distribution in single countries. This might be considered for companies' marketing approaches or the European commission's health and consumer protection policy.*

Keywords : Functional Food, New Product Development, Innovation, Consumer Segmentation, Europe

1. Introduction

Functional Food products have been launched in Europe since the mid 90s and had a market share of about 1% of the total food and drinks market in Europe at the beginning of the century. This share is estimated to grow up to 5% until 2010 ^[1]. Market researchers state a continuing and growing consumer focus onto health and thus worldwide growing markets for dietary and health related food products ^[2]. Many food companies regard Functional Food as a profitable and promising segment in the food market

and create innovative products based on new scientific findings about ingredients and their dietetic effects ^[3]. On the other hand, one can observe numerous product failures. Reasons for product failures in the Functional Food segment can be a non-existent health image of a functional ingredient, consumers' limited knowledge and awareness of the health effects of newly developed products or their lacking willingness to pay high price premiums ^[1].

Strong market orientation is crucial for successful new product development ^[4], and intensive target group consumer research was identified as one of few key factors for successful food product innovation. Active consumer research including analysis of customers' desires, trends and market niches enhances the likelihood of innovative food products to be successful ^[5]. Several steps of consumers' involvement in a product development process can be identified. At the beginning there are small consumer focus groups evaluating prototypes, whereas sizeable consumer surveys including product acceptance tests are conducted immediately before a commercial product launch ^[6]. An integral model of food product innovation includes steps like analysis of market development, categorisation of consumers regarding their preferences and perceptions, and development of adequate product assortments for several consumer segments ^[7]. Consumer segmentation seems to be a suitable approach for successful target group identification during new product development processes.

Additionally, consumer behaviour and patterns are assimilating due to an increasing globalization and a pan-European and even worldwide market presence of food and retail companies. But despite this tendency, major national and regional differences in food cultures still persist ^[8].

The aim of this project was to develop a framework for consumer segmentation in the Functional Food field and to apply it to the product development process. Further on, this segmentation approach should be considered against the background of cross-European consumption patterns and national food cultures simultaneously.

2. Methodology

2.1 Consumer segmentation and preference testing model

Consumer behaviour models try to explain the emergence and change of consumers' needs and the resulting buying decisions. The so-called S-O-R type models state that consumer behaviour is provoked by affective and influenced by cognitive components. These processes occur in the organism of a consumer and are stimulated through several input factors, such as socio-demographic determinants or marketing activities. Resulting from those processes, purchase of a specific product may be observed as a consumer's reaction ^[9].

Socio-demographic attributes have been taken for consumer segmentation since years because of their simple measurability and their stability over

time. On the other hand, they bear only little relevance for predicting consumers' buying behaviour ^[10]. Thus socio-demographic attributes are less suitable determinants, whereas psychological and life style oriented aspects are more promising ^[11].

The personal motivation is an important factor to buy or to consume healthy food ^[12]. A list of possible reasons to buy Functional Food was compiled and prepared for the empirical survey. In an opposite way also reasons which hinder someone from buying Functional Food were considered in this respect ^[13]. Further on, trust in institutions and procedures (e. g. for market approval or controlling food safety or quality) is an essential factor within the field of food behaviour, and especially when dealing with Functional Food which is supposed to support consumers' health and well-being ^[1]. Several actors have to be taken into account who may influence consumers' behaviour through their trustworthiness ^[12]. Additionally, the grade of knowledge about Functional Food ingredients and the relationship between nutrition and health is regarded to be important for consumers' attitude towards Functional Food. When dealing with food products which are still in a development process and not yet launched, another determinant for consumer's reaction has to be considered instead of consecutive purchase behaviour. Preferences are regarded as an important factor for the decision-making process of consumers with respect to fast moving consumer goods ^[14]. To make consumers prefer one product alternative against another, this specific alternative has to offer some benefits to the consumer which cannot be offered in the same way by the competing product. In this sense, consumer preferences reveal benefits or utilities. Utility is a crucial criterion for every rational decision making process ^[15]. Having regard to financial restrictions and to their necessity structure, consumers try to maximise their benefit when purchasing a product. Investigating and analysing consumers' preferences and the extent products avail to them, is crucial for the explanation of consumer behaviour. Conjoint analysis has been introduced to marketing in the early 1970s ^[16] and is considered as a suitable method for product design regarding the needs of a consumer target segment ^[17]. Combining stimulating factors, consumers' affective and cognitive components and their preferences towards newly developed food products results in the framework which is shown in Figure 1. On the stage of an individual consumer, the stimuli are his socio-demographic background, his previous purchasing pattern regarding Functional Food, and different actors in the field related to food and health. Additionally, there is a set of product alternatives of a Functional Food product. These stimuli are considered and processed by the consumer, and as a reaction, the consumer shows his preferences towards the specific product alternative.

