

COMPARISON OF CONSUMERS' PERCEPTIONS OF ORGANIC PRODUCTS  
BETWEEN THE UNITED STATES AND POLAND

By

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To my family

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## LIST OF ABBREVIATIONS

CAP	Common Agricultural Policy (European Union)
CSA	Community Supported Agriculture
ERS	Economic Research Service
FAO	Food and Agriculture Organization of the United Nations
FiBL	Research Institute of Organic Agriculture
IFOAM	The International Federation of Organic Agriculture Movements
ITC	International Trade Centre
PMR	PMR Publications - Research Center
SÖL	Foundation Ecology & Agriculture (Stiftung Ökologie & Landbau)
USDA	United States Department of Agriculture

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To explore further the potentials of organic agriculture it is important to know what is the meaning of organic farming and organic products for consumers. Good knowledge about consumers' perception for organic products may improve the ability of development of efficient policies related to promotion of the organic market, product development and marketing strategies so it will lead to efficient solutions. The United States (Florida) and Poland are interesting examples in which the level of organic market development varies and allows to test whether consumer perceptions of organic food products varies with market development. A survey was conducted at the University of Florida (US) and at the Warsaw University of Life Sciences (Poland).

The findings indicate that students from the United States and Poland have different perceptions of organic products. Some of these differences are likely explained by the different level of market development of organic markets.

The lack of development of organic market in Poland was observed as respondents rated the availability of organic products as low. Potential consumers of these products have to face higher prices of organics, likely resulting in lower

popularity of these products. Polish consumer wanted to buy organics because of some quality characteristics, because it is something new and it is good for the environment. General knowledge about organic food was high, and was similar to knowledge of U.S. respondents. As knowledge had a significant and positive impact on consumption of organic foods, it seems that education and increases in awareness would help further development of organic market in Poland.

The organic market in the United States can be characterized by higher level of development than in Poland. Organic products are common and available in most of the supermarkets. U.S. respondents did not find price for organics as a barrier to purchase. They may consider it as paying for some additional attributes (quality characteristics) of organics in which they believe. At the same time U.S consumers may believe, like the fact the organic farming is environmentally friendly, were not strong enough reasons to increase frequency of the consumption of organics. However U.S. consumers mentioned the importance of supporting local organic farmers. Further research may find that by changing the paradigms and by explaining the importance of additional potential benefits of purchasing organic products (especially the fact that it may be environmentally friendly) organic market in the United States can have still many opportunities for further development.

## CHAPTER 1 INTRODUCTION

### **Overview of Organic Agriculture**

Environmental protection and sustainable rural development have gained significant attention in the world's agriculture systems in recent years. One of the systems of agriculture which may be considered as consistent with present changes is organic farming. There are many definitions which explain what organic farming is.

The International Federation of Organic Agriculture Movements -- IFOAM -- describes organic farming as “a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved” (IFOAM, 2011).

The area of land under organic production has significantly increased in recent years . Based on the SÖL-Survey (Willer & Yussefi, 2000), in 2000 about 26 million acres (10.5 million hectares) were managed organically worldwide. Today there are more than 1.8 million organic producers in the world, who produce on almost 92 million acres (37.2 million ha), including conversion areas. This accounts for 0.9% of all agricultural land.

Organic farming has also gained popularity with consumers as evidenced by the growth in the organic market. According to the ITC study (Willer & Yussefi, 2000), in 1997 the biggest markets for organic products world-wide were in the USA, Europe and Japan. In this group the market volume was 11 billion USD (7.7 million Euros) in that time. In 2009, the value of global organic market was about 54.9 billion USD

(38.38 million Euros). The United States, Canada and Europe constitute about 97% of global revenues in the organic food products trade.

According to the Economic Research Service (ERS) of the United States Department of Agriculture, in 2008, 4.8 million acres (1.9 million hectares) of agricultural land were managed organically in the United States. In 2009, the value of the organic market in the United States was approximately \$23 billion US (16.1 billion Euros) (U.S. Department of Agriculture, 2011). This accounts for approximately 2.5% of total food sales in the United States. According to the Organic Trade Association (OTA), there has been growth of organic market about 20% annually since the 1990s. (Organic Trade Association, 2006).

However, the largest organic market in the world exists in the European Union. The value of organic market in EU 27 was nearly 26 billion USD (18 billion Euros) in 2008 (Pinckaers et al., 2010). Growth in the popularity of organic farming was supported by a number of policies which aided the development of the organic sector in the EU. In 1991, common regulations related to organic farming were implemented (European Commission, 1991). In 1993, organic agriculture became part of the agri-environmental programs of the common agricultural policy (the CAP). This resulted in an increase in the area managed organically. In 1985, there were only 6,000 organic producers. Today, 257,665 producers (FiBL, 2011) manage land in an organic way. They occupy almost 4% of the total agricultural area in EU (20.62 million acres / 8.34 million ha).

Though there have been policy changes to support organic agriculture, and much growth in the area, the level of organic market level development is not evenly spread across the EU27. New members, especially the countries which joined the

European Union in or after 2004 can be characterized as having a dynamic but still low level of organic market development in comparison to the EU15 countries.

### **Problem Statement**

Growth in organic markets in the United States and in European Union may occur for a number of reasons. They may be related to changes in consumers' lifestyles (promotion of a healthier lifestyle) or the growth in awareness of consumers regarding food quality. Also, consumer awareness of the need for environment protection is increasing. Organic farming is often considered by consumers as environmental friendly, and this may result in more attention given by consumers to organic farming.

Growth in the popularity of organic farming can be also connected to a number of policies which have aided the development of the organic sector. Organic agriculture was often promoted by a lot of countries in their domestic policies, for example, by financial subsidies for organic farmers, specific extension activities or promotion in media.

But at the same time, there are still many differences related to economic and social environment for organic farming around the world. They are related to various requirements regarding organic production, certification, legislation or marketing and to different perceptions of organic products by consumers. These differences, as well with demographic ones, create a situation in which organic farming has non-homogenous meanings for consumers in different parts of the world. This can cause some problems in creation of policies or marketing activities which could support organic farming in an efficient and proper way.

Without good knowledge about consumers' beliefs and attitudes for organic products, development of efficient policies related to promotion of the organic market,

product development and marketing strategies can be difficult and may lead to inefficient solutions (Żakowska-Biemans, 2011). By providing proper and clear information about demand for organic products, the chances for further development of organic market are increased. The future of organic agriculture will, to a large extent, depend on consumer demand (Bonti-Ankomah & Yiridoe, 2006)

However, consumer perception of organic farming may be related to the level of organic market development in a specific location. Growth in the popularity of organic products may be correlated with more positive perception of organics and greater intentions to buy them. The United States (Florida) and Poland are interesting examples in which the level of organic market development varies, allowing us to test whether consumer perceptions of organic food products varies with market development.

### **Thesis Objective**

The objectives of this paper are to investigate:

- the level of market development in two specific locations in terms of value of the market and access to places where organic food products can be purchased,
  - frequency of purchasing habits of organic food consumers,
  - consumer perception towards the purchase and consumption of organic food products,
  - differences in the lifestyles of consumers who consume or do not consume organic food,
  - differences or similarities in consumer characteristics and perceptions of organic food products between the two markets analyzed in this paper,
- and,
- correlations between consumer perceptions and the level of market development.

Additionally, this paper will try to answer the question: What are the chances for further development of organic markets, given the findings of our study of consumer perceptions of organic food products in each location?

## Hypotheses

The following specific hypotheses will be tested:

- I) Gainesville (Florida) and Warsaw represent different levels of development of organic markets in terms of sales and availability of organic products,
- II) Consumers in Gainesville (Florida) and Warsaw have different perceptions of organic food products,  
  
and,
- III) There is a correlation between level of development of the organic market and intentions to purchase organic products by consumers.

Testing these hypotheses will require the use of several research methods. A survey was created to analyze the characteristics (demographics, lifestyle etc.) of the respondents and their perceptions of organic products. The survey was conducted to obtain data for further analysis employing an Ordered Probability Model. The model was created to analyze the consumption frequency of organics in the United States and in Poland. Finally, results from a review of the literature, survey results, and the Ordered Probability Model will be integrated into a discussion concerning consumer perceptions of organic products between the United States and Poland, as well as conclusions regarding correlations between these perceptions and the level of organic market development.

## CHAPTER 2 LITERATURE REVIEW

### **The Organic Market in Poland**

In 1990 there were only 27 organic farms in Poland. For these farmers, organic farming was not only a method of production but also a passion, since there was generally a lack of any support for organic farmers. Since 2000, the number of organic farms in Poland has increased and has become more dynamic.

This growth was connected to the accession of Poland into the EU and implementation of European agro-environmental programmes of the Rural Development Plan. Since 2004, organic farmers have been able to receive subsidies for the amount of land managed organically, which has supported their income. By 2010, there were 20,956 organic farms in Poland with average size about 61.2 acres (~25 ha). In total, organic farms in 2010 accounted for 1,281,303 acres (518,527 ha). This represents 2.8% of the total agricultural land in Poland (Ministry of Agriculture and Rural Development, 2011). At the same time, there was also growth in the number of processing plants for organic products, though this growth was not as large as in the number of organic farms. In 2005 and 2006, the number of organic processing plants increased by 80% and 70%, respectively. In two years, 2008 and 2009, growth rates were much smaller, 15% and 18% respectively (PMR, 2010).

In recent years there has been a significant change in consumer awareness of food quality and safety, and the environment. However, change in awareness has been slow and it has not significantly influenced the development of the Polish organic market. According to the Research Institute of Organic Agriculture (FiBL), the value of the Polish organic market in 2009 was 71.55 million USD (50 million Euros)<sup>1</sup>. It is estimated that the Polish organic market is growing about 15-20% year by year.

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<sup>1</sup> Euro/USD = 0.6988

EuroMonitor states that in 2010 the value was 84.3 million USD (58.9 million Euros) (EuroMonitor, 2011). However, according to PMR Publications, the value of the Polish organic market reached 143.1 million USD (100 million Euros) in 2009 (PMR, 2010). These numbers suggest that the potential for further development of the Polish organic market is significant. In Western Europe, the organic market constitutes more than 2.5% of the total food market (0.2% in Poland). There are also estimates that the value of the Polish organic market will reach 5.72 billion USD (4 billion Euros) in 2013.

There are several reasons for the low level of development of the Polish organic market. The costs of distribution are high and prices of organic products are high as well. The Polish organic market also faces the problem of the export of organic products. A lot of companies and organic producers have decided to export their products, which is often easier and more profitable than trying to sell to Polish consumers (Szeremeta, 2006).

The most popular organic products in Poland are fruits and vegetables, their preserves and other products. However, more organic products are becoming available: meat, milk and dairy products, eggs, wine, honey and spices.

Distribution channels in the Polish organic market are significantly differentiated. Direct sale and specialized shops are the most popular distribution channels. There are more than 400 specialized shops with organic food in Poland. There are many disadvantages with this situation, such as unfavorable organic shop location, low percentage of organic food with organic certification, and high prices. Also, the Polish market seems to be unprepared for any significant share of sales of organic food through supermarkets. Large retailers often require large quantities of high quality organic products in professional packaging (Żakowska-Biemans, 2011).

Moreover, compared to Western Europe, the assortment of organic food in supermarkets is still very poor. The reasons for this are related to insufficient demand for organic products, a lack of promotion of organic farming in Poland, and a system of subsidies for organic farmers which does not function as well as it was expected to. Organic subsidies influenced the growth of the number of organic farms, but there was no impact on the overall level of development of the Polish organic market (Grzelak, 2009).

### **The Organic Market in Florida**

Florida is located in the southeastern part of the United States. The United States Census Bureau estimates the population of Florida of 18 million people. Florida has the area of 65,755 square miles (170,305 km<sup>2</sup>) and it ranks 22<sup>nd</sup> among the 50 U.S. states in size.

Agriculture is very significant sector in the economy of Florida. In 2007, there were 40,000 farms which together with all agricultural, food manufacturing, and natural resource industries generated added value of \$20.4 billion USD (14.25 billion Euros) (Hodges, Rahmani, & Mulkey, 2008). The average size of 85% of these farms is around 180 acres (72,84 ha). Average income of most of the farms (75%) is less than \$25,000 (17,470 Euros) (USDA-NASS, 2008).

Agriculture is the 2<sup>nd</sup> largest industry in Florida. Florida produces most of the citrus fruit grown in the United States (in 2006, 67% of all citrus in the US was produced on farms in Florida). Other important products are: sugarcane, strawberries, tomatoes, celery, sweet corn and green beans.

According to U.S census data, in 2007 were 172 organic farms which covered 8079 acres (3272 ha), with sales at \$4.34 million (3.03 million Euros). Most (around 86%) of the land was devoted to fruits and vegetables (2007 Census of Agriculture,

2009). Organic growers in Florida produce a wide range of crops: vegetables (25% of total acreage and primary production on 38% of organic farms), sprouts, citrus, micro greens, blueberries, tropical fruits, chestnuts and herbs (Austin & Chase, 2003).

Organic products are becoming more and more popular and accessible in the Florida market. According to Dimitri and Green (Dimitri & Green, 2003), organic produce is sold in 73% of the conventional markets. Retailing of organic products has changed in the last decade. Initially, natural foods stores were the main place for purchasing organic food. Now, almost half of all organic foods are purchased in conventional supermarkets or club stores (Figure 2-1) (Dimitri & Oberholtzer, 2009).

Also the level of competition increased significantly. Traditional purveyors of organic foods (natural foods stores) have had to contend with the presence of new companies that sell their products not only in natural-products stores but also supermarkets like Costco® Wholesale.

While fruits and vegetables account for the largest sales of organic products, sales of dairy products, beverages, packed and prepared foods and breads increased from 54% in 1997 to 63% total organic sales in 2008 (Dimitri & Oberholtzer, 2009).

Rapid growth in demand is causing periodic shortages of organic products in the market. Organic farms in Florida are often not able to meet existing demand as their numbers and levels of production are still too low. This is why many of the regional and national retail chains are buying organic products outside of Florida or even importing them from foreign producers. This has affected the financial security of smaller organic farms in Florida. Income from sales of certified organic products are for many small, diversified, family-owned farms a significant contribution to their income (Nguyen et al., 2008).

One of the answers for small certified organic farmers in Florida to the challenge from imports (both U.S. and foreign) is to work together to become more competitive in local markets and especially in indirect markets.

There are two main channels through which Florida organic producers can become more competitive – direct markets and indirect markets. Direct markets include farmers' markets, roadside stands, pick-your-own operations, and Community Supported Agriculture (CSA). In 2007 there were around 58 pick-your-own operations and 86 farmers' market in Florida (Nguyen et al., 2008). In case of indirect markets, farmers can choose between brokers, terminal market firms, and retail outlets. The most well-known terminal markets are: the Pompano State Farmers' Market and the Miami Produce Center.

Organic farmers in Florida can also sell their products directly to consumers through small, independent grocery stores, such as Mother Earth or through larger grocery chains such as Whole Foods Market® or Publix®. Also, more and more restaurants are purchasing organic products. This is a good opportunity for farmers. They can sell their organic products directly to restaurants or they can use foodservice distributors such as FreshPoint®, Inc. (Nguyen et al., 2008).

### **Previous Studies on Consumer Perception of Organic Products**

Interest in organic farming and organic food products in the world is growing significantly. This is connected to the fact that many consumers are more concerned about the quality of their lives and their relationship to the environment. This has spawned concerns about a set of issues related to conventional agricultural practices, food safety, human health, and environmental safety.

Consumer demand is one of the drivers of the increasing development of organic farming in the World today. By clearly understanding the consumer's needs,

attitudes and motivations, the organic sector can more effectively respond to this shifting market dynamic. The organic sector can create efficient and effective market strategies related to product development and promotion of organic food consumption (Bonti-Ankomah & Yiridoe, 2006).

Consumer beliefs and attitudes towards organic food products vary by specific locations. Numerous studies concerning the demand for organic and conventional food products have been conducted.

They highlight several important aspects of the market for organic foods:

- Differences between conventional and organic food products
- Consumer knowledge about organic food products
- Consumer perceptions of organic food product
- Consumers' willingness to pay for organics (WTP)

### **Differences between Conventional and Organic Food Products**

Organic products are purchased for different reasons. There has been long debate from perspective of both the supply side and the demand side about differences between organically and conventionally grown food products. While purchasing of organic foods, many consumers assume that organic products have some unique characteristics in comparison to conventionally-produced foods (Bonti-Ankomah & Yiridoe, 2006). However, a lot of people do not buy organic food products because for them there is no any significant difference between organic and conventional products. Nevertheless, several studies have been conducted which show that there are differences between organic and conventional products. These differences may or may not be important to some consumers (Bonti-Ankomah & Yiridoe, 2006).

A number of studies have focused on yields. The most common conclusion is that yields decrease when a farmer converts from conventional to organic production. However, this depends on the several other aspects of the farm, such as the intensity

of previous conventional production, specific properties of the land or the experience of the farmers (FAO, 2003).

