RESULTS OBTAINED CROSSING ROMANIAN SPOTTED COWS WITH RED HOLSTEIN BULLS AT RESEARCH STATION JUCU, CLUJ COUNTY

Bărbieru V. A.*, G. Onaciu, I. Drocaş, M. Munteanu
*University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Mănăştur St.3-5, 400372, Cluj-Napoca, Romania, *Corresponding author:barbieru@iname.com*

Abstract. This work present the results obtained crossing Romanian Spotted cows with Red Holstein bulls at Research Station Jucu (Cluj County, Romania). The half-blood females (50% Red Holstein) and the control batch (whitens) females (100% Romanian Spotted breed), have been analyzed, concerned body sizes, milk and feet productions per cow between born to III-rd lactation. The obtained results (Table 1-2) demonstrated the superiority of half-blood females (50% Red Holstein) to Romanian Spotted females for milk and fat production with 18 – 28 % and small differences of body size.

Keywords: crossing breeds, milk production, body size.

INTRODUCTION

An improvement solution of Romanian Spotted cattle breed for milk production and other indexes is crossing with specialized breeds like Red Holstein. Genetic progress annually to the economically useful characters subject to selection is about 1-2% and passed the 2-15 years (Bichard, 1972), depending on the number of multiplication and the interval between generations in animal farms. Adding a heterosis effect in addition of additive progress induced in elite farms constitutes the major contribution that cow's farms can bring to achieving genetic progress. Improvement system using crossing between breeds (interbreeding) has multiple advantages, heterosis increase in annual milk production has brought a gain of up to 36%, remarkable results have been achieved also in the direction of breeding activity, productive longevity, feed conversion index, increase resistance to disease, etc. Similar experiments were conducted both in our country and in other countries such as:

- In period 1975-1980, also at Research Station Jucu, (Cluj County, Romania), has been crossed Romanian Spotted breed with Rotbuntes breed <Red Danish, Denmark> (*Ilea Şt., 1977*) and obtained a milk production increase of 26%;
- In USA, Illinois Urbana University experience crossing Guernsey and Holstein breeds (*Batra, T. R., R. W. Touchberry 1974*)
- In USA, Cornell University, Ithaca, NY, cross 3 breeds: Ayrshire, Brown Swiss and Holstein (*McDowel R.E. 1986*).
- In Denmark experience crossing Red Danish, Finnish Ayrshire and Holstein-Friesian (*Pedersen, J., Christensen, L.G. 1989*).

MATHERIAL AND METHOD

The genetic material was represented by caws belong to Romanin Spotted breed from Research Station Jucu and paternal used semen from bulls Red Holstein and Romanian Spotted breeds. To conduct the experiment were constituted 2 batches of 50 cows <Go> that have been inseminated with doses of frozen semen originated from RIKKERT TRIPLE

50580 Taurus (Red Holstein) as an experimental batch, i.e. Taurus Valer 6849 (Romanian spotted) as control group. Livestock were kept in same stables and have same feeds during the experiments. Female products obtained (F1) were individualised, for each calf recording on computer files following characters:

- body sizes from birth, 6, 12, 18 months and adults,
- reproduction indexes
- milk production and fat on lactating I, II, III.

RESULTS AND DISCUSSION

Body size of female sex products from those two groups (Control batch & Experimental batch) were measured at birth, 6 months, 12 months, 18 months and adult age (1st lactation) being presented in table 1, obtained averages ($\bar{X}$), standard deviation ($S_{\bar{x}}$) and coefficient of variability (V%).

