Abstract

Food security ensurance is determined both by food availability, which depends on agrifood sector and on agricultural trade and by the access to food, which results mainly from the incomes and population purchase power; but also on other factors for example the local market supply, the physical access of persons to food, etc. Starting from these considerents, the paper’s aim is to identify the way in which the internal supply is able to assure the population access to balanced food diet, based on valuable components, respecting the nutritional specialists. Using the metabolical coefficients for macronutrients, it was realised their conversion or equivalence into calories, fact which permitted the assessment of the evolution in time of level and structure of the caloric input. Results obtained show a qualitative modification of the caloric input, by diminution of the level of calories coming from glucides and slight increase of the protein caloric level, mainly the animal origin ones. In the structure we can see as a positive aspect, a modification in the caloric share of the glucides, by increase of the input from fruits and vegetables. Structurally at the level of year 2011 the caloric share of nutrient factors is inscribing in the values recommended by nutritionists but there are identified also certain negative tendencies which in the future could generate a degradation of diet’s calorie balance.

Keywords: food security, food consumption, food available, calories, nutrient factors.

INTRODUCTION

The strategies in favour of food security are based on four main pillars: 1) availability of food products, which need an agrifood sustainable chain, 2) the access to food, by supporting the jobs, the increase of incomes and social mechanisms for their compensation, 3) the nutritional value of the food share, a domain of action that needs mainly actions for formation and education, as well as a great diversification of the agricultural production and 4) the prevention and management of crisis, by fight of price volatility based on production increase and the stability of the food merchandise stocks.

In order to ensure the food self-sufficiency and the food security, both on short and long term, Romania must exploit the agricultural potential through a political frame more favourable and the increase of investments in the agricultural and rural development. Taking into account the general frame of the Common Agricultural Policy but also the soil and climate conditions, there can be identified and hierarchizized the priorities regarding the exploitation of the potential to increase the agricultural products supply.

MATERIALS AND METHODS

The speciality literature regarding food security considerably developed, many definitions being proposed. Maxwell and Frankenberger identified 194 different studies regarding the concept and definition of food security and 172 studies regarding specific indicators. The Food Balance Sheet and the Family Budget Survey give necessary
information for the study foundation. Calories food available per inhabitant is a useful indicator in assessment of the potential of population supply. As the degree of the indicator's representativity has certain limits, for the assessment of the food supply qualitative structure there were used indicators of the consumption level and structure. These were established through quantification of sorts components of the consumption also through expressing into nutrient factors respectively: proteins, fats and glucides these being the main calories sources in the diet.

The knowledge of the food and nutritional situation of the population presupposes the existence of an ensemble of information regarding the availabilities of agrifood products, at national level and the way of their utilization. With this goal, there were consulted and put into value more data sources.

The global frame in the ensurance of the quantitative information, respectively: stocks, production, imports and exports of agrifood products, is evidenced in the Food Balances source showing, also, the relationship between agriculture and food industry, as the commercialization and distribution circuits of the agrifood products. The food availabilities represent the indicator which assesses the quantitative supply at the main food products.

For rigour and objectivity, the informational support regarding the nutrition and energetic balance, the calories sources, vitamins and minerals and the nutritional recommendation was ensured by the Guide for Healthy Food, elaborated by the Nutrition Society in Romania, but also other international sources, for comparability.

The qualitative structure of the food consumption is established through quantification of the sorts components of the consumption and through the expressing into nutritional factors, respectively: proteins, lipides și glucides, these being the main calories sources in the diet. Utilizing metabolic coefficients for macronutrients, it is realized the conversion or their equivalence into calories. The energetic value of the calorigeneous elements of the body used into practice is the following:
- glucides, representing the main source of calories, are equivalent with 4.1 calories per gramm;
- proteins are supplying also 4.3 calories per gramm; in addition to the calories, proteins are supplying also the aminoacids necessary for the body;
- fats are supplying more calories than any other source, respectively 9.3 calories per gramm;
- pure alcohol, 7 calories/g.

RESULTS AND DISCUSSIONS

Using the metabolic coefficients for macronutrients, it was realised their conversion or equivalence into calories, fact which permitted the assessment of the evolution in time of level and structure of the caloric input.

Recommendations of the nutritionists regarding the calories input are established in function of the nutritional factors and age. For a healthy diet, of major importance is the type of glucides, proteins or lipides consummed. The following table illustrates the acceptable distribution intervals for the macronutrients, these taking into account both the reduction of the risks to chronic diseases and the intake of essential nutritive substances.

