STRUCTURE AND EVOLUTION OF THE AVAILABILITY AND CONSUMPTION OF BEANS AT NATIONAL LEVEL, IN AN INTERNATIONAL CONTEXT (2011-2013)

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ABSTRACT

Beans, being rich in protein (23-25%) and carbohydrates (48-55%) is used in the form of grains or as a vegetable in the form of pods.

The berries have a high content of digestible proteins and a high nutritional value, being used in a wide range of dishes.

For a long time, it was called "meat of poor people" due to the high content of grains in very good quality proteins, rich in essential amino acids important for the human body (lysine, arginine, tryptophan, etc.).

In the diet are used not only the ripe grains, but also the green pods, which also have a high nutritional value, being rich in proteins, sugars, vitamins, etc. Some peoples, such as the Japanese and Chinese, use in their diet not only green beans and pods, but also young shoots, which are eaten as a salad.

From the point of view of the components of the balance sheet, its equitable nature is noteworthy. Imports predominate (57.77%), followed closely by production (43.72%). It can be concluded that the trade balance is clearly unfavorable.

INTRODUCTION

Dry beans are rich in starch, protein and dietary fiber and an excellent source of iron, potassium, selenium, molybdenum, thiamine, vitamin B6 and folic acid. Dry beans are kept indefinitely in a cold, dry place, but as time goes on, the nutritional value and flavour degrade and the boiling time is prolonged. Dry beans are almost always cooked by boiling, often after being soaked in water for several hours. In addition, the disposal of soaking water washes complex sugars that are difficult to digest that can cause flatulence. Ordinary beans require a longer boiling time than other vegetables in the form of beans.

Green beans compared to dried beans have less starch and protein and more vitamins A and C. Green beans are often eaten smothered in steam, sautéed or boiled. Before being eaten, raw bean seeds should be cooked for at least 10 minutes to degrade a toxic compound – lectin-phytohemaddedinin – which is found in beans and causes serious gastric disturbances. This compound is present in many varieties. Green beans contain approx. 10 times fewer protein and carbon hydrates than dry.

Bean flour in a mixture of 5-10% with wheat flour can be used in the manufacture of bread.

Bean plant strains are an important feed for sheep and goats, with a high protein content – 8.1% of dry matter, non-azotic extractive substances – 31% of dry matter, cellulose – 36% of dry matter, etc.

In the green state, the leaves contain more than 10% citric acid, in some cases even 18%.

For medicinal purposes, dry seedless pods (Phaseoli fructus sine seminibus), yellowish-white bean sheaths on the outside and white bean on the inside are used. They have no smell, and the taste is weak mucilaginous. Contains amino acids (asparagine, alginin, tyrosine, tryptophan, lysine, etc.), vitamin C, organic acids, mineral salts, etc. have

diuretic, antidiabetic and slightly hypoglycemic action. Tea from shredded bean sheaths eliminates excess water and toxins, improving rheumatic states. It is part of anti-rheumatic and dietary teas. The product is obtained from varieties with white pods. Raw beans cause inflammation of the gastrointestinal tract.

Beans are a good forerunner for all cultivated plants because they leave the land early, leaving the soil in a good state of fertility.

The countries where beans are grown are located in different climates with a very wide range of spread around the globe.

In Europe the beans were brought in 1542, until then since ancient times the beans were grown.

Beans spread relatively quickly in Europe, starting with Spain, Italy and other Mediterranean countries.

In our country was brought from Italy at the end of the 17th century the beginning of the 18th century.

METHOD AND MATERIAL

In order to carry out the work, a system of indicators was carried out, specific to establishing the balance of certain agricultural products, a system used and recommended by the Food and Agriculture Organization of the United Nations – FAO.

The creation of the total available shall take into account the following components: total production, imports, stocks and exports (expressed in natural units of measurement – t). The determination of the level of total domestic availability – according to FAO regulations, takes into account the sum of the level of production with the level of imports, ±stocks, from which the volume of exports is subtracted.

The following components of the total consumption shall be taken into account in determining the total consumption: feed consumption, seeds or planting material, food consumption, processed raw materials, other uses, losses (expressed in tones or tones). According to the FAO methodology, the total level of consumption is determined by summarizing the above-mentioned elements.

The actual determination of the balance shall take into account the achievement of the difference between the total volume of total available and the total volume of consumption. Depending on the values of total consumption and total availability the balance sheet may be surplus, deficient or a balance situation may be found between the two elements – basic – constituent.