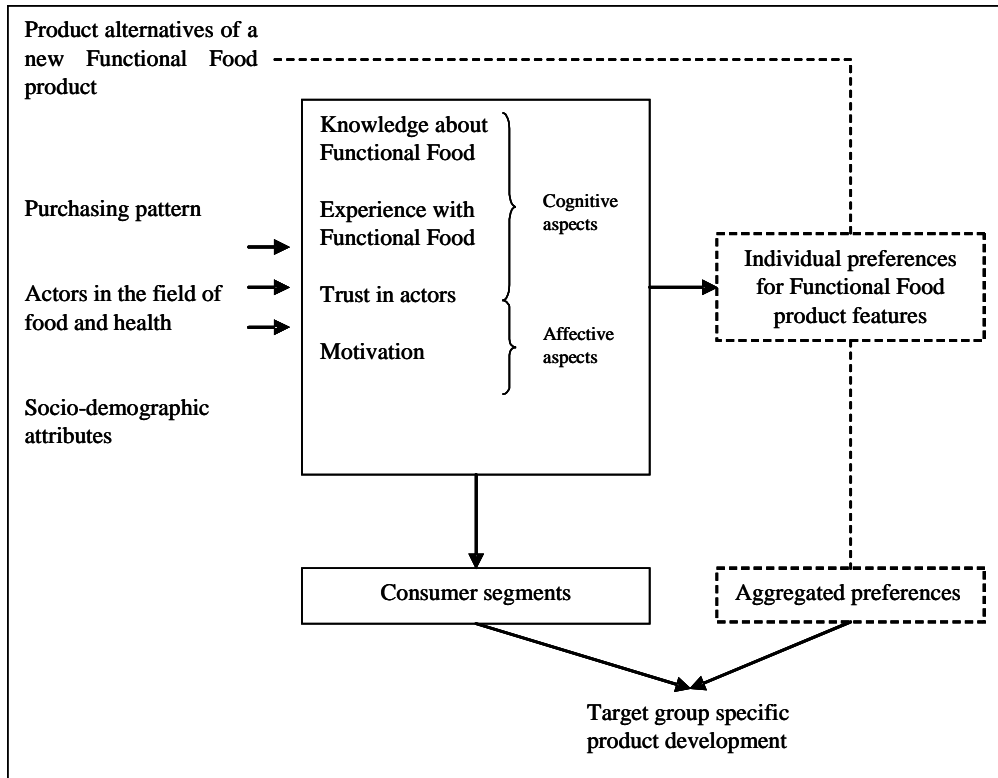


Figure 1: Framework of the Functional Food related consumer segmentation for new product development ; Source: Own inquiry

In the next step, this scheme is applied for integrating consumer related aspects in new product development. Components of the consumer's psychograph are criterions for a consumer segmentation procedure. Preferences towards the Functional Food product can be related to diverse consumer segments and give references for a target group specific new product development and marketing.

2.2 Empirical procedure

A consumer survey using a standardised questionnaire was conducted in four European countries. Country choice was based on literature review with regard to food market and food culture heterogeneity. A clustering study for Western European regions based on food consumption patterns resulted in a picture of cultural boundaries which are pretty similar to national boundaries ^[8]. The United Kingdom, Germany and Spain were chosen to be analysed as they show clear heterogeneity in their food cultures. Germany has a food market with a remarkable overall size, a rather competitive character and specific features like the high relevance of functional beverages in this country ^[1]. In Spain as a Mediterranean country there is a high volume food market, interest of consumers in new products, as well as a specific profile of the food industry, consumption pattern and consumer perception of food and nutrition. The United Kingdom is an extra-continental country and interesting because of its

high value food market with specific profile of food industry, food retailing and consumption patterns of consumers. It is the most “US” type market in the EU with a specific range of Functional Food products available for a longer time period. Additionally, Poland as a new EU member state was chosen to reflect the development of Functional Food in Eastern Europe.

The tasks of the survey were, as mentioned above, to investigate reasons to buy or not to buy Functional Food, the consumers’ previous purchasing pattern regarding Functional Food, their knowledge about different functional ingredients and their efficacies onto health, and their trust in several actors related to food and health. These aspects were operationalised in statement batteries and tests respectively. Respondents were asked to rate the trustworthiness of several actors and the importance of the diverse reasons. People who stated to have bought Functional Food products in the past, were asked to rate their reasons to buy and to numeralise their previous purchasing pattern. Non-buyers of Functional Food had to evaluate their refusal reasons.

Conjoint analysis was used to obtain consumers’ preferences towards a newly developed product. In conjoint analysis it is assumed that the product being assessed can be defined in terms of few important characteristics. Furthermore, it is assumed that the consumer decision related to such a product is based on tradeoffs among these characteristics. The purpose of conjoint analysis is to estimate utility scores, so-called part-worths, for these characteristics. Utility scores are measures of the importance of each single characteristic to the interviewee’s overall preference of a product. The characteristics of a product are explained in terms of its factor and factor levels. The factors are the general attribute categories of a product, the factor levels are the specific values of the factors ^[18].

