

Analysis of Limousine beef cattle recording results in Poland

TOMASZ PRZYSUCHA, MARCIN GOŁĘBIEWSKI,
HENRYK GRODZKI, KAROLINA WNEK, JAN SŁÓSZARZ,
MAŁGORZATA KUNOWSKA-SŁÓSZARZ, PIOTR TOKARSKI

Department of Animal Breeding and Production, Warsaw University of Life Sciences – SGGW

Abstract: *Analysis of Limousine beef cattle recording results in Poland.* The aim of the study was to assess the utility of selected results of the French Limousine breed with respect to their compliance with the breeding goal and standards adopted by the Polish Association of Breeders and Producers of Beef Cattle (PABPBC). The subject of the analysis were the results of the assessment of recording results of the French Limousine breed in Poland. The study is based on data for the years 2002–2013 of PABPBC and the National Center of Animal Breeding (NCAB) for 1996–2001. The data set included: N – the number of animals tested, min. – minimum values in the studied traits, max. – maximum value of the selected traits, average – average values of the analyzed traits, SD – standard deviation. Evaluated traits are: average weight of cows (kg), average body weight of calves after birth (kg), average daily gains for age 210 days (g), average body weight of calves at the age of 210 days (kg), average milk yield (kg), terms of cows and heifers calving aptitude, distribution of the population according to the order of calving cows. The share of purebred and crossbred Limousine cows in the national beef cattle population is dominant and in 2013 constituted 81.2%. The average body weight of cows do not depart from the masses assumed to culture. Higher birth weight bulls had reached in 2013. Weight of 37.5 kg. The difference between bulls and heifers was 3 kg. Calves were characterized by high body weight daily gains during rearing: 900–1009 g respectively for heifers and 973–1088 g for the bulls. It should be noted that since 2002 bulls exceeded daily gains of 1000 g. The Polish Limousine cattle herds in

recent years from 30.1 to 44.7% of cows calved during the relevant period. Thanks to the consistent growth of the population of Limousine, primiparous cows and cows calving for the second time amounted to about 40% of the population, despite the growing number of older cows. In 2000, only 2 cows were after 7 calvings, and in 2013 there were 1416 already (12.6%). It means that the life of the cow increases, which is of particular economic importance.

Key words: beef cattle, Limousine, beef cattle recording

INTRODUCTION

Currently in Poland there are registered 14 specialized breeds of beef cattle for which records are kept and evaluation of breeding value is conducted. Herdbook and recording assessment are conducted by the Polish Association of Breeders and Producers of Beef Cattle (PABPBC). PABPBC breeding goal for Limousine breed is to maintain high performance slaughter parameters, good weight, ease of calving course maintaining and improving weight gain of calves as an indicator of maternal milk production. The parameters for the growth of adult cows – body weight of 600–650 kg with a height of 135 cm in sacrum, bulls – body

weight 1100 kg with height of 145 cm in sacrum. In the national breeding program for Limousine cattle there are defined, inter alia, the following breeding standards for cows entered in the introductory part of the book: the minimum weight gain from birth to 210 days of age – 850 g, the minimum weight after first calving – 480 kg. The aim of the study was to assess selected recording results of the French Limousine breed with respect to their compliance with the breeding goal and standards adopted by PABPBC.

MATERIAL AND METHODS

The subject of the analysis were beef cattle recording results for the French Limousine breed in Poland, with respect to their compliance with the goal of racial breeding and standards adopted by the Polish Association of Breeders and Producers of Beef Cattle (PABPBC). The subject of the analysis were recording results of the Limousine beef cattle breed in Poland. The study was based on data for the years 2002–2013 of PABPBC and the National Center of Animal Breeding (NCAB) for 1996–2001. The data set included: N – number of animals tested, min. – minimum values in the studied traits, max. – maximum value of the selected features, average – average values of the analyzed traits, SD – standard deviation. Evaluated properties are: average weight of cows (kg), the average body weight of calves after birth (kg), the average daily gains for age 210 days (g), the average body weight of calves at the age of 210 days (kg), the average milk yield (kg), the terms of cows and heifers calving aptitude, the distribution of the population according to the order of

calving cows. The calculation of standardized animal body weight for given day in its life was done according to the following formula:

$$MCS = [(MCB - MCU) / WW] \times \times WS + MCU$$

where:

- MCS – standardized animal body weight (kg);
- MCB – mean body weight of the animal on the actual weighing (kg);
- MCU – actual body weight set for 48 hours, at birth (kg);
- WW – mean age of the animal on the weighing (days);
- WS – standardized age of the animal (s).

