

## FRUIT CONSUMPTION IN ROMANIA (2017-2019)

**Radu Lucian PÂNZARU, Dragoș Mihai MEDELETE, Diana Marina SORA**

University of Craiova, Faculty of Agronomy, 19 Liberty, 200421, Craiova, Romania, Phone: +40 741 180 976, Fax: + 40 251 418 475, rlp1967craiova@gmail.com, dragosmedelete@gmail.com, sora.diana.n7k@student.ucv.ro

**Corresponding author:** dragosmedelete@gmail.com

### **Abstract**

*Fruits can be an important component of food consumption, due to their beneficial properties, related to the content in nutritional principles. The study tries to present the situation of consumers in Romania, based on fruit consumption in the context of existing realities worldwide and at European Union level, for the period 2017-2019. The total recorded fruit consumption is characterized by an average of 3,255.33 thousand t, and the consumption per inhabitant was, on average, 102.12 kg. Worldwide, Romania accounted for an average of 0.45% of total fruit consumption, with about 4.70% of the Community consumption. Regarding the consumption per capita, compared to the situation for world and community, Romania exceeded the level for total consumption of fruit by +15.0 and 31.61%, respectively. There is a preponderance of consumption of grapes, other fruits and apples (about 86%). It can be appreciated that it is necessary to revive the fruit sector and the processing industry, as prerequisites for increasing fruit consumption in Romania.*

**Key words:** consumption, dynamics, fruits, inhabitant, structure

### **INTRODUCTION**

Fruits, along with cereals and vegetables, are essential components of the human diet, having valences related to a healthy diet due to the high and varied content in bio-active substances [13].

Fruits are products with a variable degree of perishability, the period of time influencing the storage capacity and quality of products at the time of completion of storage and availability of consignments of goods for consumption [5]. If fruit storage is not carried out properly, it is estimated that losses can reach up to 45-55% of total production [6].

Fruits obtained on the basis of traditional technologies, have a higher quality than intensive or super-intensive production, as such they can be preferred in consumption [3].

The proper capitalization of fruits may be related to their proper processing (an aspect that also influences consumption), but this is not obvious at present in Romania, where fruit and vegetable processing represents only about 3% of the added value generated by the food industry [1].

Fruit consumption is under the influence of current socio-economic changes, which have consequences on the structures of food and non-food consumption of the population [14]. Fruit consumption is linked to their quality, the aspect being directly related to the efficiency of their valorization [4].

Although Romania is a country with tradition in the cultivation of fruit species, at present, due to the exploitation of plantations and their aging, the import of fruits clearly exceeds export operations (given the decrease in production), an aspect with various effects on consumption [8,15].

After 2015, for consumers in Romania, there is a change in the structure of the food ration, through the wider use of fruits [12].

Lately, there has been an increase in fruit consumption because the average consumer is more concerned with ensuring the daily need for useful nutritional principles, as a result of the campaigns carried out in the information media concerning the properties of fruits [7].

Changes in the structure of food consumption have good effects at producer level, leading to increased fruit production due to consumer demand [2].

The purpose of this study is to present the situation of consumers in Romania, based on fruit consumption in the context of existing realities worldwide and at European Union level, for the period 2017-2019.

## MATERIALS AND METHODS

In order to carry out the work, it was operated with indicators called total consumption (availability) (thousand t) and average annual consumption per inhabitant (kg). It represents the total quantity of products available at the level of an area(s), i.e. the quantity of a product or group of agri-food products (primary or processed) consumed by an inhabitant, during the reference period, regardless of the source of supply (wholesale, retail, restaurants, canteens, own production, etc.) and the place where they are consumed (individual households, restaurants, canteens, confectioneries, institutional households, etc.) [10, 11]. The analyzed period is 2017-2019, to which by adding the average of the period, a dynamic series of four terms was achieved. The two indicators shall be presented at the general level of the product group, as well as for its components: pineapple and derived products; Bananas; oranges and mandarins; lemons and limes; grapefruit and products thereof; other citrus fruits; apples and products thereof; grape; other fruits (FAO classification) [9]. The elaboration of this study called for the method of comparison in

time and space. The dynamic series consists of four terms (to the three years analyzed being added the average of the period). The work uses only indices with a fixed base. Structural indices, calculated for total and per capita consumption, were determined by the formula:

$$IS_C = \frac{Q_i}{Q_t} \times 100 (\%) \dots \dots \dots (1)$$

where:  $IS_C$  – structure index (%);  $Q_i$  = consumption by product type (thousand t, kg);  $Q_t$  = total consumption (thousand t, kg). Establishing the positioning, for the consumption per inhabitant, beside the reference levels (the world level in the case of the European Union, respectively the world and community level for Romania) was achieved by using the following formula:

$$P = \frac{N_i}{N_t} \times 100 (\%) \dots \dots \dots (2)$$

where:  $P$ – positioning relative to baseline (%);  $N_i$  = sequential level of the indicator (national consumption - thousand t, kg);  $N_t$  = indicator reference level (world or Community consumption - thousand t, kg).

