WESTERN INFLUENCE ON DIETARY HABITS IN THE POST-COMMUNIST CZECH REPUBLIC

By

LENKA HUMENIKOVA

Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

2001

Submitted to the Faculty of the
Graduate College of
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
December, 2003

WESTERN INFLUENCE ON DIETARY HABITS IN THE POST COMMUNIST CZECH REPUBLIC

Thesis Approved:

Thesis Advisor

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to thank to my advisor Dr. Gail Gates for her guidance, support and friendship through my graduate career. I greatly appreciate the time and effort she spent on mentoring and directing me during my thesis research. I would also like to thank my thesis committee members Drs. Lea Ebro and Gary Webb whose expert suggestions and assistance improved my thesis work. They provided steadfast support and helpful suggestions that greatly improved my thesis. I would like to thank my husband Tom Shriver. He has supported all of my educational activities, and continually encourages me to always set my goals high.

Finally, I would like to thank all of the people in the Czech Republic who helped facilitate this research, including the anonymous participants, the independent reviewers, and the medical professionals who contributed additional information into the project

TABLE OF CONTENTS

Table Page

Table

Page

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The Czech Republic, formerly Czechoslovakia, was one of the Eastern European countries under communist rule for more than 40 years, from 1948 to 1989 (Cepl, 1997; Ferber, 1994). The repressive living conditions under communism, along with the unhealthy dietary patterns of the population, made the general health status of Czech citizens among the worst in Europe. For example, during the 1970s and 1980s, Czechoslovakia had some of the highest rates of cardiovascular mortality and morbidity among European countries (Ginter, 1997; Bobak et al., 1997). The fall of communism in 1989 brought freedom to the Czech Republic, and stimulated significant political changes in the region. But in order to integrate successfully with the rest of the Western world, the Czech Republic has been forced to initiate changes in many areas such as politics, economy, education and health care.

Among the changes related to the evolving political and economic system have been positive changes in dietary patterns and nutrition behavior among Czech consumers. The health and nutrition status of the population improved greatly in the years following the fall of communism (Sovinova & Csemy, 2000; Andel, 1997; Elliott, 1995). Despite the rates of several chronic diseases remaining higher than compared the rates of the European Union nations, the Czech population appears to be moving toward achieving healthy lifestyles and overall well being.

The positive trends in the health and nutritional status of the Czech population are being influenced, and possibly even negated, by emerging dietary trends that have been brought into the country along with democracy and a free market. During the first several years after the 1989 Velvet Revolution, the influence of Western culture spread around the whole country and influenced millions of Czech citizens. The influx of foreign companies and corporations had a tremendous impact on the "post-communist" mentality of Czech consumers (Rojsek, 2001). Moreover, the Western invasion caused a tremendous increase in people's demand for foreign products (Delville, 1994; Janda et al., 1998). Importantly, this infusion of Western culture has greatly influenced the nutritional behavior and food choices of the Czech population. The variety and selection of food products increased tremendously when the free market replaced the centrally planned economy that existed in the Czechoslovakia for 40 years. Czech consumers were given the opportunity to make healthier food choices and to select among various kinds of fruits, vegetables and other products. However, the Czech Republic has been also introduced to numerous American fast food restaurants. In addition, Western convenience has been infused through quick and easy microwaveable meals and frozen dinners. As a result, many Czech citizens, particularly the younger population, appear to be choosing Western diets over traditional Czech foods. Consequently, the introduction of Western lifestyle has had a tremendous influence on traditional eating habits and food choices of Czech consumers.

There are several issues to be addressed in order to determine the influence of Western culture on the diet and eating habits of the Czech population. Despite positive

changes that occurred in health and nutritional status of Czech citizens after 1989, the introduction of Western lifestyles and Western diet might represent a serious threat to the improved health and dietary choices of the Czech individuals. The fast-food restaurants and "ready-to-eat" meals have become the "symbols" of American life and success for Czech citizens, thus endangering the recent improvements in dietary habits and nutrition behavior of the Czech population. However, other Western influences such as increased availability of low-fat foods and whole-wheat products, and increased health and nutrition awareness could improve health status of the Czech population.

Objectives

The objective 1 of this research study was to assess the extent of Western influence on dietary habits and nutrition behavior of two generations using 40 subjects in the Czech Republic. The purpose of this objective was to determine whether there were differences in nutrition behavior and food choices between the younger and older respondents.

The objective 2 of this study was to assess the dietary intake of the younger and older generations and to compare their nutrient intakes to the recommended nutrient amounts based on RDA (Food and Nutrition Board, 1989), and DRI (Food and Nutrition Board, 2002). The purpose of this objective was to evaluate whether the dietary intakes of younger subjects were superior or inferior when compared to the older subjects.

Research Questions

Question I: Do the trends of Western culture have a greater influence on the eating habits of the younger or older generations? Are the foods and nutrition behaviors that represent the Western influence preferred more by younger or older people in the Czech Republic?

Question II: What foods in individual food groups are being consumed and preferred by the younger and older generations?

Question III: Is the dietary intake of younger people in Czech Republic better or worse (in terms of calories, total fat, saturated fat and other nutrients) compared to the dietary intake of older people?

Assumptions

-The dietary intakes recorded for 24-hour recalls were reported accurately by the subjects and the intakes reflected their usual intake of foods and beverages

-The subjects estimated the consumption frequency of individual foods in food frequency questionnaire as accurately as possible

-True anthropometric data was reported by the subjects in the nutrition behavior questionnaire

-The sample of 40 respondents reflected average dietary intake of younger and older generations in the Czech Republic

-Food Processor nutrient analysis program computed accurate amounts of nutrients consumed by the subjects in this study

Limitations

-The small size of the study sample (40 respondents) does not allow making accurate generalizations about the younger and older generations in the Czech population (this study was preliminary and further research is needed)

-Subjects may not recall all foods and beverages they consumed during the past 24 hours when completing 24-hour recalls

-Respondents may under-report or over-report their height and weight, and their nutrient intakes due to incorrect estimation of portion sizes, leaving out cooking methods etc.

-The responses of the subjects may be based on perceived expectations from the subjects rather than their true opinions and feelings

-The use of a convenience sample limits the possibility to make generalizations

Definitions of Terms

Body Mass Index: Index that accounts for differences in body composition by defining the level of adiposity according to the relationship of weight to height (World Health Organization, 2001).

Acceptable Macronutrient Distribution Ranges (AMDR): Provide general guidelines regarding the proportions of energy yielding nutrients that are associated with low risk for developing chronic diseases. The AMDR are 45-65% for carbohydrate, and 20-35 % for fat (10% for saturated fat) (Food and Nutrition Board, 2002).

Recommended Dietary Allowances: The levels of intakes of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy people (Food and Nutrition Board, 1989).

Food Frequency Questionnaire: A questionnaire that contains a list of selected foods and beverages usually from several food groups. The subjects select how often they consume particular foods (daily, weekly or monthly).

Multiple Pass 24-Hour Recall: A dietary recall that consists of several stages. First, the interviewer asks the respondent to recall all foods and beverages consumed during the

previous 24 hours. Then, the interviewer asks the respondents to clarify and specify some of the reported foods or beverages and helps the subjects remember whether they consumed any other foods/drinks as snacks. Lastly, the interviewer asks about cooking methods used for food preparation and helps the subjects recall any condiments or other added ingredients (U.S. Department of Agriculture, 1998).

Abbreviations

RDA	Recommended Dietary Allowances
FFQ	Food Frequency Questionnaire
NBQ	Nutrition Behavior Questionnaire
CVD	Cardiovascular disease
WHO	World Health Organization
DRI	Dietary Reference Intakes
AMDR	Acceptable Macronutrient Distribution Ranges

CHAPTER II

REVIEW OF LITERATURE

In this section, I discuss relevant literature and research articles focusing on health and nutritional problems in the Czech Republic. I begin with basis facts about the Czech Republic, and background information on the traditional cuisine and lifestyle of the Czech population. I then discuss the health and nutritional problems in the former Czechoslovakia and emphasize some of the alarming health trends that escalated during socialism in this country. Next, I discuss the political and social changes that occurred in the Czech Republic in the late 1980s. Lastly, I discuss research studies related to changes in dietary habits and consumer behavior among Czech citizens since the 1989 Velvet Revolution.

Basic Facts about the Czech Republic

The Czech Republic is a small country with a population of 10,256,760 in central Europe (*World Almanac,* 2003). The country's neighbors are Germany in the West, Poland in the North, Slovakia in the East and Austria in the South (Figure 2.1). The population consists of 94.4% Czechs, 3% Slovaks, and some minority groups that include Poles, Germans and Roma (*World Almanac*, 2003). The principal language in the Czech Republic is Czech and 99% of the population is literate (*World Almanac*, 2003).

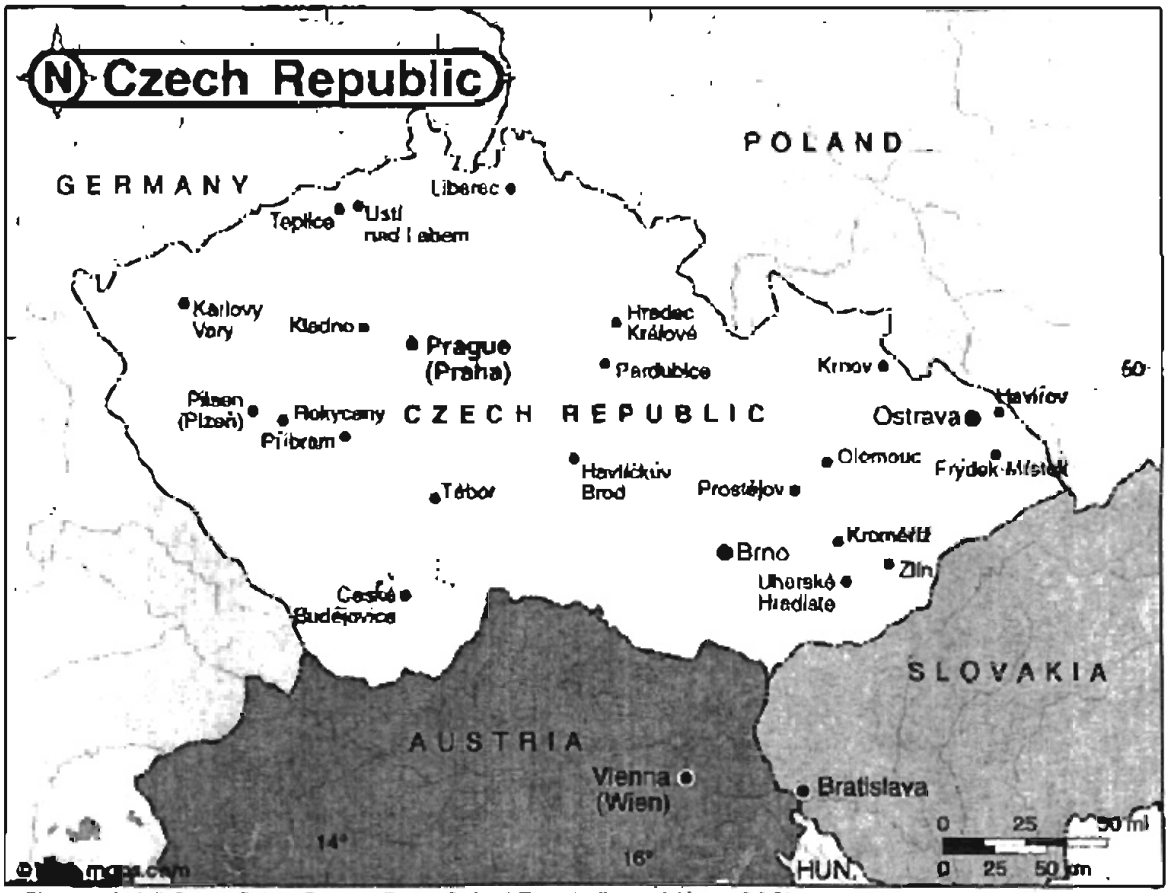

Figure 2.1 Map of the Czech Republic (Czech Republic, 1999)

Czech Republic has the second highest life expectancy at birth among other Eastern European nations, including Hungary, Poland, Bulgaria, Romania, Slovakia, Slovenia, Estonia, Latvia and Lithuania, including both men and women (71.5 years for men; 78.7 years for women) (World Health Organization [WHO], 2001). The life expectancy in Czech, however, is still 4 years shorter than the average life expectancy in European Union (WHO, 2001). Within the Czech population, 16.8% are people of age 0-14, 69.4% of age 15-64, and 13.8% are people 65 years old and older (WHO, 2001). The number of births per 1000 population (9.1) is lower than the number of deaths per 1000 population (10.8) (WHO, 2001). Therefore, the trend in the Czech Republic is moving toward an older population.

Traditional Czech Diet and Consumption Patterns

In this section I describe the traditional Czech diet. This serves as background for understanding the normal dietary patterns of Czech citizens. I also discuss the importance of beer consumption throughout the country.

Czech Cuisine and Traditional Food Choices

Czech cuisine has a long history among European nations, with the first printed Czech cookbook in 1535 (Lanska, 2003). The Czech cuisine, as any other national cuisine, evolved based on variety of food sources and regional and national customs/norms

of the country (Simoncic & Kruzliak, 1984; Trichopoulou et al., 2002). Historically, there have been differences in dietary patterns between the northern and southern parts of Europe that have been rooted in food availability in each region (WHO, 2001). While the Czech diet is very similar to the diet of other Eastern/Central European nations, it might be best classified as a northern European diet (WHO, 2001). The northern European diet is based on a high availability of animal fats and sugar, and low availability of fruits and vegetables (WHO, 2001). Similarly, the traditional Czech diet is characterized by large amounts of meat and saturated fats, and by lower amounts of fruits and vegetables (Filiberti et al., 1995). Common staples in the Czech diet include pork, beef, wheat, and potatoes. Potatoes are the most widely spread vegetable consumed in the Czech region and have been a part of Czech diet for centuries (Benesova et al., 1999). The most common dishes prepared from potatoes include boiled potatoes, mashed potatoes, and other baked and boiled dishes (Lanska, 2003). Wheat flour is used extensively in Czech cuisine and is an essential ingredient for various dishes including soups, sauces, dumplings, pastry and yeast desserts (Benesova et al., 1999). Wheat and rye flours provide 40% of energy and protein intake, and 11.4% of fat needs in the diet of Czech population (Benesova et al., 1999).

Typical Czech meals are usually served as a combination of a meat serving saturated in sauce or accompanied by sauerkraut. The type of side dish depends on whether the dish includes sauce or sauerkraut. Regular dumplings, potato dumplings and potatoes may be served either with sauces or sauerkraut. Rice and pasta are traditionally served with various kinds of sauces only (Benesova et al., 1999). These food

combinations and many others have a long history in the country, with many variations within individual regions and even families. As a result, native Czech persons rarely change the basic ingredients in traditional meals. The main course of a traditional Czech lunch or dinner is often preceded by a beef, chicken or vegetable-based soup. Salads, pickled vegetables, or canned fruits accompany some of the traditional meals (Benesova et al., 1999). The popularity of various fruits and vegetables has been gradually increasing in Czech diets, primarily because of the increased availability of these foods in recent years, yet Czech people still consume relatively low amounts (WHO, 2001).