There were calculated the average daily weight gain of the animal from the day of birth to 210 days of age, according to the formula:

$$PDMC = [(MCC - MCP) \times \times 1000] / (WK - WP)$$

where:

- PDMC – means of increase in daily body weight (g);
 - MCC – final body weight of the animal on the weighing day (kg);
 - MCP – initial body weight of the animal on the weighing (kg);
 - WK – mean age of the animal on the final weighing (days);
 - WP – mean age of the animal on the initial weighing (days)
- mean age of the animal on the initial weighing (days) milk yield in dairy cows is expressed in kg of milk per convention.

The conversion 210 day lactation and is calculated according to the formula:

$$\text{WMM210} = (\text{McOds} \times 1700) / \text{calf age}$$

where:

WMM210 – value of mother milk – milk yield for 210 day lactation conversion assuming calf birth weight 35 kg, per 1 kg body weight gain, which drank 10 kg milk a day during the first 3 months, and the remaining months of 8–9 kg a day;

McOds (kg) – actual weight of the calf at weaning;

calf age (days) – actual age of the calf at the time of weaning from the mother.

RESULTS AND DISCUSSION

Table 1 presents the quantitative changes of the female population of Limousine cattle in Poland in the years 1996–2013. It may be noticed a systematic increase in population from 1998 to 2006, while in 2007, a noticeable decrease. The reason is not a drastic decrease in the number of purebred cows and heifers, but the changes in the presentation of results. Until 2006 statement included heifers and cows, while in 2007, is given only the number of cows. The share of purebred and crossbred Limousine cows in the national beef cattle population is dominant and in 2013 constituted 81.2%.

TABLE 1. Quantitative changes of the female population of Limousine cattle in Poland*

Year	Beef breed female population			Limousine breed (purebred)	Limousine breed (crossbred)	Limousine breed (purebred + crossbred)	Limousine breed share in the population
	pure-bred	cross-bred	total				
1996	3 939	4 952	8 891	1 109	3 211	4 320	48.6
1997	6 063	5 772	11 835	1 846	3 344	5 190	43.9
1998	7 227	7 601	14 828	2 362	4 314	6 676	45.0
1999	8 375	8 243	16 618	2 882	4 919	7 801	46.9
2000	9 085	9 468	18 553	3 226	6 176	9 402	50.7
2001	9 129	9 748	18 877	3 159	6 837	9 996	53.0
2002	9 735	8 968	18 703	3 248	6 564	9 812	52.5
2003	11 768	9 382	21 150	4 653	6 925	11 578	54.7
2004	13 884	10 925	24 809	5 684	8 125	13 809	55.7
2005	17 130	11 710	28 840	8 578	9 073	17 651	61.2
2006	19 597	13 100	32 697	9 689	10 108	19 797	60.5
2007	14 541	11 676	26 217	7 443	9 070	16 513	63.0
2008	17 481	12 097	29 578	9 856	10 142	19 998	67.6
2009	15 435	7 711	23 146	9 995	6 682	16 677	72.1
2010	16 436	7 576	24 012	11 037	6 684	17 721	73.8
2011	16 216	7 459	23 675	11 310	6 653	17 963	75.9
2012	16 724	7 070	23 794	11 879	6 389	18 268	76.8
2013	17 481	6 633	24 114	12 586	6 987	19 573	81.2

*From 2007 the list includes only the cows.

