

THE REPEATABILITY STUDY OF CHARACTERS FOR DEVELOPMENT, REPRODUCTION AND MILK PRODUCTION AT THE ACTIVE ROMANIAN BLACK SPOTTED POPULATION FROM PANTELIMON AND MOGOSOAI A FARMS

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Abstract

This paper presents Romanian Black Spotted characters regarding repeatability parameter for the development, reproduction and milk production at the Pantelimon and Mogosoia farms. The milk production is the main target when we follow the goal of milk production exploitation from those two farms. From the repeatability character point of view, the quantitative characters can be divided in three categories: strong repeatability characters, when the repeatability coefficient is higher than 0.50 (milk production quality acquiring), medium repeatability characters when the repeatability coefficient is between 0.20 and 0.50 (milk production quantitative acquiring), poor repeatability characters when the repeatability coefficient is lower than 0.20 (reproduction characters and general biologic acquiring characters). The repeatability for milk quantity has different values for Pantelimon farm (0.484±0.11) and Mogosoia farm (0.430±0.15); we found similar values like other authors for Romanian Black Spotted population. The study conduct by us revealed lower values for repeatability at the fat percent (0.430±0.17 - Pantelimon farm and 0.380±0.17 - Mogosoia farm) comparative with those from the profile literature: Cacula et al .(1968)-0.780, Alexoiu (1983) – 0.690, Murat (1985) – 0.710; exception being the values calculated by Georgescu (1984) – 0.220. The repeatability characters for milk production determined by us at the Romanian Black Spotted cattle population from our study is alike with the values write in the profile literature, exception being the fat percent, which is lower.

Key words: repeatability, repeatability coefficient, fat percent, far quantity, milk quantity.

INTRODUCTION

This paper studies the characteristics of the Romanian Black Spotted breed in terms of parameter heritability of character development, reproduction and milk production farms from Pantelimon and Mogosoia.

Milk production is the main objective pursued in milk production operation on the two analyzed farms.

Lash (1937) defined genetic repeatability as a parameter, indicating phenotypic expression of the same character in the same individual at different times of life. In this situation, segregation and independent assortment of the genetic material cannot be considered as a source of fluctuations from one performance to another during the life of the animal.

Alexoiu (1983) highlights that repeatability is a parameter that expresses the upper limit of genetic heritability and while repeatability is a property of each character, being also the property of the population and generation are determinations.

MATERIALS AND METHODS

Depending on the characters of repeatability, quantitative characters can be divided into three categories (Georgescu, 1988):

- strong-repeatable when CR (coefficient of repeatability) is greater than 0.50 (the case of qualitative milk production);
- repeatable medium when CR characters varies between 0.25 and 0.50 (the case of the quantitative production of milk).

Characters poorly reproducible when CR is less than 0.25 (breeding character and situation of general biological traits).

Repeatability is a genetic parameter considered in genetic evaluation and breeding bulls. Thus, Schaffer (1976) recommends choosing minimum repeatability to ensure objective comparison of bulls at the international level.

RESULTS AND DISCUSSIONS

Repeatability coefficient values obtained for characters milk production in Romanian Black Spotted cows population from Pantelimon and Mogosoia farms, is located within the limits of the data presented in the literature.

Table.1. Comparative variation of repetability of milk production in cows from Pantelimon and Mogosoia farms

| Nr.crt. | Farm | Milk quantity | Fat quantity | Fat % |
|---------|------------|---------------|--------------|------------|
| 1. | Pantelimon | 0.484±0.11 | 0.524±0.13 | 0.430±0.17 |
| 2. | Mogosoia | 0.430±0.15 | 0.520±0.10 | 0.380±0.17 |

The data table 1 is established that the character of milk production in dairy analyzed population have an average repeatability different depending on the nature of the character (quantity of milk, amount of fat, fat percentage). So:

The amount of their milk repeatability genetic this parameter has different values at the two farms in the study (Farm Pantelimon - 0.484 ± 0.11; Farm Mogosoia - 0.430 ± 0.15) values similar to those found by other authors breed of Romanian Black Spotted cattle.

Samely or closely values were found by others researchers: Thompson and Freeman – 0.501, Mather et al. – 0.440, Johansson -0.400, Syrstad – 0.430, Cacula et al. – 0.428, Barker and Roberthson – 0.430.

Higher values were set by Butcher and Freeman – 0.560, Alps – 0.540, and lower by Hartmann – 0.340, Murat – 0.330 and Muresan – 0.250.

Generally, repeatability amount of milk falls into the values found in literature at Holstein-Friesian cattle breed.

The repeatability of the amount of fat- greater was found on the Pantelimon farm (0.524 ± 0.13), with about 5% higher than on the

Mogosoia farm. Both farms repeatability fat intake registered a value superior to that found for the amount of milk. Repeatability value found by us is similar to those established by Butcher and Freeman (1968) -0.519, Cacula et al., (1968) - 0.510, Forster (1971) - 0.537 and twice that found by Muresan (1984) - 0.260. In general, the repeatability of the amount of fat is highly repeatable character is within the range indicated by the literature.

