

# RESEARCH ON PRODUCTIVITY PERFORMANCES OBTAINED ON BROWN COWS FROM SMALL AND MEDIUM FARMS IN SUCEAVA COUNTY

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## Abstract

*The breed has a large brown structure of cattle bred in the north-east, and therefore we considered it appropriate to undertake studies and research on the current state of performance improvement and production of this breed in Suceava County. The motivation of this research is due to the fact that while in Moldova the brown race is increased by almost a century, have been taken to date little research depth (Bologa 2003; Ujica 1991, 1997, 2000) on this breed, especially in small and medium-sized farms. Number of cows that was the subject of research was 215 head, distributed in 20 private farms, small and medium (1-15 head herd size per farm) located mainly in the basin and Cimpulung Moldovenesc Wah. The analysis of milk production indices and their variability on successive lactates and the firm is found that the population has made productive performance in six of the seven lactates pursued) below 4100 kg milk, thus the genetic potential of the breed.*

**Key words:** cows, Brown, production, milk, farm

## INTRODUCTION

Due to population explosion in human population and consumer preferences towards animal products almost everywhere in the world, cattle farming was and is one of the major concerns of people over time. Compliance with European standards for cattle breeders in Romania must address a new perspective in terms of numerical growth of the number of cows and improve its genetic potential, essential for increasing prolificității and production of milk and meat.

## MATERIAL AND METHOD

Research method was based on a study conducted at the farm (macroeconomic) and sample-based individual holdings. In this regard, sources of information were used in DADR, ANARZ (for the period 1997-2007), are supplemented with direct personal observations of some holdings taken in research, aiming at the following objectives:

► study of the natural area and the specific mining technologies;

► technologies applied in small and medium-sized farms surveyed;

► production and total lactation milk produced on normal, following the lactation, on farms and counties;

► Data on duration of lactation, fat content and quantity, content and protein.

## RESULTS AND DISCUSSION

### 1. Duration of lactation

In assessing the productive performance of the brown cattle population of Suceava county area we proceeded to calculate the total duration of lactation and normal on successive lactates, results are presented in tab. 1.

The data presented in table 1 note that, during lactation total steers considered for the study has averaged close to 7 during the lactation, is between 364-334 days. Also it is noted that there were great differences between the minimum and maximum duration of lactation, the entire productive life, with outliers at 252 and 640 days, values that are within the range presented in the literature [2], [4], [5], [8], [10]

Table 1  
 Total duration of lactation and normal brown cattle population of Suceava county area

Specify	Statistics parameter	Lactation:						
		I	II	III	IV	V	VI	VII
Total duration of lactation (DLT) (days)	n	215	198	171	140	105	63	41
	X	<b>364,74</b>	<b>344,20</b>	<b>348,41</b>	<b>334,25</b>	<b>340,67</b>	<b>339,10</b>	<b>343,7</b>
	±S <sub>x</sub>	4,81	4,82	5,78	6,11	7,50	9,89	12,66
	V%	26,14	25,46	27,31	26,07	24,42	23,15	23,58
	min.	270	282	252	273	279	287	270
	max.	640	565	616	654	467	480	417
Duration normal lactation (days)	n	215	198	171	140	105	63	41
	X	<b>297,90</b>	<b>293,30</b>	<b>292,83</b>	<b>292,01</b>	<b>294,75</b>	<b>290,89</b>	<b>290,5</b>
	±S <sub>x</sub>	4,81	4,82	5,78	6,11	7,50	9,89	12,66
	V%	26,14	25,46	27,31	26,07	24,42	23,15	23,58
	min.	274	282	267	278	279	287	274
	max.	305	305	305	305	305	305	305

Depending on the sequence lactates is observed that as the aging, there is a tendency of shortening lactation and near to the normal (for 305 days) due to influence farm management applied.

High variability of the total lactation period is evidenced by the spread in values recorded (over 20%) was higher in the first lactates (26-27%) and less towards the end of productive life (23-24%).

Normal lactation duration has averaged at around 295 days, about 10 days less than the standard lactation period (305 days), which was passed on milk production achieved in normal lactation. There is pronounced the same variability as for the total lactation, the values of the coefficient of variance was over 20% in all 7 lactates.

