THE INDICATOR OF LIFE QUALITY: FOOD CONSUMPTION IN THE SOUTH PLAIN REGION[1]

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ABSTRACT

Food consumption of a household is affected by several factors. These factors relate to marketing, income, structure of expenditure. Besides satisfying physiological needs, food consumption is also used as a sociological indicator. Purchased food consumption is declining in Hungary, both at national and regional levels. The South Plain Region is one of the seven Hungarian statistical regions, 13 percent of the population live here. In the region agriculture contributes to economy with 17 percent, food industry with 20-25 percent. The economic growth is slow. The underdeveloped regions are not able to keep workforce, food consumption is stagnating. Purchased consumption is affected by many factors. Such as household incomes, food prices, household expenses like price of energy, price of substitution products, food consumption outside the household, urbanization, demographical factors. The study examines the influencing factors of food consumption in the South Plain Region. It points out the impact of these factors on food consumption and attempts to quantify the influential factors.
Keywords: food consumption, welfare indicators, South Plain Region, consumer basket

INTRODUCTION

The South Plain Region is the biggest part of Hungary, and territories of three counties – Bács-Kiskun, Csongrád and Békés counties – are involved in the region. The comparative advantages of the region are excellent. The region is situated in a flat area having outstanding quality soil, good climate and microclimate. Agriculture used to play a significant role in the economy of the region. Processing of local raw materials was the basic source of living for the people. Due to modernization and automatization the employment in the region is diminishing, while the number of the unemployed is increasing. The average salary of the population here is one of the lowest in Hungary. Low living standards, low income level and expensive food products may affect the food consumption as well.

Food and life quality
Psychologist Abraham Maslow first introduced his concept of a hierarchy of needs in his paper "A Theory of Human Motivation" in 1943. This hierarchy suggests that people are motivated to fulfill basic needs before moving on to higher levels of needs. Maslow's hierarchy of needs is most often displayed as a pyramid, with

lowest levels of the pyramid made up of the most basic needs including the need for food, water, sleep and warmth. (*Senauer*, 2001)

The definition of food consumption has expanded through the times. Food is an indicator of welfare by expressing social placement.

Food consumption is affected by social, demographic and economic characteristics. According to *Lehota* (2005) biological, psychological and anthropological factors also have an impact on consumer behaviour.

Newman et al. (2003) analyzed the Irish households' expenditure on prepared meals for home consumption. Data were gained using the 1987 and 1994 Irish Household Budget Survey data. Surveys covered random samples of 7.705 and 7.877, urban and rural households, respectively throughout the country. The aim of the paper was to analyze the factors influencing Irish households' decisions on purchasing prepared meals. A double-hurdle methodology adjusted to the problems of heteroscedasticity and non-normality was used. The double-hurdle model, originally proposed by *Cragg* (1971), assumes that households make two decisions with respect to purchasing an item, each of which is determined by a different set of explanatory variables. (*Blundell and Meghir*, 1987)

The dependent variable in Newman's analysis was household expenditure on prepared meals, the independent variables were income, age, gender, location, education, marital status. As a result, they concluded that in both 1987 and 1994, income has a positive and significant effect on household expenditure on prepared meals. In both years, the effect of this variable is negative and significant. This implies that as household income increases, expenditure on prepared meals also increases at a decreasing rate. The age of the head of household influences household expenditure on prepared meals negatively and significantly in both years. The younger the head of household is, the more likely they are to purchase prepared meals. The urban variable has a positive effect on the expenditure of prepared meals, urban households are more likely to participate in this market than rural households. The presence of children in a household and the gender of the head have a positive and significant impact on expenditure on prepared meals in both years. The overall positive result is driven by the greater likelihood of participation of female-headed households in this food market than male-headed households in both years. While married couples are more likely to participate in the prepared meals' market, compared to households with two or more unmarried adults.

