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MILK YIELD OF PRIMIPAROUS COWS AS DEPENDENT UPON THE COUNTRY OF ORIGIN OF SIRES

Jacek Szarek, Janina Pogorzelska

University of Warmia and Mazury in Olsztyn, Department of Cattle Breeding,
Oczapowskiego 5, 10-719 Olsztyn, Poland.

Milk yield of cows is related not only to environmental conditions, but also to genetic factors, including breed and – in the case of imports – the country of origin of sires (Sablik et al. 2001, Czaplicka et al. 2001, Wielgosz-Groth and Groth 2002).

The objective of the present study was to determine the effects of the country of origin of sires on the milk productivity of their daughters-primiparas.

Material and Methods

43779 305-day lactation of primiparous Black-and-White cows, used in the years 1997 – 2002 in north eastern Poland, were analyzed in the study. The cows were divided into groups taking into account the country of origin of their sires, i.e. Poland, France, the Netherlands, Canada, Germany and the USA. The yields of fat-corrected milk (FCM), fat and protein, milk fat content, milk protein content, and protein/fat ratio were determined.

The numerical material was analyzed statistically by a one-factor analysis of variance in a non-orthogonal design. The significance of differences between means of the parameters examined was determined by the Duncan test. Calculations were performed in the computer program STATISTICA.

Results

The cows by Dutch sires showed the highest values of milk yield parameters (Table 1). They were characterized by significantly ($P \leq 0.01$) higher yields of milk (6340.6 kg), fat (254.9 kg) and protein (208.9 kg), milk protein content (3.32%), and the best protein to fat ratio (0.828), as compared with the other groups. However, milk from these cows contained significantly ($P \leq 0.01$) less fat (0.09%), in comparison with milk from the daughters of German bulls, for which the highest value was achieved (4.17%). Similarly as in experiments carried out by Sitkowska and Mroczkowski (2004), the highest total yields of milk, protein, fat and FCM were recorded in the cows descended from Dutch

sires. In addition, these authors reported that milk from these cows had the lowest concentrations of fat and protein.

The daughters of Polish bulls (Table 1), compared with the other groups, were characterized by the lowest yields of milk (4533.9 kg), fat (182.6 kg) and protein (142.2 kg), and these differences were highly significant. In the 1990s milk production was also lower in these cows that in those by German and French sires. Milk yield in daughters of Hungarian bulls was still lower than in daughters of Polish sires (Dymnicki and Reklewski, 1994).

Table 1
Milk Yield of Primiparous Cows as Dependent Upon the Country of Origin of Sires

Specification	Statistical measures	Country of Origin of Sires						Total n=43779
		Poland n*=33696	France n=3884	Holland n=2238	Canada n=135	Germany n=2834	USA n=992	
FCM milk (kg)	LSM	4533,9 ^D	5358,9 ^C	6340,6 ^A	5840,2 ^B	5375,8 ^C	5444,1 ^C	4778,6
	SE	1307,3	1444,7	1350,3	1399,4	1328,0	1478,0	1414,4
Fat (kg)	LSM	182,6 ^D	216,8 ^C	254,9 ^A	234,4 ^B	218,5 ^C	216,5 ^C	192,6
	SE	55,3	61,4	58,6	59,7	57,4	62,2	59,7
Protein (kg)	LSM	142,2 ^{Dab}	168,7 ^{Cab}	208,9 ^{Aab}	186,4 ^{Bab}	167,6 ^{Cb}	172,8 ^{Ca}	150,5
	SE	41,9	48,0	46,3	45,8	43,2	48,1	46,2
Fat (%)	LSM	4,07 ^{Aa}	4,13 ^{ABb}	4,08 ^{Ab}	4,06 ^{Aa}	4,17 ^{Bab}	3,95 ^{Cab}	4,08
	SE	0,46	0,50	0,56	0,53	0,48	0,48	0,47
Protein (%)	LSM	3,17 ^{CDa}	3,20 ^{BCb}	3,32 ^{Aab}	3,21 ^{Bab}	3,19 ^{BCab}	3,14 ^{Db}	3,18
	SE	0,21	0,23	0,22	0,20	0,22	0,21	0,22
Protein/fat ratio	LSM	0,786 ^{Ca}	0,784 ^{Ca}	0,828 ^{Aab}	0,802 ^{Bab}	0,773 ^{Cb}	0,805 ^{Bab}	0,788
	SE	0,086	0,093	0,112	0,101	0,084	0,098	0,089

n* - number of lactations

A, B... - $P \leq 0,01$; a, b - $P \leq 0,05$

The fat content of milk from the cows by Polish sires (4.07% - Table 1) was similar to that observed in the cows descended from Dutch (4.08%) and Canadian (4.06%) bulls, and highly significantly higher than that recorded in the daughters of American sires (3.95%). In a study conducted by Dorynek et al. (1998) milk from cows by Polish sires contained much more fat (4.85%) than milk from cows by French, German and Swedish sires. Our research showed that milk from the daughters of Polish bulls also had a significantly lower protein content (0.03 to 0.15%), in comparison with milk from the daughters of French (3.20%), Dutch (3.32%) and Canadian (3.21%) sires. The lowest milk protein concentration (3.14%) was found in the cows descended from American bulls. The reason for low milk protein content is probably bull selection, as confirmed by the results of this experiment. Another important factor is feeding system (Trela et al. 2000).

The protein to fat ratio varied from 0.773 to 0.828 in the groups analyzed. A value exceeding 0.8 was recorded in the primiparas by Dutch, Canadian and American sires.

Conclusions

The cows descended from Dutch bulls were characterized by the highest milk productivity.

A fat content below 4% was recorded in milk from the cows by American sires; their milk was also poorest in protein (3,14%).

The highest protein to fat ratio, observed in Dutch cows, resulted from the highest protein content of their milk (3.32%).

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SUITABILITY OF MULTIPLE REGRESSION EQUATIONS FOR ESTIMATING BREAST AND LEG MUSCLE CONTENT IN MUSCOVY DUCKS

Katarzyna Kleczek, Kazimierz Wawro, Elżbieta Wilkiewicz-Wawro

Department of Breeding Methods and Animal Improvement
University of Warmia and Mazury in Olsztyn, Poland

Introduction

Muscovy ducks, similarly as chickens and turkeys, can be used for meat production. The carcass dressing percentage of Muscovy ducks is about 74% (5). Carcasses of Muscovy ducks, compared with those of Pekin ducks, usually contain more breast and leg muscles (1,2,3). Further selection within this species towards meatiness improvement requires reliable methods for meat content prediction. Thus, the objective of the present study was to develop multiple regression equations for intravital estimation of breast and leg muscle content in Muscovy ducks.