

Spaghetti Meat: Bad for Chickens, Bad for Business

Over the past few years consumers, scientists and the food industry have been observing an increasing prevalence of chicken breast muscle abnormalities. These abnormalities—white striping, woody breast, and now, spaghetti meat—are correlated with selection for fast growth and increased muscle mass in broilers. In 2017 we covered the issue of white striping and woody breast, which at the time were conservatively estimated to have cost the industry \$200 million a year in losses (Kuttappan et al, 2016). Just two years later, another muscular myopathy, spaghetti meat has begun to draw attention.

Spaghetti meat is a muscular disorder that affects the fibers of the breast muscle. The fiber bundles that make up the muscle tissue in the breast muscle separate and resemble the long, thin and cylindrical appearance of spaghetti (Petracci et al, 2019).

Myopathies have been determined to be chronic, degenerative conditions that cause pain and suffering in broilers (Kuttappan et al, 2013b). In other words, they are a breakdown of the basic structure of the muscle that occurs over an extended period of time, adding to the host of other health and welfare issues known to disproportionately affect birds bred for fast growth, heavier weights and higher breast yield. These other issues include skeletal deformities, footpad lesions, breast blisters, ascites, and sudden death syndrome. In these broiler lines, fast muscle growth is achieved mainly through hypertrophy, that is, a rapid increase in size of existing muscle fibers, rather than the addition of new fibers (Velleman, 2015). These fibers increase in size so quickly that they outgrow their support systems, including oxygen supply and waste elimination, leading to degeneration and often permanent damage (Velleman, 2015). In addition, Ahn et al. (2010) observed that the perimysial septa (the connective tissue that groups muscle fibers into bundles) of breast muscles in fast-growing birds was thinner than the slow-growing counterpart.

Spaghetti meat can occur in isolation, but often accompanies white striping (Petracci et al, 2019). Several studies have sought to understand the impact of these disorders on the nutritional quality of chicken, with overall findings pointing to white striping, woody breast, and spaghetti meat resulting in higher fat, lower protein, and higher moisture content. Studies have found that while white striping significantly affects the fat and protein content, in the most severe cases contributing to a 224% increase in fat and 9% decrease in protein, spaghetti meat is mainly associated with a decrease in the protein content and increase in the moisture level of chicken breast (Petracci et al, 2014; Baldi et al, 2018).

Consumer awareness of around issues associated with the genetic selection of broiler chickens continues to grow. In a 2012 study of consumer attitudes toward chicken breast affected by muscular disorders, 56.7% of consumers disliked fillets with severe white striping and were significantly less likely to purchase that chickens as a result (Kuttappan et al, 2012). Awareness around muscular disorders such as spaghetti meat comes at a time when consumers are becoming increasingly distrustful of the food industry. Recent research from The Center for Food Integrity has shown that only 25% of US consumers believe U.S. meat is derived from humanely treated animals and only 25% strongly agree with the statement that “I trust today’s food system” (CFI, 2019).

Solutions to date have addressed nutrition, feed management, post-production processing and incorporating down-graded meat into processed products. In short, the focus has been on trying to treat the symptoms, as opposed to treating the problem at its cause: selective breeding for fast growth. In order to meaningfully address the issue, producers and food companies must work together to move towards higher welfare strains of chickens and improved production practices.

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