The average body weight of purebred cows is shown in Table 2. Optimum weight and dimensions depend mainly on cattle production system (Morris and Wilton 1976, Andersen 1978, Dickerson 1978, Fitzhugh 1978, Nogalski et al. 2000). Genotype and weight of mother cows are always described among the many factors responsible for normal growth and development of calves. Many studies have shown that the weight of the cow has a significant impact on calf birth weight, as well as daily gains during rearing (Przysucha et al. 2002). Therefore, the weight of a cow in adulthood is an important feature to be considered for breeding programs (Anderson 1978, Brown et al. 1989). According to the breeding goal of PABPBC, cows body weight in adulthood should be 600–650 kg for Limousine breed. Analysis of the recording results shows that the average body weight of cows did not differ from the breeding goal.

to a calf body weight at weaning at the age of 210 days. The calves with highest body weight at birth also typically have the highest body weight at the end of the rearing (Przysucha et al. 2002, Przysucha et al. 2005). Bulls had reached higher birth weight in 2013 (37.5 kg). The difference between bulls and heifers was 3 kg. Nogalski et al. (2000) reported a greater number of falls of small, less vital calves. They also noticed that the mothers of dead calves were significantly lighter and in worse condition, and consequently created worse conditions for the development of the fetus, and were less prepared to make the effort in delivery.

Average daily weight gains of purebred calves to the age of 210 days are shown in Tables 5 and 6. The data presented show that the calves were characterized by high body weight gains during rearing: 900–1009 g respectively for heifers and 973–1088 g for the bulls. It should be noted that since 2002 bulls

TABLE 2. Body weight of purebred Limousine cows

Year	N	Cow body weight (kg)			
		min.	max.	average	SD
1999	1126	350	900	634.0	73.0
2000	1504	382	890	619.1	76.0
2001	1568	430	890	618.0	72.1
2002	1557	370	850	606.2	76.7
2003	1999	420	850	596.6	73.0
2004	2190	320	850	597.1	71.7
2005*	733	480	710	543.2	33.5
2006*	1489	440	796	552.1	36.1

*Body weight after first calving

Tables 3 and 4 present the mean body weight of purebred calves after birth. Many authors have shown a significant effect of calves body weight after birth

exceeded daily gains of 1000 g. These gains make, that after a short (about 1 month) supplementary fattening, bulls with a body weight of about 300 kg

TABLE 3. Average body weight of purebred heifers at birth

Year	N	Body weight (kg)			
		min.	max.	average	SD
1999*	1284	16	67	34.3	5.9
2000	650	22	55	33.1	5.2
2001	736	17	58	34.6	5.0
2002	785	20	55	34.7	4.4
2003	939	20	60	33.7	4.2
2004	1036	17	49	33.4	3.9
2005	1784	15	48	33.1	3.8
2006	2935	17	50	34.7	3.4
2007	3377	19	55	33.5	4.2
2008	4705	16	58	34.2	4.1
2009	5522	20	56	34.3	4.2
2010	5732	15	57	34.3	3.9
2011	5936	15	54	34.4	3.9
2012	6466	15	57	34.5	4.1
2013	6107	14	56	34.5	4.2

*Regardless of sex.

TABLE 4. Average body weight of purebred bulls at birth

Year	N	Body weight (kg)			
		min.	max.	average	SD
1999*	1284	16	67	34.3	5.9
2000	655	18	57	34.5	6.4
2001	716	18	53	36.2	5.5
2002	723	23	52	36.0	4.7
2003	994	20	50	35.3	4.3
2004	1103	15	50	35.3	4.4
2005	1745	18	52	35.3	4.1
2006	2774	20	55	36.2	4.2
2007	2924	20	65	35.7	4.8
2008	4249	16	61	36.8	4.5
2009	4995	20	60	37.0	4.6
2010	5349	18	65	37.2	4.5
2011	5506	20	65	37.4	4.4
2012	5879	20	70	37.7	4.4
2013	5626	15	60	37.5	4.6

*Regardless of sex.