Table 1

Age	Body sizes - cm -	Control batch			Experimental batch		
		n	$\bar{X} \pm S_{\bar{x}}$	V%	n	$\bar{X} \pm S_{\bar{x}}$	V%
BIRTH	Withers heigh	23	72.8 ± 0.9	5.3	25	76.5 ± 0.6	3.9
	Chest depth	23	26.6 ± 0.7	10.5	25	28.1 ± 0.7	5.1
	Chest perimeter	23	81.4 ± 1.4	6.8	25	84.7 ± 1.8	6.1
	Oblique body length	23	67.8 ± 0.7	3.0	25	69.0 ± 0.9	7.4
	Shoulder wide	23	19.0 ± 0.1	3.6	25	19.8 ± 0.2	4.9
	Shoulder length	23	21.3 ± 0.4	7.5	25	22.5 ± 0.4	5.9
6 MONTHS	Withers heigh	23	89.1 ± 1.1	5.0	25	96.5 ± 0.5	2.0
	Chest depth	23	39.4 ± 0.7	7.1	25	43.1 ± 0.5	4.5
	Chest perimeter	23	117.2 ± 1.8	6.1	25	126.1 ± 0.7	1.9
	Oblique body length	23	93.5 ± 2.0	8.5	25	101.4 ± 1.8	3.9
	Shoulder wide	23	28.5 ± 0.6	8.8	25	29.7 ± 0.5	6.0
	Shoulder length	23	29.7 ± 0.6	8.5	25	33.0 ± 0.4	4.5
12 MONTHS	Withers heigh	23	109.7 ± 1.0	3.8	25	108.4 ± 0.4	1.3
	Chest depth	23	50.5 ± 0.4	3.5	25	51.0 ± 0.2	1.5
	Chest perimeter	23	139.8 ± 1.1	3.2	25	142.5 ± 1.0	2.4
	Oblique body length	23	119.8 ± 0.7	2.3	25	111.7 ± 0.7	2.4
	Shoulder wide	23	35.5 ± 0.3	4.2	25	34.6 ± 0.2	3.8
	Shoulder length	23	38.0 ± 0.4	5.0	25	37.8 ± 1.4	4.2
18 MONTHS	Withers heigh	23	116.0 ± 0.8	3.0	25	116.8 ± 0.6	1.8
	Chest depth	23	54.5 ± 0.5	3.8	25	56.7 ± 0.2	1.7
	Chest perimeter	23	154.2 ± 1.6	4.2	25	157.3 ± 1.2	2.7
	Oblique body length	23	126.3 ±1.0	3.2	25	124.0 ± 1.0	2.9
	Shoulder wide	23	39.1 ± 0.3	3.5	25	38.8 ± 0.2	2.3
	Shoulder length	23	41.8 ± 0.3	3.3	25	42.7 ± 0.5	4.4
ADULTS	Withers heigh	23	120.2 ± 0.4	1.5	25	123.7 ± 0.4	0.8
	Chest depth	23	64.6 ± 0.4	2.6	25	66.2 ± 0.3	1.5
	Chest perimeter	23	179.4 ± 0.6	1.4	25	186.3 ± 0.5	2.1
	Oblique body length	23	145.2 ± 0.4	1.1	25	146.8 ± 1.5	2.6
	Shoulder wide	23	46.5 ± 0.3	3.0	25	47.0 ± 1.5	6.5
	Shoulder length	23	49.2 ± 0.3	2.5	25	48.1 ± 0.8	2.3

Analyzing the evolution of body sizes (table 1) we can see small superiority of hybrid female calfs (the experimental batch) at birth and at age of 6 months, after which the values are close to the age of 12 and 18 months, followed by a small increasing of hybrids values as adults (cows),this issues highlighted by the following graphs (fig. 1-3).