The hypothetical Functional Food product consisted of orange juice as a basic product. Despite from Germany, all countries have about the same per capita consumption of juice and nectar in a year. In the year 2004, Germans consumed 43.7 litres, Poles 20.8 litres, Spaniards 25.3 litres and Brits 23.3 litres ^[19]. Orange juice belongs to the most important fruit juices in all four analysed countries. Orange juice is available in nearly every food store and therefore common to consumers. In addition, it seems to be a suitable basic product for enrichment with functional ingredients, and food processing technologies are conceivable with functional orange juice. Table 5 gives a set-up overlook of the conjoint design used in the survey. Fruit content highly influences the quality and taste of the orange juice. Three kinds of packaging were chosen with respect to different frameworks of product packaging in the single countries. Price is an important factor of consumer acceptance for every product. Lycopene and dietary fibres were selected as functional ingredients. The latter is well established in food production and already accumulated or enriched to several Functional Food products including beverages. Positive effects on consumers’ health are expected in the sense that dietary fibres ease

digestion and it is assumed that they reduce the risk of colon cancer ^[20]. The carotinoid Lycopene is a relatively new ingredient in the field of food processing, but significant research in public and commercial institutions has been devoted to this functional ingredient in recent years. Positive effects of this ingredient are expected to skin and eye health, prostate cancer and other diseases ^[20]. To examine to which extent health claims affect consumer preferences, two different claims were developed for each ingredient. One claim of each ingredient represents a "soft functional claim", i.e. that the stated effect of the ingredient is on the level of improving well-being and body function. The second claim can be regarded as a kind of prevention claim and it points out medical advantages. Furthermore, two colours were chosen as factor levels since enrichment with Lycopene may result in red- brown coloured orange juice. This conjoint study design results in 20 different product cases which were graphically illustrated and presented as product cards within the survey. Interviewees had to arrange the cards in an order from 1 to 20, with the most preferred product being number 1 and the least preferred product being number 20.

The survey was conducted in oral interviews in supermarkets in Germany, Poland, Spain and England. The total number of interviewed persons is 593, of which are 115 Germans, 110 Poles, 255 Spaniards and 113 Brits.

3. Functional Food related consumer segments

3.1 Design and results of consumer segmentation

The sample's composition is not balanced regarding the interviewees' national origin. This fact is taken into account for the analysis and discussion of cross-European bias in chapter 5. Additionally, the respondents were chosen by random, but not to obtain absolute representativeness concerning the whole population's socio-demographic attributes. The aim when selecting the interviewees in the sample was balance in age and gender. The survey was conducted in supermarkets to meet consumers and Functional Food purchasers and to create a suitable context for the interviews. The sample's age pattern is similar to census age distributions in the four countries ^[20].

Respondents' evaluations of reasons to buy or to refuse Functional Food and their trust in actors were processed with factor analysis. Extraction method was principal component analysis, and rotation was conducted by Varimax with Kaiser Normalisation. Four motives to buy Functional Food emerged from ten primal reasons (Table 1). They were named handsomeness, medical advice and parental care, health, and hedonic motive. These motives are similar to those stated in other studies ^[12].

Explained variance 64.2%	Factor			
	1	2	3	4
	“Handsomeness”	“Medical advice and parental care”	“Health”	“Hedonic motive”
To stay attractive	0.879	- 0.025	0.089	0.070
To retard aging	0.754	0.295	0.207	0.129
For my child / children	0.125	0.812	0.032	- 0.072
Recommended by medical doctor or nutritional consultant	- 0.031	0.667	0.097	0.374
To avoid medical treatment	0.172	0.570	0.497	0.096
To do myself good	0.038	- 0.050	0.853	0.303
To stay healthy	0.333	0.300	0.693	- 0.193
Interest and curiosity	0.062	- 0.007	0.121	0.808
To salve my consciences	0.502	0.032	0.075	0.502
Good taste	0.120	0.309	- 0.003	0.449

Table 1: Rotated component matrix of factor analysis for motives to buy Functional Food; Source: Own inquiry

Explained variance: 57.8%	Factor		
	1	2	3
	“Fear and scepticism”	“Lacking necessity and bad taste”	“Costs”
Fear of artificial additives	0.864	0.077	- 0.173
Fear of side effects	0.830	0.041	0.078
Concerns about novel food	0.608	0.114	0.180
Not effective	0.403	0.302	0.388
I focus more upon present than upon future	- 0.035	0.768	0.289
I do not feel ill	0.331	0.661	0.041
Bad taste	0.016	0.583	- 0.387
Too expensive	0.255	0.170	0.742
I prefer organic food	0.420	0.171	- 0.582

Table 2: Rotated component matrix of factor analysis for motives to refuse Functional Food; Source: Own inquiry

Nine primal reasons for consumers not to buy Functional Food generated three refusal motives after performing the factor analysis (Table 2). They were entitled fear and scepticism, lacking necessity and bad taste, and

costs. The costs motive and concerns about that kind of food are stated to be key reasons for product failures of Functional Food since years ^[13].

Initially eight different actors were identified to play a key role in consumers' trust in the context of food consumption and health. Those were the food industry, food retailers, research institutes and universities, medical doctors, nutritional consultants, health insurance companies, consumer associations and the government. Factor analysis integrated them into two groups of actors with different trustworthiness towards the consumers (explained variance 55.6%). The first group consists of the food industry, food retailers, research institutes and universities, the government and the health insurance companies. It was named "Commercial and corporate actors". The second group contains the consumer associations, nutritional consultants and medical doctors and was entitled "Consumer-oriented and serving actors".

