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ECONOMIC DEVELOPMENT OF BEEF CATTLE BREEDING IN BULGARIA

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ABSTRACT
The main goal of this study is to introduce level and trends of development in Bulgarian beef cattle. Current paperwork is based on research among members of bull breeding association in Bulgaria during 2019, public data from 2007 to 2020 and own observation based on meeting farmers. In needs for analyzes are used statistic and marketing methods. The results include structure of cattle herds, farm size, diffusion in territory of the country, meat produce, prices and suggestions of development by farmers. The paper presents some specifics in marketing of beef cattle and characteristics of their meat.

Key words*:* Meat, livestock, agricultural statistic, trends, efficiency, prices

INTRODUCTION

Beef cattle breeding can be considered like a promising area for agribusiness in Bulgaria, for two main reasons: the first one is the contraction of the dairy sector, which leads to a reduction in beef and veal production due to the reduced number of large ruminants, the second reason is the untapped potential of the country of cattle raising for meat only. There is a steady trend of increasing beef cattle in Bulgaria and since 2007 they have increased more than 8 times. This suggests a study of the processes and derivation of the problems related to the economic development of this sector. High share of imported beef in national consumption (about 35%) makes it even more important.

Main specialization of cattle breeding is expressed in the fattening of calves to obtain the main product, which is beef or veal. According to Annex VII to Article 78 of Regulation 1308/2013 on the CMO for agricultural products, "veal" means meat of bovine animals under the age of 12 months but in order to avoid any constant distinction between them it's used the term "beef".

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The trend of maintaining the large differences between prices in the EU during the analyzed 14-year period is worrying, which can be considered as insufficient convergence and integration into the Community market. The differences in calves are on average 55% lower or about 1 euro / kg l.w., and young cattle between 16-24 months cost about 1.75 euros / kg l.w. in the EU, while in BG - 1.19 euro / kg l.w. In the case of the heifers the prices are lower by 0.63 euro / kg l.w., and for cows 41% lower prices or about 0.53 EUR / kg l.w.[1] A reason for that may be the insufficient classification of cattle in slaughterhouses (maximum 49%) or saleing mainly dairy animals.

METHODS

The study is based on statistical analysis of public information and a survey of farmers, which also presents synthesized indicators describing the development of beef cattle breeding in Bulgaria. Secondary data from official sources are supplemented with the results of an electronic survey conducted among members of the

[1]Price quotations at livestock markets; prices from producer (or buyer) to the trade; ex-farm (or market) Price per 100 kg live-weight, excluding VAT

Bulgarian associations for breeding beef cattle in April 2019. Used primary data can be considered to be representative because the survey included 100 farms from almost all districts in the country, breeding 13 thousand. beef cows and heifers (9% of the animals applied for support in 2019).

RESULTS

There are over 250 specialized meat breeds in the world. Unfortunately, the Bulgarian breeds, which are rather with a combined direction, do not have such productive qualities, due to which it is necessary to import and cross with foreign beef cattle. This is how the breeds for meat and milk such as the Bulgarian Simmental and the Bulgarian Brown Cattle developed (1). Hereford, Aberdeen-Angus and Limousin are the main foreign breeds which are mainly for meat, known and used in our country **(Figgure 1).** Specialized breeds of cattle in the meat direction have very good growth abilities, and through the good utilization of roughage increases the efficiency because it saves from concentrated feed (2).

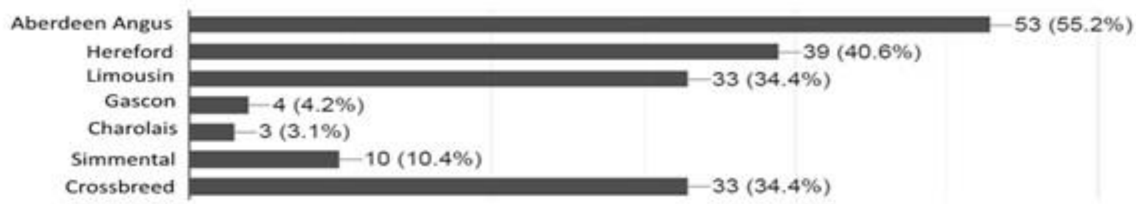


Figure 1. Structure of meat breeds in Bulgaria

Source: Own research

Due to the diverse conditions in Bulgaria can be found a variety of breeds of cattle for meat. However, in order to develop their qualities, the pastures must be used for their intended purpose, and not to be deserted and so to lose their nutritional properties. In addition, many waste feeds such as straw and maize remain from grain production can be successfully used by beef cows. In order to increase productivity and reduce production costs, the choice of breed must be in accordance with the location of breeding.