Research reported that the yields of organic cereals 10-30% were lower than under conventional production (FAO, 2003). Organic vegetables yields were 20-50% lower than those conventionally produced. A significant decline in yields (-75%) was reported in case of potatoes (Bonti-Ankomah & Yiridoe, 2006). A survey of Statistics Canada conducted a study on 11 thousand organic farms in fruit and vegetables production. In general, most of the farms reported lower yields than their conventional counterparts. In the case of some fruits and vegetables some exceptions were noticed (Parsons, 2002). For example yields of organic blueberries were 38% higher than that of conventional blueberries.

Moreover, according to FAO (FAO, 2003) in some regions in Bolivia, India and Kenya, yields from organic production were significantly higher than those from conventional farms. This is probably due to good management practices after converting from low-input conventional to organic practices.

In case of profitability it is difficult to find many long-term studies. This is due to the fact that profitability of organic farms depend significantly on a farmer's decisions and his ability to manage organic farm. However, the price premiums that organic foods generally receive can influence significantly the viability of the organic farms. Even with lower yields, with the price premium for the organic production farmers can stay profitable. But at the same time high price premiums can affect consumer demand for organic products. If prices for organic products could be reduced, this would significantly affect – and increase - demand, because the price elasticity of organic products is much higher than for conventional products (Wier & Calverley, 2002).

Price is usually the most significant determinant of demand (Gil et al. 2002). However, according to Cue utilization theory, consumers evaluate a product quality by considering direct (for example physical attributes) and indirect indicators (for example product price). In case of organic products, direct indicators can be sometimes difficult to detect (Bonti-Ankomah & Yiridoe, 2006). Moreover, frequent buyers of organic food consider other aspects that are related to health and the environment in a wide perspective called sometimes “reflection traits”. In other words, organic buyers consider more elements of the food system than just the price of the product. They pay attention to how food was produced and handled and how these methods affected people, animals and the environment in the long term (Torjusen et al., 2001). It is a fact that price can be one of the ways to highlight the quality of organic products. Most of the studies confirmed high price premiums for organic products. They vary due to differences in the level of organic market development. It can be assumed that the higher the level of market development, more organic products on the market, this would decrease the price of organic products.

From the consumer’s perspective, the differences between organically and conventionally grown products are also related also to noneconomic goods, for example, nutrition, sensory appeal, and food safety. Studies have shown that when consumers purchase organic products, they pay significant attention to factors like product appearance, taste, freshness and shelf life (Kihlberg & Risvik, 2007). However, some studies have shown that there are no differences in sensory characteristics between conventionally and organically grown organic products (Zhao et al., 2007; Chen, 2009).

Another feature that attracts consumers of organic foods is that they are produced without using fertilizers and pesticides. In general, consumers prefer

organic products because they have lower levels of chemical residues and more nutrients. Because of this they think that organic products are safer and healthier compared to conventional (Hoefkens et al., 2009).

In the literature there is an ongoing debate concerning healthiness and safety of organic food (Żakowska-Biemans, 2011). There are no clear data which can show higher content of nutrients in organic versus conventional products (Williams, 2002). Some of the studies state that for example organic food products contain more vitamin C, but at the same time other research showed the opposite (Magkos et al., 2003). Also, many studies state that the nutrient content and sensory characteristics depend mostly on the region, soil type, crop variety, climate, or post-harvest practices, and not on whether or not chemicals are used in production (Bonti-Ankomah & Yiridoe, 2006; Żakowska-Biemans, 2011).

Similar findings come from research related to the chemical and microbial contamination (Lo & Matthews, 2002). There are no clear data which state that organically grown food products are free from any contamination. In fact, some researchers state that organic products sometimes can have lower level of safety due to possibility of contamination during processing in the places in which conventional products are also used. Organic products are also exposed to contamination from pathogens such as *Salmonella* species and *E. coli* because of the use of animal manure as a fertilizer (Bonti-Ankomah & Yiridoe, 2006)

In general, among researchers on the healthfulness of organic foods, some researchers conclude that organic foods are more healthy (Grankvist & Biel, 2001), while others find that this is not the case (Azurra & Paola, 2009; Naspetti & Zanolli, 2006; Monaco et al., 2007; Williams, 2002).

## **Consumer Knowledge about Organic Food Products**

Many studies regarding consumer awareness and knowledge about organic products have been conducted. Consumer awareness and knowledge are very significant in the improving attitudes towards organic foods and in the decision making process of choosing between competing goods (Stobbelaar et al., 2006; Żakowska-Biemans, 2011). Organic products possess credence characteristics. Credence characteristics mean that utility is difficult or impossible for the consumer to ascertain. That is, even after the purchase and consumption of organic products, consumers may not know if these products were organically or conventionally grown (Owusu & Anifori Owusu, 2010). Good information about organic products is, then, a very significant factor in the decision to buy them.

Studies comparing levels of awareness and knowledge about organic foods and organic farming indicate strong geographical differences. In developed countries like in Western Europe or in the US, consumer awareness is high. But there are also some differences. In Europe, buyers and non-buyers of organic products understand the concept of “organic” in similar way. However, in the US, there are many differences in how consumers evaluate whether foods are organic or not (Bonti-Ankomah & Yiridoe, 2006). Lack of understanding about what “organic” means can be a significant reason why some people do not buy organic (Roitner-Schobesberger et al., 2008; Padel & Foster, 2005; Żakowska-Biemans, 2011). For example, some studies suggest that many consumers have problems with recognizing the symbols and logos of organic farming. They also do not know what are the tasks of institutions responsible for certification (Bonti-Ankomah & Yiridoe, 2006).

However, an organic logo does play a significant role in recognition of organic products by consumers. In some countries, organic labels can cause confusion

especially when organic farming is not so popular and standardization of requirements related to organic production does not exist (Padel & Foster, 2005).

It is clear that consumer awareness and knowledge about organic food is very important to the organic market. With growth in awareness and knowledge, the demand for organic food can increase. It will result in further development of organic markets. It can influence in positive ways not only new and young organic markets but also existing well developed organic markets by providing more detailed knowledge related to organically grown food to consumers (Radman, 2005; Żakowska-Biemans, 2011).

### **Consumer Perceptions of Organic Food Products**

“There is no common legal definition of organic food and the term organic is referred to as a process claim, not a product claim. Despite the process claim, consumers often perceive organic products as representing an environmentally friendly mode of production as well as having certain intrinsic quality and safety characteristics” (Vindigni et al., 2002).

It is a simple fact that consumers’ attitudes and perceptions influence their purchasing decisions. There is an essential difference between attitudes and perceptions. Attitudes relate to likes or dislikes. Consumers can have positive or negative feelings about organic food products. On the other hand, perceptions are related to beliefs. Perceptions are what a buyer thinks about specific products (Bonti-Ankomah & Yiridoe, 2006).

Most of the studies on consumer attitudes state that organic products are considered as safer, healthier and more environmental friendly. Consumers’ perceptions of organic food and quality of organic products are positive – they have good feelings about organic products (Magnusson et al., 2001; Conner, 2004;

Monaco et al., 2007; Zhao, 2007; Kihlberg & Risvik, 2007; Pellegrini & Farinello, 2009).

Also, consumers usually feel that their private (egoistic) benefits (health and safe food products) are higher than any social (altruistic) benefits of organic farming (more environmental friendly production). However, it is difficult to generalize about consumer attitudes about organic farming. This is because the studies that have been conducted are usually related to specific group of consumers and organic products, specific regions or food stores. Yet, each study offers additional knowledge about consumer attitudes towards organic farming and provides findings which can be useful for consumers and policy research in the future.

Consumer preferences for organic food products are related to beliefs that organically grown food is better than conventional. Buyers' preferences are influenced by what they believe about the health, food safety and environmental characteristics of organics, as well as by product characteristics such as taste, freshness, appearance, color and other sensory characteristics (Bourn & Prescott, 2002).

There have been many studies related to consumers' preferences for organic products. It has been observed that in general there are some primary factors considered in the purchase of organic products. Most of the studies in European Union reported that freshness, health, food safety and environmental concerns were at the top of the preference ranking (Sandalidou & Baourakis, 2002; Azurra & Paola, 2009). However, consumers in United States and in Canada consider taste and other quality characteristics to be the most significant factors affecting their demand. That is, buyers of organic products pay more attention to the quality of the product than to price premium which they had to pay. However, several other studies had contrasting

results. These suggest that the most significant barriers to purchase organic products were the price premiums and the lack of availability of organic products (O'Donovan & McCarthy, 2002; Hill & Lynchehaum, 2002; Hughner et al., 2007; Aertsens et al., 2009; Żakowska-Biemans, 2011).

In sum, insufficient supply of organic products, seasonality, problems with higher labor costs, lack of knowledge about organic production and difficulties related to transition from conventional to organic farming are the main problems in the process of development of organic markets and marketing strategies of organic products (Gil et al., 2002). Nevertheless, respondents to the survey used in this study were consistent about willingness to purchase locally grown organic products. They seem to place more trust when the place of production is closer. They seem to assume that they can verify the quality of producers and their products personally (Naspetti & Zanolli, 2006).

### **Willingness-To-Pay (WTP)**

Willingness to pay (WTP) is a further aspect in a comparison between organically and conventionally grown food products. "The notion of willingness to pay could be defined as the sum of money representing the difference between consumers' surplus before and after adding or improving a food product attribute" (Gil et al., 2002).

Consumer willingness to pay is an important aspect in organic farming due to the usually lower yields from organic farming, which results in producers selling of products with price premiums to ensure profitability.

Many studies related to WTP have been conducted. Results vary depending on the country, the group of the respondents, and especially the chosen organic product. In general, WTP decreases with increase of premium price (Gil et al. 2002).

But at the same time prices for organic products can increase with preferred specific attributes, e.g., freshness. However there are no clear results regarding whether consumers perceive organic products as normal or luxury goods. Further, it is difficult to determine which products that have higher price premiums attract consumers more (Bonti-Ankomah & Yiridoe, 2006).

Some research states that consumers generally will accept price premiums higher than 15-20 % (Pellegrini & Farinello, 2009; Bonti-Ankomah & Yiridoe, 2006) It is mainly social and demographic factors which affect the level of prices consumers are willing to pay for organic products.

For example, willingness to pay higher prices for organic food is related to buyers' frequency of purchases and gender (Urena, Bernabeu, & Olmeda, 2008). Women are more willing to buy organic food products. This is understandable because women are more often responsible for purchasing food for the household and know more about nutrition and food safety (O'Donovan & McCarthy, 2002; Pellegrini & Farinello, 2009; Aertsens et al. 2009). Interestingly, however, men will accept higher premium price for organic products than will women (Wandel & Bugge, 1997). WTP for organic products is high in younger groups of consumers due to better education regarding environment and food quality. However, older consumers who have more financial power to buy organic products and who are at a higher health risk are also willing to pay premiums (Bonti-Ankomah & Yiridoe, 2006). Other results show a correlation between level of income and willingness to buy organic products but some studies have reported that up to a certain level of income consumers are more willing to buy organic products, but other studies could not prove this correlation (Aertsens et al., 2009). Studies have also reported that the higher the level of education, the higher the willingness to buy organic products (Yue

et al., 2008; Pellegrini & Farinello, 2009) But because higher education is usually correlated with higher income, these studies are not definitive. In general, results concerning age and education have not been consistent when considering whole body of research (Arbindra et al., 2005; Aertsens et al., 2009).

### **Summary**

This chapter has focused on description of organic markets which exist in the United States and in Poland. Additionally the previous researches related to consumer perception of organic products were presented.

The first part noted that there are many differences in terms of the level of development of organic market between the United States and Poland. This growth is evidenced by the monetary value of both markets. In 2009, the value of the organic market in the United States was approximately \$23 billion US (16.1 billion Euros) (U.S. Department of Agriculture, 2011). This accounts for approximately 2.5% of total food sales in the United States. The value of the Polish organic market reached 143.1 million USD (100 million Euros) in 2009 (PMR, 2010) suggesting that the level of development is still low. The organic market constitutes only about 0.2% of the total food market. It results in low availability and variety of organic products. Organics in Poland can be also characterized by high prices.

The second part of this chapter focused on the presentation of previous studies related to the consumer perceptions of organic products. Previous studies show that the perception of organics varies among consumers. Most of the studies on consumer attitudes state that organic products are considered as safer, healthier and more environmental friendly. Consumers' perceptions of organic food and quality of organic products are positive – they have good feelings about organic products. They often perceive organics as having better taste, freshness, appearance and

color. However in the literature there is an ongoing debate concerning healthiness and safety of organic food. Some researchers conclude that organic foods are healthier while others find that this is not the case. There are no clear data which can show higher content of nutrients in organic or conventional products. There are also no clear differences in sensory characteristics between conventionally and organically grown organic products. Many studies state that the nutrient content and sensory characteristics depends mostly on the region, soil type, crop variety, climate, or post-harvest practices, and not on whether or not chemicals are used in production.

This chapter has focused also on specific demographic characteristics of consumers which can influence on their perception of organics. It was reported that consumers have different willingness to pay (WTP) for organic products. In general, WTP decreases with increase of premium price. But at the same time prices for organic products can increase with preferred specific attributes, e.g., freshness. Further, it is difficult to determine which products that have higher price premiums attract consumers more. However the most significant barriers to purchase organic products were the price premiums and the lack of availability of organic products.

Studies reported that women are more willing to buy organic food products. This is understandable because women are more often responsible for purchasing food for the household and know more about nutrition and food safety. Other studies show a correlation between level of income and willingness to buy organic products. Studies have also reported that the higher the level of education, the higher the willingness to buy organic products. But because higher education is usually correlated with higher income, these studies are not definitive. In general, results

concerning age and education have not been consistent when considering whole body of research.

The next chapter will present the methodology and the description of the results of a survey which was conducted among students in the United States and in Poland. The survey was created to analyze the characteristics (demographics, lifestyle etc.) of the respondents and their perceptions of organic products. This survey was conducted also to get the data for further analysis (the Ordered Probability Model) which will be analyzed in further chapters.

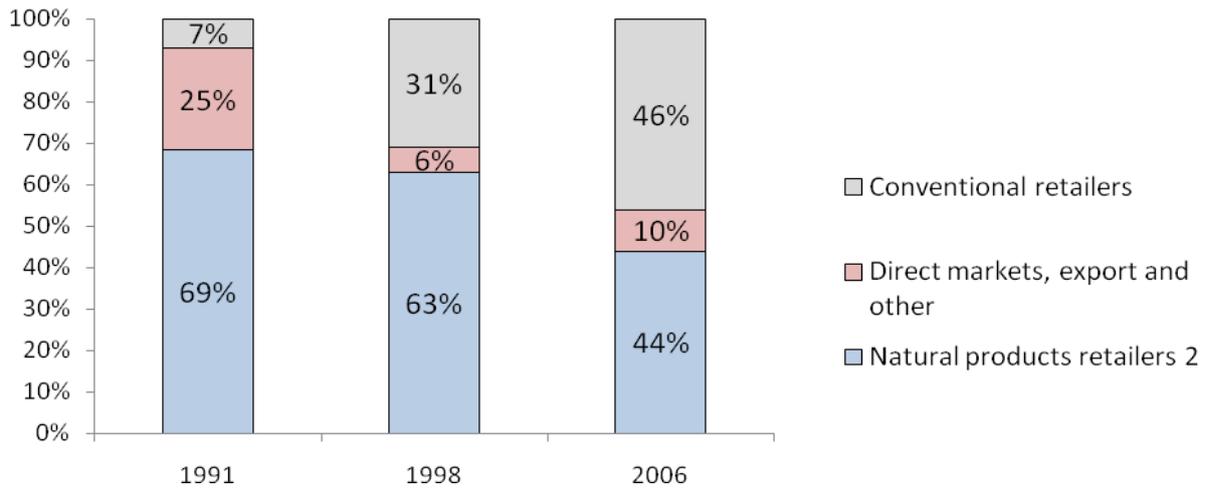


Figure 2-1. Share of organic sales by marketing channel, 1991, 1998, and 2006  
 [Natural Foods Merchandiser, various issues: Nutrition Business Journal, 2004; and Organic Trade Association, 2006]

## CHAPTER 3 DESCRIPTIVE ANALYSIS

### **Methodology**

A survey was designed to test the objectives of this study. The aim of this questionnaire was to gain information on consumer perceptions and frequency of consumption of organic foods in the United States and Poland. To collect data in both the United States and Poland, an e-mail survey was administered to students at the University of Florida (UF) in Gainesville, United States and at Warsaw University of Life Sciences – SGGW (WULS), Poland. The survey was administered in both countries during April and May 2011.

There were 34 questions. Questions were divided into four groups to investigate: 1) Purchase frequency habits of organic food products, 2) Beliefs about organic food products, 3) Attitudes towards purchase and consumption of organic food products, 4) Personal characteristics and lifestyle. Several types of questions and scales have been used.