Segmentation of consumers with respect to Functional Food consumption was conducted in several steps. At first, buyers and non-buyers were separated. 73.7% of the respondents stated that they have bought Functional Food products at least infrequently, 26.3% of the sample declared that they never have bought such products. In order to examine the interrelationship between the defined factors and consumer behaviour with respect to Functional Food, a correlation analysis was conducted for the group of buyers. Three of four buying motives correlate with the previous purchasing frequency. There are significant positive correlations for the motives handsomeness, medical advice and parental care, and health ($p < 0.01$). Trust in commercial and corporate actors and trust in consumer-oriented and serving actors correlate positively with purchase frequency. The former is significant ($p < 0.1$), whereas the latter bears no significance.

Motives and trust seem to be suitable variables when modelling consumer segments. Additionally, previous purchase frequency was taken into analysis. Respondents' knowledge about Functional Food showed no correlation with purchase frequency, but according to findings in literature about the positive interrelation between knowledge about and consumption of healthy food ^[22] this variable was also included in the analysis. Non-buyers were segmented using their knowledge about Functional Food, their three refusal motives and their trust into actors.

Variables' data has been standardised, and cluster analysis was conducted using the "Single Linkage" procedure to detect and eliminate outliers. "Ward" method followed to generate clusters. Number and size of clusters were determined with regard to a preferably low and balanced index of heterogeneity. Five clusters of buyers and three segments of non-buyers resulted from this procedure. Table 3 shows the characteristics of the buyers' segments.

Members of cluster 1 have an average knowledge about functional ingredients and their efficacies onto health and a low purchase frequency. Their main motive to buy Functional Food is handsomeness, but not

health. They show distinct below average trust in consumer- oriented and serving actors, which makes them unique among all buyers' segments. This cluster has a share of 20% of all consumers and was entitled "Hesitating Unmotivated". Persons in cluster 2 have a high grade of knowledge and a comparably high purchase frequency. They buy Functional Food primarily for health reasons. Commercial and corporate actors are not trustworthy to them in contrast to consumer- oriented actors. This cluster makes 15% of all consumers and seems to know Functional Food well and use them frequently. Thus it was named "Enlightened and Convinced".

	1	2	3	4	5
Proportion	20%	15 %	11 %	16 %	11 %
Previous purchasing frequency	Around once in three weeks	Around once in ten days	Around once in a month	Around once in three weeks	Around once in ten days
Knowledge (Percentage of correct answered questions)	57%	70%	73%	52%	53%
Motive					
Handsomeness	+	0	--	0	++
Medical advice and parental care	-	+	--	+	+
Health	--	+	+	+	+
Hedonic motive	0	0	-	++	0
Trust in					
Commercial and corporate actors	0	-	-	+	++
Consumer-oriented and serving actors	--	+	0	++	0
Name	"Hesitating Unmotivated"	"Enlightened and Convinced"	"Reasonable Health-oriented"	"Impressed Testers"	"Enthusiastic Beauty-oriented"

Annotations: ++ (distinctly above- average) + (above- average) 0 (average)
-- (distinctly below average) - (below average)

Table 3: Segments of buyers of Functional Food; Source: Own inquiry

Consumers in cluster 3 (11%) have the largest knowledge of all segments but also the lowest purchase frequency. They buy Functional Food for health reasons, the other motives are clearly not important for them. They distrust commercial and corporate actors and have average trust in

consumer- oriented actors. It is imperative for this group to buy Functional Food, and they were named “Reasonable Health- oriented”. Cluster 4 makes 16% of all consumers and consists of people with comparably little knowledge and a rather low purchase frequency. This segment focuses especially on the hedonic motive and it bears trust to both groups of actors. Due to the hedonic affection this cluster is entitled “Impressed testers”.

People in cluster 5 know comparably little about functional ingredients, but have the highest purchase frequency. Their main motive is handsomeness. They show distinct above- average trust in commercial and corporate actors and trust them even more than consumer- oriented actors. This group has a share of 11% and was named “Enthusiastic Beauty- oriented”.

The characteristics of the three segments of non- buyers are listed in table 4. The sixth cluster includes 5% of all respondents, and persons in this segment have the largest knowledge of all non- buyers. All three refusal motives appear distinctly below average, commercial and corporate actors award distinct below average trustworthiness. This group is very familiar with functional ingredients, but does not deal with Functional Food anyway. Thus it is named “Enlightened Ignoring”. Cluster 7 has a share of 9% and consists of people with average knowledge. These persons emphasize the motives of fear and scepticism, lacking necessity and bad taste. They bear below average trust in both groups of actors and therefore they are entitled “Mistrustful Sceptical”. The last group makes 13% of the sample and has the lowest knowledge level of all clusters. Higher costs of Functional Food products are the main motive for the members of this cluster not to buy Functional Food. Consumer- oriented actors award distinct below average trustworthiness, while commercial and corporate actors are trusted above average. Due to the high relevance of the costs- motive this segment is named “Cost- conscious Prevented”.