TABLE 5. Average daily gains of purebred heifers to 210 days of age

Year	N	Daily gains (g)			
		min.	max.	average	SD
2000	241	550	12 989	900.4	136.2
2001	497	518	1 495	954.8	163.9
2002	494	494	1 421	915.5	124.3
2003	641	429	1 619	937.8	142.2
2004	654	417	1 514	974.2	122.1
2005	1 007	510	1 686	991.5	136.5
2006	1 574	509	1 389	1 005.0	99.9
2007	2 544	401	2 241	959.9	126.6
2008	4 202	343	1 611	963.0	126.4
2009	4 999	351	1 482	964.9	124.7
2010	5 430	372	1 548	967.8	106.9
2011	5 381	489	1 480	983.3	88.7
2012	5 932	332	1 676	1 009.7	63.6
2013	5 632	332	1 676	1 000.9	133.7

TABLE 6. Average daily gains of purebred bulls to 210 days of age

Year	N	Daily gains (g)			
		min.	max.	average	SD
2000	280	617	1 446	973.7	164.4
2001	463	522	1 478	986.8	177.8
2002	369	546	1 427	1 007.1	122.3
2003	603	541	1 575	1 014.9	152.4
2004	692	541	1 452	1 047.8	125.7
2005	834	420	1 748	1 088.5	155.4
2006	1 624	381	2 324	1 064.1	152.1
2007	2 011	417	1 828	1 064.2	137.5
2008	3 671	474	1 835	1 051.1	128.6
2009	4 359	348	1 693	1 051.6	121.7
2010	4 677	405	1 599	1 051.2	116.2
2011	4 681	346	1 746	1 071.4	88.6
2012	5216	346	1 746	1 076.6	46.8
2013	5053	378	1 913	1 094.6	152.1

previously eliminated from breeding can be sold for export at a good price. The gains considerably in excess of the gains of heifers defined in the breeding standard ensure that after weaning with proper nutrition they obtain the required

body weight for mating (Przysucha et al. 2006) at the age of 15 months. Among the Limousine breed calves there is very low percentage of mortality by as much as 3% lower in the French breeding conditions. Besides they are characterized

by rapid growth and development, and vitality (Przysucha et al. 2005). In study of Pogorzelska et al. (1998) Limousine bulls daily gains from birth to weaning were more than 1000 g, and at the age of 3–4 months obtained body weight of approximately 170 kg. It should be emphasized that the average daily gains of calves ranged considerably in the last years of assessment. This is confirmed by the high standard deviations.

The average body weight of purebred calves at 210 days of age are presented in Tables 7 and 8. The body weights at the time of weaning were at the level of the 222–253 kg for heifers and 238–274 kg for bulls. The highest weight at the age of 210 days for heifers was reached in 2006 and for the bulls in 2007. The studies lead to the conclusion that by the breeding standards weights at weaning for both heifers and bulls were at

medium level, but fall within the French standards. The average weight of bulls was evaluated by approximately 20 kg higher than the average weight of heifers of the same age.

Table 9 shows the average milk yield of purebred cows in different years of assessment. As can be seen from the following statement, the average milk yield of Limousine cows was 2002.4 kg in the last year of the assessment and did not undergo significant changes in subsequent years. The minimum value of this trait was 640 kg and the maximum 3312 kg. The data should be approached with great caution because milk yield was calculated based on the weight gain of calves, and as we know in the herd calves can always be found that approach to other cows choke or are fed by the breeder. For this reason, since 2010, evaluation of this feature was a ceased.

TABLE 7. Average body weight of purebred heifers at 210 days of age

Year	N	Body weight (kg)			
		min.	max.	average	SD
1999*	873	70	213	140.6	21.5
2000	241	149	315	221.7	29.7
2001	499	155	347	237.2	34.3
2002	497	128	329	227.0	26.8
2003	642	120	370	230.2	30.6
2004	654	118	350	238.2	26.4
2005	1007	110	380	241.6	29.1
2006	1574	120	397	246.2	34.3
2007	2544	103	395	236.4	31.5
2008	4202	127	371	237.7	32.5
2009	4999	110	398	240.1	32.8
2010	5430	120	500	239.0	31.4
2011	5381	122	365	247.1	22.3
2012	5918	104	401	253.3	13.7
2013	5632	135	410	251.7	11.7

*Regardless of sex.

