

TRENDS IN AVERAGE ANNUAL FOOD CONSUMPTION PER INHABITANT IN ROMANIA

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Abstract

The paper aimed to analyze the dynamics and trends in average annual food consumption of the population in Romania based on the empirical data provided by National Institute of Statistics for the period 2014-2020. Fixed basis index, growth rate, regression equation, coefficient of determination, graphical method and comparisons were the main procedures used to process. Cereals consumption declined by 1.26%, accounting for 204.4 kg/capita in 2020 and wheat and rye have the highest share in consumption. In the studied interval, vegetable consumption increased by +6.28%, accounting for 194.4 kg in 2020. Consumption decreased for potatoes (-7.4%) and cabbage, while for onion remained the same. Tomatoes reached 42.1 kg (+10.5%) and keep the top position among vegetables. Fruits consumption increased by +34.1%, reaching 107.6 kg in 2020. The consumption increase for (+15.5%), plums (+68%), grapes (+27.4%), peaches (+12.1%), melons (+5.5%), and nuts, while for cherries remained relatively constant and for apricots declined. Romanians consume 39.5 kg Mediterranean and exotic fruits by + 53.6% more, exceeding the apple consumption. Sugar consumption increased 25.5 kg in 2020 (+20.8%), while egg consumption decreased to 236 pieces (-4.1%). Milk and dairy products consumption increased 252.6 litres in 2020 (+3.4%). Oil consumption increased to 18.3 kg with 85.2% share in vegetal fats. Butter consumption account for 3.5 kg/capita. Meat consumption is by +27% higher in 2020, accounting for 77.4 kg/capita. Pork keeps its top position with 38.3 kg (+28.6%), being followed by poultry meat 28 kg (+39.3%). Pork keeps 48.1% and poultry meat 36.1% in meat consumption and together accounting for 84.2%. Fish consumption reached 6.3 kg (+38.5, while honey attained 0.8 kg. Income and price are the main factors influencing buying decision and consumption in Romania, besides product quality, landmark and fidelity, life style and desire to a healthier diet. Consumption plays an important role in GDP creation, and that is why the authorities have to increase salaries and pensions, income per household in a word and to establish thresholds among which prices could vary to stimulate consumption.

Key words: average annual food consumption per inhabitant, trends, features, factors of influence, Romania

INTRODUCTION

The population dynamics changes the current production and consumption patterns to achieve a more sustainable development model [72].

In this context, food security is one of the major challenges of mankind because it is needed to produce for the entire population [3].

Only in this way, economic development, growth and stability, a low unemployment

rate, a higher productivity, trade intensification, poverty reduction and health improvement could be attained [60].

Food consumption is linked to purchasing power, in close relationship with disposable income, inflation rate, price levels of food products. Taking into consideration the inequalities of income distribution and between urban and rural areas, the high pressure on the family budget, human consumption varies between different categories of consumers. Therefore, income

level per household is one of the major economic factors which influence consumer decision to buy [2].

Besides this, other factors like education, cultural level, lifestyle, and other psychological aspects could influence purchasing behaviour. Consumers with higher income are more oriented to buy products of high quality and with a high price, while the ones with a lower income per household are obliged to choose food products of lower nutritional value being marketed at a lower price.

Therefore income and price are the main factors influencing buying decision, but consumers also take into account other choosing criteria like: aspect, taste, durability, nutritive and energetic value, satisfaction degree after consumption, choice of the purchase place, landmark, brand loyalty. A comprehensive understanding of consumer consumption and purchasing behaviour should substantiate an efficient marketing strategy [16].

An interesting validation of Engel's law on the connection between household income and food expenditure is proved by the decline in real income [17, 32].

Romania has a high agricultural potential to increase production to cover better the population consumption. However, in the period 2007-2013, the analysis regarding food consumption per capita reflected that it is either insufficient for a category of agri-food products (fruits, vegetables, milk and dairy products) or quantitatively sufficient for other groups of products (cereals and oilseeds). In this case the surplus is destined to export and the deficit of the internal market requests to be covered by imports [3].

Agricultural and food industry are called to produce more products and of higher quality to cover the demand, and food supply to correspond as volume, diversity, quality and sufficiency.

As a country cannot produce all sorts of agro-food products, imports are needed to complete domestic production for covering consumers' requirements [60].

An analysis on agro-food products consumption in Romania in the period 2015-2020 proved that consumers have become more oriented to a healthier diet, as consumption of fruits, vegetables, meat and fish increased, while the consumption of potatoes, cereals, sugar and eggs declined [60].

During the COVID-19 pandemic, a new problem has been raised regarding the transfer of agri-food products from the place of production to the final consumer. The movement restraints imposed to the population by authorities proved the necessity to emphasize the role of short food supply chains, which are the most preferred solutions both by consumers and producers [70].

Food wastes are a big problem along the product chain from farm to fork. New challenges are in front of the research, practitioners, organizations and authorities for preventing and reducing food waste, and a large range of models and good practices are recommended (digital technology, projects and platforms, volunteering, food banks, mobile applications, social innovation, corporate social entrepreneurship, education, and public awareness [69].

In Romania, the growth of the average monthly income per household had a positive influence on the average monthly expenditure, but there are still differences between the residence areas (urban and rural). Taking into account the difference of income level between Romania and all the other EU countries, consumption in Romania accounts for 71 % of total expenditure, compared to a much lower percentage in the high developed countries. Regarding the expenditures on agro-food products, it was noticed that, in the urban area, they exceed the national average, while in the rural area they represent 96.7 % of the country average [61].

For having a healthy population, Romania has proposed to develop a sustainable agriculture and to improve life quality and the living standard and at the same time to make the population more conscious of the importance of healthy nutrition. Aligned to the EU Green Deal, Romania has proposed to pay more

attention to organic agriculture to strike a balance between the three areas of agricultural sustainability: environmental, economic and social. Despite that, organic products have appeared in the domestic market of Romania, but a few studies have been done on organic farming and consumption of organic products. However, it is expected that the consumption of organic products to ensure environment protection and at the same time to support family farming and the local economy [8].

Ecological system is planned to be applied on more than 25% of the EU agriculture by 2030. In this way, the synergy between European Green Pact, Biodiversity Conservation Strategy and Farm to Fork Strategy is expected to be ensured [10].

A study on consumer behaviour related to ECO products, marketed in Romania-Bulgaria cross border, pointed out that it is needed to better clarify and educate the population regarding the notions of ecological, bio, organic and natural product, as between the peoples' thinking on these products is different than the reality [18, 19].

In this context, the purpose of the paper was to examine the dynamics of food consumption in Romania in terms of average annual consumption per inhabitant in the period 2014-2020 for which available data are provided by National Institute of Statistics. The study includes the description of the evolution and structure of various categories of food products, emphasizing the trends in the studied interval as a reflection of the changes in consumer behaviour.

Taking into account the insufficient literature and data regarding the consumption of organic products in Romania, this aspect has not been approached and treated in this study.

MATERIALS AND METHODS

The research paper is based on a large literature which has been carefully studied regarding food consumption and also on the empirical data provided by National Institute of Statistics for the period 2014 -2020.

The average annual food consumption was studied by the main categories of products as follows:

- cereals and products made of cereals (wheat, rye, maize, other cereals, rice) in terms of cereals equivalent in grains;

-potatoes;

-vegetables, including a selection of the main consumed vegetables such as: tomatoes, cabbage, onion, roots (carrots, celery, parsnip, parsley, etc), in terms of fresh vegetables equivalent;

-melons;

-fruit, including: apples, grapes, plums, cherries, peaches and nectarines, pears, apricots, nuts and Mediterranean and exotic fruits, with the highest share in consumption;

- sugar and products made of sugar;

- fats of vegetal origin (oil and margarine) and of animal origin (butter and lard);

-meat and meat preparations, including: pork, poultry meat, bovine meat, sheep and goat meat, other sorts, edible organs), in terms of fresh meat equivalent;

-fish.

The main procedures used to process the statistical data have been: fixed basis index, growth rate in 2020 versus 2014, regression equation, coefficient of determination, graphical method and comparison method.

The results are illustrated in graphics and conclusions emphasize the main ideas resulting from this research.

RESULTS AND DISCUSSIONS

Cereal consumption

Cereals, especially wheat, rye, maize, oats, barley and rice represents an important raw material for food industry.

The flours made of wheat, rye, barley, oats grains are utilized in the milling and bakery industry for producing various sorts of bread and specialties (croissants, buns, bagels, pasta, biscuits etc) [63].