In the case of total availability and total consumption, taking into account their component elements and their way of participating in determining the general level of the two indicators, the structure was formed, as a percentage, distinct for both total domestic availability and total consumption.

RESULTS AND DISCUSSIONS

Table 1 shows the components of the world balance for beans.

At first instance it should be noted that if statistical data exist for all the constituent elements of the total availability, while at the level of total consumption there is no data for the raw materials processed.

In 2011, total availability was 22,550,667 t, which was 23,107,800 t total production (102.47%), 3,334,745 t import (14,97%), 482,326 t stocks (2.14%), 4,374,204 t exports (-19.40%). For total consumption, a level of 22,576,125 t was reached, to which they contributed: forage consumption by 2,434,938 t (10,78%), seeds by 1,196,330 t (5,30%), human consumption by 17,626,824 t (78.08%),

Table 1.

World product balance (t) - structure (2011 – 2013)

No.	Specification	YEAR						Period average**	
		2011		2012		2013			
		Effective*	Str. (%)**	Effective*	Str. (%)**	Effective*	Str. (%)**	Effective	Str. (%)
1	Production	23,107,800	102,47	23,359,698	105.30	22,791,581	100.99	23,086,359.67	102.91
2	Import	3,334,745	14,79	3464,305	15.62	3,422,839	15.17	3,407,296.33	15.19
3	Inventories	482,326	2.14	-402,427	-1.81	271,941	1.21	117,280.00	0.52
4	Export	4,374,204	-19.40	4,236,638	-19.11	3,919,768	-17.37	4,176,870.00	-18.62
5	Total available	22,550,667	100	22,184,938	100	22,566,593	100	22,434,066.00	100
6	Feed consumption	2,434,938	10.78	2,599,136	11.71	2,668,644	11.80	2,567,572.67	11.43
7	Seeds	1,196,330	5.30	1,186,106	5.34	1,226,891	5.42	1,203,109.00	5.35
8	Human consumption	17,626,824	78.08	17,122,805	77.14	17,416,335	77.01	17,388,654.67	77.41
9	Other uses	64,917	0.29	44,158	0.20	58,848	0,26	55,974.33	0.25
10	Loss	1,253,116	5.55	1,244,916	5.61	1,246,343	5.51	1,248,125.00	5.56
11	Total consumption	22,576,125	100	22,197,121	100	22,617,061	100	22,463,435.67	100
12	Balance	-25,458	-	-12,183	-	-50468	-	-29,369.67	-

*http://www.fao.org/faostat/fr/#data/BC (28.03.2020)
**own calculation

64.917 t (0.29%), losses with 1,253,116 t (5,55%). As a result of these aspects it can be concluded that for that year the balance was deficient: -25,458 t.

For 2012 the product balance was deficient (-12,183 t), which is based on a total available of 22,184,938 t and a total consumption of 22,197,121 t. The creation of the total available is based on the following components: 105.30% production – 23,359,698 t, 15.62% imports – 3,464,305 t, -1.81% stocks – -402,427 t, -19,11% exports – 4,236,638 t. In terms of total consumption, the component parts were as follows: 77.14% human consumption – 17,122,805 t, 11,71% forage consumption – 2,599,136 t, 5.61% losses – 1,244,916 t, 5,34% seeds – 1,186,106 t, 0.20% other uses – 44,158 t.

If we consider the situation of 2013, we can see a level of 22,566,593 t for total availability, 22,617,061 t for total consumption and a balance deficit of 50,468 t. The creation of the total available is based on: 22,791,581 t total production (100.99%), 3,422,839 t imports (15.17%), 271,941 t stocks (1.21%), 3,919,768 t exports (-17.37%). At the level of total consumption, the components were: 58,848 t other uses (0.26%), 1,226,891 t seeds (5.42%), 1,246,343 t losses (5,51%), 2,668,644 t feed consumption (11,80%), 17,416,335 t human consumption (77,01%).

Based on the sequential values of 2011, 2012 and 2013, the average of the period was determined. At the average level, the total availability was 22,434,066 t, showing the following structure (fig. 1): 102.91% total production (23,086,359.67 t); 15.19% import (3,407,296.33 t); 0.52% stocks (117,280 t); -18.62% export (4,176,870 t).