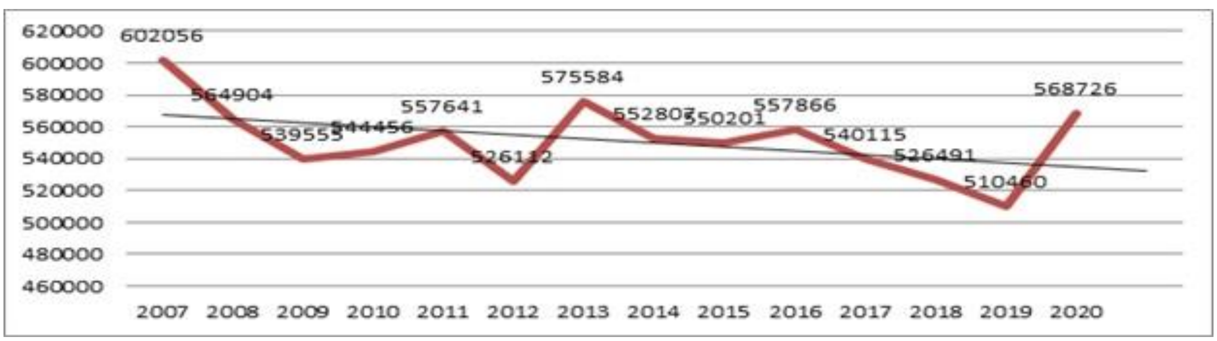


Figure 2. Raised cattle in Bulgaria for the period 2007-2020.

Source: Agrostatistics Department at the Ministry of Agriculture and Food

According to the Department of Agrostatistics at the Ministry of Agriculture and Food, there are trends of reduction of the **total number of cattle** in Bulgaria for the period 2007-2020 **(Figure 2).** Since 2007 to 2012 there is a clear downward trend, and then in 2013 there is a significant increase in livestock. After 2014 there is a decline again and it reaches its lowest levels in 2019 (3). In the last reporting year 2020 there is a sharp jump in cattle (compared to 2019) by 11% and they reach nearly 569 thousand , but still have 34 thousand less than in 2007. Such an increase on an annual basis may be due to the retention of animals in herd turnover or the introduction into the system of existing but not registered animals, because a reference made in the international trade system does not report increased imports in 2019/2020 (4).

Fluctuations in the number of cattle raised are similar to those in Bulgaria In comparison with the EU 27 data. In 2020 they number 76.5 million throughout the EU 28, as in contrast to Bulgaria continues the downward trend since 2016 and for 2020 compared to 2019 - a decrease of 1% is reported (5).

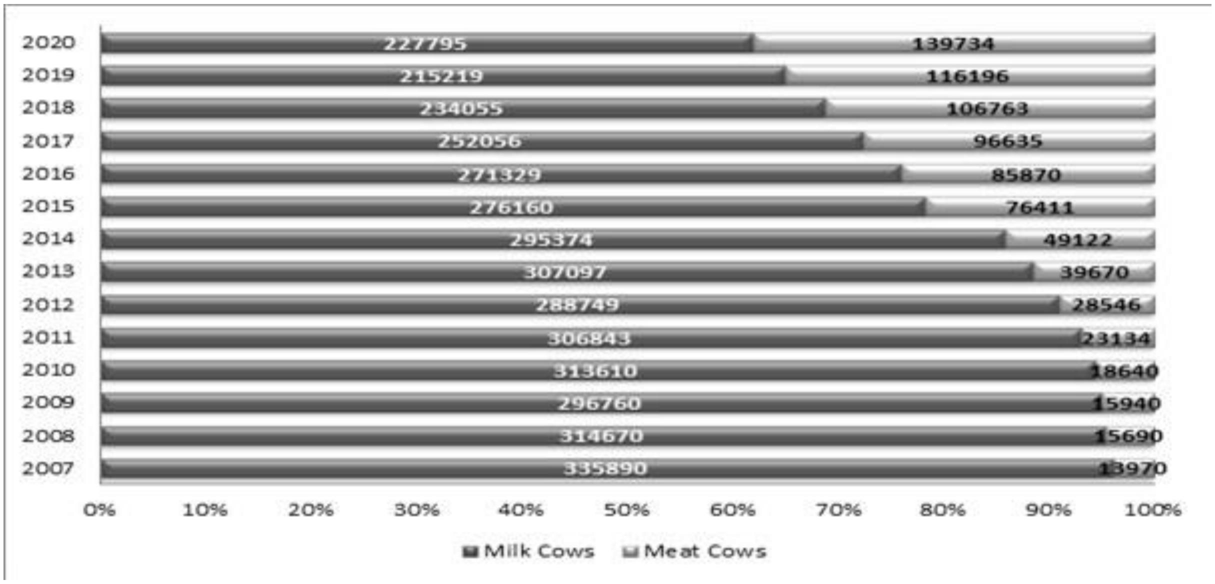


Figure 3. Distribution of cows in Bulgaria by directions

Source: Agrostatistics Department at the Ministry of Agriculture and Food

Meat-producing cows[2] form an increasing part of the cows in Bulgaria, which shows a partial reorientation of cattle breeding to cattle breeding for the purpose of meat production. While at the beginning of the period in 2007 beef cows are only 2.3% by the end of 2020 they **make up to 38% of all cows (Figure 3).** Only for the last year their relative increase is by 20%, while in dairy only 6%.

