

*Full Length Research Paper*

## **Correlation analysis of milk production traits across three generations of Simmental cows**

**Petrovic D. Milun<sup>1\*</sup>, Bogdanovic Vladan<sup>2</sup>, Djedovic Radica<sup>2</sup>, Skalicki Zlatko<sup>2</sup>,  
Petrovic M. Milan<sup>3</sup>, Bogosavljevic-Boskovic Snezana<sup>1</sup> and Djokovic Radojica<sup>1</sup>**

<sup>1</sup>University of Kragujevac, Faculty of Agronomy, Cacak, Cara Dusana 34, 32000 Cacak, Republic of Serbia.

<sup>2</sup>University of Belgrade, Faculty of Agriculture. Institute of Zootechny, Nemanjina 6, 11080 Belgrade-Zemun, Republic of Serbia.

<sup>3</sup>Institute for Animal Husbandry, Belgrade-Zemun, 11080 Zemun, Republic of Serbia.

Accepted 4 June, 2012

The relationship between milk production traits over whole lactations was evaluated across three generations of Simmental cows (between daughters, dams and granddams) by a correlation analysis with whole lactation traits in the daughter generation being used as the dependent variables ( $x_1$ ), and those in the dam and granddam generations being used as the independent variables ( $x_2$  and  $x_3$ ). The results were obtained from a sample of 1170 daughters and as many dams and granddams. The correlation of whole lactation milk production traits between daughters, dams and granddams, as calculated by simple, partial and multiple correlation coefficients was very weak or non-existent. All of the calculated simple and partial correlation coefficients were positive and mostly statistically very significant ( $P < 0.01$ ). The calculated coefficients of multiple correlation ( $R_{1,23}$ ) between lactation length, milk fat content, milk yield, milk fat yield and 4% FCM yield with the expression of the traits in the daughters being used as the dependent variable and that in the dams and granddams as the independent variable were statistically very significant ( $P < 0.01$ ), amounting to 0.091, 0.251, 0.180, 0.133 and 0.153, respectively.

**Key words:** Simmental breed, production traits, generation, coefficient of partial correlation, coefficient of multiple correlation.

### **INTRODUCTION**

The heritability of milk production traits of 25% continuous breeding for improvement and the enhancement of raising conditions lead to both yield increases and correlative relationship among traits across generations. However, the relevant literature on the correlation among production traits across generations is rather scarce. Yield increases across generations have been facilitated by continuous breeding work and improving raising conditions, primarily nutrition and care, as reported by Rycken (1996, 1997, 1998), whereas Serbian authors observe declining trends in milk and milk

fat yields across generations in imported breeding heifers as being primarily induced by poorer raising conditions and earlier exposure to breeding as compared to the situation in Western European developed countries (Germany, Switzerland, Austria) from which they were imported (Lazarević et al., 1984; Nenadovic et al., 1986; Petrović et al., 1997; Pantelić, 1997, 2008).

The above mentioned facts suggests that more substantial increases in milk performance in Serbian spotted Simmental dairy cattle can be achieved through breeding work by using superior sire bulls and via timely exposure to breeding along with continuous improvements in raising conditions as compared to the imported Simmental breeding heifers. Knowledge of genetic and phenotypic parameters is of great importance in the evaluation of the additive genetic value of milk traits in cattle population (Pantelić et al., 2011). Genetic

\*Corresponding author. E-mail: milunp@tfc.kg.ac.rs.  
Tel:+38132303400. Fax: +38132303401.







