

# CONTRIBUTIONS REGARDING THE STUDY OF MILK PRODUCTION IN FARMS WITH ROMANIAN BLACK PIED COWS BELONGING TO A.G.C.T.R. - ROMANIA

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## Abstract

Research was carried out on a number of 4208 BNR cows population from private farms situated in 11 Counties, belonging to AGCTR. Using the data from the Official control were analysed: period of lactation, milk production per total lactation, normal and at maturity equivalent, milk content in fat and proteins, function of farm, county association, and total population. Data obtained show the following: milk production per normal lactation was 5822.73 Kg for the entire population, with limits between 4413.60 Kg for the BNR population from Ilfov County and 7364.80 Kg from Vaslui County. Between the county associations the differences were significant, even between the farms from the same county. Per total population, there were six counties with performances over the average, the most performing being Târzii and Bădeana farms from Vaslui County, which overcame with 26.48 % the population average. Milk content in fat was 3.90% and the protein one was 3.41% but with a great variability ( $V\% = 22.98\%$  for fat and 21.45 % for protein). Period of total lactation was on average of 263.84 days, which influenced the performance of milk production. In the studied farms the individual variability was very high, with a maximum of 18476 Kg milk for a cow from Târzii farm, Vaslui County. The presence of this plus variables and pronounced variability in every farm are favourable for positive selective pathways and real possibilities for genetic improvement of the studied flocks.

**Key words:** milk production, cows, lactation, genetic improvement

## INTRODUCTION

Using the data from the official production control for BNR cow population in farms belonging to A.G.C.T.R on 2011-2012, but also a wide literature, in this paper are presented the indexes of milk production, by county and per farms in order to highlight the biological value and degree of genetic improvement of the BNR cow population exploited in private farms.

## MATERIAL AND METHOD

Were taken in study the farms with Romanian Black Pied (BNR) cow population belonging to AGCTR (General Association of Romanian Cattle breeders) being in the COP (official production register) for 2011-2012. Using the data from the Official control were analysed: period of lactation, milk production

per total lactation, normal and at maturity equivalent, milk content in fat and proteins, function of farm, county association, and total population.

Cows' number was of 4208 in 1-13 lactation from 11 Counties, where BNR population has a significant share and farmers acceded to General Association of Cattle Breeders from Romania.

Primary data from monitoring each farm were statistically processed ( $\bar{X}$ ,  $\pm s_{\bar{X}}$ ,  $s$ ,  $V\%$ ) and are summarized in tables and figures.

## RESULTS AND DISCUSSIONS

In tables 1 and 2, fig. 1 are presented the mean values and variability of milk production indexes at BNR cow population from the farms taken in COP (Official Production Register) for 2011-2012.

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Table 1 Statistical indicators for milk production characters from BNR cow farms, belonging to A.G.C.T.R