The questionnaire contains closed ended and matrix questions.

There is only one yes/no question related to availability of organics in the place where respondents live. However questionnaire contains several questions with multiple choices. These questions investigate frequency of consumption of organics, easiness to buy them, willingness to pay for organic products and demographics of the respondents (education and gender).

Additionally several scaled questions were used. Likert scale was used in four questions related to opinions of the respondents about their eating behavior, knowledge about organic products and the barriers to purchase organics.

There were also several different scales. One of them was related to the level of importance of factors which respondents take into account during purchasing

organics. Scales were also used in questions related to eating habits of the respondents and their feelings during consumption of organics. Respondents have been also asked to use scale in the question which investigate their level of certainty about their knowledge about organics. Last two questions with scales describe respondents' frequency of using information from specific sources and the level of trust to mentioned sources.

Matrix questions were used in the questionnaire to investigate for example the lifestyle and the health of the respondents (their diet, amount of physical activity and types of diseases that they have). There are also two matrix questions which were related to the percentage of the purchase of the products which are organic and to the frequency of purchasing organics in specific places.

Last question was open ended question which respondents could use to write their comments or remarks related to the content of questionnaire.

## **Results**

At UF, the questionnaire was sent to three groups using a convenience sampling method. The first group was composed of students in the course ““AEB 3133 Principles of Agribusiness Management.” Of 144 students in the class, 127 (88%) successfully completed the survey. The second group was from a course called ““FOS 3042 Introduction to Food Science.” Of the 270 students in this class, 137 (51%) completed the survey. The final group consisted of graduate students from the Food and Resource Economics Department. Of 76 graduate students, 8 completed the survey. In total, 392 respondents started the survey, however only 274 (69%) successfully completed the survey. 14 respondents started, but did not complete the survey, and an additional 119 did not complete a validation question

correctly. The validation question asks respondents to enter a specific answer to a specific question to ensure they are properly reading the questions before answering.

The majority of students (81%) were from the College of Agricultural and Life Sciences. Other colleges included Liberal Arts and Sciences (11.36%) Business Administration, Engineering, Health and Human Performance, Law, Medicine, Pharmacy and Public Health and Health Professions.

Not surprisingly since the classes were for undergraduate students, most of the respondents (97%) were the undergraduate students. Among this, 66% were in their Junior or Senior terms and 31% were Freshman or Sophomores. Three percent of the students were pursuing their Master, PhD or equivalent graduate degrees (Table 3-1).

At Warsaw University of Life Sciences (WULS), the questionnaire was sent to students using convenience sampling method. In total, 269 respondents started the survey, however only 134 (50%) successfully completed the survey. Additionally 36 students did not complete a validation question correctly. The majority of students (95%) were from the Faculty of Economic Sciences. Other faculties included Faculty of Veterinary Medicine, Faculty of Wood Technology, Interfaculty Studies of Regional Planning, Interfaculty Studies of Commodity Science and Faculty of Applied Informatics and Mathematics.

Most of the students were pursuing their master degree (55%). However 45% of respondents were undergraduate students. One percent of the students were pursuing their PhD degree (Table 3-2).

Demographic information was collected to determine if these characteristics could be used to explain organic food preferences. As a proxy for income, data was collected on the education level of their parents (often students' incomes do not

reflect their purchasing power, and they are unlikely to know their parents household incomes).

In the United States fathers had more education than mothers of the students (Table 3-3). Fifty three percentages fathers and 49% of mothers had a Bachelor or Advanced degree from college. However at the same time there were more fathers (27%) without the college degree (high school or less than high school completed) than mothers (23%) (Table 3-4). In Poland mothers had more education than fathers of the students (Table 3-5). Thirty three percentages mothers had a Bachelor or Advanced degree from collage comparing to 27% in case of fathers (Table 3-6)

Out of the 274 respondents from the United States, 56% were female, while 44% were male. However 70% of Polish students were female and 30% were male.

As expected, the majority of students in the United States were of similar ages, with about 82% born between 1988 and 1992. The most numerous group was born in 1990 (26%). In case of Poland more than 70% of students were born between 1987 and 1989. The most numerous group was born in 1988 (31%).

Respondents were asked about their lifestyle to investigate possible correlations between the type of lifestyle and perception of organic foods. In the United States 89% of the respondents (75% in case of Poland) are aware of that food choices affect their health. (Table 3-7). At the same time 93% U.S. students agreed that some foods have a beneficial effect on health (84% in Poland). Though they may recognize the difference between healthy foods and less healthy, in the United States 42% of the students are not choosing the healthiest option during shopping. In Poland this behavior is related to 39% of the respondents. Additionally 66% respondents in the United States do not want to give up the foods that they like even

if these foods are not the best option for their health. In Poland fewer students (55%) behave in this way (Table 3-8).

In question 21 most of the students (between 60-80%) rated their eating habits, knowledge of nutrition and healthy behaviors, nutritional quality of their diet, the level of physical activity and overall physical health now and over the past 5 years as a “good” or “very good” (Table 3-9). Polish students were more critical. Between 60-70% of them rated the same behavior as “good” or “very good” (Table 3-10).

To determine if their self-rating of eating habits was sound, respondents were asked to identify the types of food eaten the previous day. Most of the U.S. students had fruit, fruit juice, green salad or cooked vegetables more than once the previous day (Table 3-11). The consumption of French fries, potato chips, hamburgers, hot dogs or sausages or cookies was lower. In case of Polish students results were very similar (Table 3-12).

Another measure of health is physical activity. Approximately 40% of the students stated that they take part in different physical activities three or more times per week (Table 3-13). The level of physical activity of Polish students was significantly lower. Approximately less than 30% of the students stated they do sport three or more times per week (Table 3-14).

In next sections respondents were asked questions related to organic farming and organic products. Questions were divided into several groups referred to purchase frequency habits of organic food products, beliefs about organic food products and attitudes towards purchase and consumption of organic food products. Almost 40% of respondents in the United States stated that they eat organic food products less than once a month. (Table 3-15). However 32% of the students eat organic food once per week or more often. 8% of the respondents eat organic food

once or several times per day. In Poland frequency of consumption of organics among students was lower than in the United States. Forty percentages of the students eat organics less than once a month. However 20% of the students eat organic food once per week or more often (Table 3-16).

Among organic foods, fruits and vegetables were the most popular. There also appears to be an increasing trend in consuming organic foods (Tables 3-17 and Table 3-18).

In the United States 60 % of the respondents stated they bought more organic products than 5 years ago (Table 3-20) and 29% bought more organic foods than in last year (Table 3-19). The results for Polish students are almost the same (Tables 3-21 and Table 3-22)

Supermarkets and grocery stores were the most popular sources of organic food products in the United States (Table 3-23). More than 20% of respondents purchase organic products in supermarkets and grocery stores once or more times per week. Specialty grocery stores and organic food stores are also important, with 5-6% of the respondents shopping at these locations once or more per week. Direct sales from a farm, farmers market and owned organic gardens were also mentioned but purchase frequency was lower. In Poland, specialty food stores/organic food stores, farmers markets and own organic garden were the most popular sources of organic food products. Supermarkets were also significant but not as in the United States (Table 3-24).

To determine how much students knew about organic foods, they were asked both to rate their knowledge (subjective knowledge) and to answer a series of true/false questions to test their knowledge. In most cases respondents in both countries were critical in terms of information which they possess (Tables 3-25 and 3-

26). Most of the students disagreed with the statement that they know more about organic food than the average person. They also mostly disagreed that they have a lot of knowledge to assess the quality of organic products.

On the objective knowledge test, respondents both had to identify if they believed the statements were “True” or “Untrue” and identify their level of certainty for each answer. In the United States the distribution of the level of certainty was similar. Nearly half (between 40-50%) of respondents indicated they had “Average” certainty and 25% stated their level of certainty was “Low” or “Very low” (Table 3-27 and Table 3-28). Almost the same percentage (around 25%) of students assumed their level of certainty as “High” or “Very high”. In Poland the level of certainty was higher. More than half of the respondents indicated they had “High” or “Very high” level of certainty in case of almost all statements.

Eight true-false questions were asked. In general it can be said that students in the United States (Table 3-29) and in Poland (Table 3-20) have similar level of knowledge about organic products and organic farming in general. One of the items that most respondents answered correctly was whether or not organic farmers are allowed to use synthetic pesticides. In this case in the United States and in Poland, over 80% of the respondents answered correctly. Other question was answered correctly by the majority of students included that: flavor enhancers are not allowed in organic products (75% in case of U.S. students and 90% in case of Polish students answered correctly) (Table 3-28). Sixty six percentages of U.S. students and 83% of Polish students knew that organic farmers cannot use synthetic fertilizers for their crops. Moreover 63% of students in the United States and 75% students in Poland were aware of the fact that organic farmers cannot use genetically modified seeds. At the same time 76% of U.S. students and 73% of Polish students knew that every

year, for verification, organic farms are inspected to see if all requirements of organic farming are being met. Students in the United States had better knowledge related to the fact that organic farmers have to comply with all other legal rules valid for conventional farmers. Eighty seven percentages of them indicated that (70% in case of Polish students). There were not any differences in case of the knowledge related to the fact that 'organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming. Half of the students in the United States and in Poland stated that. However Polish students knew better (94% of them) that organic products cannot be irradiated to prolong their shelf life. In the United States 73% of the students indicated that.

Respondents were also asked about their beliefs related to organic farming and organic food products. Students in both countries answered similarly to most of the statements (Table 3-31 and 3-32). A significant number of respondents (60-70%) agreed or strongly agreed that organic products do not contain or contain less unwanted substances (eg. Pesticides and nitrates) than conventional products. A large part of respondents believe that there is a greater biodiversity (insects, plants, weeds ...) on and around organic farms and there is less contamination of groundwater than on conventional farms. Between 45-49% of respondents chose "Agree" or "Strongly agree" in these cases. In the United States almost 60% of respondents "Agree" or "Strongly Agree" when asked if organic food products are healthier than conventional. In Poland almost 80% indicated that organic products are healthier. In the United States students also believe that organic food products contain more nutrients (around 40% "Agree" or "Strongly agree" in this case). In Poland the number of the students who stated this is higher (60%). At the same time,

only 37% of the U.S. students and almost 75% of Polish students “Agree” or “Strongly agree” that organic products are among the most controlled products.

In addition to asking about beliefs, the respondents were asked how often they use specific sources of information about organic products (Table 3-33 and Table 3-34). In both countries the least popular sources of information were organic farming certification services, organic farmers, organic shops and scientists (doctors or nutritionists). Between 60-70% percent of the respondents had never used these sources. Students stated that they obtain information from other organic consumers or by people responsible for demonstrations of organic food in supermarkets. In these cases, between 30-50% of the respondents stated they use these sources of information “Sometimes” or more often. The most popular sources of information about organic food products are organic product labels, media (newspapers, television, radio), own internet search and friends and family. Only about 20-30% of the respondents stated they had never used these sources. At the same time around 50% of the respondents use these sources “Sometimes” or more often.

In addition to use of these information sources, respondents were asked how much they trust the information from these sources (Table 3-35 and Table 3-36). The results were in contrast with the answers in the previous question. Almost 60% of the respondents stated they “Trust slightly” or “Trust completely” organic farming certification services, even though it was one of the least popular sources of information. At the same time they did not trust the media, though it was one of the most popular sources of information. Nearly three-quarters (75%) of the respondents stated they trust completely or trust slightly Scientists (Doctor, Nutritionist), but again, they do not obtain information from this source as often. Organic farmers, organic product labels, own internet search and friends and family were as source that was

used frequently and trusted (“Trust slightly” or “Trust completely”) by nearly half of the respondents.

The next subject covered in the survey was about consumers attitudes towards purchase and consumption of organic food products. Respondents were asked how important specific factors were in the decision to purchase organic food products. In the United States the most important factors were freshness, high quality, and the fact that organic products are perceived as healthier (Table 3-37). A large part of respondents also put a high level of importance on the fact that organic farms are not allowed to use synthetic fertilizers, that organic production is environmentally friendly, and that organic farms are inspected. Respondents put less importance on factors like taste, lack of GMO in organic foods, and the idea that organic foods can be better for the children. The last two are not surprising as many students were unaware GMOs are not allowed in organic food and that this age group is unlikely to have children of their own yet. The idea that organic farming is something different, modern or trendy was not perceived as important. Other factors that were rated lower than the previous were: products are produced in specific location, supporting organic farmers or lack of trust in conventional production. In case of Poland the results were very similar (Table 3-38). The most significant factor in the decision to purchase organic was that organics are healthier and better quality products. The biggest difference was related to freshness of organics. In the United States it was the most important factor but in Poland it was not. Like in the United States, polish respondents do not mention the factors that organics are modern, trendy or something different as important in the decision to buy them.

In addition to identifying reasons to purchase, participants were asked to identify barriers to purchasing organic food products. In the United States the most

important barriers were costs and availability of organic products, as well as lack of information about organic farming (Table 3-39). Respondents agreed also that lack of advertising of organic food products, lack of trust in organic food, and little difference between organic and conventional products are important barriers. The results in Poland were similar but one important difference was found (Table 3-40). Polish respondents mentioned that one of the most significant barriers to purchase organics is: too much effort to find and buy organics.

This is analogous with the results from next question in which respondents were asked how easy is it for them to find organic foods in their area. In the United States almost 20% of the respondents stated it is “Very easy” for them to find organic food products (Table 3-41). At the same time 50% of students said it is “Easy”. The majority (72%) of the respondents do not need to go to a special store or location to purchase organic food products. U.S. respondents assumed that in general finding and purchasing organic food products is not difficult (Table 3-43). In Poland respondents answered oppositely (Table 3-42). Almost 47% of them stated that it is “Difficult” or “Very difficult” to find organics in their area. At the same time 76% of polish respondents stated that they have to go to a special store or location to purchase organics (Table 3-44).

To determine if respondents were willing to pay more for organic foods, they were asked at what price difference they would select organic food products over conventional products. Respondents were able to select from several levels of price difference which varied from a 50% discount compared to conventional products to a 100% price premium compared to conventional products (Figure 14). In the United States of the respondents chose the price difference between 0-10% and 11-50% compared to conventional products (Table 3-45). One-quarter (26%) of the

respondents stated they would select organic products if they have the same price as conventional. The largest group of students (30%) would purchase organic products if their price is up to, but not more than, 10% higher than conventional. At the same time 24% of the respondents were willing to accept up to a 50% price premium for organic products compared to conventional. Polish respondents answered similarly (Table 3-46). The largest group of Polish students (48%) would purchase organics if their price is up to, but not more than, 10% higher than conventional. Twenty six percentages of respondents would pay the same price for organics as for conventional products. At the same time 19% of the respondents in Poland would pay 10-50% premium price compared to conventional products.

Finally, respondents were asked to identify how they feel when they consume organic products. There was a scale where they had to choose between specific feelings: Bad – Good, Dissatisfied - Satisfied Unpleasant – Pleasant, Sad – Cheerful and Negative – Positive. In general they had very positive feelings (Table 3-47 and Table 3-48). They feel good, pleasant and satisfied. Respondents did not express their opinion about if they felt sad or cheerful during consumption of organic products.

