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Effect of Heat Stress During Transport and Rest Before Slaughter, on the Metabolic Profile, Blood Gases and Meat Quality of Quail

V.A. González[1], G.E. Rojas[1], A.E. Aguilera[1], S.C. Flores-Peinado[2], C. Lemus-Flores[3], A. Olmos-Hernández[4], M. Becerril-Herrera[5], A. Cardona-Leija[2], M. Alonso-Spilsbury[4], R. Ramírez-Necoechea[4] and D. Mota-Rojas[4]
[1]Tesista de la Licenciatura de Medicina Veterinaria y Zootecnia, Universidad Autónoma Metropolitana-Plantel Xochimilco, México
[2]Taller de Cárnicos, Facultad de Estudios Superiores de Cuautitlán, FES-C, UNAM, Edo, de México
[3]Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma de Nayarit (UAN), México
[4]Departamento de Producción Agrícola y Animal, Área de Investigación, Ecodesarrollo de la Producción Animal, Universidad Autónoma Metropolitana-Xochimilco, Mexico.D.F.
[5]EIAH-Benemérita Universidad Autónoma de Puebla, Teziutlán, Puebla, México

Abstract: Currently in Mexico there is no regulation ruling over transportation and the rest period before slaughtering quail. An experiment was carried out to evaluate transportation and rest period effects before sacrifice on the metabolic profile, blood gas, pH and meat quality of the Japanese quail carcass. Sixty quail (*Coturnix coturnix japonica*) were transported to slaughter, on arrival they were randomly divided in 2 groups: with (4 hours) rest and without rest (slaughtered right away). A blood simple was taken before and post sacrifice. After transportation, the rested quail had significantly lower lactate levels ($p<0.05$), compared to the quail without rest (36.33±6.17 *vs*. 21.64±2.14, respectively). The results showed that when quail are stressed, pCO_2 and lactate levels tend to diminish significantly ($p<0.05$) compared to mammals. Rest showed a direct effect on temperature ($p<0.05$), diminishing acidity, reflected though hot and cold carcass pH as compared to the group of quail without rest.

Key words: Stress, transport, meat quality, quail

Introduction

Due to an increase in quail meat consumption, it is necessary to get familiar with factors that influence the muscle metabolism which is reflected in meat quality, said factors can occur before and during sacrifice of the animal, as well as in the subsequent processing of the carcass. *Ante mortem* factors such as catching, caging, transport and immobilizing on the slaughter line, have great impact on the metabolic status of the animal at the moment of sacrifice and in development of a ridged cadaver (Schreurs, 2000; Woelfel *et al.*, 2002). Manual handling before sacrifice has been identified as a potential source for injury and quail stress (Kettlewell and Mitchell, 1994; Elrom, 2001), therefore repercussions from stress before sacrifice and quality deficient transport and stunning influence the quality of the carcass meat.

Health problems arise from poor handling and transportation from the farm to the slaughter house (Randall *et al.*, 1994). Transportation is an important activity of the farming industry. It is a topical controversial area of animal welfare. Several workers have confirmed that transportation for short or long periods can impose stress on animals (Warris, 1995; Knowles, 1998; Broom, 2003; Ali *et al.*, 2006). Signs of this stress have been demonstrated in different animal species by Ali *et al.* (2006), for example, increased heart rate (Kent and Ewbank, 1986), increased adrenal-cortical activity (Ruiz-de-la-Torre *et al.*, 2001), decrease hormonal immunity (Machenzie *et al.*, 1997), increased morbidity and mortality (Chirase *et al.*, 2004).

We have known for a long time now, that stress causes changes in muscle metabolism in animals and therefore produces differences in meat quality (Remignon *et al.*, 1998). The main consequence of transport is metabolic fatigue and dehydration which is a result of survival metabolic rate, when evaporation and acid-base increase. The birds are metabolically exhausted after dealing with a variety of events such as beating their wings after unloading and muscle contraction due to vibration (Elrom, 2001). Vehicle vibration has a negative effect on the birds, when attempting to maintain balance they contract their muscles during transport. Randall *et al*. (1994), indicate there is evidence that the birds are stressed from the mechanical vibration and implicates physiological and physiological tension (Mitchell and Kettwell, 1994). Knowles *et al*. (1996), indicates that calorific stress is an important problem for the bird before and during transport. While a bird is under calorific stress, a series of changes are mediated by the hormonal system