

## SELECTED MICROBIOLOGICAL RISKS OF CHICKEN BREAST MUSCLE MYOPATHIES IN RELATION TO PHYSICOCHEMICAL AND HISTOPATHOLOGICAL CHANGES

### THE AIM OF THE STUDY

The aim of the study was to analyze physicochemical and histopathological changes and to evaluate selected microbiological risks of the chicken breasts with myopathies or defects.

The study included visual determination of the occurrence of quality defects, physicochemical analysis of the breast muscles, microbiological evaluation and determination of antibiotic resistance of selected bacteria isolated from the intestinal contents of broiler chickens. Changes in color parameters and pH were observed in the breast muscles of chickens with meat quality defects.

### INTRODUCTION

Intensive selection of poultry toward increasing the growth rate and meat production led to a more frequent occurrence of metabolic defects. New disorders appeared, such as white stripping, wooden breast, fibrosis of the connective tissue, so-called spaghetti meat, disqualifying or significantly reducing safety, quality and processing value of meat. Meat structure, resulting from the presence of muscle fibers, the proportion and distribution of connective and fat tissues as well as production sustainability, microbiological safety i.e. the absence of pathogenic organisms and toxins, animal health and welfare are among the most crucial aspects in meat production nowadays. Zhang et. al. (2021) stated that the chicken ceca microbiota may be associated with the development of muscle myopathies and woody breast.

### RESULTS AND CONCLUSIONS

→ In defective meat, especially with bloody bruises, after electrophoretic separation clear bands are observed on the stained polyacrylamide gel corresponding to protein substances with a molecular weight above 60 kDa, which are not visible in meat without defects.

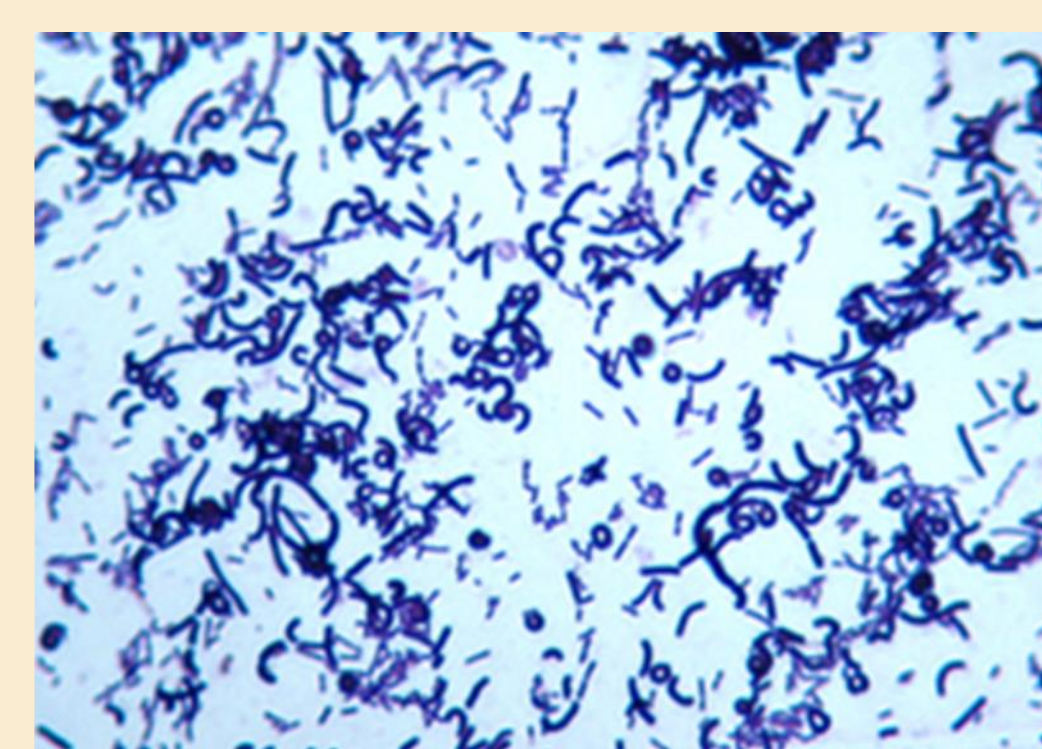
→ In the case of meat with white stripes, additional bands of proteins with a mass of approx. 220 kDa can be observed.