### **Tables**

Table 3-1. Standing of the students at the University of Florida

Answer	Response	%
Freshman or Sophomore	84	31%
Junior or Senior	180	66%
Graduate student, pursuing a Masters or equivalent	3	1%
Graduate student, pursuing a PhD or equivalent	6	2%
Total	273	100%

Table 3-2. Standing of the students at the Warsaw University of Life Sciences

Answer	Response	%
Freshman or Sophomore	12	13%
Junior or Senior	30	32%
Graduate student, pursuing a Masters or equivalent	52	55%
Graduate student, pursuing a PhD or equivalent	1	1%
Total	95	100%

Table 3-3. Education of mothers of the respondents at the University of Florida

Answer	Response	%
Less than high school	14	5%
High School degree or equivalent	50	18%
Some college or technical school beyond high school	76	28%
Bachelor degree from college	84	31%
Advanced degree from college	49	18%
Total	273	100%

Table 3-4. Education of fathers of the respondents at the University of Florida

Answer	Response	%
Less than high school	16	6%
High School degree or equivalent	58	21%
Some college or technical school beyond high school	56	21%
Bachelor degree from college	70	26%
Advanced degree from college	73	27%
Total	273	100%

Table 3-5. Education of mothers of the respondents at the Warsaw University of Life Sciences

Answer	Response	%
Less than high school	11	11%
High School degree or equivalent	27	28%
Some college or technical school beyond high school	27	28%
Bachelor degree from college	6	6%
Advanced degree from college	25	26%
Total	96	100%

Table 3-6. Education of fathers of the respondents at the Warsaw University of Life Sciences

Answer	Response	%
Less than high school	11	12%
High School degree or equivalent	21	22%
Some college or technical school beyond high school	37	39%
Bachelor degree from college	1	1%
Advanced degree from college	25	26%
Total	95	100%

Table 3-7. Subjective opinion of the respondents about their eating habits at the University of Florida

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
My food choices affect my health	1.88%	0.38%	7.52%	31.58%	58.65%	266	4.45
Some foods have a beneficial effect on my health	0.75%	0.38%	6.02%	38.72%	54.14%	266	4.45
I don't want to give up the foods that I like	1.50%	10.90%	21.05%	46.62%	19.92%	266	3.73
I have control of my health no matter what I eat	9.77%	30.83%	22.93%	27.82%	8.65%	266	2.95
I always choose the healthiest option, even if it is more expensive	10.53%	32.33%	25.94%	25.19%	6.02%	266	2.84

Table 3-8. Subjective opinion of the respondents about their eating habits at the Warsaw University of Life Sciences

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Some foods have a beneficial effect on my health	1.03%	5.15%	9.28%	53.61%	30.93%	97	4.08
My food choices affect my health	2.08%	10.42%	12.50%	37.50%	37.50%	96	3.98
I don't want to give up the foods that I like	5.15%	23.71%	18.56%	38.14%	14.43%	97	3.33
I always choose the healthiest option, even if it is more expensive	14.43%	24.74%	28.87%	23.71%	8.25%	97	2.87
I have control of my health no matter what I eat	11.34%	35.05%	29.90%	20.62%	3.09%	97	2.69

Table 3-9. Rating of the behavior of students from the University of Florida

Question	Very Bad	Bad	Neither Good nor Bad	Good	Very Good	Responses	Mean
Knowledge of healthy behaviors:	2	8	33	138	85	266	4.11
Overall physical health over the past 5 years:	2	11	49	124	80	266	4.01
Knowledge of nutrition:	2	6	54	137	67	266	3.98
Overall physical health in the present:	2	11	56	128	69	266	3.94
Level of physical activity:	4	28	55	118	61	266	3.77
Nutritional quality of your diet:	6	30	68	138	24	266	3.54
Eating habits:	6	38	59	140	23	266	3.51

Table 3-10. Rating of the behavior of students from Warsaw University of Life Sciences

Question	Very Bad	Bad	Neither Good nor Bad	Good	Very Good	Responses	Mean
Level of physical activity:	0	10	21	47	19	97	3.77
Overall physical health in the present:	0	5	23	62	7	97	3.73
Overall physical health over the past 5 years:	0	8	20	60	9	97	3.72
Knowledge of healthy behaviors:	0	8	28	52	9	97	3.64
Knowledge of nutrition:	0	14	22	52	9	97	3.58
Nutritional quality of your diet:	1	13	26	51	6	97	3.49
Eating habits:	1	12	30	50	4	97	3.45

Table 3-11. Yesterday diet of the respondents at the University of Florida

Question	0 times	1 times	2 times	3 or more times	Responses	Mean
Eat fruit?	29.06%	42.26%	21.51%	7.17%	265	2.07
Eat cooked vegetables?	35.09%	41.13%	16.98%	6.79%	265	1.95
Drink milk?	36.60%	40.38%	18.49%	4.53%	265	1.91
Drink fruit juice?	41.13%	38.11%	15.09%	5.66%	265	1.85
Eat out in a restaurant, fast-food place, diner, cafeteria, etc?	44.53%	37.74%	15.47%	2.26%	265	1.75
Eat a green salad?	55.09%	36.23%	7.17%	1.51%	265	1.55
Drink soda?	66.29%	21.97%	6.82%	4.92%	264	1.50
Eat cookies, doughnuts, pie or cake?	58.87%	33.96%	6.42%	0.75%	265	1.49
Eat French fries or potato chips?	65.91%	28.41%	4.92%	0.76%	264	1.41
Eat a hamburger, hot dog, or sausage?	80.00%	15.47%	4.15%	0.38%	265	1.25

Table 3-12. Yesterday diet of the respondents at the Warsaw University of Life Sciences

Question	0 times	1 times	2 times	3 or more times	Responses	Mean
Eat fruit?	37.50%	30.21%	15.63%	16.67%	96	2.11
Drink fruit juice?	34.38%	35.42%	19.79%	10.42%	96	2.06
Eat a green salad?	25.00%	51.04%	20.83%	3.13%	96	2.02
Eat cookies, doughnuts, pie or cake?	36.46%	45.83%	13.54%	4.17%	96	1.85
Drink milk?	45.83%	39.58%	10.42%	4.17%	96	1.73
Eat cooked vegetables?	52.08%	34.38%	11.46%	2.08%	96	1.64
Drink soda?	59.38%	26.04%	10.42%	4.17%	96	1.59
Eat out in a restaurant, fast-food place, diner, cafeteria, etc?	82.29%	14.58%	2.08%	1.04%	96	1.22
Eat a hamburger, hot dog, or sausage?	87.50%	9.38%	2.08%	1.04%	96	1.17
Eat French fries or potato chips?	89.58%	8.33%	1.04%	1.04%	96	1.14

Table 3-13. Physical activity of the students at the UF

Question	0 days	1 day	2 days	3 days	4 days	5 days	6-7 days	Responses	Mean
Take part in any other type of physical activity for at least 10 minutes?	13.26%	9.85%	19.70%	14.77%	9.09%	12.50%	20.83%	264	4.17
Walk or bicycle for at least 30 minutes at a time? (Include Walking or bicycling to or from class or work.)	17.36%	8.30%	11.32%	20.00%	10.94%	15.85%	16.23%	265	4.11
Exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?	24.53%	12.45%	20.75%	15.47%	7.92%	6.42%	12.45%	265	3.39
Do stretching exercises, such as toe touching, knee bending, or leg stretching?	25.76%	10.98%	15.91%	21.59%	6.82%	10.23%	8.71%	264	3.38
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	30.94%	15.09%	13.58%	17.74%	6.04%	9.06%	7.55%	265	3.10

Table 3-14. Physical activity of the students at the WULS

Question	0 days	1 day	2 days	3 days	4 days	5 days	6-7 days	Responses	Mean
Walk or bicycle for at least 30 minutes at a time? (Include Walking or bicycling to or from class or work.)	14.58%	10.42%	23.96%	20.83%	14.58%	5.21%	10.42%	96	3.68
Take part in any other type of physical activity for at least 10 minutes?	22.92%	25.00%	12.50%	21.88%	6.25%	3.13%	8.33%	96	3.06
Exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?	32.29%	22.92%	19.79%	14.58%	6.25%	1.04%	3.13%	96	2.55
Do stretching exercises, such as toe touching, knee bending, or leg stretching?	52.08%	21.88%	10.42%	7.29%	3.13%	2.08%	3.13%	96	2.06
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	66.67%	15.63%	8.33%	5.21%	1.04%	2.08%	1.04%	96	1.69

Table 3-15. Consumption frequency of organic products at the UF

Answer	Response	%
Less than Once a Month	107	40%
Once a Month	37	14%
2-3 Times a Month	38	14%
Once a Week	28	11%
2-4 Times a Week	34	13%
Everyday	18	7%
Several times per day	4	2%
Total	266	100%

Table 3-16. Consumption frequency of organic products at the WULS

Answer	Response	%
Less than Once a Month	46	47%
Once a Month	22	23%
2-3 Times a Month	10	10%
2-3 Times a Month	11	11%
2-4 Times a Week	5	5%
Everyday	1	1%
Several times per day	2	2%
Total	97	100%

Table 3-17. Type of organic products purchased by students from the UF

Question	Do not purchase organic 0%	1-10%	11-50%	51-99%	100%	Responses	Mean
Vegetables	41.35%	27.07%	17.67%	11.28%	2.63%	266	2.07
Fruits	42.48%	27.07%	16.54%	9.77%	4.14%	266	2.06
Milk and Dairy	57.52%	12.03%	11.65%	11.28%	7.52%	266	1.99
Eggs	55.26%	17.67%	10.90%	8.65%	7.52%	266	1.95
Meat	63.40%	16.60%	10.19%	6.42%	3.40%	265	1.70
Bread	71.43%	14.29%	7.14%	4.51%	2.63%	266	1.53

Table 3-18. Type of organic products purchased by students from the WULS

Question	Do not purchase organic 0%	1-10%	11-50%	51-99%	100%	Responses	Mean
Eggs	28.87%	21.65%	23.71%	9.28%	16.49%	97	2.63
Vegetables	31.25%	26.04%	22.92%	15.63%	4.17%	96	2.35
Fruits	34.02%	31.96%	15.46%	15.46%	3.09%	97	2.22
Bread	48.45%	24.74%	14.43%	10.31%	2.06%	97	1.93
Milk and Dairy	46.39%	36.08%	7.22%	6.19%	4.12%	97	1.86
Meat	50.00%	29.17%	12.50%	6.25%	2.08%	96	1.81

Table 3-19. Are you eating more or less organic food products compared to last year? Students from the UF

Answer	Response	%
I buy more organic products now	78	29%
I buy as many organic products as before	148	56%
I buy less organic products now	40	15%
Total	266	100%

Table 3-20. Are you eating more or less organic food products compared to 5 years ago? students from the UF

Answer	Response	%
I buy more organic products now	160	60%
I buy as many organic products as before	68	26%
I buy less organic products now	38	14%
Total	266	100%

Table 3-21. Are you eating more or less organic food products compared to last year? Students from the WULS

Answer	Response	%
I buy more organic products now	26	27%
I buy as many organic products as before	63	65%
I buy less organic products now	8	8%
Total	97	100%

Table 3-22. Are you eating more or less organic food products compared to 5 years ago? Students from the WULS

Answer	Response	%
I buy more organic products now	60	62%
I buy as many organic products as before	29	30%
I buy less organic products now	8	8%
Total	97	100%

Table 3-23. Where students for the UF purchase organics?

Question	Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	Several times a Week	Daily	Response s	Mean
Supermarkets/Grocery stores	23.31 %	19.17 %	16.17 %	19.17 %	18.80 %	3.01%	0.38 %	266	3.25
Specialty grocery stores	58.65 %	16.92 %	10.90 %	6.77%	4.89%	1.88%	0.00 %	266	1.88
Farmers markets	60.90 %	21.80 %	8.27%	5.64%	3.38%	0.00%	0.00 %	266	1.69
Organic food stores	65.79 %	14.66 %	9.02%	6.02%	4.14%	0.38%	0.00 %	266	1.69
Own organic garden	85.34 %	6.39%	3.01%	2.26%	2.26%	0.75%	0.00 %	266	1.32
Direct sales from a farm	85.71 %	9.02%	1.88%	1.13%	1.88%	0.38%	0.00 %	266	1.26

Table 3-24. Where students for the WULS purchase organics?

Question	Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	Several times a Week	Daily	Mean
Supermarkets/Grocery stores	32.99%	23.71%	10.31%	16.49%	10.31%	4.12%	2.06%	2.68
Specialty grocery stores	35.05%	16.49%	14.43%	9.28%	12.37%	10.31%	2.06%	2.87
Organic food stores	68.04%	19.59%	7.22%	1.03%	2.06%	0.00%	2.06%	1.58
Direct sales from a farm	67.01%	17.53%	2.06%	6.19%	2.06%	2.06%	3.09%	1.77
Farmers markets	22.68%	19.59%	16.49%	20.62%	14.43%	4.12%	2.06%	3.05
Own organic garden	38.14%	13.40%	11.34%	12.37%	5.15%	13.40%	6.19%	2.98

Table 3-25. How much students knew about organic foods - the UF

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Compared to an average person, I know a lot about organic products.	18.11%	23.77%	30.57%	22.64%	4.91%	265	2.72
I know a lot about how I should assess the quality of organic products	19.17%	32.33%	25.19%	20.30%	3.01%	266	2.56
People consider me an expert in the field of organic food products	40.98%	28.57%	25.19%	5.26%	0.00%	266	1.95

Table 3-26. How much students knew about organic foods - the WULS

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean
People consider me an expert in the field of organic food products	50.52%	25.77%	18.56%	2.06%	3.09%	1.81
I know a lot about how I should assess the quality of organic products	17.53%	29.90%	35.05%	12.37%	5.15%	2.58
Compared to an average person, I know a lot about organic products.	14.43%	24.74%	23.71%	31.96%	5.15%	2.89

Table 3-27. The level of certainty of students from the UF

Question	Very low	Low	Average	High	Very high	Mean
Organic farmers are allow to use synthetic pesticides	9.30%	15.89%	36.82%	22.87%	15.12%	3.19
Organic farmers have to comply with all other legal rules valid for conventional farmers.	6.20%	13.18%	48.45%	20.16%	12.02%	3.19
Organic farmers use synthetic fertilizers for their crops	8.49%	16.22%	40.93%	22.78%	11.58%	3.13
Organic farmers may use genetically modified seeds	6.56%	19.69%	42.08%	18.15%	13.51%	3.12
Every year, for verification, organic farms are inspected to see if all requirements of organic farming are being met	7.36%	16.28%	48.45%	21.71%	6.20%	3.03
Flavor enhancers are allowed in organic products	8.11%	20.46%	42.47%	19.69%	9.27%	3.02
Organic products can be irradiated to prolong their shelf life	12.06%	24.12%	38.52%	19.07%	6.23%	2.83
'Organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming	12.45%	31.13%	42.02%	11.28%	3.11%	2.61

Table 3-28. The level of certainty of students from the WULS

Question	Very low	Low	Average	High	Very high	Responses	Mean
Flavor enhancers are allowed in organic products	3.16%	10.53%	25.26%	37.89%	23.16%	95	3.67
Organic products can be irradiated to prolong their shelf life	5.15%	10.31%	26.80%	38.14%	19.59%	97	3.57
Organic farmers are allow to use synthetic pesticides	4.21%	10.53%	30.53%	35.79%	18.95%	95	3.55
Organic farmers use synthetic fertilizers for their crops	7.37%	10.53%	28.42%	34.74%	18.95%	95	3.47
Organic farmers may use genetically modified seeds	10.53%	11.58%	32.63%	25.26%	20.00%	95	3.33
Every year, for verification, organic farms are inspected to see if all requirements of organic farming are being met	6.19%	19.59%	32.99%	32.99%	8.25%	97	3.18
Organic farmers have to comply with all other legal rules valid for conventional farmers.	4.12%	20.62%	46.39%	18.56%	10.31%	97	3.10
'Organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming	11.46%	27.08%	34.38%	19.79%	7.29%	96	2.84

Table 3-29. Knowledge about organic farming - the UF

Question	True	Untrue	Responses
Organic farmers are allow to use synthetic pesticides	17.80%	82.20%	264
Flavor enhancers are allowed in organic products	25.00%	75.00%	264
Organic products can be irradiated to prolong their shelf life	27.10%	72.90%	262
Organic farmers use synthetic fertilizers for their crops	33.96%	66.04%	265
Organic farmers may use genetically modified seeds	36.98%	63.02%	265
'Organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming	51.71%	48.29%	263
Every year, for verification, organic farms are inspected to see if all requirements of organic farming are being met	76.60%	23.40%	265
Organic farmers have to comply with all other legal rules valid for conventional farmers.	87.55%	12.45%	265

Table 3-30. Knowledge about organic farming - the WULS

Question	True	Untrue	Responses	Mean
Organic products can be irradiated to prolong their shelf life	5.15%	94.85%	97	1.95
Organic farmers use synthetic fertilizers for their crops	16.67%	83.33%	96	1.83
Organic farmers may use genetically modified seeds	23.96%	76.04%	96	1.76
'Organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming	55.67%	44.33%	97	1.44
Organic farmers have to comply with all other legal rules valid for conventional farmers.	70.10%	29.90%	97	1.30
Every year, for verification, organic farms are inspected to see if all requirements of organic farming are being met	72.16%	27.84%	97	1.28
Organic farmers are allow to use synthetic pesticides	79.38%	20.62%	97	1.21
Flavor enhancers are allowed in organic products	89.69%	10.31%	97	1.10

Table 3-31. Beliefs related to organic farming and organic food products - students from the UF

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Organic products contain less unwanted substances (eg. Pesticides and nitrates) than conventional products	1.13%	7.55%	19.62%	50.57%	21.13%	265	3.83
Organic products are healthier than conventional products	4.53%	12.45%	26.42%	39.25%	17.36%	265	3.52
There is a greater biodiversity (insects, plants, weeds ...) on and around organic farms compared to conventional farms	1.51%	11.70%	38.11%	42.26%	6.42%	265	3.40
Organic products do not contain residues of synthetic pesticides	3.77%	18.11%	23.77%	44.53%	9.81%	265	3.38
There is less contamination of groundwater on organic farms than conventional farms	3.77%	18.11%	33.58%	34.72%	9.81%	265	3.29
Organic products taste better than conventional products	9.06%	15.47%	41.13%	24.15%	10.19%	265	3.11
Organic products are among the most controlled products	4.15%	22.26%	36.23%	33.96%	3.40%	265	3.10
Organic products contain more nutrients (eg. vitamins and minerals) than conventional products	7.17%	24.15%	32.45%	27.92%	8.30%	265	3.06
Organic products contain more harmful fungi than conventional products	7.92%	36.98%	44.15%	9.43%	1.51%	265	2.60