Zhang et al. (2006) intended to provide an objective view of the consumers' social economic features contributing to the growth of the fresh organic produce market with a generalized double-hurdle model. Their objective was to identify important consumer features that are associated with fresh organic produce consumption and to investigate their effects on consumption. To achieve this purpose, they utilized a generalized double-hurdle model which allows different parameterizations of the participation and consumption processes, and the possible correlation between those two processes. Authors acquired AC Neilson Homescan data of 2003 for 7.052 households. The response variable of their model, the expenditure of fresh organic produce was modeled as a function of various consumers' social economic variables, like household size, income, age, education, children, and location of residents. Their
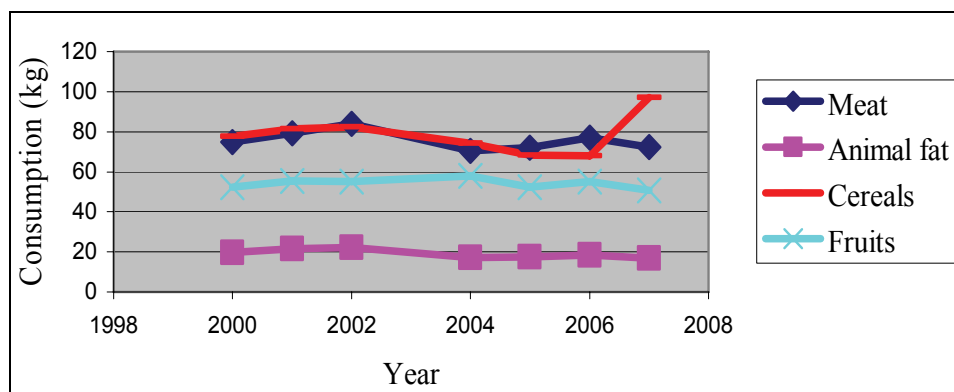
estimated results indicate that marketing strategies targeted at higher income and higher educated consumers can be effective in both attracting new consumers and eliciting more sales from the current consumers. Household size is not likely to be a factor affecting fresh organic produce consumption. Even though older people may be more likely to consume organic produce, the age of the current consumers may not be a distinguishing factor for further promotions to aim at increasing sales.

Food consumption in the South Plain Region
There are three main groups of food consumption: self-produced consumption, meals outside and shopped food products. *Figure 1* indicates the consumption of some basic food products for the region of South Plain.

Figure 1

Food Consumption in the South Plain Region

Source: *KSH,* 1996-2007

Between 2000 and 2007 fruit and fat consumption was roughly balanced. After a decrease in meat consumption in 2004 another increase can be observed. The most significant change appeared in cereal consumption. Compared to 2006 in 2007 the consumption of this kind of goods increased by 42 percent.

MATERIALS AND METHODS

For welfare analysis of a region or a country it is possible to observe the food expenditures of the consumers. This study focuses on the consumers from the South Plain Region. This region was chosen because of the low average salary level of the country. Food consumption as a welfare indicator was expressed in HUF. According to *Lakner and Hajdu* (2002) the concept of "average consumer" has had less importance since the 1990s, average consumption was examined with disregard of different income deciles. Instead of regional food prices country average prices were used for the calculations. The study concentrates only on the influencing

economic factors without social factors. Such economic factors are investigated that may affect consumer choices in the South Plain Region.

The source of the data regarding consumption, household income, expenditure and prices of food products and energy are from the Hungarian Central Statistical Office. Consumption meant average consumption of products from the consumer basket: cereals, meat products, dairy products, fruits and vegetables, non-alcoholic beverages. The study intends to verify that food expenditures depend on average income, price change of food products and price change in energy products of the households. It is the reason for that two hypotheses can be drafted: 1. consumer's income and food expenses are correlate. 2. Economic factors affect not only the consumption behavior but they also correlate to each other.

The period of the utilized data was between 1996 and 2007. For the calculations regression analysis was used, where y meant the food expenditure and x_i meant average income, food and energy price changes. If the correlation between the xi variables is eligible, the calculation can be accomplished by regression. However, if the independent variables correlate to each other, the first step to the regression analysis is standardization, which is followed by factor analysis. As a result of the factor analysis 2-3 variables will explain all the information of all previous variables.

For the analysis multi-variable regression models evaluated by SPSS 14.0 for Windows program were utilized.

