

## RELATION BETWEEN POLYMORPHIC PROTEINS OF BLOOD SERUM OF CATTLE AND IMPORTANT TRAITS OF PERFORMANCE

Rapport entre la protéine polymorphique du serum sanguin chez le bétail  
avec des caractères importants de performance

Relación entre la proteína polimórfica del suero sanguíneo de vacuno  
con importantes caracteres de rendimiento

J. KLIMENT \*

We studied the relations of biochemical polymorphism of blood serum proteins to some indices of milk utility. 453 dairy cows of the Slovak spotted cattle of three breed herds were evaluated. We observed six polymorphic marks with the total number of 31 types, namely: haemoglobin and post-albumins (*AA, AB, BB*); carbonic anhydrase (*FF, FS, SS*); ceruloplasmin and amylase (*AA, BB, CC, AB, AC, BC*) and transferins (*AA, D<sub>1</sub>D<sub>1</sub>, D<sub>2</sub>D<sub>2</sub>, EE, AD<sub>1</sub>, AD<sub>2</sub>, AE, D<sub>1</sub>D<sub>2</sub>, D<sub>1</sub>E, D<sub>2</sub>E*).

From the milk utility indices we evaluated the milk amount in Kg, fat content percentage, fat in Kg, FCM, relative utility (milk amount per 100 Kg of live weight) according to lactations.

The mathematical-statistical evaluation was carried out on the computing machine MSP-2A. We calculated the variation-statistical values for individual groups of dairy cows with a different type of polymorphic marks in each herd separately and for the whole set together. By means of t-test a divergence significance was calculated among groups consisting of five dairy cows at least.

The average utility of the whole dairy cow set in the first lactation was: milk amount 3272 Kg, 3.91 per cent of fat, 130 Kg of fat, 3232 Kg of FCM, 612 Kg of milk per 100 Kg of live weight.

The difference significance among dairy cows of different types of polymorphic marks and milk utility was manifested differently according to individual herds and at the evaluation of the whole set together.

Most frequently significant differences of individual types of polymorphism were in the case of haemoglobin and transferins, then at postalbumins and also

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\* Agricultural University, Nitra 949 01, Czechoslovakia/CSSR.

at amylase. The tendency of a «higher» utility without difference significance (at the levels of  $\alpha$  0.05 and  $\alpha$  0.01) often occurred. In individual herds and at individual indices of milk utility the same types of polymorphism were not always the «best».

In order to compare more deeply the relations of individual types of polymorphism and milk utility we calculated the average values of the indices observed for the dairy cows with *homozygous* and *heterozygous* sets. There appeared an unambiguous tendency that *heterozygotes* have the highest milk utility at ceruloplasmin and carbonic anhydrase and *homozygotes* at amylase.

At transferrins the dairy cow group  $D_1D_1$ ,  $D_2D_2$ ,  $D_1D_2$  had a higher milk utility than the dairy cows with the other types ( $AA$ ,  $EE$ ,  $AD_1$ , etc.).

At postalbumins individual types were manifested differently. In some cases homozygous ones ( $AA$ ,  $BB$  respectively) were better in others heterozygous ones ( $AB$ ).

The numeric values are worked out in tables and diagrams. The differences in the utility of the compared dairy cow groups make as much as 550 Kg of milk, 0.1 per cent of fat and 20 Kg of fat.

The obtained results show to certain possibilities of utilizing biochemical and polymorphic marks of blood serum when selecting dairy cows. A selection is to be carried out according to several combinations of polymorphic marks. It has been shown that the relations found among the types of polymorphism and utility hold for actual herds (sets, breeds).

The study of other herds, when increasing the number of indices of significant farm characteristics and various combinations of polymorphic types and marks is being continued.

## SUMMARY

The author has observed the relations between the milk utility of the cows of the Slovak Spotted Breed and six biochemical polymorphic characters ( $Hb$ ;  $Ca$ ;  $Pa$ ;  $Tf$ ;  $Cp$ ;  $Am$ ). Obtained results have confirmed the existence of a positive correlation between some coefficients of milk utility and particular combinations of phenogroups within one as well as several genetic systems. It will be possible to make use of the obtained results in the selection of farm animals.

## RESUME

L'auteur a observé qu'il y existe des rapports entre l'utilisation de productrices de lait de la race slovaque tachée, et six caractères polymorphiques ( $Hb$ ;  $Ca$ ;  $Pa$ ;  $Tf$ ;  $Cp$ ;  $Am$ ). Les résultats obtenus confirment l'existence d'une corrélation positive entre quelques coefficients de la capacité laitière, et quelques combinaisons particulières de phénogroups, tant dans un système génétique comme dans plusieurs. Il sera possible d'utiliser les résultats obtenus dans la sélection des animaux domestiques.

## RESUMEN

El autor ha observado que existen relaciones entre la utilización productora de leche de la raza eslovaca berrenda y seis caracteres polimórficos (*Hb*; *Ca*; *Pa*; *Tf*; *Cp*; *Am*). Los resultados obtenidos confirman la existencia de una correlación positiva entre algunos coeficientes de la capacidad lechera y combinaciones particulares de fenogrupos tanto dentro de uno como de varios sistemas genéticos. Será posible utilizar los resultados obtenidos en la selección de los animales domésticos.

