



HERD HEALTH MANAGEMENT & ECONOMY

HHM-050

IS SKIN TEMPERATURE RELIABLE AS CORE BODY TEMPERATURE INDICATOR?

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Introduction

The circadian system is based on a multioscillatory neural network that generates and sends a temporal signal throughout the entire organism, which drives biological rhythms. From the main marker rhythms of the circadian system core body temperature (CBT) and skin temperature (ST) are two of the most used due to its reliability and ease of use, respectively. Thus, the aim of this study is to check the reliability of ST as CBT indicator.

Material and methods

Thermochron iButton DS1921H (Maxim Integrated Products, Sunnyvale, California) were used to measure CBT and ST with a precision of $\pm 0.125^{\circ}\text{C}$ and a sample rate of 1 minute during 1,4 days. One device was subcutaneously implanted under sedation in the neck and other device was placed in contact with skin in the opposite side of neck. The animals were subjected to natural illumination (dawn: 8:13, sunset: 17:46).

A nonparametric analysis was performed for each animal to characterize their temperature cycle. It consisted on the following parameters: L8 and M8 as the average of the 8 hours with the minimum temperature and maximum values and their respective timing (TL8, and TM8); RA or Relative Amplitude calculated by $(M8-L8)/(M8+L8)$.

Results

Our animals showed a circadian CBT pattern with the highest values ($M8=37.97\pm 0.27$) at the end of the day ($TM8=20:04\pm 01:31$) and the lowest values ($L8=36.86\pm 0.12$) at the end of the night ($TL8=05:40\pm 00:44$). The differences between day and night values were statistically significant (student t test; $p<0.01$). ST pattern showed similar results with lower temperatures during day and night and a slightly phase advance respect to CBT. The regression analysis showed a positive relationship between CBT and ST ($r=0.65$; $p<0.01$).

Discussion and conclusion

This preliminary study suggests ST as a CBT indicator due to the similitudes between CBT and ST patterns and the strong existing relationship between them.