# ROMANIAN AVAILABILITY OF SUNFLOWER OIL IN REGIONAL AND GLOBAL CONTEXT (2009-2011)

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## ABSTRACT

*Sunflower oil is one of the foods with beneficial properties to the body, so it is used all over the world. This is an indisputable source of folic acid, magnesium and tryptophan. It has been scientifically proven that sunflower oil contains certain essential fatty acids for the body. Cold-pressed sunflower oil is very rich in vitamin E, being considered an important source of protection for the arteries and the heart.*

*In general, the conventional oil production process comprises the following main operations: the reception of raw materials; storage of raw materials; seed cleaning; drying of oilseeds; shelling; grinding; roasting; pressing; solvent extraction; refining.*

*Food consumption is differentiated according to the differences in the level of development of countries, namely poor, developing and rich countries.*

*For the EU food security strategy, four important elements can be structured: the rules on food safety and animal feed; independent scientific information available to the public; action to strengthen rules and process control; recognition of the consumer's right to choose, based on complete food information, where it comes from and what it contains.*

*Food security does not mean food uniformity. The food safety system is common to all EU countries, but it allows for the diversity of production methods and national specifics.*

## INTRODUCTION

Sunflower belongs to the group of technical plants and oleaginous plants, as a result of which the behavior of the market can be conceived in this context.

The process of harnessing crop products must be considered in all market relations. In this category of products, particular account is taken of the purpose of recovery, which is determined by the variety of the assortment and the possibilities for taking as raw material (from spontaneous crops and flora). For this reason, in the process of capitalizing the products of the crops, it is necessary to know some characteristic technical and economic elements that outline the stages and stages of the market circuit: the technical quality, the medicinal value etc. of these products, which is different, in depending on the chemical and physical composition; the offer for medicinal plant products can be from both agricultural crops and spontaneous flora; For the purpose of higher recovery after harvesting some of the products related to the technical plants are suitable for special treatments (chopping, boiling, thermal or chemical treatment etc.), by the economic agent which takes over these plants. The cost of these treatments influences delivery prices and, ultimately, profitability; in the sorting of technical crops there are specific operations that refer to the part of the plant used (leaves, stems, roots, fruits), technological division which has a different weight in the total quantity structure, with differentiated prices; the beneficiaries of crops of technical products and medicinal plants are represented by economic agents with industrial or commercial profile, the distribution channels being very short (in this case, the economic agent specialized in the takeover of these products may also have retail activities), as well as channels medium or long distribution (situation where intermediaries in processing and distribution are also reported); the take-up prices for the same product range and quality are differentiated both by market demand and supply

systems, but also due to certain causes specific to the territorial distribution, differentiation of harvesting-takeover periods, presentation form (fresh or dry) etc.

In the exploitation of oil products, the processing system, a complex industrialization, is linked to the great diversity of the components that are extracted and then processed separately.

The sunflower pile and its derivatives can be structured into phases delimited as follows: seed production, processing (usually taking place within industrialization units), packaging, distribution and consumption.

Regarding the oil and margarine balance for the last period in Romania, trends have been reported that can be presented as follows: relative stability of oil production and increase of margarine output; increased oil and margarine imports and insignificant exports; the sharp decline in oil stocks and the shortage of stocks in recent years, especially in situations where exports have taken place; a trend of increasing consumption of oil and margarine in the last period.

Hence, it can be concluded that a significant increase in sunflower production has taken place in Romania, which has involved an important volume for processing in modernized and refurbished factories. Internal consumption of edible oils and margarine is low and price developments reflect a growing trend. This trend has intensified as unfavorable on the world market for seeds and sunflower oil.

## METHOD AND MATERIAL

The study was based on the operation of a system of indicators, specific for establishing the availability for some agricultural-food products.

The specific indicators are represented by: total food available (thousand tons), annual food available (kg / pers.), daily available food (g / pers.), daily caloric food available (kcal / pers.) and the available lipid daily (g / pers.) for the period 2009-2011.

In order to highlight the situation at national level, it is presented in an international context, making a comparative analysis of the specific world situation of the European Union and the five main continental units - Africa, America (North, South, Central, Caribbean area), Asia, Europe and Oceania (Australia, New Zealand, Polynesia, etc.).

Elaboration of this study, appealed to the comparison method in space. In addition to the temporal sequences included in the analysis, the media was also operated.

## RESULTS AND DISCUSSIONS

Table 1. contains total food available for 2009-2011.