## RESULTS AND DISCUSSIONS

Table 1 shows the level of total fruit consumption, at national level, for this product group and its components.

Table 1. Total fruit consumption in Romania – thousand t (2017-2019)

Specification	Year						Period average**		
	2017		2018		2019		Effective	Ibf %	Structure %
Effective*	Ibf** (%)	Effective*	Ibf** (%)	Effective*	Ibf** (%)				
Pineapple and products thereof	15	100	15	100.0	14	93.33	14.67	97.80	0.45
Banans	204	100	217	106.37	209	102.45	210.00	102.94	6.46
Oranges and tangerines	153	100	160	104.58	155	101.31	156.00	101.96	4.79
Lemons and limes	61	100	62	101.64	62	101.64	61.67	101.10	1.89
Grapefruit and products thereof	10	100	3	30.0	6	60.0	6.33	63.30	0.19
Other citrus fruits	1	100	1	100.0	1	100.0	1.00	100.0	0.03
Apples and products thereof	530	100	583	110.0	603	113.77	572.00	107.92	17.57
Grape	1,126	100	1,192	105.86	1,013	89.96	1,110.33	98.61	34.11
Other fruits	863	100	1,373	159.10	1,134	131.40	1,123.33	130.17	34.51
Total	2,963	100	3,606	121.70	3,197	107.90	3,255.33	109.87	100

Source: \*<https://www.fao.org/faostat/fr/#data/FBS> (20.02.2023) [9].

\*\*own calculations.

For pineapples and derived products, consumption levels from 14 thousand t (2019) to 15 thousand t (2017 and 2018) are found, and the average indicator was 14.67 thousand t. The dynamics of the indicator is uniformly downward, – equity level of incidence in 2018 and decreases compared to the comparison term by 6.67% in 2019 and 2.20% at the level of the average of the period.

Banana consumption is characterized by an average of 210 thousand t (+2.94% compared to the reporting base – 2017), a level based on annual situations of: 204 thousand t in 2017, 217 thousand t in 2018 and 209 thousand t for 2019. The dynamics shows an upward-fluctuating evolution, the indices were strictly supra-unitary: 106.37% for 2018, 102.45% for 2019.

For the consumption of orange and mandarin, annual levels of 153 thousand t were recorded for year 2017, 160 thousand t in 2018 and 155 thousand t in 2019. As a result, the average of the period recorded a level of 156 thousand t. Under these circumstances, the evolution of the indicator is ascending-uneven – increases by 1.31, 1.96 and 4.58% for the average of the period and respectively at the level of 2019 and 2018.

If we refer to the specific situation of lemon and lime consumption, there are limits of variation of 61 (2017) and 62 thousand t (2018 and 2019, respectively), levels that led to an average of 61.67 thousand t. In these circumstances, there is a uniform upward-trend of the indicator, the comparison base being exceeded as follows: +1.64% for 2018 and 2019, +1.10% for the average period.

For grapefruit and derived products, consumption levels from 3 thousand t (2018) to 10 thousand t (2017) are found, and the average indicator was 6.33 thousand t. The dynamics of the indicator contains strictly subunit values - decreases compared to the comparison term by 36.70% at the level of the average of the period, by 40% in 2019 (6 thousand t) and by 70% in the case of 2018.

The quantities consumed from other citrus fruits were characterized by a uniform evolution – level of 1 thousand tons for all components of the dynamic series. In the case of consumption of apples and derived

products, annual sequential levels of 530 thousand t were recorded for 2017, 583 thousand t for 2018 and 603 thousand t for 2019, respectively. Thus, the average of the period had a level of 572 thousand t. Under these circumstances, we observe an upward evolution of the indicator – annual increases of 1.10 and 1.13 times at the level of 2018 and 2019, respectively. The average period, exceeded the reporting level by 7.92%.