In the EU-28 for the same period, the ratio between dairy and non-dairy does not change which is indicative that Bulgaria is rapidly developing and increasing beef cattle. Due to the high rate of increase, the values of the relative share already exceed the average for the Union, where cows in the beef direction account for 34.5% in 2020 (5). Meat-producing cattle in Bulgaria may increase even more, because 80% of respondents plan to increase the number of cows raised in the next 5 years.

To the analyzes for the number of beef cattle can be added the data for **the beef cows and / or heifers** applied for application **under the Scheme for tied support**, which starts to be applied in 2015. Until then, beef cattle breeders had received Specific support for suckler cows, which to some extent overlapped with the current subsidy per head of animal. In the first year of implementation of the coupled support, beef cows and / or heifers – 2015 over 99 thousand animals are applied for support. Due to growing interest from farmers an amendment to the coupled support schemes is applied in 2017, as it is divided into two and opens a reception for coupled support of beef cows for selection control (6). According to a survey, 77% of the surveyed farmers (engaged in beef cattle breeding) consider “beef cows” those who are purebred from the specialized breeds for meat.

Total number of registered beef cows and / or heifers under the support schemes tends to increase every year **(Figure 4),** and for 5-years period the growth is 62% (over 161 thousand are requested for 2020). The share of cows applied for support under selection control (SC) is also constantly increasing and from 9% in 2017, when the scheme was introduced, now there are 17.2% of all applied beef cows (7).

[2] According to Regulation (EC) № 1165-2008 on farm statistics, other cows are "non-dairy cows, which may include infertile cows."

According to a specialized study in 1/3 of farms there are over 60% of cattle under SC. Only 16% of the respondents do NOT intend to increase the share of cattle under selection in the following years. Due to this positive trend, it can be said that Bulgaria is moving towards the development of a truly specialized beef cattle breeding.

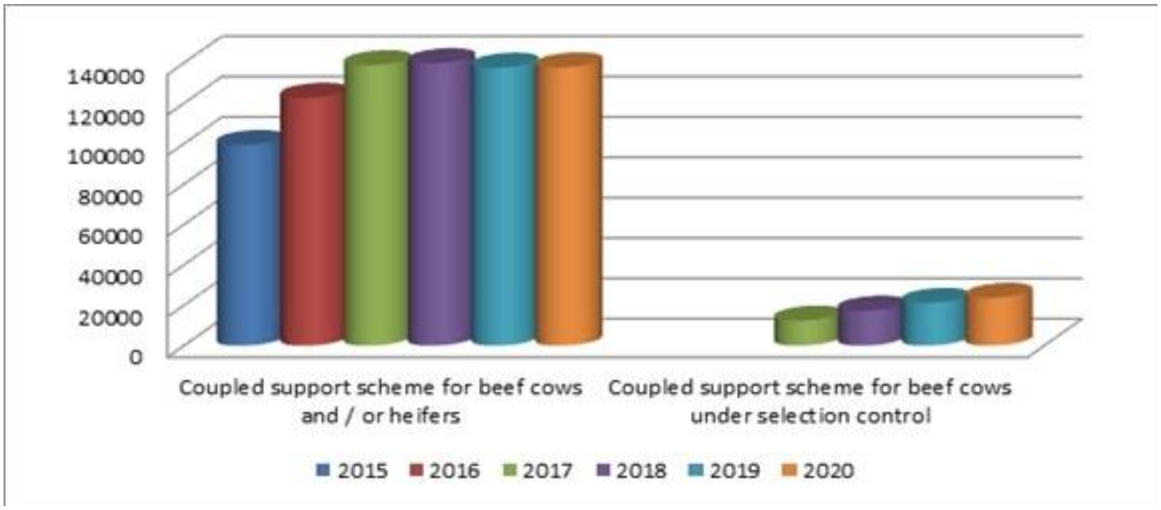
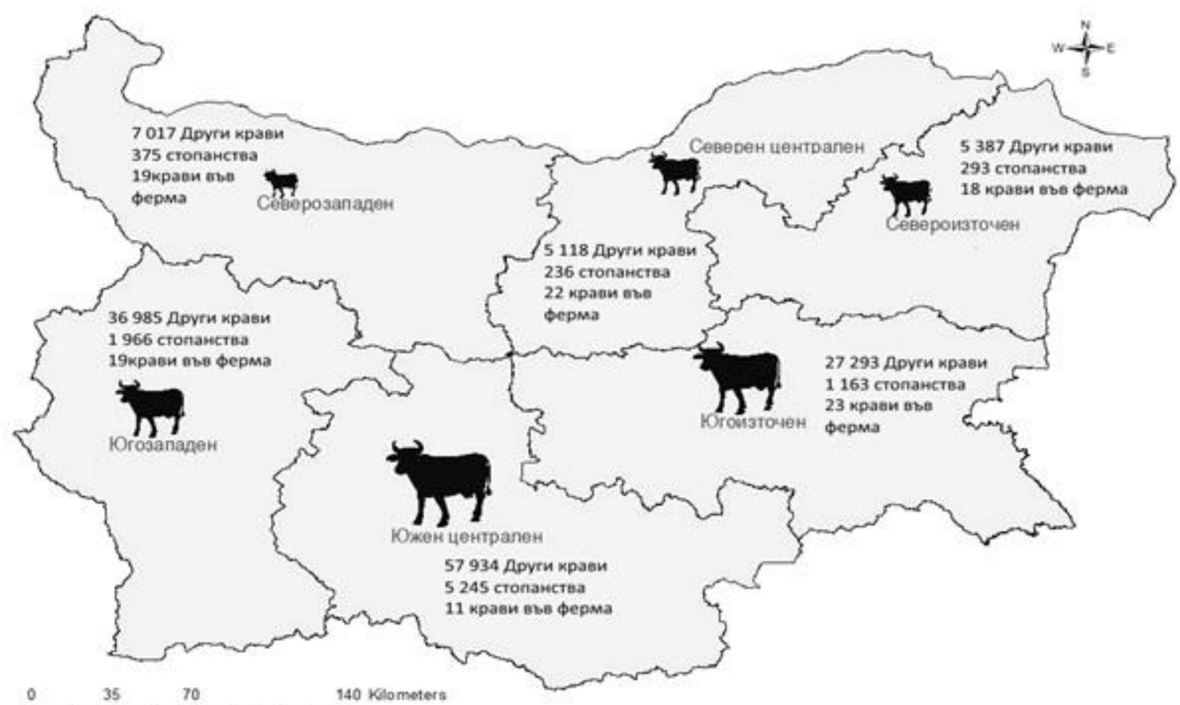