## 2. Quantitative production of milk per lactation and normal total

Production quantity of milk had a upward trend until lactation IV, followed by a decrease in milk production by lactation VII of the cows are reformed.

For quantitative analysis of milk production total lactates shows that the population has made the 4000 kg milk production performance on each of seven successive lactates, except lactation IV (4088.9 kilograms) but with a very strong variability.

Individual milk yields have been very different extreme values, but within the data presented by literature [2], [3], [5], [10], is between 2247 kg (lactation VI) and 10,441 kilograms lactating IV. The explanation for these large differences we think can be attributed to mining technology applied in each farm and the fluctuations of feeding.

 Table 2  
 The total amount of milk per lactation and normal Brown cattle population of Suceava county area

Specify	Statistics parameter	Lactation:						
		I	II	III	IV	V	VI	VII
The total amount of milk per lactation (kg)	n	215	198	171	105	140	63	41
	X	<b>3214,5</b>	<b>3447,6</b>	<b>3624,8</b>	<b>4088,9</b>	<b>3734,4</b>	<b>3815,7</b>	<b>3362,1</b>
	±S <sub>x</sub>	55,16	61,33	81,12	86,24	79,31	92,68	94,14
	V%	26,44	24,59	21,45	21,12	21,52	21,15	22,05
	min.	2538	2988	2567	2862	2854	2247	2351
	max.	6897	8947	9320	10441	9570	8590	6015
The amount of milk on normal lactation (kg)	n	215	198	171	105	140	63	41
	X	<b>2873,8</b>	<b>3066,4</b>	<b>3212,7</b>	<b>3672,1</b>	<b>3375,2</b>	<b>3462,2</b>	<b>2890,2</b>
	±S <sub>x</sub>	57,26	49,73	77,06	81,24	82,18	92,35	93,02
	V%	22,31	23,87	24,11	20,92	20,47	23,27	21,08
	min.	2922	3109	3098	3105	3268	2978	2903
	max.	6537	8377	8870	9867	9260	7823	5539

Analysis of milk production throughout the productive life points out that the herd of cows studied showed modest production, well below the breed performance in countries with tradition in increasing race brown.

Individual variability of milk production is increased, the coefficient of variability with values exceeding 20% in all 7 lactations.

The data presented in table 2 shows an onset of milk production of 3214.5 kilograms, followed by an increase in milk

production by lactation IV, which is the maximum lactation (4088.9 kilograms), after which production decreases until it reaches the end of productive life to a value of 3362.1 kilograms.

### 3. Content and milk protein

To characterize the population as well milk quality analysis was performed on protein and fat content. Data on protein content and milk to brown cattle population of Suceava county area are presented in table 3.

Table 3  
Quantity and protein content of milk from the brown cattle population of Suceava county area

Specify	Statistics parameter	Lactation:						
		I	II	III	IV	V	VI	VII
Protein content on total lactation(%)	n	215	198	171	140	105	63	41
	X	<b>3,30</b>	<b>3,33</b>	<b>3,28</b>	<b>3,29</b>	<b>3,21</b>	<b>3,22</b>	<b>3,19</b>
	±S <sub>x</sub>	0,12	0,07	0,04	0,05	0,03	0,04	0,05
	V%	10,78	8,75	8,86	9,90	8,31	8,44	9,37
	min	3,05	2,72	2,57	2,65	2,68	2,75	2,80
	max	4,34	4,23	4,45	4,21	4,19	3,90	4,20
Protein quantity on total lactation (kg)	n	215	198	171	140	105	63	41
	X	<b>135,30</b>	<b>141,37</b>	<b>137,43</b>	<b>148,14</b>	<b>128,41</b>	<b>127,49</b>	<b>119,2</b>
	±S <sub>x</sub>	10,22	14,45	10,14	15,81	13,42	15,21	10,06
	V%	25,18	32,25	35,12	28,54	26,07	25,28	29,41
	min	78,15	98,72	89,32	79,40	87,40	83,80	85,15
	max	248,66	224,19	229,41	253,22	219,35	223,31	242,62
Protein content on normal lactation (%)	n	215	198	171	140	105	63	41
	X	<b>3,30</b>	<b>3,32</b>	<b>3,27</b>	<b>3,28</b>	<b>3,20</b>	<b>3,21</b>	<b>3,17</b>
	±S <sub>x</sub>	0,08	0,05	0,03	0,04	0,03	0,06	0,04
	V%	10,99	9,09	9,12	8,77	8,17	8,62	9,40
	min	3,15	2,95	2,90	2,75	2,86	2,91	3,01
	max	4,27	4,21	4,39	4,20	4,15	3,88	4,18
Protein quantity on normal lactation (kg)	n	215	198	171	140	105	63	41
	X	<b>124,44</b>	<b>128,25</b>	<b>126,76</b>	<b>129,21</b>	<b>114,39</b>	<b>112,58</b>	<b>111,5</b>
	±S <sub>x</sub>	11,48	14,76	10,61	14,34	12,50	11,95	9,22
	V%	25,45	36,42	33,29	27,77	23,41	24,87	29,19
	min	81,80	101,64	91,22	82,31	89,44	92,81	88,31
	max	244,12	214,80	218,30	247,55	211,62	220,30	235,22

