

## Beef cattle breeding in Latvia

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Today one of the major challenges for beef cattle breeders is to increase meat quality while contributing to breeding efficiency. Beef cattle breeding contributes to the supply of beef cattle in the market and involves collecting information on livestock production. To make prudent decisions on the selection of beef cattle, it is necessary to collect and process the data, as well as interpret and distribute the results. Beef production is mainly based on beef cattle breeds, involving natural insemination, rearing the calves as well as fattening the young cattle. In contrast, artificial insemination is mainly practiced in dairy farming, which also makes a significant contribution to beef production in many countries. The International Committee for Animal Recording (ICAR) has specified two main ways of beef cattle registration: the European approach and the North American approach. This could be mainly explained by differences in consumer demand, which affect the pricing system and, therefore, selection goals. There are also significant differences in production conditions, particularly in herd size. After amendments to the European Union (EU) legal framework governing animal breeding and the sale of purebred and crossbred breeding animals and their reproductive products were made in 2016, the EU Member States also adopted new legal acts and revised prerequisites for animal production. Therefore, the present research aims to examine beef cattle breeding in Latvia. The research found that at the beginning of 2023, 4536 beef cattle herds with 94418 beef cattle were registered in Latvia, of which 25% or 1113 herds with 77829 beef cattle were under performance recording.

### Abstract

*Keywords: beef, beef breeds, breeding, crossbreeds, Latvia, recording.*

Identifying cattle productivity and the unique climatic and production systems around the world is important to be able to examine the diversity of cattle productivity in beef cattle production (Kahn L. and Cottle D., 2014).

### Introduction

Despite the large amount of available information, there is still no convincing evidence in Europe that would allow us to project the quality of beef and the supply of beef breed cattle of constant quality to consumers (Przybylski C. *et al.*, 2015). Raising animals for food is associated with various controversies. Consumers often are not aware of the specifics of the industry regarding the cost of producing quality meat, animal welfare, food safety and free enterprise. It should be considered that food safety needs to be assured to explain the specifics of meat production and trade (Terence J. Centner, 2019).

One of the main possibilities for providing an adequate supply of beef cattle in the market is an animal registration system that is capable of collecting and processing

comprehensive information about the animals involved in the production process, as well as the interpretation of the results obtained (Flamant J.C., 1998). Therefore, the present research aims to examine beef cattle breeding in Latvia.

## Material and methods

The research used data for the period 2004-2023 available in the information system of the Agricultural Data Centre (hereinafter referred to as the ADC), a subordinate institution of the Ministry of Agriculture of the Republic of Latvia (RoL), on:

1. Changes in the number of herds of beef breeds and crossbreeds under performance recording.
2. Changes in the number of beef breed cattle under performance recording.
3. The distribution of beef cattle raised in Latvia by breed (incl. crossbreed) and by sex (F, M).

The research employed the comprehensive analysis and synthesis methods and performed a comprehensive analysis of ADC data, incl. collecting, interpreting and visually representing the data.

□The novelty of the research involves setting goals and objectives for beef cattle breeding and identifying opportunities for its development in Latvia, based on the information obtained after performing an analysis of the data, to increase the efficiency of farming and the demand for cattle of beef breeds in Latvia.

## Beef cattle breeding in Latvia

### Legal aspects of beef cattle breeding in Latvia

In the Republic of Latvia, beef cattle breeding traditions began in the late 1990s, in contrast to European countries such as Spain, Italy, France (Hocquette J.F. *et al.*, 2018), as well as Argentina, Uruguay, the USA and Australia, where the beef cattle industry has been highly developed for a long time (Scholtz M.M. *et al.*, 2011).

□In 1998 in Latvia, a purebred animal producer organization – the JSC Beef Cattle Breeding Association – was founded with the aim of designing a programme for raising beef cattle and contributing to beef cattle breeding. Even before joining the EU, a number of cooperation projects with foreign countries on the creation and enhancement of the beef cattle breeding system was implemented in Latvia, e.g. a joint project of Latvia and Denmark for making legal acts on methods for identifying a pedigree value and creating a breeding book system, as well as a joint project of Latvia and Switzerland for creating a system for high-quality beef cattle production in Latvia (Annual Report by the Latvian Beef Cattle Breeding Association, 2002). In 2004 when Latvia joined the EU, Cabinet regulation No. 275 Beef Cattle Monitoring Procedure, which governed the monitoring procedure for cattle of beef breeds and other cattle produced for meat in Latvia, was revised. Based on the legal acts, the ADC developed software for processing monitoring data on beef breed cattle, and in 2004 the recording of quality performance data on beef breed cattle began in Latvia. The data were sent to cattle breeders for further herd enhancement and management (Annual Report, 2005).