One of the most popular food items in the Czech diet are dumplings. The variety of Czech dumplings ranges from "regular" wheat dumplings and potato dumplings to so-called "hairy dumplings." The particular types of dumplings served with a meal are determined by well- established norms in Czech cuisine. For instance, meals that include cream-based sauces or sauerkraut, are generally served with "regular" wheat dumplings. A standard Czech traditional meal is "Svickova na Smetane" which includes a portion of roasted beef, wheat dumplings and a creamy sauce seasoned with paprika. The Czech national meal is "Veprova Pecene," which represents another classic example of the traditional Czech cuisine. This meal includes pork and sauerkraut, and it is traditionally served with wheat dumplings. Despite the popularity of dumplings, Czech cuisine contains relatively large amounts of boiled and mashed potatoes, rice, bread, and noodles, as mentioned above (Benesova et al., 1999; Lanska, 2003).

Along with dumplings, the Czech diet also includes a wide variety of meat and dairy products. Fatty meat products such as sausages and salamis remain relatively

popular among Czech people, and the overall meat consumption in the Czech Republic is higher than in many countries (Ginter, 1997). Beef and pork is used in Czech cuisine the most often, forming 75% of total meat consumption (Benesova et al., 1999). In addition, pork alone makes up 50% of overall meat consumption (Benesova et al., 1999). Due to the popularity of cream-based sauces, large amounts of butter and cream are used in typical Czech cuisine. In a comparative study of food consumption, Ginter (1997) examined the intake of butter among twelve different countries, including Czechoslovakia. In his study, Czechoslovakia ranked second highest among the 12 countries in terms of butter consumption, with the average person consuming 7.1 kilograms of butter per year.

Sweets and desserts represent another important part of Czech traditional cuisine and diet. Czech pastries are well-known around the world, and the Czech "Kolace" is particularly popular. The preparation of Czech pastries requires basic pastry ingredients; however, the Czech pastries have traditional fillings, including poppy seed, plums, and "tvaroh" (Czech cheese similar to American cottage cheese). Tvaroh is one of the most popular ingredients, and is widely used in a variety of Czech cakes, pies, and other desserts. Czech pastries and baked goods are very popular among the population, and are important staples in traditional diet (Benesova et al., 1999). Many Czech people consume various pastries for breakfast, or/and as a snack during the day. The grocery stores offer a broad range of these products and specialized bakeries are very common in every Czech town.

The history of communism in the country had a significant impact on the eating habits and dietary patterns of Czech individuals. The Czech diet was greatly influenced

by the lifestyle that many people developed during the communist regime. For example, many women were frustrated from working at low-level jobs for almost no salary that were created for them by the communist regime, so many of them gave up their work life and devoted themselves to their families. Thus, their primary role was focused on taking care of households and preparing meals for the family (Ferber, 1994). As a result, the diet of Czech population, especially men, was based on home-cooked meals prepared from fresh and wholesome ingredients rather than the use of instant and precooked meals. The situation of women has somewhat changed since the communist regime, with many women returning to the workforce, however, many women are still expected to continue cooking on daily basis for their families. Therefore, many traditional Czech recipes had to be simplified over time due to the high demand for time and amount of ingredients these recipes required (Lanska, 2003).

Alcohol Consumption

Consumption of beer and other alcoholic beverages represents a traditional aspect of the Czech diet and lifestyle. Similar to some other Eastern European countries, such as Slovakia and Poland, alcohol remains an important part of Czech life as it plays a significant role in family and other social gatherings (Krosnar, 2002). The country's rich history of beer breweries is ingrained in the Czech nation, and Czech people are extremely proud of their beer tradition. For example, Pilsner Urqueall is popular throughout Europe and in other parts of the world. The consumption of beer is highest among men; however,

it is also common for women to drink, especially with their meals. The social standards related to alcohol consumption, especially beer, are very relaxed in the Czech society. Czech beer is considered superior to other beers, and Czech people often consider it as preventive measures, or even as treatment, for certain health problems (Krosnar, 2002). In 1998 and 1999, the Czech Republic became the leading nation in consumption of beer per capita in the world. With 159.4 liters per person, Czech people consumed the highest amount of beer in the world followed by Irish and Germans (Brewers Association of Japan, 1999). Since 1993, the alcohol consumption in the Czech Republic has been increasing and it finally exceeded the average alcohol consumption in European Union (EU) in 1997 (WHO, 2001). The difference between the Czech Republic and the EU average was 0.5 liter (WHO, 2001).

Health and Nutritional Status of Population in the Communist Czechoslovakia

In this section I discuss the health status of Czech citizens during communism. Specially, I address the prevalence of chronic diseases in former Czechoslovakia and I link the high rates of these diseases to the repressive living conditions.

Prevalence of Chronic Diseases in Czechoslovakia

The Czech Republic, formerly Czechoslovakia, was under communist rule from 1948 to 1989. During the period of socialism, the health and nutritional status of

Czechoslovakian citizens significantly deteriorated and the rates of various chronic diseases, including cancer and obesity, increased. The prevalence of cardiovascular disease in Czechoslovakia increased significantly, and the rates of this disease gradually exceeded the highest levels of cardiovascular disease existing in Finland and the U.S. at that time (Ginter, 1997). A comparative study by Ginter (1997) examined the relationship between communism and cardiovascular mortality. The study examined the risk factors that are commonly associated with cardiovascular disease, while comparing these factors between several democratic and communist nations (Ginter, 1997). The findings demonstrated that the rates of the top three risk factors for cardiovascular disease (smoking, hypercholesterolemia and diastolic hypertension) were significantly higher in the communist than democratic nations (Ginter, 1997). Ginter's study also showed that the prevalence of hypercholesterolemia in Czechoslovakia in 1987-1988 was comparable to the alarming levels of this disease found in Northern Europe during a cardiovascular disease epidemic in Finland in 1960s (Ginter, 1997).

The high prevalence of cardiovascular mortality and morbidity was related to many other health problems associated with the Czech population. In addition to high rates of hypercholesterolemia and diabetes, Czech citizens suffered from increased levels of other risk factors for cardiovascular disease. A research study conducted by Bobak, Skodova, Pisa, Poledne, and Marmot (1997) showed that the proportion of people smoking in Czechoslovakia was very high, especially in men (45 percent of men versus 24 percent of women). Among other Eastern European countries, Czechoslovakian citizens had the highest mortality for trachea, bronchus and lung cancer until the mid-1980's

(WHO, 2001). Consequently, Czechoslovakia gradually began to show the highest mortality and morbidity rates from cardiovascular disease among European nations and the rest of the world (Ginter, 1997). In 1970, Czechoslovakia had the highest standard death rate (SDR) from cardiovascular disease (CVD) for males of age 0-64 among other Eastern European countries, including Hungary, Poland and others (WHO, 2001). The high prevalence of cardiovascular disease in Czechoslovakia, and in other communist countries, resulted in the low life expectancy relative to Western democratic nations (Bobak et al., 1997).

The statistical data emphasizing the deteriorated health status and dietary habits of Czech citizens during the communist regime is extensive. Mortality from all cancers continually increased from 1970 to 1990, and the rates of ischemic heart disease and cerebrovascular disease continuously exceeded the rates of other European nations (Filiberti, 1995; WHO, 2001). By the mid-1980's, standardized death rate (SDR) for cancer in males became the highest compared to many other Eastern European nations (WHO, 2001). In the last several decades, the incidence of higher proportion of body fat without being overweight (so-called "hidden obesity") also started increasing in the Czech nation (Parizkova, 1993). Furthermore, studies showed that 40 percent of middle-aged Czech adults were obese by the 1980s, closely following similar trends in the United States (Andel, 1997).

The Health and Nutrition Consequences of Communist Regime

The worsening health and nutritional status of people in former the Czechoslovakia was also related to the political situation in the country. The communist government ruled Czechoslovakia for more than 40 years and often enforced actions that further deteriorated the health and well being of Czech citizens. The ineffective centralized economy did not allow for the production of a variety of healthy foods, and the import of these products was minimized because of the "capitalist threat" from Western countries. One of the major reasons for extreme limitation of imports from foreign countries was to avoid food dependency on the Western "enemies" (Janda et al., 1998). As a result, the selection of nutritious foods was poor due to an extremely limited national food market and the anti-western sentiment among communists that conflicted with the importation of foreign products (Parizkova, 1993). There was a chronic shortage of various products, and the product demand, including food items, of Czech consumers was not satisfied at all by minimal supply of local, Czech products (Feick et al., 1995). Czechoslovakia's agriculture represented only 10.5% of the national economy and was unable to produce adequate amounts of food (Cumming, 1982). The major part of agricultural production consisted of producing old cattle and pork, which contained high levels of body fat. As a result, the production of leaner meats was limited (Parizkova, 1993). Furthermore, the communist government indirectly promoted unhealthy food choices by subsidizing full-cream milk, dairy, and high-fat animal products while keeping the prices of other products, such as fruits and vegetables relatively high (Elliot, 1995;

Ginter, 1997). In terms of the overall quality of diet, research findings indicated that the amount of carbohydrates in a typical Czech diet was below the recommended 50 percent, while the amount of protein was above the recommended 12 percent (Miquel & Laisney, 2001).

According to Filiberti, Kubik, Reissigova, Merlo, and Bonassi (1995), the composition of Czech diet is likely to be associated with higher rates of cardiovascular disease. Their study compared Italian and Czech diets to determine the differences between the dietary habits of these two nations, and to assess the relationship between diet and cardiovascular mortality. Czechs were found to consume significantly higher amounts of milk, eggs, sugar and meats than Italians (Filiberti et al., 1995). Interestingly, Czech consumers reported consuming the largest amounts of eggs, approximately 330-340 eggs per capita a year. On the other hand, Czechs were found to consume lower amounts of food items that should constitute the core of a well-balanced diet: fish, oil, fruit, and pasta (Filiberti et al., 1995).

Another study on Czech dietary patterns was conducted to compare food consumption patterns in eleven European countries and the U.S. The data collected from Czechoslovakia showed several negative dietary patterns relative to the rest of the selected countries. The consumption of fruits and vegetables was significantly lower in Czechoslovakia than in eight of the study countries, including West Germany and the U.S. (Ginter, 1997). The most alarming dietary characteristic of the Czech diet was the high consumption of butter (Ginter, 1997).

The political and economic system under the rule of a single socialist party also influenced the health care services in Czechoslovakia (Benoit & Heitlinger, 1998). While the provision of health care was free for all citizens, the quality of health care services lagged far behind the Western countries until the end of communist regime (WHO, 2001). For instance, health education was not provided to Czech citizens at any level, and the promotion of healthy lifestyle and nutrition was completely neglected (Ginter, 1997).

Political and Economic Changes in Czechoslovakia since the Late 1980s

In this section I discuss the importance of political and economic changes in Czech in 1989, and emphasize the effects of these changes on the health and nutritional status of Czech citizens. I also discuss how Western influence has affected consumer preferences.

1989 Transition to Democracy and Market Economy

The Velvet Revolution in November 1989 brought significant political changes, including democracy and freedom to the country. These changes had a tremendous impact on many aspects of Czech society, including health and consumer behavior. The communist regime was defeated after 40 years of totalitarian rule and Czechoslovakia became free of the socialist practices that were gradually leading toward an economic and social collapse. The centralized economy was replaced by free market and private ownership, and Czechoslovakia has focused on bringing its deteriorated economy back to

the levels that would be comparable to other Western European nations (Brada, 1991). After the 1989 revolution, the borders of the country opened for the first time in 40 years and Czech people were able to freely leave and return to their country without facing communist prosecution. As a result, Czechoslovakia became opened to the world market and many international companies started competing to introduce new products to the Czech nation (Brada, 1991). Czech consumers became exposed to many new products and brands that were not known and available for purchase in Czechoslovakia during communist regime (Rojsek, 2001; Feick et al., 1995). By 1992, the economic transition in Czechoslovakia, which later split into Czech Republic and Slovak Republic, has been one of the most successful transitions among the European post-communist countries (Hanel, 1992).

Changes in Dietary Choices and Consumer Behavior of Czech Population After 1989

The political, economic and social changes after 1989 influenced the nutrition and consumer behavior of Czech citizens in many positive ways. The subsidies of many food products, promoted by the communist government, were removed during price deregulation in 1991. As a result, the price of products such as beef, eggs and dairy products increased significantly (De Souza & Lundell, 1993). For example, the cost of butter increased 300% and the cost of salami doubled within a short period of time (Elliot, 1995). Consequently, the consumption of dairy products and meat products significantly decreased. According to a study by Krejci and Stikova (1994), the consumption of butter

alone decreased from 9.4 kilograms in 1989 to 5.4 kilograms in 1992. In addition, beef consumption fell from 28 kilograms per person in 1990 to 18.5 kilograms per person in 1995 (Andel, 1997). According to Janda, Rausser, and McCluskey (1998), higher prices of butter and dairy products also resulted in the increased import of animal and vegetable fats and oils that Czech consumers began to substitute for expensive butter and other milk products. The changes in market prices also greatly increased the consumption of various healthy foods, including fruits, vegetables and bread that served as a replacement for meat and dairy products (De Souza & Lundell, 1993). From 1990 to 1995, vegetable consumption increased from 66.6 kilograms per person to 78 kilograms per person. Fruit consumption increased as well during this period, from 59.7 kilograms to 72.1 kilograms per person (Andel, 1997). Especially high demand was noted for tropical and semi-tropical fruits that were virtually unknown among Czech consumers until 1989 (Janda et al., 1998).

The range of food products offered to the Czech consumers became much broader as the national market opened to foreign producers and suppliers. Compared to the period of communism, Czech families finally had the opportunity to choose among a wide variety of fruits, vegetables, lean meats and other food items that had not previously been available. In addition to a wide variety of products, many international brands started competing with each other within the same product lines, thus offering Czech consumers not only new products but also cheaper prices and better quality. Within several years after the 1989 Velvet Revolution, the Czech nation moved away from an extremely limited selection of government subsidized food products to a wide variety of

domestic and international products that were comparable to those sold in the Western European countries and the U.S. Moreover, the development of healthier eating habits became more realistic for Czech people due to the variety of foods in the stores that allowed for more nutritious food choices. For example, the sudden availability of good quality vegetable oils and margarine was reflected in their increasing popularity among the Czech population. In contrast, the consumption of animal fats high in saturated fatty acids gradually declined (Bobak et al., 1997).

Another factor that had a positive impact on health and nutrition behavior of the Czech nation was the change in peoples' mentality about health issues after 1989 Velvet Revolution (Andel, 1997). As the Czech Republic became exposed to the lifestyle of Western developed countries, new health trends and nutrition guidelines were introduced in the country. As a result, concern regarding health and dietary habits among Czech citizens has continued to grow. By being exposed to very intense advertising of various "healthy foods", the Czech consumers began to show increasing concern related to health aspects of the foods they consume on daily basis (Janda et al, 1998). For instance, the food import demand for breakfast cereals, previously unknown in Czechoslovakia, increased significantly after 1989 (Janda et al., 1998). Moreover, the emphasis on personal responsibility and health awareness became extremely important as the future of formerly socialist health care system became unclear (Andel, 1997). In 1990s, the new democratic government designed a series of plans for health care reform in the Czech Republic. The primary focus of the reform was to rebuild the existing health care system and to change the "socialist" approach to health and well being (Misconiova, 1992).

Furthermore, the new approach to health, nutrition and healthy lifestyle became a driving force for designing a variety of health education activities and nutrition programs by health care facilities around the country (Andel, 1997).

New Trends in the Czech Republic during the Post-communist Period

There have been a number of new trends in the Czech society since 1989. In this section I discuss the improvements of the health status and the infusion of Western culture in the Czech Republic.