Specification	Samples statistics	Total lactation							Normal lactation						Maternity Equivalent		
		DLT days	Milk Kg	Fat		Proteins		F+ P Kg	DLN days	Milk Kg	Fat		Proteins		Milk kg	Fat kg	Proteins kg
				%	kg	%	kg				%	kg	%	kg			
CALARASI	n	853	853	853	853	853	853	853	853	853	853	853	853	853	945	945	945
	x	297.73	5765.09	3.78	198.63	3.42	180.28	378.91	264.92	5486.66	3.78	181.53	3.43	164.43	5673.75	185.64	163.05
	sx	2.99	66.26	0.01	2.83	0.01	2.33	5.06	1.69	56.81	0.01	2.45	0.01	1.99	56.35	2.21	1.88
	s	87.55	1235.34	0.12	42.88	0.22	38.09	58.03	39.56	1059.32	0.1	41.72	0.23	38.32	1296.27	40.42	39.14
	v%	29.34	31.75	12.56	32.73	6.44	31.77	39.07	18.7	27.66	11.21	29.51	6.91	25.48	37.16	38.09	36.89
	Min	145	1705	2.37	64.48	59.95	124.4	124.4	150	1705	2.38	61	2.63	57.95	1700	68.44	55.05
	Max	560	12737	9.14	698.94	4.51	519.88	1217.65	305	11745	9.14	630.52	4.79	482.65	12333	538.07	473.66
CONSTANTA	n	390	390	390	390	390	390	390	390	390	390	390	390	390	450	450	450
	x	296.41	6705.07	3.75	230.95	3.31	202.55	433.5	259.07	5935.41	3.74	205.11	3.31	179.9	5951.6	219.12	190.97
	sx	5.25	167.13	0.03	6.05	0.02	5.16	11.15	2.82	137.32	0.03	4.03	0.01	4.23	122.08	4.78	4.06
	s	100.68	1201.81	0.28	49.52	0.21	42.04	63.2	54.02	1130.69	0.2	39.48	0.13	83.55	1489.72	41.46	39.23
	v%	33.96	32.44	11.58	41.75	10.46	40.38	49.8	20.85	28.39	11.2	40.5	9.05	46.45	37.64	38.51	37.64
	Min	150	1178	1.99	49.25	2.07	46.61	94.21	150	1178	1.99	49.25	2.06	46.61	1638	37.27	35.63
	Max	567	18387	9.51	681.68	8.05	561.89	1236.05	305	134.87	9.53	570.28	8.01	453.81	12709	512.65	436.9
COVASNA	n	263	263	263	263	263	263	263	263	263	263	263	263	263	320	320	320
	x	274.52	6781.97	4.03	272.62	3.25	221.45	494.06	249.25	6346.56	4.04	233.91	3.23	198.13	6583.38	226.07	185.54
	sx	5.67	197.38	0.02	7.32	0.02	6.12	13.35	3.5	158.73	0.02	4.98	0.01	5.87	134.68	4.53	3.73
	s	91.2	1370.42	0.41	48.72	0.32	45.4	76.52	56.36	1249.67	0.27	42.26	0.19	94.36	1209.35	39.04	36.7
	v%	33.22	43.74	10.27	41.55	9.93	40.89	43.82	22.61	40.17	9.62	40.99	9.32	39.62	32.15	33.81	31.65
	Min	13.22	1608	3.25	63.73	1.99	50.68	116	137	1608	3.25	63.73	1.99	50.68	1899	74.42	70.44
	Max	558	27241	6.92	810.61	6.59	658.59	1418.88	305	2045	6.92	766.85	6.59	641.94	14161	606.75	507.02
GIURGIU	n	401	401	401	401	401	401	401	401	401	401	401	401	401	581	581	581
	x	322.16	5061	3.83	188.6	3.49	173.58	362.17	279.16	4717.5	3.83	168.22	3.5	154.62	4753.71	158.93	139.66
	sx	4.23	137.88	0.02	5.46	0.01	4.94	10.34	1.64	111.09	0.02	4.4	0.01	3.95	91.43	3.63	3.33
	s	84.87	1461.05	0.52	109.52	0.21	99	207.07	33.01	1224.6	0.55	88.18	0.23	79.22	1203.97	37.3	35.44
	v%	26.35	45.66	13.64	41.07	6.24	40.04	47.18	11.83	39.36	14.49	38.42	6.65	37.24	34.68	32.72	31.43
	Min	205	1736	1.89	42.7	2.79	49.37	105.2	205	1736	1.75	42.7	2.63	49.5	1727	60.27	59.92
	Max	567	16424	5.75	838.67	4.29	634.84	1473.51	305	11559	5.89	549	4.29	409.63	11618	599.49	475.79

From the analysis of lactation period (tab. 1) it can be observed that the average value on total lactation ranged between 234.96 from Sibiu County and 322.47 days in Vaslui County cow population, with an average of 29718 days for the entire BNR, which means that the period of total lactation was shorter with 7.28 days than normal lactation with direct influence on milk production

Analyzing this index according to BNR cow population from the 11 Counties it appears that only in two counties (Giurgiu, Vaslui), total lactations exceeded 305 days, and in the rest of the Counties total lactation period is shorter than normal lactation of 305 days.

Individual variability is very pronounced with limits between 150 – 574 days and high values of the dispersion indexes ( $s = 41.19$  days and  $V\% = 27.69$ ).