In 2014, Latvia joined INTERBEEF, which was a working group of the International Committee for Animal Recording (ICAR), for comparing the data on beef breed cattle to create a unified genetic evaluation method that would facilitate cattle breeding in the future and give the owners of cattle an opportunity to select the most genetically valuable cattle. The first official Estimated Breeding Values (EBVs) for Latvia were

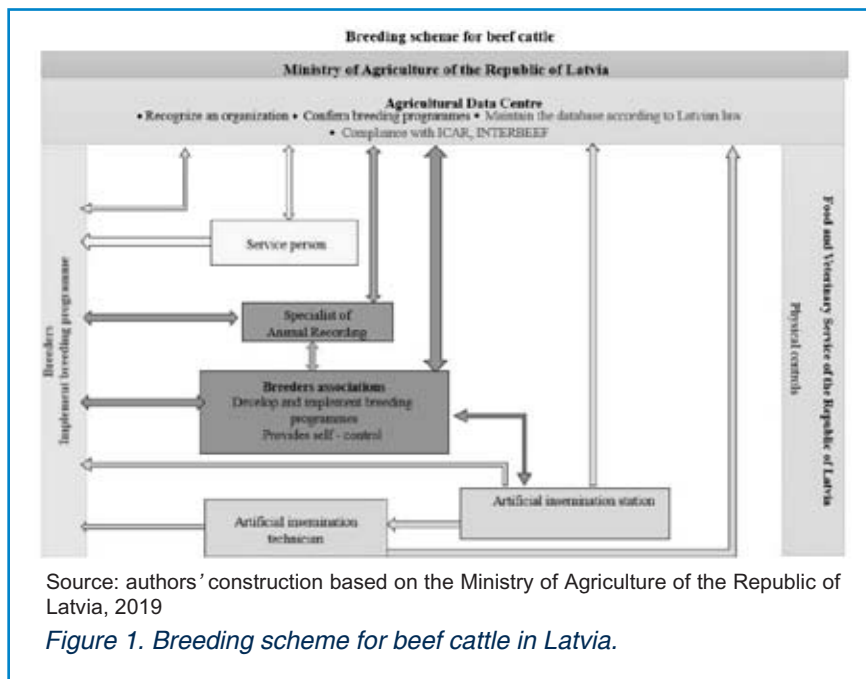
published by INTERBEEF in 2020, indicating the weaning weight for Charolais and Limousin cattle.

The participation in INTERBEEF gave an opportunity to compare the data on beef breed cattle raised in Latvia with international data. This was an important achievement to have access to the results of evaluations of breeding beef cattle, gain the experience of other countries in beef cattle production and develop beef cattle breeding and this industry (Agricultural Data Centre, 2023).

In 2016, Regulation (EU) 2016/1012 of the European Parliament and of the Council was adopted, which aimed to ensure uniform application of EU regulations in the Member States on breeding animals and trade in breeding animals and the reproductive products, as well as to govern the trade in breeding animals and the reproductive products in the EU (EU regulation, 2016). Therefore, the Law on Animal Production and Breeding was adopted in Latvia in 2018. In accordance with this law, Cabinet Regulation No. 796 Procedure for Recognition of the Purebred Agricultural Animal Producer Association, and the Crossbred Pig Producer Organization, as well as the Procedure for Approving the Breeding Programme was adopted. The purpose of the regulation was to set eligibility criteria and recognition procedures, as well as procedures for approving breeding programmes.

In 2019, Cabinet Regulation No. 227 Procedure for Beef Cattle Monitoring and Performance Testing with the aim of establishing a uniform monitoring and performance testing procedure in Latvia was adopted.

Figure 1 shows the breeding scheme for beef cattle, which represents the procedure for beef cattle monitoring and breeding activities in Latvia. In 2019, the Latvian Beef Cattle Breeding Association designed a new breeding programme for beef cattle, the purpose of which was to increase the genetic quality of beef cattle. In Latvia, the four most popular beef cattle breeds were Charolais, Hereford, Limousin and Aberdin Angus, followed by Simmental, Highland and Galloway that were gradually approaching them (Beef Cattle Breeding Programme, 2019).