Improved Health Status of the Czech Population

The health and nutrition status of the Czech population greatly benefited from the fall of the communist regime in the 1989 Velvet Revolution. The greater variety of foods, removal of product subsidies and increased health awareness became reflected in the improved health and dietary habits of the Czech citizens. The health statistical data show that the overall quality of health and well being of the Czech individuals is significantly better compared to the health status of the population under the communist regime. The rates of cardiovascular mortality and morbidity in middle-aged individuals decreased by 20% between 1990-1997 (Andel, 1997). By 1999, standardized death rate (SDR) for CVD in the age group 0-64 years was the lowest among many other post-communist Eastern European countries (WHO, 2001). Furthermore, the rates of ischemic heart

disease decreased by 44% since the early 1990's in the Czech Republic, and the standardized death rate for cerebrovascular disease decreased by 52% between 1985 and 1999 (WHO, 2001). The life expectancy of men increased from 68.1 years in 1989 to 70.5 years in 1997, and in women from 75.4 years to 77.5 years (Sovinova & Csemy, 2000). In 2001, the life expectancy in the Czech Republic was reported to be 71.5 years for men and 78.7 years for women (WHO, 2001). Consumption of healthy foods such as vegetables, fruits, and chicken has increased, especially among Czech women, while consumption of pork, sausages, butter and eggs has decreased over several years after the fall of communism (Ministry of Health, 1998). Moreover, the changes in individuals' dietary habits and consumer behavior became obvious in decreased rates of hypercholesterolemia and obesity in both men and women. Between 1988 and 1990, the mean total cholesterol levels decreased by 0.34 mmol/l in men, and by 0.27 mmol/l in women, with the highest improvements among younger generations (Bobak et al., 1997).

Introduction of Western Culture and Its Impact in the Czech Republic

The political and economic transition to democracy and a free market initiated many positive changes in health status, dietary patterns and consumer behavior of Czech citizens. The chronic disease rates declined for the first time in several decades, and health education and disease prevention became a priority of health care workers. However, the introduction of capitalism has also exposed the country to some of the potentially negative aspects of Western culture. Consequently, some of these trends have

been representing a new threat to the health and nutrition status of the Czech society since the early 1990s.

Immediately after the borders of Czechoslovakia opened in 1989, Western culture started influencing millions of Czechs around the entire country. Czech people were exposed to the Western lifestyle, including clothing, television shows, foods and drinks (Rojsek, 2001; Feick et al., 1995). The push for introducing new Western products and brands to the consumers was not limited only to the post-communist Czech Republic. For instance, Hungary, Poland and Russia have been experiencing the same patterns since the end of communist regimes in Eastern Europe (Rojsek, 2001). The influx of well-known foreign companies and corporations had a tremendous impact on the "post-communist" mentality of Czech population, their consumption patterns, and their consumer behavior (Rojsek, 2001). The Western invasion caused a tremendous increase in peoples' demand for various foreign products, mainly due to the chronic scarcity of such products during communism (Delville, 1994; Janda et al., 1998). More importantly, the Western trends have significantly influenced the food choices and nutrition behavior of the Czech population. In a short period of time, the Czech Republic was introduced to various new products, Western brands, retail stores, and fast food restaurants ranging from McDonalds and Burger King to Dunkin' Donuts and other similar restaurants.

The exposure to Western culture had a tremendous influence on the product demand and consumer behavior of the Czech consumers. According to Gabor (1991), the purchase and ownership of a Western brand product gained a symbolic value among many Eastern European consumers. Such products became a measure of wealth, well being and

social class in society (Gabor, 1991). While younger and wealthier people have been more likely to accept the Western culture, older people have been inclined to keep their original habits and cultural customs (Rojsek, 2001). In addition, some of the Western trends are more likely to influence men than women (Quinton et al., 1990). For instance, the frequency of eating in fast-food restaurants per week was shown to be higher in male adults in the U.S. (Quinton et al., 1990). The study by Rogers (1988) conducted in Australia also showed that men form the majority of fast-food eaters. According to the results of the study, 90% of people who eat in fast-food restaurants are males under 25 years of age (Rogers, 1988). Furthermore, women often have overall better dietary habits than men. The results of the study conducted by Fiala and Brazdova (2000) showed that women consumed considerably less processed meats, high-fat foods, and full-fat products, and higher amounts of low-fat dairy and whole wheat products.

Ritzer (2000) refers to the infusion of Western culture, including new brands, products, and fast food restaurants, as the process of "McDonaldization" of the society. McDonalds and other similar restaurants became a symbol of American culture and American lifestyle for the Czech citizens. As a result, it has become fashionable in Czech to eat hamburgers, pizzas and french-fries, especially for the younger generation. Many Czech people associate dining in Burger King or McDonalds with success, entertainment, and wealth (Ritzer, 2000). The success of fast-food restaurants in the Czech Republic can be explained by the basic principles of "McDonaldization" that have been attracting Czech consumers since the early 1990's. The four basic principles of "McDonaldization" are efficiency, calculability, predictability, and control (Ritzer, 2000).

Similar to customers in other developed countries, Czech consumers desire the efficiency of the fast-food meals, the bigger portions compared to other dining facilities, and the predictability of the menu and services in McDonald's restaurants (Ritzer, 2000). Unfortunately, the "McDonaldization" of the Czech society exposed Czech consumers to a variety of unhealthy foods that had not been previously available to them during the communist regime. In addition, Czech people have been exposed to other Western trends that might be influencing their eating habits and dietary choices. These trends include longer working hours, a higher percentage of women in workforce, and the consumption of instant and "ready-to-eat" meals (Delville, 1994).

As mentioned above, the political, economic and social changes in the years immediately following the transition caused a significant decrease in chronic diseases, and an improvement of dietary habits of the Czech population. Despite these positive health and nutrition trends that have emerged in the country after 1989, the health statistics collected in the Czech Republic document that the health status of Czech people has been continuously failing to reach the average standards of other European nations (WHO, 2001). By 1992, the rate of cardiovascular disease, cancer and other related diseases remained one of the highest in Europe (Andel, 1997). The rates of cerebrovascular disease, ischemic disease and cancer in the Czech Republic are still higher than the average rates of these diseases in European Union (EU) (WHO, 2001).

According to 1996 Czech Health Interview Survey, 10.5% of adult men and 12.1% of adult women had Body Mass Index (BMI) higher than 30. In addition, 19% of men between 45-54 years old and 28% of women between 65-74 years old had their BMI

higher than 25 (Institute of Health Information and Statistics [IHIS], 2001). According to World Health Organization standards, BMI of at least 30 kg/(m)^2 determines that an individual is obese, and BMI of at least 25 determines that an individual is overweight (WHO, 2001). Based on the data collected for the Sample Survey of the Health Status of the Czech Population in 1999, the average BMI for men was 25.9 and 24.8 for women (IHIS, 2001). Furthermore, 36.5% of men and 28.8% of women were classified as overweight with BMI of at least 27 kg/(m)^2 (IHIS, 2001). The lack of physical activity correlated with the large number of overweight/obese individuals, as revealed in the results of the health survey in 1999. The total of 34% men and 44% women reported having a sedentary lifestyle (IHIS, 2001).

These findings support the data from the World Health Report illustrating that the rates of obesity tripled in some areas of Eastern Europe since 1980's due to increased intakes of simple sugars, saturated fat, and decreased levels of exercise (WHO, 2002). Despite some positive changes that have emerged in dietary habits of the Czech population, many Czech consumers continue consuming excessive amounts of fats, meats, fish and eggs while consuming inadequate servings of vegetables, cereals, whole wheat products, fruits and legumes (WHO, 2001; Lanska, 2003).

There are several questions to be addressed in order to understand, explore and explain the impact of Western culture on Czech dietary habits. First, to what extent does Western culture influence the dietary choices of Czech individuals? Is the impact consistent across generations, or is the impact greater within the younger age group? How does the Western diet compare to the traditional Czech diet in relation to health and

nutritious food choices? Finally, has Western influence had a positive effect on nutritional status of Czech people?

CHAPTER III

RESEARCH METHODOLOGY

The main purposes of this research study were to assess the extent of Western influence on Czech dietary habits and to compare dietary profiles and nutrition behavior in two generations. The study's main hypothesis rested on the assumption that Western influence has a greater impact on the diet and nutrition behavior of the younger generation in the Czech Republic.

In this section I discuss the research methodology used in the study. I begin with the sampling procedures used to recruit study participants. I then discuss the nutritional assessment tools that were used to collect data on dietary habits and nutrition behavior of the participants, including food frequency questionnaire, nutrition behavior questionnaire and 24-hour recall. Finally, I outline the procedures that were used in data analysis.

Sampling

Convenience sampling was used to identify a total of 40 participants living in Pilsen (an industrial city of 200,000 inhabitants) or Prague (the capital of the Czech Republic; 1.2 million inhabitants). Sampling was conducted through personal recruitment and by posting flyers in public places. The flyers contained a description of the research study, activities required to be completed by the study participants, and contact

information for potential volunteers (Appendix A). After recruitment of the subjects, the study sample was divided into two groups of 20 each. Group 1 consisted of 10 males and 10 females between the ages of 18 and 30. Group 2 was composed of 10 males and 10 females aged 40 and older. Participation was completely confidential and anonymous. This research study was approved by the Institutional Review Board at Oklahoma State University in April 2002 (Appendix B).

All respondents were given a survey packet containing a food frequency questionnaire and nutrition behavior questionnaire. The subjects were given the option to complete the survey immediately after being recruited for the study, or to schedule a future meeting with the researcher. Subjects were identified by gender and age, and were given an identification number in order for the researcher to match the subjects' nutrition behavior questionnaires with their 24-hour recalls.

Food Frequency Questionnaire

The primary data for comparing the dietary intake and food choices between the two generations were collected from the food frequency questionnaire (Appendix C). The questionnaire (FFQ) consisted of several food groups with the list of specific food items within each group. Five food groups were included in the questionnaire ("dairy products," "grains, breads and cereals," "meat, fish and eggs," "fruits and fruit drinks," "vegetables," "sweets, desserts and other." The questionnaire was adapted from food frequency questionnaire published in Health Habits and History Questionnaire (HHHQ)

(Block et al., 1990a, 1990b). The questionnaire also contained additional food items that are typical in Eastern Europe cuisine, specifically in the Czech region. For instance, bread and potato dumplings were included in the "grains, breads and cereal" group because they represent a very important part of the Czech traditional diet. The subjects were asked to report their normal frequency of consumption for each item on the list. The frequency of food intake was classified into seven categories (>2 per day, 1 per day, 5-6 per week, 2-3 per week, 1 per week, 2-3 per month, <1 per month). The investigator assisted the subjects with completing the food frequency questionnaire.

The FFQ was translated from English to Czech language by the investigator who is a native Czech speaker. The translation was done prior administration of the FFQ to the subjects. Three English-speaking Czech citizens, who were not participating in the study, were recruited by the investigator to serve as independent consultants for the FFQ. All three individuals were less than 25 years old and had college education. The consultants were asked to review the Czech version of the FFQ and make comments and suggestions about the format and the types of foods included in the questionnaire. Their comments were then used to increase clarity and comprehensiveness of the questionnaire.

Nutrition Behavior Questionnaire

The nutrition behavior questionnaire was administered to the subjects in the survey packet containing FFQ (Appendix D). The nutrition behavior questionnaire (NBQ) consisted of twelve questions utilizing multiple choice answers. The main

purpose of the nutrition behavior questionnaire was to assess the degree of Western influence on eating habits in the two generations, and to determine some of the behaviors that might reflect the Western influence on their diet. The questions included in the questionnaire were related to the participants' food choices, changes in their diet, patterns of dining out, and other factors that influence their eating patterns and nutrition behavior. The last section of the questionnaire was designed to obtain information about the participants' age, weight, height, gender and occupation.

24-hour Recall

After the subjects finished the food frequency and nutrition behavior questionnaires, they were asked to complete a 24-hour recall. The 24-hour recall was conducted in the form of a short interview during which the subjects were asked to recall all foods and drinks they consumed from the morning of the previous day until the morning of the day of the interview. The multiple-pass 24-hour recall was used in this study (U.S. Department of Agriculture, 1998). In order to obtain accurate and useful data from the 24-hour recalls, the researcher educated the subjects on the accurate description of food items, and on proper estimation of portion sizes. After respondents recalled the foods and beverages they consumed in the previous 24 hours, the researcher asked additional probing questions. The additional questions were necessary to ensure that accurate and sufficient detail on the participants' dietary intake was collected. Lastly, subjects were asked to specify a cooking method they used for a particular meal, clarify a

type of food, or give a better estimation of serving size of a specific food item. The subjects were asked to recall any additional snacks or condiments they consumed within the same 24 hour period. In addition, the respondents were asked to report whether or not they took nutritional supplements. Subjects who were taking some form of vitamin or mineral supplements were asked to specify the type and frequency of the supplement consumption.

Data Analyses

Food Frequency Questionnaire

The data obtained from the food frequency questionnaire served as a primary tool for assessing the food choices and eating preferences of the younger and older generations. In the food frequency questionnaire, the primary analysis was focused on the types of foods commonly consumed by the respondents and the frequency of their consumption. In order to compare the dietary intake of younger and older generations, the assessment focused on the differences/similarities in dietary patterns of the two study groups. Therefore, the average frequency of consumption of selected foods was calculated for both groups. Among the items of special interest were foods that reflect an individual's intake of fat, saturated fat and cholesterol such as butter, margarine, salad dressings, pork, sausage, whole milk and other. These foods were grouped into special categories ("high-fat meats," "fried foods," "full-fat dairy," "fats/ oils," and "baked sweets") (Appendix

E). In order to determine a nature of the Western influence on the dietary habits of the younger and older generations, two other food categories were created. "Western high-fat foods" category included French-fries, pizza, doughnuts, and salad dressings. "Western low-fat foods" category included several types of low-fat dairy products, cereals, and whole-wheat products (Appendix E). Some of the food items had to be placed in more than one food category. French fries and doughnuts were simultaneously included in "fried foods" and "Western high-fat foods" categories. Salad dressings were included in "fats/oils" and "Western high-fat foods."

The emphasis in the FFQ was also placed on identifying the most frequently consumed food items in each food category. The dietary intake of the participants was also analyzed in terms of gender differences. The consumption of certain foods was compared between male and female respondents to determine what types of foods are preferred by men and women.

Data analysis of the food frequency questionnaire was conducted using the Statistical Package for Social Sciences (SPSS 10.0 for Macintosh; 1999). The level of significance for the tests performed was $p \leq 0.1$. The consumption frequencies of the selected foods between the older and younger groups, and between men and women, were compared by Chi-square test; however, levels of significance were not provided because of too many empty cells in the Chi-square analysis. The levels of the consumption frequency were classified into three categories (0=rarely; 1=moderately; 2=frequently). The categories derived from collapsing the original 7 levels of consumption frequency into

3 levels (rarely = 0 to 3 times a month; moderately = 1 to 3 times a week; frequently = 5-6 a week, once a day or >2 a day).

The differences in frequency of consumption of the specially created food categories (fried foods, high-fat meats, full-fat dairy products, products, fats/oils, baked sweets, Western high-fat foods, and Western low-fat foods) by older and younger generations, and men and women were analyzed using independent t-test. The consumption frequency for this test were kept in the original seven categories (0= <1 per month; 1= 2-3 per month; 2= 1 per week; 3= 2-3 per week; 4= 5-6 per week; 5= 1 per day; 6= >2 per day). The frequencies of consumption were added up for all food items within the food categories, and the total score was divided by the number of individual foods in each food category.

Nutrition Behavior Questionnaire

The data collected from the nutrition behavior questionnaire were used to assess whether the Western influence on dietary habits and nutrition behavior was greater in the younger generation than in the older generation. In addition, nutrition behavior and eating patterns of men were compared to women to determine whether there were gender differences. The data analysis was performed using the Statistical Package for Social Sciences (SPSS 10.0 for Macintosh; 1999). The level of significance was set at $p \leq 0.1$. Independent t-tests were used to analyze the questions that were related to the frequency

of consumption of meals, dining out, fast-foods, convenience foods, and instant meals (see NBQ; questions 1-11, Appendix D). Cross tabulations were conducted in order to describe the subjects' responses to the questions related to the respondents' satisfaction with dietary habits, factors influencing their eating habits, and purchase of new food products.