From this data, we can withdraw the conclusion that the studied BNR population falls within the breeds with short lactation,

but they varies widely depending on the exploitation technology and management of the technological factors, and directly related with calving interval.

In table 2 are presented, the mean and variability of milk production by county and per entire BNR cow population.

Analysis of milk production on a number of 4204 normal lactations shows that they oscillated between 4713.60 kg in Ilfov County and 7364.80 kg in Vaslui County, average of the entire population being of 5822.73 kg milk. Expressed in terms of maturity equivalent (Em), the medium of the entire population was of 6153.22 kg, with limits between 4317.4 kg in Ilfov County and 7732 kg in Vaslui County.

The variability of milk production assessed by the value of dispersion indices indicates highly heterogeneous batches in all counties, especially in Covasna County, where the limits of variability were between 1608 kg and 20405 kg.

Table 2 Statistical indicators for milk production characters by counties and per entire BNR cow population belonging to A.G.C.T.R.

Specification	Total lactation		Normal lactation		Difference ( $\pm$ ) tot. lact./norm. lact.		Specification
	Milk, kg	% population average	Milk, kg	% population average	Milk, kg	% population average	
Calarasi	5765.09	91.67	5486.66	94.22	+278.43	+5.07	5673.75
Constanta	6705.07	106.61	5935.41	101.93	+769.66	+12.96	5951.60
Covasna	6781.97	107.84	6346.56	108.99	+435.41	+6.86	6583.38
Giurgiu	5061	80.47	4717.50	81.01	+343.50	+7.28	4753.71
Ialomita	6687.5	106.33	6235.50	107.08	+452.00	+7.24	6834.95
Iasi	6416	102.02	5869.90	100.81	+546.10	+9.30	6217.30
Ilfov	4735.6	75.30	4413.60	75.79	+322.00	+7.29	4397.40
Olt	5749.74	91.42	5065.07	86.98	+684.67	+13.51	4997.73
Sibiu	5789.21	92.05	5426.19	93.18	+363.02	+6.69	6377.52
Vaslui	7963.43	126.62	7364.80	126.48	+598.63	+8.12	7732.90
Vrancea	6799.98	108.12	6340.13	108.88	+459.85	+7.25	6506.80
Total population	6288.91	100.00	5822.73	100.00	+466.18	+8.00	6153.22

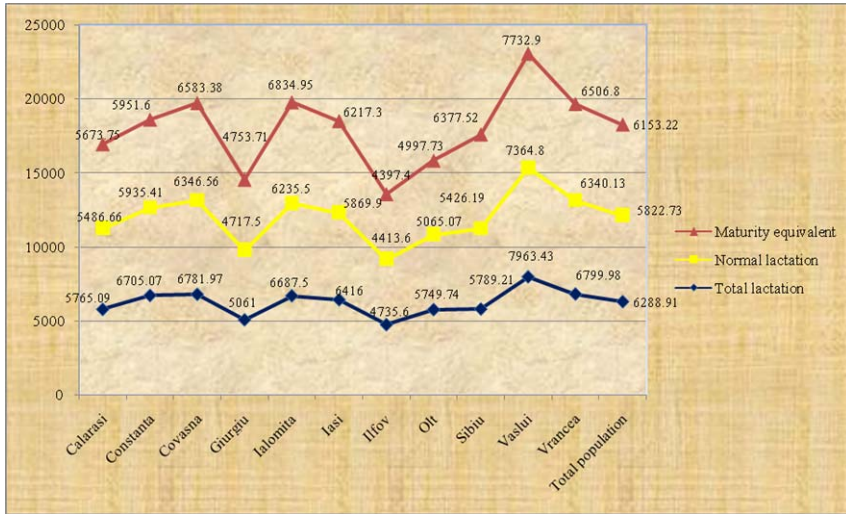


Fig. 1 Mean values and variability of milk production at BNR cow population

The difference between total and normal lactation was of 466.18 kg milk, which represents 8% per entire population, and difference among counties were between 6% and 9%.

Milk content in fat was 3.90%, with limits between 3.74% for the population from Constanta County and 4.32 in Vaslui County.