Table 3-32. Beliefs related to organic farming and organic food products - students from the WULS

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Organic products are healthier than conventional products	0.00%	2.06%	14.43%	42.27%	41.24%	97	4.23
Organic products contain less unwanted substances (eg. Pesticides and nitrates) than conventional products	0.00%	4.12%	9.28%	46.39%	40.21%	97	4.23
Organic products do not contain residues of synthetic pesticides	0.00%	3.09%	16.49%	51.55%	28.87%	97	4.06
Organic products are among the most controlled products	1.03%	3.09%	20.62%	47.42%	27.84%	97	3.98
Organic products contain more nutrients (eg. vitamins and minerals) than conventional products	1.03%	8.25%	28.87%	38.14%	23.71%	97	3.75
Organic products taste better than conventional products	1.03%	15.46%	21.65%	36.08%	25.77%	97	3.70
There is less contamination of groundwater on organic farms than conventional farms	5.15%	11.34%	27.84%	34.02%	21.65%	97	3.56
There is a greater biodiversity (insects, plants, weeds ...) on and around organic farms compared to conventional farms	2.06%	15.46%	30.93%	32.99%	18.56%	97	3.51
Organic products contain more harmful fungi than conventional products	4.12%	13.40%	53.61%	23.71%	5.15%	97	3.12

Table 3-33. Sources to obtain information about organic products at the UF

Question	Never	Rarely	Sometimes	Quite Often	Very Often	Responses	Mean
Friends, family	23.68%	26.32%	31.58%	13.53%	4.89%	266	2.50
Organic product labels	31.20%	18.05%	27.44%	18.05%	5.26%	266	2.48
Own internet search	33.83%	16.54%	28.57%	15.79%	5.26%	266	2.42
Media (newspapers, television, radio)	26.69%	25.19%	33.46%	12.41%	2.26%	266	2.38
Other organic consumers	44.36%	16.92%	29.32%	8.27%	1.13%	266	2.05
Scientists (Doctor, Nutritionist)	50.38%	18.80%	21.43%	7.52%	1.88%	266	1.92
Demonstrations in supermarkets	45.49%	24.44%	24.06%	4.89%	1.13%	266	1.92
Organic shops	61.28%	15.04%	15.79%	6.77%	1.13%	266	1.71
Scientific magazines	60.53%	18.05%	15.41%	5.26%	0.75%	266	1.68
Organic farmers	64.29%	16.17%	14.29%	4.89%	0.38%	266	1.61
Organic farming certification services	72.56%	12.41%	10.90%	2.26%	1.88%	266	1.48

Table 3-34. Sources to obtain information about organic products at the WULS

Question	Never	Rarely	Sometimes	Quite Often	Very Often	Responses	Mean
Friends, family	21.65%	19.59%	27.84%	20.62%	10.31%	97	2.78
Media (newspapers, television, radio)	20.62%	19.59%	30.93%	24.74%	4.12%	97	2.72
Own internet search	31.96%	17.53%	23.71%	19.59%	7.22%	97	2.53
Organic product labels	32.99%	17.53%	26.80%	17.53%	5.15%	97	2.44
Other organic consumers	32.99%	21.65%	28.87%	12.37%	4.12%	97	2.33
Demonstrations in supermarkets	36.08%	26.80%	24.74%	9.28%	3.09%	97	2.16
Organic farmers	44.33%	29.90%	16.49%	6.19%	3.09%	97	1.94
Scientists (Doctor, Nutritionist)	51.55%	18.56%	23.71%	3.09%	3.09%	97	1.88
Organic shops	55.67%	20.62%	15.46%	5.15%	3.09%	97	1.79
Organic farming certification services	62.89%	17.53%	13.40%	4.12%	2.06%	97	1.65

Table 3-35. Indication how much do students trust to the information about organics from different sources? - the UF

Question	Distrust	Distrust slightly	Neither trust nor distrust	Trust slightly	Trust completely	Responses	Mean
Scientists (Doctor, Nutritionist)	2.26%	3.76%	20.68%	34.59%	38.72%	266	4.04
Organic farming certification services	3.01%	4.89%	33.08%	39.47%	19.55%	266	3.68
Organic product labels	2.26%	9.77%	27.07%	47.37%	13.53%	266	3.60
Organic farmers	3.01%	6.02%	35.71%	46.24%	9.02%	266	3.52
Friends, family	3.38%	7.52%	37.59%	43.98%	7.52%	266	3.45
Own internet search	3.01%	10.15%	37.97%	41.35%	7.52%	266	3.40
Organic shops	2.63%	10.53%	40.98%	39.47%	6.39%	266	3.36
Other organic consumers	4.14%	10.90%	44.36%	37.97%	2.63%	266	3.24
Demonstrations in supermarkets	4.14%	16.17%	48.50%	26.69%	4.51%	266	3.11
Media (newspapers, television, radio)	6.77%	26.69%	38.35%	25.94%	2.26%	266	2.90

Table 3-36. Indication how much do students trust to the information about organics from different sources? - the WULS

Question	Distrust	Distrust slightly	Neither trust nor distrust	Trust slightly	Trust completely	Responses	Mean
Organic farming certification services	1.03%	4.12%	26.80%	47.42%	20.62%	97	3.82
Scientists (Doctor, Nutritionist)	1.03%	3.09%	28.87%	50.52%	16.49%	97	3.78
Friends, family	0.00%	2.06%	31.96%	51.55%	14.43%	97	3.78
Organic product labels	0.00%	7.22%	36.08%	49.48%	7.22%	97	3.57
Other organic consumers	0.00%	6.19%	38.14%	50.52%	5.15%	97	3.55
Own internet search	1.03%	8.25%	46.39%	39.18%	5.15%	97	3.39
Organic shops	4.12%	9.28%	45.36%	36.08%	5.15%	97	3.29
Organic farmers	3.09%	13.40%	44.33%	35.05%	4.12%	97	3.24
Media (newspapers, television, radio)	8.25%	20.62%	48.45%	20.62%	2.06%	97	2.88
Demonstrations in supermarkets	9.28%	38.14%	43.30%	7.22%	2.06%	97	2.55

Table 3-37. Factors for purchasing organic products - students from the UF

Question	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important	Responses	Mean
Organic products are fresher	5.66%	5.66%	19.62%	37.74%	31.32%	265	3.83
Organic products are healthier	6.04%	5.66%	20.00%	36.98%	31.32%	265	3.82
Organic farming is environmentally friendly	7.55%	6.42%	15.47%	41.51%	29.06%	265	3.78
Organic farms are inspected	6.79%	4.15%	21.89%	40.00%	27.17%	265	3.77
Organic food has better quality	9.06%	4.15%	19.62%	38.11%	29.06%	265	3.74
Synthetic pesticides are not allowed in production	9.47%	5.30%	22.35%	36.74%	26.14%	264	3.65
Organic food has better taste	8.30%	9.06%	29.43%	32.45%	20.75%	265	3.48
Organic food is better for my children	13.96%	4.53%	26.42%	32.45%	22.64%	265	3.45
I am supporting organic farmers	11.70%	11.32%	29.81%	26.79%	20.38%	265	3.33
Genetic modification is not allowed in organic foods	13.21%	9.81%	26.79%	32.83%	17.36%	265	3.31
Organic products are produced in a particular location	13.21%	13.58%	39.25%	24.53%	9.43%	265	3.03
I do not trust conventional production	15.09%	15.85%	47.92%	15.09%	6.04%	265	2.81
It's something different	20.83%	12.12%	42.05%	21.59%	3.41%	264	2.75
Organic farming is modern & trendy	28.41%	16.67%	34.47%	16.29%	4.17%	264	2.51

Table 3-38. Factors for purchasing organic products - students from the WULS

Question	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important	Responses	Mean
Organic products are healthier	3.09%	2.06%	12.37%	48.45%	34.02%	97	4.08
Organic food has better quality	4.12%	3.09%	14.43%	48.45%	29.90%	97	3.97
Synthetic pesticides are not allowed in production	5.15%	2.06%	17.53%	44.33%	30.93%	97	3.94
Organic farming is environmentally friendly	5.15%	5.15%	17.53%	44.33%	27.84%	97	3.85
Organic food has better taste	4.12%	6.19%	21.65%	44.33%	23.71%	97	3.77
Organic farms are inspected	5.15%	6.19%	19.59%	51.55%	17.53%	97	3.70
Organic food is better for my children	8.25%	6.19%	18.56%	41.24%	25.77%	97	3.70
Organic products are fresher	5.15%	6.19%	24.74%	42.27%	21.65%	97	3.69
Genetic modification is not allowed in organic foods	7.22%	7.22%	25.77%	32.99%	26.80%	97	3.65
I am supporting organic farmers	14.43%	17.53%	35.05%	22.68%	10.31%	97	2.97
I do not trust conventional production	10.31%	17.53%	51.55%	16.49%	4.12%	97	2.87
Organic products are produced in a particular location	13.40%	15.46%	52.58%	12.37%	6.19%	97	2.82
It's something different	20.62%	12.37%	44.33%	19.59%	3.09%	97	2.72
Organic farming is modern & trendy	32.99%	24.74%	29.90%	9.28%	3.09%	97	2.25

Table 3-39. Barriers for purchasing organic products - the UF

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Cost	1.50%	4.51%	9.77%	39.47%	44.74%	266	4.21
Availability	3.38%	17.29%	21.05%	48.12%	10.15%	266	3.44
Trust	4.15%	17.36%	30.94%	36.60%	10.94%	265	3.33
Too little information	4.14%	18.80%	30.08%	40.23%	6.77%	266	3.27
Lack of advertising of organic farming and organic products	5.26%	18.42%	33.83%	34.59%	7.89%	266	3.21
Too much effort	3.38%	25.56%	34.21%	25.56%	11.28%	266	3.16
Reliability	4.89%	18.80%	38.35%	32.33%	5.64%	266	3.15
Little or no difference between organic and conventional products	8.27%	20.68%	30.83%	31.95%	8.27%	266	3.11
Appearance of the product	6.39%	23.68%	30.45%	31.20%	8.27%	266	3.11
Insufficient variety	5.64%	19.92%	39.47%	30.83%	4.14%	266	3.08
Taste	7.89%	24.81%	29.70%	30.45%	7.14%	266	3.04
Too many organic labels	4.89%	26.32%	45.49%	18.42%	4.89%	266	2.92
It is in fashion	15.41%	27.07%	33.83%	16.54%	7.14%	266	2.73

Table 3-40. Barriers for purchasing organic products - the WULS

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Responses	Mean
Cost	1.03%	4.12%	8.25%	38.14%	48.45%	97	4.29
Availability	2.06%	10.31%	24.74%	45.36%	17.53%	97	3.66
Too much effort	4.12%	12.37%	22.68%	42.27%	18.56%	97	3.59
Too little information	1.03%	15.46%	29.90%	40.21%	13.40%	97	3.49
Lack of advertising of organic farming and organic products	5.15%	17.53%	29.90%	38.14%	9.28%	97	3.29
Insufficient variety	2.06%	24.74%	31.96%	32.99%	8.25%	97	3.21
Too many organic labels	6.19%	9.28%	50.52%	28.87%	5.15%	97	3.18
Trust	7.22%	19.59%	35.05%	30.93%	7.22%	97	3.11
Reliability	7.22%	27.84%	29.90%	25.77%	9.28%	97	3.02
Appearance of the product	9.28%	24.74%	35.05%	24.74%	6.19%	97	2.94
Little or no difference between organic and conventional products	11.34%	26.80%	32.99%	20.62%	8.25%	97	2.88
Taste	13.40%	21.65%	36.08%	22.68%	6.19%	97	2.87
It is in fashion	16.49%	26.80%	37.11%	14.43%	5.15%	97	2.65

Table 3-41. The level of easiness to find organics - the UF

Answer	Response	%
Very Difficult	4	2%
Difficult	15	6%
Neither easy, nor difficult	59	22%
Easy	135	51%
Very Easy	53	20%
Total	266	100%

Table 3-42. The level of easiness to find organics - the WULS

Answer	Response	%
Very Difficult	9	9%
Difficult	36	37%
Neither easy, nor difficult	23	24%
Easy	24	25%
Very Easy	5	5%
Total	97	100%

Table 3-43. The question - Is there a need to go to a special store or location to purchase organic foods? – the UF

Answer	Response	%
Yes	72	27%
No	194	73%
Total	266	100%

Table 3-44. The question - Is there a need to go to a special store or location to purchase organic foods? – the WULS

Answer	Response	%
Yes	74	76%
No	23	24%
Total	97	100%

Table 3-45. Willingness to pay for organics - the UF

Answer	Response	%
> 50% discount compared to conventional	17	6%
1-49% discount compared to conventional	19	7%
the same price	68	26%
0-10% premium compared to conventional	82	31%
11-50% premium compared to conventional	63	24%
51%-99% premium compared to conventional	14	5%
> 100% premium compared to conventional	2	1%
Total	265	100%

Table 3-46. Willingness to pay for organics - the WULS

Answer	Response	%
> 50% discount compared to conventional	0	0%
1-49% discount compared to conventional	7	7%
the same price	25	26%
0-10% premium compared to conventional	47	48%
11-50% premium compared to conventional	18	19%
51%-99% premium compared to conventional	0	0%
> 100% premium compared to conventional	0	0%
Total	97	100%

Table 3-47. Feelings during consumption of organics - the UF

Question	1	2	3	4	5	Responses	Mean
Bad:Good	1.50%	0.75%	30.83%	28.57%	38.35%	266	4.02
Dissatisfied:Satisfied	2.26%	2.63%	30.83%	31.95%	32.33%	266	3.89
Unpleasant:Pleasant	1.88%	1.50%	36.09%	30.45%	30.08%	266	3.85
Sad:Cheerful	1.50%	1.13%	48.87%	21.80%	26.69%	266	3.71
Negative:Positive	1.50%	0.75%	37.59%	29.32%	30.83%	266	3.87

Table 3-48. Feelings during consumption of organics - the WULS

Question	1	2	3	4	5	Responses	Mean
Bad:Good	0.00%	1.03%	29.90%	30.93%	38.14%	97	4.06
Dissatisfied:Satisfied	0.00%	3.13%	39.58%	32.29%	25.00%	96	3.79
Unpleasant:Pleasant	1.03%	1.03%	41.24%	36.08%	20.62%	97	3.74
Sad:Cheerful	0.00%	0.00%	43.30%	32.99%	23.71%	97	3.80
Negative:Positive	1.03%	0.00%	35.05%	41.24%	22.68%	97	3.85

## CHAPTER 4 METHODS, THEORETICAL MODEL AND MODEL SPECIFICATIONS

### **Methods**

This chapter consists of two parts, 1) the development and administering of an online survey and 2) analysis of the data obtained from the survey. Initially, background research on the organic food market and a review of past studies about consumer perceptions of organic products was conducted. This information was then used to create the online questionnaire. The results obtained from this survey were analyzed through econometric modeling.

### **Theoretical Model**

Neoclassical economics is a theoretical methodology which explains prices, outputs and income distributions in markets through demand and supply. Markets are thought to achieve two general goals: to maximize the utility by income-constrained individuals and to maximize the cost-constrained profits of the companies given available information and factors of production. Additionally, neoclassical demand theory says demand is a function of income, information, the price of a good, the prices of other goods, government policy and other socioeconomic and demographic elements (Perloff, 2004).

The demand for organic food was analyzed by asking respondents about the frequency of consumption of organic products. Data in this research was collected by using the survey instrument (online questionnaire) which was presented and discussed in the previous chapter. This data is then used to conduct an Ordered Probit Model to determine the independent variables which influence a respondent's frequency of consumption of organic products (the dependent variable). This analysis uses many variables to test their impact on the dependent variable. These variables include attitudes, perceptions and knowledge of the respondents about organic

products. There are also questions related to socioeconomic and demographic information about the respondents.

### **Ordered Probit Model (Ordered Probability Model)**

The approach used to estimate models with a dependent variable which is ordinal but not continuous is the ordered response model. This method uses a probit link function and it is referred to as the “ordered probit model”. The model was created by two researchers who worked in bio-statistics (Aitchison and Silvey 1957). It was first used in social sciences in the work of two political scientists, McKelvey and Zavoina (1975). The ordered probit model relies on the idea of a continuous metric which underlies the ordinal responses observed in the analysis. The basic probit model is shown in Equation 4-1.

$$Y^* = X' \beta + \varepsilon \tag{4-1}$$

$Y^*$  is a continuous variable which is a linear combination of a set of predictors, X. Additionally  $\varepsilon$  represents a disturbance term that has a normal distribution.  $\beta$  represents the vector of regression coefficients which we want to estimate.