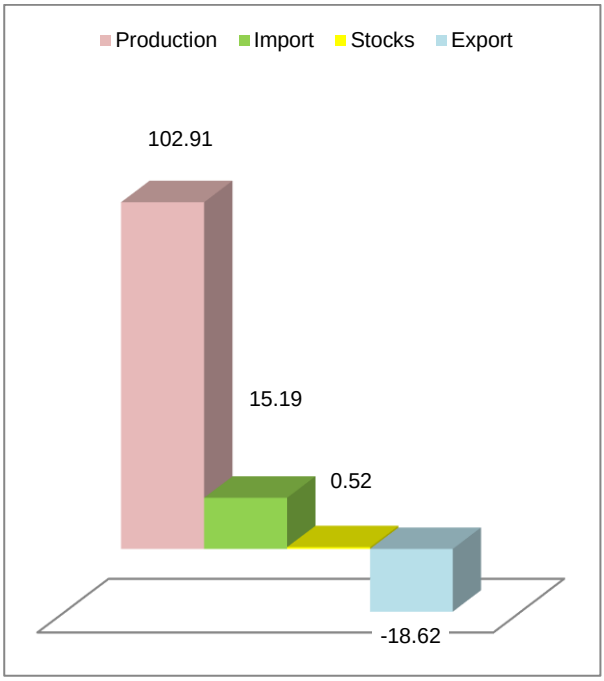

Fig. 1. **Total available global structure - average of the period (%)**

For total consumption, a share of 22,463,435.67 t was reached, which is based on percentage contributions, as follows (fig. 2): 0.25% other uses (55,974.33 t); 5.35% seeds (1,203,109 t); 5.56% losses (1,248,125 t); 11.43% feed consumption (2,567,572.67 t); 77.41% human consumption (17,388,654.67 t).

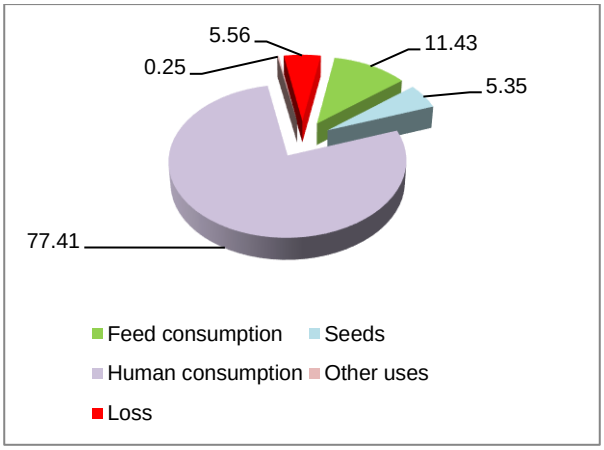

Fig. 2. **The structure of total world consumption - the average of the period (%)**

Under these conditions, the balance of the product was deficient: -29,369.67 t. Figure 3 shows the situation of the world balance for beans, for the analyzed period.

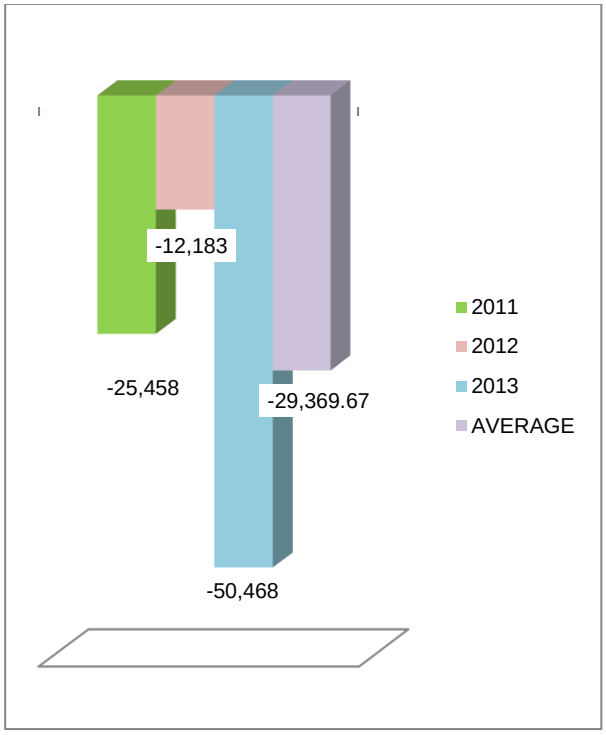

Fig. 3. **World balance (t)**

The information relating to the regional balance for beans is given in Table 2.