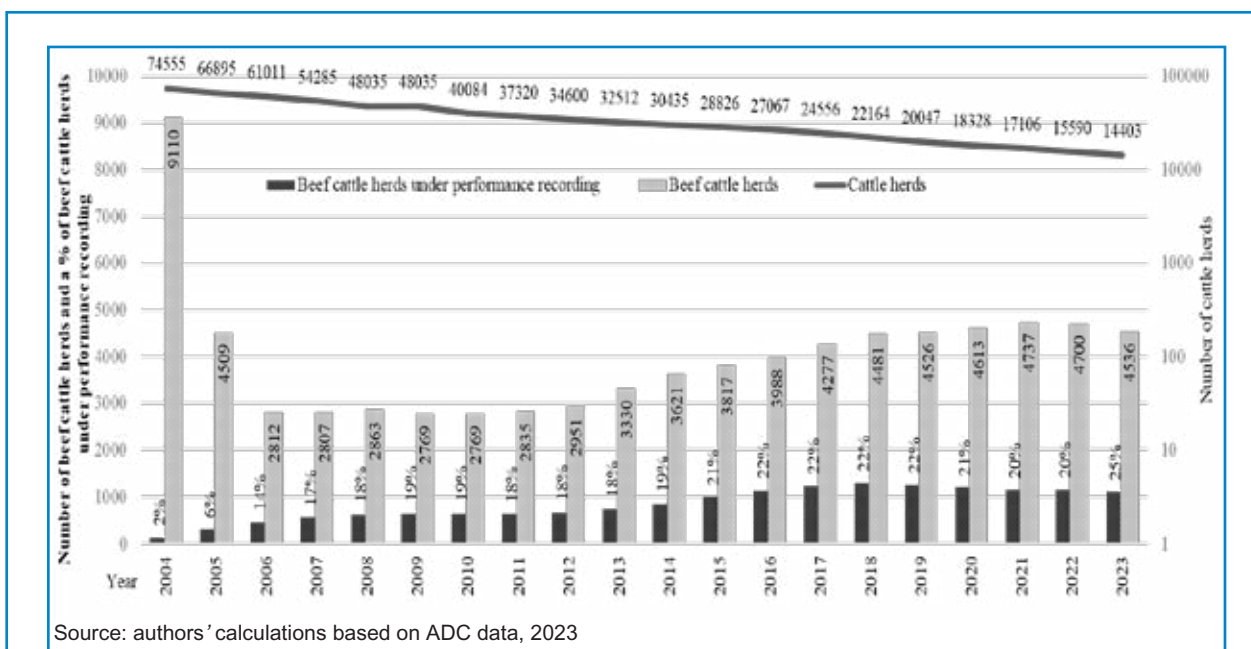
In 2019, the ADC introduced a Web-based application program – the beef monitoring data recording system CILDA, which aimed to provide centralized administration of the monitoring data in accordance with the current national and international legislation, with a special focus on the International Agreement on Monitoring Procedure and the ICAR and INTERBEEF guidelines to assist producers in beef cattle monitoring planning (Agricultural Data Centre, 2017).

**Performance analysis of beef cattle breeding in Latvia**

On 1 January 2004, 74555 cattle herds were registered in Latvia, of which 9110 or 12% were specialized in beef cattle breeding, and only 139 herds or 2% of the total number of registered beef cattle herds performed performance recording. From 2004 to 2023, the performance recording of beef cattle herds had progressed steadily, i.e., by 1 to 2% of the total number of beef cattle herds a year.

In 2023, 25% or 1113 beef cattle herds were under performance recording (totally 4536) (Figure 2).

After granting support for breeding activities to the beef industry in the country, the herds under performance recording began to focus on identifying the genetic quality and implementing evaluation programmes (Law on Animal Production and Breeding, 2018) when starting the breeding activities. However, it should be noted that performance recording was only a process for the implementation of a cattle breeding programme that provided quantitative and qualitative data on beef cattle, their productivity and appearance. Breeding is considered successful if 50% of the animals produced are sold for further breeding. It sets special requirements for the farm, the basic principles of animal diets and also the management of the farm (Averbeks F., 2013).



