Cecal volatilome and microbiota profile of organic chickens supplemented with black soldier fly live larvae

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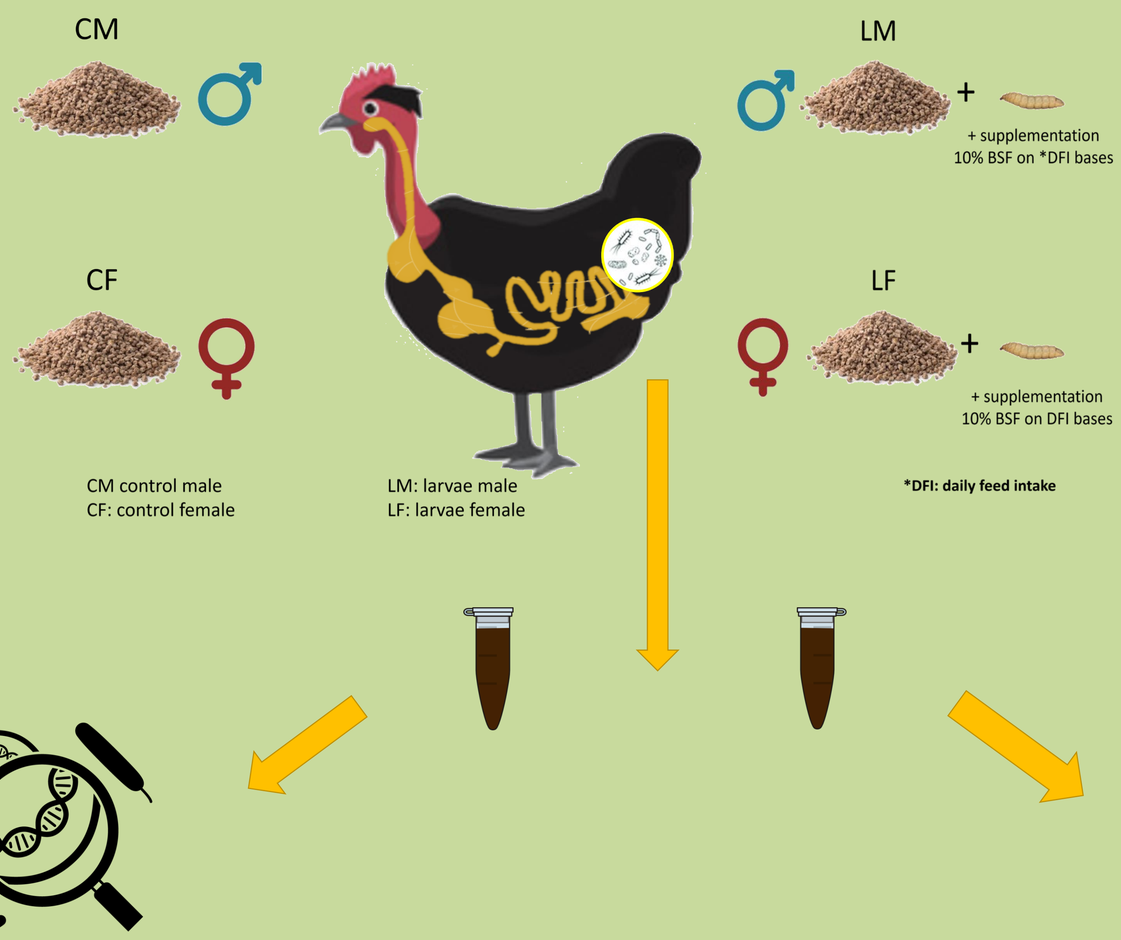
INTRODUCTION

- ✓ **Insects** have shown to be a potential nutritional replacement in poultry as substitute of traditional protein sources, with positive effects on gut microbiota.
- ✓ Only few studies have yet investigated the effects of black soldier fly (BSF) live larvae provision on **short-chain fatty acids (SCFAs)** and **microbiota** composition in chicken's gut.

Fig. 1 Graphical representation of the experimental design.



MATERIAL AND METHODS

- ➢ **240 Label naked neck (LNN)** birds were reared from 21 to 82 days of age;
- ➢ **4 groups of both gender (M and F),** 10 birds/pen; (6 replicates; 60 birds/treatment)**.**
- ➢ Experimental groups **(LM and LF)** were fed **10% supplementation of black soldier fly (BSF) live larvae** based on the **DFI*** and compared to control groups **(CM and CF) (Fig. 1).**
- ➢ **60 birds** were then slaughtered and samples of their cecum content were taken for the following analyses**:**
  - **Microbiota by DNA sequencing techniques**
  - **Volatilome by SPME-GC-MS**