The repeatability of the percentage of fat - this purpose, the repeatability is found by us (430±0.17 at Pantelimon farm and 0.380±0.17 at the Mogosoia farm) is lower than those found in the literature: Cacula et al. (1968) - 0.780, Alexoiu (1983) - 0.690, Murat (1985) - 0.710; except that determined by Georgescu (1984) - 0.220.

The repeatability value that we established for this character indicates a strong influence of environmental factors on it, reducing the certainty assessment or improvement value. Instead, repeatability and quantity of milk-fat creates favorable premises for increasing certainty phenotypic assessment to determine the actual production and capacity utilization in the animal improvement.

Table 2.Comparative repetability coefficient variation of the milk production characters in dairy cows from Pantelimon and Mogosoia farms in the sequence of lactation

| Nr.crt. | Farm | Milk quantity | | | Fat quantity | | | Fat % | | |
|---------|------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | | I | II | III | I | II | III | I | II | III |
| 1 | Pantelimon | 0.64± 0.28 | 0.41± 0.13 | 0.54± 0.22 | 0.53± 0.18 | 0.44± 0.16 | 0.52± 0.17 | 0.27± 0.15 | 0.20± 0.05 | 0.33± 0.13 |
| 2 | Mogosoia | 0.48± 0.21 | 0.42± 0.18 | 0.33± 0.15 | 0.58± 0.26 | 0.46± 0.20 | 0.42± 0.19 | 0.36± 0.13 | 0.28± 0.12 | 0.30± 0.19 |

Repeatability amount of milk - at both farms studied, the value of this parameter in the sequence of lactations, recorded the highest rates in primiparous (0.64 ± 0.28 at the Pantelimon farm to 0.48 ± 0.21 at the Mogosoia farm) then declined cows secundiparous tendency is preserved and lactation III to farm Mogosoia.

Repeatability amount of fat - by age, there is an increasingly high value on breast feeding I, high value being recorded at the primiparous from the Mogosoia farm (0.58 ± 0.26). Further evolution of this parameter is similar to the entire cow effective registering a downward trend from one lactation to another.

Repeatability fat-percentage - depending on the sequence of lactations, has different values at the two farms studied (between 0.20-0.33 at the Pantelimon farm to 0.28-0.36 at the Mogosoia farm). **Butcher** and **Freeman** show that the links between successive lactations increases as the animal gets older.

Thus, the coefficient of repeatability of fat percentage increase of 2.35 times on adult cows compared to primiparous.

CONCLUSIONS

Overall, milk production repeatability characters we established at the Romanian Black Spottedherd breed analyzed is similar to values found in the literature, except fat percentage, which has a lower value.

REFERENCES

- Alexoiu A., 1983. Studiul insusirilor fenotipice si genotipice ale populatiei active de taurine zonate in Romania, IANB, Bucuresti.
- Barba D., Margarit G., Toma R.C., 2016. The heritability study of the characters for development, reproduction and milk production at the active RSC population from the Bucharest area of milk supply, Scientific Papers. Series D. Animal Science. Vol. LIX.
- Dinu I., Georgescu Gh., Popescu-Vifor S., 1982. Dictionar enciclopedic de zootehnie, Ed. Ceres, Bucuresti
- Georgescu Gh. 1983. Cartea fermierului – Cresterea taurinelor, Ed. Ceres, Bucuresti
- Georgescu, Gh. (coord.), 1993. Cercetari privind optimizarea controlului productiei de lapte la vaci, Lucr. St. ,seria D, USAMV, Bucuresti
- Murat Jeana, Murat I., 1997. Monografia rasei BNR, Ed. Tehnica Agricola, Bucuresti
- Petcu M., 2000. Cercetari privind maximizarea productiei de lapte in ferma de Elita Pantelimon, Teza de doctorat, USAMV-Bucuresti.
- Sandu Gh.,1995. Modele experimentale in zootehnie, Ed. Coral Sanivet, Bucuresti
- Silvas E., 1998. Modernizarea tehnologiilor de crestere a taurinelor, EDP, Bucuresti
- Sirbulesc, V., 1996. Dinamica continutului si corelatiei procentului de grasime si proteine din laptele de vaca, IANB, Seria D, vol IX, Bucuresti
- Stockinger C. et al., 1999. Planing and evaluation of automatic milking systems. Institut fur Landtechnik der TU Munchen- Weihenstephan.
- Velea C., 1999. Productia, reproductia si ameliorarea taurinelor, Ed. Tehnica Agricola, Bucuresti.
- ***2000. Zootehnie si medicina veterinara, nr.7
- ***2000. Agrarmagazin, nr.11, Munchen.
- ***2000. Die OsterreichscheRindzucht, Wien.
- ***2015. Raport anual, A.N.A.R.Z.