Source: authors' calculations based on ADC data, 2023

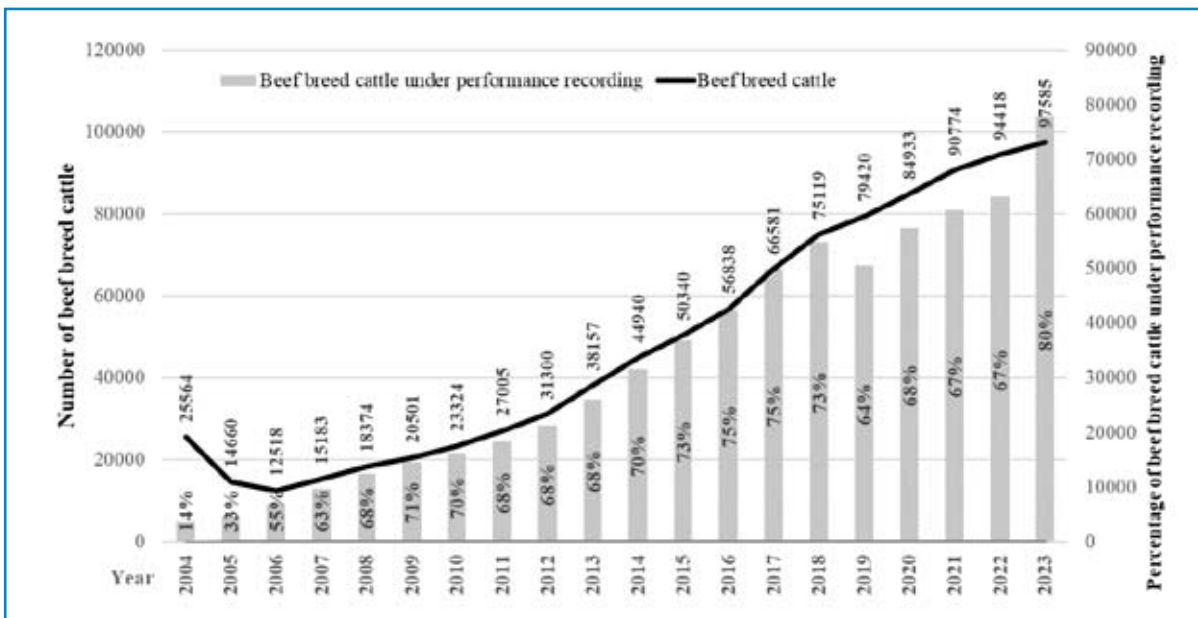
Figure 2. Changes in the numbers of cattle herds, beef cattle herds and herds under performance recording expressed as a percentage of the total, in Latvia in 2004-2023.

In 2004, according to the ADC (Figure 3), 25564 beef breeds, incl. beef crossbreeds, were registered in Latvia. An analysis of the data for the period 2004-2023 revealed that the number of cattle had increased 3.8-fold, which was the result of national support and EU Common Agricultural Policy (CAP) support payments, especially direct payments, including voluntary coupled support for cattle paid from 2015 (Pilvere *et al.*, 2022b). The increase in the number of beef cattle could be expected because without direct payments, cattle farms would operate at a loss. Support is therefore particularly important for economic, social, or environmental reasons (Vinci C., 2022).

In the period of analysis, the number of beef cattle has increased since 2004; however, as a result of meeting the requirements of European Parliament and Council Regulation (EU) 2016/1012 as well as the beef cattle breeding programme adopted in Latvia in 2019, the number of beef cattle involved in breeding decreased by 8%, yet a 13% increase was reported at the beginning of 2023 compared with the previous year (Figure 3). The data indicate that the total number of beef breed cattle and the number of breeding cattle have gradually increased in Latvia, reaching 77829 or 80% of the total (Figure 3). Therefore, in Latvia the total number of beef breed cattle gradually increased, as the cattle farms focused more on the role of cattle breeding and growth in the beef industry.