The descriptive statistics of the study sample were obtained from the last section of the NBQ. Each subject was asked to report his or her age, weight, height, occupation, and the status of employment. Height and weight data were used to calculate Body Mass Index (BMI) for each respondent. Mean age, height, weight, and BMI were calculated for younger and older groups, and men and women.

24-Hour Recall

All foods and beverages obtained from the 24-hour recalls were analyzed using the nutrient analysis software database Food Processor (version 7.4 ESHA Research, 1999-2000). The Food Processor database is based on typical American diet and contains more than 22,000 different foods and beverages (Food Processor 7.4, ESHA Research, 1999). Since this study was conducted with Czech citizens, several subjects reported consumption of foods and meals that are traditional for the Czech Republic, and therefore, they are not included in the Food Processor database. To perform an adequate nutrient analysis of the 24-hour recalls, the recipes of the typical foods and meals were entered by the researcher into the nutrition database. Examples of such traditional meals

reported by the subjects were "Svickova na Smetane" (a meal consisting of beef roast and creamy vegetable gravy), and potato salad that differs significantly from its American version. The recipes entered into the Food Processor database were obtained from a Czech traditional cookbook (Benesova et al., 1999).

Dietary intakes of the respondents were analyzed by entering all foods and beverages reported during the 24-hour recall into the nutrition analysis software. The main emphasis in the nutrient analysis was placed on the amount of energy, total fat, saturated fat, cholesterol, protein and fiber consumed by the subjects. The amount of energy was compared to the Recommended Energy Allowances, based on the subject's gender, age, weight, and height (Food and Nutrition Board, 1989). The intake of fat, saturated fat, cholesterol, protein, and fiber of every subject was compared to the DRIs based on the individuals' age, gender, weight and height (Food and Nutrition Board, 2002).

The Statistical Package for Social Sciences (SPSS 10.0, version for Macintosh, 1999) was used to compare the subjects' intake of calories, fat, saturated fat, cholesterol, protein and fiber to the recommended values. One-sample t-test was conducted to determine whether the calorie and nutrient intakes of the subjects were significantly different from their recommended values. To compare intakes of cholesterol, protein, and fiber between the younger and older generations, and men and women, independent t-tests were performed. In addition, the obtained data were analyzed in terms of types of foods eaten by each group of subjects. The level of significance for the tests was set at $p \leq 0.1$.

Hypotheses

The following hypothesis were analyzed in this study:

1) The eating patterns and food choices of the younger generation will more likely reflect the influence of Western culture on their diet when compared to the older generation.

   A) The younger subjects will report a significantly higher consumption frequency of Western high-fat foods.

   Statistical test performed: Independent t-test ($p \leq 0.1$)

   B) The younger generation will report significantly higher intake of Western low-fat foods.

   Statistical test performed: Independent t-test ($p \leq 0.1$)

   C) The younger generation will report significantly higher frequency of consumption of instant meals, instant soups, and frozen meals when compared to the older generation.

   Statistical test performed: Independent t-test ($p \leq 0.1$)

D) The younger subjects will report higher frequency of dining out in the Western –type restaurants, for example in fast-food restaurants, pizzerias, and other restaurants.

Statistical test performed: Independent t-test ($p \leq 0.1$)

2) The overall quality of the diet in the older generation will be higher compared to the diet of the younger generation (due to the increased availability of healthy food products on the market and other factors that allow younger Czechs to make healthy food choices).

A) The total fat intake (% energy) of the older generation will be significantly higher when compared to the younger generation.

Statistical test performed: Independent t-test ($p \leq 0.1$)

B) The proportion of energy from saturated fat will be higher in the diet of the older generation.

Statistical test performed: Independent t-test ($p \leq 0.1$)

C) The older generation will report consuming a significantly lower amount of fiber when compared with the younger generation.

Statistical test performed: Independent t-test ($p \leq 0.1$)

3) The eating patterns and food choices of men will more likely reflect the negative influence of Western culture on their diet. This trend will be reflected in men having a worse diet compared to women.

A) Men will report higher frequency of dining out in Western-type restaurants.

Statistical test performed: Independent t-test ($p \leq 0.1$)

B) Men will report a significantly higher consumption frequency of Western high-fat foods.

Statistical test performed: Independent t-test ($p \leq 0.1$)

C) Women will report significantly higher intake of Western low-fat foods.

Statistical test performed: Independent t-test ($p \leq 0.1$)

D) The total fat intake (% energy) of men will be higher when compared to women.

Statistical test performed: Independent t-test ($p \leq 0.1$)

CHAPTER IV

RESULTS

Demographic characteristics of subjects in the younger and older groups, and males and females are summarized in Tables 4.1, 4.2 and 4.3. There was a significant difference in age between the younger and older groups; however, this difference was established by the investigator in order to make comparisons between the younger and older generations (Table 4.1). The range of age for males and females in the younger generation was 20-28 and 18-28, respectively. The age range for males and females in the older generation was 40-60 and 48-76. There was a significant difference in mean weight and height between the younger and older generations. The older subjects reported significantly higher weight when compared to the younger subjects (Table 4.1). On the other hand, the younger respondents were taller than the older respondents (Table 4.1). There was no significant difference in BMI between the two study groups (Table 4.1).

Independent t-tests revealed significant differences in anthropometric measures between younger and older men, and women. Men in the younger generation were lighter and had a lower BMI (Table 4.2). There was no significant difference in height between the younger and older men (Table 4.2). Weight was similar in both generations of women (Table 4.3), however, BMI of older women was significantly higher when compared to younger women (Table 4.3). Women in the younger generation were taller than the older women (Table 4.3).

In the younger generation, 60% of the subjects were employed full-time (n=12), 25% of the subjects were students (n=5) and 3 subjects were completing their mandatory military service. In the older generation, 85% of the subjects had a full-time employment (n=17), including all the older men. In addition, 1 woman was employed part-time, and 2 women were retired. Neither young females nor young males took any vitamin or mineral supplements. Among the older subjects, 4 females reported taking calcium supplements on daily basis, and 1 female reported taking multivitamin supplement occasionally. Two older males reported taking multivitamin supplements, one occasionally and one on daily basis.

Food Frequency Questionnaire

Generation Comparison

Independent t-test revealed a significant difference in the consumption frequency of fried foods between the younger and older generation, with the younger generation consuming fried foods significantly more often (Table 4.4). After creating the new levels of consumption frequency (0=rarely, 1=moderately, 2=frequently), cross tabulations were performed for each food item within each food category. Fried chicken was consumed by 35% of the younger groups compared to only 20% of the older group (Table 4.5a). While most of the older subjects ate potato chips only rarely, 40% of the younger respondents reported consuming potato chips at moderate level (4.5a).

The younger group also reported a higher consumption of Western high-fat foods (Table 4.4). Pizza was consumed by 35% of the younger subjects moderately, while 100% of the older subjects ate pizza rarely. Half of the younger subjects consumed French fries moderately (1 to 3 times a week) compared to the older generation while 90% of the subjects consumed French fries rarely (less than 3 times a month) (4.5a).

The comparison of the consumption frequency of the other food categories (high-fat meats, full-fat dairy products, fats/oils, baked sweets, and Western low-fat foods) by independent t-test revealed no significant differences (Table 4.4). However, cross tabulations of all food items (using frequency levels "rarely," "moderately," and "frequently") suggested that there maybe differences in consumption of certain individual foods within the food categories.

Among the high-fat meats, roasted/grilled or baked pork was reported to be consumed moderately by 60% of the older subjects compared to only 35% of the younger subjects. Potted meat was consumed moderately by 40% of the younger subjects compared to only 15% of the older subjects. The consumption frequency of chicken with skin, sausages, salami, bacon, organ meats, hot dogs and other high-fat meats was similar between the two generations.

In full-fat dairy group, the number of subjects who reported consuming whole milk, full-fat hard cheese and full-fat cheese spread frequently appeared to be higher in the younger generation (Table 4.5b). The frequency consumption of several foods classified as fats/oils also may differ between the two generations (Table 4.5c). There was an apparent difference in consumption of butter between the two groups, with the younger

generation consuming more often than the older generation (Table 4.5c). Margarine, lard, salad dressing with mayonnaise, tartar sauce and sour cream were consumed by both generations at similar rates (Table 4.5c). In addition, pastry, fruit "kolache", and cookies were consumed more frequently by the younger generation when compared to the older generation (Table 4.5d).

Within the Western low-fat dairy foods, the frequency consumption of low-fat milk, fat-free milk, and nonfat yogurt was higher in the older generation (Table 4.6 a). Within the Western low-fat grains, the frequent consumption of whole wheat bread was higher among the older group when compared to the younger group (Table 4.6b). Half of the older group reported consuming whole wheat bread frequently, while only 35% of the younger group ate whole wheat bread frequently (Table 4.6b). Breakfast cereals were consumed slightly more by the younger group (Table 4.6b). The consumption of oatmeal and musli was similar for both groups (Table 4.6b).

For the younger generation, the most frequently consumed foods in each food category were chicken with skin (85% frequently), full-fat hard cheese (35% frequently), low-fat yogurt (20% frequently), butter (50% frequently), and pastry (40% frequently). For the older subjects, the most frequently consumed foods were chicken with skin (85% frequently), buttermilk (30% frequently), low-fat milk (30% frequently), margarine (35% frequently), and cookies (20% frequently).

Gender Comparison

Comparison between male and female subjects of the study was performed to determine whether gender differences play a significant role in the consumption frequency and preference of certain foods. Independent t-test suggested a significant difference in the consumption frequency of high-fat meats ($p=0.002$) (Table 4.7a). Further analysis of the gender differences in consumption frequency of various foods was conducted using cross tabulations. The results revealed an apparent difference in the consumption of pork hot dogs and pork between men and women, with men consuming both foods more frequently compared to women (Table 4.7b). Males reported higher consumption rate of sausage and salami as well, with 40% consuming sausage moderately and 25% consuming salami frequently (Table 4.7b).

There were no significant differences in consumption frequency of fried foods, full-fat dairy, baked sweets, fats/oils, Western high-fat foods, and Western low-fat foods between men and women (Table 4.7a). Cross tabulations, however, revealed certain trends between men and women. Regarding fried foods, fried fish and French fries were consumed more often by men compared to women (Table 4.7b). For instance, 45% of men ate French fries 1-3 times per week compared to only 15% of women. The consumption frequency of whole milk, whole-milk yogurt, and full-fat hard cheese was similar for men and women. Interestingly, 30% of females consumed buttermilk at moderate level compared to only 5% of males.

Within the category of fats/oils, there was an apparent difference between genders in consumption of fats. Women reported consuming the dressing with oil and vinegar more often than men (Table 4.7 b). Similarly, women's consumption of margarine was higher than in men (Table 4.7 b). Men reported more frequent consumption of dressing with mayonnaise and tartar sauce (Table 4.7 b).

The consumption of Western high-fat foods was similar in both males and females except the consumption of French fries and salad dressings. The frequencies of the consumption of these foods are shown in Table 4.7b.

A relatively high variation between genders was seen in consumption frequencies of Western low-fat foods. More women than men consumed low-fat milk (30%), fat-free milk (15%) and low-fat yogurt (25%) frequently. In comparison, only 15%, 5%, and 15% of men consumed these low-fat dairy products frequently. More than half of women consumed whole wheat bread frequently compared to only 30% of men. Men reported a slightly more frequent consumption of whole-wheat cereals, oatmeal, and musli.

The most frequently consumed foods from each food category for men were chicken with skin (90% frequently), French fries (45% moderately), full-fat hard cheese (25% frequently), low-fat milk (15% frequently) and low-fat yogurt (15% frequently), butter (30% frequently), and cookies (35% frequently). For females, the most frequently consumed foods were chicken with skin (80% frequently), doughnut (40% moderately), full-fat hard cheese (30% frequently), low-fat milk (30% frequently), butter (30% frequently), and pastry (25% frequently).

Generation Comparison

Results of independent t-test conducted for the NBQ indicated that Western influence on diet varies by generation, with the younger generation being influenced by the nutritional trends of the West to a greater degree when compared with the older generation. The younger generation had significantly higher rate of dining out for dinner meals when compared with the older generation ($p=0.003$) (Table 4.8). There was no significant difference in the frequency of eating out for lunch between the two groups.

Compared to the older generation, the younger generation had significantly higher frequency of dining in the Western-type restaurants such as Italian restaurants/pizzerias, Chinese restaurants, and fast-food restaurants ($p=0.001$) (Table 4.8). The older generation tended to report eating more often in traditional Czech restaurants, buffets and cafeterias ($p=0.075$) (Table 4.8). In addition, the greater degree of Western influence on younger generation was noted in comparison of convenience food consumption. The younger subjects had significantly higher consumption of instant soups, instant and frozen meals ($p=0.003$) (Table 4.8).

In terms of satisfaction with the diet, majority of subjects in both groups were partially satisfied with their current diet (Table 4.9). Most subjects reported being the most influenced by taste in their eating habits (Table 4.9). Almost all subjects reported to

buy new food products only occasionally, with recommendation from family or friends being the most frequent reason for trying a new product (Table 4.9).

There was an apparent difference between the younger and older subjects in the perception of their current dietary habits compared to their eating habits prior to 1989 (Table 4.9). Thirteen older subjects (65%) reported that their current dietary habits were somewhat similar to their eating habits before the fall of communism, while only 4 (20%) younger subjects reported the same opinion. Half of subjects in both groups believed the changes in their diet were somewhat positive (Table 4.9).

Gender Comparison

There were no significant differences in responses on any of the NBQ questions between male and female subjects. A slightly higher proportion of women (10) than men (7) indicated they were influenced by taste the most in their eating habits. For men, the two leading factors that influenced their eating habits were time/convenience and taste. A larger number of men compared to women (4 vs. 1) thought that their eating habits were the same compared to prior 1989. In addition, majority of those subjects who perceived their eating habits as different or somewhat different compared to prior 1989 reported that these changes were somewhat positive (13 females and 7 males). There were no significant differences between men and women in patterns of dining out, with the

exception of men eating in cafeterias more often than women ($p=0.041$). The frequency of dining out in Western-type and traditional restaurants, and consumption frequency of instant meals, soups and frozen meals were the same between men and women.

24-Hour Recall

Generation Comparison

There were significant differences in the amounts of energy, total fat and protein consumed by the younger and older generations. The energy intake of the younger generation was significantly higher compared to the older generation. However, neither group exceeded the recommended dietary allowances for energy (4.10). The intake of total fat was also significantly higher in the younger group; however, the proportion of energy derived from fat was not significantly different between the two groups (Table 4.10). Both groups reported consuming more energy from fat than it is recommended ($\leq$ 30% of energy) (Table 4.10).

There was a significant difference in protein intake and the proportion of energy derived from protein between the two groups. The younger group consumed significantly higher amount of protein and energy from protein (Table 4.10). Both groups consumed higher amounts of protein than in is recommended by both U.S. RDA (0.8 g/kg body weight) and Czech recommendations for protein (less than 1 g per kg of body weight)

(Food and Nutrition Board, 2002; Andel, 1994). The dietary intake of cholesterol, saturated fat and dietary fiber was similar for both study groups (4.10).

Comparison of Younger and Older Women

There were no significant differences in nutrient intake between the younger and older women (Table 4.11). Both generations of women consumed more energy from total fat, protein, and saturated fat than it is recommended by the U.S. DRI and the Czech dietary recommendations (Table 4.11) (Food and Nutrition Board, 2002; Andel, 1994).

