Effect of heat stress on heat-shock protein (Hsp60) mRNA expression in rainbow trout *Oncorhynchus mykiss*


College of Animal Science and Technology, Gansu Agricultural University, Lanzhou, Gansu, China

Corresponding author: Z. Liu
E-mail: liuz@gsau.edu.cn

Received October 30, 2014
Accepted April 8, 2015
Published May 18, 2015
DOI http://dx.doi.org/10.4238/2015.May.18.20

**ABSTRACT.** The enhanced expression of heat shock proteins (hsp60) in organisms can be detected in response to many kinds of stressor. For fish, high temperature is an important stressor, and hsp expression is associated with differences in environmental temperature. In this study, rainbow trout (*Oncorhynchus mykiss*) that were accustomed to an aquatic temperature of 18°C were exposed to an elevated temperature (25°C), and hsp60 expression in the gill, liver, spleen, heart, and head kidney was quantified using real-time polymerase chain reaction in unstressed and heat-stressed animals. The fish responded to heat stress in a time- and tissue-specific manner. Cardiac hsp60 mRNA levels were largely unchanged, and the greatest induction of hsp60 in heat-stressed animals was recorded in the liver, suggesting that protein damage and the consequent requirement for the Hsp60 protein are probably greater in hepatic tissue. Therefore, fish must be provided with optimal...
temperature conditions in order to realize their potential growth and maximize fish farm profits.

**Key words:** Hsp60; mRNA expression; *Oncorhynchus mykiss*; Heat stress