Milk content in proteins ranged between 3.23% for BNR cow population from Covasna County and 3.52% in Sibiu County, with an average of 3.4% per entire population. This qualitative index is falls within the breed standard, proving the qualitative improvement of milk obtained from BNR cow population.

The same aspect is also valid for milk content in fat, the most valuable being the cow population from Vaslui County, with an average of 4.32% for fat.

The studied batches of animals are less homogenous for this aspect with an exaggerated individual variability ( $s=0.57\%$  for fat and  $s=0.46\%$  for proteins).

Increased variability is favorable to selection and genetic improvement of the population by retaining individuals with a high content of fat and protein.

Appropriate to the quantity and quality of milk, total quantity of fat per normal lactation was 220.08 kg, and the total quantity of

protein was 191.42 kg for the entire population. This values, highlights the genetic value of the studied biologic material, similar to the Friesian cows from countries with tradition in cows breeding with genetically improved effective.

## CONCLUSIONS

Breeding dairy cows in farms of different sizes from our country knows some peculiarities under the aspect of the genetic value of animals, technical and material endowment, forage base and mechanization on the technological flux, labour force, economical management and last but not the least capitalization of farms and production, or even traditions existing in each area.

Regarding the productive performances of BNR cow population from farms belonging to A.G.C.T.R, it includes animals with high genetic value, with average milk productions of over 7000 kg milk in Vaslui County. It is noted a genetic improvement of the active population of 1.5-2% or 100-150 kg milk.

Genetic improvement is carried out slowly, and technological factors of exploitation and management have a crucial influence.

The obtained results are considering serve as technical elements for knowledge the

current state of genetic improvement of BNR breed in Romania, and the use of these results in future orientation of the National Cattle Breeding Plan.

## REFERENCES

- [1] Acatincăi, Stelian – 2010: Tehnologia creșterii bovinelor, Editura Agroprint, Timișoara.
- [2] Csiszter, L., 2008: Factorii tehnologici și producția de lapte Revista “Ferma”, anul x, nr.8 (63), Timișoara.
- [3] Cozma, Dănel, 2012 – Contribuții la studiul influenței valorii genetice și managementul asupra performanțelor de producție și reproducție într-o fermă de vaci de lapte. Teză de doctorat, UȘAMV Iași.
- [4] Grosu, H., 2003 – Programe de ameliorare. Editura tehnică Agricolă, București.
- [5] Grosu, H., 2006 – Criterii utilizate pentru selecția rasei Holstein – Friză în unele țări membre Interbull, Revista de Zootehnie, nr.5, Iași.
- [6] Maciuc, V., Ujică, Nistor, I., 2003 – Ghid de ameliorare genetică a bovinelor pentru producția de lapte. Editura Alfa, Iași.
- [7] Maciuc, V., - Managementul creșterii bovinelor. Editura Alfa, Iași.
- [8] Mureșan, Gh., 2006 – Quality control of milk hygiene, buletinul USAMV Cluj-Napoca.
- [9] Neaga, Gh., 2008 – Contribuții la studiul creșterii vacilor de lapte în unele exploatații mici și mijlocii din Dobrogea. Teză de doctorat, UȘAMV Iași.
- [10] Pântia, Ioana-Raluca, Ujică, V., Nistor, I., Nistor, C.E., Cozma, D., 2011 – Contribuții la studiul precocității și longevității productive a populației BNR dintr-o fermă de elită din Moldova, Revista de Zootehnie, Anul VIII (2011), nr.2, Iași.
- [11] Ujică, V., Maciuc, V., Nistor, I., Nistor, C.E., Cozma, D., Grigoroșcuță, Geluca, Dascălu, C., Șonea, Cr., Pântia Ioana-Raluca, 2011 – Contribuții la studiul performanțelor productive la populația de taurine BNR din zona de nord-est a țării. Simpozion științific internațional, Universitatea Agrară de Stat, Chișinău.
- [12] Ujică, V., Maciuc, V., Nistor, I., 2007 – Managementul creșterii vacilor de lapte. Editura Alfa, Iași.