Figure 4. Number of animals applied for coupled support schemes
Source: Agricultural reports of the Ministry of Agriculture and Food

The average size of beef cows per farm can be calculated from the data of applied animals and the number of applications for submitted support. **In the selection control scheme they vary around 50**, while in the other, although heifers are included in the scheme, they are only 27 in 2020, but there is a rate of steady growth since 2017, when there were 21 in the farm.



Picture 1. Distribution of animals and holdings as at 1 November 2020 by region (NUTS 2)
Source: Agrostatistical Department of Ministry of Agriculture and Food

According to the data from the annual reporting of animals in Bulgaria, the **average size of farms with other cows on a farm is 15** (the smallest ones are in South Central region). These averages show that there are still many farms in Bulgaria that keep a small number of animals, most likely for additional income and not as a main business. This is a common practice, especially when available resources such as cheap buildings or pastures are available. **Picture 1** shows geographically distributed beef cows are much more in Southern Bulgaria (122 thousand) than in the Northern regions of the country (17 thousand). This characteristic feature of beef cattle breeding is not observed in the zoning of dairy cows.

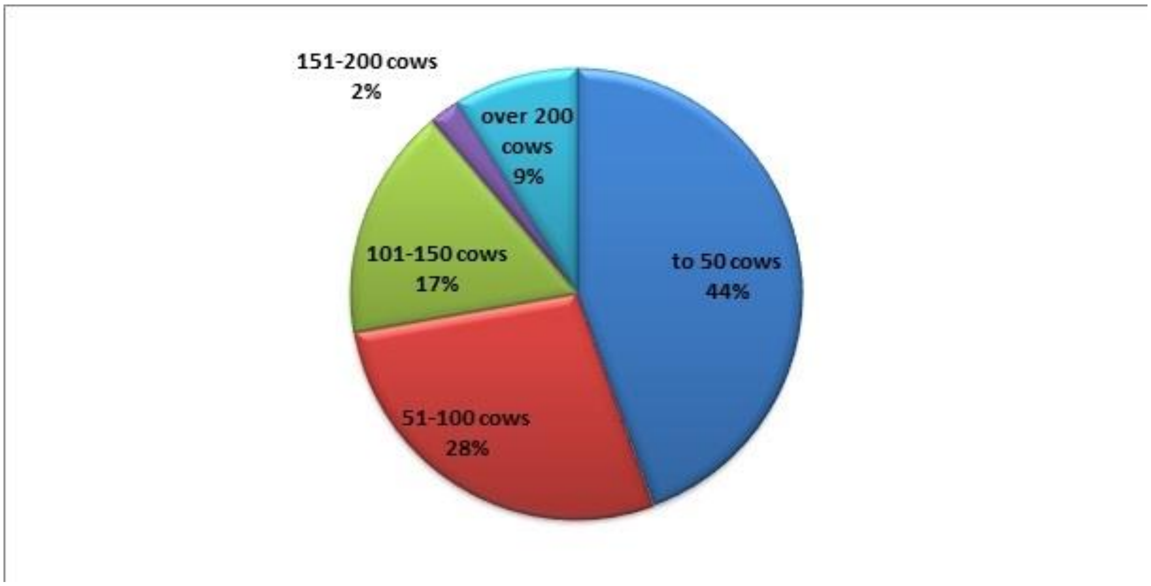


Figure 5. Grouping of farms according to the number of cows in 2019.
Source: own study

The results of our own study among beef farms show a different structure according to the number of cows raised **(Figure 5).** Most of the farms (44%) have up to 50 animals, and the large farms with more than 200 mother cows are 9% (the largest farm - 850 cows).

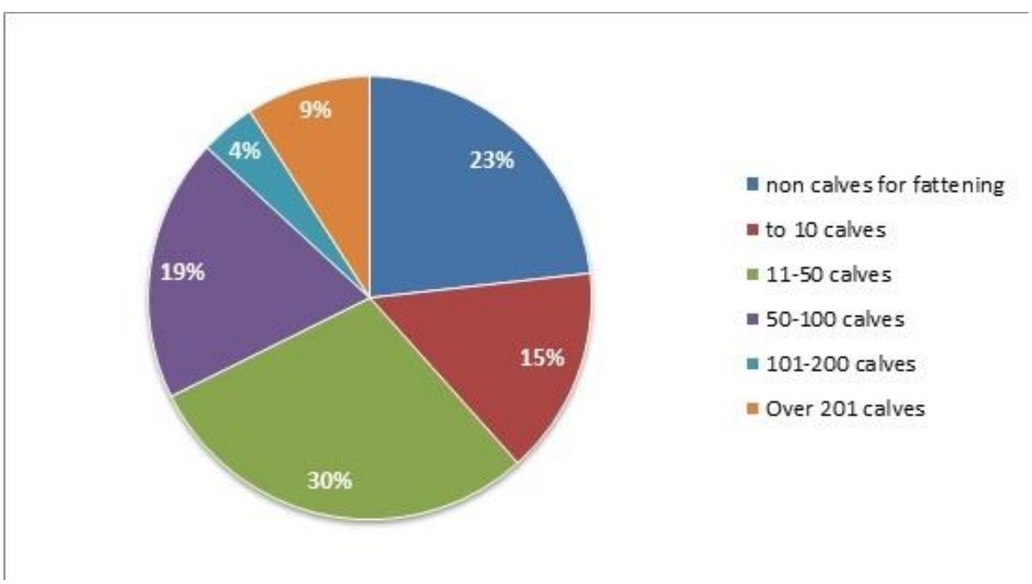


Figure 6. Grouping of farms according to the number of fattened calves
Source: Own research

By structuring the farms according to the **fattened calves**, you can see that the largest is the group of farms, where between 11 and 100 calves are fattened, and then only 9 farms have more than 200 animals **(Figure 6).** A significant part (almost 1/4) share that they do not fatten calves. A specific feature of the profile of farms in Bulgaria is that **only 2% define their farms as specialized only in fattening calves**. According to the survey, the **socio-economic profile of the meat-producing cattle** farms is related to the employees in them, and as on average 4 of them have a permanent contract in them. In 58% of the farms there are no employed relatives and at the same time in over 20% of them, all are from the family. At 65%, the income from beef cattle breeding is mostly additional.