If we refer to the specific situation of grape consumption, there are limits of variation of 1,013 and 1,192 thousand t for 2019 and 2018, respectively, levels that, corroborated with the specific situation of 2017 (1,126 thousand t) led to an average of 1,110.33 thousand t. In these circumstances, there is an uneven trend of the indicator, compared to the comparison base being recorded exceedances and decreases, as follows: +5.86% for 2018, -10.04% for 2019, -1.39% for the average period.

For other fruits, consumption levels are found from 863 thousand t (2017) to 1,373 thousand t (2018), and the average indicator was 1,123.33 thousand t. The dynamics of the indicator contains only supra-unitary values - exceedances of the comparison term by 59.10% in 2018, 31.40% for 2019 and 30.17% at the level of the average of the period. As a result, it can be said that the evolution was an upward-fluctuating one.

The total recorded fruit consumption is characterized by an average of 3,255.33 thousand t (+9.87% compared to the reporting base - 2017), level based on annual situations of: 2936 thousand t in 2017, 3606 thousand t in 2018 and 3197 thousand t for 2019. The dynamics shows an upward-uneven evolution - the indices were strictly supra-unitary: 121.70% for 2018, 107.90% for 2019.

If we analyze the structure of total fruit consumption, at national level (average of the period), we find variable weights of different products, as follows (Fig. 1): 34.51% other fruits; 34.11% grapes; 17.57% apples and products thereof; 6.46% bananas; 4.79% oranges and mandarins; 1.89% lemons and limes; 0.45% pineapple and products thereof; 0.19% grapefruit and products thereof; 0.03% other citrus fruits.

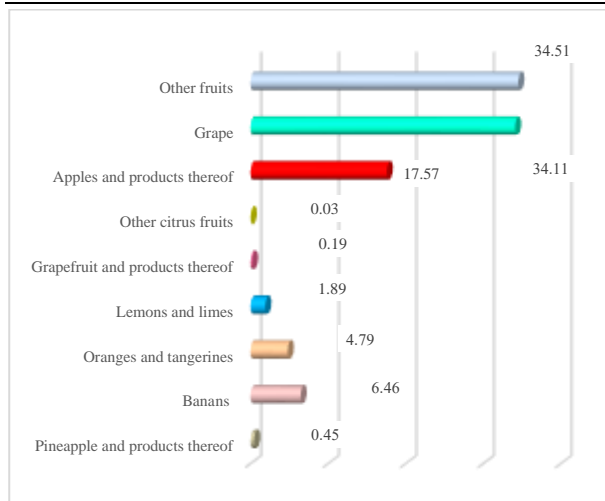


Fig. 1. Structure of total fruit consumption in Romania – average period (%)

Source: own calculations.

Table 2, shows the consumption of fruits and fruit products per inhabitant, at national level. In the case of consumption of pineapple and derived products, annual sequential levels of 0.75 kg were recorded for 2017, 0.77 kg for 2018 and 0.70 for 2019, respectively. So, the period average period reached a level of 0.74

kg. Under this conditions, the evolution of the indicator is fluctuating – annual increase of 1.02 times at the level of 2018 and decreases respectively for 2019 and the average of the period by 6.67 and 1.33%. If we refer to the specific situation of banana consumption, there are limits of variation of 10.03 and 10.73 kg for 2017 and 2018, respectively, levels that corroborated with the specific situation of 2019 (10.36 kg) led to an average of 10.37 kg. Under these circumstances, there is an upward-uneven trend of the indicator – effective values of 106.98, 103.29 and 103.39% for 2018, 2019 and respectively for the average of the period. For oranges and mandarins, consumption levels range from 6.95 kg (2017) to 7.32 kg (2018), and the average indicator was 7.15 kg. The dynamics of the indicator contains only supra-unitary values of the component indices (compared to the reporting deadline 2017): 105.32% in 2018, 103.31% in 2019 (7.18 kg) and 102.88% at the average level of the period.

Table 2. Fruit consumption per inhabitant in Romania – kg (2017-2019)

Specification	Year						Period average**		
	2017		2018		2019		Effective	Ibf %	Structure %
	Effective*	Ibf** (%)	Effective*	Ibf** (%)	Effective*	Ibf** (%)			
Pineapple and products thereof	0.75	100	0.77	102.67	0.70	93.33	0.74	98.67	0.72
Banans	10.03	100	10.73	106.98	10.36	103.29	10.37	103.39	10.15
Oranges and tangerines	6.95	100	7.32	105.32	7.18	103.31	7.15	102.88	7.01
Lemons and limes	2.95	100	3.01	102.03	3.06	103.73	3.01	102.03	2.95
Grapefruit and products thereof	0.48	100	0.44	91.67	0.32	66.67	0.41	85.42	0.40
Other citrus fruits	0.05	100	0.04	80.0	0.05	100.0	0.05	100.0	0.05
Apples and products thereof	24.39	100	26.23	107.54	27.46	112.59	26.03	106.72	25.49
Grape	13.54	100	14.37	106.13	17.90	132.20	15.27	112.78	14.95
Other fruits	32.59	100	44.67	137.07	40.01	122.77	39.09	119.94	38.28
Total	91.73	100	107.58	117.28	107.04	116.69	102.12	111.33	100