	6	7	8
Proportion	5%	9%	13%
Knowledge (Percentage of correct answered questions)	65%	58%	32%
Motive			
Fear and scepticism	--	+	0
Lacking necessity and bad taste	--	+	0
Costs	--	0	+
Trust in			
Commercial and corporate actors	--	--	+
Consumer- oriented and serving actors	0	-	--
Name	“Enlightened Ignoring”	“Mistrustful Sceptical”	“Cost- conscious

			Prevented"
Annotations:	++ (distinctly above- average)	+ (above- average)	0 (average)
	-- (distinctly below average)	- (below average)	

Table 4: Segments of non- buyers of Functional Food; Source: Own inquiry

At a glance, parallelism between segments can be detected as well as apparent differences. For instance, the clusters 2 and 6 show similar characteristics in some way. Both segments have a large knowledge about functional ingredients and their efficacies onto health, judge trustworthiness of actors likewise and seem to be familiar with Functional Food. But while the "Enlightened and convinced" consumers buy Functional Food products regularly, the "Enlightened ignoring" consumers do not deal with them. This implies that there must be additional factors which are not included in the survey, which influence behaviour of those consumers.

When looking at the socio-demographic background of the diverse segments, clear differences become obvious. A Chi²-test regarding age, gender, education, income and the fact whether a person has children or not, reveals significant differences between single segments. Significant differences can be observed concerning income ($p < 0.001$), children ($p < 0.01$) and gender ($p < 0.1$). Differences regarding respondents' education and age are also significant ($p < 0.001$), but the share of cross table cells with an expected frequency below 5 is 25% and exceeds the defined limit of 20%.

In tendency, persons belonging to the "Hesitating unmotivated" consumers are younger than 30 years. School certificates with authorisation for academic education are overrepresented in this group, while persons older than 70 years are rarely found in this group. "Enlightened and convinced" consumers can be described as persons younger than 40 years old, who have children and academic background and earn above- average incomes. Among the "Reasonable and health- oriented" consumers persons in the age of 40 to 60 are overrepresented. Many of them have professional certificates or academic education, and middle and high incomes are overbalanced. Women are overrepresented in this group. "Impressed testers" can be depicted as persons with normal school certificate and low incomes. There is no particularity regarding age or gender. Among the "Enthusiastic beauty- oriented" consumers persons younger than 30 years are slightly overrepresented. This group has little academic background and mostly low incomes.

Many of the "Enlightened ignoring" consumers are between 30 and 40 years old and have children. People with academic degrees and men are overrepresented. Incomes are high or very high. Persons belonging to the "Mistrustful sceptical" consumers can be described as older than 50 having no or no more children in the household respectively. Many of them have professional training certificates. "Cost- conscious prevented" consumers are mainly men and older than 60 years and have no or no more children

in their household respectively. Low and very low incomes are overrepresented in this group.

3.2 Relevance within marketing strategies

Among the buyers of Functional Food, the groups of “Enlightened and convinced” as well as “Enthusiastic beauty- oriented” consumers give the impression to be key trendsetting groups. The former group seems to enclose those persons who are considered to be the “typical” Functional Food consumers: well informed about the concept, convinced of it and consuming the food for “reasonable” motives ^[20], whereas the latter segment has the same purchase frequency but nearly totally differing characteristics. Less well informed but more trustful in the acting institutions in this field they consume that type of food for reasons which are not ascribed originally to Functional Food. But both groups can be stated to be the core target segments for Functional Food. The other three segments of buyers are less important for producers and retailers when looking at their purchasing pattern, but they might be stimulated to enhance their purchase frequency when using differentiated marketing strategies.

4. Preference analysis

4.1 Results of the conjoint analysis

Respondents’ individual rankings of 20 cards of product alternatives of a functional orange juice were the data basis for conjoint analysis. SPSS statistical software was used to calculate the importance of each factor and the part- worth utility values for the factor levels ^[17]. The sum of importance of all factors is 100 %. Positive linearity was implied for the factor fruit content because it was regarded to be an indicator for quality. Therefore an increasing fruit content or quality respectively should result in increasing utility values. Price was assumed to have a negative linearity, because reasonably a product with a higher price leads to a lower benefit to the consumer. Table 5 lists the importance of several factors and part- worth utilities of their factor levels for the whole sample.