Maize flour is utilized for producing "polenta", frequently used in Romania but also under other names and means of preparation in other 16 countries in the world (Italy, Switzerland, Slovenia, Croatia, North Macedonia, Turkey, Canada, Mexico, USA, Ghana, Kenya, Zambia, Nigeria, South Africa, Zimbabwe, Sri Lanka). In Romania,

polenta or "mamaliga" in Romanian, usually accompanies other dishes like: polenta with fresh cheese and sour cream, like garnish for "sarmale" another traditional dish (cabbage leaves rolled and filled with chopped pork meat, rice, onion, pepper), for "tochitura" (minced pork and slices of sausages), for "ciulama" (scumbag made of poultry meat or mushrooms), also for dishes made of fish (carp brine, fried fish), and for mutton pastrami. In Romania, rice is used like an ingredient in soups and borsch, and also in dishes like pilaf or garnish to other basic dishes and rice and milk which is an well known dessert. Rice has many types: brown, white, red and black which are consumed being rich in phosphorus, potassium, magnesium and B1 vitamin [9]. The average annual cereal consumption per inhabitant in grains equivalent decreased by 1.26% from 207 kg/year in 2014 to 204.4 kg in the year 2020. This decline is justified by the consumer awareness about the fact that flour products could increase body weight and the modern consumer has become more interested in a healthy diet. However, cereals cannot be entirely eliminated from the daily diet being

necessary for their content in fibres. Cereal consumption was studied by many authors in Romania but in various period of time pointing the specific trends [30]. Average annual wheat and rye grain consumption registered variations from 160 kg in the year 2014 to 163.2 kg in 2017, but then, it declined to 160.5 kg in the year 2020, meaning by +0.3% more than in 2014. Similar results were found [22]. Maize grains consumption recorded a significant decrease from 42 kg in 2014 to 38.8 kg in 2020 (-7.7%). Similar results were found by [29]. Rice consumption varied between 4.4 kg in 2014, then to 5.2 kg in 2015, and after this year it declined to 4.1 kg in 2018, and again, it started raising to 4.6 kg in 2020 (+4.5% compared to 2014 level). Analyzing rice balance sheet, it was found an increased rice consumption in Romania by [20]. Other cereals are more and more consumed, the average amount of grains increasing from 0.2 kg in 2014 to 0.5 kg in 2020, meaning + 150% . Figure 1 reflects the dynamics of the average annual consumption of cereals, and also for wheat and rye, and maize grains.

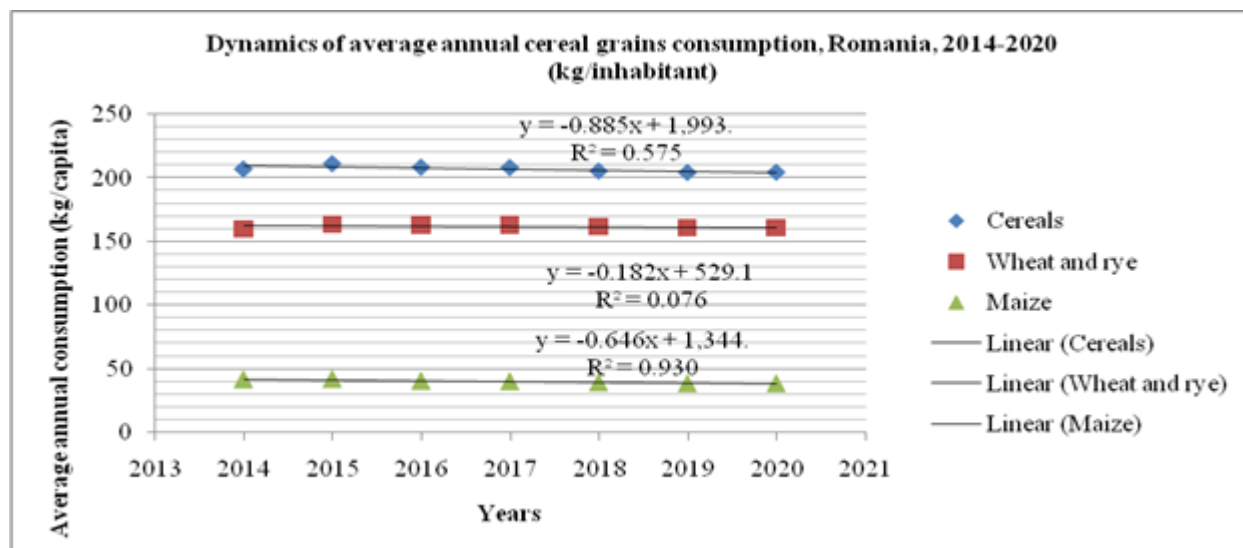


Fig. 1. Dynamics of the average annual consumption of cereals grains, of which: wheat and rye, and maize grains, in equivalent cereal grains, 2014-2020 (kg/inhabitant/year)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23,24, 25, 26, 27, 28].

Analyzing the structure of cereal consumption, we may notice that the highest share belongs to wheat and rye, 77.3% in

2014 and 78.5% in 2020, meaning +1.2 pp, followed by maize with 202.2% in 2014 and 18.9% in 2020 (-1.3 pp).

Rice has a relatively small share, but with an increasing trend from 2.1% in 2014 to 2.25% in 2020 (+0.15 pp), and other cereals have the

smallest weight, but with an ascending tendency from 0.2% in 2014 to 0.5% in 2020.

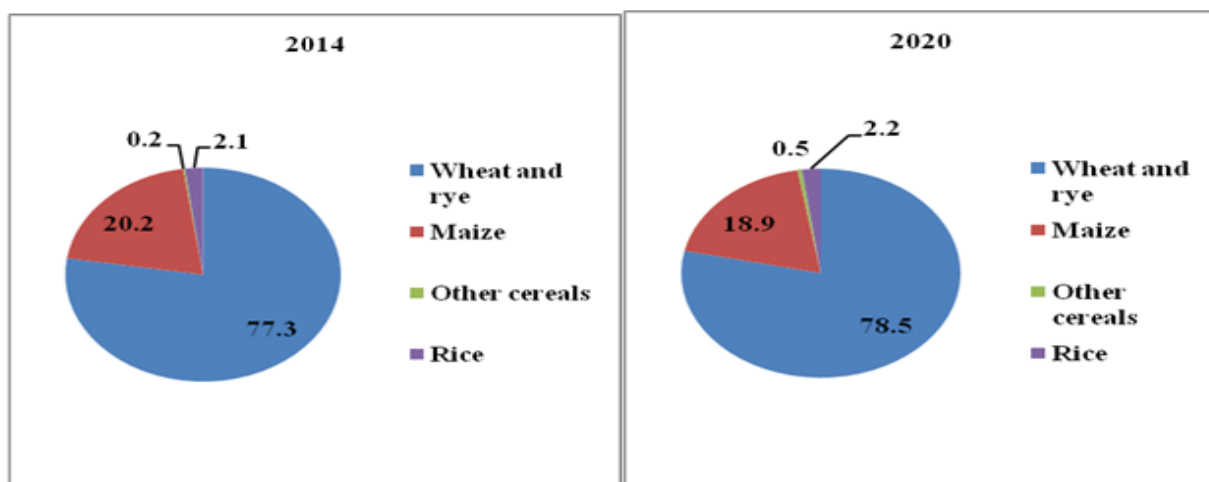


Fig. 2. The share of various cereals in average annual consumption in the year 2020 versus 2014 (%)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

This structure reflects the importance of wheat and rye, and also of maize, which are the basic grains consumed in Romania.

Wheat and rye grains are the main raw material for producing bread and specialties. The average monthly bread consumption in Romania accounted for 7.38 kg/inhabitant in the year 2021, being by -20% smaller than in 2008. In 2020, the annual consumption accounted for 88.57 kg/capita compared to 91.19 kg in the year 2020 [1].

Cereal production in Romania is enough to cover consumption needs and even to assure amounts for export [40, 58].

Potatoes consumption

Potatoes are a basic food for the population, being considered a vegetable, used in general like: boiled potatoes, mashed potatoes, fries, crisps, flakes or as an ingredient in soups, borsch, dishes. Also, potatoes are considered a healthy food being recommended to the people having: diabetes, heart disease, high blood pressure, indigestion etc.

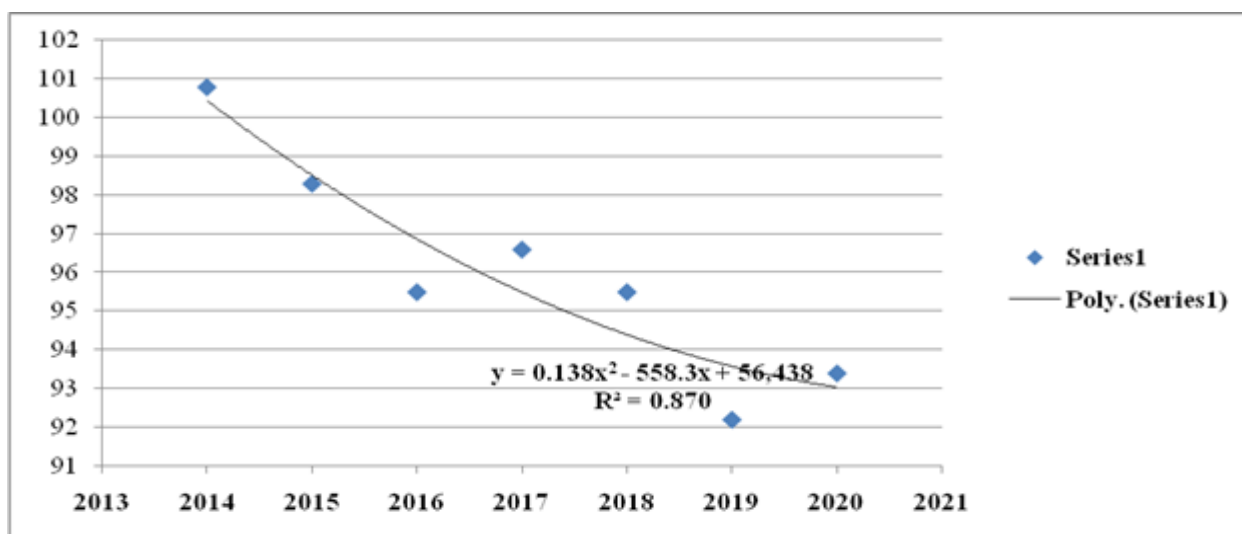


Fig. 3. Dynamics of average annual potato consumption, Romania, 2014-2020 (kg/capita)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

Potatoes consumption declined in Romania by -7.4% from 100.8 kg/capita in 2014 to 93.4 kg in 2022, as a result of the higher price on the internal market, caused by the imbalanced ratio between the high demand and low production. The climate change and the increased prices for farm inputs during the last years determined the reduction of production and for covering market needs, imports were needed [35, 36, 66] (Figure 3).