The variable  $Y_i^*$  is related to ordinal categories coded for example as 0, 1, 2, 3, ... k. The underlying continuous response decreases in the k-th interval (Equation 4-1, 4-2, 4-3 and 4-5):

$$Y^* = 0 \text{ if } Y^* \leq 0 \tag{4-2}$$

$$Y^* = 1 \text{ if } 0 < Y^* \leq \mu_1 \tag{4-3}$$

$$Y^* = 2 \text{ if } \mu_1 < Y^* \leq \mu_2 \tag{4-4}$$

$$Y^* = 3 \text{ if } \mu_2 < Y^* \leq \mu_3 \tag{4-5}$$

Then the response of category k is observed. The  $\mu$ 's are unknown parameters which are estimated with  $\beta$ . In the model used to analyze consumption of organic food by students, there are unknown threshold parameters  $Y^*$  ( $i=0, 1, 2$ ), with  $y$  values specified as:

$Y = 0$  if consumers do not consume organic food products

$Y = 1$  if consumers consume organic products monthly

$Y = 2$  if consumers consume organic products weekly

$Y = 3$  if consumers consume organic products daily

$Y^*$  will be estimated with other parameters. In the situation where there is an intercept coefficient in the model, parameter  $Y_0^*$  is normalized to a value 0 and  $k-1$  additional parameters will be estimated with  $X$ s.

The probabilities of observing  $Y$ , given  $X$  are written as (Equation 4-6):

$$Prob(Y = n) = \Phi(\mu_n - \beta X') - \Phi(\mu_{n-1} - \beta X'), n = 0, 1, 2, \quad (4-6)$$

$\Phi$  is the normal density function. The probabilities for each ordinal response that is observed in the model with 4 responses (0, 1, 2, 3) will be given as (Equation 4-7, 4-8, 4-9 and 4-10):

$$Prob(Y = 0) = \Phi(-\beta X') \quad (4-7)$$

$$Prob(Y = 1) = \Phi(\mu_1 - \beta X') - \Phi(-\beta X') \quad (4-8)$$

$$Prob(Y = 2) = \Phi(\mu_2 - \beta X') - \Phi(\mu_1 - \beta X') \quad (4-9)$$

$$Prob(Y = 3) = \Phi(\mu_3 - \beta X') - \Phi(\mu_2 - \beta X') \quad (4-10)$$

The marginal effects of the independent variables on the probabilities are also observed. They vary from the values of the coefficients estimates. The marginal effects are related to the values of all independent variables. They are calculated as follows (Equation 4-11):

$$\frac{\partial Prob(Y=n)}{\partial X} = [\Phi(\mu_{n-1} - \beta X') - \Phi(\mu_n - \beta X')] \times \beta \quad (4-11)$$

The sum of the marginal effects equals zero. Typical marginal effects are calculated at the mean of the variable. However, in the case of dummy variables, a different way must be used to compute marginal effects as the mean is not relevant. In this case, the difference of the two resulting probabilities when the dummy variable is equal to its two values 0 and 1 is used.

### **Model Specification**

The model used for this study is the Ordered Probability Model. This model is used to compare the frequency of organic consumption between Florida (U.S.) and Polish students. The dependent variable for the Ordered Probability Model is the frequency of consumption of organic food products. The model uses several socioeconomic, demographic and habit independent variables (Table 4-1). SPSS and LIMDEP were used to compute the model.

The specification for the Ordered Probability Model is as follows:

Freqcons = Gender, Genderl, Eatbehav1, Eatbehav1l, Eatbehav2, Eatbehav2l, Eatbehav3, Eatbehav3l, Eatbehav4, Eatbehav4l, Yestgood, Yestgoodl, Yestbad, Yestbadl, Country, Superm, Superml, Orgstore, Orgstorel, Directorg, Directorgl, Farmarkt, Farmarktl, Subjknow, Subjknowl, Objknow, Objknowl, Factdifferent, Factdifferentl, Factsupport, Factsupportl, Factqualit, Factqualitl, Factpest, Factpestl, Facthealth, Facthealthl, Factenvir, Factenvirl, Barravail, Barravaill, Barrcost, Barrcostl, Barrvariet, Barrvarietl, Barrinfo, Barrinfo, Easyfind, Easyfindl, Primary, Primaryl, WTP, WTPI

The dependent variable is related to the consumption frequency of organic food products. Model is checking how the dependent variable is behaving by being influenced by independent variables. Independent variables used in the model can be divided into several groups. The first group is related to demographics (gender) and the lifestyle of the respondents. Respondents could present their opinion about what they think about their diets (Eatbehav1, Eatbehav2, Eatbehav3, and Eatbehav4). At the same time they were assessed about their diets on the day before of the survey (Yestgood and Yestbad). The next group of variables was related to the purchase frequency habits of organics. This includes variables which represent places in which organic products can be purchased by respondents, (Superm, Orgstore, Directorg, Farmarkt). Then there are variables which represent the knowledge of respondents about organic farming and organic products. The first variable may be described as subjective (Subjknow) because it represents respondents' opinions about their knowledge about organics. The second variable in this group may be considered as objective because it includes the score of respondents about their knowledge about organic farming (Objknow).

The next group of variables is related to attitudes towards purchase and consumption of organics. Six factors for the purchase of organics were included: that organics are something different, that buying organic provides the opportunity to support organic farmers, that the quality of organic food is greater, that there is a lack of pesticides in organic production, that there are health benefits of eating organics, and that organic farming is environmentally friendly (Factdifferent, Factsupport, Factqualit, Factpest, Facthealth, Factenvir).

Variables which represent the barriers to purchase of organic farming were also used in the model. They include lack of availability, high costs, insufficient variety and lack of information about organic farming (Barravail, Barrcost, Barrvariet, Barrinfo).

The model also contains variables which describe the opinions of respondents about how easy is to find organic products in their area (Easyfind). Another variable is related to the question whether the respondents are the primary shoppers in their households (Primary). One of the final variables used in the model is the willingness to pay for organics (WTP). The model also contains a variable, "country," which describes the effect of the respondent's country on the frequency of consumption of organic products.

Variables with the "I" symbol represent the interactions related to specific variables between countries. In other words, it means that there are possible differences or similarities in case of specific variables between countries which can be significant to the consumption frequency of organic products.

### **Expected Results**

It is expected that many variables will affect the frequency of consumption of organic foods. A person's knowledge about organic foods might influence how often they consume that food. There are two types of knowledge measured in this study: subjective and objective knowledge. Subjective knowledge is related to consumers' opinions about their knowledge about organic products. Objective knowledge is related to factual knowledge about organics which respondents possess.

It would be reasonable to assume that respondents who subjectively rate their own knowledge about organic food products higher will consume them more often. Also, respondents who have higher objective knowledge about organic products may

consume organic products more frequently, although if they do not, this may mean that their objective knowledge is not pro-organic.

There are also several factors which would be expected to have an impact on frequency of consumption. For example, if a respondent sees purchasing organic food as a means of supporting farmers, or believes that organic food is of better quality, they may be more likely to purchase organics more frequently. Other factors include if the participant believes: a) that organic products are produced without synthetic pesticides, b) that organic foods are healthier, c) that organic farming is environmentally friendly, or d) that organic products are something new and different. Similarly, if respondents feel barriers to purchasing organics exist, they may be likely to purchase organics less frequently. Examples of such barriers include: cost, insufficient variety, too little information and lack of availability of organics. There is also an assumption that those who do not see lack of availability of organic as a barrier (i.e., perceive that organic products are easy to find) are expected to consume organic products more frequently. A similar assumption is related to costs of organics. Those who are willing to more likely value attributes of organic products higher than the attributes of conventional products would be expected to consume organic food more frequently.

For many people, organic products are considered to have high quality and health benefits. People who ate healthy products on the day before the survey may be in the group which pays a lot of attention to their diet so they may consume organic food more frequently.

Demographic variables are also expected to impact the frequency of consumption of organic foods. Gender has been assumed to influence frequency of consumption of organic products significantly (O'Donovan & McCarthy, Irish

consumer preference for organic meat, 2002). It is expected that women pay more attention to what they buy as they are frequently the primary shopper. There are also expectations related to differences between countries in which the survey was conducted. Because of the different level of development of the organic market between Poland and Florida, Polish respondents are expected to have more limited knowledge about organic products. Moreover, it is more difficult to find organic products in Poland. This may result in lower frequency of consumption of organic products.

The next chapter focuses on the description of statistical results of the model. It presents differences between the United States and Poland in terms of impact of specific independent variables on the consumption frequency of organic products.

Table 4-1. Variables used in the Ordered Probit Model

Variable	Definition of variable	Coding
Freqcons	Frequency of consumption of organic food	= 0 if consumers do not consume organic food products = 1 if consumers consume organic products monthly = 2 if consumers consume organic products weekly = 3 if consumers consume organic products daily
Gender	Gender	Female = 1, Male = 0
Genderl	Interaction of gender and country	= 0 if Country = PL = Gender if Country = US
Eatbehav1	Eating behavior - My food choices affect my health	Ranges from 1 to 5
Eatbehav1l	Interaction of "Eating behavior - My food choices affect my health" and country	= 0 if Country = PL = Eatbehav1 if Country = US
Eatbehav2	Eating behavior - I always choose the healthiest option, even if it is more expensive	Ranges from 1 to 5
Eatbehav2l	Interaction of "Eating behavior - I always choose the healthiest option, even if it is more expensive" and country	= 0 if Country = PL = Eatbehav2 if Country = US
Eatbehav3	Eating behavior - I have control of my health no matter what I eat	Ranges from 1 to 5
Eatbehav3l	Interaction of "Eating behavior - I have control of my health no matter what I eat" and country	= 0 if Country = PL = Eatbehav3 if Country = US
Eatbehav4	Eating behavior - I don't want to give up the foods that I like	Ranges from 1 to 5
Eatbehav4l	Interaction of "Eating behavior - I don't want to give up the foods that I like" and country	= 0 if Country = PL = Eatbehav4 if Country = US
Yestgood	Good diet on the day before the survey	Ranges from 0 to 5
Yestgoodl	Interaction of "good diet on the day before the survey" and country	= 0 if Country = PL = Yestgood if Country = US
Yestbad	Bad diet on the day before the survey	Ranges from 0 to 5
Yestbadl	Interaction of "bad diet on the day before the survey" and country	= 0 if Country = PL = Yestbad if Country = US
Country	Country – Poland or the United States (FL)	Poland (PL) = 0, United States (US) = 1
Superm	Place where individual purchase organic food- supermarket	Ranges from 1 to 5
Superml	Interaction of "supermarket" and country	= 0 if Country = PL = Superm if Country = US
Orgstore	Place where individual purchase organic food - organic food store	Ranges from 1 to 5
Orgstorel	Interaction of "organic food store" and country	= 0 if Country = PL = Orgstore if Country = US
Directorg	Place where individual purchase organic food - direct sales from a farm	Ranges from 1 to 5
Directorgl	Interaction of "direct sales from a farm" and country	= 0 if Country = PL = Directorg if Country = US
Farmarkt	Place where individual purchase organic food - farmers markets	Ranges from 1 to 5
Farmarktl	Interaction of "farmers markets" and country	= 0 if Country = PL = Farmarkt if Country = US
Subjknow	Subjective knowledge (opinion) of individual about organic farming and organic products	Ranges from 1 to 5
Subjknowl	Interaction of "subjective knowledge" and country	= 0 if Country = PL = Subjknow if Country = US
Objknow	Objective knowledge of individual about organic farming and organic products	Ranges from 1 to 8
Objknowl	Interaction of "objective knowledge" and country	= 0 if Country = PL = Objknow if Country = US
Factdifferent	Factor for purchasing organic products - It's something different	Ranges from 1 to 5
Factdifferentl	Interaction of factor "It's something different" and country	= 0 if Country = PL = Factdifferent if Country = US

Table 4-1. Continued

Factsupport	Factor for purchasing organic products - I am supporting organic farmers	Ranges from 1 to 5
Factsupportl	Interaction of factor "I am supporting organic farmers" and country	= 0 if Country = PL = Factsupport if Country = US
Factqualit	Factor for purchasing organic products - Organic food has better quality	Ranges from 1 to 5
Factqualitl	Interaction of factor "Organic food has better quality" and country	= 0 if Country = PL = Factqualit if Country = US
Factpest	Factor for purchasing organic products - Synthetic pesticides are not allowed in production	Ranges from 1 to 5
Factpestl	Interaction of factor "Synthetic pesticides are not allowed in production" and country	= 0 if Country = PL = Factpest if Country = US
Facthealth	Factor for purchasing organic products - Organic products are healthier	Ranges from 1 to 5
Facthealthl	Interaction of factor "Organic products are healthier" and country	= 0 if Country = PL = Facthealth if Country = US
Factenvir	Factor for purchasing organic products - Organic farming is environmentally friendly	Ranges from 1 to 5
Factenvirl	Interaction of factor "Organic farming is environmentally friendly" and country	= 0 if Country = PL = Factenvir if Country = US
Barravail	Barrier for purchasing organic products - Availability	Ranges from 1 to 5
Barravaill	Interaction of barrier "Availability" and country	= 0 if Country = PL = Barravail if Country = US
Barrcost	Barrier for purchasing organic products - Cost	Ranges from 1 to 5
Barrcostl	Interaction of barrier "Cost" and country	= 0 if Country = PL = Barrcost if Country = US
Barrvariet	Barrier for purchasing organic products - Insufficient variety	Ranges from 1 to 5
Barrvarietl	Interaction of barrier "Insufficient variety" and country	= 0 if Country = PL = Barrvariet if Country = US
Barrinfo	Barrier for purchasing organic products - Too little information	Ranges from 1 to 5
Barrinfo	Interaction of barrier "Too little information" and country	= 0 if Country = PL = Barrinfo if Country = US
Easyfind	Level of difficulty to find organic products	Easy = 1 Difficult = 0
Easyfindl	Interaction of "level of difficulty to find organic products" and country	= 0 if Country = PL = Easyfind if Country = US
Primary	Variable which states if individual is the primary shopper in the household or not	Primary shopper = 1 Not primary shopper = 0
Primaryl	Interaction of "Primary" and country	= 0 if Country = PL = Primary if Country = US
WTP	Willingness to pay of the individual for organic products	Ranges from 0 to 3
WTPI	Interaction of "willingness to pay" and country	= 0 if Country = PL = WTP if Country = US

## CHAPTER 5 EMPIRICAL MODEL

### **Ordered Probability Model Results**

The Ordered Probability Model was used to investigate the consumption of organic food products. Frequency of consumption was calculated on the basis of a question that asked the respondents how often they eat organic food products. The assumption is made that consumption of organic foods less than once per month is equivalent to not consuming organic food at all. Observations with missing information were deleted leaving 349 usable observations. Statistical results are divided into four parts, 1) Personal characteristics and lifestyle 2) Purchase frequency habits of organic food products 3) Knowledge and beliefs about organic farming 4) Attitudes towards purchase and consumption of organic food products.

The results of the ordered probit analysis were explanatory, with the model making correct predictions 68.48% of the time compared to the naive prediction of 60.17%. The results of the ordered probability analysis revealed interesting information (results shown in Table 5-1 and Table 5-2). Variables are reported as statistically significant at a confidence level of 90% or greater.

#### **Personal Characteristics and Lifestyle**

Demographics and other variables related to the person's lifestyle were included in the model. For example, gender did not affect the frequency of consumption of organic products. It was expected that women will consume more organic products as they normally care more about their diet and they are often more responsible for shopping for a households (O'Donovan & McCarthy, 2002). But female respondents in this survey were mainly undergraduate students and most of them were living on their own. This may have decreased the impact of gender on the frequency of consumption of organics.

However, males and females had been asked about their eating behavior.

There were two types of questions.

The students had been asked several questions related to the opinion about their eating behavior. At the beginning they were asked if food choices may affect their health. This variable was significant to the frequency of consumption of organics but did not behave in the manner expected. Students in both countries said they will eat organic food less frequently if they said that the food they eat can influence their health.

However, U.S. students, who indicated they do not want to give up foods they like to eat, even if they are not healthy foods, were 11.92% more likely to consume organic food more frequently. First may mean that they appreciate, for example, the taste of organics so they include these foods in their diet. For Polish students this variable was not statistically significant which may mean that reasons other than taste influences their consumption of organics.

Other opinions of the respondents about their eating behavior like “I always choose the healthiest option, even if it is more expensive” and “I have control of my health no matter what I eat” were not statistically related to the frequency of consumption of organic food products.

In the second type of questions related to eating behavior, respondents were asked about their diet on the day before taking the survey. Students reported which of different types of foods they ate in the previous day, and these foods were then divided into two groups representing a healthy diet and a less healthy diet. Those who ate less healthy foods the previous day eat organics less frequently. However, those who did eat healthy foods the previous day were more likely to consume organic foods more frequently. This held true for respondents in both countries.

Polish respondents who ate more healthy foods on the day before are 7.65% (0.98% in case of U.S. students) more likely to consume organics more frequently.

