Title: In vivo and in vitro heat shock proteins gene expression in cattle

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The main purpose for this study was the quantification of the heat shock proteins HSPA1A and HSP90AA1, in cow lymphocytes, when subjected to heat stress directly - *in vivo*, or indirectly - *in vitro*. The aim was to identify differences between HSP expression *in vitro* and *in vivo*. The experiment was conducted in the Biometeorology and Ethology Laboratory of FZEA-USP. Were used three female Holstein Frisian, which were subjected to heat stress, by sun exposure. The blood samples were collected after sun exposure, with a temperature of 40 ± 2 º C, during three days. For in vitro tests, blood of the same animals was collected and placed for a period of 4 hours in a water bath at 40 º C, thus simulating the thermal stress. Total RNA of lymphocytes was extracted, treated with DNase I and submitted to cDNA synthesis for gene expression quantification of HSPA1A and HSP90AA1, by real time PCR (qRT-PCR). The data were tested for normality by Kolmogorov-Smirnov test and for homocedasticity by Levene test. Data were analyzed according to a general linear model procedure with 2 fixed factors treatment and genes expression. Significantly different means were submitted to post-hoc comparisons of means (LSD test) and regarded as significantly different when $P<0.05$. The results showed that there are no significant differences between the *in vitro* and the *in vivo* treatments, but there are significant differences in genes expression in the different treatments.

Keywords:
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