Vegetable consumption

Vegetables are an important item in the daily diet taking into account their high content in vitamins and minerals. For this reason, they are recommended to be used fresh in various salads and vegetable juices, and also

processed in various dishes like: soups, borsches, vegetable mix, garnishes, pickles, and also like canned vegetables.

Romania has a high potential to produce a large range of vegetables: lettuce, tomatoes, cucumbers, green peppers, onion, garlic, roots (carrots, celery, parsnip, parsley), mushrooms, cabbage, cauliflower, pumpkins, beans, peas etc. The internal production is not sufficient at present, despite that it is achieved both in the field and the protected areas, and imports are required mainly in extra season [42].

The average annual vegetable consumption per capita increased in the studied period by + 6.28% from 182.9 kg in 2014 to 194.4 kg in 2020 (Fig. 4).

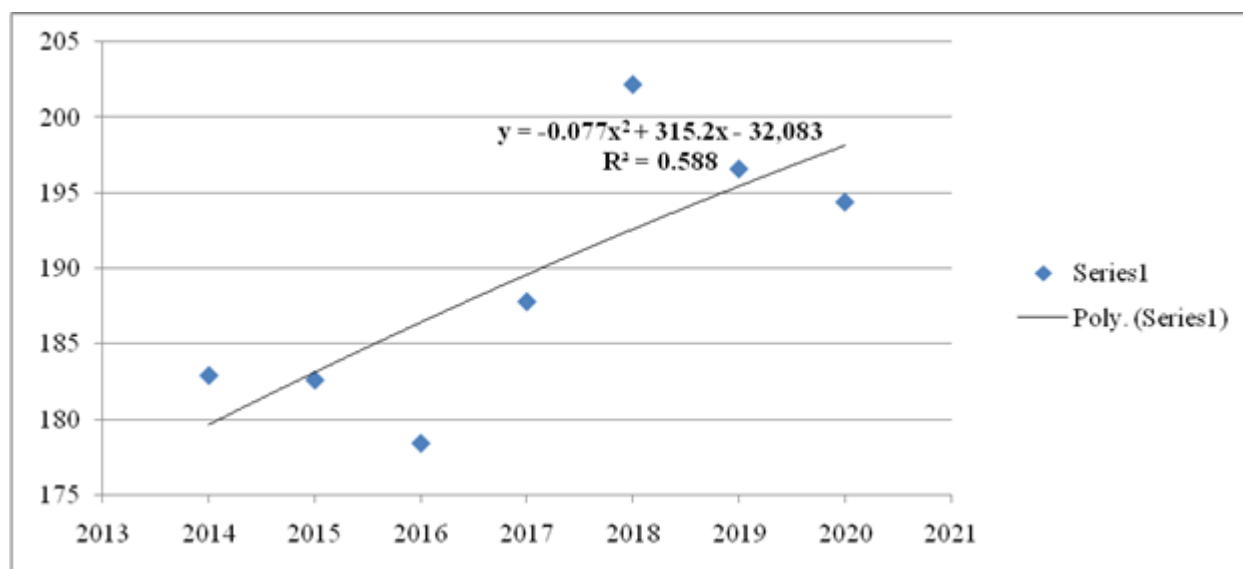


Fig. 4. Dynamics of average annual vegetables consumption, Romania, 2014-2020 (kg/capita)

Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The maximum consumption was recorded in the year 2018 and accounted for 202.8 kg/capita, but then, it declined year by year due to the increased price for various vegetables [51].

Regarding the evolution of the vegetables consumption in the analyzed interval, we may notice that from 2014 to 2020 the tendency was as follows:

- consumption of tomatoes increased by +10.5% from 38.1 kg to 42.1 kg; similar trends were found by [21, 67].
- cabbage consumption declined by -1.2% from 44.1 kg to 43.6 kg;

-onion consumption remained relatively the same about 20.6 kg, despite that in 2019 it reached a peak of 22.8 kg;

- roots consumption increased by + 2.9% from 13.6 kg to 14 kg;

-consumption of green peppers also increased, but by +8.3% from 12.1 kg to 13.1 kg (Figure 5).

In the vegetable consumption, the share of each vegetable differs from a category to another and also in 2020 compared to 2014 (Figure 6).

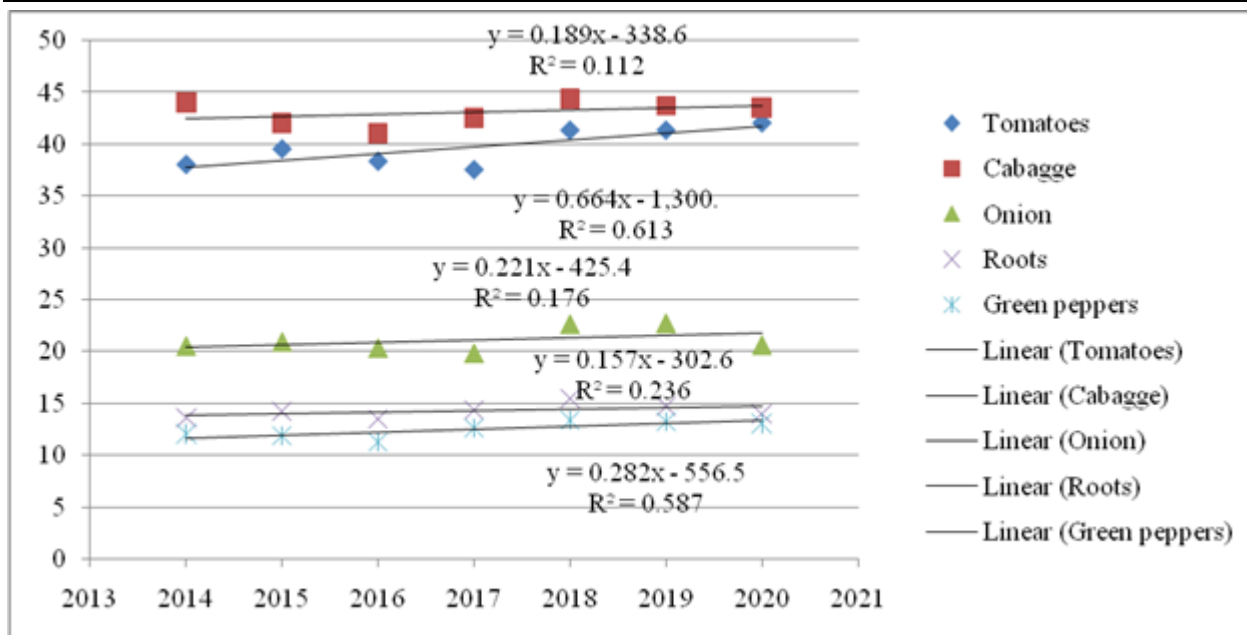


Fig. 5. Dynamics of average annual vegetables consumption by main categories, Romania, 2014-2020 (kg/capita)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

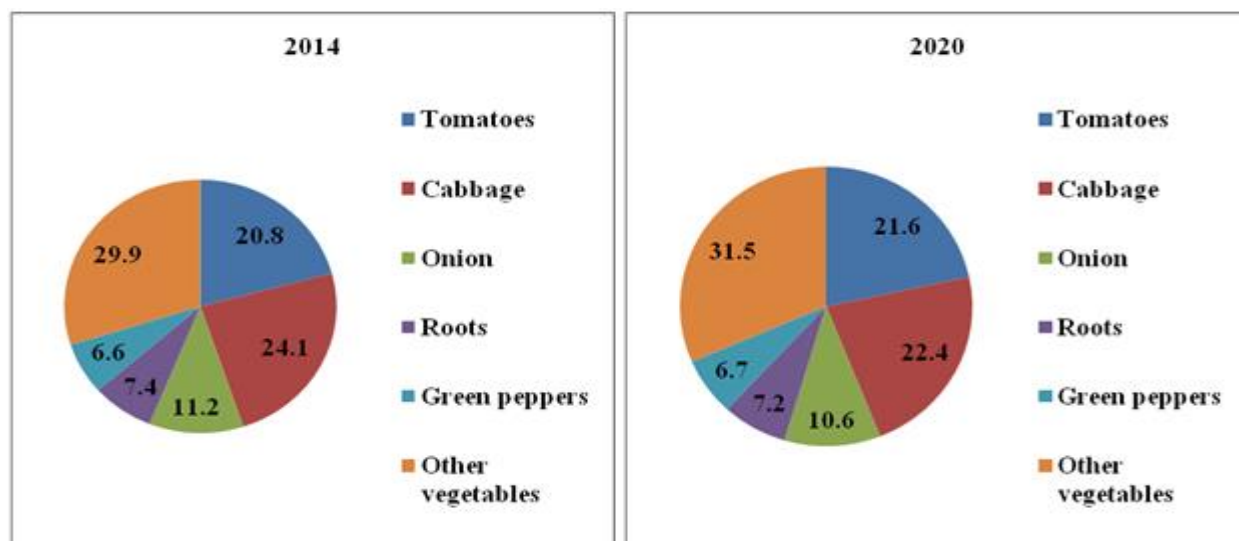


Fig. 6. The share of various vegetables in average annual consumption in the year 2020 versus 2014 (%)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The data from Fig. 6 shows that, compared to 2014, in the year 2020, the share of tomatoes increased in consumption by +0.8 pp, for green peppers by +0.1 pp and for other vegetables by +1.6 pp, while for the other vegetables their weight diminished as follows: cabbage by -1.7 pp., onion by -0.6 pp and roots by -0.2 pp.