Comparison of Younger and Older Men

Both generations of men consumed less energy than recommended by RDA (Table 4.12). The only significant differences in nutrient intakes between the younger and older men were found in total fat intake (in grams) and in protein (% RDA) (Table 4.12). Although both groups of men exceeded the RDA for protein, the younger men reported significantly higher protein intake compared to older men (Table 4.12). There were no significant differences found in the intakes of saturated fat, dietary fiber and cholesterol between the two generations of men (Table 4.12).

Table 4.1 Comparison of mean age, weight, height, and BMI between younger and older group

Descriptive Variables	YOUNGER Age 18-30	OLDER Age 40 and older	p values
Age (years)	23.1±2.8	52.0±8.4	< 0.001
Weight (kg)	65.6±8.2	73.2±13.5	0.038
Height (cm)	174.1±5.2	169.9±7.9	0.048
BMI[1]	21.6±2.2	25.2±3.0	0.159

[1]BMI was calculated using the following equation: BMI= wt(kg)/ ht(m)^2
Values are means plus/minus standard deviations

Table 4.2 Comparison of weight, height, and BMI between males in younger and older groups

Descriptive Variables	Younger Men (n=10)	Older Men (n=10)	p values
Age (years)	23.3±3.0	48.9±5.7	< 0.001
Weight (kg)	72.1±4.9	81.9±8.7	0.006
Height (cm)	177.8±4.8	175.9±4.5	0.374
BMI[1]	22.9±2.0	26.4±2.0	0.001

[1]BMI was calculated using the following equation: BMI= wt(kg)/ ht(m)^2
Values are means plus/minus standard deviations

Table 4.3 Comparison of weight, height, and BMI between females in younger and older groups

Descriptive Variables	Younger Females (n=10)	Older Females (n=10)	p values
Age (years)	23.0±2.7	55.1±9.7	< 0.001
Weight (kg)	59.2±5.2	64.6±11.9	0.212
Height (cm)	170.4±2.2	164.0±5.7	0.006
BMI[1]	20.4±1.8	23.9±3.5	0.013

[1]BMI was calculated using the following equation: BMI= wt(kg)/ ht(m)^2
Values are means plus/minus standard deviations

Table 4.4 Consumption frequency of selected food categories in younger and older groups

Food Categories	YOUNGER	OLDER	p values
Fried Foods	1.1±0.6	0.8±0.5	0.085
High-Fat Meats	1.2±0.6	1.2±0.4	0.771
Full-Fat Dairy	1.7±0.9	1.3±0.7	0.238
Fats/Oils	1.2±0.6	1.1±0.6	0.590
Baked Sweets	1.8±0.8	1.3±0.8	0.119
Western High-Fat Foods	1.1±0.6	0.7±0.4	0.009
Western Low-Fat Foods	1.3±0.7	1.3±0.8	0.883

Values are means plus/minus standard deviations

Frequencies (0= < 1 per month; 1=2-3 times per month; 2=1 per week; 3=2-3 times per week; 4=5-6 times per week; 5=1 per day; 6=>2 per day)

Table 4.5a Comparison of fried food consumption between younger and older groups

Fried Foods	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Doughnut[1]	12 (60)	7 (35)	1 (5)	12 (60)	8 (40)	0 (0)
French Fries[1]	10 (50)	10 (50)	0 (0)	18 (90)	2 (10)	0 (0)
Fried Chicken	13 (65)	7 (35)	0 (0)	16 (80)	4 (20)	0 (0)
Fried Fish	18 (90)	2 (10)	0 (0)	17 (85)	3 (15)	0 (0)
Fried Pork	16 (80)	4 (20)	0 (0)	16 (80)	4 (20)	0 (0)
Potato Chips	12 (60)	8(40)	0 (0)	17 (85)	3 (15)	0 (0)

[1] French fries and doughnuts were included in two food categories: Fried Foods & Western High-Fat foods

4.5b Comparison of full-fat dairy consumption between younger and older groups

Full-Fat Dairy Products	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Buttermilk	19 (95)	1 (5)	0 (0)	14 (70)	6 (30)	0 (0)
Cottage Cheese	18 (90)	1 (5)	1 (5)	16 (80)	4 (20)	0 (0)
Hard Cheese	7 (35)	6 (30)	7 (35)	2 (10)	14 (70)	4 (20)
Ice Cream	10 (50)	8 (40)	2 (10)	13 (65)	5 (25)	2 (10)
Soft Cheese	5 (25)	9 (45)	6 (30)	10 (50)	8 (40)	2 (10)
Whole Milk	10 (50)	5 (25)	5 (25)	15 (75)	3 (15)	2 (10)
Yogurt	8 (40)	10 (50)	2 (10)	11 (55)	8 (40)	1 (5)

Table 4.5c Comparison of consumption of fats/oils between younger and older groups

Fats/Oils	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Butter	8 (40)	2 (10)	10 (50)	8 (40)	10 (50)	2 (10)
Dressing with Mayonnaise[1]	15 (75)	5 (25)	0 (0)	16 (80)	4 (20)	0 (0)
Lard	19 (95)	1 (5)	0 (0)	16 (80)	3 (15)	1 (5)
Margarine	10 (50)	5 (25)	5 (25)	11 (55)	2 (10)	7 (35)
Nonfat Yogurt	14 (70)	6 (30)	0 (0)	7 (35)	13 (65)	0 (0)
Sour Cream	13 (65)	7 (35)	0 (0)	13 (65)	6 (30)	1 (5)
Tartar Sauce	13 (65)	7 (35)	0 (0)	14 (70)	6 (30)	0 (0)

[1] Dressing with mayonnaise is included in two food categories: Fats/Oils and Western High-Fat Foods

Table 4.5d Comparison of consumption of baked sweets between younger and older groups

Baked Sweets	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Cake	14 (70)	5 (25)	1 (5)	15 (75)	5 (25)	0 (0)
Cookies	0 (0)	13 (65)	7 (35)	4 (20)	12 (60)	4 (20)
Fruit Kolache	11 (55)	6 (30)	3 (15)	16 (80)	4 (20)	0 (0)
Kolache	8 (40)	10 (50)	2 (10)	9 (45)	10 (50)	1 (5)
Pancake	20 (100)	0 (0)	0 (0)	19 (95)	1 (5)	0 (0)
Pastry	6 (30)	6 (30)	8 (40)	7 (35)	12 (60)	1 (5)

Table 4.6a Comparison of consumption of Western low-fat dairy foods between younger and older groups

Western Low-Fat Dairy	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Fat-Free Milk	18 (90)	1 (5)	1 (5)	17 (85)	0 (0)	3 (15)
Low-Fat Cheese Spread	8 (40)	11 (55)	1 (5)	7 (35)	12 (60)	1 (5)
Low-Fat Milk	11 (55)	6 (30)	3 (15)	10 (50)	4 (20)	6 (30)
Low-Fat Yogurt	7 (35)	9 (45)	4 (20)	7 (35)	9 (45)	4 (20)
Nonfat Yogurt	14 (70)	5 (25)	1 (5)	10 (50)	8 (40)	2 (10)

Table 4.6b Comparison of consumption of Western low-fat grains between younger and older groups

Western Low-Fat Grains	YOUNGER			OLDER		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Breakfast Cereals	11 (55)	6 (30)	3 (15)	18 (90)	1 (5)	1 (5)
Breakfast Cereals (whole wheat)	14 (70)	5 (25)	1 (5)	18 (90)	1 (5)	1 (5)
Musli	20 (100)	0 (0)	0 (0)	19 (95)	1 (5)	0 (0)
Oatmeal	18 (90)	2 (10)	0 (0)	19 (95)	1 (5)	0 (0)
Whole Wheat Bread	13 (65)	7 (35)	0 (0)	10 (50)	10 (50)	0 (0)

Table 4.7a Consumption frequency of selected food categories in females and males

Food Categories	FEMALES	MALES	p values
Fried Foods	0.8±0.5	1.0±0.6	0.125
High-fat Meats	1.0±0.4	1.5±0.4	0.002
Full-Fat Dairy	1.6±0.9	1.4±0.7	0.360
Fats/Oils	1.1±0.6	1.2±0.5	0.840
Baked Sweets	1.6±0.9	1.5±0.8	0.667
Western High-Fat Foods	0.8±0.4	1.0±0.6	0.342
Western Low-Fat Foods	1.5±0.7	1.7±0.7	0.168

Values are means plus/minus standard deviations

Frequencies (0=< 1 per month; 1=2-3 times per month; 2 =1 per week; 3=2-3 times per week; 4=5-6 times per week; 5=1 per day; 6=>2 per day)

Table 4.7b Comparison of consumption of selected foods between males and females

Selected Foods	FEMALES			MALES		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Chicken with skin	3 (15)	1 (5)	16 (80)	2 (10)	0 (0)	18 (90)
Dressing with oil & vinegar	12 (60)	8 (40)	0 (0)	18 (90)	2 (10)	0 (0)
French Fries	17 (85)	3 (15)	0 (0)	11 (55)	9 (45)	0 (0)
Fried Fish	19 (95)	1 (5)	0 (0)	16 (80)	4 (20)	0 (0)
Margarine	9 (45)	2 (10)	9 (45)	12 (69)	5 (25)	3 (15)
Mayonnaise	19 (95)	1 (5)	0 (0)	16 (80)	4 (20)	0 (0)

Table 4.7b (continued) Comparison of consumption of selected foods between males and females

Selected Foods	FEMALES			MALES		
	Rarely n (%)	Moderately n (%)	Frequently n (%)	Rarely n (%)	Moderately n (%)	Frequently n (%)
Pork Hot Dogs	16 (80)	4 (20)	0 (0)	9 (45)	11 (65)	0 (0)
Pork (grill..)	14 (70)	6 (30)	0 (0)	7 (35)	13 (65)	0 (0)
Salami	8 (40)	11 (55)	1 (5)	2 (10)	13 (65)	5 (25)
Sausage	16 (80)	3 (15)	1 (5)	12 (60)	8 (40)	0 (0)
Tartar Sauce	16 (80)	4 (20)	0 (0)	11 (55)	9 (45)	0 (0)

Table 4.8 Responses from the NBQ: Comparison of mean frequencies between younger and older groups

Questions	YOUNGER	OLDER	p values
How many times a day do you eat?[1]	3.0±0.6	2.8±0.7	0.255
How often do you eat lunch out?[2]	3.1±1.2	3.0±1.5	0.908
How often do you eat dinner out?[2]	1.9±1.2	0.7±1.2	0.003
How many times per month do you eat in:			
Traditional Restaurants[3]	0.8±0.6	1.2±0.8	0.075
Western-Type Restaurants[3]	1.4±1.1	0.3±0.5	0.001
How often do you eat instant meals?[4]	0.8±0.5	0.4±0.3	0.003

[1] Frequencies (1=1-2 times per day; 2=3 times per day; 3=3-5 times per day; 4=>5 times per day

[2] Frequencies (0=almost never; 1=1-2 per month; 2=1 time per week; 3=2-3 times per week; 4=almost daily)

[3] Frequencies (0=never; 1=1-2 times per month; 2=3-4 times per month; 3=5-6 times per month; 4=>6 times per month)

[4] Frequencies (0=never; 1=1-2 times per week; 2=3-4 times per week; 3=5-6 times per week; 4=>6 times per week)

Table 4.9 Responses from the nutrition behavior questionnaire (NBQ)

Nutrition Behavior/Eating Patterns	Generation	
	Younger N (%)	Older N (%)
Are you satisfied with your diet (eating habits)?		
Not satisfied	2 (10)	2 (10)
Partially satisfied	12 (60)	13 (65)
Partially dissatisfied	4 (20)	1 (5)
Very satisfied	4 (20)	4 (20)
What is the primary factor that influences your dietary habits?		
Taste/craving	9 (45)	8 (40)
Time/convenience	4 (20)	7 (35)
Environment (family, friends)	6 (30)	4 (20)
Cost/finances	1 (5)	1 (5)
How often do you (or your family) try new food products?		
Almost never	1 (5)	4 (20)
Occasionally	18 (90)	15 (75)
Very often	1 (5)	1 (5)
When you do try new food products, what influences your decision to try a new product the most?		
Recommendation from friends & family	12 (60)	13 (65)
In-store advertisement	5 (25)	4 (20)
TV commercials	2 (10)	2 (10)
Advertisement in newspapers & magazines	1 (5)	1 (5)
How does your diet today compare to your diet prior to 1989?		
Same	1 (5)	4 (20)
Somewhat similar	4 (20)	13 (65)
Different	15 (75)	3 (15)
If there has been a change, how would you characterize that difference in your diet?		
Very positive	5 (25)	3 (15)
Somewhat positive	10 (50)	10 (50)
Somewhat negative	3 (15)	3 (15)
Very negative	1 (5)	1 (5)
Not applicable	1 (5)	4 (5)

Table 4.10 Comparison of nutrient intake from 24-hour recall between younger and older groups

Nutrients	YOUNGER	OLDER	p value
Energy (Kcal)	2483±858	2071±598	0.087
Energy (% RDA)	98±35	87±25	0.417
Total fat (g)	104.3±42.7	82.1±35.6	0.083
Total fat (% energy)	36.8±7.3	34.7±8.8	0.271
Cholesterol (mg)	368.7±301.1	277.9±115.7	0.220
Saturated fat (g)	41.3±22.1	34.1±19.0	0.276
Saturated fat (% energy)	14.6±5.2	14.2±5.3	0.833
Protein (g)	103.1±43.7	84.2±21.5	0.094
Protein (% RDA)	190.3±88.1	146.9±41.3	0.056
Protein (% energy)	16.7±3.9	16.7±3.4	0.953
Dietary fiber (g)	19.3±7.6	16.8±6.7	0.294

Table 4.11 Comparison of nutrient intake of younger and older females

Nutrients	YOUNGER Females	OLDER Females	p value
Energy (Kcal)	2278±914	1990±542	0.402
Energy (% RDA)	104±42	97±27	0.696
Total fat (g)	93.7±47.7	81.2±37.8	0.523
Total fat (% energy)	35.5±8.1	35.8±10.1	0.942
Cholesterol (mg)	245.2±124.5	246.7±111.1	0.997
Saturated fat (g)	40.0±29.0	34.2±22.8	0.623
Saturated fat (% energy)	14.4±5.8	14.7±5.9	0.901
Protein (g)	87.0±31.2	77.5±21.4	0.434
Protein (% RDA)	170.8±81.0	153.5±49.3	0.572
Protein (% energy)	15.9±4.9	15.9±3.1	0.982
Dietary fiber (g)	20.0±7.5	15.6±4.5	0.133

Table 4.12 Comparison of nutrient intake of younger and older males

Nutrients	YOUNGER Males	OLDER Males	p value
Energy (Kcal)	2689±790	2152±668	0.119
Energy (% RDA)	93±27	77±22	0.184
Total fat (g)	114.8±36.5	83.0±35.3	0.063
Total fat (% energy)	38.1±6.7	33.6±7.6	0.175
Cholesterol (mg)	492.1±376.8	309.1±117.3	0.160
Saturated fat (g)	42.5±13.5	33.9±15.5	0.205
Saturated fat (% energy)	14.8±4.9	13.8±3.5	0.606
Protein (g)	119.2±49.9	91.0±20.3	0.115
Protein (% RDA)	209.8±94.8	140.3±32.6	0.051
Protein (% energy)	17.4±2.6	17.5±3.6	0.948
Dietary fiber (g)	18.5±7.9	18.1±8.4	0.912

CHAPTER V

DISCUSSION

The results of this study identified several important patterns in the dietary habits and nutrition behavior of younger and older generations in the Czech Republic. The analyses of the nutrition behavior questionnaire, food frequency questionnaire, and 24-hour recall revealed that both generations of Czechs were influenced by Western trends, including the infusion of new food products into the country.

