

S-1027 ALABAMA STATION REPORT 2006

The Poultry Food System: A Farm to Table Model

Period Covered: 08-2005 to 09-2006

Date of Report: 29-Sep-2006

Annual Meeting Dates: 09-Sep-2006

Participants

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Accomplishments

Progress Report:

Variance among broilers in their growth and quality characteristics is required in order to implement welfare while maintaining product quality. Experiments were conducted to evaluate the influence of strain-cross and feeding programs such as lighting, diet density and various feed additives on live performance, processing yields and feet (paw) quality and yields of male and female broiler chickens. Lighting programs having short duration and low intensity that excessively restricted development were detrimental to meat yields even though long-term stress response, as measured by heterophil:lymphocyte ratio remained unaltered. Expression of quality in terms of carcass defects and fillet characteristics is not constant among strains and between sexes with age at marketing. Differences in fatness are obvious in terms of abdominal depots. Extent of wing bruising was the dominant carcass defect, and strain differences suggest pre-slaughter behavior as the predominant reason. Fillet percentages after simulated commercial deboning also varied widely among four strains and increased from 6 to 8 weeks age, but differences remained similar between the sexes. Tenders changed in parallel with those of fillets, however, females always had distinct advantage compared to males. Microbial control during processing is paramount. Effective biocides and sanitary conditions necessitate a cleansable surface. Austenitic stainless steels used in food processing undergo micro-structural changes during welding that result in 3 distinctive zones and termed- weld, heat affected zone (HAZ), and parent metal. Attachment of *Listeria monocytogenes* to weld vs HAZ vs parent metal, and effect of corrosion of these 3 zones on bacterial attachment were determined. Polished stainless steel welds do not lead to differences in bacterial attachment; however, corrosion of different weld zones leads to differential attachment of *L. monocytogenes* to stainless steel. Alterations with increasing hen age on the total microflora counts and prevalence of *Salmonella* associated with the egg was studied. As the hen aged total microbial load increased but not necessarily salmonella. The egg breaking industry has reported variable whipping performance of egg whites that seems to be associated with selection pressure on hen performance. Five of the most popular

egg strains were tested. Both strain of hen and its age led to significant differences in egg functionality. Cool water washing was tested in two shell egg operations. Results indicated that cool water washing could enhance the cooling of shell eggs and potentially reduce pathogen growth.

Impact

Terms of live production and pre-slaughter handling must be considered together to assure both broiler welfare and consumer quality. Reduced duration and intensity of lighting used to relieve late mortality may excessively impair live performance and meat yield when aggressively imposed. Such restrictions are not easily remedied by either increased diet density or feed additives that improve performance. While body weight and carcass quality is expected to differ between broiler sexes and change with age, variance of expression among commercial strains appears to be equally extensive. In turn, response to feed formulation modifications, environment, and pre-slaughter handling indicated by one strain may not be equivalently expressed by another. Maintaining product quality must continue in the processing plant. Alterations to exposed steel surfaces at the point of weld attachment during equipment assembly can be modified by differential heating to create aberrations that harbor micro-organisms and impair sanitation. Access to data regarding quality, functionality and microbial susceptibility of eggs among hen strains over time will enable processors to select strains, process products to meet for target markets. Cool water washing information provides baseline data for submission to USDA for approval of an alternative washing process. Approving the use of cool water wash process would not only reduce energy costs but improve egg quality and safety.

Publications

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