In 2011 the total availability was 575,594 t, at which level the following factors contributed differentiated: 25.29% production – 145,559 t, 96.61% imports – 556,099 t, 1.74% stocks – 10,000 t, -23.64% exports – 136,064 t. Total consumption was 575,594 t, which was based on the following contributions: 422,365 t human consumption – 73,38%, 110,202 t forage consumption – 19,15%, 24,452 t losses – 4.25%, 18,158 t seeds – 3.15%, 417 t other uses – 0.07%.

For 2012 we can see a level of 542,921 t of total availability, which has as component parts the following quantities: 118,071 t exports – -21.75%, 135,059 t production – 24.88%, 525,932 t imports – 96.87%. Total consumption reached 542,923 t, which is based on the following components: 426,926 t human consumption – 78,63%, 74,060 t forage consumption – 13,64%, 22,174 t losses –

4.08%, 19,395t seeds – 3.57%, 368 t other uses – 0.08%.

At the level of 2013, the region is characterized by a total available of 572,984 t and a total consumption of 572,985 t. Components of total availability were: production – 160,360 t (27.99%), import – 535,561 t (93.47%), export – 122,936 t (-21.46%). For total consumption the components were: other uses 348 t (0.06%), seeds – 19,728 t (3.44%), losses – 24,441 t (4.27%), feed consumption – 132,707 t (23.16%) and human consumption – 395,761 t (69.07%).

The average period is characterized by a total available of 563,833 t, the structure of which (fig. 4) is as follows: 95.63% import (539,197.33 t); 26.07% production (146,992.67 t); 0.59% stocks (3,333.33 t); -22.29% export (125,690.33 t).

Table 2.

European Union. Product balance (t) - structure (2011 – 2013)

No.	Specification	*YEAR*						Period average**	
		2011		2012		2013			
		Effective*	Str. (%)**	Effective*	Str. (%)**	Effective*	Str. (%)**	Effective	Str. (%)
1	Production	145,559	25.29	135,059	24.88	160,360	27.99	146,992.67	26.07
2	Import	556,099	96.61	525,932	96.87	535,561	93.47	539,197.33	95.63
3	Inventories	10,000	1.74	0	0	0	0	3,333.33	0.59
4	Export	136,064	-23.64	118,071	-21.75	122,936	-21.46	125,690.33	-22.29
5	Total available	575,594	100	542,921	100	572,984	100	563,833.00	100
6	Feed consumption	110,202	19.15	74,060	13.64	132,707	23.16	105,656.33	18.73
7	Seeds	18,158	3.15	19,395	3.57	19,728	3.44	19,093.67	3.39
8	Human consumption	422,365	73.38	426,926	78.63	395,761	69.07	415,017.33	73.61
9	Other uses	417	0.07	368	0.08	348	0.06	377.67	0.07
10	Loss	24,452	4.25	22,174	4.08	24,441	4.27	23,689.00	4.20
11	Total consumption	575,594	100	542,923	100	572,985	100	563,834.00	100
12	Balance	0	-	-2.0	-	-1.0	-	-1.0	-

* http://www.fao.org/faostat/fr/#data/BC (28.03.2020)
**own calculation

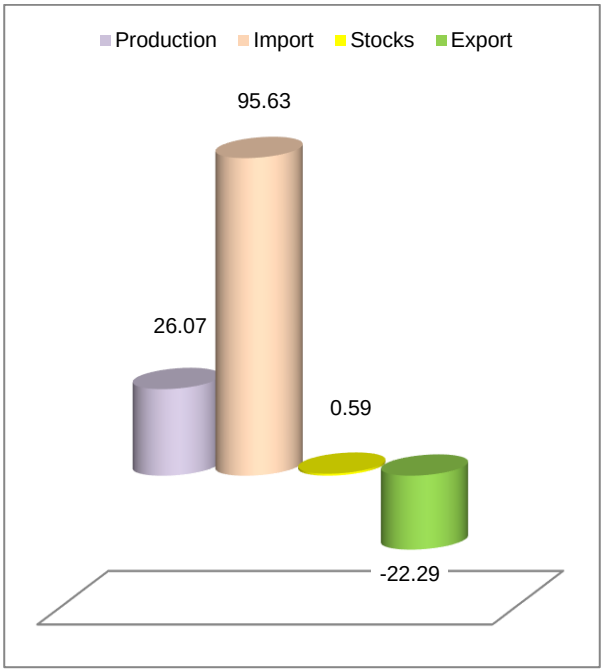

Fig. 4. Structure of the total community's availability – average of the period (%)

From the point of view of total consumption – 563,834 t, the following component parts are found (fig. 5): 0.07% other uses (377.67 t); 3.39% seeds (19,093.67 t); 4.20% losses (23,689.0 t); 18.73% feed consumption (105,656.33 t); 73.61% human consumption (415.017.33 t).