RESULTS AND DISCUSSION

Table 1 shows the average income and average food expenditure of a household from the South Plain Region between 1996 and 2007. The ratio of food expenses and salary is also displayed. Data are also represented on *Figure 2*.
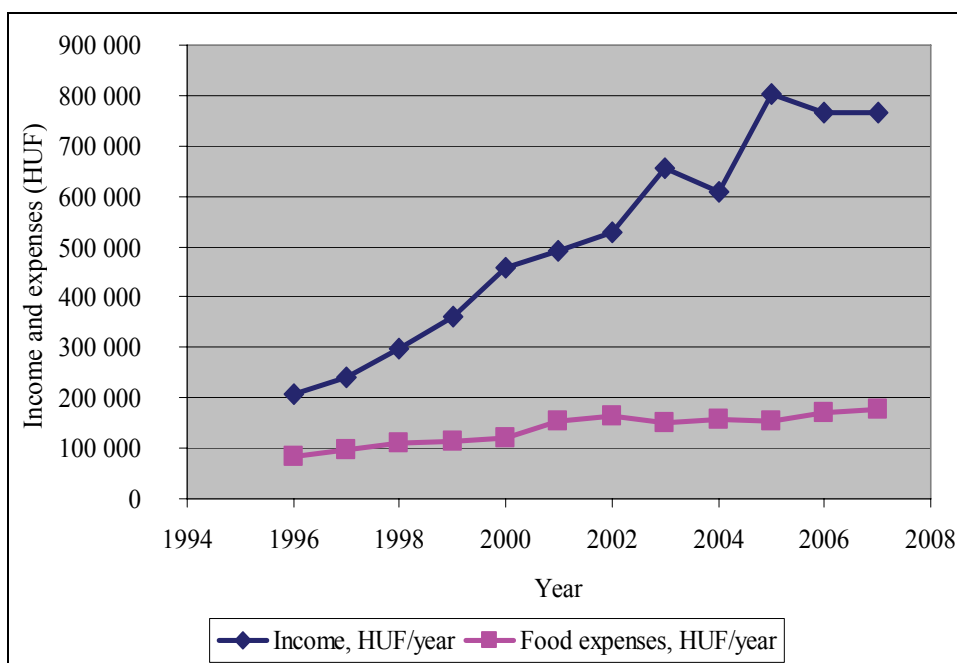
Table 1

Income and food expenses between 1996 and 2007 (HUF)

Year	Income	Food expenses	Expenses/Income (%)
1996	208.523	82.020	39.3338
1997	241.627	95.484	39.5171
1998	298.172	109.067	36.5786
1999	362.717	113.024	31.1604
2000	457.628	121.885	26.6341
2001	493.000	153.896	31.2162
2002	529.347	163.354	30.8595
2003	656.610	151.060	23.006
2004	608.178	156.689	25.7637
2005	804.104	154.122	19.1669
2006	767.443	171.670	22.3691
2007	767.569	176.996	23.0593

Source: *KSH*, 1996-2007 based authors' calculation

Figure 2

Income and food expenses between 1996 and 2007

Source: *KSH,* 1996-2007

It can be stated that during the examined period both incomes and food expenses increased, however, at different rates (similarly to Newman's result). Income rise is more dynamical, which means that the population of the South Plain Region spent a smaller ratio of their salary on food products. While the residents spent 39 percent of their salary on food products in 1996, this ratio diminished to 23 percent until 2007. The EU average is 17 percent. Food expenses are tending towards the EU average, thus welfare expansion can be mentioned.
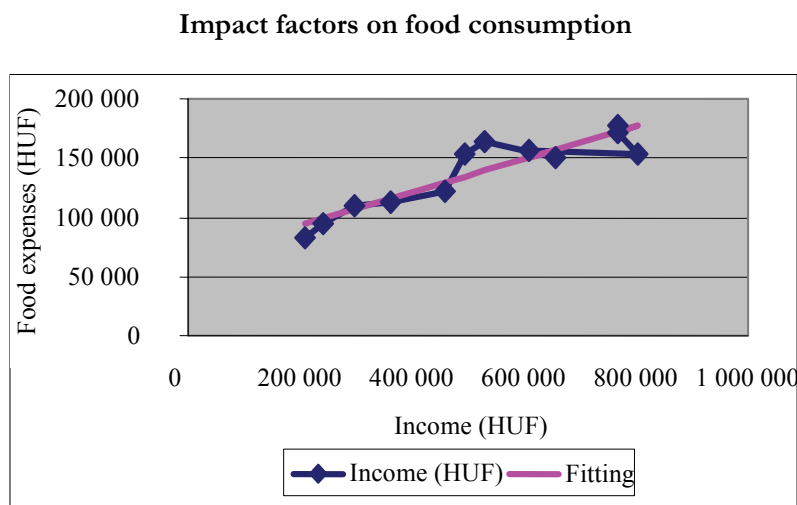
In order to verify the first hypothesis, i.e. income of consumers and food expenditures correlate to each other, linear regression was utilized (*Table 2*). Linear correlation between the two factors is displayed on *Figure 3*. Parallel to an increase of salaries, food expenses rose too.

