

学 位 論 文 要 旨	
氏 名	ARAKAKI daichi
題 目	Analysis of reaction trajectory under heat stress for days open of Japanese Black cattle (暑熱ストレスに対する黒毛和種空胎期間の反応軌道分析)
<p>Days open (DO) is the most important trait for improving the fertility of cattle. In this study, the effects of heat stress for DO were evaluated from various points using cattle raised in the heat environment of Okinawa.</p> <p>DO was set to 50d from 22d to 50d and 250d for 250d and above, except for 21d and below. The year of calving was from 2008 to 2016, and records from the first to the sixth parity were included. The temperature-humidity index (THI) was calculated from the average temperature and average relative humidity on the day of calving at the meteorological station closest to each farm. The area of Okinawa was the main island area including Nago, Naha, Kume Island, and Minamidaito Island. Yaeyama area including Miyako Island, Ishigaki Island, Iriomote Island, and Yonaguni Island.</p> <p>In Okinawa, the record of achieving one production per year was 44% of the total, and more than half of the cattle required improvement of DO. The seasonal DO trend was that summer calving were the longest and spring and autumn calving were shorter. The monthly DO trend was that the calving in June was the longest and the calving in April was the shortest. As a result of using THI, the threshold for worsening DO existed in THI 70 to 72. In the analysis using the THI rising period and the falling period during the hot period, a high acclimation effect was generated by THI + 7 in the rising period due to the reactivity of DO. THI of + 7 was defined as the correction value for the rising period, and the genetic analysis of DO was performed using THI. Calving interval (CI) and pregnancy period (PP) were set as reproductive traits, and a one-trait model and a two-trait model were used. The heritability of DO, CI and PP was 0.138, 0.124 and 0.230, respectively. In the random regression model, the heritability of DO for corrected THI ranged from 0.20 to 0.120. Heritability tended to decrease as THI increased. Heritabilities of intercept and slope were 0.231 and 0.065, respectively. In terms of breeding value for each cow, the top 50 cattle had a breeding value that decreased DO from 25d to 40d, and the bottom 50 cattle had a breeding value that increased DO from 40d to 60d.</p> <p>From these results, it was considered that the optimum season for calving in Okinawa is spring (April), and in particular, alleviation of heat stress during this rising season is effective in improving DO. Although the selection is slow due to the low heritability of DO, it was concluded that it is possible to select individuals with heat tolerance based on the heritability of the slope when THI was used.</p>	