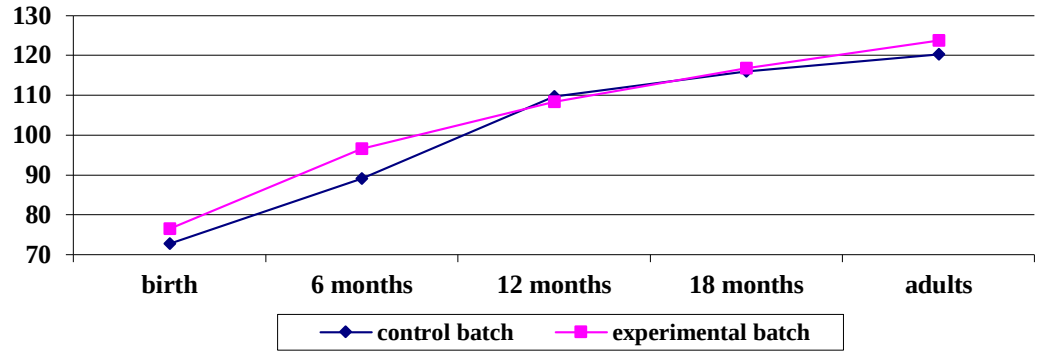

Fig. 1. Withers heigh evolution of female calfs from two batches

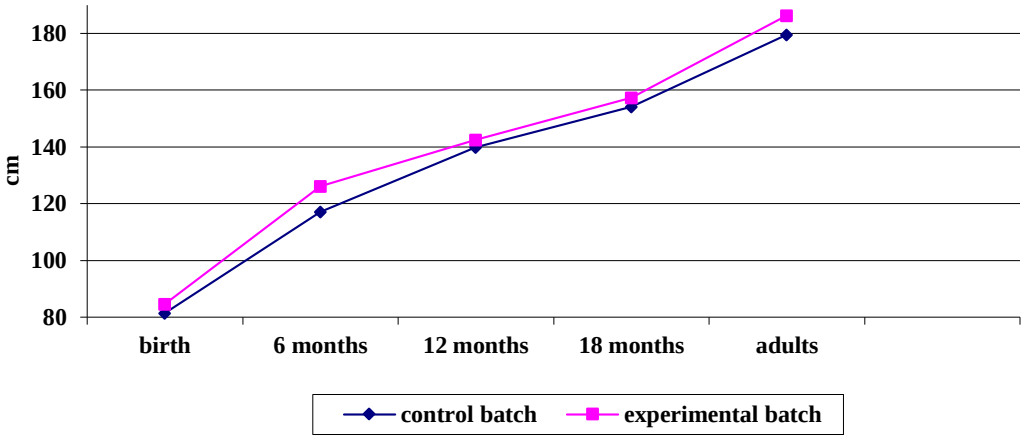

Fig. 2. Chest perimeter evolution of female calfs from two batches

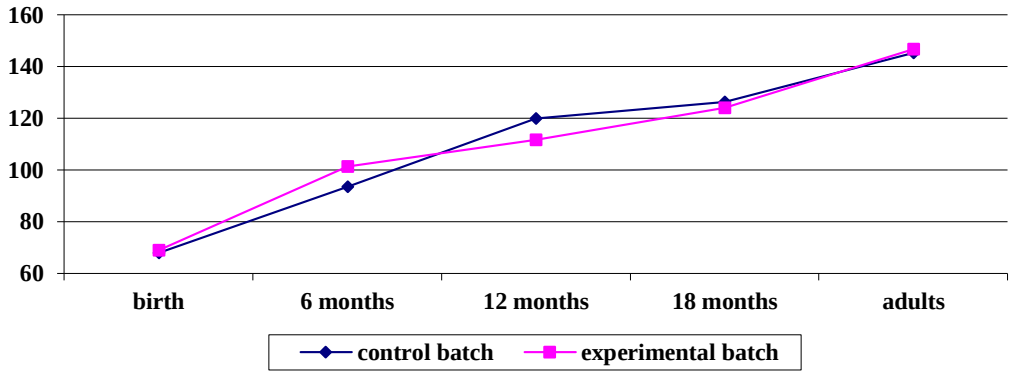

Fig. 3. Oblique body length evolution of female calfs from two batches

In milk production, between this two groups there are significant differences in most cases statistical provided. If the first lactation the difference is 18.05% for experimental batch, this increase in lactation II at 28.83% and 26.4% to lactation III (table 2) and highlighted in fig.4.