Findings indicated that the influence of Western culture and lifestyle has had a more negative impact on the food choices and nutrition behavior among the younger generation. On the other hand, the older generation has taken advantage of the greater selection and variety of food products that were introduced to them after the fall of communism. In this section, I will discuss the results of this study and describe some of the trends that were found in dietary patterns and nutrition behavior of both younger and older generations. I will also highlight some of the important differences found between men and women in the Czech Republic.

Body Mass Index of the Younger and Older Generations

The mean BMI of the subjects in this study was lower than the mean BMI reported in previous studies on the Czech population. According to the Sample Survey

of the Health Status of the Czech Population in 1999, the average BMI for adult men and women was 25.9 and 24.8 kg/m^2. Furthermore, 36.5% of adult men and 28.8% of adult women had BMI of at least 27 kg/m^2, thus they were classified as overweight (IHIS, 2001).

Based on the self-reported anthropometric measurements in this study, the adult men and women had mean BMI scores of 24.7 and 22.2 kg/m^2, respectively. Only 3 out of 20 females (15%), and 5 out of 20 males (25%) had BMIs of more than 25. Most of the individuals with BMI of 25 and above were older men, which is consistent with the results of the Czech Health Interview Survey conducted in 1996 (IHIS, 2001). Therefore, the results of this study suggest that the subjects were less likely to be overweight than typical Czech adults identified in other research studies. The mean BMIs of male and female subjects in this study fell within the recommended values established by the Czech dietary guidelines, which are 19-24 for women, and 20-25 for men (Brazdova et al., 2001).

Energy and Nutrient Intake of the Younger and Older Generations

The nutritional analysis of the 24-hour recalls revealed that the energy intake of the older generation was below the RDA recommendations for energy (Food and Nutrition Board, 1989). The younger generation reported consuming nearly 100% of the RDA for energy, while the older generation consumed only 87% of the RDA for energy.

The proportion of energy derived from fat was 36.8% in the younger group and 34.7% in the older group. Thus, the younger group exceeded the U.S. Acceptable

Macronutrient Distribution Range (AMDR) of 20-35% of energy from fat, as well as the Czech dietary recommendations of 30% of energy from fat (Food and Nutrition Board, 2002; Brazdova et al., 2001). The older subjects did not exceed the AMDR for energy derived from fat; however, their intake of energy derived from fat exceeded the Czech dietary recommendations (Food and Nutrition Board, 2002; Brazdova et al., 2001). While the proportion of energy derived from fat was similar for both generations, the amount of total fat (in grams) was significantly higher in the younger generation. This trend suggests that the higher consumption of total fat in the younger generation is proportional to the higher intake of total energy in the younger generation. The mean intake of fat (% energy) for men and women in the study sample differed from those found in other studies of Czech adults. According to the World Health Organization, the Czech population consumes a moderate amount of animal fats that is reflected in the average proportion of calories from fat being 32% (WHO, 2001). The results of this study indicated that the percentage of calories derived from fat by younger men, younger women, and older women was higher than the 32% found in the World Health Organization study. Interestingly, older men in this study reported to have the lowest proportion of calories from fat (33.6%) in this study.

In terms of saturated fat and cholesterol, there were no significant differences between the younger and older group. The intake of dietary cholesterol for younger generation, specifically younger men, exceeded the 300 mg per day that is recommended by the U.S. DRI and the Czech dietary standards (Food and Nutrition Board, 2002;

Andel, 1994). In terms of saturated fat, both generations exceeded the recommended 10% of energy derived from fat by approximately 4% (Food and Nutrition Board, 2002).

Similar trends were found regarding protein intake. While the intake of energy derived from protein was similar in both generations, the younger group consumed a significantly larger amount of protein (g) compared to the older group. The higher intake of protein in the younger group was further indicated by their consumption of 190.3% of the RDA for protein. Even though the protein intake was lower in the older group, it still exceeded the U.S. RDA, as well as the Czech dietary recommendations for protein intake (Food and Nutrition Board, 2002; Andel, 1994).

The excessive intake of fat, saturated fat, and protein suggests that the dietary habits of both Czech generations lag behind the recommendations for what constitutes a healthy and nutritious diet. The Czech dietary recommendations do not fundamentally vary from the U.S. dietary standards. The diet should provide 55% of the energy from carbohydrate, 30% of the energy from fat, and individuals should consume less than 1g of protein per kg of body weight (Andel, 1994). According to the U.S. Dietary Reference Intakes, a healthy diet should consists of 20-35% of energy derived from fat (10% from saturated fat), 45-65% of energy derived from carbohydrates, and protein intake should not be greater than 0.8 g per kg of body weight (Food and Nutrition Board, 2002). The results of this study indicated that subjects in both groups exceeded the U.S. DRI as well as the Czech dietary recommendations for fat and protein, with the younger men exceeding the recommended levels at the greatest level. In the younger group, the proportions of energy from fat, protein and carbohydrates were approximately 37%

(15% from saturated fat), 17%, and 46%. In the older group, the proportions for fat, protein, and carbohydrate were 35% (14% from saturated fat), 17%, and 48%, respectively.

The results indicated that both generations of Czechs consumed excessive amounts of fat and protein while they consumed relatively low amounts of carbohydrates. This finding may be explained by the nature of traditional Eastern European diet and the history of communism in Czechoslovakia. The Czech cuisine is historically based on the high consumption of meats, animal fats, and the low intake of fruits and vegetables (WHO, 2001; Filiberti et al., 1995). This was confirmed in a national survey indicating that while Czechs consume higher amounts of fats, meat, fish, and eggs, than is recommended, they consume less than adequate servings of fruits and vegetables (Brazdova & Fiala, 1998). Moreover, the high dietary intakes of fat and protein were promoted by the communist government for 40 years in Czechoslovakia. The communist government subsidized a variety of full-cream dairy products and high-fat animal products on the market, and kept their prices artificially low while increasing the prices of other products (Elliot, 1995; Ginter, 1997). Because of very limited food supplies and low prices of the subsidized foods, the consumption of fatty meats and full-fat dairy products increased significantly and these unhealthy foods became staples of Czechs during the communist regime (Ginter, 1997; Benesova et al., 1999).

It is very likely that the current high intakes of fat and protein in the diet of Czechs, particularly the older generation, are the result of eating habits that were developed during communism and remained unchanged despite the political and economic

transition in the late 1980's. This explanation is especially true for older Czech adults who developed their dietary habits and food preferences during several decades of communism. Given the high availability and low cost of animal products, and the poor selection of healthy foods, the older generation was susceptible for developing unhealthy eating habits that remain in their lifestyle until today. Because of the differences in age, younger Czechs did not experience the limited food market and the scarcity of healthier foods to the same degree as the older generation. Yet, the younger group in this study showed a similar intake of fat and protein.

The political and economic changes of 1989 resulted in many positive trends that have been influencing the health and nutritional status of the Czechs since the fall of communism. The availability of fruits and vegetables increased significantly, as did the selection and variety of low-fat dairy products and other healthy foods (De Souza & Lundell, 1993). Thus, younger Czechs have had the opportunity to make healthy and nutritious food choices, and to control their intake of fat, protein, and refined sugars. Unfortunately, the introduction of the free market in the Czech Republic also brought some negative nutrition trends into the country. As the selection of healthy foods increased, the influx and advertisement of fast-food restaurants and Western foods increased as well. The Czechs have been exposed to a tremendous amount of "trendy" products such as French fries, pizzas and other foods that often contain very high amounts of fat. The threat of choosing Western unhealthy foods is especially high among younger men who are more likely to eat high-fat foods and processed meat. Thus,

younger males are more likely to accept new Western foods that are often high in fat, compared to young women (Quinton et al., 1990).

The results from this study indicated that the high intake of fat, saturated fat, cholesterol, and protein found in the younger group reflect unhealthy eating habits among this group. Based on the wide selection of fruits and vegetables, and other low-fat foods that are currently available to Czech consumers, the younger generation has the opportunity to make more nutritious food choices, and thus to develop a more healthy diet that would meet the general dietary recommendations such as Dietary Reference Intakes (Food and Nutrition Board, 2002).

The intake of dietary fiber was lower than recommended in both generations. Neither generation met the U.S. RDA for dietary fiber, which is 38g and 25g for men and women under 51, and 30g and 21g for men and women between ages 51 to 70 (Food and Nutrition Board, 2002). The analysis of dietary fiber intake also indicated that the younger and older generations did not follow the Czech Dietary Guidelines of consuming foods rich in fiber such as fruits, vegetables, grains, and lentils (Brazdova et al., 2001). Low intakes of dietary fiber are commonly known to increase the risk of various chronic diseases such as CVD, diabetes, and other chronic diseases (Jenkins et al., 2002). Even though the rate of CVD has decreased in the Czech Republic since 1980's, it is still almost twice the European Union average (WHO, 2001). Moreover, the rate of colon cancer increased by 5% in a short two-year period between 1993 and 1995 (Ministry of Health, 1997). Based on the findings of this study, it is recommended that Czech consumers, regardless of age, should focus on increasing the intake of fruits, vegetables,

and whole-wheat products in order to protect themselves from CVD, diabetes and other chronic diseases that have been associated with low intakes of dietary fiber.

Trends in Food Choices and Nutrition Behavior of the Younger and Older Czechs

The majority of subjects in both generations were partially satisfied with their diet, and taste was the major factor influencing their eating habits. In terms of comparing the current dietary habits to those prior to 1989, most younger respondents reported that their eating habits were "somewhat changed," while most older subjects felt that their diet was "somewhat similar." However, both groups felt the changes they had made in their diets were positive. According to Rojsek (2001), older people are usually inclined to preserve their traditional habits and cultural customs more than younger people. His argument could be used to explain why the diet of the older Czechs, despite the significant changes in the society, was less likely to be changed since the fall of communism. While the older generation kept its food preferences and eating patterns the same over time, the younger generation has been more likely to respond to changes in the environment. Thus, the younger Czechs were more likely to be influenced by the nutritional and lifestyle trends coming from Western culture.

The majority of both younger and older subjects bought new food products occasionally. The most common factor influencing the purchase of a new product for both groups was "recommendation from family and friends." Some studies suggested that the exposure to aggressive advertisement and marketing of Western products after 1989

has had a tremendous impact on the consumer behavior and consumption patterns in Eastern European countries (Rojsek, 2001; Feick et al., 1995). However, the Czech consumers in this study appeared to be influenced more by their family members and friends rather than by commercial advertisements.

The analysis of the food frequency questionnaire identified several trends in the food choices of the two Czech generations. Both generations showed similar consumption patterns of high-fat meats, full-fat dairy products, fats/oils, baked sweets, and Western low-fat foods. However, the younger generation indicated consuming fried and Western high-fat foods more often than the older group. Among the most frequently consumed foods from these two categories were fried chicken, potato chips, pizza, and French fries.

The higher consumption of fried and Western high-fat foods in the younger generation was also confirmed by their responses to questions related to dining out. There was a significant difference between the two generations regarding dining out in Western-type restaurants, including fast-food chains, Italian/Pizzeria, and other non-traditional restaurants. The younger Czechs ate significantly more often in these types of restaurants, while the older generation preferred dining out in more traditional Czech establishments, such as Czech restaurants and buffets. The preference of the younger Czechs for fast-food chains and other Western-type restaurants explains, in part, their higher consumption of fried and Western high-fat foods. With few exceptions, fast-food restaurants do not offer the option of healthier low-fat meals. Thus, those who eat in fast-food restaurants are very likely to consume meals high in calories and fat. While

Czech traditional restaurants and buffets also offer a variety of high-fat and fried foods, the selection and variety of foods is greater and thus, the consumers have the opportunity to make healthier food choices.

The negative western influence on younger Czechs was also apparent from the analysis of the 24-hour recalls. Many of the younger subjects reported consuming pop sodas, French fries and other Western high-fat and high-sugar foods in their 24-hour recalls. On the other hand, none of the older Czechs consumed similar foods.

The greater degree of Western influence on the younger Czechs was also apparent in the consumption of instant and ready-to-eat meals. Younger Czechs consumed these products significantly more often than the older Czechs. The influx of Western culture in the Czech Republic introduced Czech consumers not only to new products, but to new trends related to their lifestyle. The higher pace of life, two working parents, and increased demand for working hours were only some of the new factors that started influencing the lifestyle of Czechs after 1989 (Delville, 1994). The changes in lifestyle influenced the dietary habits and food choices of many people, with increased consumption of fast foods, instant meals, and frozen dinners. The findings of this study suggest that the younger Czechs are more likely to take advantage of the quick Western products such as instant soups, frozen meals, and instant meals.

The introduction of the free-market economy in 1989 exposed Czech consumers to various Western trends that have influenced their dietary habits and nutrition behavior. In Eastern European countries, including the Czech Republic, French fries, pizza, and similar foods became the symbols representing Western culture and lifestyle, especially

among the younger people (Gabor, 1991). Thus, those people who can afford to buy pizza or French fries are associated with higher status. In another words, the Western "trendy" foods have become a measure of wealth and success for many people in these countries (Ritzer, 2000). According to Ritzer (2000), the influx of the Western trends such as fast-food chains and Western brands into the culture is referred to as the "McDonaldization" of the society. The globalization of markets and the aggressive advertisement of Western investors has initiated this process in many nations of the world, including Eastern European countries. As suggested in Ritzer's thesis, the "McDonaldization" of the society has influenced the dietary habits and food choices of millions of people around the world.

The main characteristics of many of the Western "trendy" foods that have emerged on the Czech market after 1989 are the high levels of fat, refined sugar and calories that these foods contain. It is commonly known that the consumption of excessive amounts of fat and energy contribute to increased obesity, elevated cholesterol and the overall higher risk for chronic diseases among the population (Jequier & Bray, 2002). Therefore, the younger Czechs who frequently consume foods such as French fries, pizzas, other high-fat meals are likely to experience serious health and nutrition consequences if their dietary habits remain unchanged.

According to Rojsek (2001), younger people are more likely to be exposed to Western culture than older adults and are thus more likely to accept the new trends coming from the West. With the exception of breakfast cereals, the younger Czechs were less likely to consume Western low-fat products such as low-fat milk, nonfat milk, nonfat

yogurt, and whole wheat breads, as compared to the older Czechs. The findings of this study suggest that the younger generation consumed not only higher amounts of Western high-fat foods, fried foods, full-fat dairy products, butter, and baked sweets, but also lower amounts of Western low-fat foods compared to the older generation.

The trends found in the dietary habits suggest that the younger Czechs prefer products that are higher in fat compared to the older Czechs. For instance, the younger Czechs consumed butter and whole milk more often than the older Czechs. Given the wide selection and variety of healthy, low-fat products on the Czech market since 1989, the food choices and preferences of the younger generation seem to be focused on the Western foods that are high in fat and calories. In contrast, the older generation appears to be taking advantage of the wide selection of food products on the Czech market, and seem to be making healthier and more nutritious food choices compared to the younger generation.

The differences in the food choices of the younger and older groups were also reflected in the 24-hour recall analysis. The healthier food choices made by the older Czechs may explain why the intake of energy derived from fat was found to be slightly, but not significantly, lower in the older group rather than in the younger group (35% vs. 37%).

Energy and Nutrient Intake of Men and Women within Each Generation

Analysis of the 24-hour recalls revealed several gender differences in nutrient intake within both the younger and older generations. In the younger generation, men consumed a higher proportion of energy from fat and protein, and a slightly higher proportion of energy from saturated fat. There was a significant difference between men and women in cholesterol intake. While the intake of dietary cholesterol was below the U.S. and Czech recommendations in women, it exceeded the recommended level in men by nearly 100 mg per day. Even though men consumed higher intakes of energy from fat and protein than women, the intake of these nutrients exceeded the recommended levels among women as well.