In 2009, the global indicator was 9364094,04 t, of which the contribution at the continental level was the following: 52454,92 t Oceania (0,56%), 742556,93 t America (7,94%), 824279 t Africa (8,80%), 2802105,86 t Asia (29,92%) and 4942697,33 t Europe (52,78%). For the European Union and Romania, levels were 2411381,24 and 242571,17 t respectively (25.75 and 2.59% of the world total).

In 2010, variable levels of the indicator from 30781,25 t in the case of Oceania to 4999924,67 t for Europe (extreme weights of 0,34 and 54,24%) are discussed and the overall global indicator indicator shown 9031927,64 t. Worldwide, Asia also contributed 2428316.73 t (26.89%), Africa with 869792 t (9.63%) and America with 803787.99 t (8.90%). The weight of Romania and the European Union at the world level was 3.12 and 25.63% respectively (281768.93 and 2315210.94 t).

***Table 1.***

**Available food total (thousand tons)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Effective* | Str. %** | Effective* | Str. %** | Effective* | Str. %** | Effective | Str. % |
| Africa | 824279,00 | 8,80 | 869792,00 | 9,63 | 858394,00 | 9,08 | 850821,67 | 9,16 |
| America | 742556,93 | 7,94 | 803787,99 | 8,90 | 885102.29 | 9,37 | 810482,40 | 8,73 |
| Asia | 2802105,86 | 29,92 | 2428316,73 | 26,89 | 2825445,50 | 29,89 | 2685289,37 | 28,93 |
| Europe | 4942697,33 | 52,78 | 4899249,67 | 54,24 | 4841982,93 | 51,22 | 4894643,31 | 52,73 |
| Oceania | 52454,92 | 0,56 | 30781,25 | 0,34 | 41685,40 | 0,44 | 41640,52 | 0,45 |
| World | 9364094,04 | 100 | 9031927,64 | 100 | 9452610,12 | 100 | 9282877,27 | 100 |
| U.E. | 2411381,24 | 25,75 | 2315210,94 | 25,63 | 2289776,52 | 24,22 | 2338789,57 | 25,19 |
| Romania | 242571,17 | 2,59 | 281768,93 | 3,12 | 249522,78 | 2,64 | 257954,29 | 2,78 |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

If we refer to the specific situation of 2011, there is a global situation characterized by a total available of 9452610,12 t, constituted by percentage contributions as follows: 51,22% Europe (4841982,93 t), 29,89% Asia (2825445,50 t), 9,37% America (885102,29 t), 9,08% Africa (858394 t) and 0,44% Oceania (41685,40 t). The situation of the European Union and Romania is reflected by the weight of 24,22 and 2,64% worldwide (2289776,52 and 249522,78 t respectively).

Based on the data presented above, the average of the period was formed, highlighting the following structural aspects: 9282877,27 t available worldwide; 41640,52 t Oceania (0.45%); 810482,40 t America (8.73%); 850821,67 t Africa (9.16%); 2685289,37 t Asia (28.93%); 4894643,31 t Europe (52.73%) - Figure 1.