→ Statistical analysis of the intestinal microflora of broiler chickens proved that the presence of petechiae can be correlated with the reduction of the amount of beneficial *Lactobacillus* spp.

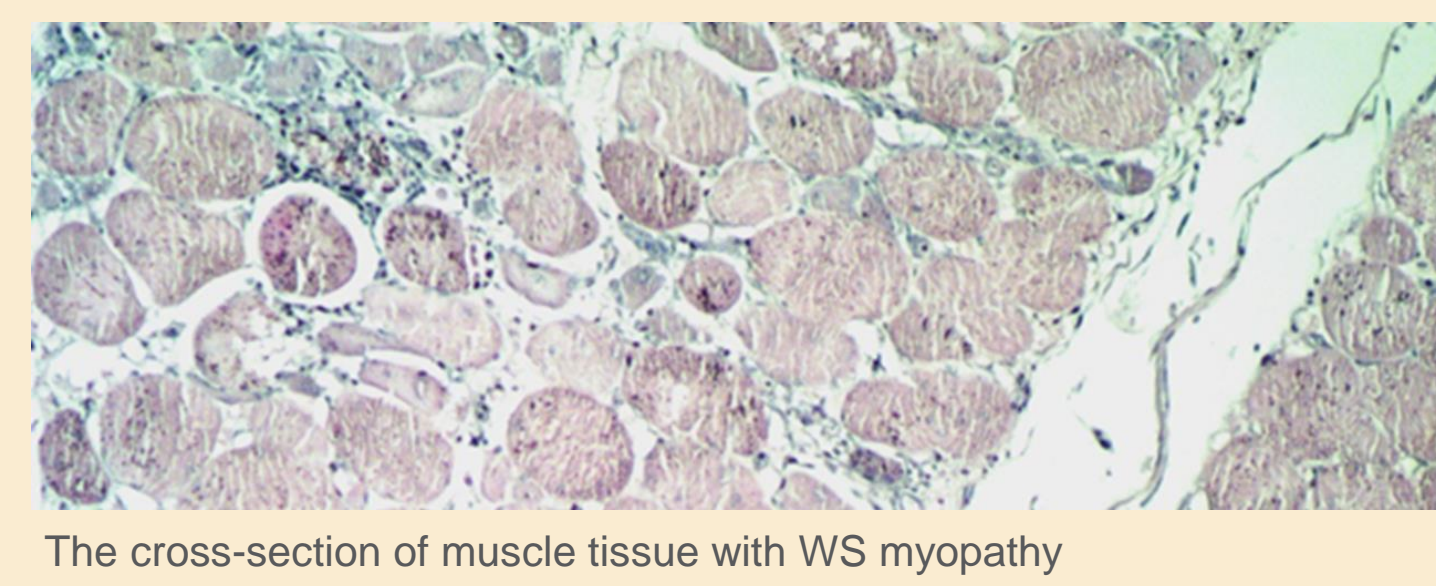
→ There was no correlation between the number of enterococci and *Escherichia coli* in the intestinal microflora of chickens and the appearance of myopathy in poultry as well as between the MIC values of colistin, cefotaxime or meropenem responsible for antibiotic resistance in *Escherichia coli* isolates.