### **Purchase Frequency Habits of Organic Food Products**

To consume, organic products have to be purchased. Students indicated several places where they buy organics. The places like “supermarket,” “organic food stores,” “direct sales on the farm” and “farmers' market” were statistically related in the decision to consume organic products in both countries. Though differences exist between the two countries, this is mostly related to the fact that there is a different organization of the retail market between the two countries. In the United States, the retail market consists mainly of large supermarket chains. Supermarket chains are also popular in Poland (their significance is increasing), but a large proportion of respondents indicated they do their primary shopping in small grocery stores or at farmers' markets, which are very common.

With further development of organic markets in Poland a higher significance of supermarkets as the source of organic products is expected. The possibility to find organics in supermarkets may grow the consumption of organics due to increase in their availability, popularity, assortment and possible lower price for consumers.

### **Knowledge and Beliefs about Organic Farming**

Some differences related to the beliefs and knowledge about organic farming and organic food products between the U.S. and Polish students were observed. Students were asked how much they think they know about organic farming. This variable is related to the opinion of the respondents about their knowledge and called in the model “subjective knowledge”. A positive relationship between this opinion and the frequency of consumption of organic food was found only for U.S. students. This indicates that students in the United States who believe they know more about

organic production are 14.85% more likely than an average person to consume organic food more frequently. On the other hand this variable was not statistically related to the decision to frequency of consumption of organics in Poland.

Polish and U.S. students were also evaluated on how much they actually know about organic farming in general. This variable was statistically related to the consumption frequency of organic products. However, there were also differences in this case. Students in Poland are 8.78% more likely to consume organics more frequently if they have better knowledge about organic farming. This relationship shows that in Poland, where the level of organic market development is still very low (compared to the United States), there is still large potential for organic production. More knowledge may also translate into higher consumption of organic foods and further development of the organics market in Poland.

The relationship had been expected to be similar as well for the U.S. students, but in the United States, the relationship is small and opposite. It may mean that knowledge of organics can be not pro-organic for the U.S. students so it may create negative image of organic farming.

Having different knowledge and beliefs about organic products, respondents may be also characterized by different purchasing factors for organic food products.

### **Attitudes Towards Purchase and Consumption of Organic Food Products**

Among the reasons for consumption, there were different relationships to the frequency of consumption of organic food for students from the two countries.

Polish students were 14.05% more likely to eat organic food if they stated they consume these products because they are something new. Students from the United States presented an opposite attitude. This can be explained by the fact that organic food is still not common in Poland. There is willingness among students to try

something new and different from conventional products. In case of United States, organic foods exist in almost all supermarkets and do not catch people's attention as something "new." Therefore, it is possible that if students from the United States thought organic food was new, they were already showing a lack of interest, and were less likely to be organic purchasers.

Another factor which influenced the decision to buy organic food was significant only for U.S. students. Students from the United States said that they buy organic because they want to support organic farmers. They are 16.54% more likely to consume organic products more frequently if this factor is important for them.

Respondents in the United States may support organic farmers because they assume they are small, local farmers, and the support goes directly to them, which may often not be true. Polish consumers, knowing that organic farmers in Poland receive financial subsidies, may pay less attention to the income of organic farmers while purchasing organic food.

However, there were not many differences between Polish and U.S. students in case of the purchasing factor "synthetic pesticides are not allowed in production," but this variable did not behave in the manner expected. The literature suggests that organic foods being produced without synthetic pesticides are one of the drivers for buying organic products (Hoefkens et al. 2009). This analysis suggests that in both the United States and Poland other factors have more of an impact on consumption frequency of organic products.

The purchasing factor "organic farming is environmentally friendly" had a significant impact on the consumption frequency of Polish and U.S., but in opposite ways. The fact that organic farming may positively affect the environment was a convincing reason for Polish students to consume organics more frequently. They

are 25.13% more likely to consume organics more frequently in this case. Students from the United States who thought organic farming is environmentally friendly were less likely to consume organic products as much. It may mean that U.S. students who said organic farming was environmentally friendly were not motivated enough to purchase organic products because of that.

At the same time purchasing factors like “organic food has better quality” and “organic products are healthier” did not influence statistically on the consumption frequency of organic food.

Some differences between U.S. and Polish students in case of barriers for purchasing organics were found. The higher cost of organic products had an impact on the decision to buy organics less frequently, but only for Polish students. Polish students were 14.47% more likely to consume organics less frequently if they say that “cost” is the barrier for purchasing organic products.

This may be explained by the lower income of Polish students in comparison to students in the United States. U.S. students did not find higher cost of organic food as a barrier. It is interesting that U.S. students are even more likely to buy organic if they are aware of higher costs for organics. This situation may be explained by better financial situation of U.S. students. At the same time they may find a higher price for organic as paying for some additional value or attributes of organic food in which they believe in. They may also be more aware about these attributes than students in Poland. It is also worth mentioning that the low level of development of the organic market in Poland may create much higher prices of organic products than in the United States. In Poland, the lack of organic products on the market, lack of suppliers and the underdeveloped organic market chain is likely the cause these higher prices.

With further development of the organic market, prices for organic products in Poland should be more stable and their variety may increase.

Students in both countries would buy organics more frequently if the variety was better. They are 12.56% more likely to eat organics less frequently if they agree that “insufficient variety” of organic products is the barrier to purchasing organics. This problem is especially important to Poland where the market is still not developed. Again it shows that demand for organic food exists, but that one of the essential problems is lack of variety.

Also interesting is the fact that availability of organic products as the barrier did not influence the consumption frequency of organics. It was expected that students, especially in Poland, would react to the lack of availability of organic products by indicating they purchase less frequently. Availability was not a barrier for U.S. students. This may be understandable, given the fact that in the United States organic products are available in almost all supermarkets.

Another explanation may be that variable for “variety” is substituting for the variable “availability,” so the lack of availability is seen more as a lack of variety. This may mean that students from both countries would consume organics more frequently if a greater variety of organics is easy available for purchasers.

However, students in the United States and Poland did present different attitudes in terms of the relationship between frequency of consuming organics and ease of finding organic products in their area. This variable did not behave in the manner expected in case of Polish respondents. They consume organics less frequently if they say that it is easy to find these products in their area.

It may be that people who consume organics less frequently do not have an idea about lack of availability of organic products. In other words, only the people

who are interested in consumption of organics know how difficult is to find these products in Poland. In the survey only 30% of Polish students admitted that it is easy for them to find organic products in their area. At the same time students in the United States are 8.87% more likely to consume organics more frequently if they say they do not have problems finding organic products in their area. This is what was generally expected. In the questionnaire more than 70% of the U.S. students said it is easy to find organics in their area.

In both countries students who are responsible for their own shopping are 45.57% more likely to consume organics more frequently. Similar results can be found in the literature. People who are responsible for buying food are often better informed about the diet and the products they are interested in.

In the survey respondents were also asked at what price difference (willingness to pay) they would select organic food products in comparison to conventional products. In general, students in both countries would pay around 10% more for organic products. However this variable was not statistically related in the consumption frequency of organics. The lack of a relationship between WTP and frequency of consumption of organic food may mean that buyers of organic products have different opinions about the price for these products. Some of them may expect low price for organics but others may be willing to pay more for potential additional attributes of organic food in which they may believe in.

The model also investigated the relationship between the country of the respondents and the consumption frequency of organics. Based only on the country variable there are not any significant differences between the United States and Poland in terms of the frequency of consumption of organics.

## **Summary**

The Ordered Probability Model was used to investigate the frequency of consumption of organic food products. Observations with missing information were deleted leaving 349 usable observations. Model used 54 variables, one dependent variable (frequency of consumption of organic products) and 53 independent variables. Relationships between consumption frequency of organic products and specific variables had been investigated and several differences between the United States and Poland were found. The chapter presents conclusions which include a comparison of the results from Poland and the United States, and final remarks about the development of the organic market in Poland.

Table 5-1. Ordered Probability Model Results

Variable	Coefficient	Standard Error	b/St.Er.	P[ Z >z	Mean of X
Freqcons	-4.651	2.109	-2.205	.027	
Gender	.154	.421	.367	.713	.593
Genderl	-.242	.456	-.532	.594	.404
Eatbehav1	-.669	.189	-3.539	.000	4.323
Eatbehav1l	.574	.221	2.597	.009	3.255
Eatbehav2	.281	.201	1.399	.161	2.842
Eatbehav2l	-.239	.218	-1.095	.273	2.071
Eatbehav3	-.178	.161	-1.105	.269	2.891
Eatbehav3l	.140	.178	.787	.431	2.171
Eatbehav4	-.235	.164	-1.429	.153	3.613
Eatbehav4l	.315	.189	1.664	.096	2.730
Yestgood	.202	.062	3.232	.001	9.409
Yestgoodl	-.176	.070	-2.521	.011	6.839
Yestbad	-.052	.091	-.570	.568	7.292
Yestbadl	.026	.100	.259	.795	5.438
Country	2.154	2.315	.930	.352	.733
Superm	.348	.125	2.780	.005	2.908
Superml	.241	.141	1.708	.087	2.174
Orgstore	-.361	.174	-2.076	.037	1.664
Orgstorel	.544	.194	2.802	.005	1.237
Directorg	.387	.117	3.292	.001	1.398
Directorgl	-.332	.163	-2.034	.041	.916
Farmarkt	.269	.136	1.978	.048	2.057
Farmarktl	-.365	.167	-2.183	.029	1.237
Subjknow	-.074	.185	-.401	.688	2.762
Subjknowl	.393	.203	1.929	.053	1.985
Objknow	.232	.125	1.846	.064	5.805
Objknowl	-.304	.135	-2.257	.024	4.186
Factdifferent	.372	.181	2.048	.040	2.753
Factdifferentl	-.453	.197	-2.298	.021	2.020
Factsupport	-.209	.193	-1.084	.278	3.240
Factsupportl	.437	.216	2.026	.042	2.438
Factqualit	.140	.286	.489	.624	3.810
Factqualitl	-.108	.312	-.346	.729	2.744
Factpest	-.498	.316	-1.574	.115	3.742
Factpestl	.496	.333	1.492	.135	2.681
Facthealth	.450	.330	1.364	.172	3.885
Facthealthl	-.225	.352	-.638	.523	2.793
Factenvir	.665	.260	2.553	.010	3.810
Factenvirl	-.860	.282	-3.043	.002	2.776
Barravail	-.057	.215	-.268	.788	3.498
Barravaill	.049	.232	.213	.831	2.527
Barrcost	-.383	.207	-1.844	.065	4.226
Barrcostl	.402	.232	1.728	.084	3.088
Barrvariet	-.332	.201	-1.655	.098	3.111
Barrvarietl	.210	.224	.935	.349	2.249
Barrinfo	.116	.209	.556	.578	3.303
Barrinfol	-.083	.228	-.366	.714	2.375
Easyfind	-.837	.415	-2.017	.043	.601
Easyfindl	1.063	.455	2.337	.019	.521
Primary	1.232	.718	1.716	.086	.914
Primaryl	-1.183	.774	-1.528	.126	.676
WTP	.282	.210	1.342	.179	3.785
WTPI	-.293	.221	-1.323	.186	2.773

Table 5-2. Summary of Marginal Effects for Ordered Probability Model

Variable	Y=00	Y=01	Y=02	Y=03
Freqcons	.0000	.0000	.0000	.0000
Gender	-.0585	.0264	.0305	.0016
Genderl	.0921	-.0422	-.0475	-.0024
Eatbehav1	.2527	-.1114	-.1344	-.0070
Eatbehav1l	-.2171	.0957	.1154	.0060
Eatbehav2	-.1062	.0468	.0565	.0029
Eatbehav2l	.0903	-.0398	-.0480	-.0025
Eatbehav3	.0676	-.0298	-.0359	-.0019
Eatbehav3l	-.0531	.0234	.0282	.0015
Eatbehav4	.0890	-.0392	-.0473	-.0024
Eatbehav4l	-.1192	.0525	.0634	.0033
Yestgood	-.0765	.0337	.0407	.0021
Yestgoodl	.0667	-.0294	-.0354	-.0018
Yestbad	.0197	-.0087	-.0105	-.0005
Yestbadl	-.0098	.0043	.0052	.0003
Country	-.7114	.4250	.2698	.0167
Superm	-.1315	.0579	.0699	.0036
Superml	.1365	-.0602	-.0726	-.0038
Orgstore	-.1462	.0644	.0777	.0040
Orgstorel	-.1018	.0449	.0541	.0028
Directorg	-.0912	.0402	.0485	.0025
Directorgl	-.2057	.0907	.1094	.0057
Farmarkt	.1258	-.0554	-.0669	-.0035
Farmarktl	.1380	-.0608	-.0734	-.0038
Subjknow	.0281	-.0124	-.0149	-.0008
Subjknowl	-.1485	.0655	.0789	.0041
Objknow	-.0878	.0387	.0467	.0024
Objknowl	.1152	-.0508	-.0612	-.0032
Factdifferent	-.1405	.0619	.0747	.0039
Factdifferentl	.1714	-.0755	-.0911	-.0047
Factsupport	.0792	-.0349	-.0421	-.0022
Factsupportl	-.1654	.0729	.0879	.0046
Factqualit	-.0530	.0234	.0282	.0015
Factqualitl	.0408	-.0180	-.0217	-.0011
Factpest	.1883	-.0830	-.1001	-.0052
Factpestl	-.1877	.0827	.0998	.0052
Facthealth	-.1703	.0751	.0905	.0047
Facthealthl	.0851	-.0375	-.0452	-.0023
Factenvir	-.2513	.1108	.1336	.0069
Factenvirl	.3251	-.1433	-.1728	-.0089
Barravail	.0218	-.0096	-.0116	-.0006
Barravaill	-.0187	.0082	.0099	.0005
Barrcost	.1447	-.0638	-.0769	-.0040
Barrcostl	-.1519	.0670	.0808	.0042
Barrvariet	.1256	-.0554	-.0668	-.0035
Barrvarietl	-.0793	.0350	.0422	.0022
Barrinfo	-.0440	.0194	.0234	.0012
Barrinfo	.0316	-.0139	-.0168	-.0009
Easyfind	.2993	-.1048	-.1817	-.0128
Easyfindl	-.3880	.1663	.2081	.0136
Primary	-.4557	.3144	.1367	.0047
Primaryl	.3919	-.0856	-.2786	-.0277
WTP	-.1067	.0470	.0567	.0029
WTPI	.1108	-.0488	-.0589	-.0030

## CHAPTER 6 CONCLUSIONS

### **Introduction**

Many differences in consumers' perceptions and consumption frequency of organic products between U.S. and Polish consumers may exist. These differences can be related to many general or specific issues. Some of the issues may be caused by different surroundings of the organic farming: governmental policy within a specific country or state, level of development of the economy (consumers' income) or organization of the food market. These differences can also be related to differences within the organic farming system that are different, such as policy (taxes, subsidies etc.), production requirements, or the level of organic market development (marketing channels, popularity, availability, prices etc.). Moreover differences between U.S. and Polish consumers on to the decision of how frequently to consume organics can be caused by demographic characteristics (gender, education etc.) or lifestyle in general (for example nutrition habits). This paper focuses on the differences in consumers' perceptions of organic products between Poland and the United States in relation to the level of organic market development in terms of sales and availability of organic products.

### **Comparison of the level of development of organic markets**

According to the Research Institute of Organic Agriculture FiBL the value of the Polish organic market in 2009 was 50 million Euros (71.55 million USD). It is estimated that the Polish organic market is growing about 15-20% per year. A recent EuroMonitor report stated that the value of the Polish organic market was 58.9 million Euros (84.3 million USD) in 2010 (EuroMonitor, 2011). However, according to PMR Publications, the value of the Polish organic market reached 400 million zł (100 million Euros / 143.1 million USD) in 2009 (PMR, 2010).

Compared to West Europe, the assortment of organic food in supermarkets is still very poor. Reasons for poor selection include insufficient demand and supply for organic products, lack of promotion of organic farming in Poland, and a system of organic subsidies for organic farmers that did not meet all expectations (Grzelak, 2009). Organic subsidies influenced the growth of the number of organic farms, but there was no impact on development of Polish organic market (Grzelak, 2009). The potential of further development of the Polish organic market is significant. In Western Europe, the organic market constitutes more than 2.5% in the whole food market. In Poland, the market share is only 0.2% .

The market for organic foods in the United States is much larger. The estimated value of the organic market was approximately 24.6 billion US Dollars (17.2 billion Euro) in 2008. This constituted approximately 2.5% of total food sales in the United States. According to the Organic Trade Association (OTA), the organic market grew more than 17.1% in 2007 and has a growth rate of 20% annually since the 1990s (Organic Trade Association, 2006).

