

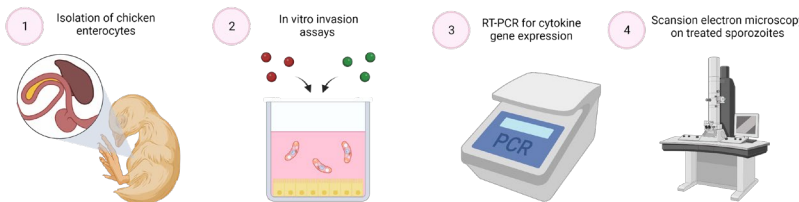


Investigating the effects of a thymol-based blend of botanicals against *E. tenella* in vitro

Objectives

1. Investigation of the anticoccidial power of a thymol-based blend of botanicals on *E. tenella* invasion in primary chicken enterocytes
2. Investigation of immune response modulation
3. Investigation on morphological changes occurring on *E. tenella* sporozoites after treatment by scanning electron microscopy

Materials and Methods

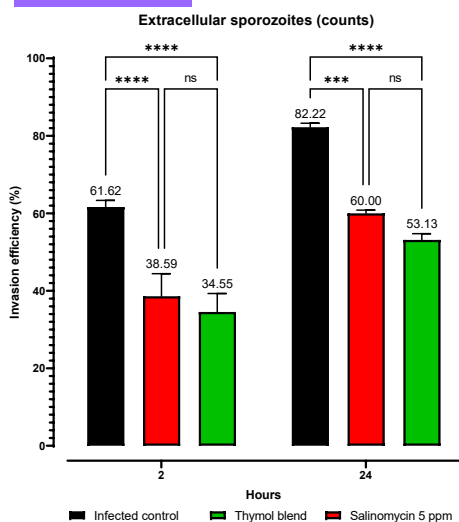


Conclusions

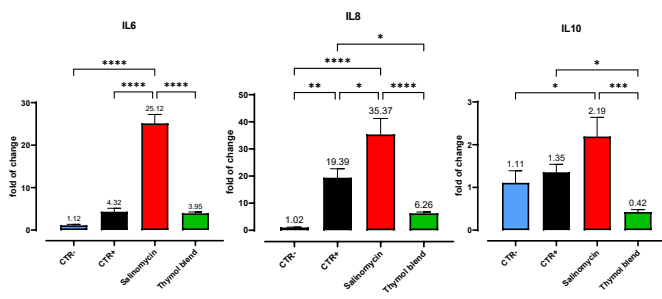
The tested botanical blend exhibited promising anticoccidial properties by preventing *E. tenella* invasion in chicken intestinal enterocytes, comparable to salinomycin. Also, the botanical blend prevented excessive inflammation and induced morphological changes in sporozoites, indicating its potential in combating chicken coccidiosis and promoting intestinal health.

Results

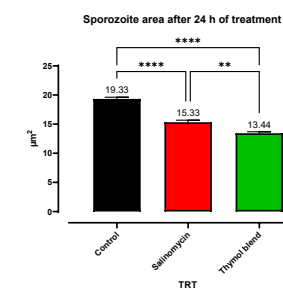
Mean with SEM, n=6, p<0.05.



The botanical blend and the ionophore drug significantly inhibited *Eimeria* invasion in cIEC within 2 hours, with comparable efficiency. The botanical blend also suppressed the overexpression of pro-inflammatory cytokines induced by *Eimeria* invasion at 24 hours.



Furthermore, the sporozoites treated with salinomycin or the botanical treatment exhibited reduced dimensions, suggesting a correlation with the decreased ability to invade cells



Future Proposal and Period Abroad

The next phase of this research will involve a detailed examination of the *E. tenella* lifecycle in vitro using a fluorescent strain of *E. tenella* at the Royal Veterinary College in London, UK. This model will be utilized to evaluate the anticoccidial effects of both drug and botanical treatments in the post-invasion phase

References

Ghiselli, F., Rossi, B., Felici, M. et al. Isolation, culture, and characterization of chicken intestinal epithelial cells. *BMC Mol and Cell Biol* 22, 12 (2021).
 Felici M., Tugnoli B., Ghiselli F. et al In vitro anticoccidial activity of thymol, carvacrol, and saponins. *Poultry Science* 99, 11 (2020)
 Marugan-Hernandez V., Jeremiah G., Aguiar-Martins K., The Growth of *Eimeria tenella*: Characterization and Application of Quantitative Methods to Assess Sporozoite Invasion and Endogenous Development in Cell Culture *Front. Cell. Infect. Microbiol.*, 10 (2020)