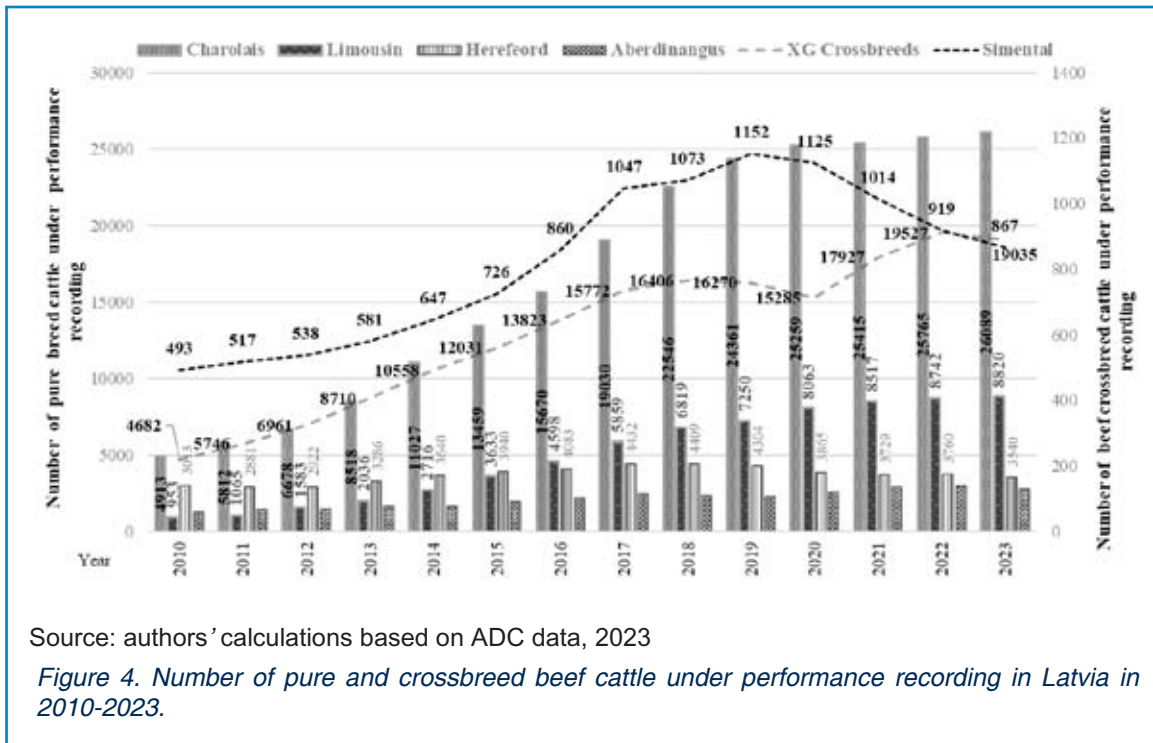
□\* Source: authors' calculations based on ADC data, 2023

In Latvia, four beef cattle breeds – Charolais, Limousin, Hereford and Aberdin Angus – made up the highest proportion in the total number of cattle, while the Simmental



Source: authors' calculations based on ADC data, 2023

Figure 3. Number of beef breed cattle, including beef breed cattle under performance recording, %, in Latvia in 2004-2023.



Source: authors' calculations based on ADC data, 2023

Figure 4. Number of pure and crossbred beef cattle under performance recording in Latvia in 2010-2023.

breed as well as crossbreeds were also gaining popularity (Figure 4). These were the most important breeds for the beef cattle breeding programme in Latvia. In Latvia, the number of Charolais and Limousin cattle, as well as the number of beef crossbreeds tended to increase every year. As regards dual-purpose beef-dairy breed cattle, Simmental were the most popular breed in Latvia. An analysis of the data presented in Figure 4 revealed that in the period 2010-2023, Charolais cattle represented the most popular breed in Latvia, as their number increased five-fold or by 21176 cattle in 2023 compared with 2010. The number of cattle of XG (beef breed) crosses increased 3-fold or by 14353 cattle, the number of Limousin breed cattle increased 9-fold or by 7867 cattle, the number of Simmental breed cattle increased almost 2-fold, while the increase in the number of Aberdinangus breed cattle was 2.3-fold in the period 2010-2023. The number of Hereford cattle had increased only 1.2-fold. Therefore, it could be concluded that, when implementing the beef cattle breeding programme, beef breed cattle producers obtained offspring by continuing crossing their cattle with breeding cattle of the same breed that could be recorded in the supplementary and basic parts of the breeding book. To achieve the goals of breeding, it was necessary to involve as many beef cattle farms as possible in the implementation of the beef cattle breeding programme in order to improve the genetic potential of the breeds, develop the production of high-quality, competitive products (breeding material, meat) for the domestic and foreign markets (Beef Cattle Breeding Programme, 2019).