TABLE 8. Average body weight of purebred bulls at 210 days of age

Year	N	Body weight (kg)			
		min.	max.	average	SD
1999*	873	70	213	140.6	21.5
2000	280	162	351	238.5	36.6
2001	466	153	348	245.5	37.8
2002	370	143	336	247.5	27.6
2003	608	146	363	248.0	32.6
2004	692	142	339	255.4	27.1
2005	834	119	393	246.3	33.6
2006	1624	113	430	249.0	48.9
2007	2011	120	450	260.7	36.1
2008	3671	150	406	258.7	34.8
2009	4359	119	440	261.6	34.3
2010	4677	126	430	259.4	33.6
2011	4681	128	420	269.2	28.1
2012	5216	138	431	271.5	11.7
2013	5053	107	450	274.7	33.6

*Regardless of sex.

TABLE 9. The average milk yield of purebred cows

Year	N	Estimated milk yield of cows (kg)			
		min.	max.	average	SD
2000	858	745.0	3 250.0	1 884.8	315.9
2001	795	1020.0	3 311.9	1 951.4	354.1
2002	796	971.4	2 833.3	1 914.2	232.4
2003	1 249	971.4	2 995.2	1 933.8	265.6
2004	1 346	951.9	2 833.1	1 999.8	227.5
2005	1 628	640.0	2 395.0	1 881.0	206.5
2006	3 205	1 009.0	3 087.0	2 069.2	238.6
2009	9 157	899.0	2 958.0	2 002.4	231.6

Table 10 summarizes the terms of cows and heifers calving aptitude in the coming months in the year, in the years 1999–2013. Season of birth has a significant impact on the vitality and growth pace of reared calves, which directly affects the economic effects of the rearing (Makulska et al. 2002, Przysucha et al. 2005). Seasonality

in calvings in breeding herds is very important. because appropriate term of calving in the future allows to receive breeding material of a very good quality with the least amount of cost of rearing (maximum utilization of pastures). Many authors believe (Dobicki 1996, Jasiorowski 1999, Jasiorowski and Przysucha 2004). that the period

TABLE 10. Time of purebred cows and heifers calving

Year	Unit	Months												Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1999	N	127	127	172	177	171	103	101	71	58	81	68	73	1329
	%	9.6	9.6	12.9	13.3	12.9	7.8	7.6	5.3	4.4	6.1	5.1	5.5	100.0
2000	N	107	135	235	191	166	115	111	88	70	95	83	122	1518
	%	7.0	8.9	15.5	12.6	10.9	7.6	7.3	5.8	4.6	6.3	3.5	8.0	100.0
2001	N	174	156	203	211	159	104	123	110	79	84	83	90	1576
	%	11.0	9.9	12.9	13.4	10.1	6.6	7.8	7.0	5.0	5.3	5.3	5.7	100.0
2002	N	148	142	214	244	182	135	79	97	89	71	85	84	1570
	%	9.4	9.0	13.6	15.5	11.6	8.6	5.0	6.2	5.7	4.5	5.4	5.4	100.0
2003	N	147	236	276	279	241	191	150	96	73	96	91	126	2002
	%	7.3	11.8	13.8	13.9	12.0	9.5	7.5	4.8	3.6	4.8	4.5	6.3	100.0
2004	N	165	177	323	336	233	223	172	111	124	131	89	107	2191
	%	7.5	8.1	14.7	15.3	10.6	10.2	7.9	5.1	5.7	6.0	4.1	4.9	100.0
2005	N	232	356	435	325	365	286	245	216	220	152	122	156	3110
	%	7.5	11.4	14.0	10.5	11.7	9.2	7.9	6.9	7.1	4.9	3.9	5.0	100.0
2006	N	750	768	843	567	332	456	567	456	312	345	123	190	5709
	%	13.1	13.5	14.8	9.9	5.8	8.0	9.9	8.0	5.5	6.0	2.2	3.3	100.0
2007	N	389	484	678	893	800	624	497	428	464	447	389	403	6496
	%	6.0	7.5	10.4	13.7	12.3	9.6	7.7	6.6	7.1	6.9	6.0	6.2	100.0
2008	N	531	673	927	936	1085	787	481	485	484	424	404	406	7623
	%	7.0	8.8	12.2	12.3	14.2	10.3	6.3	6.4	6.4	5.6	5.3	5.3	100.0
2009	N	670	676	1087	1335	1208	805	596	560	500	459	590	581	9067
	%	7.4	7.5	12.0	14.7	13.3	8.9	6.6	6.2	5.5	5.1	6.5	6.4	100.0
2010	N	739	762	1175	1581	1201	835	694	591	550	447	533	580	9688
	%	7.6	7.9	12.1	16.3	12.4	8.6	7.2	6.1	5.7	4.6	5.5	6.0	100.0
2011	N	913	761	1195	1349	1417	1016	733	546	604	473	494	635	10136
	%	9.0	7.5	11.8	13.3	14.0	10.0	7.2	5.4	6.0	4.7	4.9	6.3	100.0
2012	N	953	942	1374	1491	1439	976	738	664	595	547	562	762	1043
	%	8.6	8.5	12.4	13.5	13.0	8.8	6.7	6.0	5.4	5.0	5.1	6.9	100.0
2013	N	1058	960	1257	1508	1337	1046	818	727	598	600	677	600	11186
	%	9.5	8.6	11.2	13.5	12.0	9.4	7.3	6.5	5.3	5.4	6.1	5.4	100.0