MICROBIOTA

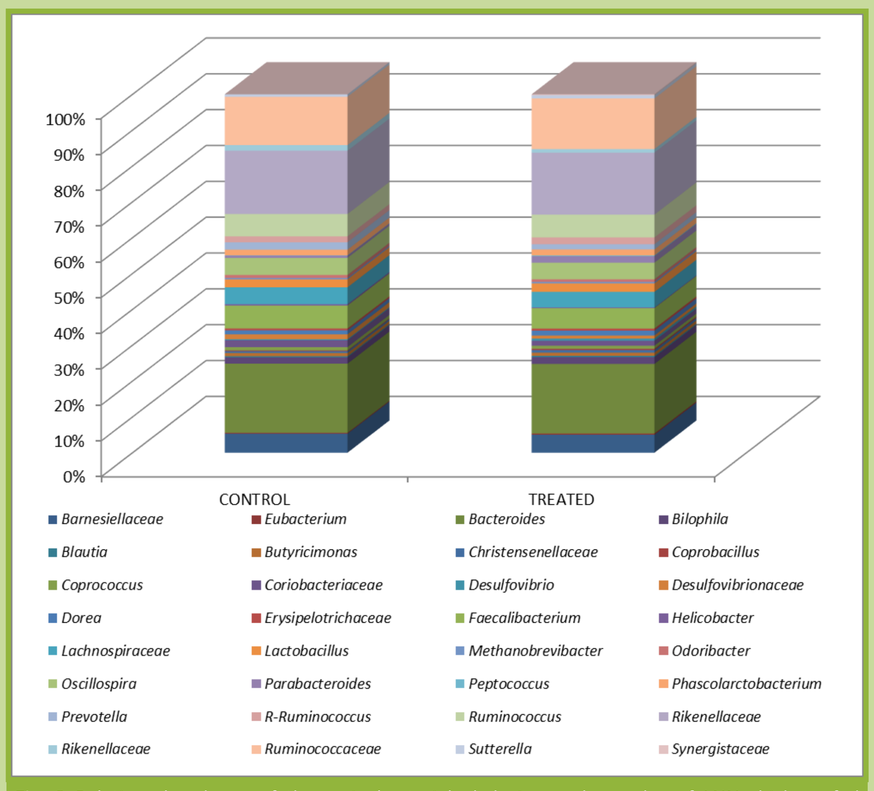


Fig. 2 Relative abundance of the main bacterial phyla in cecal samples of LNN chickens fed Control diet and a 10% BSF live larvae supplementation.

RESULTS & DISCUSSION

- ✓ Cecal microbiota analysis of birds fed BSF live larvae **(Fig.2)** showed a higher incidence of:
  - *Coprobacillus*
  - *Synergistaceae*
  - *Christensenellaceae*

with the latter having the potential to degrade **chitin** insect meal, a compound with immunoregulatory properties.

- ✓ **Seven SCFAs** were identified, with **butyrate** as the most abundant (**Fig.3**).
- ✓ Even if no significant differences were found between treatments, **cecal SCFAs** concentration in insect-fed animals were noticed to be **less variable** than in control group.

CONCLUSIONS

Results show that even a dietary **10%** supplementation of **BSF live larvae** can slightly **improve microbiota profile** and potentially, **SCFAs production** in LNN chickens.

SPME-GC-MS

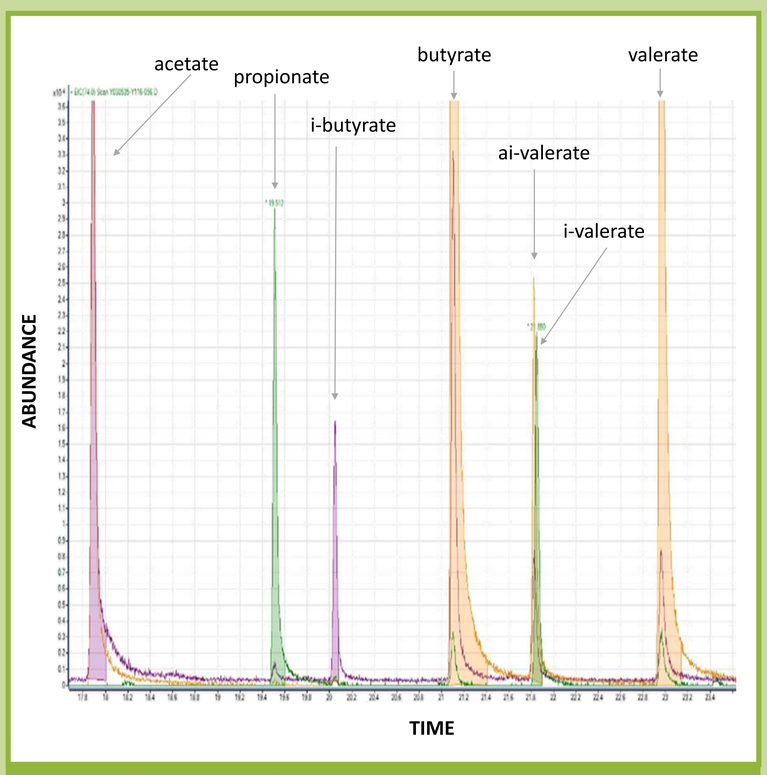


Fig.3 SPME-GC-MS analysis (Total Ion chromatogram) showing the 7 key SCFAs identified in cecal samples of LNN chickens.

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For more information on this project please visit: https://poultrynsect.eu or scan this QR code