

研究报告

## 外源金属硫蛋白对奶牛抗热应激调控及SOD基因表达的影响

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**摘要** 将28头泌乳奶牛随机分成A、B、C、D 4组, 分别按每头0 (对照)、6.0、12.0和16.0 mg剂量静脉注射经生理盐水溶解的Zn-MT, 以探讨外源性金属硫蛋白(MT)对奶牛抗热应激的调控作用及其机理. 结果表明: B、C和D组的脉搏、呼吸频率及血清MDA含量均显著( $P < 0.05$ 或 $P < 0.01$ )低于A组; 4%标准乳产量、血液GSH-PX活性、红细胞SOD活性、血清MT含量、奶MT含量及SOD基因表达水平均显著( $P < 0.05$ 或 $P < 0.01$ )高于A组; C和D组的上述各项指标又优于( $P < 0.05$ 或 $P > 0.05$ )B组; 外源性MT的调控效果以注射后第30天表达最佳. 说明MT是一种能够有效调控奶牛热应激能力的生理活性物质, 且在奶牛体内表现出一定的剂量效应和时间效应.

**关键词** [金属硫蛋白](#) [热应激](#) [SOD](#) [基因表达](#) [奶牛](#)

分类号

## Effects of exogenous metallothionein on thermoresistance and SOD gene expression of dairy cattle

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### Abstract

To approach the effects of exogenous metallothionein (Zn-MT) on the thermoresistance and SOD gene expression of dairy cattle, an experiment was conducted with 28 lactating cows, which were randomly allocated to groups A, B, C and D, and supplemented with 0, 6.0, 12.0 and 16.0 mg Zn-MT-capita<sup>-1</sup>, respectively, by intravenous injection. The results showed that the pulse, breath rate, and serum MDA content of the cows in groups B, C and D were lower ( $P < 0.05$  or  $P < 0.01$ ), while their milk yield, serum- and milk MT contents, blood GSH-PX activity, erythrocyte SOD activity, and SOD gene expression level were higher ( $P < 0.05$  or  $P < 0.01$ ) than those in group A. All the test indices of the cows in groups C and D were superior ( $P < 0.05$  or  $P > 0.05$ ) than those in group B, but no significant difference ( $P > 0.05$ ) was observed between groups C and D. Exogenous Zn-MT had the best effects on the thermoresistance and SOD gene expression of dairy cattle 30 days after injection. All of these suggested that exogenous Zn-MT should be a physiologically active substance effective to the thermoresistance and SOD mRNA expression of dairy cattle, and presented time- and dose-dependent effects.

**Key words** [metallothionein](#) [thermal stress](#) [SOD](#) [gene expression](#) [dairy cattle](#)

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