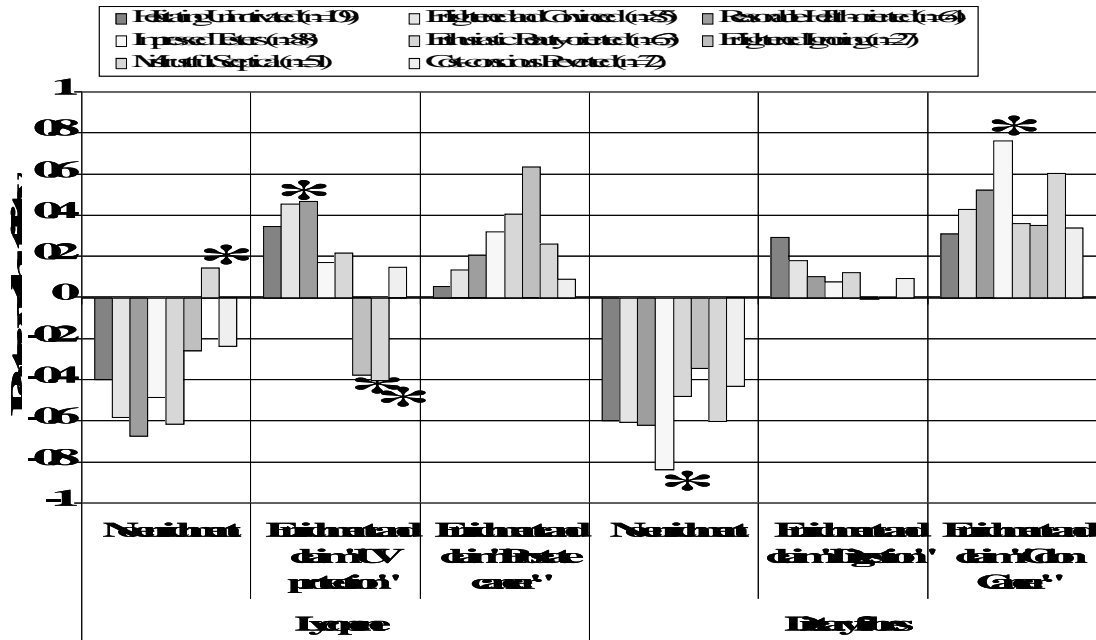
Fruit content is by far the most important factor with an importance of more than 31%. Packaging is second, followed by the enrichment with Lycopene and dietary fibres, which have about the same importance of 14% or 13% respectively. The factors dealing with enrichment with functional ingredients achieve the third rank of all factors and seem to be of similar importance. Looking at their part- worth utilities it becomes apparent that juice without enrichment of either Lycopene or dietary fibres results in lower benefit because the factor level “no enrichment” obtains negative part- worth utilities. Further on, there is evidence that prevention claims are more positively assessed than soft functional claims.

Factor	Importance	Factor levels	Part- worth
--------	------------	---------------	-------------

	(%)		utility
Packaging	21.29	Glass bottle	0.3682
		Plastic bottle	- 0.8373
		Tetra Pak carton	0.4691
Colour	6.84	Normal (yellow)	0.0000
		Discoloured (red- brown)	0.0000
Lycopene	14.03	No enrichment	- 0.4221
		Enrichment (“Contains Lycopene”) and claim “Lycopene improves the skin’s protection against ultraviolet radiation”	0.1990
		Enrichment (“Contains Lycopene”) and claim “Lycopene reduces the risk of prostate cancer”	0.2232
Dietary fibres	13.40	No enrichment	- 0.5874
		Enrichment (“Contains dietary fibres”) and claim “Dietary fibres ease digestion”	0.1259
		Enrichment (“Contains dietary fibres”) and claim “Dietary fibres reduce the risk of colon cancer”	0.4615
Fruit content	31.35	20%	2.8766
		50%	5.7532
		100%	8.6298
Price	13.09	Cheap (- 30%)	- 0.7500
		Normal	- 1.5000
		Expensive (+30%)	- 2.2500
Country		Basic price (Currency exchange rates from October 2004)	
Germany		1.29 €	
Poland		2.99 Złoty (=0.69 €)	
Spain		1.29 €	
United Kingdom		1.29 £ (=1.81 €)	

Table 5: Set up and results of the conjoint analysis for functional orange juice; Source: Own inquiry

Part- worth utilities were also aggregated for the eight identified consumer segments with respect to Functional Food. The results of this analysis are shown in Figure 2.



Annotations: * indicates a significant deviation from sample mean ($p < 0.1$)

Figure 2: Part- worth utilities for the factors Lycopene and dietary fibres regarding consumer segments; Source: Own inquiry

All segments of buyers of Functional Food assess enrichment with Lycopene positively. In opposite, there are two groups of non- buyers, namely “Enlightened ignoring” consumers and “Mistrustful sceptical” consumers, who evaluate enrichment with Lycopene in combination with the soft functional claim negatively. Lycopene enrichment in combination with the prevention claim reveals positive utility values for all consumer segments. The non- buyer group of “Enlightened ignoring” persons assesses this feature best. The positive evaluation of the prevention claim and negative evaluation of the soft functional claim may result from the fact that this segment consists in a majority of men, who may not be interested in skin’s care but in prevention from prostate cancer – a men- related concern.

Altogether, there are no big differences in part- worth utilities of single segments towards dietary fibres. Non- enrichment obtains negative part- worth utilities, while both claims are evaluated positively. The prevention claim achieves higher preference values compared to the soft functional claim. The fact that consumer segments diverge more in assessment of Lycopene than in evaluation of fibres may result from the different name recognition of both ingredients. Fibres are well known as an ingredient in several food products and not really innovative anymore and thus better and broader accepted, whereas Lycopene emerged in recent years as an interesting functional ingredient and thus consumers are rarely aware of its functional properties.