The food resources are grouping the totality of quantities in a certain agrifood product which the economy disposes of in an year. For the ensurance of the food security, the resources are coming from: the utilizable agrifood production (the production obtained) and the import of agrifood products. By their destination, the resources can be utilized,

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<tr>
<th>Tab. 1. Recommendations regarding the percentage variation of the calories' sources, in function of the age</th>
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<td>Children under (1–3 yo)</td>
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<td>Children and adolescents (4–18 yo)</td>
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<td>Adults (19 and more)</td>
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in different degrees, for export and to ensure the internal availabilities for the consumption: intermediary consumption, the stocks formation, (stocks variation), including also the losses and not last the available for the human consumption.

By the norms in vigour, given by the Ministry of Health in Romania, a structure of the caloric necessary and of the food principles for the adults with a medium activity is of 2900 calories/day for men and 2200 calories /day for women, and the value in percents recommended of the calories sources is of: 13% proteines, 58% glucides și 30% lipides.1

For the analysis of the food consumption pattern of the population in our country there are utilised specific indicators, and as reference in the assessment of the food security it was utilized the annual average consumption by agrifood products.

The quantitative assessment of the food consumption in Romania

As regards the annual average consumption per inhabitant, the trend was decreasing at cereals, in 2011 the consumption decreased by 7.14% towards 2001, respectively from 221.2 kg/ inhabitant in year 2001 to 205.5 kg/inhabitant in 2011, less at rice where it was registered a slight increase of 5%, an increase was registered also at fruits and fruit products 46%, meridional and exotic fruits 86%.

If we refer to apples, the annual average consumption is low. For example, one person consumes averagely, 24.7 kg of apples /year, which represents less than ½ apple /day. If we report ourselves to the period before Romania’s accession to the EU (year 2006), in the year 2011 a person consumes averagely:
- less by 9.2 kg apples /year
- less by 0.3 kg apricots /year
- less by 0.9 kg cherries and morello cherries

This evolution is due, besides the decrease of the population purchase power, to the deficitary internal supply which could satisfy the consumption necessary at lower prices.

Whereas, the potatoes consumption increased by 10%, milk by 15.3% and meat-total by 17.8%, significant increases being registered at pork meat 48%, as it can be seen in graph 1.

If in the year 2001, one person was consuming averagely per month 9.8 kg bread and bakery products, in the year 2011 this was consuming averagely per month 8.5 kg, by 12.8% less, pasta registered a slight increase by 13%, and the maize flour consumption registered the biggest decrease that is 40%, whereas the total fresh meat consumption increased by 41.5% from 2.18 kg in 2001 to 3.08 kg in 2011, the highest consumption registering at the poultry meat by 65%, followed by the pork meat with 25%, it also increased the fish and fish products by 82%. Sugar consumption decreased by 11.7% and honey increased by 70.6%, it also grew the cheese varieties by 16.6% and butter by 165%. The total milk consumption remained approximately constant, in 2011 the consumption is the same as in 2001, respectively 5.96 litres /person averagely. Exotic fruits consumption knew the highest increase of over 150% while at the home fruits the consumption increased by 58.5% and vegetables and vegetable cans (in fresh vegetable equivalent) with only 4.2%. (graph 2.)

Romania’s food availabilities

The utilizable production fluctuant, the instability being generated, mainly by the climate factors and by the deficitary production technologies in the melioration of the climate factors. At the same time, the ensuring of the resources from the internal production is restricted by the way of organization and functioning of the agrifood chains, mainly at the industrial processing level. As the supply of agricultural products is extremely dispersed, in many cases, the raw material for the processing comes from import.

The self-sufficiency degree is an important indicator in the assessment of the food security. This reflects the degree of the covering of the food necessary of the population by the internal production. At the extent at which the self-sufficiency degree has values near 100% and it maintains relatively constant, we could appreciate that the internal supply can ensure the population food security. The more reduced the degree of self-sufficiency and accompanied by annual fluctuations, the supply is volatile and the country’s vulnerability increases.

Fig. 1. The annual average consumption per inhabitant, at food products, in 2011 comparatively to 2001

The highest volatility is specific to the group of cereals, the self sufficiency degree varying from one year to another, in the interval 87% (in 2003) up to 130% (in 2010).

The other products analyzed are situated constantly under the level of 100%, and the cover of the agricultural and food deficits are completed by imports.

The share of imports in the internal consumption availabilities is more important in the case of vegetables and vegetable products (7% in 2002, 11%
in 2011) and especially in the case of leguminous for beans: 23% in 2002 with a maximum of 42% in the period 2007-2009.