Source: \*[https://www.fao.org/faostat/fr/#data/FBS\(20.02.2023\)](https://www.fao.org/faostat/fr/#data/FBS(20.02.2023)) [9].

\*\* own calculations.

The consumption of lemons and limes recorded is characterized by an average of 3.01 kg (+2.03% compared to the reporting base – 2017), a level based on annual situations of: 2.95 kg for 2017, 3.01 kg for 2018 and 3.06 kg for 2019. The dynamics shows an upward trend, the indices were supra-unitary for 2018 and 2019: 102.03 and 103.73%.

In the case of grapefruit consumption and derived products, annual sequential levels of 0.48 kg were recorded for 2017, 0.44 kg in 2018 and 0.32 kg in 2019, respectively. As a result, the average of the period recorded a level of 0.41 kg (-14.58% when compared to the reference term – 2017). Under this conditions, the evolution of the indicator is a decreasing one, highlighted by the level of

dynamics indices: 91.67% in 2018, 66.67% in 2019.

If we refer to the specific situation of consumption of other citrus fruits, there are limits of variation of 0.04 and 0.05 kg for 2018 and 2017 and 2019, respectively, levels that led to an average of 0.05 kg. In these circumstances, there is a downward-uniform trend of the indicator, compared to the comparison base, with decreases of 20.0% for 2018 and equal levels for the rest of the terms of the dynamic series.

For apples and derived products, consumption levels range from 24.39 kg (2017) to 27.46 kg (2019) and the average indicator was 26.03 kg. The dynamics of the indicator contains only supra-unitary values (evolution is ascending) - exceedances of the comparison term by 7.54% in 2018 (26.23 kg), 12.59% in the case of 2019 and 6.72% at the level of the average of the period.

The recorded grape consumption is characterized by an average of 15.27 kg (+12.78% compared to the reporting base – 2017), level based on annual situations of: 13.54 kg in 2017, 14.37 kg in 2018 and 17.90 kg respectively in 2019. The dynamics shows an upward evolution, the reporting base being surpassed by 1.06, 1.32 and 1.12 times in 2018, 2019 and respectively by the average of the period.

If we refer to other fruits - consumption -, we observe sequential annual levels of 32.59 kg that were recorded for 2017, 44.67 kg in 2018 and 40.01 kg in 2019, respectively. As a result, the average period recorded a level of 39.09 kg. Under these circumstances, the evolution of the indicator is ascending-uneven – differences compared to the reference term, as follows: +37.07% in 2018, +22.77% in 2019, +19.94% for the average of the period.

If we refer to the specific situation of total fruit consumption, there are limits of variation of 91.73 and 107.58 kg for 2017 and 2018, respectively, levels that corroborated with the specific situation of 2019 (107.04 kg) led to an average of 102.12 kg. In these circumstances, the upward-uneven trend of the indicator is observed, the comparison base being exceeded as follows: +17.28% for 2018,

+16.69% for 2019, +11.33% for the average period.

At national level, the structure of fruit consumption per inhabitant (average of the period) was (Fig. 2): 0.05% other citrus fruits; 0.40% grapefruit and derived products; 0.72% pineapple and products thereof; 2.95% lemons and limes; 7.01% oranges and mandarins; 10.15% bananas; 14.95% grapes; 25.49% apples and products thereof; 38.28% other fruits.