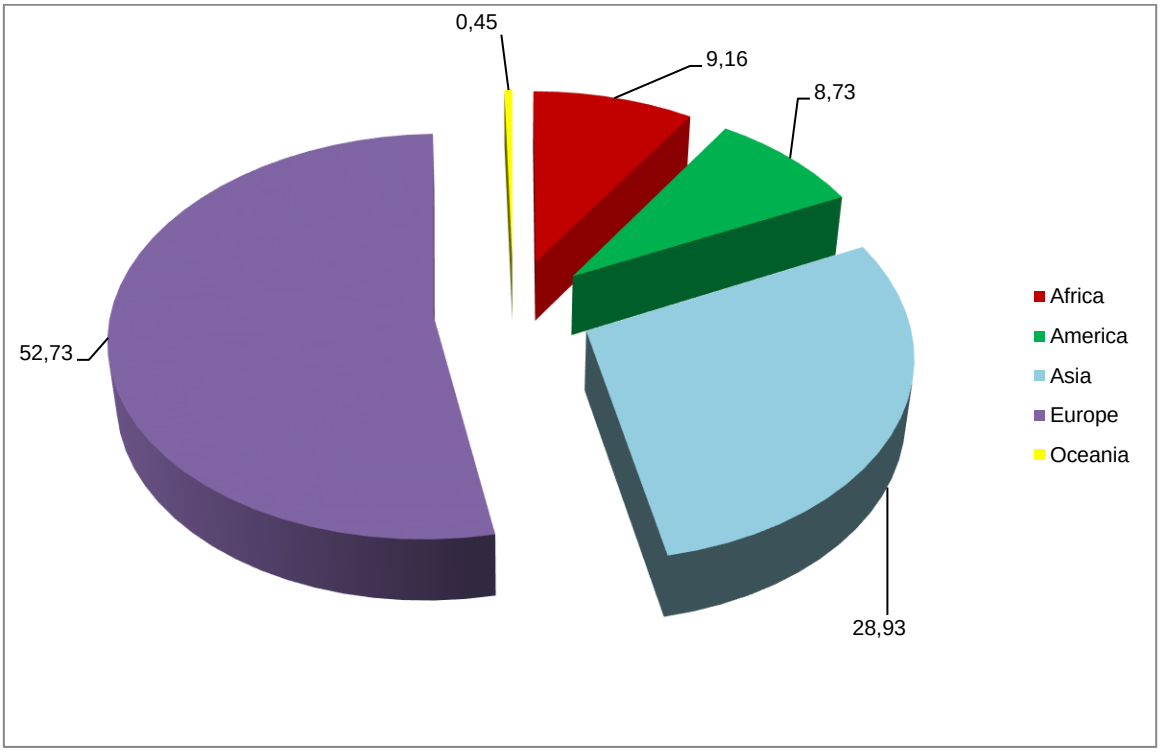


**Fig. 1. Structure of the total world food supply (%) - the average of the period**

For the European Union and Romania, the average available quota was 2338789,57 and 257954,29 t, respectively 25,19 and 2,78% worldwide.

Annual population per capita data is included in Table 2.

***Table 2.***

**Annual food availability (kg/pers.)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff | % compared to average |
| Africa | 0,91 | 65,00 | 0,93 | 69,92 | 0,90 | 65,22 | 0,91 | 66,42 |
| America | 0,80 | 57,14 | 0,86 | 64,66 | 0,93 | 67,39 | 0,86 | 62,77 |
| Asia | 0,69 | 49,29 | 0,59 | 44,36 | 0,68 | 49,28 | 0,65 | 47,45 |
| Europe | 6,69 | 477,86 | 6,62 | 497,74 | 6,53 | 473,19 | 6,61 | 482,48 |
| Oceania | 1,82 | 130,00 | 1,05 | 78,95 | 1,41 | 102,17 | 1,43 | 104,38 |
| World | 1,40 | 100 | 1,33 | 100 | 1,38 | 100 | 1,37 | 100 |
| U.E. | 4,78 | 341,43 | 4,58 | 344,36 | 4,51 | 326,81 | 4,62 | 337,23 |
| Romania | 11,07 | 790,71 | 12,89 | 969,17 | 11,44 | 828,99 | 11,80 | 861,31 |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

Regarding the specific situation in 2009, there is an annual global food available of 1.40 kg / person, compared with higher levels in Europe and Oceania (6.69 and 1.82 kg / person - 477.86 and 130.0%, respectively), but also subunit levels for Africa, America and Asia (0.91, 0.80 and 0.69 kg / person - 65.0, 57.14 and respectively 49.29 %).

For 2010, the indicator ranged from 0.59 kg / person. in Asia, up to 6.62 kg / person. at European level (44.36 and 497.74% respectively), in conjunction with the other situations (0.86, 0.93 and 1.05 kg / person for America, Africa and Oceania - positions at 64.66, 69.92 and 78.95% respectively), the world indicator was 1.33 kg / pers.

If we analyze the specific situation of 2011, there is a global indicator level of 1.38 kg / pers., with limits of 0.68 kg / person. in Asia (49.28%) and 6.53 kg / person. in Europe (473.19%). The rest of the continents recorded: 1.41 kg / person. Oceania (102.17%), 0.93 kg / pers. America (67.39%) and 0.90 kg / pers. Africa (65,22%).

For the European Union, there are sequential levels of annual food availability of: 4.78, 4.58, 4.51 and 4.62 kg / pers. (2009, 2010, 2011 and the average of the period respectively), while the national situation was the following: 11.07, 12.89, 11.44 and 11.80 kg / pers. (2009, 2010, 2011 and the average of the period).