Table 2

Specificare	U.M.	Control batch (BRxBR)			Experimental batch (RHxBR)			Difference & statistical provided	
		n	$\bar{X} \pm S_{\bar{x}}$	V%	n	$\bar{X} \pm S_{\bar{x}}$	V%		
Age of first birth	months	22	34.7 ± 1.36	18.4	25	33.5 ± 2.2	18.1	1.2	x
Milk production at Ist Lactation	Kg	22	2299 ± 94	19.3	25	2714 ± 218	26.6	415	xxx
Milk production at IInd Lactation	Kg	17	2462 ± 156	20.2	18	3172 ± 771	17.2	710	xxx
Milk production at IIIrd Lactation	Kg	12	2823 ± 830	29.2	13	3568 ± 320	24.4	745	xxx
Fat production at Ist lactation	Kg	22	88.5 ± 3.9	21.1	25	99.6 ± 1.65	18.2	11.1	xxx
Fat production at IInd lactation	Kg	17	96.1 ± 6.7	22.1	18	116.4 ± 2.37	19.7	20,3	xxx
Fat production at IIIrd lactation	Kg	12	108.4 ± 5.5	23.1	13	130.9 ±2.51	24.1	22,5	xxx
Fat %	%	22	3.84 ± 0.01	5.5	25	3.67 ± 0.01	5.4	0.17	x

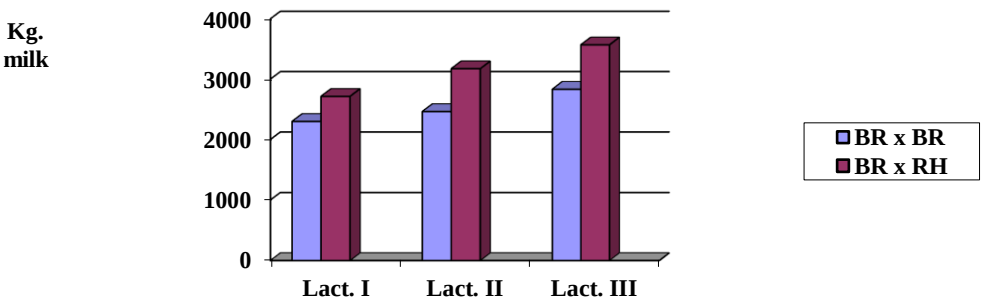

Fig. 4. Evolution of milk productions for control batch (BR x BR) and experimental batch (BR x RH)

CONCLUSIONS

- Female sex products from experimental batch have a small superiority of main body size at birth and 6 months, but at the age of 12 months and 18 months the body size are mostly similar to control and experimental batches, followed by a small difference as adults for experimental batch.
- Milk and fat production are much bigger to experimental batch for all lactations, the differences obtained are similar with the results from other authors.

REFERENCES

1. Batra, T. R., R. W. Touchberry (1974) - Weights and body measurements of purebred Holstein and Guernsey females and their crossbreds. J. Dairy Sci. 57:842.

2. Bărbieru, V.A. - (2004) - Contributions to the characterization of populations of Romania

Spotted cattle breed in order to optimize its technology operating in the specific conditions in Central Transylvania. Doctoral thesis USAMV Cluj-Napoca.

3. Ilea, St. – (1977) - Forming lines and families in the core of Romanian Spotted cattle breed from SEZ Jucu-Bontida (Cluj County) and their morpf-production qualities. Simposium of Agronomy House Cluj County.
4. McDowell R.E., (1986) – Growth and Reproduction Characteristics of Purebred and Crossbred Dairy Cattle in First Lactation, J. Dairy Sci. 69, pag.782 – 793.
5. Pedersen, J., Christensen, L.G. (1989) - Heterosis for milk production traits by crossing Red Danish, Finnish Ayrshire and Holstein-Friesian cattle. Livestock sciences 1989, vol. 23, pag. 253-266.