With the organic food market accounting for 2.5% of the food market in the United States and only 0.2% in Poland, there is an observable difference in the level of development of this market. Survey respondents recognized this difference. Most of students in Poland said that it is not easy to find organic products in their area. In the U.S., where the organic market is better developed, respondents found it significantly easier to find these products. This difficulty in finding organic products was also included in a regression model estimating the frequency of consumption of organic foods. This variable was significantly related to the consumption frequency of organic food. Students in the United States are more likely to consume organics if they do not have problems in finding them in their area. Surprisingly, Polish students

were more likely to consume organics the less available they said organics were. This may be a result of the lack of market development and related lack of knowledge of the market. Students who did not consume organics as frequently might have rated them as more available because they are unaware of whether they are or are not available. Students who are interested in organics may rate them as less available because they have attempted to find the products.

The lower level of development of the organic market in Poland can also be characterized by the lack of organics in the supermarkets. In the United States, most organic food is sold at the supermarket (Dimitri & Oberholtzer, 2009). However, in Poland, the share of organics sold in supermarkets is low, though it is growing slowly (Żakowska-Biemans, 2011). This lack of organics in the supermarkets makes consumers make an extra effort to find the products.

Polish respondents mentioned cost and the availability of organic products as barriers which may lower the frequency of consumption. Students from the United States did not find costs of organics as a barrier.

Different levels of organic market development, lower availability, higher prices of organics, and lower levels of promotion may all cause different perceptions of organic products between Poland and the United States. Several differences between Polish and U.S. students were found in this research and are discussed further.

### **Comparison of the perception of organic products**

Respondents to the survey on organic food perceptions were in similar age. Respondents from the United States were mainly undergraduate students (bachelor's degree), while those from Poland were mainly pursuing their Master degrees (graduate students). Many students were pursuing their academic degrees in an

agricultural major. It could have influenced in positive way on the knowledge about organic products and organic farming in general.

Other variables related to demographics and personal lifestyles were included in the regression analysis to investigate if they were related to consumer perception and the decision on frequency of consumption of organic food products. One unexpected results was that gender did not affect the decision to eat organic food either in the U.S. or in Poland. It was expected that women consume more organic products as they normally care more about their diet and they are often more responsible for shopping for a households (Padel & Foster, 2005). But female and male respondents in this survey were mainly students and most of them live on their own. This may have decreased the impact of gender on the decision to eat organics.

The frequency of consumption of organics was influenced by variables related to personal lifestyle. With these variables, there were few differences between the United States and Poland. For example, respondents who reported a higher consumption of vegetables and fruits versus fast foods were more likely to have a higher frequency of consumption of organic products. This relation was stronger for Polish students. It may mean that especially in Poland there is a group of people who consume organics to enrich their good diet.

There was also a connection between students' opinion about their eating behavior and the decision to consume organics more frequently. In general, students from both countries are willing to consume organics more frequently if they felt they did not take care of their health with their diet. This may indicate that reasons other than health drive them towards eating organic food, such as concern for the environment, taste or the fashion.

Students from the United States were more against giving up foods they like even if they recognize the foods are not healthy. At the same time they are still interested in consuming organic food. Together, this may indicate that students in the United States pay a lot of attention to the taste of organic products, which is often considered as better than the taste of conventional products (Kihlberg & Risvik, 2007). Most previous research finds that consumers in the United States and Canada consider taste and other quality characteristics as the most significant factors impacting consumer demand. At the same time in the European Union, other drivers (freshness, health, food safety and environmental concerns) for demand for organics play the main role (Sandalidou et al., 2009).

Another factor that might impact demand for organics and frequency of consumption is knowledge and beliefs about organic farming. Students from both countries were found to have a good amount of knowledge about organic farming. Out of a possible score of eight on a knowledge test on organic farming, Polish students scored 6.0 and U.S. students scored 5.7 (the minimum score was 0, the maximum 8). This indicates both groups had a similar level of knowledge, and that their level of knowledge was relatively strong. However, the relation between the level of knowledge about organic farming and the frequency of consumption of organic products was opposite for students from the two countries. Polish students are more likely to consume organic products more frequently if they have better knowledge about organic farming. The improvement of that knowledge and promotion of organic farming may be drivers for further development of organic market in Poland. U.S. students consume organic food less frequently if they know more about organic farming. Though this seems counterintuitive, it may mean that demand for organic products in the U.S. may be based more on the marketing image

of organic food. This image portrayed by the media may not always contain correct information. Again, this may point to the concept that the demand for consumption of organic products can be driven mainly by quality characteristics of organic food. But the beliefs about these characteristics can be sometimes wrong. For example, consumers may consider organic products as healthier or tastier, but scientific research does not prove these statements. Then, as the level of knowledge about organic products and organic farming in general increases, U.S. consumers may decide their previous beliefs were incorrect, thus leading to a decrease in the consumption of organics.

Another reason for consumption of organics in Poland is related to the low level of development of organic market is that respondents of the survey were more likely to eat organic food if they stated they believe organic food is something new. There is willingness among Polish students to try something different from conventional products. This is different from the United States, where organic foods are available in almost all supermarkets and do not catch people's attention as something "new." Therefore, it is possible that if students from the United States thought organic food was new, they were already showing a lack of interest, and were less likely to be organic purchasers.

Another difference between U.S. students and Polish students related to the desire to support organic farmers. Students from Poland (where organic farmers receive financial subsidies), are not as concerned as U.S. students about the income received by organic farmers while purchasing organic food. In the United States, many people may see supporting organic farming as similar to supporting small or local farmers. There is a history in the United States of people wanting to support those farmers because they have an interest in this type of lifestyle. In other words,

people in the US may support organic farmers because they assume the support goes directly to them, not to big companies or businesses (whether that be the truth or not).

Organic farming may be seen as small and local not only in the United States but also in Poland. This view can be connected with the belief that organic farming is environmental friendly. In both countries believing that organic farming is environmental friendly was a significant factor in the decision to consume organics, but it influenced on this consumption differently. U.S. students even if they feel organic farming is good for the environment that is not enough of a reason to increase frequency of organic consumption for them. Polish students reacted positively, with students who felt organic farming was environmentally friendly more likely to purchase organics.

### **Final remarks**

Students from the United States and Poland have different perceptions about organic products. Some of these differences are likely explained by the different level of market development of organic markets.

The lack of development of organic market in Poland was observed as respondents rated the availability of organic products as low. Potential consumers of these products have to face higher prices of organics, likely resulting in lower popularity of these products. However, one reason Polish consumers were willing to consume organics more frequently is because they saw the products as something new. Though they may perceive the products to be new, and the market is less developed in the United States, general knowledge about organic food was high, and was similar to knowledge of U.S. students.

In addition to consuming organics more frequently because they see them as new, innovative products, Polish students also increased their consumption if they felt organic production was good for the environment. It does appear there is potential for consumer demand as the students were excited about the new products and new production method as a potential alternative to conventional agriculture.

They may consider themselves as potential buyers of organics. As knowledge had a significant and positive impact on consumption of organic foods, it seems that education and increases in awareness would help further development of organic market in Poland.

The organic market in the United States can be characterized by higher level of development than in Poland. Organic products are common and available in most of the supermarkets. U.S. students did not find price for organics as a barrier to purchase.

They may consider higher price for organics as paying for some additional attributes of organics in which they believe in. These attributes and qualities may be considered as one of the main reason of purchasing organics in the United States. This corresponds with previous research which has found that quality characteristics (especially taste) are the main drivers of demand for organics in the United States. At the same time other potential benefits of organics in which U.S consumers may believe, like the fact the organic farming is environmentally friendly, were not strong enough reasons to increase frequency of the consumption of organics.

However U.S. consumers mentioned the importance of supporting local organic farmers so it can be said they are also care about other benefits then their own. Further research may find that by changing the paradigms and by explaining the importance of additional potential benefits of purchasing organic products (especially

the fact that it may be environmentally friendly) organic market in the United States can have still many chances for further development.

## APPENDIX QUESTIONNAIRE

**Q1 Thank you for agreeing to participate in our survey today. The purpose of this survey is to better understand consumer perception of organic products. Please note that there are no right or wrong answers to the following questions. Please be assured that all answers will be kept anonymous and used only for the purpose of this research. In this survey, you will be asked to answer a series of questions that should take you approximately 15 minutes to complete. There are no expected risks or benefits to you for participating in this survey, and you will not receive any compensation for participating. The survey is anonymous and your participation is voluntary. You have the right to withdraw from the study at any time by exiting the survey. If you have questions about the survey, you can contact Dr. Lisa House, PO Box 110240, Gainesville, FL 32611, phone 352 392-1826. For questions about your rights as a research participant in the study, you can contact IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 352 392-0433. By answering the next question, you are indicating that you voluntarily agree to participate in this survey.**

- I agree to participate
- I choose not to participate

**Q2 How often do you eat organic food products?**

- Less than Once a Month
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-4 Times a Week
- Everyday
- Several times per day

**Q3 What percent of your purchases of the following products are organic (using quantity, not value)?**

	Do not purchase organic 0%	1-10%	11-50%	51-99%	100%
Fruits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eggs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk and Dairy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q4 Are you eating more or less organic food products compared to last year?**

- I buy more organic products now
- I buy as many organic products as before
- I buy less organic products now

**Q5 Are you eating more or less organic food products compared to 5 years ago?**

- I buy more organic products now
- I buy as many organic products as before
- I buy less organic products now

**Q6 How often do you obtain organic products in the following places?**

	Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	Several times a Week	Daily
Supermarkets/Grocery stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Specialty grocery stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic food stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Direct sales from a farm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farmers markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Own organic garden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q7 Indicate your level of agreement with the following statements:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Compared to an average person, I know a lot about organic products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know a lot about how I should assess the quality of organic products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People consider me an expert in the field of organic food products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q8 Please indicate if you believe the following statements are true or false.**

	The following statements are...		Your level of certainty is...				
	True	Untrue	Very low	Low	Average	High	Very high
Organic farmers are allow to use synthetic pesticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flavor enhancers are allowed in organic products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farmers use synthetic fertilizers for their crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farmers may use genetically modified seeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Every year, for verification, organic farms are inspected to see if all requirements of organic farming are being met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farmers have to comply with all other legal rules valid for conventional farmers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
'Organic in conversion' means a farm is being in the process of transition to organic and does not need to comply with all rules associated with organic farming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products can be irradiated to prolong their shelf life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q9 Indicate your level of agreement with the following statements:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Organic products taste better than conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products do not contain residues of synthetic pesticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a greater biodiversity (insects, plants, weeds ...) on and around organic farms compared to conventional farms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is less contamination of groundwater on organic farms than conventional farms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products contain more harmful fungi than conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products are among the most controlled products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products contain less unwanted substances (eg. Pesticides and nitrates) than conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products contain more nutrients (eg. vitamins and minerals) than conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products are healthier than conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q10 How often do you use the following sources to obtain information about organic products?**

	Never	Rarely	Sometimes	Quite Often	Very Often
Organic farming certification services	<input type="radio"/>				
Other organic consumers	<input type="radio"/>				
Organic farmers	<input type="radio"/>				
Organic product labels	<input type="radio"/>				
Demonstrations in supermarkets	<input type="radio"/>				
Organic shops	<input type="radio"/>				
Scientists (Doctor, Nutritionist)	<input type="radio"/>				
Media (newspapers, television, radio)	<input type="radio"/>				
Own internet search	<input type="radio"/>				
Friends, family	<input type="radio"/>				
Scientific magazines	<input type="radio"/>				

**Q11 Indicate how much do you trust to the information about organic products from following sources?**

	Distrust	Distrust slightly	Neither trust nor distrust	Trust slightly	Trust completely
Organic farming certification services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other organic consumers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farmers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic product labels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrations in supermarkets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic shops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scientists (Doctor, Nutritionist)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Media (newspapers, television, radio)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Own internet search	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends, family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q12 What are the factors for purchasing organic products?**

	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important
It's something different	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products are produced in a particular location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am supporting organic farmers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farms are inspected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic food has better quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic food has better taste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Genetic modification is not allowed in organic foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Synthetic pesticides are not allowed in production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products are healthier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farming is environmentally friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farming is modern & trendy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic products are fresher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not trust conventional production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic food is better for my children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q13 Please indicate your level of agreement that the following factors are barriers to purchasing organic food products?**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appearance of the product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reliability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is in fashion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient variety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too much effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too little information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too many organic labels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of advertising of organic farming and organic products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Little or no difference between organic and conventional products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please enter Strongly Agree for this question	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q14 How easy is it for you to find organic foods in your area?**

- Very Difficult
- Difficult
- Neither easy, nor difficult
- Easy
- Very Easy

**Q15 Do you have to go to a special store or location to purchase organic foods? In other words do you go out of your way to purchase organic foods?**

- Yes
- No

**Q16 At what price difference would you select organic food products in comparison to conventional products (%)?**

- > 50% discount compared to conventional
- 1-49% discount compared to conventional
- the same price
- 0-10% premium compared to conventional
- 11-50% premium compared to conventional
- 51%-99% premium compared to conventional
- > 100% premium compared to conventional

**Q17 In my opinion a person who eats often organic products is...**

	1	2	3	4	5
ill:Healthy	<input type="radio"/>				
Ethical:Unethical	<input type="radio"/>				
Not environmentally conscious:Environmentally conscious	<input type="radio"/>				
Friendly:Notfriendly	<input type="radio"/>				
Old:Young	<input type="radio"/>				
Not critical:Critical	<input type="radio"/>				
Social:Unsociable	<input type="radio"/>				
Realistic:Idealistic	<input type="radio"/>				
Traditional:Modern	<input type="radio"/>				

**Q18 When I eat organic food products, I feel...**

	1	2	3	4	5
Bad:Good	<input type="radio"/>				
Dissatisfied:Satisfied	<input type="radio"/>				
Unpleasant:Pleasant	<input type="radio"/>				
Sad:Cheerful	<input type="radio"/>				
Negative:Positive	<input type="radio"/>				

**Q19 Indicate how strongly you agree or disagree with the following statements:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
My food choices affect my health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always choose the healthiest option, even if it is more expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some foods have a beneficial effect on my health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have control of my health no matter what I eat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't want to give up the foods that I like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select Strongly Agree to this question	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q20 How would you rate your:**

	Very Bad	Bad	Neither Good nor Bad	Good	Very Good
Eating habits:	<input type="radio"/>				
Knowledge of nutrition:	<input type="radio"/>				
Knowledge of healthy behaviors:	<input type="radio"/>				
Nutritional quality of your diet:	<input type="radio"/>				
Level of physical activity:	<input type="radio"/>				
Overall physical health in the present:	<input type="radio"/>				
Overall physical health over the past 5 years:	<input type="radio"/>				

**Q21 Yesterday, how many times did you...**

	0 times	1 times	2 times	3 or more times
Eat fruit?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drink fruit juice?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat a green salad?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat cooked vegetables?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat a hamburger, hot dog, or sausage?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat french fries or potato chips?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat cookies, doughnuts, pie or cake?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drink milk?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drink soda?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat out in a restaurant, fast-food place, diner, cafeteria, etc?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q22 On how many of the past 7 days did you:**

	0 days	1 day	2 days	3 days	4 days	5 days	6-7 days
Exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?	<input type="radio"/>						
Do stretching exercises, such as toe touching, knee bending, or leg stretching?	<input type="radio"/>						
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	<input type="radio"/>						
Walk or bicycle for at least 30 minutes at a time? (Include Walking or bicycling to or from class or work.)	<input type="radio"/>						
Take part in any other type of physical activity for at least 10 minutes?	<input type="radio"/>						

**Q23 What is your standing at school?**

- Freshman or Sophomore
- Junior or Senior
- Graduate student, pursuing a Masters or equivalent
- Graduate student, pursuing a PhD or equivalent

**Q24 What college are you?**

**Q25 What is the highest level of education your mother (or guardian) has?**

- Less than high school
- High School degree or equivalent
- Some college or technical school beyond high school
- Bachelor degree from college
- Advanced degree from college

**Q26 What is the highest level of education your father (or guardian) has?**

- Less than high school
- High School degree or equivalent
- Some college or technical school beyond high school
- Bachelor degree from college
- Advanced degree from college

**Q27 What is your height?**

**Q28 What is your weight?**

**Q29 Are you responsible for buying food at home?**

- Yes, all of the food
- Sometimes (refers to several times a month)
- No

**Q30 Are you or anyone in your immediate area already faced with the following diseases?**

	Yourself		Close family	
	Yes	No	Yes	No
Heart or cardiovascular disease	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diabetes (diabetes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obesity (overweight)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe case of fatigue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anorexia or bulimia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q31 In which year you were born?**

**Q32 What is your gender?**

- Female
- Male

**Q33 If there is anything you would like to add, feel free to make some comments or remarks:**

**Q34 Thank you for completing the survey. If you are completing this survey for extra credit in a class, please select the link below to submit your name. This will be kept in a seperate file so your responses to this survey will remain anonymous. If you are not completing this for credit, please select finish below.**

- Enter name for extra credit
- Finish survey

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