Melon consumption

Melons could be considered fruits, but also vegetables being preferred by consumers

especially during summer season when Romanian melons appear in the market, but also in a few measure in extra season when imports try to diversify the fruit offer.

The Romanian producers passed to the use of early and extra early cultivars and to the implementation of modern technologies producing melons in protected spaces besides the field cultivation so that the melons to be sold in the market at the end of June and beginning of July.

In extra season, Greece, Turkey and Spain are the main suppliers of melons on the Romanian market [38, 39]. Grace to their sweet taste, pleasant flavour and succulence, melon

consumption increased from 21.8 kg/year and capita in the year 2014 to 23 kg in 2020 (+5.5%) (Figure 7).

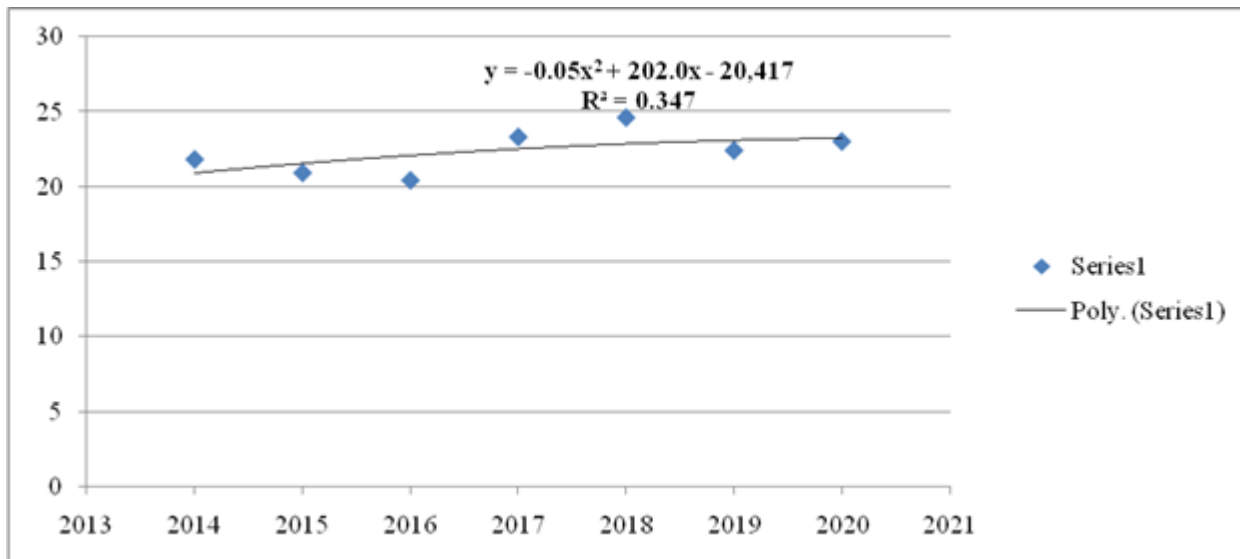


Fig. 7. Dynamics of average annual melon consumption, Romania, 2014-2020 (kg/capita)

Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

Fruits consumption in fresh fruit equivalent

Fruits are very important for human diet due to their intake in fructose and vitamins from

which the body absolutely needs. Fruits are recommended to be consumed fresh, in the morning on an empty stomach, before breakfast, but also between meals.

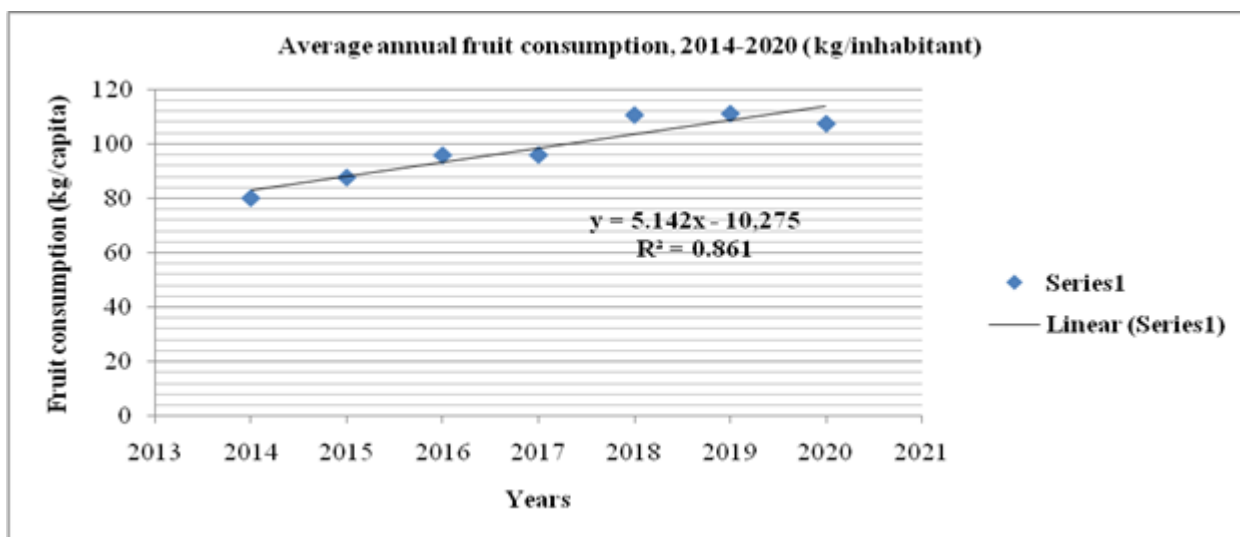


Fig. 8. Dynamics of average annual fruit consumption, Romania, 2014-2020 (kg/capita)

Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The daily fruit recommended consumption is 350-400 grams and should include different sorts of fruits. It is preferred to be consumed as fresh fruits, but they also could be used as

fresh fruit juices, liqueur, brandy, jams, compote and canned fruit [50]. Average annual fruit consumption in Romania increased by +34.1% in the studied period

from 80.2 kg in 2014 to 107.6 kg in 2020, but in 2019 it was recorded the peak of 111.3 kg/inhabitant (Figure 8).

Romania produces a large range of fruits: apples, plums, cherries, apricots, peaches, nectarines, pears, nuts, but production is not sufficient, and that is why the needs of the internal market are covered by imports which also diversify the offer bringing Mediterranean and exotic fruits like oranges, lemons, pineapple, bananas, kiwi, kaki, papaya, pomegranates, dates etc. [50, 55].

In the analyzed interval 2014 to 2020, fruit dynamics was as follows:

- apple consumption increased by +15.5% from 25.2 kg to 29.1 kg, but the highest performance was 34.5 kg in 2019 [55, 68].
- grapes consumption also increased but by +27.4% from 6.2 kg to 7.9 kg;
- plums consumption increased by +68% from 4.7 kg to 7.9 kg because this sort of fruits is

consumed not only like fresh fruit, but also like jam and raw material for producing plum brandy called "tuica" in Romanian.

- cherry consumption remained relatively at the same level of about 4-4.1 kg/capita, the peak being registered in the year 2018 when it accounted for 4.8 kg/capita;
- peaches and nectarines consumption increased by +12.1% from 4.1 kg to 4.6 kg;
- pear consumption also increased by +11.1% from 4.5 kg to 5 kg;
- apricots consumption declined by -9.1% from 2.2 kg to 2 kg, due to the diminished production and the high price of imported apricots coming mainly from Turkey;
- nuts consumption increased 3.87 times from 0.8 kg top 3.1 kg;
- Mediterranean and exotic fruits were consumed in a higher proportion, + 53.6%, as the offer is attractive; therefore, from 25.7 kg to 39.5 kg per inhabitant (Figure 9).

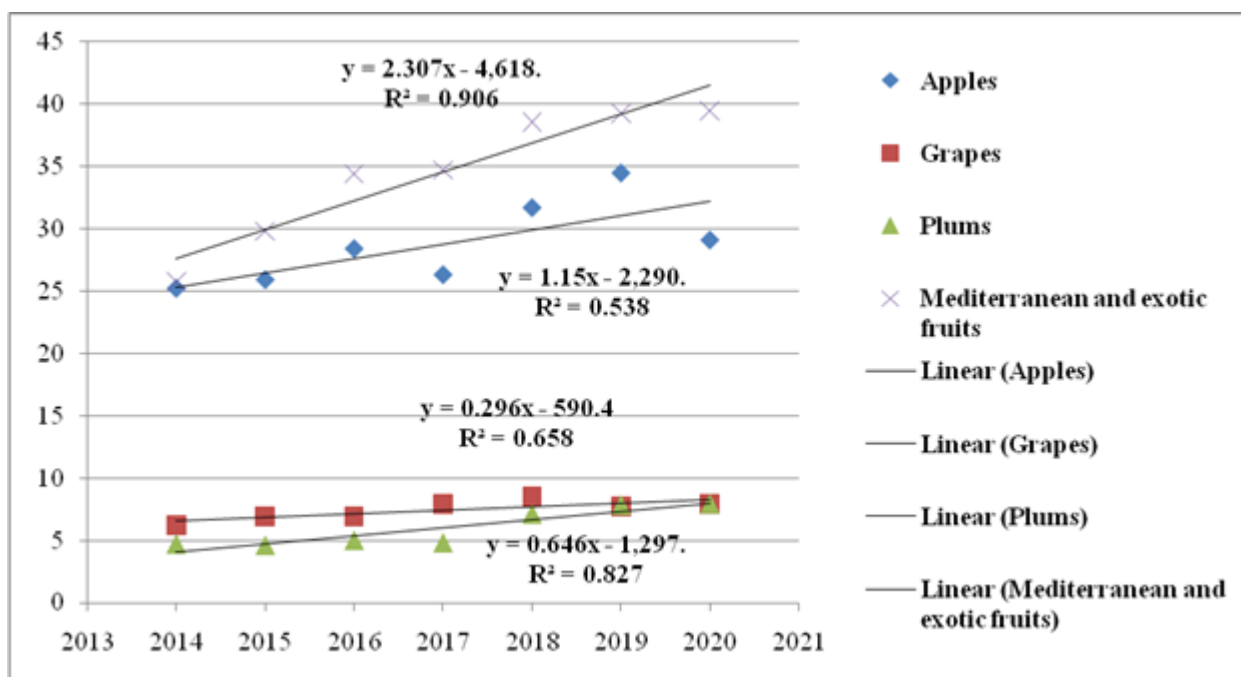


Fig. 9. Dynamics of average annual consumption for apples, grapes, plums and Mediterranean and exotic fruits, 2014-2020 (kg/inhabitant)

Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The share of different types of fruits in average annual consumption has changed depending on consumers' preferences and

price evolution. Figure 10 reflects these changes in 2020 versus 2014.

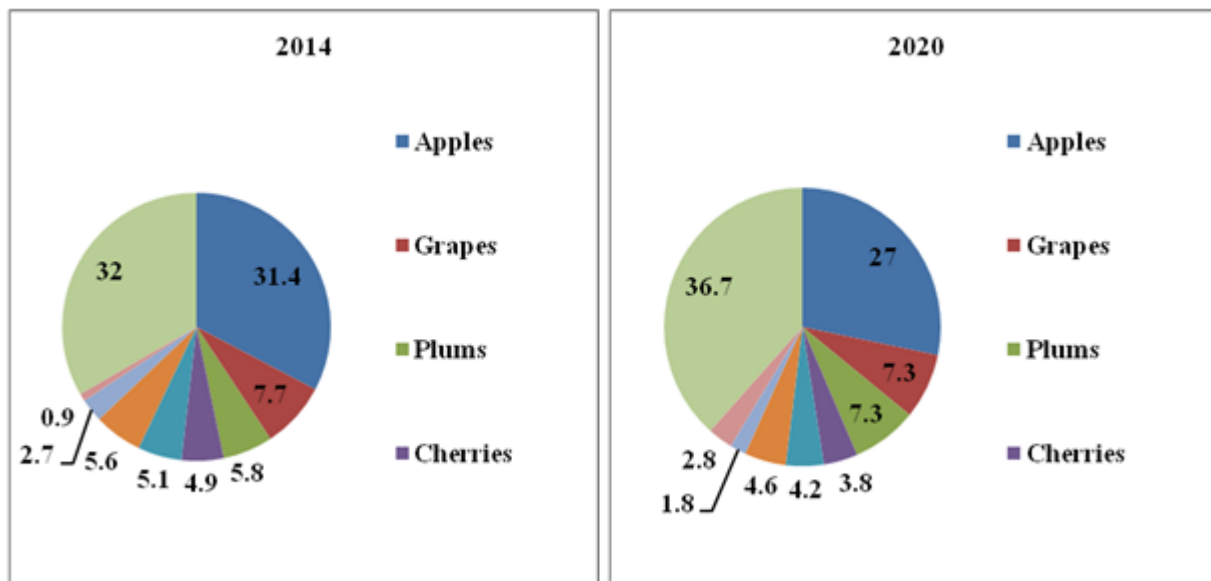


Fig. 10. Changes in the share of various fruits in average annual consumption (%)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The data from Figure 10 show that in 2020 compared to 2014, it was recorded a higher share in case of apples, plums, nuts and Mediterranean and exotic fruits. as well as a decline of the weight of grapes, cherries, peaches and nectarines, pears, apricots in close relationship with the high price of the imported fruits.

Consumption of sugar and products made of sugar

Sugar consumption increased from 21.1 kg in 2014 to 25.5 kg in 2020, meaning by + 20.8%, despite that a more intense advertising was made for decreasing sugar consumption due to the high risk of diabetes, heart diseases etc. (Figure 11).

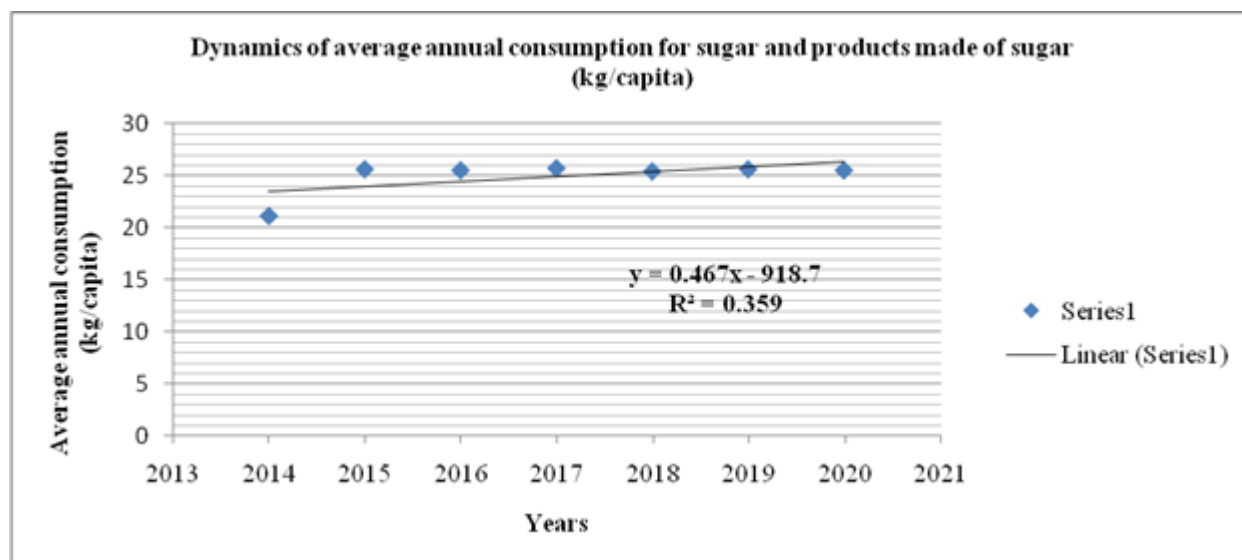


Fig. 11. Dynamics of average annual consumption for sugar and products made of sugar, 2014-2020 (kg/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

Egg consumption

Eggs are important in human diet due to their content in high value protein, amino-acids and

A vitamin. A higher consumption of eggs could increase cholesterol. Egg consumption declined in Romania from 246 pieces per year

and inhabitant in 2014 to 236 pieces in 2020 (-4.1%). This was a result that consumers thought that it is healthier to consume less eggs and also the higher prices have had a

negative influence on consumption level, Similar results were found by [5, 57]. (Figure 12).

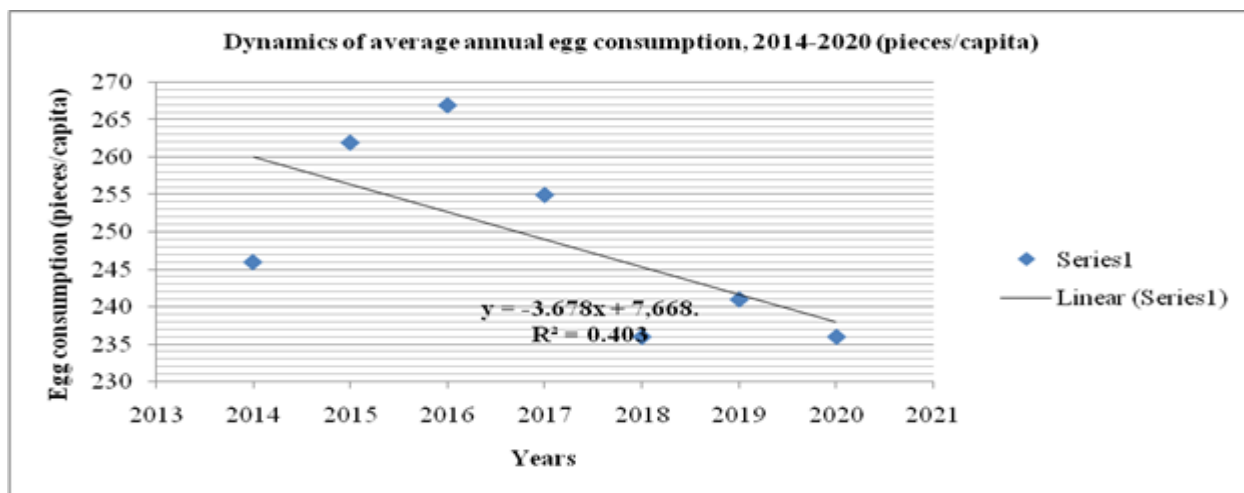


Fig. 12. Dynamics of average annual egg consumption, 2014-2020 (pieces/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

Milk and dairy products consumption in fresh milk equivalent with 3.5% fat (butter excluded)

Due to their high content in nutrients especially high value protein and calcium., milk and dairy products are extremely important in adults and children diet. Yoghourts and cheese should not miss from the daily diet of any consumer. They could be used together with fruits, for example, there

are sorts of yoghourts with fruits (forest fruits, cherries, apricots, raspberry, blueberry etc), and cheese made of cow, buffalo, sheep and goat milk which could be served with fruits mainly grapes and apples at the end of the meals.

