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An Overview of Advanced Use of Essential Oils for Poultry Health and Disease Management

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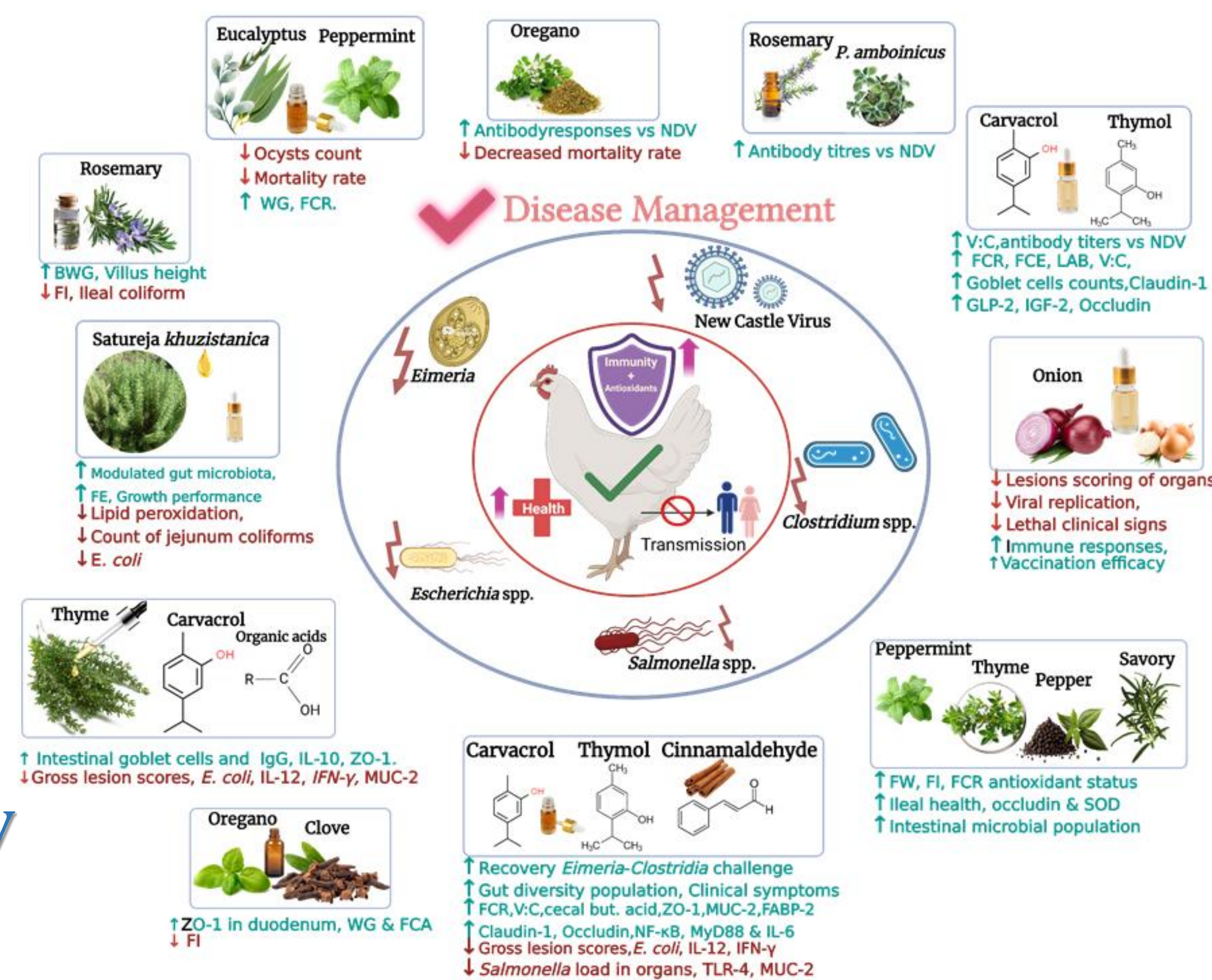
Abstract: In this review, we discuss how essential oils (EOs) can be used in poultry farming as a sustainable alternative to conventional practices. Given their antimicrobial, antioxidant and growth promoting capability, EOs are highlighted as potential substitutes with their rich composition of terpenes and phenolics. The review approach how EOs promote poultry health with regard to growth promotion, improving immune function and enhancing feed conversion ratios. It further examines their impact on gut health, disease resistance, and the potential to elevate product quality. We aimed to provide a review of the biological mechanisms behind the efficacy of EOs in managing diseases and promoting health in poultry, against a backdrop of various pathogens.

Keywords: Biological mechanisms, disease management, essential oils, poultry production, antibiotic alternatives

Introduction

Currently, poultry meat is on track to become the most consumed meat worldwide. Given their potential role as reservoirs for zoonotic diseases, effective farm management has become a critical priority as meat production increases. Additionally, the ongoing issue of bacteria developing resistance to antibiotics is associated with the excessive and often unnecessary use of these drugs. This concern extends to veterinary alternatives to antibiotics, which include various plant extracts, EOs, organic acids, and natural antimicrobial mixtures [2, 3]. To elucidate the mechanisms by which EOs exert their beneficial effects in poultry, these figures provides a schematic representation, illustrating their modes of action, including antimicrobial activity, stimulation of the immune response, and improvement of gut health.