of mating and the resulting of calving aptitude time should not be longer than 2–3 months. Beef cows maintained all year round in grazing system should make the best offspring in the winter.

Calves born in the period after the completion of the first period of milk drinking are prepared to make full use of the pasture. then their growth rate is fast. calves are healthy and good developed

and breeder bear the smallest rearing costs. It should also be noted that in the winter calvings weaning calves moment coincides with the impoverishment of pastures in autumn. the consequence is natural dry-off pregnant cows. With winter calvings cows mostly deliver in the barn so that it is easier to monitor deliveries and possible assistance in the event of complications. Analyzing the obtained results and assuming that the most favorable period of cows calving aptitude is the period from December

to March. It should be noted that from 30.1 to 44.7% of the Polish Limousine cows delivered in recent years during the relevant period cows. It follows that more than half of the calves born at other times of the year only to a small degree can take full advantage of the pasture.

Table 11 shows the percentage distribution of calving aptitude of purebred Limousine cows according to calving order. Limousine breed is considered to be long-lived and early maturing breed.

TABLE 11. Distribution of the order of calving

Year	Unit	Months												Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	≥ XII	
2000	N	360	282	323	364	158	25	2	–	–	–	–	–	1514
	%	23.8	18.6	21.3	24.0	10.4	1.7	0.1	–	–	–	–	–	100.0
2001	N	363	299	222	274	278	124	12	2	–	–	–	–	1574
	%	23.1	19.0	14.1	17.4	17.7	7.9	0.8	0.1	–	–	–	–	100.0
2002	N	387	300	193	164	186	196	104	19	–	–	–	–	1549
	%	25.0	19.4	12.5	10.6	12.0	12.7	6.7	1.2	–	–	–	–	100.0
2003	N	474	369	353	218	191	156	146	67	12	–	–	–	1986
	%	23.9	18.6	17.8	11.0	9.6	7.9	7.4	3.4	0.6	–	–	–	100.0
2004	N	544	412	287	271	179	174	149	122	45	8	–	–	2191
	%	24.8	18.8	13.1	12.4	8.2	7.9	6.8	5.6	2.1	0.4	–	–	100.0
2005	N	919	573	412	326	268	166	148	149	102	40	7	–	3110
	%	29.5	18.4	13.2	10.5	8.6	5.3	4.8	4.8	3.3	1.3	0.2	–	100.0
2006	N	1484	1235	1123	943	345	359	56	76	56	12	8	12	5709
	%	26.0	21.6	19.7	16.5	6.0	6.3	1.0	1.3	1.0	0.2	0.1	0.2	100.0
2010	N	2362	2124	1960	1352	803	403	248	169	117	67	34	49	9688
	%	24.3	21.9	20.2	13.9	8.2	4.1	2.5	1.7	1.2	0.6	0.3	0.4	100.0
2011	N	2335	2090	1717	1586	1047	616	303	172	115	79	42	34	10 136
	%	23.0	20.6	16.9	15.6	10.3	6.0	2.9	1.6	1.1	0.7	0.4	0.2	100.0
2012	N	2564	1947	1756	1477	1396	834	482	273	135	77	53	49	11 043
	%	23.2	17.6	15.9	13.3	12.6	7.5	4.3	2.4	1.2	0.6	0.4	0.3	100.0
2013	N	2153	2110	619	1522	1262	1105	636	346	216	100	61	56	11 186
	%	19.2	18.9	14.5	13.6	11.3	9.9	5.7	3.1	1.9	0.9	0.5	0.5	100.0