Milk and dairy products consumption increased from 244.2 litres in 2014 to 252.6 litres per inhabitant in 2020, meaning by +3.4% (Figure 13).

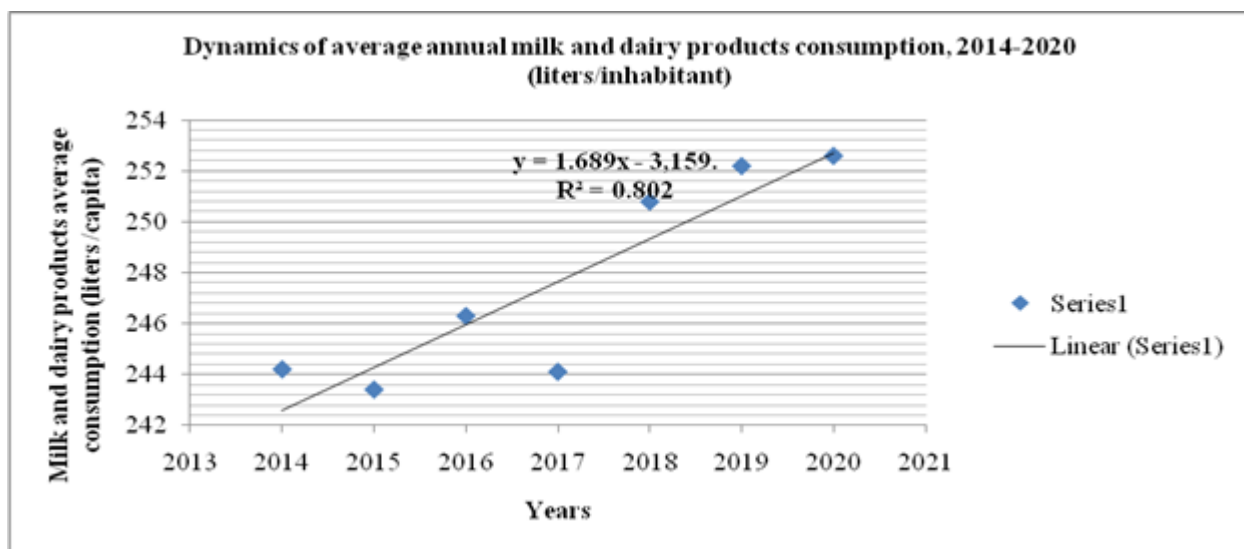


Fig. 13. Dynamics of average annual milk and dairy products consumption, 2014-2020 (liters/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

Various authors sustained that milk sector in Romania is passing through a period of crisis due to the reduction of the bovine livestock, high prices for farm inputs, problems in milk collection and quality and decline in self-sufficiency [11, 12, 14, 45, 54].

Milk market is dominated by a few milk and dairy products producers, the competition has increased and also sheep and goats contribute in a slight higher percentage to milk production due to their increased livestock [44, 46, 49, 56]

Consumption of fats of vegetal and animal origin

Fats, both of vegetal origin (oil and margarine) and of animal origin (butter and lard) are an important source of energy for our body, under the condition to be consumed in small quantities. Butter could be used at breakfast on a slice of bread or in a few

dishes, oil is used in salads and also for the preparation of some meals, margarine, butter and lard are used for frying meat or potatoes etc.

The consumption of fats of vegetal origin is higher than the one of fats of animal origin. The consumption of fats of vegetal origin increased by +6.4% in the studied interval from 17.2 kg in 2014 to 18.3 kg in 2020. In consumption, oil has the highest share accounting for 79% in 2014 and for 85.2% in 2020, reflecting a considerable reduction of margarine consumption from 3.4 kg in 2014 to 2.7 kg in 2020 (-21%) (Figure 14).

Oil is commercialized in a large range of seeds sources (sunflower, maize, rape, olives etc) and technologies (extra virgin or refined) satisfying much better consumers' preferences.

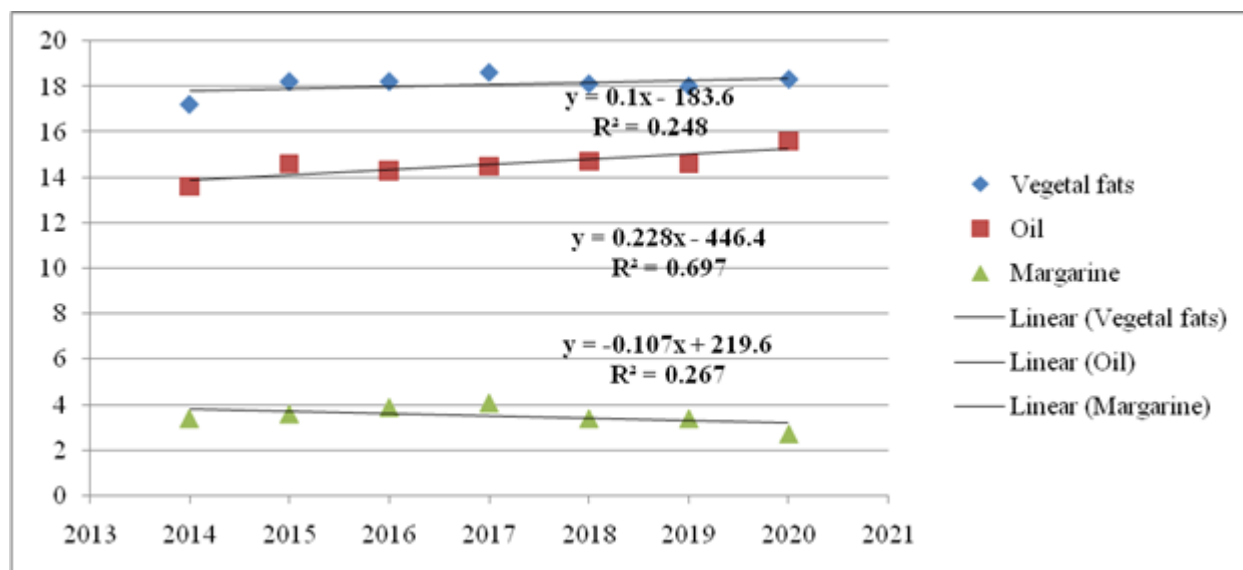


Fig. 14. Dynamics of average annual consumption of vegetal fats, 2014-2020 (kg/inhabitant)

Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The consumption of fats of animal origin has registered an important growth especially regarding butter, from 0.8 kg/capita in 2014 to 3.9 kg/capita in 2020, meaning that in the last year of the study it was 4.8 times higher than in the first year (Figure 15).

This figure shows that butter consumption exceeded lard consumption.

Consumption of meat and meat preparation in term of fresh meat

Meat brings a rich content of high value protein needed by the metabolic processes in our body.

The average consumption in Romania registered a spectacular increase in the studied period from 60.9 kg/capita in 2014 to 77.4 kg in 2020, meaning by +27% more (Figure 16).

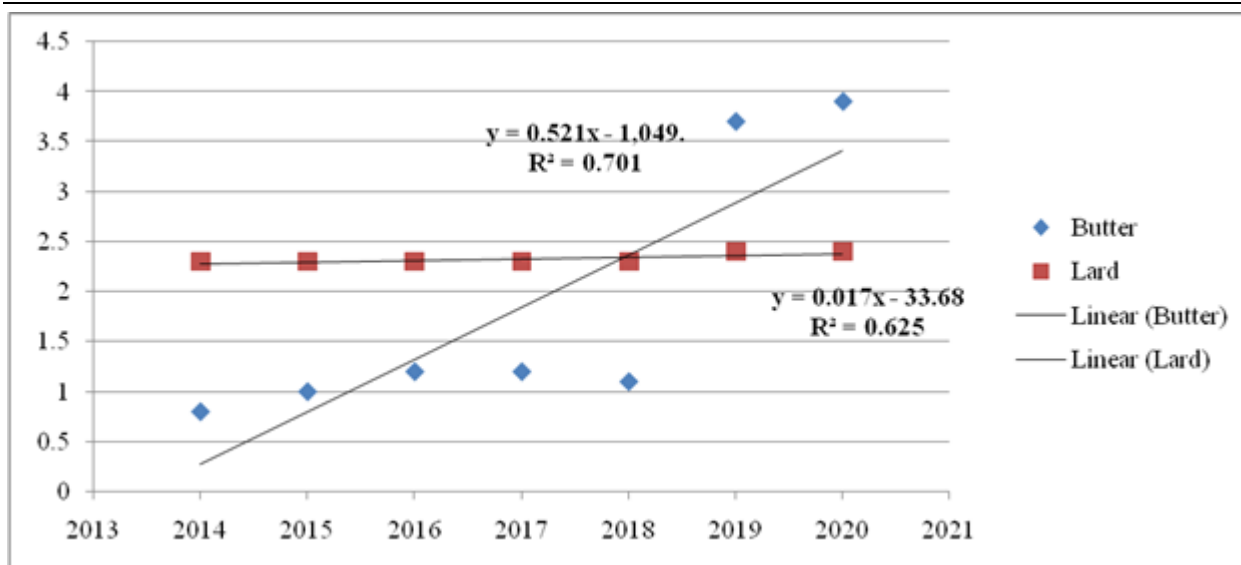


Fig. 15. Dynamics of average annual consumption of animal fats, 2014-2020 (kg/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

