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Opinion

Method of Harmonizing Poultry Farming with Nature and Controlling D. Gallinae - Small Mobile Poultry House

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Abstract

The control of the poultry red mite, *Dermanyssus gallinae*, remains one of the greatest challenges in both intensive and extensive poultry production. Achieving effective parasite control while safeguarding poultry welfare, human health, and environmental sustainability is difficult under current production systems. Although industrial poultry farming primarily relies on eradication and strict biosecurity measures, these approaches are often less suitable for extensive production systems. In this opinion, we propose that the "Small Mobile Poultry House (SMPH)" model offers a practical and nature-oriented approach to managing *D. gallinae* populations. By combining flock relocation, improved hygiene, simple housing design, and environmentally safe control measures when necessary, the SMPH concept may contribute to sustainable poultry production while maintaining ecological balance and supporting traditional family farming.'

Opinion

In our opinion, controlling the poultry red mite, *Dermanyssus gallinae*, in extensive poultry production requires a different approach from that used in industrial systems. Rather than relying solely on eradication, sustainable control should seek to balance parasite management, poultry welfare, human health, and environmental protection. Red poultry mites, *Dermanyssus gallinae*, represent a global health and economic problem in poultry production. The continued expansion of the poultry industry has been accompanied by an increasing prevalence of *D. gallinae*. Industrial poultry production is particularly affected because large numbers of birds are housed in confined systems, most commonly in cages. Once *D. gallinae* is introduced into a facility, technological connections and conventional control strategies based mainly on suppression rather than prevention allow the parasite to spread throughout the production system [1]. The consequences include health problems, increasing economic losses, and, when control measures are used indiscriminately,

concerns regarding chemical residues in eggs and meat. In addition, *D. gallinae* is a zoonotic parasite that can infest people working with poultry [2].

In contrast, extensive poultry production in rural households allows greater contact between domestic poultry and wild birds, creating additional opportunities for the introduction and persistence of *D. gallinae*. Consequently, the control of poultry red mites in extensive systems presents unique challenges. Compared with industrial production, these systems are generally less favorable for conventional control because of their complexity, variable hygiene conditions, larger environmental surface area per hen, and continuous use. Under the conditions of both intensive and extensive poultry production, achieving effective control of *D. gallinae* while ensuring the welfare of poultry, protecting human health, and preserving the environment remains difficult. Unlike industrial poultry production, where eradication supported by strict biosecurity measures is the primary objective, extensive poultry production requires a management strategy that respects natural ecological processes while maintaining a practical balance between parasite control and sustainability [3, 4]. In our opinion, these objectives may be achieved through the model and technology of the "Small Mobile Poultry House (SMPH)" (P 2024/1123). The basic SMPH unit accommodates approximately 50 hens and includes 12 nests, 10 m of perch space, and a 100 m^2 outdoor run.

Figure 1: The first prototype of small mobile poultry house

The number of units can be adapted to family needs, ranging from a single unit for household egg production to six or more units for family-scale commercial production. The SMPH incorporates traditional and practical design principles, variable grazing areas to improve feed quality and hygiene, conditions that reduce the risk of mass infestation by *D. gallinae*, a simple and functional environment for nesting and roosting, and a structure that is easy to relocate and maintain [5, 6]. Within this concept, control of *D. gallinae* is supported by regular relocation of the poultry house, which may substantially reduce infestation pressure, particularly because there is no permanent floor where mites can persist. The system also allows hens to express natural defensive behaviors, exposes mite populations to seasonal temperature variations that may naturally limit their development, and provides a simple housing environment that facilitates effective cleaning. If mite populations nevertheless reach levels capable of affecting poultry welfare or productivity, safe control measures for humans, poultry, and the environment have been developed and tested to regulate their population. The close relationship between the SMPH concept and the natural environment is, in our opinion, one of its principal strengths. Modern agriculture has increasingly become separated from natural ecological processes, often reducing biodiversity and disrupting the interactions between humans, animals, and their environment. Approaches that work with, rather than against, natural systems may contribute to healthier and more sustainable agricultural practices. From this perspective, the SMPH represents a practical step toward supporting environmentally responsible poultry production while preserving traditional family farming and its associated values.

Conclusion

In our opinion, sustainable management of Dermanyssus gallinae in extensive poultry production requires approaches that extend beyond conventional eradication strategies. While industrial production primarily depends on strict biosecurity and suppression measures, extensive systems may benefit from management practices that better align with natural ecological processes. The Small Mobile Poultry House (SMPH) concept represents one such approach by integrating poultry welfare, environmental sustainability, and practical parasite management within family-based and small-scale poultry production. Although further field evaluation will help to confirm its long-term effectiveness under different production conditions, we believe that the SMPH model has the potential to contribute to more sustainable control of D. gallinae while supporting responsible poultry farming and preserving the balance between agricultural production and nature.

Conflict of Interest: The authors declare no conflicts of interest.

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