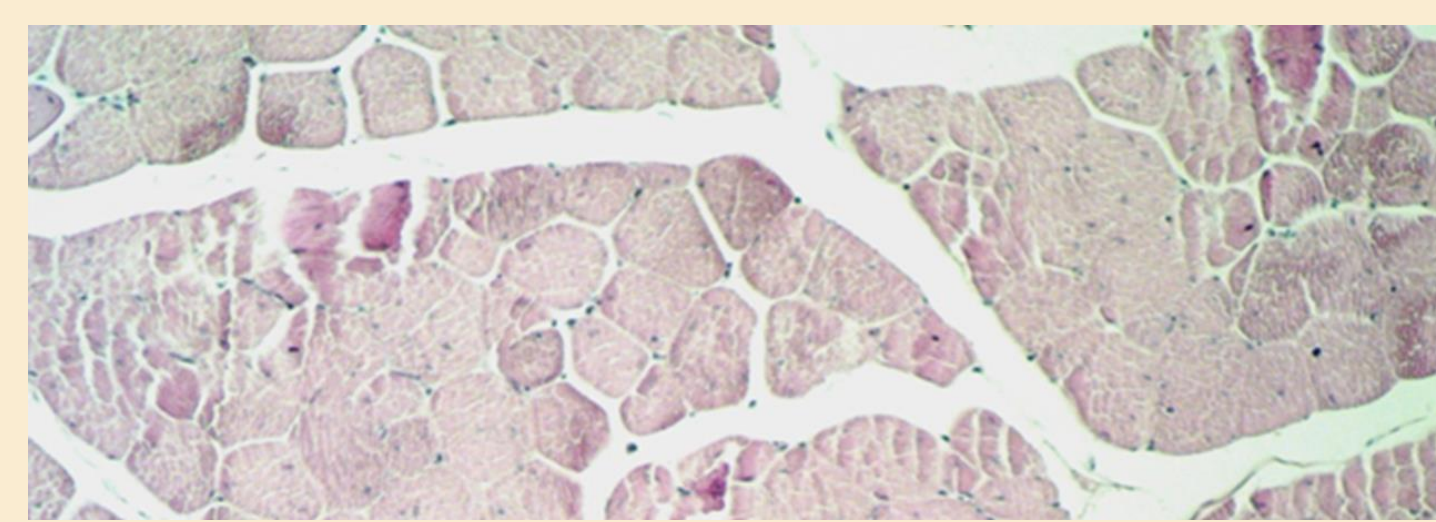
Appearance of *Lactobacillus* species colonies on MRS agar after 72 h of incubation



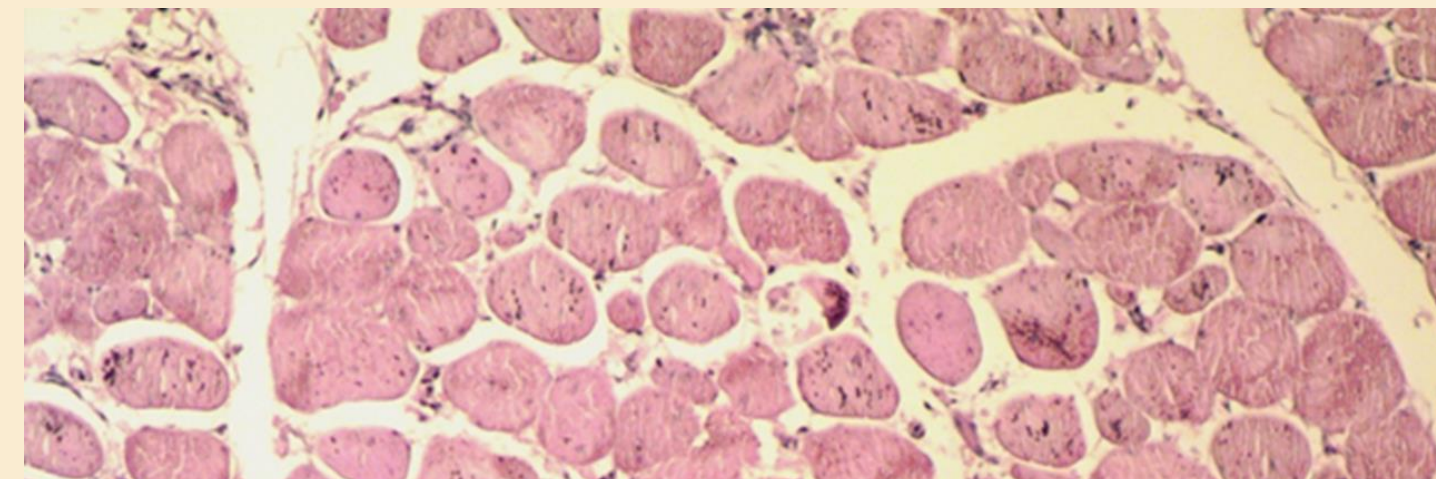
Appearance of lactobacilli on the culture preparation, Gram staining, 1000x magnification