Average life expectancy of cows is 8–11 years, and the number of calves born during the lifetime of a single cow an average 7 pieces. Cows of this breed very well take care of their offspring – are very good and caring mothers (Pogorzelska et al. 1998). It should be noted that due to the systematic increase in the population of Limousine breed cows, primiparous cows and cows calving for the second time constitute about 40% of the population, despite the growing number of older cows. In 2000, only 2 cows were after 7 calving, and in 2013 there were already 1416 (12.6%). It proves that the life of the cow increases, which is of particular economic importance. Long life of cows in herds of beef cattle is one of the main factors allowing for reducing the cost, so the breeders should try to use cows as long as possible.

CONCLUSIONS

Analysis of selected results of the evaluation of the French utility Limousine with regard to their compliance with the breeding goal and standards adopted by PABPBC shows maintenance of high standards of the national breeding population of this breed of cattle.

REFERENCES

ANDERSEN B.B., 1978: Animal size and efficiency, with special reference to growth and feed conversion in cattle. *Anim. Prod.* 27: 381–391.

BROWN C.J., JOHNSON Z.B., BROWN A.H. jr., 1989: Between and within breed variation in mature weight and maturing interval of beef cattle. *J. Anim. Sci.* 67 (Suppl. 2): 9.

DICKERSON G.E., 1978: Animal size and efficiency: basic concepts. *Anim. Prod.* 27: 367–379.

DOBICKIA., 1996: Technologiczne aspekty efektywności produkcji w populacjach mięsnych bydła. *Zesz. Nauk. Przegł. Hod.* 17: 57–71.

FITZHUGH H.A., 1978: Animal size and efficiency, with special reference to the breeding female. *Anim. Prod.* 27: 393–401.

JASIOROWSKI H., 1999: Blaski i cienie hodowli bydła mięsnego w Polsce. *Więś Jutra* 7–8: 27–28.

JASIOROWSKI H., KIJAK Z., POCZYNAJŁO S., WAJDA S., 1996: Program rozwoju hodowli bydła mięsnego w Polsce. Fundacja „Rozwój SGGW”, Warszawa: 5–67.

JASIOROWSKI H., PRZYSUCHA T., 2004: Bydło mięsne: wybór rasy. *Top Agrar Polska* 1: 102–104.

KRAJOWE CENTRUM HODOWLI ZWIERZĄT, 1997–2000: Ocena wartości użytkowej krów oraz ocena i selekcja buhajów. Wyniki za lata 1996–1999.

MAKULSKA J., WĘGLARZ A., SZAREK J., 2002: Wpływ sezonu urodzenia na produkcyjno-ekonomiczne wyniki odchovu cieląt rasy limousine. *Rocz. Nauk. Zoot. (Supl.)* 15: 213–218.

MORRIS C.A., WILTON J.W., 1976: The influence of body size on the biological efficiency of cows: A review. *Can. Anim. Sci.* 56: 613–647.

NOGALSKI Z., KLUPCZYŃSKI J., MICIŃSKI J., 2000: Przebieg porodu, wielkość i żywotność cieląt w zależności od wymiarów ciała krów. *Rocz. Nauk. Zoot.* 27 (3): 43–57.