Milk protein content on total lactation a downward trend in succession seven lactation. Thus, lactation Ia and II, the protein content was 3.30% and 3.33% reaching VII of lactation at a rate of 3.19%.

Minimum and maximum limit for protein content occurred in lactation II, that the seventh lactation. We can also notice that there are also variations that have developed in 4.45% milk protein, which shows very good genetic potential of this breed.

Individual variability was rather high, the protein content in total and normal lactation, with the coefficient of variation of about 10% and the amount of protein was spread in about 25%.

Regarding the total amount of protein on lactation and normal, it was consistent with data presented in literature [6], [7], [10] and recorded on lactation milk production, its maximum is 129.21 kilograms and was recorded in lactation IV and the minimum value is 111.5 kilograms at the VII lactation

#### 4. The content and quantity of milk fat

On milk quality, milk fat content did not differ significantly between total and normal lactation depending on the success of

lactation. Even if they are not significant differences in content and quantity of milk fat values were slightly lower than the normal lactation to lactation total (table 4).

Table 4

The content and quantity of milk fat to brown cattle population of Suceava county area

Specify	Statistics parameter	Lactation:						
		I	II	III	IV	V	VI	VII
Fat content on total lactation (%)	n	215	198	171	140	105	63	41
	X	<b>3,84</b>	<b>3,85</b>	<b>3,88</b>	<b>3,98</b>	<b>3,96</b>	<b>3,81</b>	<b>3,84</b>
	±s <sub>x</sub>	0,08	0,06	0,06	0,04	0,05	0,06	0,11
	V%	7,89	8,31	8,54	10,50	10,19	8,53	9,41
	min	3,41	3,06	3,05	3,50	3,38	3,36	3,27
	max	4,87	4,93	4,89	4,80	4,61	4,93	4,90
Fat quantity on total lactation (kg)	n	215	198	171	140	105	63	41
	X	<b>151,30</b>	<b>148,21</b>	<b>159,11</b>	<b>185,31</b>	<b>172,61</b>	<b>164,10</b>	<b>165,5</b>
	±s <sub>x</sub>	4,51	5,65	5,32	14,08	8,89	14,18	8,56
	V%	29,13	26,74	21,08	26,48	28,32	21,72	27,66
	min	58,60	71,30	65,00	82,00	60,40	89,40	89,70
	max	421,10	468,50	459,40	776,30	668,10	532,90	384,10
Fat content on normal lactation (%)	n	215	198	171	140	105	63	41
	X	<b>3,83</b>	<b>3,85</b>	<b>3,87</b>	<b>3,95</b>	<b>3,94</b>	<b>3,80</b>	<b>3,82</b>
	±s <sub>x</sub>	0,05	0,03	0,02	0,04	0,03	0,05	0,07
	V%	8,26	7,83	8,93	9,24	9,43	9,00	9,40
	min	3,41	3,06	3,05	3,48	3,38	3,48	3,27
	max	4,84	4,92	4,73	4,80	4,69	4,93	4,84
Fat quantity on total lactation (kg)	n	215	198	171	140	105	63	41
	X	<b>118,38</b>	<b>112,46</b>	<b>118,98</b>	<b>142,11</b>	<b>131,87</b>	<b>119,62</b>	<b>121,6</b>
	±s <sub>x</sub>	3,52	4,66	4,60	9,78	6,87	8,62	7,11
	V%	26,48	23,10	20,20	22,11	28,35	26,24	25,68
	min	67,90	72,25	68,50	84,40	68,10	89,40	97,60
	max	395,40	443,10	410,23	698,40	635,40	516,40	376,40

