

Poster 30

Microplastics in eggs from cage and free-range production systems

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Abstract

Background: Microplastics (plastics ≤ 5 mm) are ubiquitous contaminants that may cause adverse human health effects [1]. However, information on human exposure to microplastics from terrestrial foods is lacking [2], including in eggs [3]. **Objective:** This work aims to compare the number and physical characteristics of microplastics present in eggs from cage and free-range production systems. **Methods:** Eggs identified as cage (size M, $n = 6$) and free-range (size M/L, $n = 5$) were acquired in local supermarkets, opened into glass flasks, subjected to lyophilization (7 days), stored in an oven at 30°C, followed by sample preparation, and photographing particles in 1.2 μm glass fiber filters (GFFC, Prat Dumas) under blue light (450 nm, SPEX Forensic) in the optical microscope (Zeiss Scope A1 Axio) using a Canon 550D camera equipped with an orange filter (Slim K&F Concept) [4]. Procedures were followed to prevent contamination and using three procedural blanks. Particles were analyzed in ImageJ, statistics were conducted on IBM SPSS Statistics 26 considering $\alpha = 0.05$, and results were expressed in microplastics per egg (MP/egg) and per gram (MP/g). **Results:** There was no significant difference in the number of microplastics per egg ($p = 0.199$) nor per gram ($p = 0.462$) between free-range (17 MP/egg; 0.4 MP/g) and cage eggs (9 MP/egg; 0.2 MP/g). The largest size of microplastics was significantly different ($p = 0.003$) between free-range (84.8 μm) and cage eggs (121.7 μm). Only 2 microplastics were found in one of the three procedural blanks. **Conclusions:** Estimated daily intake is 24 and 44 MP/day for cage and free-range eggs, respectively, similar to a previous estimate of 24 MP/day [2]. Comparisons between eggs production systems must be further explored, considering differences in dietary and environmental exposure of hens.

Keywords: microplastics; food safety; human exposure

Acknowledgments

This research received no external funding.

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