There are no differences in evaluation of fruit content between the consumer segments. All groups favour high fruit contents in the final juice product. Concordant to the assumption of positive linearity of this factor, part- worth utilities rise over different fruit content levels. Only 11.3% of all consumers did not behave in this assumed way. Assessment of the factor price was supposed to run in negative linearity. About 34.1% of all consumers did not behave in this way when evaluating the product cards. This may be due to deviations which can also be observed in reality: price is regarded as a parameter for quality. Consumers who cannot assess information like Lycopene enrichment rely on price as a reference for their purchase decision or product card ranking order respectively. On the other hand, the conjoint study is just a hypothetical instrument to evaluate products. Consumers are forced to make tradeoffs between single factors but they do not have to bear the consequences of their assessment which means that they do not have to buy those products and spend their money for them.

The segment of the “Enlightened and ignoring” consumers awards price positively. The factor level “expensive” obtains higher part- worth utility than the level “cheap” for this consumer group, which is a significant deviation from sample’s mean ($p < 0.01$). The group of “Cost- conscious prevented” consumers evaluated price significantly worse than the whole sample ($p < 0.05$). This result is accordant to the segment’s motivation not to buy Functional Food.

4.2 Target group specific product development

Importance of factors and part- worth utilities of factor levels can be used as indicators for final product design or even target group specific product design. As shown in table 5, fruit content is the most important factor within the tested Functional Food product design. High fruit content is essential in every fruit juice concept, particularly because fruit content indicates taste and quality and accounts for high- grade products. Up to now Functional Food is marketed and communicated to belong to such high- grade food products. Packaging was also found to be of importance, but this fact is overlaid by national country- related tendencies. Returnable bottles are widespread and well accepted in Germany, thus glass bottles obtain best values in this country, whereas consumers in Spain and the United Kingdom prefer non- returnable packaging like tetra pak carton.

A product concept which focuses on the “heavy user” segments of the “Enlightened and convinced” as well as the “Enthusiastic beauty- oriented” consumers should be enriched with both functional ingredients. But while Lycopene should be communicated with the soft functional claim, fibres should be marketed in combination with the prevention claim.

The segment of “Enlightened ignoring” consumers was found to be addressable for Functional Food under certain preconditions. This group does not refuse Functional Food for budget reasons; contrariwise they prefer high- value products. To make this segment buy Functional Food

products, it is not necessary to cut prices but to offer reasonable and elaborated products. This is supported by the segments' positive and highest evaluation of Lycopene enrichment in combination with the prevention claim.

Application of these findings for concrete Functional Food product development and marketing has to follow the legal framework. In May 2006 the European parliament agreed to a compromise on regulation of health claims of food. Health-related declarations on food products have to pass through an admission procedure ^[23].

5. Cross- European differences

With food markets shifting into a global food system and producers sourcing their commodities transnationally ^[24], changes on the consumption side can be observed as well. Two opposing tendencies seem to describe the consumers in the food market. Due to mass communication and mobility food culture in diverse countries converges and consumers around the world are likely to develop homogenous preferences. A survey about food-related lifestyle consumer segmentation in four European countries found similar groups of consumers in all countries which indicate a strong tendency towards cross-national consumer segments ^[25]. On the other, hand national food cultures can bear and maintain singularities.

Functional Food related consumer segmentation has been conducted across the countries of Germany, Poland, Spain and the United Kingdom. Country choice was motivated for several reasons such as differences in market structure or heterogeneity in food consumption style according to previous studies ^[8]. Cross-tabulation of nationality and consumer segment membership generates significant differences ($p < 0.01$). Table 6 lists the distribution of consumer segments in the four countries.

	Sample	Germany	Poland	Spain	The United Kingdom
Share of respondents (%)	100.0	18.8	19.3	42.6	19.3
Share of consumer segments (%)					
Hesitating Unmotivated	19.5	19.0	25.0	20.2	13.0
Enlightened and Convinced	15.2	10.5	16.7	15.5	17.6
Reasonable Health-oriented	11.4	21.9	0.0	8.8	18.5
Impressed Testers	15.7	12.4	13.0	21.4	9.3
Enthusiastic Beauty-oriented	11.3	8.6	15.7	12.6	6.5
Enlightened Ignoring	4.8	7.6	0.9	1.7	13.0
Mistrustful Sceptical	9.1	14.3	4.6	8.4	10.2
Cost-conscious	12.9	5.7	24.1	11.3	12.0

Prevented					
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Table 6: Distribution of Functional Food related consumer segments in Germany, Poland, Spain and the United Kingdom; Source: Own inquiry

Compared to the whole sample the cluster of “Reasonable health- oriented” consumers is overrepresented in Germany. They have a share of nearly 22% among German respondents, but only 11% in total. This group is also overrepresented in the United Kingdom, but cannot be found among Polish consumers anyway. When looking at the two “heavy user” segments of Functional Food, namely “Enlightened and convinced” consumers as well as “Enthusiastic beauty- oriented” consumers, differences between countries can be observed as well. The first segment has a lower share in Germany and nearly average shares in the other countries, while “Enthusiastic and beauty- oriented” consumers are mainly found in Poland and Spain and less often in Germany and the United Kingdom. The group of “Impressed testers” stands out among the Spanish respondents with a share of 21%, compared to 9% to 13% in the other three countries under investigation.

