



Research Summary

Yellow mealworm larvae (*Tenebrio molitor*) grown on deoxynivalenol contaminated wheat as a feed ingredient for broiler chickens

Purpose of study

Deoxynivalenol (DON) is a toxin produced by *Fusarium* fungal species which has negative impacts in poultry and other livestock species resulting in economic losses. As such, crops contaminated with high levels of DON are costly economically. Yellow mealworms have been found to be able to grow on crops with high DON levels (up to 95 ppm) without any impacts on growth and reproduction while retaining relatively little detectable mycotoxins within their bodies which could allow them to be used in feed.

Yellow mealworms have been fed to poultry previously with increases seen in feed intake, feed-gain ratios, and growth, the use of mealworms grown on DON contaminated crops have not been tested. This project aims to evaluate if mealworms reared on DON contaminated wheat are safe for poultry consumption or affect performance

of broilers.

Methodology

Yellow mealworms were raised on low and high DON wheat (<1ppm and 30ppm DON), harvested, dried, and used to produce diets. Diets consisted of one control diet not using any mealworms (CD), one diet using 5% mealworms reared on low DON wheat (LMD), and a third using 5% mealworms reared on high DON wheat (HMD).

75, later reduced to 60 male Ross 708 broiler chickens were placed into 15 cages and fed one of the three diets from 0-35 days of age. Body weight and feed intake were measured at the start of the experiment and every seventh day following. Other data collected includes crude protein retention, dry matter digestibility, meat yield (breasts, thighs, drums, wings), organ length, and organ weights.

Findings

Feed intake. Feed intake was reduced in birds grown on the HMD diet, which may be indicative of the presence of a DON-like metabolite being present.

Performance. Overall body weight, meat yield, mortality, average daily gain, and feed-to-gain ratios were not affected by the diets.

Crude protein retention. Crude protein retention was higher in birds grown on diets containing insect meal.

Dry matter digestibility. Digestibility was increased in broilers fed HMD.

Conclusion

Yellow mealworms have the potential to be a good feed for use in poultry, however, mealworms reared on high DON crops may not be suitable for use in feed. Further research is required to determine how mealworms metabolise DON and if there are effects in poultry.



About the researchers

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