Genetic relationship between birth weight and some of economically important traits of Holstein cattle in Iran

Abstract

Genetic improvement of livestock through breeding (select superior animals as next generation parents), is a sustainable approach to increase animal production. According to the importance of birth weight (first record after birth) in this study we investigate the relationship between birth weight (BW) and or calve birth weight (CBW) production and reproduction traits and cow survivallity to make future attention to birth weight. The registered records of National Livestock Breeding Center (1346 to 1389) were used. Data preparation (by CFC and FoxPro software), Statistical and genetic analysis (by ASReml and DMU software, respectively); and also survival and longevity analysis (by Survival and Cmprsk , R.2.14 software packages) were down. Production traits was including100-days milk (MY100), 305-day milk (MY305), fat 305-day (FY305) and 305-day protein (PY305) production and reproductive traits were the interval between calving to first service (CFI), the interval between first service to conception (FSTC), calving interval (CI) and dystocia (CE) of the first three lactation, and age at first calving (AFC). Statistical analysis showed a significant effect (P > 0.001) of CBW and BW on all production traits; based on the estimation of on least square means (LSM) cows which gave birth to heavier calves, had a higher production rate; and also calves with high BW, produced more in their future lactation periods. In statistical analysis of reproductive traits, CBW had a significant effect (P > 0.001) on all reproductive traits except of FSTC traits. The results of LSM showed the highest effects of CBW in cow reproductive traits were on the CFI and CE. Also the BW had a significant effect (P > 0.001) on the CFI, CI, CE, and the AFC traits; while the FSTC was not significant in none of the lactation periods. According to the variance analysis, as expected, by increasing in BW, CFI and CI increased, too. The results showed that by BW increasing, cow production and reproduction maturity (AFC) and also the incidence of CE decreased. The estimation of genetic correlations of CBW showed that the highest genetic correlations of productive traits were related to the second weighted groups. In reproductive traits, these components had an incremental process for CI but decreased for CFI. The high correlation of CE showed the large amount of CE is related to CBW. Estimation of genetic correlation components of BW showed a fairly high positive genetic correlation between BW and all productive traits, except of PY305. For CI, the negative components had a n increasing rate, while the estimation of CE genetic correlation, unlike our expectation, was positive. These components were negative for AFC. In the analysis of CBW, herd, age at birth, maternal age, sex and weighted groups had a significant effect (P > 0.001) on survival, persistence milk production days (except of sex) and longevity (except of sex); in these traits by CBW increasing, the eliminated cows risk increased. In the analysis of BW, all effective factors of survival (except of weighted codes), persistence milk production days (except of CE) and longevity (except of sex, maternal age and CE) were significant (P > 0.001); in these traits, as expected, by BW increasing, the eliminated cows risk decreased.

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