

Cryptosporidium Implications to Agriculture and Beyond - Risks and Research Needs

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Abstract

Cryptosporidiosis is a significant diarrhoeal disease for both people and animals worldwide. Several species of this protozoan parasite can cause the disease. *Cryptosporidium* oocysts have a ubiquitous presence in the environment. *Cryptosporidium* oocysts transmission can occur following direct or indirect contact with an infected host, usually via the faecal-oral route. Person-to-person contact, zoonosis, and consuming contaminated food or water are well-known mechanisms for faecal-oral transmission, with a significant risk of infection from ingesting a single oocyst. Among the agricultural sectors, livestock plays an essential role in the supply of global food security. The growth of the farming and livestock industries has affected the environment, driving the depletion of natural resources, pollution, and greenhouse gas emissions, which concerns these practices' sustainability and future viability. The management of waste, especially agricultural waste, considering the principles of circular economy is crucial for the future viability of these activities; the recovery of by-products, energy, nutrients, and water reuse is fundamental to the closure of the materials cycle. The present article critically reviews scientific research on *Cryptosporidium* species related to the agriculture sector. It summarizes the knowledge about the risks of cryptosporidiosis in agricultural production, emphasizing the sources of contamination, the importance of animal production in parasite transmission, and the role of farmed animals as hosts. The zoonotic potential and the risk to farmers and household members are also highlighted. In contrast, the necessity of a training strategy for farmers and the One Health approach are advocated for controlling and preventing zoonotic cryptosporidiosis.

Keywords: Cryptosporidium, agriculture, water treatment, farms, animals, humans, food, environment

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