Metabolomics **analysis** of "wooden **breast** syndrome" in **chickens**

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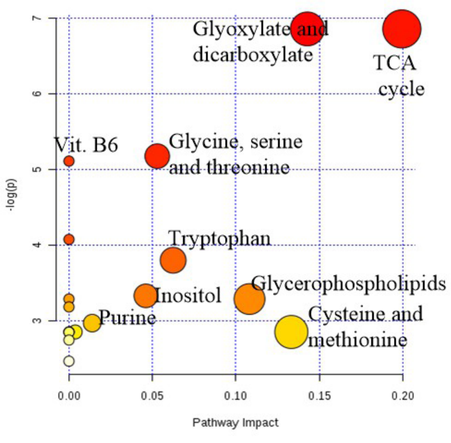
Introduction

Wooden breast (WB) is an emerging muscular disease macroscopically characterize for hardness in the pectoralis major muscle that have substantial implications on meat quality, causing economically losses to poultry industry. The etiology of this syndrome is unknown

Objective

To identify metabolic changes associated with WB by metabolomics analysis using UPLC-Qtof and bioinformatics.

Pathway analysis

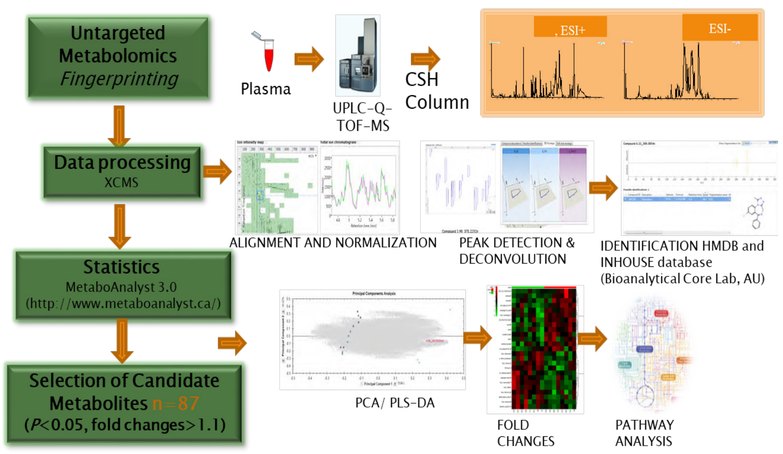


Material and Methods

Ross308 broilers (n=308) were reared for 34 days in a commercial poultry farm. 40 broilers were sacrificed on the farm by cervical dislocation and blood was collected. Breast fillets from the broilers were graded into 3 wooden breast (WB) categories (Dalgaard et al.2018):

- △ 0 = Normal/control: fillets without hardened areas (n=10)
- + 1 = Moderate WB: fillets with diffuse hardness areas (n=14)
- x 2 = Severe WB: fillets with very hardness areas (n=16)

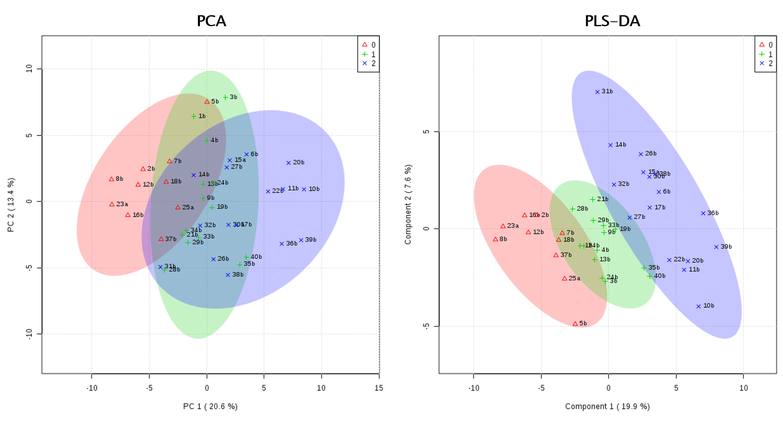
Metabolomics Workflow



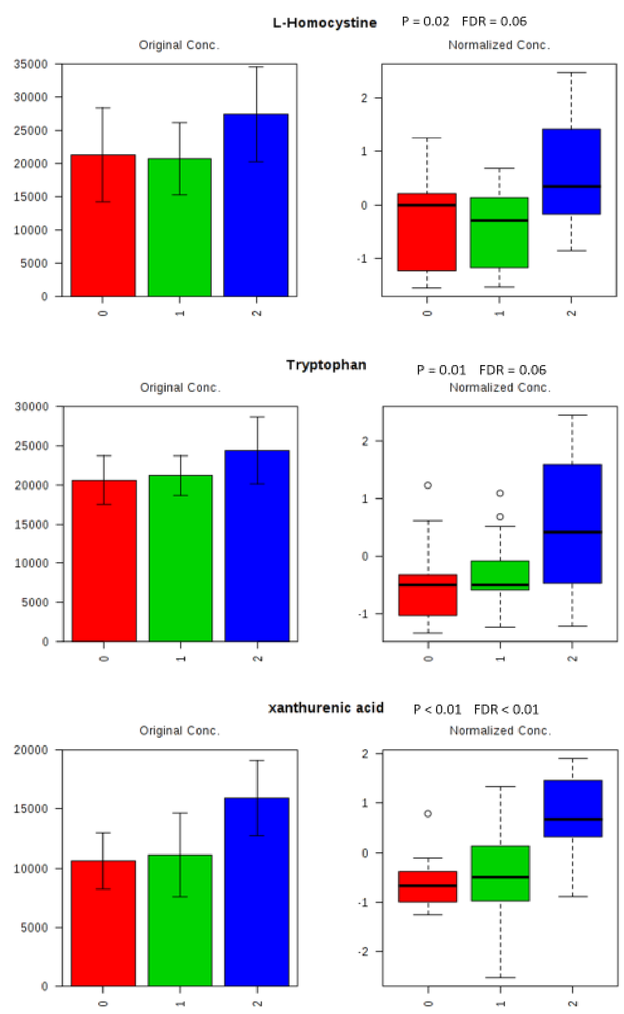
Results

Principal components analysis (PCA) and partial-least square of discriminant analysis (PLS-DA) from 87 compounds identified P < 0.05

△ Normal/control; + Moderate WB; x Severe WB



Levels (original intensity) and box-plots (auto-scaling normalization) of the metabolites in plasma samples obtained from 0=control (red); 1=medium WB (green); 2=sever WB (blue)



Conclusions and Implications

Animals with WB presented high levels in plasma of xanthurenic acid, homocysteine and tryptophan. The levels of these circulating metabolites are considered functional biomarkers reflecting enzymatic or metabolic functions of vitamin B, particularly vitamin B6, which serves as a coenzyme in amino acid, glucose, and lipid metabolism. Metabolomics gives new insight into the pathophysiology of WB syndrome.