

IN OVO INJECTION OF ESSENTIAL OILS FOR ENHANCING POULTRY HATCHABILITY, POST-HATCH PERFORMANCE, AND WELFARE: A REVIEW AND FUTURE PROSPECTS

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In ovo technology represents a promising approach to improving the efficiency and sustainability of the poultry industry. Certain studies have explored other delivery methods, such as incorporating essential oils into water or diets after in ovo injection, to maximize their benefits. The main potential of in-ovo injection with essential oils is to enhance hatching parameters, chick quality, post-hatch performance, and welfare. Additionally, they exhibit antibacterial properties and can modulate the immune system. The success of this innovative method relies not only on the type of injected essential oil but also on various factors including the dosage, volume, timing, and formulation of these substances. The form in which essential oils are delivered, whether alone, with an emulsifier, or encapsulated, can significantly influence the hatchability rates and subsequently impact the benefits attained from its application. Interestingly, nanoemulsified thyme oil at a high concentration adversely affects the reproductive system and blood parameters, whereas nano-encapsulated thyme oil demonstrates an improvement in broiler chicken growth performance and conversion ratio. Regarding the hatchability rates which are a critical indicator of the success of in-ovo injection, rosemary essential oil is a beneficial additive in poultry production, particularly in improving hatchability and enhancing the quality of newly hatched chicks. Finally, ensuring the safe and effective utilization of essential oils in poultry production involves mitigating the risk of toxicity-related adverse effects while maximizing their potential benefits.