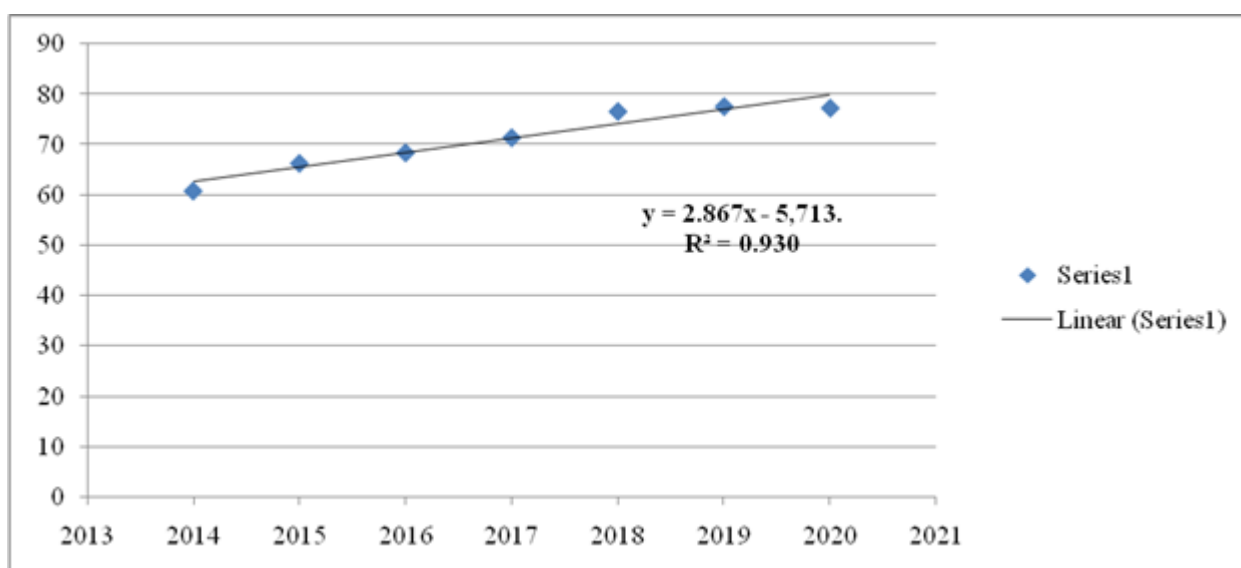


Fig. 16. Dynamics of average annual consumption of meat and meat products, 2014-2020 (kg/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

If we analyze average daily meat consumption, we may notice that it increased from 166.8 gr. per day in 2014 to 212 gr. per day in 2020, which is very much.

Many authors shows that pork dominates consumption, production is completed by imports, and that is why the trade balance is a negative one [31, 33, 41, 71].

The average annual meat consumption by meat sorts has evolved as follows from 2014 to 2020:

-pork is on the top position as it is a traditional type of meat in Romania; its

average consumption increased from 29 kg to 37.3 kg (+28.6%); pork is the most preferred meat by Romanians, but pork market is passing through a period of crisis related to the lack of piglets, high price for farm inputs, low price at delivery to slaughter houses, competition with imports, African fever which diminish the livestock [47, 48, 59, 64]. -poultry meat comes on the 2nd position and registered an increase from 20.1 kg to 28 kg (+39.3%); poultry is a lean meat, with high value protein and less cholesterol than pork,

reasons to be more and more preferred by consumers and also assures farmers' profit [6].
 -bovine meat is consumed in a lower amount which continue to decline from 5.6 kg in 2014 to 5.4 kg in 2020 (-3.6%); however, efforts are done to recover this sector and improve trade balance [13, 15, 52, 65].
 -sheep and goat meat registered a growth by +13 % from 2.3 kg in 2014 to 2.6 kg in 2020;

sheep and goat stock has increased during the last years favouring to grow their contributions to milk and meat production [4, 7, 56].
 -other sorts of meat are maintained at a constant level of 0.8 kg/capita/year;
 - edible organs are consumed in a higher amount, whose level raised from 3.1 kg to 3.3 kg (+6.4%) (Figure 17).

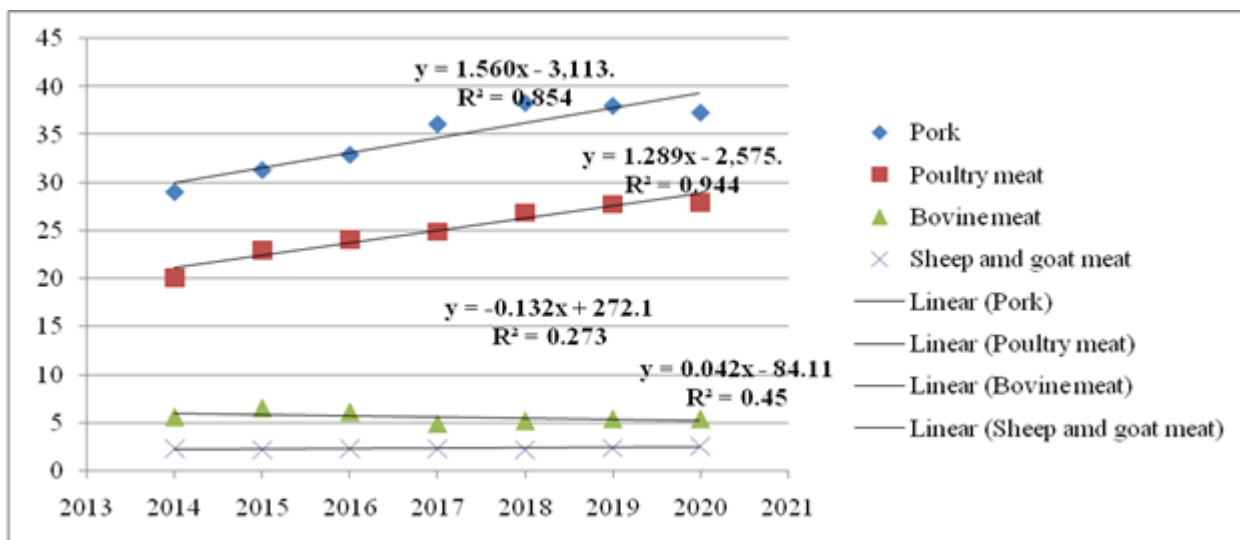


Fig. 17. Dynamics of average annual consumption of pork, poultry, bovine and sheep and goat meat, 2014-2020 (kg/inhabitant)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26,27, 28].

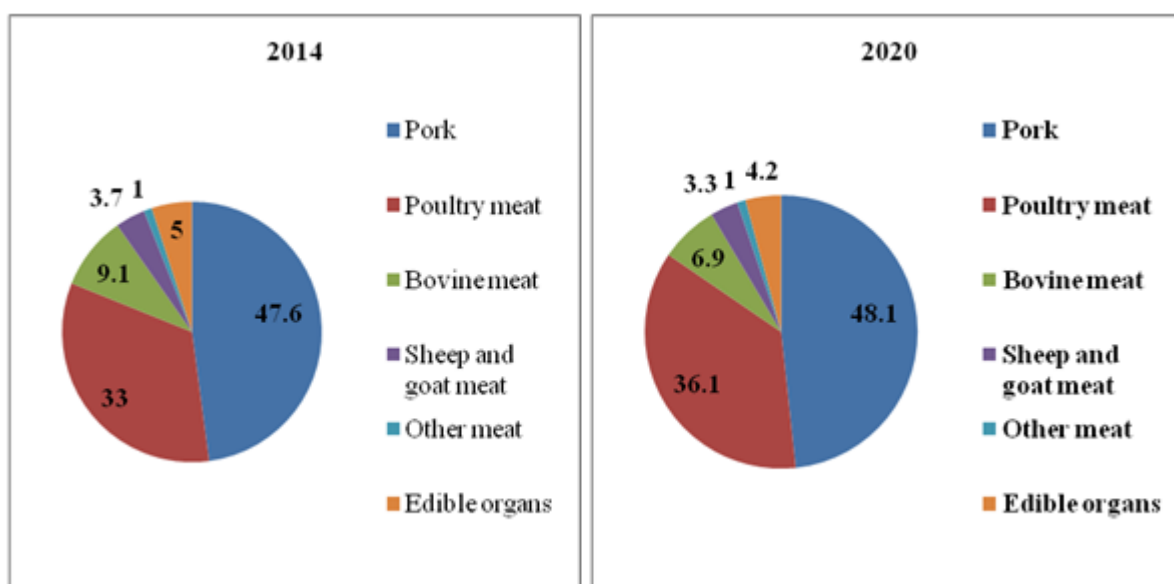


Fig. 18. Changes in the share of various sorts of meat in average annual consumption per inhabitant (%)
 Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The share of various sorts of meat in the average annual consumption of meat has

changed in 2020 compared to 2014 as shown in Figure 18. From Figure 18, we may see an

increase of the share of pork meat to 48.1%, of poultry meat to 36.1% and a decrease of the weight of bovine meat, sheep and goat meat, other meat sorts and edible organs.

Fish and fish preparations consumption in terms of fresh fish equivalent

Fish consumption increased from 4.9 kg in 2014 to 6.3 kg in 2020, that is by +38.5%, which reflects the orientation of the consumers to this sort of food of high value protein, despite that the price per kilogram is much higher than in case of meat (Figure 19).

