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Prevalence of Pale, Soft and Exudative (PSE) and White Striping (WS) in Poultry Meat: Possible Influence of Lineage. (#248)

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Introduction

In modern poultry farming new lineages were developed by the companies, after years of investment in genetic selection aiming weight gain in a shorter period of time, has made the birds show different characteristics of their ancestors. With advances in nutrition and breeding for fast growth, myopathies and muscle pathological changes have emerged resulting in loss of quality and sensory atributes of meat (Santiago, 2015). According to Petracci et al. (2015), the pressure in "genetics" to improve fast growth rates in broilers breast meat production led to a high incidence of various abnormalities in these muscles in the last 20 years, even the poultry industry can attenuate the negative effects of abnormalities in meat quality by modulating the growth rate of the birds through agricultural strategies and incorporating the meat with defects in processed products. Alterations to the morphological structure of the muscle ultimately affect meat quality, since meat quality is a reflection of the morphological structure and cell biology of the muscle. (Velleman, 2015) and these myopathies may be associated with genetics or nutrition. Based on this premise, the objective of this study was to determine the incidence of PSE and of White Striping (WS) myopathy in lineages, slaughtered in a standard industial facility in the south of Brazil.

Methods

The sampling for this study was N = 742, whereas in the first stage were used 360 samples from broilers of two commercial lines (A and B) slaughtered at an average age of 45 days (± 2) and average weight of 3 kg, raised in similar conditions as well as diets. Chicken breast cuts were collected and evaluated for WS after cooling, at the end of the boning line and scored visually by the trained team in three ranking categories: normal (N), moderate (MOD) and severe (SEV), as described by Kuttappan et al. (2013). In the second stage, 389 birds were collected and evaluated for PSE and normal and their respective percentage, using commercial strains (A, B and C) followed a model proposed by Kato et at., (2013).

Results

To verify the WS incidence, values of 16.7% for lineage B and 23.3% for lineage A (Figure 1) were observed. These values suggest that the development of WS may be associated with lineage, therefore something that goes beyond only nutritional issues. These results are in agreement with those found by Kuttappan et al. (2013) who mentions that all 3 lineages evaluated had a number of birds exhibiting some degree of WS, with some differences in percentage of occurrence among the 3 degrees (normal, moderate and severe), showing there are no predilection of lineages for the incidence of WS. For PSE it was verified that the birds were in a prolonged period of fasting, on average 13 hours and 56 minutes and 14.7°C room temperature, due some issues in procces problem, considering the ideal time around 12 hours of fasting. When comparing fasting time and its direct impact on bird welfare, which may result in PSE, we obtained results that are not described in the literature. Comparing the percentage of birds PSE taking into consideration the strains of birds sampled, there is a greater susceptibility to the occurrence of PSE meat in lineage A. showing an average 39% of incidence of PSE in carcasses avaluated, followed by lineage B with 23% of incidence and lineage C with 21% of incidence of PSE (Figure 2). In a study conducted by Schneider (2004) during the winter (12°C to 15°C) with a sampling of 329 birds, obtained 24.92% for PSE, 73.55% for Normal. It is well known by industry and breeders that the lineage A is more susceptible to the incidence of these problems since it is more active compared to other lineages which can progress to stress conditions during handling and consequently to higher incidence rates of PSE.

Conclusion

It was concluded that the lineages could have a direct influence on the development of myopathies, but elements such as diet, stress and other environmental factors are associated, especially in the two myopathies analyzed in this context. It is suggested that a more detailed study has to be done aimming a mapping of the impact of the strains used, and its relationship with the development of muscular disorders in poultry meats.

References

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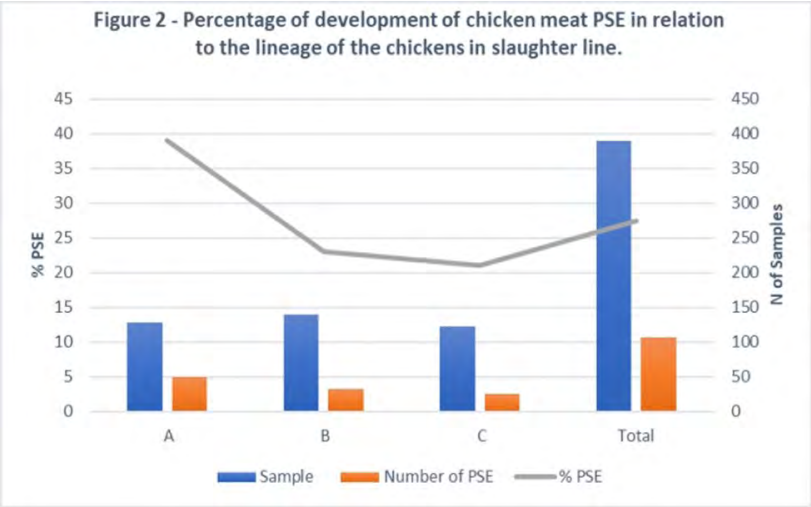

Figure 2
Incidence of PSE meat in three differents lineages.

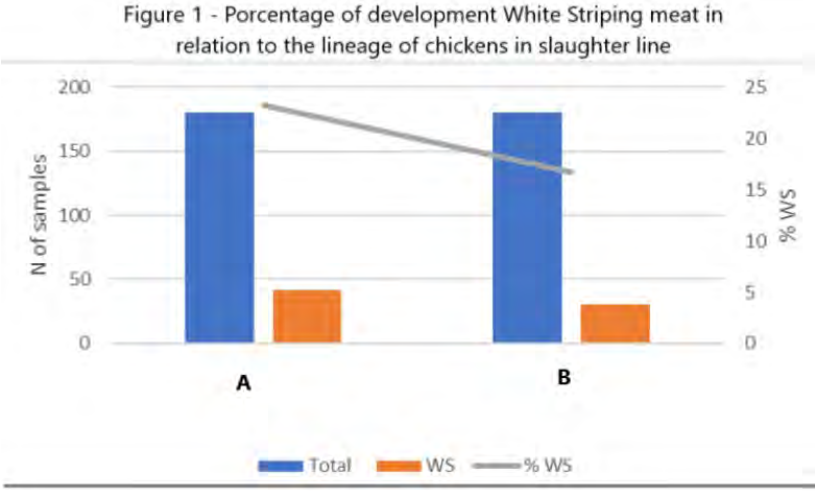

Figure 1
Incidence of WS meat in broilers in two different strains.

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