According to Fiala and Brazdova (2000), women are less likely than men to consume high-fat meats and whole milk products. In fact, some studies found that women have higher intakes of fruits, vegetables, and other "healthy" foods when compared to men. This trend may be explained, at least in part, by women's heightened concerns with body appearance and body weight. According to Hill (2002), women are generally more dissatisfied with their bodies than men. Moreover, the study conducted in Great Britain indicated that more than half of teenage girls feel fat and would like to lose weight (Hill, 2002). Since women are more sensitive about weight gain and body image, they are more likely to avoid foods that are high in fat and calories, such as fatty meats, full-fat dairy products, and fast foods, when compared to men.

Interestingly, the assumption that women consume less fat compared to men was not confirmed within the older generation in this study. The patterns between men and women related to the consumption of energy derived from protein and intake of dietary cholesterol were the same as in the younger generation. Men were found to consume more energy derived from protein, and higher level of dietary cholesterol compared to women. Similar to the younger generation, both men and women consumed more energy from fat, protein, and saturated fat than it is recommended by the U.S. and Czech dietary recommendations (Food and Nutrition Board, 2002; Andel, 1994).

Trends in Food Choices and Nutrition Behavior in Men and Women

The analysis of the food frequency questionnaire revealed several differences in food choices of men and women. Based on the results of this study, both genders consumed fried foods, Western high-fat foods, fats/oils, baked sweets, full-fat dairy products, and Western low-fat foods at the same rate. However, men reported consuming high-fat meats more often than did women. The most striking differences between men and women were in the consumption of pork, pork hot dogs, sausages, and salami, which were all consumed by men more often than by women.

The cross tabulations revealed several other trends in consumption patterns of men and women. In addition to the higher consumption of high fat meats, men were also more likely to consume French fries, fried fish, salad dressing with mayonnaise, and tartar sauce. In contrast, women showed tendencies to consume healthier foods that were lower

in fat more frequently than men. For instance, women consumed low-fat milk, fat-free milk, low-fat yogurt, whole wheat bread, margarine, and salad dressing with oil & vinegar more often.

The analysis of the nutrition behavior questionnaire indicated no differences in restaurant preferences between men and women, with the exception of men eating in cafeterias more often than women. In addition, the consumption frequency of instant meals, soups, and frozen meals was identical in men and women.

Results indicated that men were more likely to consume foods higher in fat. This finding is consistent with previous research that indicated that men are generally known to consume higher amounts of processed meats and other high-fat foods compared to women (Fiala & Brazdova, 2000). In contrast, women tend to choose products lower in fat and calories, such as low-fat dairy products, fruits, and vegetables (Fiala & Brazdova, 2000). The results of this study confirmed these trends by demonstrating that men consumed pork, sausages, salami, fried fish, French fries, and other high-fat foods more often than women. Men were also less likely to eat low-fat milk, nonfat milk, low-fat yogurt, and whole wheat bread.

While both men and women exceeded the recommended levels of energy derived from fat, protein, and saturated fat, the energy proportions of these nutrients were somewhat higher among men when compared to women. In addition, men also exceeded the U.S. and the Czech recommended level of 300 mg per day for dietary cholesterol (Food and Nutrition Board, 2002; Andel, 1994). Because cholesterol is only found in animal sources, the elevated intake of dietary cholesterol in men indicates that they

consume animal products such as meat, eggs, and whole milk dairy products more often than women.

Conclusions and Implications

Study Summary

The results of this study provided important insights into food choices, food preferences, and nutrition behavior of younger and older adults in the Czech Republic. The study indicated that both generations are influenced by the process known as the "McDonaldization" of the society, with younger Czechs being influenced to a greater degree. Furthermore, the nature of the Western influence varied between the two generations.

Based on the results of this study, the younger generation showed a greater degree of unhealthy tendencies in their dietary habits and nutrition behaviors associated with the Western influence. The Western influence among younger Czechs was mostly reflected in their increased consumption of French fries, pizzas, and other high-fat foods that were not readily available in the Czech Republic before 1989. The higher consumption of these foods is also directly associated with the high preference of the younger Czechs for fast-food and other Western-type restaurants.

While the younger generation appears to be more influenced by the negative Western trends, the older generation is influenced by Western culture in a more positive

way. Older Czechs consume significantly less fried and Western high-fat foods, and they prefer dining out in more traditional Czech dining establishments, rather than in Western-type restaurants. More importantly, the older generation of Czechs has taken a greater advantage of the broad selection and variety of Western "healthy" foods on the market. For example, the older generation appears to consume low-fat dairy products and whole-wheat breads more often than the younger generation. The healthier food choices made by the older generation were reflected in the results of the 24-hour recall analysis. The older Czechs consumed slightly less energy from fat and saturated fat when compared to the younger Czechs. Thus, both generations have been influenced by some of the Western trends that invaded the Czech Republic after the fall of communist regime.

The results of this study suggest a need to focus on dietary habits and nutrition behavior of the Czech population. Both generations of Czechs in this study consumed excessive amount of fat, saturated fat and protein, while they consumed less than recommended levels of complex carbohydrates and dietary fiber. Regardless of whether or not they consume Western high-fat foods, many Czechs consume large amounts of meats and other animal products. Many studies have shown that the excessive intake of dietary fat and protein is associated with increased body weight and obesity (Woods et al., 2003; Parizkova & Rolland-Cachera, 1997). Furthermore, overweight and obese individuals are often at high risk for diabetes, hypercholesterolemia, cardiovascular disease, and overall poor health status (Mokdad et al., 2003). For the younger generation, in addition to the diet traditionally based on meat and animal products, the high intake of fat and protein is being promoted by many Western foods such as French fries, pizzas,

and other foods that have been introduced to the country since the fall of communism in 1989. Since the younger generation consumed Western high-fat foods more often than the older generation, the younger generation is potentially at an even greater risk for developing health problems in the future.

Despite some positive nutritional trends that have emerged in the Czech Republic in 1990's, neither of the Czech generations met the U.S. and the Czech dietary recommendations for a healthy diet. Czech consumers, especially the younger generation, should incorporate more low-fat dairy products, fruits and vegetables, and other low-fat foods into their diet. While some of these healthier food choices were observed among the older Czechs in this study, the younger Czechs appeared to prefer foods high in fat and calories.

The following hypothesis were analyzed in this study:

1A) The younger subjects will report a significantly higher consumption frequency of Western high-fat foods (low-fat and non-fat milk, yogurt etc.)

This hypothesis was supported by the results of this study. The younger generation reported significantly higher consumption of Western high-fat foods (French fries, potato chips, pizza, and salad dressings), when compared to the older generation. The level of significance was $p = 0.009$.

1B) The younger generation will report significantly higher intake of Western low-fat foods.

The findings of this study did not show that the younger generation consumed higher amounts of Western low-fat foods. More importantly, older Czechs showed tendencies to consume some of these products more often than younger Czechs.

1C) The younger generation will report significantly more frequent consumption of instant meals, instant soups, and frozen meals when compared to the older generation.

Younger Czechs consumed instant meals significantly more often than older Czechs, thus this hypothesis was supported by the study. The level of significance was $p = 0.003$

1D) The younger subjects will report higher frequency of dining out in the Western–type restaurants, for example in fast-food restaurants, pizzerias, and other restaurants.

The younger generation reported dining out in Western-type restaurants significantly more often than the older generation, with the level of significance $p = 0.001$.

2A) The total fat intake (% energy) of the older generation will be significantly higher when compared to the younger generation.

There was no significant difference between the two generations in their intake of energy derived from fat. The younger generation reported a slightly higher intake of energy from fat as well as higher intake of total fat and saturated fat in grams. Furthermore, younger Czechs consumed excessive amounts of dietary cholesterol while older Czechs were below the recommended level of 300 mg.

2B) The proportion of energy from saturated fat will be higher in the diet of the older generation.

The intake of energy from saturated fat exceeded the recommendation in both generations. There was no significant difference between the two groups; however, younger Czechs consumed a higher amount of saturated fat in grams, compared to older Czechs.

2C) The older generation will report consuming a significantly lower amount of fiber when compared with the younger generation.

This hypothesis was not supported by the study. While the dietary fiber intake was similar in both groups, both younger and older generations consumed less dietary fiber than recommended.

3A) Men will report higher frequency of dining out in Western-type restaurants.

The results of this study did not support this hypothesis. There was no significance difference in the frequency of dining out in Western-type restaurants between men and women.

3B) Men will report a significantly higher consumption frequency of Western high-fat foods.

There was no significance difference in consumption frequency of Western high-fat foods between men and women.

3C) Women will report significantly higher intake of Western low-fat foods.

This hypothesis was not supported by the results of this study. However, women showed tendencies to consume some of the Western low-fat foods more often than men. For example, women consumed low-fat milk, fat-free milk, low-fat yogurt, and whole wheat bread more frequently compared to men.

3D) The total fat intake (% energy) of men will be higher when compared to women.

The proportion of energy derived from fat was similar for men and women, thus this hypothesis was not supported by the study. Men consumed approximately 36% of energy from fat, while women consumed 35% energy from fat.

There were several limitations in this study. First, the size of the study sample was relatively small. Data from additional respondents may have further strengthened the findings of this study. Second, the anthropometric measurements that were obtained from the subjects were self-reported, thus the accuracy of these measurements can not be ensured. Third, the dietary analysis and assessment of individual diets in this study were limited due to the completion of only one 24-hour recall by the subjects. Given these issues, generalizations to the entire Czech population are limited. However, the results of this preliminary study provided valuable insights into food choices, food preferences, and nutrition behavior of younger and older Czechs.

Implications

This study, along with other literature, indicates that the process of "McDonaldization" has influenced Czech citizens in many aspects of their lives since the end of communism in 1989. In addition to fashion style and lifestyle patterns, nutrition behavior and dietary habits have also been impacted by this process. This study indicates that the influence of Western culture has had both positive and negative impacts. In terms of positive influence of Western culture, there have been decreased rates of several chronic diseases since the 1990's. In addition, Czech consumers have a wider selection of healthy food products, including fruits and vegetables. But despite the positive trends of Western influence brought into the Czech Republic, the

"McDonaldization of society" represents a serious threat to the health and nutrition status of Czech consumers.

Findings of this study indicate that the younger generation is especially vulnerable to embracing unhealthy nutritional trends introduced to them through the "McDonaldization" process, such as dining in fast-food restaurants, eating fried foods, and consuming ready-to-eat meals. The importance of this study lies in the identification of several unhealthy dietary trends that exist among the younger generation of Czech consumers.

This research also has implications for the influx of Western culture in the other post-communist countries. It is likely that similar trends are influencing the dietary habits in other Eastern European countries. Through exposure to continuously larger amounts of fast foods and other foods that have little nutritional value, young Czechs and other Eastern Europeans are susceptible to developing unhealthy dietary habits and thus, suffer from increased rates of chronic diseases later in life.

The degree of "McDonaldization" in the Czech Republic is likely to continue increasing, and thus Czech consumers are going to be exposed to even greater influence from Western nutritional trends. Nutritional professionals should be aware of the positive and negative consequences of these trends on the nutritional status of the Czech population as well as in other post-communist societies.

Nutrition education and assessment is largely absent in the Czech Republic. Additional resources are needed to focus on educating and informing consumers about the nutritional content and quality of various products. Through nutrition education and

information access, Czech consumers will become aware of what Western foods are high in calories, fats and cholesterol, and they will be able to make healthier and more nutritious food choices on their own.

Future Research

Due to the limitations of this research, further studies are needed in order to evaluate the dietary intakes and food choices of average Czech adults. While the results of this study highlighted important dietary trends in the Czech Republic, future research drawing from a representative sample of Czechs is needed to examine these trends in more detail. A larger sample of subjects should be randomly selected from the population in order to obtain a representative sample of Czech consumers. In order to obtain accurate estimates of their dietary intakes, subjects should ideally complete a minimum of 4 days of food records in addition to one 24-hour recall. Emphasis should also be placed on assessing the fruit and vegetable intakes of Czech consumers, as their consumption was not investigated in this study. Furthermore, additional research is needed to examine the factors influencing the broad trends in Western influence on Czech dietary habits. This future research could be conducted by using a survey instrument designed to determine the factors that are influencing dietary choices and nutrition behavior among a representative sample of Czechs consumers.

BIBLIOGRAPHY

Andel, M. (1994). Potrebuji nemocni diabetem zvlastni diabeticke potraviny? [Do diabetics need special foods?] Casopis Lekaru Ceskych, 133(10), 292-294.

Andel, M. (1997). Nutritional epidemiology in the Czech Republic after the fall of communism: Problems with interpretation. Nutrition, 13, 1008-1009.

Benesova, A., Havelkova, M., & et al. (1999). Kucharka Nasi Vesnice. [Country Cookery]. (15th edition). Prague: OTTOVO nakladatelstvi, s.r.o.

Benoit, C., & Heitlinger, A. (1998). Women's health care work in comparative perspective Canada, Sweden and Czechoslovakia/Czech Republic as case examples. Social Science and Medicine, 47(8), 1101-1111.

Block, G., Hartman, A.M., & Naughton, D. (1990a). A reduced dietary questionnaire: Development and validation. Epidemiology, 1, 58-64.

Block, G., Woods, M., Potosky, S., & Clifford, C. (1990b). Validation of a self-administered diet history questionnaire using multiple diet records. Journal of Clinical Epidemiology, 43, 1327-1335.

Bobak, M., Skodova, Z., Pisa, Z., Poledne, R., & Marmot, M. (1997). Political changes and trends in cardiovascular risk factors in the Czech Republic, 1985-1992. Journal of Epidemiology and Community Health, 51, 272-277.

Brada, J. (1991). The economic transition of Czechoslovakia from plan to market. Journal of Economic Perspective, 5(4), 171-177.

Brazdova, Z., & Fiala, J. (1998). Dietary Guidelines in the Czech Republic. Masaryk University, Brno. Acta Facultatis Medicae, 115.

Brazdova, Z., Ruprich, J., Hruba, D., Petrakova, A. (2001). Dietary guidelines in the Czech Republic III.: Challenge for the 3rd millenium. Central European Journal of Public Health, 9(1), 30-34.

Brewers Association of Japan. (1999). Beer consumption per capita around the world, retrieved 03/10, 2003, from www.brewers.or.jp/english/consupt2htm

Cepl, V. (1997). The transformation of hearts and minds in Eastern Europe. Cato Journal, 17(2), 229-234.

Cumming, R. (1982). A survey of Czechoslovakia's agriculture. Foreign Agricultural Economic Report-U.S. Department of Agriculture, Economic Research Services, 171.

Czech Republic. (1999). The map of the Czech Republic, retrieved 03/20, 2003, from www.maps.com

Delville, R. (1994). Opportunities for growth in the food and drink industry. Health, Nutrition, Low-Calorie Sweeteners: Common Themes in a changing Europe; 1994 ISA Annual Conference; edited by Lisansky, S. G.; Hall, K. E.

De Souza, M., & Lundell, M.R. (1993). Price reform and the consumer in Central and Eastern Europe. Food Review, 16(3),17-23.

Elliot, D. (1995, March 20). The Fat of the Land. Newsweek, 125(12), 42-43.

Feick, L., Coulte, R.H., & Price, L.L. (1995). Consumers in the transition to a market economy. International Marketing Review, 12(5), 18-34.

Ferber, M.A. (1994). Czech women in transition. Monthly Labor Review, 117(11), 32-37.

Fiala, J., & Brazdova, Z. (2000). A comparison between the lifestyles of men and women-parents of school age children. Central European Journal of Public Health, 8(2), 94-100.

