

GENETIC PARAMETER ESTIMATION OF DYSTOCIA VARIABLE IN IRANIAN HOLSTEIN DAIRY CATTLE

Karami Maryam^{*}, M.T.BeigiNassiri^{**}, A.Nazari Nejad^{***}; M. Chaji^{****},
H. Roshanfekr^{*****}, B. Mohammad Nazari^{*****}

^{*}Department of Animal science, Ramin Agriculture, and Natural Resources University,
Ahwaz, Iran

^{**}Department Of animal science, Ramin Agriculture, and Natural Resources University,
Ahwaz, Iran

^{***}Department of Animal science, Ramin Agriculture, and Natural Resources University,
Ahwaz, Iran

^{****}Department of Animal science, Ramin Agriculture, and Natural Resources
University, Ahwaz, Iran

^{*****}Department of animal science, Ramin Agriculture, and Natural Resources
University, Ahwaz, Iran

^{*****}.Animal breeding Research Center, Tehran, Iran

Keywords: Holstein dairy cows, dystocia, genetic parameter, heritability

ABSTRACT

The aim of this study was to estimated genetic parameters of dystocia variable in Holstein dairy cows in Iran. For this purpose we used of data set that related to 734 herds of Holstein cows in Iran that was collected from 24 years ago (between 1990-2014) by breeding center and improve livestock production of Iran country. To study the structure of the data, descriptive statistics and observations to correction effects we used of the SAS 9.1 statistical software and GLM procedure. To obtain genetic parameters attribute dystocia we used of AI REML procedures of WOMBAT software to analyzed univariate linear model and the results obtained are as follows: Additive variance, residual variance, phenotypic variance and heritability (\pm SE) for the first period of lactation, are 0.0045103, 0.029629, 0.034139, 0.132 \pm 0.003 respectively, for the second period of lactation are 0.00063452, 0.073695, 0.074329, 0.009 \pm 0.002 respectively and for third period of lactation are 0.00036919, 0.073817, 0.074187, 0.005 \pm 0.001 respectively was estimated. In all three lactation periods we can seen that lowest percentage of dystocia was occurred at age 27 to 28 months 18.66%, between the ages of 28 to 38 months 10.14% and for ages 40 to 51 months 9.61% and by

considering Cochran Armitage test results we can determined that the difference between the classes for this trend is significant statistically($p < 0.0001$).

INTRODUCTION

The cows, That don't have access to sufficient energy in their ration can getsickness(1;2; 3). Milk production has a high priority in metabolism of dairy cows so lactating cows are more prone to get sick for example infertility than dry cows. This can ruin all the benefits of higher milk yield because of the higher prevalence of the disorders (4 ;6; 7). There is an extensive controversy among researchers about that and the proof of this hypothesis is so difficult. Although some scientists have shown these correlations (6; 7; 8) but the hypothesis of high correlation between higher milk yield and occurrence of the disorders is not completely clear. Dohoo and Martin(5) have shown that milk fever was the only disorder that has relation with milk yield among their 17 controlled disorders. They couldn't find any relationship between other controlled disorders like dystocia, retain placenta, metritis and ovarian cysts. Therefore with providing good management and nutrients sufficiency the high milk yield is not a risk factor for disorders. The Aim of study was to know the effect of higher milk yield as a risk factor of disorders and estimated genetic parameters of dystocia variable in Holstein dairy cows.

MATERIAL AND METHODS

Data of this research has gathered from veterinarians weekly visits to dairy cows herds in Iran. Data for this research had gathered from 734 herds with 1655244 Holstein-Frisian cows which had parturition among 1990-2014 by breeding center and improve livestock production of Iran country. Data were from three lactation period. Two classes of groups disorders have been analyzed. They are as follow: group dystocia positive(1) and health group(0). Each model consist of milk yield, parity, year (age) of calving to determine the correlation between

milk yield, parity, year of calving and occurring of disorders data have been analyzed with univariate linear model. In this research current lactation was used as the lactation with occurrence of particular disorder (dystocia). To study the structure of the data, descriptive statistics and observations to correction effects we used of the SAS 9.1 statistical software and GLM procedure. To obtain genetic parameters attribute dystocia we used of AI REML procedures of WOMBAT software to analyzed Univariate linear model.

RESULTS

The results obtained are as follows: Additive variance, residual variance, phenotypic variance and heritability (\pm SE) for the first period of lactation, are 0.0045103, 0.029629, 0.034139, 0.132 \pm 0.003 respectively, for the second period of lactation are 0.00063452, 0.073695, 0.074329, 0.009 \pm 0.002 respectively and for third period of lactation are 0.00036919, 0.073817, 0.074187, 0.005 \pm 0.001 respectively was estimated. In all three lactation periods we can see that lowest percentage of dystocia was occurred at age 27 to 28 months 18.66%, between the ages of 28 to 38 months 10.14% and for ages 40 to 51 months 9.61% and by considering Cochran Armitage test results we can determined that the difference between the classes for this trend is significant statistically ($p < 0.0001$). According to performed analysis on all cattles (heifers and the cows with several parturition) higher milk yield was not a risk factor for the disorder.

DISCUSSION

Lots of bias factors in researches exist about the correlation of milk yield and occurrence of the diseases that makes these relations unclear. For example elimination of low milk producers with mastitis and saving the high producers with the disease could produce a correlation between mastitis and high production but it could be false. With our knowledge, there is not many research about the relation of milk yield and diseases. It should be noted

that milk yield is not the only risk factor of diseases. Occurrence of a particle illness can have management and conditional reasons but understanding of all factors and their importance is something hard to do even with modern digital and computerized technologies, so, it is not simple to evaluate the interaction between different factors. There are some biases in evaluating the correlation between milk yield and occurrence of the illnesses. One of these biases is finding the sick animal and treatment or omitting of them by the animal owner himself and so not observing of that by veterinarians (7). Our outcomes showed a negative correlation between dystocia with parturition. Analysis of correlation between prevalence of the disorder and parturition showed a negative correlation. Parity had a negative correlation with dystocia, and a positive correlation with lowest age. The year of calving had a significant correlation with dystocia.

REFERENCES

1. Baird, G. D. (1982). Primary Ketosis in the high producing dairy cow: clinical and subclinical disorders, treatment, prevention, and outlook. *J. Dairy sci.* 65:1.
2. Bauman, D. E., Currie W. B. (1980). Partitioning of nutrients during pregnancy and lactation. A review of mechanisms involving homeostasis and homeorhesis. *J. Dairy Sci.* 63:1514.
3. Butler W. R., Smith R. D. (1989). Interrelationships between energy balance and postpartum reproductive functions in dairy cattle. *J. Dairy Sci.* 72:767.
4. Bigras-Poulin M., Meek A. H., Martin S. W. (1990). Intrrelationships among health problems and milk production from consecutive lactations in selected Ontario Holstein cows. *J. Prev. Vet. Med.* 8:15-24.
5. Dohoo I. R., Martin S. (1984). Disease, production and culling in Holstein-Friesian cows. III. Disease and production as determinant of disease. *J. Prev. Vet. Med.* 2:671-690.
6. Erb, H. N. (1987). Interrelationships among production and clinical disease in dairy cattle: A review. *J. Can. Vet.* 28:326.
7. Grohn, Y. T., Eicker S. W., Hertl J. A. (1995). The association between Previous 305-day milk yield and disease in New York state dairy cows. *J. Dairy Sci.* 78:1693-1702.
8. Uribe H. A., Kennedy B. W., Martin S. W., Kelton D. F. (1995). Genetic parameters for common health disorders of Holstein cows. *J. Dairy Sci.* 78:421-430.