The average of the period reached 1.37 kg / person worldwide, compared with the continental situation: -52.55% Asia (0.65 kg / pers.); -37.23% America (0.86 kg / pers.); -33.58% Africa (0.91kg / pers.); + 4.38% Oceania (1.43 kg / pers.); + 237.23% European Union (4.62 kg / pers.); + 382.48% Europe (6.61 kg / pers.); + 761.31% Romania (11.80 kg / pers.).

The available daily / inhabitant (g / day / person) is shown in table 3.

Regarding the specific situation of 2009, there is a global level of the indicator of 3.83 g / person, compared to which are found both subunit levels (49.09, 57.18 and 64.75% respectively 1.88, 2, 19 and 2.48 g / pers. for Asia, America and Africa) as well as supra-unit values (130.55, 342.04, 478.59 and 791.91% - 5.0, 13.10, 18, 33 and 30.33 g / pers. respectively for Oceania, European Union, Europe and Romania).

If we relate to 2010, we have a range of 1.61 and 35.31 g / pers. in the case of Asia and Romania, limits that corroborate with the other specific situations specific to the territorial units under analysis led to a global level of the indicator of 3.65 g / pers. (lower than in 2009). America, Africa and Oceania show relative subunit relative to the world average (64.38, 69.86 and 79.18% respectively - effective levels of 2.35, 2.55 and 2.89 g / pers.), The rest of the components being higher (496.99 and 343.56% for Europe and the European Union - effective levels of 12.54 and 18.14 g / pers. respectively).

***Table 3.***

**Available daily food quantity (g/pers.)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff | % compared to average |
| Africa | 2,48 | 64,75 | 2,55 | 69,86 | 2,46 | 65,08 | 2,50 | 66,67 |
| America | 2,19 | 57,18 | 2,35 | 64,38 | 2,56 | 67,72 | 2,37 | 63,20 |
| Asia | 1,88 | 49,09 | 1,61 | 44,11 | 1,85 | 48,94 | 1,78 | 47,47 |
| Europe | 18,33 | 478,59 | 18,14 | 496,99 | 17,90 | 473,54 | 18,12 | 483,20 |
| Oceania | 5,00 | 130,55 | 2,89 | 79,18 | 3,86 | 102,12 | 3,92 | 104,53 |
| World | 3,83 | 100 | 3,65 | 100 | 3,78 | 100 | 3,75 | 100 |
| U.E. | 13,10 | 342,04 | 12,54 | 343,56 | 12,36 | 326,98 | 12,67 | 337,87 |
| Romania | 30,33 | 791,91 | 35,31 | 967,40 | 31,35 | 829,37 | 32,33 | 862,13 |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

As far as the state of affairs in 2011 is concerned, the indicator at the global level reached 3.78 g / pers., with more favorable conditions for Asia, Africa and America (1.85, 2.46 and 2, 56 g / pers., respectively decreases compared to the level of comparison with 51.06, 34.92 and 32.28%, respectively), but also with more favorable situations in Oceania, the European Union, Europe and Romania (3.86, 12 , 36, 17.90 and 31.35 g / pers. - outflows of 1.02, 3.26, 4.73 and 8.29 times, respectively, of the reference period - the global level of the indicator).

The average of the period is characterized by an actual global level of the indicator of 3.75 g / person, with the following positions being found: -52.53% Asia (1.78 g / person); -36.80% America (2.37 g / pers.); -33.33% Africa (2.50 g / pers.); + 4.53% Oceania (3.92 g / pers.); + 237.87% European Union (12.67 g / person); + 383.20% Europe (18.12 g / pers.); + 762.13% Romania (32.33 g / pers.).

The data on the daily availability of milk expressed in kcal / person are presented in Table 4.

***Table 4.***

**Available daily caloric food (kcal/pers.)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff | % compared to average |
| Africa | 22 | 64,71 | 23 | 71,88 | 22 | 66,67 | 22,33 | 67,67 |
| America | 19 | 55,88 | 21 | 65,63 | 22 | 66,67 | 20,67 | 62,64 |
| Asia | 17 | 50,00 | 14 | 43,75 | 16 | 48,48 | 15,67 | 47,48 |
| Europe | 162 | 476,47 | 160 | 500,00 | 158 | 478,79 | 160,00 | 484,85 |
| Oceania | 41 | 120,59 | 25 | 78,13 | 33 | 100,00 | 33,00 | 100,00 |
| World | 34 | 100 | 32 | 100 | 33 | 100 | 33,00 | 100 |
| U.E. | 116 | 341,18 | 111 | 346,88 | 109 | 330,30 | 112,00 | 339,39 |
| Romania | 266 | 782,35 | 311 | 971,88 | 276 | 836,36 | 284,33 | 861,61 |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