Filiberti, R., Kubik, A., Reissigova, J., Merlo, F., & Bonassi, S. (1995). Cancer, cardiovascular mortality, and diet in Italy and the Czech Republic. Neoplasma, 42(5), 275-283.

Food and Nutrition Board. (1989). Recommended Dietary Allowances. Washington, D.C.: National Academy Press.

Food and Nutrition Board. (2002). Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids (Macronutrients). Institute of Medicine (IOM). Washington, D.C.: National Academy Press,

Gabor, I.R. (1991). Second economy in state socialism: past experience and future prospects, European Economic Review, 33, 597-604.

Ginter, E. (1997). Cardiovascular disease prevention in Eastern Europe. Nutrition, 14 (5), 452-457.

Hanel, P. (1992). Trade liberalization in Czechoslovakia, Hungary and Poland through 1991: A survey. Comparative Economic Studies, 34(3/4), 34-54.

Hill, J.H. (2002). Developmental issues in attitudes to food and diet. Proceedings of the Nutrition Society, 61, 259-266.

Institute of Health Information and Statistics (IHIS). (2001). Sample Survey of the Health Status of the Czech Population 1999. Prague, Czech Republic: Institute of Health Information and Statistics of the Czech Republic.

Janda, K., Rausser, G.C., & McCluskey, J. (1998). Food import demand in the Czech Republic. Giannini Foundation Working Paper # 796, Giannini Foundation of Agricultural Economics, California Agricultural Experiment Station.

Jenkins, D. J., Kendall, C. W., Augustin, L. S., Vuksan, V. (2002). High-complex carbohydrate or lente carbohydrate foods? American Journal of Medicine, 113 (Suppl 9B), 30S-37S

Jequier, E., & Bray, G. A. (2002). Low-fat diets are preferred. American Journal of Medicine, 113 (Suppl 9B), 41S-46S

Krejci, J., & Stikova, O. (1994). Vyvoj zmen ve spotrebitelske poptavce po potravinach. [Trends in consumer demand for foods]. Prague: Vyzkumny Ustav Zemedelske Ekonomiky.

Krosnar, K. (2002, May 6). Bohemian beer bust; Czechs drink more beer than anyone in the world-but less than they used to. The brewers fight back. Newsweek, New York, 59-60.

Lanska, D. (2003). Domaci kuchyne [Home cooking]. Obchodni tiskarny, a.s., Kolin.

Miquel, R., & Laisney, F. (2001). Consumption and nutrition: Age-intake profiles for Czechoslovakia 1989-1992. Economics of Transition, 9(1), 115-151.

Ministry of Health. (1998). National Environmental Health Action Plan. Prague, Czech Republic.

Misconiova, B. (1992, September/October). Healing a sick society. World Health, 4-5.

Mokdad, A.H., Ford, E.S., Bowman, B.A., Dietz, W.H., & et al. (2003). Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. Journal of the American Medical Association, 289(1), 76-79.

Quinton, B., Lorenzini, B., & Townsend, R. (1990). R & I exclusive: American tastes 1990. Restaurant & Institutions, 100(20), 39-78.

Parizkova, J. (1993). Food choices in Czechoslovakia. Appetite, 21, 299-302.

Parizkova, J., Rolland-Cachera, M.F. (2003). High proteins early in life as a predisposition for later obesity and further health risks [Editorial comments]. Nutrition, 13(9),818-819.

Ritzer, G. (2000). The McDonaldization of Society. New Century Edition. Thousand Oaks, California: Pine Forge Press.

Rogers, J. (1988). The food supply: food prepared away from home. Food Technology in Australia, 40(1), 20-21.

Rojsek, I. (2001). A comparison of the purchasing and consumption behavior of Slovenian and other Eastern European consumers. International Marketing Review, 18(5), 509-520.

Simoncic, R., & Kruzliak, P. (1984). Vyziva [Nutrition] (5th edition), Prague, Czech Republic: Nakladatelstvi a vydavatelstvi IQ 147, spol. s r.o.

Sovinova, H., & Csemy, L. (2000). The changing smoking and health scene in the Czech Republic. Nutrition, 16, 1112-1113.

Trichopoulou, A., Naska, A., & Costacou, T. (2002). Disparities in food habits across Europe. Proceedings of the Nutrition Society, 61, 553-558.

World Almanac and Book of Facts. (2003). Nations of the world: Czech Republic, 777-779.

World Health Organization (WHO). (2001). Highlights on health in Czech Republic. European Communities and World Health Organization. WHO Regional Office, Denmark.

World Health Organization (WHO). (2002). The World Health Report. Geneva, Switzerland.

U.S. Department of Agriculture (USDA). (1998). Design and operation. The Continuing Survey of Food Intakes by Individuals and the Diet and Health Knowledge Survey, 1994-1996. Washington D.C: US Department of Agriculture, Report No. 96-1.

Woods, S.C., Seeley, R.J., Rushing, P.A., D'Alessio, D., Tso, P.J. (2003). A controlled high-fat diet induces an obese syndrome in rats. Nutrition, 133(4), 1081-7.

APPENDICES

APPENDIX A

NOTICE TO POTENTIAL VOLUNTEERS

A nutritional research project on the changes in Czech dietary habits in last several years is being conducted by a graduate student from Oklahoma State University, U.S.A. If you agree to participate in the study, you will be asked a series of questions regarding your dietary habits and nutrition behavior. The research findings will be used to analyze Czech dietary habits across two generations and to determine what changes occurred in Czech diet in recent years.

Your participation in this study will be completely anonymous and confidential. Neither your name, nor any other type of personal identification will be linked to this study. Your participation is voluntary and you will be free to withdraw your participation at any time, and you will be free not to answer any single question, or series of questions if you choose.

Please contact Lenka Humenikova if you wish to participate or have questions about the study.

Contact Information, CR:
Lenka Humenikova
Vrchlickeho 22
Plzen 32029
Phone #1: 019 737 8492
Phone # 2 (mobile): 0602 477 238
Email: humenikova@yahoo.com

Contact Information, U.S.A.
Lenka Humenikova
Department of Nutritional Sciences
Oklahoma State University
Stillwater, OK 74078
U.S.A.
Phone: (405) 744-5040

APPENDIX B

Oklahoma State University
Institutional Review Board

Protocol Expires: 3/24/03

Date: Monday, March 25, 2002 IRB Application No HE0241

Proposal Title: WESTERN INFLUENCE ON DIETARY HABITS IN THE CZECH REPUBLIC

Principal Investigator(s):

Lenka Humenikova
425 HES
Stillwater, OK 74078

Gail Gates
425 HES
Stillwater, OK 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 203 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,

Carol Olson

Carol Olson, Chair
Institutional Review Board

Oklahoma State University
Institutional Review Board

Protocol Expires: 3/24/03

Date : Thursday, May 30, 2002 IRB Application No: HE0241

Proposal Title: WESTERN INFLUENCE ON DIETARY HABITS IN THE CZECH REPUBLIC

Principal Investigator(s) :

Lenka Humenikova
425 HES
Stillwater, OK 74078

Gail Gates
425 HES
Stillwater, OK 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s) : Approved **Modification**

Please note that the protocol expires on the following date which is one year from the date of the approval of the original protocol:

Protocol Expires: 3/24/03

Signature :

Carol Olson, Director of University Research Compliance

Thursday, May 30, 2002
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX C

Food Frequency Questionnaire

Please indicate how often you consume the following foods:

Type of foods Dairy Foods	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Skim milk	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Whole milk	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Low-fat milk	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Buttermilk	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cream	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Butter	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Margarine	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cream cheese	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Full fat cottage cheese	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Low-fat cottage cheese	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Yogurt (low-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Yogurt (non-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Yogurt (full-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mozzarella	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Parmesan	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hard cheese (full-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Spread cheese/full-fat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Spread cheese/low-fat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Ice cream	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Milk drinks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Yogurt drinks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Whipping cream	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lard	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Grains,cereals, breads	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
White bread/rolls	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Whole wheat bread/rolls	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cornflakes and other cereal	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Whole wheat cereal	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Musli/Granola	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
White rice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Brown rice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sweet pastry ("satecky".)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potato dumplings	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Regular dumplings	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pasta, spaghetti	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potato chips	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pretzels, sticks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pizza	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Waffles	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pancakes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Oatmeal	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cream of Wheat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Meat & Eggs	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Eggs	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Chicken with skin	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Chicken without skin	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fried chicken	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Turkey with skin	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Turkey without skin	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Duck	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Goose (baked, roasted)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Bacon	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hot dogs/pork	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hot dogs/chicken/turkey	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
"Vurty"/pork sausage	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Salami/soft	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Salami/hard	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Organ meat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lunchmeat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sausage	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potted meat	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Meat & Eggs	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Sousse ("tlacenka")	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Liver sausage	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Beef	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pork (baked, roasted..)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fried Pork	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fish (boiled, baked...)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fried fish	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mackerel	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Salmon	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sardines	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tuna	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Shrimp	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Crab	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lobster	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fish fillet	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mussel	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Fruits & Juices	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Apple, pear	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Bananas	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Oranges/orange juice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Grapefruit/g. juice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Watermelon	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mandarines	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Grapes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Strawberries	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Peaches	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Apricots	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Nectarines	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Blueberries and other berries	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cherries	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Currants	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Plums	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Kiwi	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lemons	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fruit drinks (Tang etc.)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other fruit juices	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other fruit	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Vegetables	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Tomatoes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tomato concentrate/paste	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tomato juice	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Carrots	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Celery (root)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Celery (stalk)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Green beans	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Peas	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Beans/lentils	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Corn	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Zucchini	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Broccoli	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cauliflower	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Spinach (raw)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Spinach (cooked/frozen	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Peppers (red, green etc.)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Pickles	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cabbage	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Vegetables	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Mixed vegetables/frozen	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
French fries, other fried	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
potatoes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potatoes-boiled	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potato- baked/pan-fried	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mashed potatoes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Potato salad	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sweet potatoes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Eggplant	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Onions	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mushrooms	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Garlic	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Leeks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cucumber	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sauerkraur, fresh	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sauerkraut, pickled	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lettuce/other salads	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Chinese kraut	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Sweets, Desserts,Beverages & other	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Cookies	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cakes	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sweet baked goods	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
(kolache)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Fruit kolache	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Doughnuts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Milk chocolate	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Dark chocolate	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Chocolate bars	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Hard candy	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Gummy bears/candy	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Honey, jelly	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sugar in coffee/tea	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Regular soft drinks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Diet soft drinks	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Beer	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Non-alcoholic beer	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
White wine	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Red wine	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Liquor	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Sweets, Desserts,Beverages & other	2+ per day	1 per day	5-6 per week	2-3 per week	1 per week	2-3 per month	<1 per month
Coffee, decaf.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Coffee, regular	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tea (hot or cold)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Dairy/Non-dairy coffee cream	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Water/min. water/0.3L	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Nuts (peanuts,almonds..)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Artificial sweetener	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Salad dressings:	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
With mayonnaise	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
With oil & vinegar	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mayonnaise (full-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Mayonnaise (low-fat)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tartar sauce	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
White gravy (creamy)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Brown gravy	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Stuffing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Creamy soups	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Vegetable soups	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Broth / bouillon	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Ketchup, mustard	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

APPENDIX D

Nutrition Behavior Interview

1. Are you satisfied with your diet (eating habits)?

[ ] not satisfied [ ] slightly satisfied

[ ] moderately satisfied [ ] highly satisfied

2. How many times a day do you eat? (includes snacks)

[ ] 1-2 times per day [ ] 3 times per day

[ ] 3-5 times per day [ ] >5 times per day

3. What is the primary factor that influences your dietary habits?

[ ] time/convenience [ ] cost/finances

[ ] environment (family, friends) [ ] taste/craving

4. How often do you (or your family) try new food products?

[ ] almost never [ ] occasionally

[ ] often [ ] very often

5. When you do try new food products, what influences your (your family) decision to try a new food product the most?

[ ] TV commercials [ ] Advertising in newspapers & magazines

[ ] In-store Advertising [ ] Recommendation from friends & family

6. How often do you eat lunch out?

[ ] almost daily [ ] 2-3 times per week

[ ] 1 time per week [ ] 1-2 per month

[ ] almost never

6. How often do you eat dinner out?

[ ] almost daily [ ] 2-3 times per week

[ ] 1 time per week [ ] 1-2 per month

[ ] almost never

7. How often do you eat in the following types of establishments per month?

	0	1-2	3-4	5-6	>6
Restaurant	[ ]	[ ]	[ ]	[ ]	[ ]
Buffet/Bistro	[ ]	[ ]	[ ]	[ ]	[ ]
Cafeteria	[ ]	[ ]	[ ]	[ ]	[ ]
Fastfood*	[ ]	[ ]	[ ]	[ ]	[ ]

* e.g., McDonalds, Pizza, Chinese fastfood, Czech fatsfood.....

8. How does your diet today compare to your diet prior to 1989?

[ ] very similar [ ] somewhat similar

[ ] somewhat different [ ] very different

9. If there has been a change, how would you characterize that difference in your diet?

[ ] very positive [ ] somewhat positive

[ ] somewhat negative [ ] very negative

10. How often do you eat the following types of food products per week ?

	0	1-2	3-4	5-6	>6
Instant soups	[ ]	[ ]	[ ]	[ ]	[ ]
Instant meals*	[ ]	[ ]	[ ]	[ ]	[ ]
Frozen meals	[ ]	[ ]	[ ]	[ ]	[ ]

*(e.g. instant dumpling, mashed potatoes, pasta dishes, gravy)

11. Demographic Information

Age:_____

Weight (kg):_____

Gender:_____

Height (cm):_____

Occupation:_____

Full-Time/Part-time

APPENDIX E

Food Categories

High-Fat Meats

Chicken with skin; turkey with skin, bacon; organ meat; sausage; pork hot dogs; mackerel; luncheon meat; salami; pork (roasted/grilled/baked)

Fried Foods

Fried chicken; fried pork; French fries; fried fish; potato chips; doughnuts

Full-Fat Dairy

Whole milk; full-fat yogurt; buttermilk; cottage cheese (full-fat); ice cream; hard cheese (full-fat); cheese spread (full-fat)

Fats/Oils

Margarine; butter; sour cream; lard; salad dressing with mayonnaise; salad dressing with oil & vinegar; mayonnaise; tartar sauce

Baked Sweets

Pastry; fruit kolache; kolache; pancakes; cakes; cookies

Western High-Fat Foods

French fries; pizza; doughnuts; salad dressing with mayonnaise, salad dressing with oil & vinegar

Western Low-Fat Foods

Low-fat & nonfat milk; low-fat and nonfat yogurt; low-fat cheese spread; breakfast cereals; whole wheat cereals; whole wheat bread; musli; oatmeal

Vita (2)

Lenka Humenikova

Candidate for the Degree of

Master of Science

Thesis: WESTERN INFLUENCE ON DIETARY HABITS IN THE POST-COMMUNIST CZECH REPUBLIC

Major Field: Nutritional Sciences

Biographical:

Personal Data: Born in Rokycany, Czech Republic, On May 21, 1977, the daughter of Josef and Jitka

Education: Graduated from Sport High School, Pilsen, Czech Republic in May 1996; received Bachelor of Science degree in Foods and Nutrition from Oklahoma State University, Stillwater, Oklahoma in May 2001. Completed the requirements for the Master of Science degree with a major in Nutritional Sciences at Oklahoma State University in December, 2003.

Experience: Employed by Oklahoma State University, Department of Nutritional Sciences as a graduate teaching and research assistant; Oklahoma State University, Department of Nutritional Sciences, 2001-present.

Professional Membership: Society for Nutrition Education