Table 2

Regression statistics

R	R²	Adjusted R²	SE	N
0.911833	0.831439	0.814583	13609.26	12

Figure 3

Impact factors on food consumption

Source: *KSH*, 1996-2007

After proceeding the linear regression it can be concluded that the value of R^2 is 83 percent (*Table 2*), which means that food expenses of the inhabitants of the South Plain Region depend significantly on their income. Correlation between the variables is positive; the most suitable model is indicated as follows.

$$Y = 66415.22 + 0.13 \text{ x} \tag{1}$$

Food expenses may be affected not only by income, but by prices of food and energy products as well. Since x_i variables correlate each other, in order to verify or reject the second hypothesis with regression analyses, terminating the correlation between the variables was necessary. An increase in the price of electricity, gas and fuel may result in an increase of food production prices. In this case different situations can occur:

- An increase in the electricity price results in an increase of the price of bakery goods and chilled/mirelit products, which also appears in the price of the final product.
- An increase in the fuel price results in an increase of the price of all food products that need to be carried.
- An increase in the price of substitution products can induce an increase in the demand for other food products (for example if the price of beef meat increases, the demand for pork meat increases too).

Table 3 summarizes the price changes of some food products, while *Table 4* presents other costs related to food production.

Standardization of data from *Table 3* and *Table 4* was followed by data reduction using SPSS 14.0 For Windows program in order to put all information of the 10 variables into one single variable with minimal loss. It became the independent x variable of the subsequent regression analysis (*Table 5*).

Table 3

Price changes of food products (HUF/kg, HUF/liter)

Year	Pork meat	Beef meat	Poultry	Milk	Bread	Potatoe	Apple
1996	589	508	346	64	86	35	102
1997	721	536	424	80	99	30	94
1998	775	607	448	91	104	60	107
1999	638	629	426	98	106	62	133
2000	817	670	443	115	118	60	133
2001	1.080	781	501	141	144	67	123
2002	948	846	479	155	151	68	159
2003	831	890	462	160	156	103	149
2004	955	959	505	159	178	101	142
2005	1.000	1.033	521	156	173	60	143
2006	1.100	1.130	538	168	179	106	175
2007	1.090	1.230	626	187	215	151	223

Source: *KSH,* 2008

Table 4

Price changes of energy and fuel

Year	Electricity HUF/10 kw	Gas HUF/10 m³	Fuel HUF/liter
1996	111	200	120
1997	147	266	142
1998	178	316	156
1999	205	321	185
2000	220	325	234
2001	234	364	226
2002	245	390	223
2003	270	410	233
2004	318	457	244
2005	338	491	260
2006	343	548	277
2007	383	757	276

Source: *KSH,* 2008

Table 5

Regression statistics

R	R²	Adjusted R²	SE	N
0.948095	0.898884	0.888773	10540.59	12

The results in *Table 5* show that food expenditures mainly depend on price changes. The value of R^2 is 0.89, which means that there is a significant relationship between the dependent and the independent variables. The model can be described by the following equation:

$$y=137438.9 + 29964.84x \tag{2}$$

CONCLUSION

The primary hypotheses are justified by the accomplished calculations. According to the calculations, consumer behavior is affected by income (83%) and by price changes (89%). The study did not consider consumers' age, education, gender, religion etc. when examining consumers' behavior.

The study is based on full-consumption of products in the consumer basket, however, it is possible to analyze single specific product consumption as well. Welfare models were established for those purposes. A welfare model, such as the double hurdle model, is applicable for counting factors that affect welfare. The models are suitable to give a basis to food industry to make production meet the customers' needs.

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