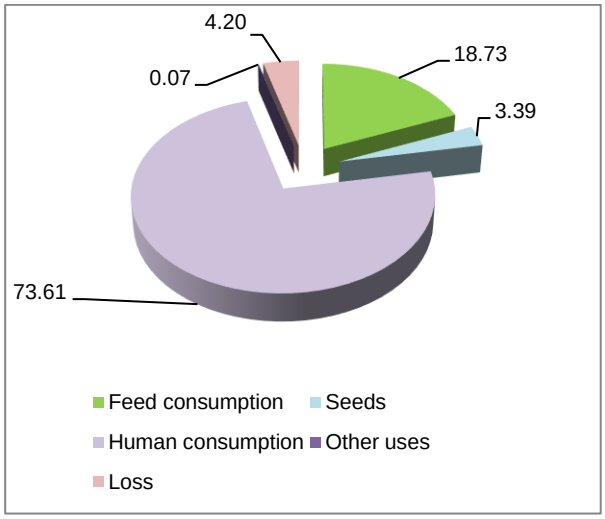

Fig. 5. Structure of total Community consumption - average of the period (%)

In these circumstances the product balance was equal in 2011, slightly deficient for the years 2012, 2013 and for the average period (2.0, 1.0 and 1.0 t respectively).

Table 3 shows the components of the national bean balance. It can be seen that among the components of the total available, stocks are missing, and at the level of total consumption, processed raw materials and other uses are missing.

Table 3.

Romania. Product balance (t) - structure (2011 – 2013)

No.	Specification	YEAR						Period average**	
		2011		2012		2013			
		Effective*	Str. (%)**	Effective*	Str. (%)**	Effective*	Str. (%)**	Effective	Str. (%)
1	Production	21,351	48.55	16,603	37.54	18,861	45.17	18,938.33	43.72
2	Import	23,625	53.72	27,920	63.13	23,542	56.38	25,029.00	57.77
3	Export	998	-2.27	294	-0.67	646	-1.55	646.00	-1.49
4	Total available	43,978	100	44,229	100	41,757	100	43,321.33	100
5	Feed consumption	3,115	7.09	57	0.13	14	0.03	1,062.00	2.46
6	Seeds	2,414	5.49	2,546	5.76	2,123	5.08	2,361.00	5.45
7	Human consumption	36,200	82.31	39,400	89.08	37,500	89.81	37,700.00	87.02
8	Loss	2,249	5.11	2,226	5.03	2,120	5.08	2,198.33	5.07
9	Total consumption	43,978	100	44,229	100	41,757	100	43,321.33	100
10	Balance	0	-	0	-	0	-	0	-

* http://www.fao.org/faostat/fr/#data/BC (28.03.2020)
**own calculation

For 2011 it can be observed that the balance was a balanced one, the availability being equal to the level manifested for consumption – 43,978 t. Available is based on the following

components: 21,351 t production (48,55%), 23,625 t imports (53.72%), 998 t exports (-2.27%). Total consumption contributed: losses – 2,249 t (5,11%), seeds – 2,414 t (5.49%), feed consumption – 3,115 t (7,09%), and human consumption – 36,200 t (82,31%).

At the level of 2012 the total availability was 44,229 t, at which level the components had the following percentage participation rates: 63,13% imports (27,920 t), 37,54% production (16,603 t), -0.67% exports (294 t). Total consumption was equal to the existing available, with the following elements as components: human consumption – 89.08% (39,400 t), seeds – 5.76% (2,546 t), losses – 5,03% (2,226 t) and feed consumption – 0.13% (57 t).

In the case of 2013 there is a balance between availability and consumption, with each indicator reaching 41,757 t. To establish the total available acted: import – 23,542 t (56.38%), production – 18,861 t (45.17%) and exports – 646 t (-1.55%). The formation of total consumption is based on variable quantities of product used as follows: 14 t forage consumption (0.03%), 2,120 t losses (5.08%), 2,123 t seeds (5.08%) and 37,500 t human consumption (89.81%).

