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# MILK AND BEEF PRODUCTION VOLATILITY IN ROMANIA – DOMESTIC SUPPLY STABILITY FACTOR

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***Abstract***

*Having in view the self-sufficiency level in the year 2013, i.e. 92% in beef and 94% in milk, which reveals a chronic deficit in meeting the consumption needs for these products, the purpose of the paper is to identify some new opportunities to revigorate the meat and milk production with the support provided to the cattle sector through the NRDP 2014-2020 measures. Among the three pillars of food security (accessibility, availability, quality and safety), the paper investigates the availability of beef and cow milk, in the light of the representative factor – production volatility. The conclusions reveal a different volatility of beef production (27.38) versus cow milk (12.93); by species, the highest variation coefficient for the production of live weight meat, in the period 2005-2014, is found in the case of beef (27.38), followed by poultry meat (9.70), pork (6.19) and mutton and goat meat (4.25).*

***Key words*****:** *meat production, milk, variation coefficient, volatility*

## INTRODUCTION

Agriculture is considered an industry in the EU developed countries that has received sustained support from public sources to reach a high performance and stability level. However, there are concerns related to agricultural production variation depending on the climate changes and agricultural price volatility under the pressure of looking for alternative energy resources and the speculative actions [4].

Production volatility in Romania stems from several drawbacks, mainly the high taxes, low investments in the agricultural sector, absence of land consolidation, absence of a specialized bank, loss of domestic market in favor of imports, little information and an almost non-existing consultancy, etc.[2]. Romania's agriculture performance in terms of supply is influenced by numerous factors that determine the low efficiency level of production, among which a non-homogenous farm structure, low market orientation of family farms, low productivity, low modernization level of the farming sector, adding to the high variability of weather and climate conditions after 2000[1].

Farm production volatility diminution is closely related to the development of the irrigation system, as well as to the development of middle class, of SME market. The agricultural market continues of be highly exposed to the volatilities on the world trade markets with vegetable raw materials, in the conditions in which the relatively small number of animals in the economy does not generate a sufficient market to absorb a part of the raw products that are presently exported [7]. The attracted and future EU funds lie at the basis of growth in agriculture. In this respect, we consider that the livestock sector development would decisively contribute to the diminution of farm production volatility, in the sense that the growth of their number in most species would entail the sustained development of crop production. From this point of view, cattle raising represents a branch of first importance of the world agriculture, due to the volume, diversity and value of productions and products obtained from this activity. Thus, bovines contribute by 90-96% to the total milk production consumed worldwide, 30-35% of meat production and about 90% of total hard animal skins processed in the world tannery industry. Under normal operation conditions, one cow can cover the optimum consumption needs for 6-8 inhabitants, while the milk

needs for 10-15 inhabitants [1]. Beef, by its nutritional and biological value, represents a healthy food with a high biological value due to its protein (18-20 %) content and essential amino acids, vitamins (mainly from the B complex) and mineral salts (25 microelements - Zn, Fe, Cu). Its energy value of 2000 kcal/kg and the moderate cholesterol content gives it the possibility to be used in different food diets, mainly in the digestive tract diseases [6].

## MATERIALS AND METHODS

The evaluations of aspects linked to beef and cow milk production volatility in Romania, from the perspective of domestic supply stability, was based on the analysis of technical indicators (herds, milk and meat productions, import, export), using as data source the Tempo-online database – time series – NIS, Population's Consumption Availabilities, 2007-2013, MARD information.

The documentation and synthesis of the main ideas was made from the specialty economic literature on the evolution of cow milk and beef market at European level (reports, studies, EUROSTAT, FAOSTAT publications), while having in view the future agricultural reform, national market operation, management of risks generated by the current climate changes and the economic-financial crisis. [5]

## RESULTS AND DISCUSSIONS

In 2014, animal production value represented 32.9% of the agricultural production value, up by 2.5% compared to 2013 (30.4%). The milk production ranks on the second place in animal production, in value terms, after meat. In terms of structure, in the year 2014, bovines accounted for 25.2% of the animal production value, while the products obtained from milk processing on the livestock farms 28%.

Although cattle raising is a traditional activity for the rural population and mainly for the population living in the mountain areas of Romania, the integration into the EU structures in the year 2007 did not result in the revigoration of the milk and beef sector; on the contrary, a strong production decline has followed.

Beef production in EU-28 totalled 7.3 million tons in the year 2014, the main large producers being France with 19%, Germany 15%, United Kingdom 12% and Italy 10%, summing up 56% of total beef production in EU-28. In this rating, Romania is on the 20th position, with a production of carcass meat of 29.2 thousand tons.

