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Influence of a preen gland secretion on growth and meat quality of heavy broilers

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Preen gland secretions were obtained from several hens that were rearing their chicks and the content of these secretions was analysed. From these results, a synthetic analogue of the secretions was created (given the title Mother Hen Uropygial Secretion Analogue, or MHUSA, in this study). According to a blinded, controlled experimental design, heavy broilers (strain SASSO T56N) were reared from 1 day of age in an environment treated with either MHUSA or control. At 80 days the birds were slaughtered. Post mortem*carcass weight, abdominal fat and fillet weights were then measured. Colour, pH and yield were also measured as indicators of meat quality. Broilers exposed to MHUSA had both higher carcass weights and higher fillet weights compared with control-treated birds (*$P < 0.05$*). Abdominal fat, pH, water loss and colorimetry results were similar between the treatment groups at all time points (24 h and 6 days* post mortem*) and also after a cooking procedure. The meat from the MHUSA birds was less yellow compared with control. It is concluded that constant exposure to MHUSA from rearing until slaughter improves growth rate in broilers without significantly affecting meat quality.*

Keywords: broilers, growth, meat quality, preen gland

Introduction

Meat quality is a major issue both for the process meat industry and the consumers. Pale, soft and exudative (PSE) meat, which is seen in pig meat production, has seldom been analysed in poultry meat, apart from turkey (Alvarado and Sams, 2002). So-called PSE meats show low water-holding capacity, bad textural properties and reduced protein extractability (Tankson *et al*., 2001). A relationship also exists between colour, pH and water-holding capacity (Woelfel *et al*., 2002; Campo *et al*., 2005). PSE meat from pigs loses more water during cooking compared with normal meat (Tankson *et al*., 2001). In a study on boneless and skinless fillets from broilers, Barbut *et al*. (2005) also reported dark, firm and dry (DFD) meat. In poultry, stress has severe consequences on the quality of the final product, with effects on pH, pigmentation, water-holding or fat percentage (Fletcher, 1999; Tankson *et al*., 2001; Campo *et al*., 2005). In poultry, secretions from the preen (or uropygial) gland have a role in physiology and behaviour as their composition is affected by age and season, as well as by whether or not a bird has been feather pecked (Sandilands *et al*., 2004). It is also known that hens raising their chicks produce specific hormonal secretions from this gland (Richard-Yris *et al*., 1983; Bohnet *et al*., 1991). Their lack may be related to the level of stress observed in broiler husbandries, as observed by Madec *et al*. (2005) and Madec *et al*. (2006). In order to test the effect on the quality of broilers' production, the secretion from the uropygial gland of hens was isolated under natural mothering conditions. A synthetic analogue was prepared according to the analysis of the secretion. The purpose of the present study was to investigate the effect of this synthetic analogue on several meat quality indicators in heavy broilers, along with carcass performances.

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Material and methods

Animals and breeding conditions

The experiment was conducted in two similar buildings, both with a stocking density of 11 birds per square metre (i.e. approximately 25 kg/m^2 when birds are due for slaughter). A heavy broiler strain (Sasso T56N) was used, and a total of 4400 chicks were kept in each building from