By determining the average of the period analyzed, a uniform balance is found. This situation starts from a total available of 43,321.33 t, which had the following structure (fig. 6): 57.77% imports (25,029 t); 43.72% production (18,938.33 t); -1.49% exports (646 t).

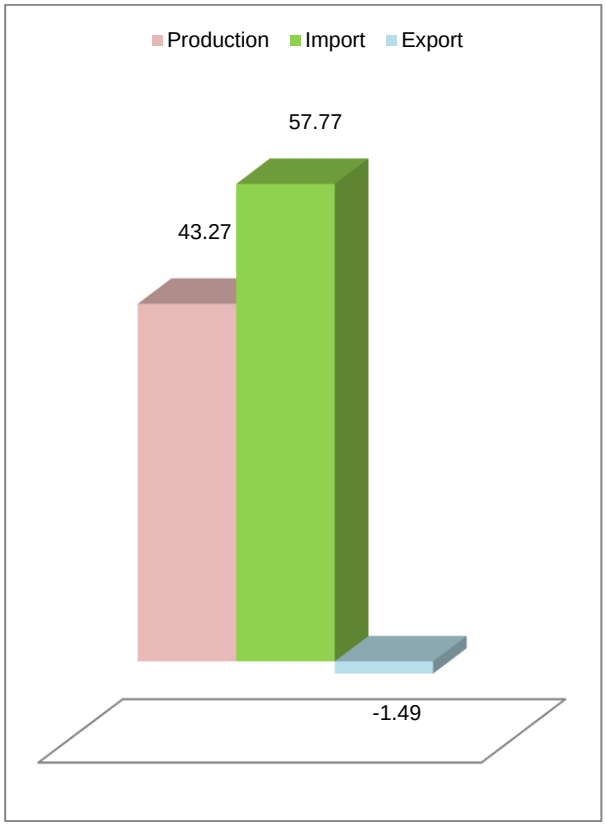

Fig. 6. Structure of total national availability – average of the period (%)

Total consumption was 43,321.33 t, its structure being thus (fig. 7): 2.46% forage consumption (1,062 t); 5.07% losses (2,198.33 t); 5.45% seeds (2,361 t); 87.02% human consumption (37,700 t).

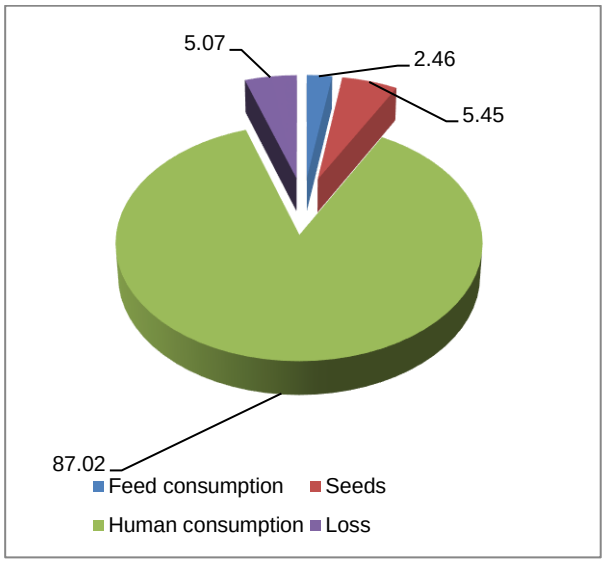

Fig. 7. The structure of the total national consumption - the average of the period (%)

CONCLUSIONS

For Romania, the following aspects are noted:

- from the point of view of the components of the balance, it is worth noting the equiunitary nature of the balance, a situation different from that of the world, but very close to that of the Community. Imports (57.77 per cent) predominate in the available area, closely followed by production (43.72%) – a different situation from what is happening at global and Community level (a higher and lower dependence on exports respectively). It can be concluded that the trade balance is clearly unfavourable;
- total consumption is predominant, as in the regional situation, by human consumption (87.02%), similar to the world and the Community;
- the vast majority of the elements of the balance have uneven developments, excluding forage consumption and losses with downward developments;
- the national total represents 0.19% of the global level of the indicator and 7.68% of the Community level. For total consumption the weights are equal to those shown above;
- there is a need to make greater use of the existing potential for bean cultivation, given the possibilities of increasing productive potential – especially if the resizing of the cultivated areas were to take place.

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