Analyzing the 2009 specific situation, indicators of variation of the indicator from 17 kcal / pers. are found. for Asia (-50.0% compared to the world situation), up to 266 kcal / pers. in the case of Romania (7.82 times the global situation) and the overall indicator level reached 34 kcal / pers. Compared to this level, subunit values (America and Africa - 19 and 22 kcal / pers., respectively -44.12 and -35.29% versus the world level), as well as supra-unit levels (Oceania, European Union and Europe - 41, 116 and 162 kcal / pers., global 1.20, 3.41 and 4.76 respectively).

The year 2010 is characterized by a global indicator level of 32 kcal / person, which is based on specific situations of: 14 kcal / pers. Asia (-56.25%), 21 kcal / pers. America (-

34.37%), 23kcal / pers. Africa (-28.12%), 25 kcal / pers. Oceania (-21.87%), 111 kcal / pers. European Union (+ 246.88%), 160 kcal / pers. Europe (+ 400%) and 311 kcal / pers. Romania (+ 871.88%).

At the level of 2011, there is a variation of the indicator of 16 kcal / pers. in Asia and 276 kcal / pers. in the case of Romania, to which the situation specific to the other analyzed entities adds a world level of 33 kcal / pers. The relative values of the sequential indicators were higher for Romania (836.36%), Europe (478.79% - 158 kcal / pers.), the European Union (330.30% - 109 kcal / pers.), Oceania (100% - 33 kcal / pers.) and subunits for Africa and America (66.67% respectively) Asia (48.48%).

If we refer to the average of the period, there is a global indicator level of 33 kcal / pers., against which the analyzed territorial units were placed as follows: -52,52% Asia (15,67 kcal / person); -37.36% America (20.67 kcal / pers.); -32.33% Africa (22.33 kcal / pers.); equivocal level for Oceania (33 kcal / pers.); + 239.39% European Union (112 kcal / pers.); + 384.85% Europe (160 kcal / pers.); + 761.61% Romania (284.33 kcal / pers.).

Table 5 shows the daily protein availability data, expressed in grams per person.

***Table 5.***

**Available protein daily (g/pers.)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff | % compared to average |
| Europe | 0,03 | - | 0,03 | - | 0,03 | - | 0,03 | - |
| Oceania | 0,03 | - | 0,01 | - | 0,02 | - | 0,02 | - |
| U.E. | 0,01 | - | 0,01 | - | 0,01 | - | 0,01 | - |
| Romania | 0,04 | - | 0,04 | - | 0,04 | - | 0,04 | - |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

Existing statistical data refers only to four entities, namely: Europe with a unit level of the indicator of 0.03 g / person; Oceans showing variations from 0.01 to 0.03 g / person (2010 and 2009 respectively), which lead to an average of 0.02 g / person; European Union with a constant level of 0.01 g / person; Romania with a situation characterized by a constant level of 0.04 g / person, throughout the entire dynamic series.

Table 6 shows the daily lipid availability data, expressed in grams per person.

***Table 6.***

**Available lipid daily (g/pers.)**

| Specification | 2009 | | 2010 | | 2011 | | Average** | |
|---|---|---|---|---|---|---|---|---|
| | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff* | % compared to average ** | Eff | % compared to average |
| Africa | 2,48 | 64,92 | 2,55 | 69,86 | 2,46 | 65,25 | 2,50 | 66,67 |
| America | 2,18 | 57,07 | 2,32 | 63,56 | 2,53 | 67,11 | 2,34 | 62,40 |
| Asia | 1,87 | 48,95 | 1,61 | 44,11 | 1,85 | 49,07 | 1,78 | 47,47 |
| Europe | 18,28 | 478,53 | 18,10 | 495,89 | 17,86 | 473,74 | 18,08 | 482,13 |
| Oceania | 4,62 | 120,94 | 2,80 | 76,71 | 3,73 | 98,94 | 3,72 | 99,20 |
| World | 3,82 | 100 | 3,65 | 100 | 3,77 | 100 | 3,75 | 100 |
| U.E. | 13,10 | 342,93 | 12,52 | 343,01 | 12,34 | 327,32 | 12,65 | 337,33 |
| Romania | 30,07 | 787,17 | 35,18 | 963,84 | 31,19 | 827,32 | 32,15 | 857,33 |