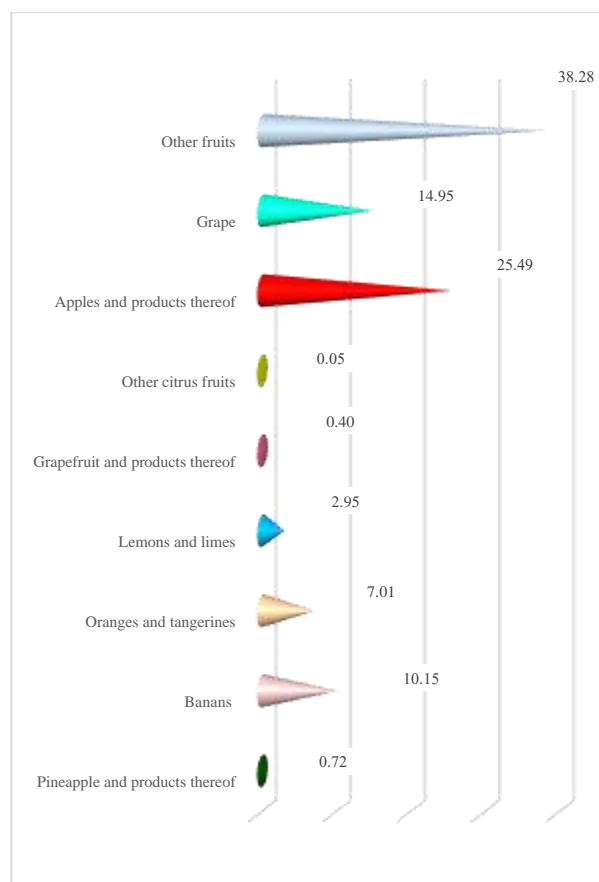


Fig. 2. Structure of fruit consumption per inhabitant in Romania – average period (%)

Source: own calculations.

Table 3 shows Romania's positioning at international level, in terms of fruit consumption.

Worldwide, Romania accounted for an average of 0.45% of total fruit consumption, and for the rest of the products the threshold of 1% is exceeded only for grapes (1.46%). Romania, regardless of consumption for other citrus fruits, has very low shares for pineapple and derived products, grapefruit and derived products, bananas, oranges and mandarins (0.06, 0.07, 0.14 and 0.15%, respectively) and

higher shares for lemons and limes, other fruits as well as for apples and derived products (0.34, 0.48 and 0.67%, respectively - Fig. 3). In the Community context, Romania held shares of about 4.70% for total fruit consumption. At the level of the component products of the group, there are situations exceeding the aforementioned level (5.77% for apples and derived products; 8.33% for other fruits), but also situations placed below this level (1.24% - pineapple and derived products; 3.85% - bananas; 1.45% - oranges and mandarins; 3.52% - lemons and limes;

1.51% grapefruit and derived products; 0.69% - other citrus fruits; 4.30% - grapes). These aspects are shown in Figure 3.

If we refer, strictly, to Romania's positioning in the global and community context, in terms of consumption per capita, the following aspects are noteworthy: compared to the world situation, Romania has exceeded the specific level for total consumption of fruits (+15.0%) and those for other fruits (+41.58%), lemons and limes (+48.28%), apples and derived products (+193.46%), grapes (+224.04%).

Table 3. Romania's share in international fruit consumption – average period (%)\*

No.	Specification	Total consumption		Consumption per capita	
		% from the world level	% from the community level	% compared to the world level	% compared to the community level
1	Pineapple and products thereof	0.06	1.24	25.69	30.58
2	Banans	0.14	3.85	62.92	98.48
3	Oranges and tangerines	0.15	1.45	58.04	34.76
4	Lemons and limes	0.34	3.52	148.28	87.25
5	Grapefruit and products thereof	0.07	1.51	39.05	47.13
6	Other citrus fruits	-	0.69	3.03	15.15
7	Apples and products thereof	0.67	5.77	293.46	175.76
8	Grape	1.46	4.30	334.04	159.73
9	Other fruits	0.48	8.33	141.58	148.86
10	Total	0.45	4.73	115.0	131.61

Source: \*own calculations.

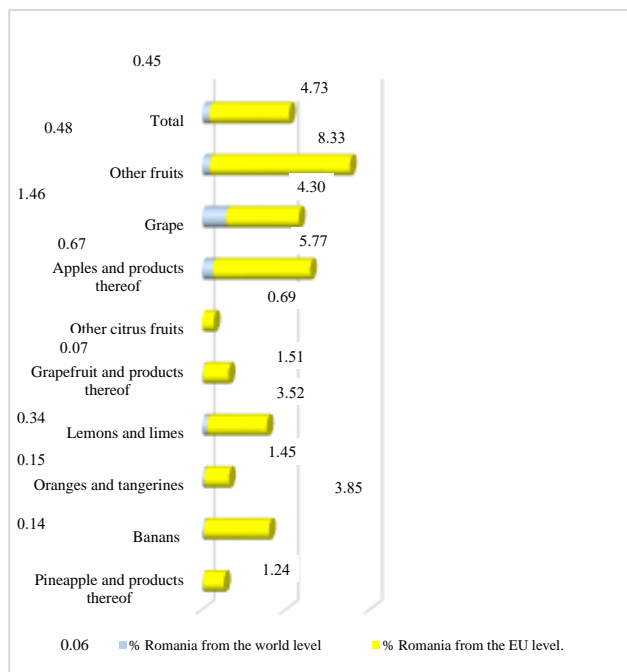


Fig. 3. Romania's share in the international context of total fruit consumption – average of the period (%)

Source: own calculations.