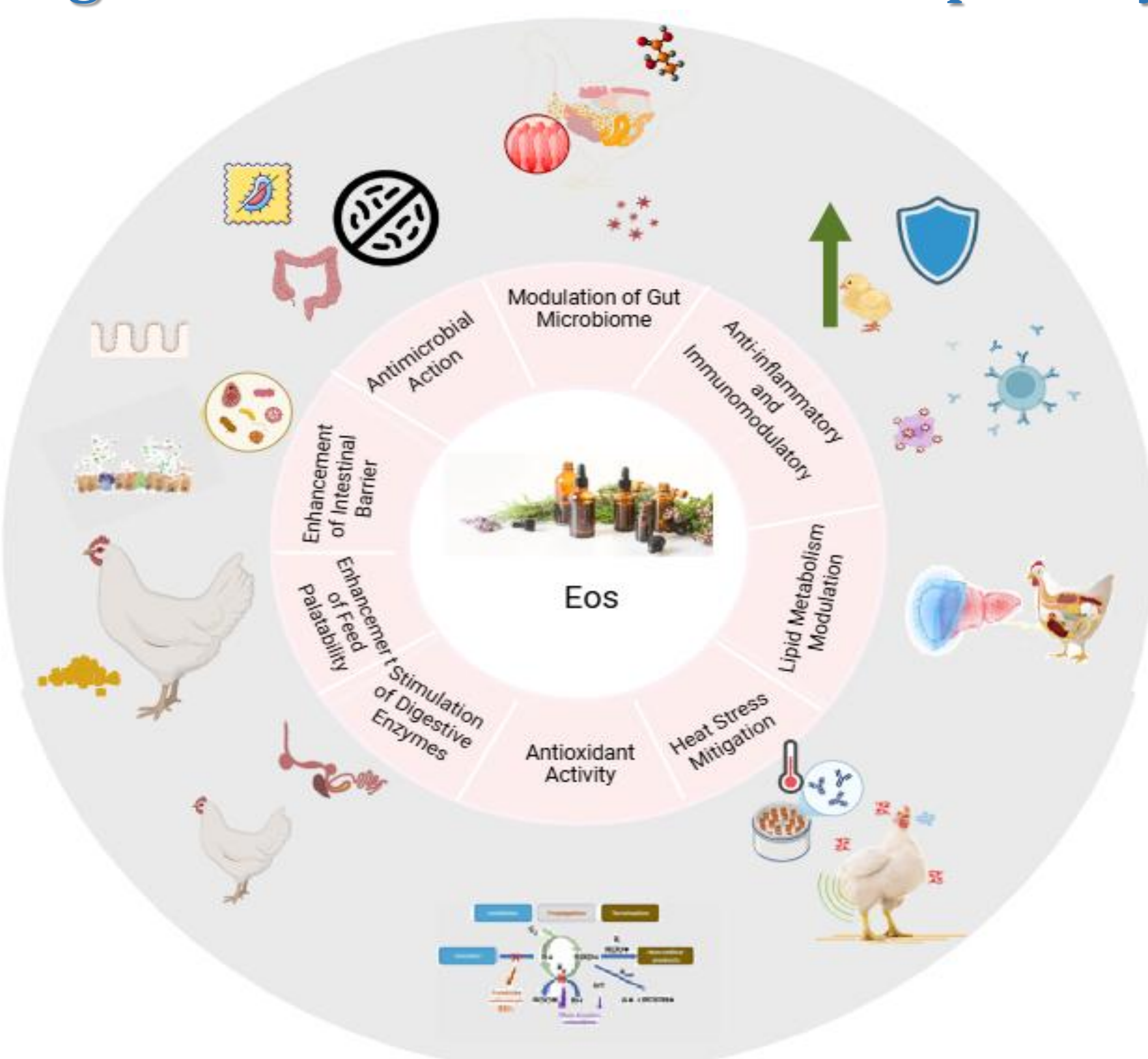
Pathogen Mitigating Insights of EOs in Poultry



Conclusions

Current literature indicates that EOs show promising results in managing diseases caused by various avian pathogens that impose a significant economic burden on the poultry industry. EOs can be viewed as a sustainable alternative for combating poultry pathogens because they can reversibly modulate immune responses and enhance tissue integrity without developing resistance. However, it is important to evaluate their efficacy and safety in a contextual manner for comparative studies, as reactions can vary based on differences in chemical composition, concentrations, bioavailability, and bird breeds.

Biological effects of EOs linked to poultry



References

- Ding, Y., et al., *Dietary essential oils improves the growth performance, antioxidant properties and intestinal permeability by inhibiting bacterial proliferation, and altering the gut microbiota of yellow-feather broilers*. Poultry Science, 2022. **101**(11): p. 102087.
- Rahimpour, F., et al., *Microencapsulation of savory essential oil within alginate: Effect on performance, oxidative stability of meat, and intestinal microflora of broilers*. Animal Production Research, 2022. **11**(2): p. 43-55.
- El-Sabrou, K., A. Khalifah, and B. Mishra, *Application of botanical products as nutraceutical feed additives for improving poultry health and production*. Veterinary World, 2023. **16**(2): p. 369.
- Yilmaz, E. and M. Gul, *Effects of cumin (Cuminum cyminum L.) essential oil and chronic heat stress on growth performance, carcass characteristics, serum biochemistry, antioxidant enzyme activity, and intestinal microbiology in broiler chickens*. Veterinary Research Communications, 2023. **47**(2): p. 861-875.