In the period 2006-2014, the slaughter meat production for consumption was down by 134.5 thousand tons (-42.3%), but the bovines slaughtered in slaughter houses in carcass equivalent had a slighter decrease, by 3.9 thousand tons (-11.8%), which reveals that a large part of farmers prefer slaughtering their animals on specialized slaughtering units; this is also proved by the increase of slaughtering on specialized units from 26.8% in 2011 to 32.2% in 2014 (Table 1).

Table 1. Evolution of beef production in Romania

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2014/ 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Slaughtter bovines for human consumption -total-tons liveweight | 318,054 | 333,282 | 306,373 | 264,155 | 205,347 | 211,971 | 198,510 | 192,206 | 183,562 | -42,3 |
| Bovines slaughtered in slaughter houses-tons liveweight | 66,101 | 87,995 | 81,717 | 50,531 | 57,336 | 56,897 | 58,941 | 60,476 | 59,116 | -10,6 |
| % | 20.8 | 26.4 | 26.7 | 19.1 | 27.9 | 26.8 | 29.7 | 31.5 | 32.2 | |
| Bovines slaughtered in slaghter houses-tons carcass weight | 33,111 | 43,477 | 39,821 | 24,912 | 28,313 | 28,065 | 28,714 | 29,338 | 29,203 | -11.8 |

Source: National Institute of Statistics – Tempo online [8].

France, Germany, Italy and the United Kingdom together account for 58% of the bovines slaughtered in slaughtering units in EU-28, Romania being placed on the 20th position, with a share of only 0.4%.

Milk production in EU-28 in the year 2014

totalled 162.8 million tons, out of which cow milk production accounted for 96.8%, the difference of 3.2% being covered by the buffalo cow, ewe and goat milk. The main large producers in EU-28 that account for 53% of the milk production are Germany 20%, France 19%, United Kingdom 9% and Poland 8%.

In this hierarchy, Romania ranks on the 10th position, with a total production of 4.8 million tons, out of which cow milk represents 4.5 million tons. In the period 2011 – 2014, milk production slightly increased (0.15%), as a result of stimulative measures from NRDP (Figure 1).

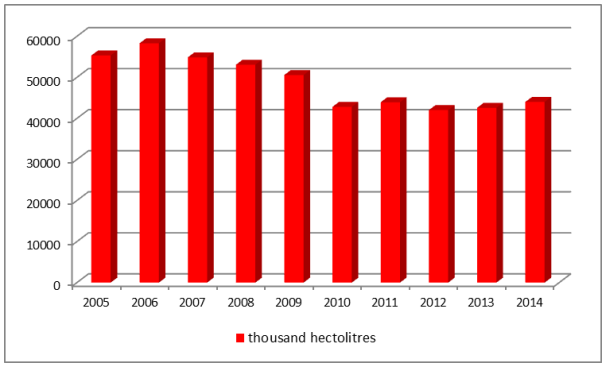


Fig. 1. Evolution of cow and buffalo cow milk production – thousand hectoliters
Source: National Institute of Statistics – Tempo online

The calculation of the variation coefficient for the live weight meat production in all species in the period 2005-2014, as presented in Table 6, reveals that the highest variation coefficient (and the highest production volatility) is noticed in beef (27.38), followed by the poultry meat (9.70), pork (6.19) and the sheep and goat meat (4.25).

Table 2. Variation coefficient for the animal production

| Item | Variation coefficient |
|---|---|
| Beef | 27.38 |
| Pork | 6.19 |
| Sheep and goat meat | 4.25 |
| Poultry meat | 9.70 |
| Cow and buffalo cow milk | 12.93 |

Source: own calculations

On comparative basis, the calculation of production variation coefficient reveals a higher volatility in beef (27.38) versus milk (12.93).

In the year 2014, the bovine herds totallized 83.4 million heads in EU-28, and almost half of these (47%) came from three member states (France 22%, Germany 14% and United Kingdom 11%). Romania is on the 10th position among the EU-28 member states, with a total number of 2.1 million bovine heads.

Analyzing the evolution of total bovine herds and of the number of cows and heifers in Romania in the period 2005-2014, we can notice the same stabilization of this number after 2011, like in the case of production (Figure 2).