The cross-section of muscle tissue with WWS myopathy



The cross-section of normal muscle tissue



The cross-section of the muscle tissue - chicken breast meat with petechiae



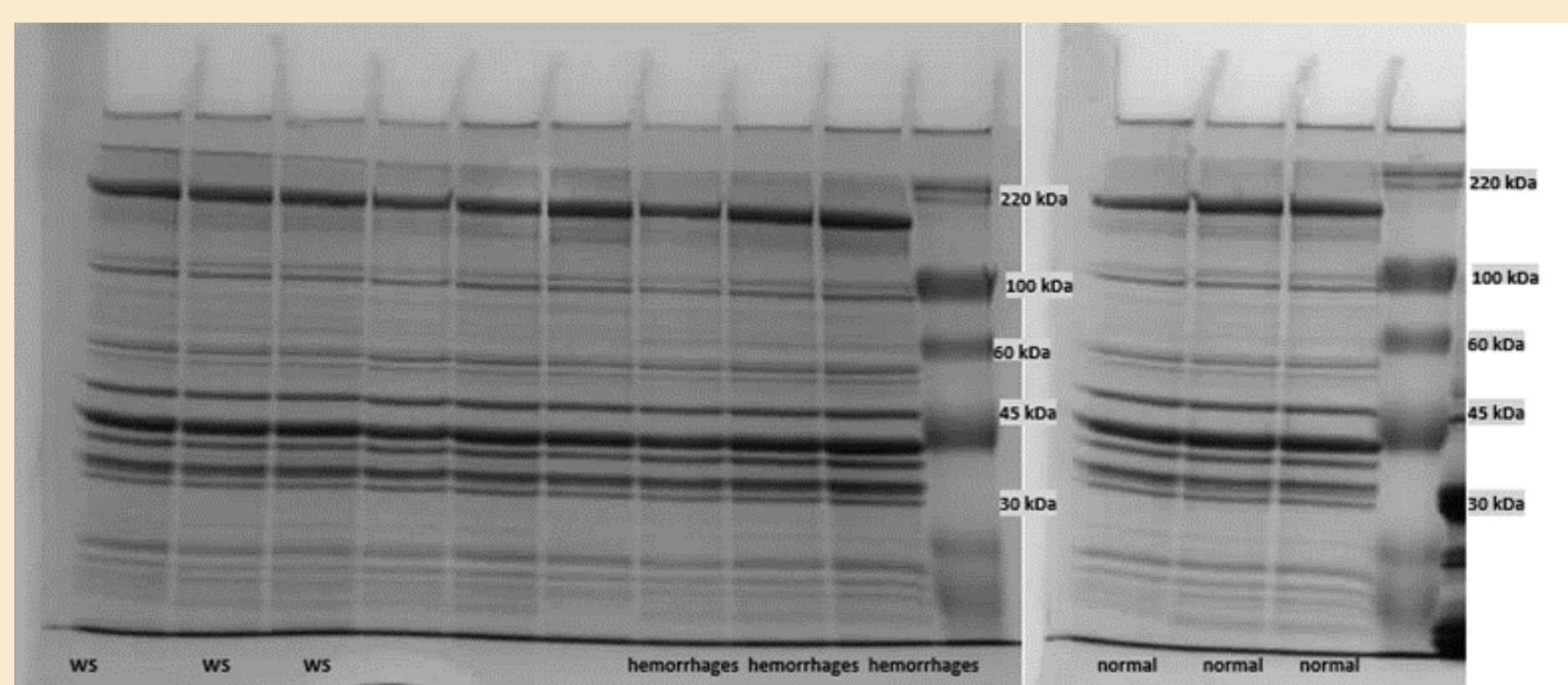
Pectoral muscle with echymoses and white stripes



