Establishment and endogeny of haematologic rhythms in calves

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Resumen

The aims of the present work were to analyse the variations of haematological variables in neonatal bovine submitted to different photoperiods and to establish the origin and the ontogeny of the rhythms. This work was carried out during the months of June and July of 2004. Twelve Holstein bovine were used, and they were divided into two groups and submitted to different photoperiods. One group received LD 10:14 and the other one LD 24:00. Blood samples by jugular punction were obtained from animals of 3, 7, 14, 20 and 30 days of life (LD 10:14) and the ones with 30 days of life (LD 24:00), during a period of 24 h at intervals of 20 h. The following tests of erythrocytes, haemoglobin concentration, lymphocytes, monocytes, granulocytes and platelets were done in all samples. Haematological variables were measured by means of a haematological counter and analysed by repeated measures through analysis of variance and cosinor analysis. There were chronobiological variations adjusted to daily rhythms in the erythrocytes, haemoglobin, lymphocytes, monocytes and granulocytes. The platelets variable presented ultradian variations. The biological rhythms of free running in calves under constant light conditions go on being expressed, showing the existence of an endogenous biological clock. With respect to the establishment of the biological rhythms in neonatal bovines, it is observed that the circadian system is not totally present at the moment of birth but is developed during the postnatal period. At birth, calves present ultradian rhythms in most of their variables but, progressively, they shorten their frequencies until settling down daily; this transition corresponds to the period of morphophysiological changes of the digestive system. The results shown in this study evidence that most of haematological variables represent circadian rhythms synchronised mainly by the photoperiod.

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