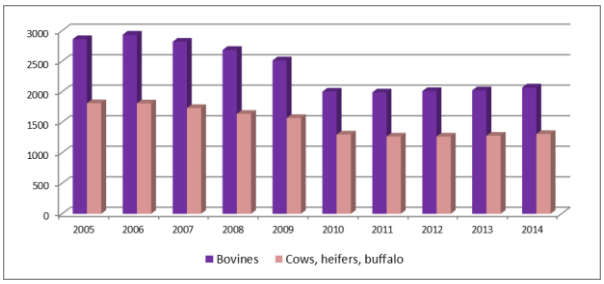


Fig. 2. Evolution of total bovine herds and of cows, heifers and buffalo cows herds – thousand heads
Source: National Institute of Statistics – Tempo online

The milk sector performance in Romania is also affected by its excessive fragmentation. Thus, in the year 2014, the average farm size was 2.14 heads/farm, and 52 % of the total number of dairy cows is found on very small-sized farms with 1-2 heads. Out of the total 655541 farms, 84.4 % (553531) have 1-2 cow heads and only 2042 farms (0.16 %) are considered professional farms that deliver milk directly to the dairy factories (Fig. 3).

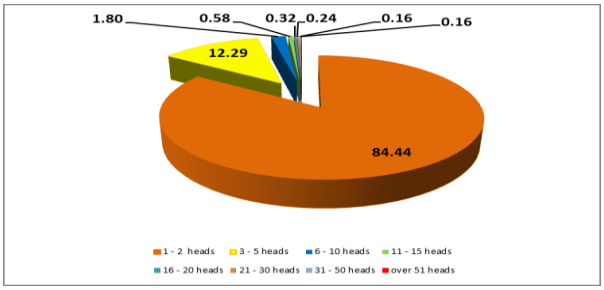


Fig. 3. Structure of cow, buffalo cow and heifer farms – 2014, %
Source: MARD [9]

Even though the total number of farms was down by 38% compared to their number in 2007, the number of the small, non-performant farms has remained quite high,

which reflects the persistent subsistence and semi-subsistence phenomenon in the dairy sector in Romania, as main factor hindering competitiveness growth. On a comparative basis, the average dairy cow farm size is 35 heads in Italy, 46 heads in Germany, 45 heads in France, 58 heads in Ireland, 75 heads in Netherlands or 6 heads in Poland.

Similarly to the milk sector, the sector of young cattle raising and fattening is also extremely **fragmented**.

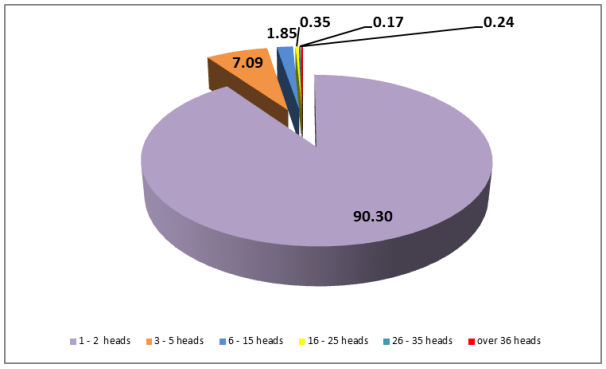


Fig. 4. Structure of farms raising and fattening young cattle – 2014, %
Source: MARD [9]

Thus, out of the total number of 171288 farms, in the year 2014, 90.3% had 1-2 heads; 60.7% of the young cattle herds can be found on these farms (Fig. 4).

## CONCLUSIONS

A different volatility of beef (27.38) can be noticed compared to cow milk volatility (12.93).

The calculation of variation coefficient for live weight meat production in all species, in the period 2005-2014, reveals that the highest variation coefficient (and the highest production volatility) has been found in beef (27.38), followed by poultry meat (9.70), pork (6.19) and sheep and goat meat (4.25). This situation can be explained by the fact that in the above-mentioned period, the beef procurement price almost doubled, from 3.1 RON/kg (January 2005) to 5.94 RON/kg (December 2014).

Having in view the self-sufficiency level, in the year 2013, i.e. 92% for beef and 94% in milk, which reveals a chronic deficit in covering the consumption needs for these products, the paper has tried to identify new opportunities for beef and milk production relaunching, while having in view the support provided to the bovine raising sector under the NRDP 2014-2020 measures, i.e. the *de minimis* aid for the procurement of heifers from specialized breeds (measure launched in the year 2014), *de minimis* aid for the procurement of milk cooling tanks (measure launched in 2013), national transitory aids, the coupled support scheme in the bovine species for the beef and milk sector (for the period 2015 - 2020), which adds to the support under NRDP 2014-2020 measures for improving the general performance of farms (Investments on agricultural holdings), improvement of small-sized farm management and increase of market orientation (Support to the development of small farms), increase of the number of young farmers who set up for the first time an agricultural holding as head of the holding (Support to setting up of young farmers).

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