Milk fat content on total lactation on successive lactates ranged from 3.98% to lactation IV, with limits between 3.41% and 4.87% to 3.81%, the most low of seven lactates, with limits between 3.36% and 4.63%.

The total amount of fat on lactation and normal, it was consistent with recorded lactation milk production, its maximum being 185.31 kilograms and was registered in lactation IV and the minimum value is 151.30 kilograms VII of the lactation.

Appropriate fat content, amount of fat in normal lactation significantly different compared with the total lactation, differences of the same order of magnitude as the quantity of milk.

#### CONCLUSIONS

Following research the following conclusions can be drawn:

- ▶ for farms studied, with brown cows, in Suceava County, estimate variability reflects very heterogeneous groups and the lack of rigorous selection and great influence of the technological factors operating, first feeding, the production achieved;
- ▶ the assessments made on production performance, on successive lactates result that the average duration of total lactation showed very close values (344.9 days) the limits shown in the literature;
- ▶ indices analysis of milk production and their variability on successive lactates and the firm is found that the population has made the 4100 kg milk production performance, on each of seven successive lactates, but with a

very pronounced variability within farms and between farms ;

►protein content (3.26%) performed productive life was entered in the data presented in the literature;

►parameter on the fat content (3.88%) is remarkable average variability of populations analyzed ( $V\% = 4\% - 10\%$ ), the mean value obtained fits the data presented in literature.

## REFERENCES

[1]. Bocanici Mioara, 2007 - *Contribution to study cattle growth in private holdings and Campulung Moldovan Dorna Basin*. Doctoral Thesis, U.S.A.M.V., Iasi

[2]. Danaila Rodica Ujica, V., and col., 2005 - *Genetic parameters for characters morfoproductive of cattle raised in some private farms in Moldova*, the annual Scientific Session "Achievements and Prospects of European livestock", 22-23 April, Iasi

[3]. Ducroq, V., 1990 - *Les techniques d'Evaluation génétique des bovins laitiers*. INRA Production Animales, Vol XIII, p.401-411

[4]. Esse, A., 1998 - *Longevity in Dairy Cattle breeding: a review*. Livest Prod. Sci. 57, p. 79-89

[5]. Gemene, Gh, and col., 2005 - *Growth and operation of dairy cows in micro family in the North-east of Moldova, managerial and technical study, efficiency and agritourism*. Pan Europe Publishing House, Iasi

[6]. Gilca, I., Drăgotoiu D., 2003 - *Technology growth and exploitation of animals*, Ed ACE, Bucharest

[7]. Gilca I and col., 2009 - *Researches concerning the comparison of milk yield between cattle of Schwyz breed imported from Switzerland and Brown of Maramures breed* - UASVM Iasi, scientific papers, Livestock Series, Vol.52 (14)

[8]. Silistru, V., 1997 - *Contributions to the Brown Swiss breed influence on morpho-productive characteristics and breeding of the brown cattle from the eastern part of the country (Moldova)*. Doctoral Thesis, U.A. Iasi

[9]. Ujica, V., Silistru, V., Marc Mioara, Sone, C., 1997 - *Race brown in Romania, past, present and future*, scientific papers, first congress of engineers zootechnicians in Romania - UASVM Iasi, 10-12 December.

[10]. Ujica, V. and col., 2000 - *Aspects of Cattle Breeding in Small and Medium Family Farms in the Hill and Mountains Zones of Moldova - Romania*, bulletin FAO Technical Review Series 57.