Effects of catching and transportation versus pre-slaughter handling at the abattoir on the prevalence of wing fractures in broilers

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Abstract

Fractures occurring in conscious broiler chickens are painful and severely compromise animal welfare. The aim of this study was to investigate the effects of pre-slaughter handling procedures on the frequency of wing fractures. Wings were examined for fractures in 11,609 broilers, from 12 different flocks, slaughtered in two abattoirs: one using bi-phasic CO₂ stunning (CS); and one using electric water-bath stunning (ES). The same broilers were examined: i) in lairage, representing fractures attributed to catching and transportation; ii) after evacuation of transport containers and shackling (only ES); and iii) post-stunning. The mean frequencies of wing fractures were: in the lairage; 0.8% (CS 0.73%, ES 0.88%); after shackling prior to stunning; 2.90% (only ES); and after stunning; 2.35% (CS 1.80%, ES 2.90%). Regardless of stunning method, significantly more fractures occurred during pre-slaughter handling at the abattoirs than during catching/transportation. The difference in prevalence between CS and ES was not significant. All fractures observed in the ES occurred in conscious animals, whereas in the CS it was not possible to distinguish between fractures occurring in conscious or stunned broilers. From a welfare perspective, fractures occurring on-farm/transport result in prolonged suffering and are thus considered more serious in risk assessments of broiler welfare, even though more fractures occur at the abattoir. Monitoring of wing fractures at abattoirs should be included as an indicator of broiler welfare.

Keywords: animal welfare, broiler, catching, pre-slaughter handling, transport, wing fractures

Introduction

There is growing evidence that poultry experience pain (Gentle 1992; McGeown et al 1999; Gentle & Tilston 2000; Nasr et al 2012) and, therefore, the prevalence of, eg wing fractures in live broilers has important welfare implications. Fractures in general may be attributed to pre-slaughter handling on-farm, the transportation or handling at the abattoir (Stuart 1985; Bayliss & Hinton 1990; Kettlewell & Mitchell 1994; Elrom 2001; Nijdam et al 2006). Wing fractures are among the most common post mortem findings in broilers that are dead-on-arrival (DOA) at the slaughter plant (Bayliss 1986; Gregory & Austin 1992; Nijdam et al 2006), however, the pre-slaughter steps attributing to these fractures in live broilers have not been investigated. The aim of this study was to investigate the effects of pre-slaughter handling procedures on wing fractures in broilers before bleeding in two abattoirs; one using bi-phasic CO₂ stunning (CS); and one using electric water-bath stunning (ES). The specific objective was to quantify the number of live broilers with wing fractures: i) upon arrival at the abattoir, ie attributed to factors relating to catching and transportation (CS and ES); ii) after container evacuation and shackling (ES); and iii) after evacuation of the containers, shackling and stunning, ie attributed to factors at the abattoir (CS and ES).

Materials and methods

Flocks and abattoirs

Two abattoirs were included in the study and six flocks were observed at each abattoir. The 12 flocks were all Ross 308 hybrids, mixed gender, 31 days of age, which is the mean slaughter age for broilers in Norway. All broilers were manually caught. One abattoir used biphasic CO₂ stunning (CS); 40% CO₂ for 1 min, followed by 80% CO₂ for 2 min (Stork®, Linco, UK), the other used electrical water-bath stunning (ES); total current 4.1 A, 150 mA per bird, 300 Hz (Meyn®, Linco, UK). Both abattoirs used the same type of transport containers (Stork®, 2.43 × 1.30 m [length × height], eight drawers, minimum 200 cm² per kg live bird, ie more than the minimum required 160 cm² per kg). At the CS abattoir, broilers were emptied directly from the containers into the CO₂ tunnel, whereas live broilers were shackled prior to stunning at the ES abattoir. The broiler containers were emptied onto tilted slides at the CS from a maximum evacuation height of 50 cm. The ES abattoir did not have slides and the evacuation heights were 83, 65, 47 and 29 cm, respectively, for the four container compartments.