In the period 2010-2022, as shown in Table 1, the largest increase in the number of cattle of beef breeds, incl. crossbreeds (suckler cows, heifers <15m and ≥ 15m, bulls <15m and ≥ 15m and breeders) was found for Charolais cattle – 5.2-fold and for XG cattle – 4-fold. This could be explained by the fact that Charolais bulls were used for crossing with other beef and dairy breeds (Lujane B. *et al.*, 2013). The increase in the number of XG cattle was due to the restructuring of dairy farms to beef production. Overall, it could be concluded that the breeding activities in beef cattle herds have been successful in Latvia, as the number of beef cattle continued to increase, as well as their productivity performance improved. It is important to be aware that in beef cattle production, many possible combinations of animal genetics, production settings

Table 1. Breakdown of the number of animals in beef breeding herds by breed, including crossbreeds (cows, heifers <15 m and ≥ 15 m, bulls <15 m and ≥ 15 m and breeders) in Latvia for the period 2010;2022

Breeds	01/01/2010							01/01/2022						
	Total	Suckler cows	Heifer <15 m.	Heifer ≥15m	Bull <15 m.	Bull ≥15m	Sires	Total	Suckler cows	Heifer <15 m.	Heifer ≥15 m.	Bull <15 m.	Bull ≥15 m.	Sires
<b>Charolais</b>	<b>4913</b>	2106	1003	902	644	258	169	<b>25765</b>	12808	4460	4775	2654	1068	722
<b>Beef Crossbreed</b>	<b>4682</b>	1214	1387	951	1001	129	5	<b>19527</b>	8213	4926	2782	3313	293	0
<b>Hereford</b>	<b>3013</b>	1526	487	495	367	138	43	<b>3760</b>	2131	514	580	339	196	73
<b>Aberdin Angus</b>	<b>1288</b>	641	193	218	193	43	19	<b>3019</b>	1399	531	445	388	256	66
<b>Limousin</b>	<b>953</b>	344	190	195	137	87	63	<b>8742</b>	4012	1445	1789	967	529	388
Simmental	493	276	54	83	40	40	35	919	562	122	113	79	43	29
Highland Cattle	410	153	58	76	53	70	14	638	263	71	90	92	122	21
Galloway	291	106	39	61	39	46	8	794	319	90	144	91	150	21
Saler	71	28	19	11	10	3	3	43	27	5	2	8	1	0
Tyrol Grey	70	30	12	11	13	4	2	6	6	0	0	0	0	0
Belgian Blue	19	9	6	0	1	3	3	10	9	0	1	0	0	0
Brown Swiss	10	9	0	1	0	0	0	0	0	0	0	0	0	0
Dexter	7	2	1	1	0	3	2	0	0	0	0	0	0	0
Blonde d'Aquitaine	1	0	0	0	0	1	1	61	34	4	6	7	10	2

Source: authors' calculations based on ADC data, 2023

and market expectations can produce favourable or unfavourable outcomes (Herring A.D., 2014). According to the basic principles of sustainable development, in order for meat of beef cattle to be recognized as produced in a sustainable way, the meat must meet the highest quality standards and its production must be economically feasible for beef cattle farms, thereby benefiting not only the farms themselves but also the population (Jamieson A., 2013).

In Latvia, the legal framework for beef cattle breeding is shaped by EU and national legal acts, as well as producer association documents, e.g., the Animal Breeding Programme, as well as documents of international organizations (ICAR, INTERBEEF).

□ In Latvia, the ADC has introduced a Web-based application program – the beef monitoring data recording system CILDA –, which aimed to provide centralized administration of the monitoring data in accordance with the current national and international legislation, with a special focus on the International Agreement on Monitoring Procedure and the ICAR and INTERBEEF guidelines.

At the beginning of 2023, 4536 herds of beef cattle with 94418 beef cattle were registered in Latvia. Of the total, 25% or 1113 herds were included in the breeding programme, which covered 77829 cattle. The most popular breeds in Latvia were Charolais with 26089 cattle, Limousin (8820), Hereford (3540) and Aberdin Angus (2812), making up 44% of the total beef cattle.

The number of dual-purpose beef-dairy breed (Simmental) cattle under performance recording tended to decrease, reaching 867 (25% decrease) in 2023 compared with 2019, while the number of crossbreed beef cattle reached 19035 or 15% of the total cattle involved in breeding in 2023. It follows that that the breeding work expanded, with a focus on pure breed cattle, whereas the number of crossbreed beef cattle involved in breeding tended to decrease.□

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