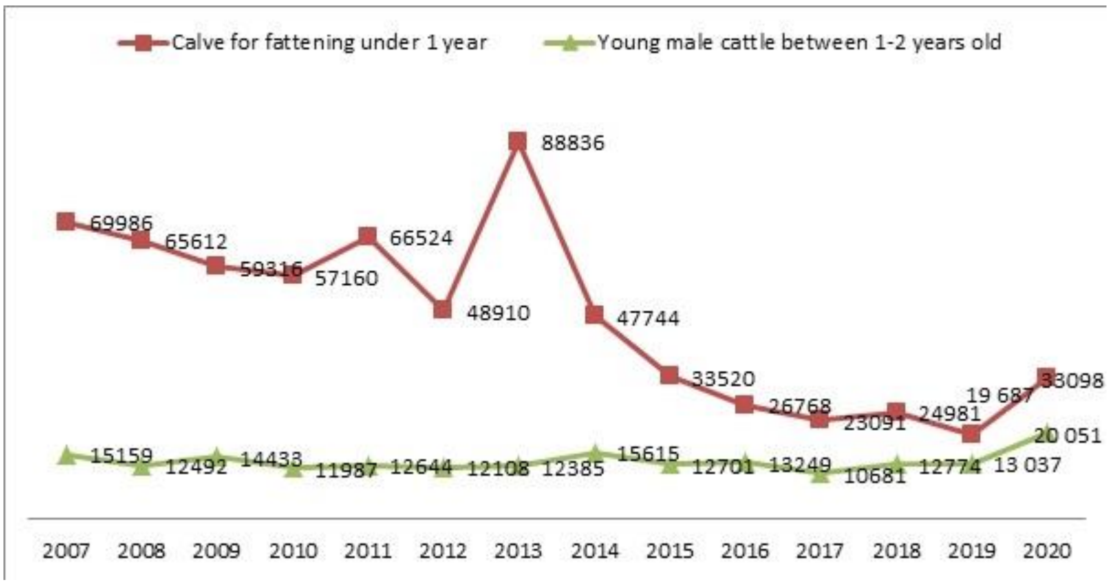


Figure 7. Number of young cattle in Bulgaria
Source: Agrostatistics Department at the Ministry of Agriculture and Food

The main **categories of cattle from which beef and veal are expected** to be produced are calves up to 1 year of age and young male cattle between 1 and 2 years of age, and the age at which pre-slaughter weight is reached depends on the intensity of fattening. Analyzing the ratio between the two groups in the last 2 years reports a larger share of young cattle between 1-2, which shows a choice of semi-intensive and extensive fattening **(Figure 7).** The decrease in the absolute number of calves for fattening less than 1 year is two or three times compared to 2007. This may linked to the reduction in dairy cows, of which cattle are usually fattened more intensively, due to the aim of a shorter lactation period.

During the analyzed years in Bulgaria **the sold cattle for meat**, incl. handed over to slaughterhouses and slaughtered on farms, generally decreased (8). They have decreased by 16% for the period of 2007-2019. **Meat produced from bovine animals** in Bulgaria also forms a lasting downward trend during the analyzed period, as in 2019 17 thousand tons slaughter weight were obtained, which is 23 % less than in 2007 (8). With the development of beef cattle breeding, this negative trend is expected to be reversed or at least stopped.

The market orientation of beef cattle breeding presupposes that the fattened cattle are sold mainly in registered slaughterhouses and not on farms. 43 **slaughterhouses** declared that they slaughtered cattle in 2009 in Bulgaria (8). Given the territorial distribution of the country in 28 districts, it can be conditionally said that each district has 1.5 slaughterhouses in which cattle are slaughtered. This restricts competition at the local level and is a prerequisite for market dominance. On the other hand, due to the small number of slaughterhouses and the territorial dispersion of cattle breeding, the transport costs to the processing points are increasing.

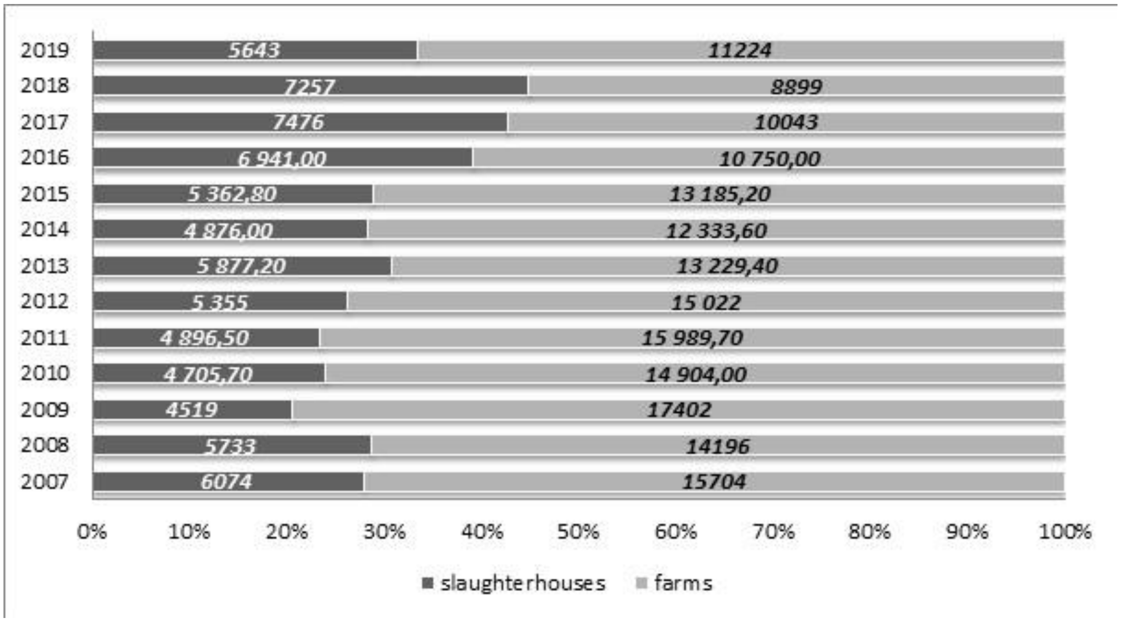


Figure 8. Proportion between bovine meat obtained in slaughterhouses and holdings
Source: Activity of red meat slaughterhouses and meat production in Bulgaria