POGORZELSKA J., ROMANOWSKI A., PUCHAJDA Z., 1998: Analiza użytkowania rozplodowego i rozwój importowanego z Francji bydła limousine i charolaise. *Zesz. Nauk. AR we Wrocławiu* XIX (336): 143–148.

Polski Związek Hodowców i Producentów Bydła Mięsnego, 2001–2014: Ocena wartości użytkowej bydła ras mięsnych. Wyniki za lata 2000–2013.

PRZYSUCHA T., GRODZKI H., BRZOZOWSKI P., ZDZIARSKI K., 2005: Wpływ wybranych czynników na przebieg porodów krów rasy limousine. *Medycyna Weterynaryjna* 61 (9), 1036–1038.

PRZYSUCHA T., GRODZKI H., CHARŁAMPOWICZ A., ZDZIARSKI K., 2002: The effect of selected factors on growth rate of Limousine calves. *Anim. Sci. Pap. Rep.* 20, (Suppl.) 1: 221–228.

STĄPOREK K., ZIEMIŃSKI R., 2006: Aktualne trendy w chowie i hodowli rasy Limousine. *Przegl. Hod.* 7: 1–4.

Streszczenie: *Analiza wyników oceny użyteczności francuskiej rasy limousine w Polsce.* Celem pracy była analiza wybranych wyników oceny użyteczności francuskiej rasy limousine w odniesieniu do ich zgodności z celem hodowlanym i standardami rasowymi przyjętymi przez Polski Związek Hodowców i Producentów Bydła Mięsnego. Przedmiotem analiz były wyniki oceny użyteczności francuskiej rasy bydła mięsnego limousine w Polsce. Opracowanie oparte jest na danych PZHiPBM za lata 2002–2013 oraz Krajowego Centrum Hodowli Zwierząt (KCHZ) za lata 1996–2001. Zbiór danych obejmował: N – liczbę badanych zwierząt, min. – minimalne wartości w badanej cechy, max. – maksymalne wartości badanej cechy, średnia – uśrednione wartości badanej cechy, SD – odchylenie standardowe. Oceniane cechy to: średnie masy ciała krów (kg), średnie masy ciała cieląt po urodzeniu (kg), średnie przyrosty dobowe do wieku 210 dni (g), średnie masy ciała cieląt w wieku 210 dni (kg), średnia mleczność krów (kg), terminy ocieleni krów i jałowic, rozkład populacji krów według kolejności ocielenia. Udział czystorasowych i mieszańcowych krów rasy limousine w krajowej populacji bydła mięsnego jest dominujący i w 2013 roku stanowił 81,2%. Średnie masy ciała krów nie odbiegają

od mas założonych w celu hodowlanym. Większą masą urodzeniową miały buhajki, osiągając w 2013 roku wagę 37,5 kg. Różnicą między buhajkami a jałówkami wynosiła 3 kg. Cielęta charakteryzowały się dużymi przyrostami w okresie odchowu: 900–1009 g odpowiednio dla cieliczek i 973–1088 g dla buhajków. Należy zauważyć, iż od 2002 roku buhajki przekroczyły 1000-gramowe przyrosty dobowe. W polskich stadach bydła limousine cielęto się w ostatnich latach we właściwym okresie od 30,1 do 44,7% krów. Dzięki systematycznemu wzrostowi populacji krów rasy limousine pierwiastki i krowy cielące się po raz drugi stanowią około 40% populacji, mimo stale rosnącej liczby krów starszych. W 2000 roku tylko 2 krowy były po 7. ocieleniu, a w 2013 roku było ich już 1416 (12,6%). Wynika z tego, że wydłuża się czas użytkowania krów, co ma szczególne znaczenie ekonomiczne.

MS received May 2015

Authors' address:

Tomasz Przysucha
Wydział Nauk o Zwierzętach SGGW
ul. Ciszewskiego 8
02-786 Warszawa
Poland
e-mail: tomasz_przysucha@sggw.pl