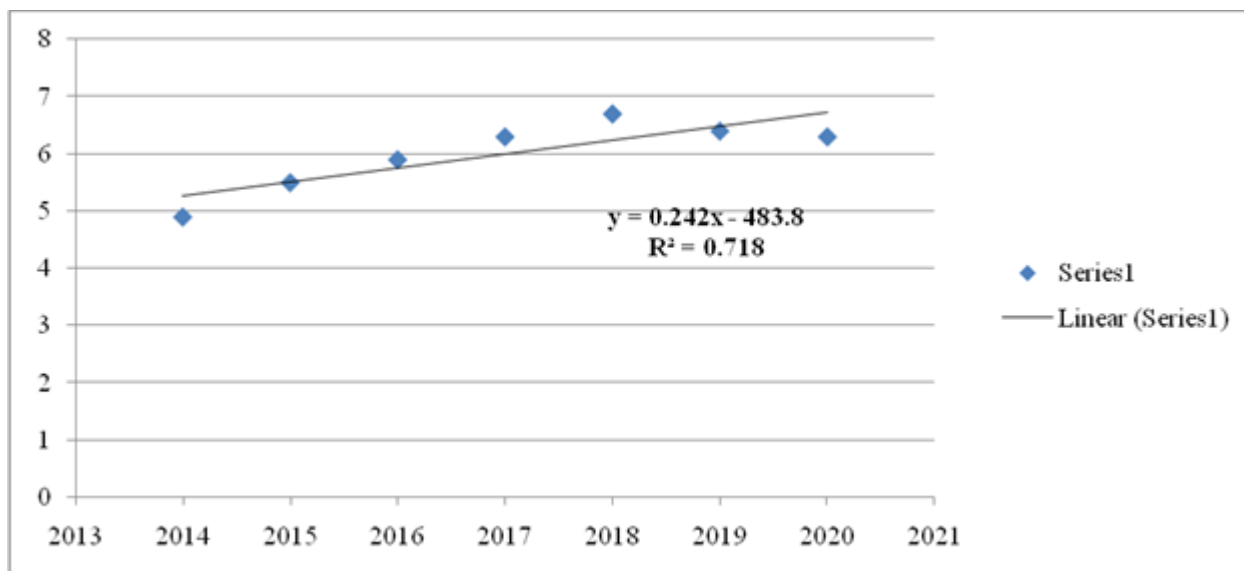


Fig. 19. Dynamics of average annual consumption of fish and fish products, 2014-2020 (kg/inhabitant)
Source: Own design and calculation based on National Institute of Statistics, 2015-2021, Consumption availability of the population [23, 24, 25, 26, 27, 28].

The sorts of fish are less from the domestic production, but more from imports: salmon, sea bream fish, tilapia fish, trout, sea fruits etc.

Honey consumption

Bee honey is a natural product, a food of high nutritive and energetic value, and also a medicine utilized in the prophylaxis and therapeutics being used in the treatment of digestive affections, nutrition, cardiovascular, respiratory, nervous system, and infectious diseases. Romania produces has many honey types, 50% of production is represented by floral honey, 35% by monofloral honey (Robinia), and 15% by Tillia honey.

Romania, next to Spain, Hungary and Germany are the major honey producers in the EU with over 20,000 tons per year.

The ascending trend of honey demand has encouraged the beekeeping development and production responded with higher performance across the time in the main producing countries.

Beekeepers made efforts to extend the apiary size and grow strong bee colonies and produce more honey and other bee products to satisfy better the market needs and increase their income [34, 37, 43].

Romanian honey has a high quality well appreciated at export.

However, Romanians still not consume too much honey compared to the Western EU countries, but consumption raised even thou price honey is higher than sugar price [53, 62].

Honey consumption increased from 0.2 kg in the year 2009, to 0.7 kg in 2019 and to 0.8 kg in 2021, therefore very slowly and that is why most of honey production is exported. Consumption in Romania is lower than 2.4 kg/inhabitant per year in Switzerland, 2.2 kg in Germany, 1.5 kg in Netherlands and Belgium.

Factors which influence average annual food consumption

There are many economical, social and psychological factors which could influence

average annual food consumption. A selection in our opinion is presented below as follows:

- the need of nutrients: proteins, carbohydrates, fats, vitamins, minerals, enzymes, energy etc for sustaining our body to live and work;
- the existence of the health problems (obesity, diabetes, heart diseases, cancer, osteoporosis, dental diseases etc) which imposes a specific diet;
- changes in our life style in the sense of a new orientation to a healthier diet, based on natural food, with lower calories, organic food, which could assure food security;
- a higher consciousness degree regarding the nutritive and energetic value of food;
- the need of a spiritual satisfaction after consuming food and dishes, besides the basic vital needs;
- the limited capacity of intake, storage and processing of our stomach, which imposes a careful selection and suitable association of various food products in consumption, a reasonable amount and high quality;
- the utility and novelty of food which create the volume and structure of the daily food basket;
- consumption habits and routine in daily food, the preference for specific food products, tastes, flavours etc;
- product quality which is quantified by consumer using multiple criteria such as: aspect, colour, freshness, taste, smell, flavour, nutritive value;
- product price in the market and in the supermarket shelf; any increase of food product price could lead either to a change in purchasing options preferring lower quality products but cheaper or giving up buying that product;
- product landmark and consumer fidelity to products and producers which satisfy the best his needs by product quality well related to price;
- identifying the products achieved by farmers who used technologies environmentally friendly, assuring animal welfare and environment quality preservation;
- average income per household which influences the budget allotted for expenses

destined to buy food in close relationship to their amount and price.

In the EU, food expenditures in the family budget represent about 21.5%, while in Romania their share is about 31%.

Average annual food consumption is closely linked to food balances which reflects production, imports, exports, stock variation and availabilities for consumption.

In many cases, the internal market is completed by imports in order to diversify offer and to cover better the population needs.

CONCLUSIONS

This study reflected the average annual consumption of agri-food products per inhabitant in its dynamics during the interval 2014-2020 and identified the following trends and aspects:

-Cereals consumption declined by 1.26%, accounting for 204.4 kg/capita in 2020; wheat and rye keeps the highest share in consumption connected to the fact that they are the basic raw material for producing bread and specialties, being followed by maize.

-Potatoes consumption decreased by -7.4% accounting for 93.4 kg/capita in 2020; this happened due to the lower internal production, imports invasion on the market and high selling price.

-Vegetable consumption increased by +6.28%, accounting for 194.4 kg in 2020; both internal production and imports represent the availabilities to cover the consumer demand.

-By vegetable category, tomatoes are the most consumed vegetable, and its consumption increased by +10.5%, reaching 42.1 kg; roots consumption also increased, as well as green peppers consumption; in case of cabbage, consumption declined and onion remained at the same level.

-The highest share in vegetable consumption is kept by tomatoes, cabbage and other vegetables.

-Melons consumption raised by +5.5%, accounting for 23 kg/capita in 2020.

-Fruits consumption increased by +34.1%, reaching 107.6 kg in 2020, but it is still below its level in the Western countries.

-The level of consumption increased for apples to 29.1 kg (+15.5%), plums (+68%), grapes (+27.4%), peaches (+12.1%), nuts, while for cherries remained relatively constant and for apricots declined.

-The consumption of Mediterranean and exotic fruits increased by + 53.6%, accounting for 39.5 kg/capita in 2020, exceeding the consumption of apples.

-The highest share in fruit consumption is kept by Mediterranean and exotic fruits (36.7%) followed by apples (27%).

- Sugar consumption increased 25.5 kg in 2020 (+20.8%).

- Egg consumption decreased to 236 pieces in 2020 (-4.1%) due to the high selling price and consumers tendency to a healthier diet.

- Milk and dairy products consumption increased 252.6 litres per inhabitant in 2020, meaning by +3.4% .

- The consumption of fats of vegetal origin is higher than the one of fats of animal origin. Oil consumption has increased to 18.3 kg in 2020, and its share in vegetal fats reached 85.2%.

-Butter consumption raised to almost 3.5 kg/capita and year while lard remained at the level of consumption.

-Meat consumption is by +27% higher in 2020, accounting for 77.4 kg/capita.

-Pork is maintaining its top position, being the most preferred meat sort by Romanians and its consumption increased by +28.6% in 2020 attaining 37.3 kg.

-Poultry meat comes on the 2nd position and its consumption also increased (+39.3%) and its level reached 28 kg in 2020.

-Bovine meat consumption is in decline by - 3.6%, while sheep and goat meat consumption increased by +6.4%.

-The highest weight in meat consumption is kept by pork 48.1% and poultry meat 36.1%, together accounting for 84.2%.

- Fish consumption increased by +38.5%, reaching 6.3 kg in 2020, reflecting consumers orientation to a high value protein.

- Honey consumption increased and accounted for 0.8 kg in 2021, but it is still lower than in the Western EU countries, and this contributed to the export intensification.

Among the factors which influence food consumption are income and price being considered the most important, besides product quality (aspect, colour, freshness, taste, smell, flavour, nutritive and energetic value), landmark and fidelity, life style and desire to a healthier diet of the consumer.

Consumption is close related to production, import and export, and the analysis of the balances for each food product could reflect in what measure internal production could cover the market needs. From this point of view, Romania has a high potential to produce enough food, but there are other restrictive factors like climate change, high input prices for farm inputs, imbalances along the market chain, which do not allow this and for this reason imports are required to cover the demand.

As long as in Romania consumption contributes in a higher proportion than export to GDP, the authorities have to increase salaries and pensions, income per household in a word and to establish thresholds among which prices could vary to stimulate consumption.

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