The ratio between the yield in the registered slaughterhouses and in the farms during the analyzed years shows a clear tendency for increasing the share of the industrial production **(Figure 8)**. After 2013, there is a tendency for more and more beef to be harvested in slaughterhouses, even to order[3]. Since 2016 there is a serious change in the ratio in 2018 reaches 45% in slaughterhouses against 55% in farms. Unfortunately in 2019 it collapsed again and fell to 33:77, slightly above the average for the period **30:70**.

The analysis of the ratio between meat production in slaughterhouses and farms helps characterizing the choice of distribution channels. Low purchase prices or high toll processing fees for slaughterhouses may be possible preconditions. On the other hand, slaughterhouses may not be interested in buying animals due to a limited market.

Based on the distinction made for meat production in registered slaughterhouses and farms, comparisons can be made on the

qualitative assessments - average productivity and slaughter yield **(Table 1).** In the first place it's noticed that animals with much higher live weight, with over 200 kg, are delivered to the slaughterhouses (8). Accordingly, the meat obtained from one animal is more - 210 / kg in slaughterhouses compared to 127 kg in farms. Interesting fact is that on the basis of the declared meat obtained in the farms there is better slaughter yield – over 48%, while in slaughterhouses the indicator is 1.5% lower. The values of the indicator give information about low efficiency of fattening and non-use of slaughter qualities of cattle, especially of meat-producing breeds.

Table 1. *Meat production indicators in slaughterhouses and farms 2007-2019*

Place of produce	Average live weight kg/pc	Average meat productivity kg/pc	Randeman %
Slaughterhouses	444,83	208,20	46,83%
Farms	263,01	126,71	48,16%

Source: Activity of slaughterhouses for red meat and meat production in Bulgaria in 2007-2019 and own calculations

[3]Beef obtained through the services of slaughterhouses (toll) forms between 20 and 25% of the total meat obtained in slaughterhouses.

Other data of a qualitative nature can be deduced from the Agricultural Reports of the Ministry of Agriculture and Food for the years 2008-2020, which refer to the **classification of cattle in slaughterhouses according to the EUROP system**[4]. Data from the Agrarian Reports show that the classification of slaughtered cattle is still not a well-developed process. During the analyzed period the share of classified animals from the total processed in slaughterhouses varies widely (between 24 and 49%), as in the last few years only about 1/3 of the slaughtered cattle are classified by a licensed appraiser. In the distribution of the classified carcasses by categories, the number of cows is the largest, as on average for the period their share is 60% of all processed cattle, then followed by young cattle up to 2 years. with an average relative share of 26%. The results for the conformation class show that on average 68% of the slaughtered cattle during the period were classified in the lowest class "P" (weak). According to the scale for the degree of fattening of the carcass, the results are better - on average 58% of the cattle fall into the second group (average). This proves that the main part of the classified beef is obtained from dairy animals, whose carcasses have a low yield and poorly developed conformation.

Based on the data for production, import and export in the period 2007-2019 the dynamics in **the national consumption of beef** in Bulgaria **(Figure 9).** On average it is about 28 thousand tons, but for the analyzed years there is a decreasing trend, as at the end of the period the decrease is equal to 22.4% compared to the beginning. Only in 2014 and 2019 domestic consumption increased.