Romania ranks below the world level with: 37.08% for bananas, 41.96% for oranges and mandarins, 60.95% for grapefruit and derived products, 74.31% for pineapple and derived products, 96.97% for other citrus fruits (Fig. 4).

Compared to the Community situation, Romania exceeded the level of the indicator for apples and derived products, grapes, other fruits and at general level (175.76, 159.73, 148.86 and 131.61%, respectively).

In the rest of the situations, we are below the Community level, as follows: 98.48% for bananas, 87.25% for lemons and limes, 47.13% for grapefruit and derived products, 34.76% for oranges and mandarins, 30.58% for pineapples and derived products, 15.15% for other citrus fruits (Fig. 4).

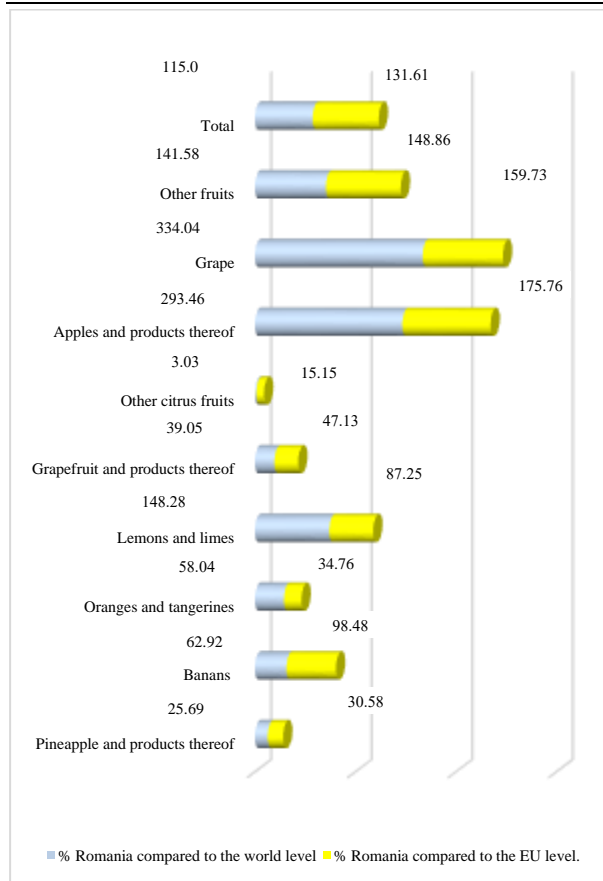


Fig. 4. Romania's positioning in the international context of fruit consumption per capita – average of the period (%)

Source: own calculations.

## CONCLUSIONS

Total consumption evolved upward-uneven, except for apples (upward trend), lemons and limes (upward-uniform trend), other citrus fruits (uniform evolution), pineapple (uniform-downward trend), grapes (fluctuating trend), grapefruit (downward-uneven trend).

The consumption of grapes, other fruits and apples (about 86%) is predominant. This aspect must also be assessed in accordance with the zoning of species, depending on the favorability of the cultivation areas, but also according to the consumption habits of the population.

The consumption per capita registered an upward-uneven trend, situation from which grapes deviate, namely lemons and limes (upward trend), pineapple (fluctuating trend), other citrus fruits (downward-uniform evolution) and grapefruit (downward trend).

There are pronounced amplitudes for other fruits, grapes and apples (12.08, 4.46 and 3.07 kg respectively), but for other citrus fruits and pineapples the amplitude of variation is reduced (0.01 and 0.07 kg).

Currently, for Romania, it is necessary to revive both fruit plantations and the processing industry, given that most of the consumption is ensured by imports of specific products. To these must be added an adequate involvement of the state at the level of intermediaries. In conjunction with this, measures must be taken to influence the purchasing and implicitly consumption behavior of the population, in order to improve the share of fruits and fruit products in the structure of total food consumption. These aspects can be improved by food, industrial, commercial and agricultural policy regulations.

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