For fruits and fruit products the quantities imported ensured 13% of availabilities in 2002 but, on the ground of increase of demand and consumption, the share of import in ensuring the availabilities increased to 24% in 2011.

The imports increased from one year to another, in 2011 reaching a maximum of 4.445 billion euro. The agricultural and agrifood products exports followed the same trend, but the commercial balance is still negative.

Romania is predominantly exporting non processed agricultural products. Vegetal products have the biggest share in the structure of the export in the year 2011, of 52%, divided mainly between cereals and oilseeds. If we report ourselves to total export of agrifood products, the cereals have a share of over 27% in its value. The export of processed agrifood products represent only 27.3%. Whereas, in the import structure, the processed products have a share of 43%. (graph 4.).

The qualitative assessment of the food consumption in Romania

There are more methods for assessment the energetical intakes, but there is not yet a method which should permit an exact assessment of the food intake, an important factor being the increase of food number and the extreme diversification of their composition. The food surveys can offer relations regarding the nutritional consumption of an individual or a group.2

From the analysis of the evolution of the food availabilities for the human consumption, expressed in calories, it results that the supply or the apparent consumption has a trend of increase,


Fig. 3. The self sufficiency degree at the main food products, period 2002-2011, %

Source: processing after the Food Balances, NIS
Fig. 4. The balance account of the commercial balance at the main agrifood products


Source: processing after NIS, Data Base

Fig. 5. Evolution of availabilities for food consumption by sources of caloric intake provenience period 2001-2011 – number calories /person /day

Source: Processing after NIS, Data Base Tempo online
Comparatively to 2001, in 2011 the apparent consumption of one person increased by over 100 calories. In the composition of this increase positive values has registered the caloric intake of the proteins, mainly those of animal origin and, more consistently, the caloric intake of the lipids of vegetal and animal origin. Calories from glucides diminished as level, diminution given by cereals and cereal products and in a smaller extent by sugar and sugar products. As a positive aspect it can be remarked an increase of the caloric intake from glucides from fruits and vegetables.

Structurally, at the level of 2011, the caloric share of the nutritional factors in the apparent consumption is inscribed in the values recommended, respectively: 13.9% calories coming from proteins, 28.6 calories from lipides and 57.5 calories coming from glucide.

Comparing the data regarding the consumption availabilities and the foods entered in the consumption it results that, at national level the food availabilities ensure the caloric necessary, regardless the provenience source (internal production and import). For the identification of the vulnerable groups to food insecurity the component of food security can be expanded for an in depth analysis of the phenomenon, by population categories.

CONCLUSION

The concept of food security has evolved in time, reaching to the acknowledgement of the fact that the existence of the food available at national level does not permit in itself the ensurance of the food security at individual level and household, and it is necessary, also, that the poor and the vulnerable to have access, physical and economic to food. Nevertheless, when they discuss options of national economy policy, the food security at national level is best defined as being an satisfactory equilibrium between the food demand and the supply of foods at reasonable prices.

The more recent approaches attribute a special importance as a factor of the stability of the food security „to the food autonomy“, which reduces vulnerability to the fluctuations of the internal and international agricultural markets.

The multidimensional character of the food security solicitates a good correlation between the different activity sectors - agriculture, trade, infrastructure, and the importance given to the sectors, agricultural and food one, results from the
fact that these constitute the support of the food consumption.

The knowledge of the food and nutritional situation of the population presupposes the existence of an ensemble of information regarding the availabilities of agrifood products, at national, regional and local level and the way of their utilization, and the satisfying of the nutritional needs of the population, can be realized through interventions and orientations towards the market through measures of agricultural policy.

Results obtained show a qualitative modification of the caloric input, by diminution of the level of calories coming from glucides and slight increase of the protein caloric level, mainly the animal origin ones. In the structure we can see as a positive aspect, a modification in the caloric share of the glucides, by increase of the input from fruits and vegetables. Structurally at the level of year 2011 the caloric share of nutrient factors is inscribing in the values recommended by nutritionists but there are identified also certain negative tendencies which in the future could generate a degradation of diet’s calorie balance.

In food security measurement’s besides the level of the caloric input, its qualitative structure is an indispensable indicator. Food security measurement is necessary for any development project, with the aim to identify the uncertain food products, and consequently, for the hierarchization of the priorities for rural and agricultural development.

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**REFERENCES**

6. x x x (2013). NIS, Data Base Tempo online.