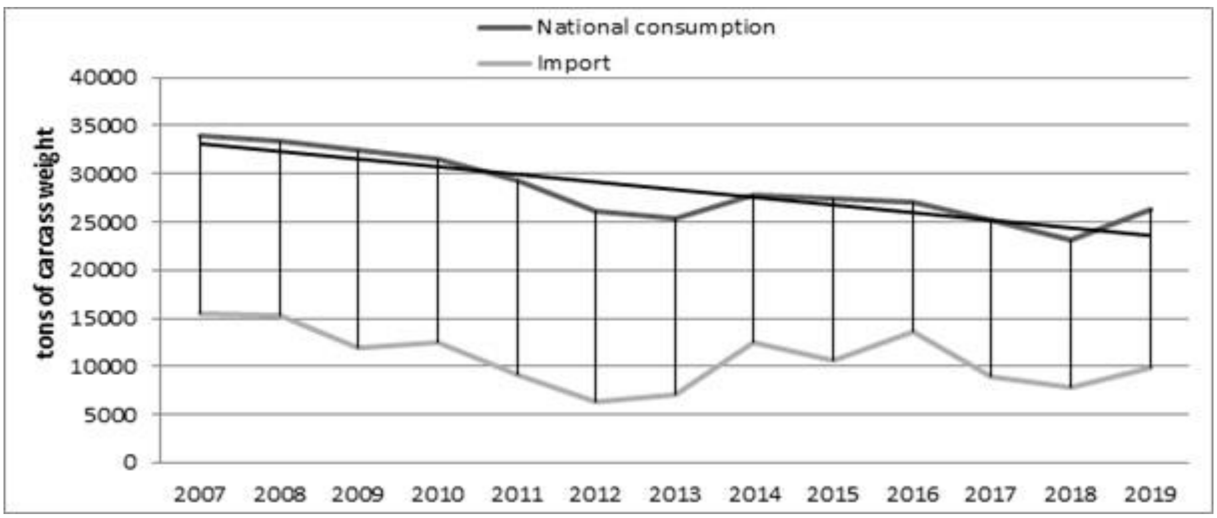


Figure 9. National consumption and import of meat from bovine animals

The relative share of imported meat in national consumption can be used to assess the market situation in the country. On average **the share of imported beef in domestic consumption is 38%**. The peak of its growth is in 2016 (4), when imported beef met 50.3% of national consumption, but in recent years has varied about 30% of consumption and about 80% of imports are frozen.

[4]The assessment scales are based on Regulation № 1308/2013 and were introduced in Bulgaria by Ordinance № 15 of 8 May 2009 on the classification and classification of carcases of bovine, porcine and ovine animals on the EUROP scale, price reporting and verification. in slaughterhouses.

CONCLUSION

At the end of survey there are some summaries, which could be done:

- Expansion beef cattle sector in Bulgaria from 2007 to now days;
- Beef cows make up to 38% of all cows;
- Orientation to specialized breeds of cattle in the meat direction (17.2% of supported beef cows);
- In the selection control scheme average herd is 50 cows, double than other support scheme;
- Few farms specialized only in fattening calves;

- Mainly realized cattle meat in farms, not by the distribution of slaughterhouses;
- Bad indicators for quality fattening and low classification of cattle in slaughterhouses
- Large differences between producers price in Bulgaria and EU 28 for all categories of cattle
- 23 % less beef production than in 2007 and decreasing national consumption with 22.4%.
- The share of imported beef in domestic consumption is average 38% for the period.

The above emphasizes the need to develop beef cattle breeding. Some of the tops farmers' suggestions on "how to do this" are set out in **Figure 10.**

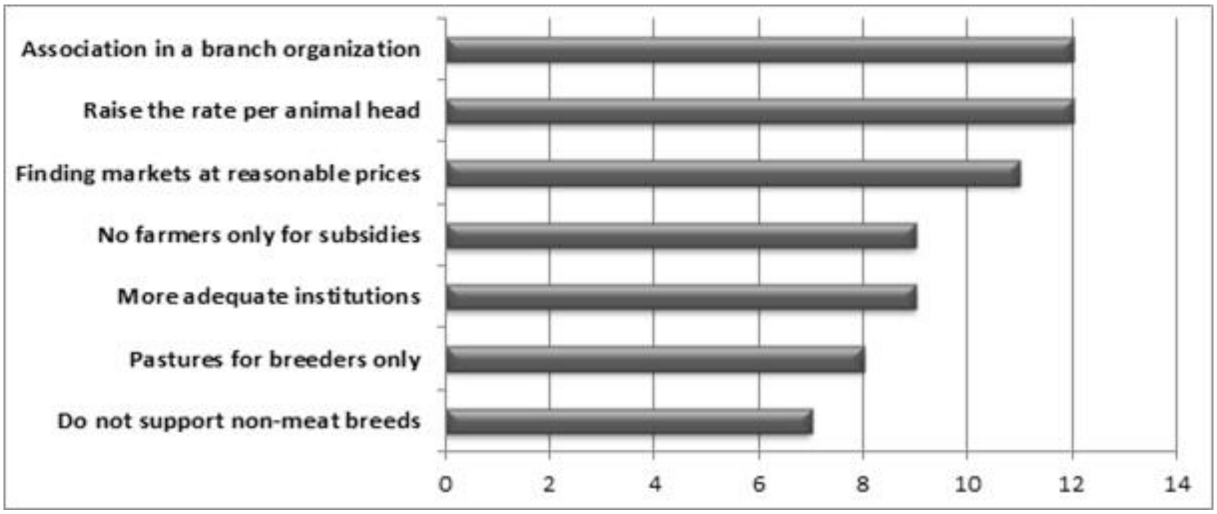


Figure 10. Ranking of farm development recommendations

Source: Own research

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