*http://faostat3.fao.org/download/FB/CC/F (19.12.2016)
** own calculation

The year 2009 shows a worldwide available lipid daily of 3.82 g / person, level based on sequential indicators, as follows: 30.07 g / pers. Romania (7.87 times over the world, considered as reference), 18.28 g / pers. Europe (overtaking 4.78 times the world situation), 13.10 g / pers. European Union (3.42 times the world level), 4.62 g / pers. Oceania (1.20 times the world level), 2.48 g / pers. Africa (-35.08% compared to the

world), 2.18 g / pers. America (-42.93% compared to the world), 1.87 g / pers. Asia (-51.05% vs. world).

For the year 2010, the variation limits of the indicator are 1.61 g / pers. in the case of the Asian continent (44,11% compared to the world level) and 35,18 g / pers. respectively. for Romania (963.84% compared to the global general situation), and the world level reached 3.65 g / pers. There are inappropriate situations in Africa, America and Oceania (2.55, 2.32 and 2.80 g / persons - 69.86, 63.56 and 76.71%, respectively), but also more favorable situations compared to the world level for the European Union and Europe (12.52 and 18.10 g / pers. - 343.01 and respectively 495.89%).

If we analyze the situation of the daily lipid available for 2011, we can observe a global level of the indicator of 3.77 g / pers., which is higher (Romania, Europe and the European Union - 31.19, 17.86 and 12.34 g / pers. respectively compared with the comparison term of 8.27, 4.73 and 3.27 times respectively), but also lower values (Oceania, America, Africa and Asia - 3.73, 2, 53, 2.46 and 1.85 g / person respectively decreases from the reference level by 1.06, 32.89, 34.75 and 50.93%, respectively).

If we refer to the average of the period, there is a global level of the indicator of 3.75 g / person, to which the analyzed territorial units were placed as follows: -32.53% Asia (1.78 g / pers.); -37.60% America (2.34 g / pers.); -32.33% Africa (2.50 g / pers.); -0.80% Oceania (3.72 g / pers.); + 237,33% European Union (12,65 g / person); + 382.13% Europe (18.08 g / pers.); + 757.33% Romania (32.15 g / pers.).

## CONCLUSIONS

In the case of total available food (t) Europe prevails (almost 52.73% of the total) followed by appreciable distances from Asia (28.93%), while Africa, America and Oceania share less than 10%. The variation of the indicator is uneven (a situation that is found for most of the analyzed entities, with the exception of America and the European Union with upward and downward developments).

The available annual food (kg / person) has a fairly large amplitude (11.15 kg), which highlights the different potentials of the continents, as we discuss a rather large variation in the number of inhabitants and the existence of other plants as a source of food oil (soybeans, corn, peanuts, etc.). The evolution over time of the indicator has been uneven across the world (except for this trend made America, Europe and the European Union - ascending evolution in the first case and downward developments for the last two cases).

The available daily food quantity (g / pers.) was 3.75 g / person, compared to which were found favorable situations in Oceania, the European Union, Europe and Romania (advances at the world level from 1.04 at 8.62 times) but also less convenient situations for the rest. Evolution of the indicator is fluctuating globally (similar situations for Africa, Asia, Oceania and Romania), while for America the evolution is ascending, in the case of Europe and the European Union the evolution is descending.

The available daily caloric food (kcal / pers.) Shows fairly wide variation ranges (from 15.67 to 284.33 kcal / pers. in Asia and Romania respectively, with an average of 33.0 kcal / person). The evolution of the global level of the indicator has been fluctuating (the same phenomenon appears for Africa, Asia, Oceania and Romania), with exceptions: upward trends for America, downward trends for Europe and the European Union.

The available daily protein (g / pers.) is uniform in Europe, the European Union and Romania (0.03, 0.01 and 0.04 g / person respectively) and unevenly in Oceania.

The available daily lipid (g / pers.) has a world average of 3.75 g / person, which is very close to Oceania - 3.72 g / person. The analyzed administrative entities are placed both below the global level (Asia, America and Africa) and beyond (the European Union, Europe and Romania.) The indicator has evolved unevenly across the globe, a trend that

also appears for Africa, Asia, Oceania and Romania. In the case of the American continent, we are talking about an upward trend in the indicator, while Europe and the European Union are characterized by downward trends in daily lipid availability.

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