

Skeletal muscle proteome and meat quality of broiler chickens subjected to gas stunning prior slaughter or slaughtered without stunning

ABSTRACT

The study examined the effects of pre-slaughter gas stunning and slaughter without stunning on meat quality and skeletal muscle proteome of broiler chickens. Fifty Cobb broiler chickens were randomly assigned to either a neck cut without pre-slaughter stunning (Halal slaughter) or pre-slaughter gas stunning followed by a neck cut. Samples of Pectoralis major muscle at 7 min, 4 h and 24 h postmortem were analyzed for pH, shear force, color, drip and cooking losses. Proteome profile of the 7 min samples was examined by two-dimensional polyacrylamide gel electrophoresis. Birds subjected to Halal slaughter had higher ($P < 0.05$) redness than those gas stunned at 4 and 24 h postmortem. Gas-stunned birds had lower ($P < 0.05$) muscle pH and shear force and higher ($P < 0.05$) drip and cooking losses compared with those subjected to Halal slaughter throughout postmortem storage. Gas stunning up-regulated ($P < 0.05$) the expression of beta-enolase, pyruvate kinase and creatine kinase compared with Halal slaughter. Results indicate that pre-slaughter gas stunning hastened postmortem energy metabolism and had detrimental effects on the water holding capacity and redness of broiler breast muscles.

Keyword: Gas stunning; Halal slaughter; Meat quality; Proteomics