Non- buyers have a share in all countries ranging from a fourth to a third. The “Mistrustful sceptical” consumers have a comparably large share in Germany, while many of the “Enlightened ignoring” consumers can be found among the British respondents. “Cost- conscious prevented” consumers have a distinct large share in the Polish sub- sample.

Taken all together, it can be stated that certain consumer segmentation patterns exist within and across single countries. Segments with cognitive accentuation are overrepresented in the United Kingdom and Germany, while the hedonic motive plays a much bigger role among Polish and Spanish consumers. These differences and tendencies might be considered for Functional Food product development and marketing within Europe and single countries respectively.

References

- [1] Menrad, K. (2003), Market and marketing of Functional Food in Europe, Journal of Food Engineering, 56, pp. 181- 188
- [2] N.N. (2004), What’s hot around the globe - insights on growth in food and beverages 2004, AC Nielsen Publication
- [3] Heasman, M. and Mellentin, J. (2001), The Functional Foods Revolution: Healthy people, Healthy profits?, Earthscan Publications, London
- [4] Grunert, K.G., Larsen, H.H., Madsen, T.K. and Baadsgard, A. (1996), Market Orientation in Food and Agriculture, Kluwer, Boston
- [5] Schmalen, C. (2005), Einflussfaktoren der Markteinfuehrung von Produktinnovationen klein- und mittelstandischer Unternehmen der Ernahrungsindustrie, Utz- Verlag, München
- [6] Earle, M., Earle, A. and Anderson, A. (2001), Food product development, Woodhead Publishing Limited, Boca Raton

- [7] Linnemann, M., Meerdink, C.H., Meulenber, M.T.G. and Jongen, W.M.F. (1999):
Consumer- oriented technology development, Trends in Food Science and Technology,
9, pp. 409- 414
- [8] Askegaard, S. and Madsen, T.K. (1995), European food cultures: An exploratory analysis
of food related preferences and behaviour in European regions, MAPP working paper
no 26, Aarhus
- [9] Wagner, P. (2000), Marketing in der Agrar- und Ernährungswirtschaft, Ulmer Verlag,
Stuttgart
- [10] Meffert, H. (2000), Marketing, Gabler Verlag, Wiesbaden
- [11] Loudon, D.L. and Della Bitta, A.J. (1993), Consumer behaviour: Concepts and
Applications, McGraw- Hill, New York
- [12] Wansink, B. (2005), Marketing Nutrition: Soy, Functional Foods, Biotechnology and
Obesity, University of Illinois Press, Urbana and Chicago
- [13] Hilliam, M.(1996), Functional Foods: The Western consumer viewpoint, Nutrition
Reviews, 11, pp. 189- 194
- [14] Kotler, P., Armstrong, G., Saunders, J. and Wong, V. (2003), Grundlagen des Marketing,
Pearson Education, München
- [15] Krelle, W. (1968), Praeferenz- und Entscheidungstheorie, J.C.B. Mohr, Tuebingen
- [16] Green, P.E. and Srinivasan, V. (1978), Conjoint Analysis in Consumer Research: Issues
and Outlook, Journal of Consumer Research, 5, pp. 103- 123
- [17] Backhaus, K., Erichson, B., Plinke, W. and Weiber, R. (2003), Multivariate
Analysemethoden, Springer Verlag, Berlin
- [18] N.N. (1997), SPSS Conjoint 8.0, SPSS Marketing Department, Chicago
- [19] N.N. (2005), Markt- und Strukturzahlen der Nahrungs- und Genussmittelbranche, LZ
Report 2005/2006, Deutscher Fachverlag, Frankfurt am Main
- [20] Menrad, M., Hüsing, B., Menrad, K., Reiß, T., Beer- Borst, S. and Zenger, C. A. (2000),
Functional Food, TA Report 37/2000, Schweizerischer Wissenschafts- und
Technologierat, Bern
- [21] Eurostat (2006), Statistical database, <http://epp.eurostat.cec.eu.int>
- [22] Wansink, B., Westgren, R.E. and Cheney, M.M. (2005), Hierarchy of nutritional
knowledge that relates to the consumption of a functional food, Nutrition, 21, pp.
264- 268
- [23] Epping, M. and Greifeneder, S. (2006), Health- Claims bringen Veraenderungen, LZ
Lebensmittelzeitung, 22, p. 31
- [24] Lang, T. and Heasman, M. (2004), Food Wars: The Global Battle for Mouths, Minds and
Markets, Earthscan, London
- [25] Brunsoe, K. Gruner, K.G. and Bredahl, L. (1996), An analysis of national and cross-
national consumer segments using the food- related- lifestyle instrument in Denmark,
France, Germany and Great Britain, MAPP working paper no. 35, Aarhus