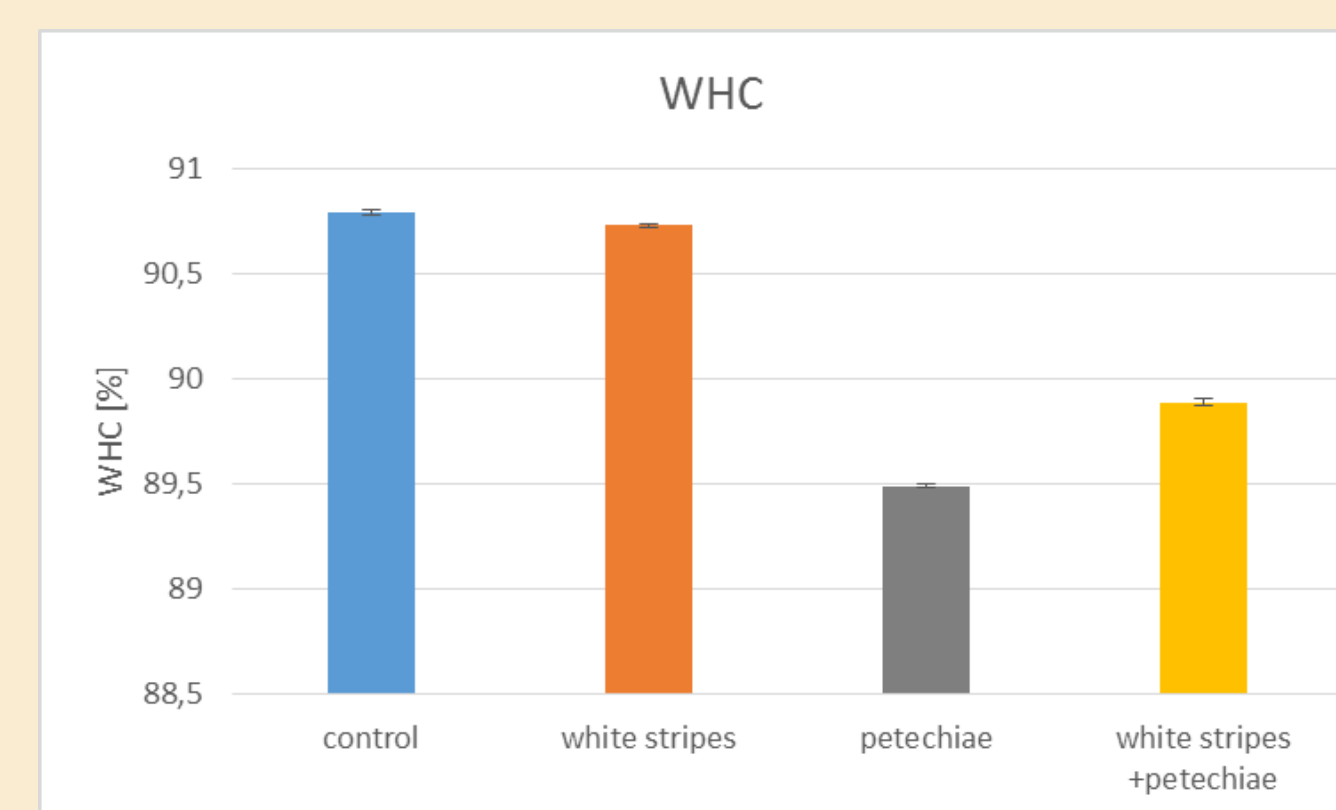
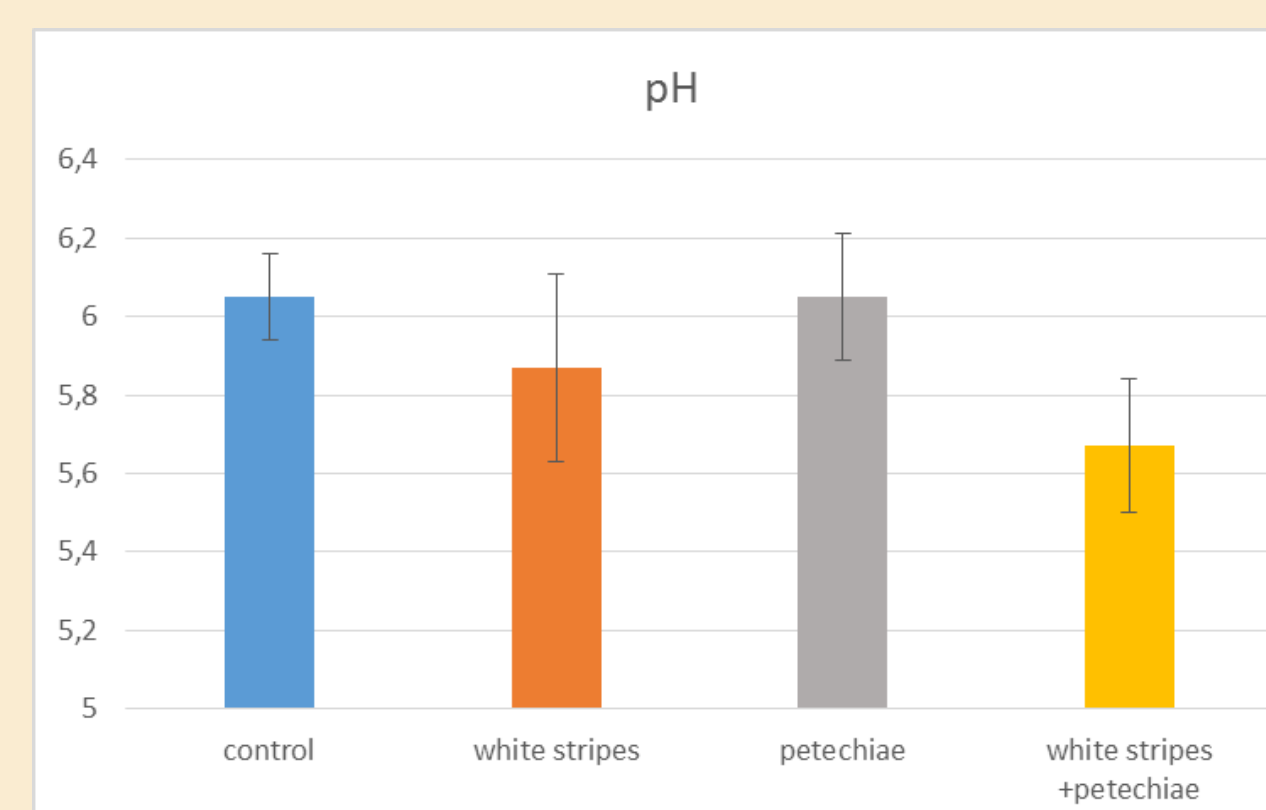
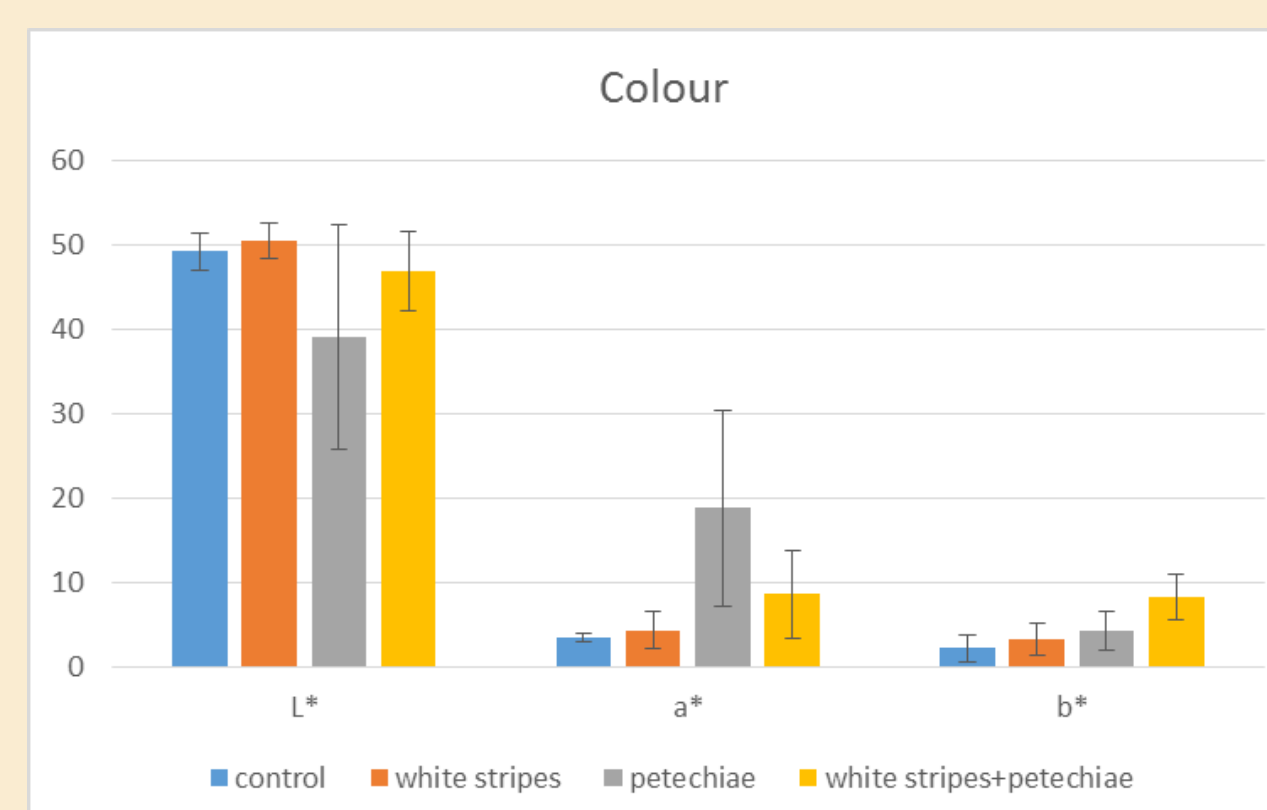
Pectoral muscle with white stripes



The pectoral muscle with echymosis



SDS PAGE Electrophoretogram of normal and defected chicken breast meat



	All fibers	Hypertrophy	Fiber necrosis	Atrophy	Splitting
<b>Hemorrhage</b>	109 <sup>a</sup>	22.8 <sup>b</sup>	20.9%	39.9 <sup>c</sup>	36.6%
<b>White stripes</b>	120 <sup>a</sup>	34.2 <sup>c</sup>	28.5%	16.9 <sup>b</sup>	14.1%
<b>Control</b>	139 <sup>b</sup>	15.3 <sup>a</sup>	11.0%	4.38 <sup>a</sup>	3.15%
<b>p</b>	0.006	0.000	0.000	0.008	0.000

### Acknowledgement

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