Effects of laying hens housing system on laying performance, egg quality characteristics, and egg microbial contamination

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The objective of this study was to compare the performance, egg quality, and microbial contamination of egg shells from hens maintained in different housing systems, such as conventional and enriched cages, litter, and aviaries. The housing system significantly ($P < 0.001$) influenced the performance characteristics. The highest egg production, lowest daily feed consumption, and feed conversion ratio were measured in conventional cages compared to litter and aviaries. Higher egg shell and albumen qualities were observed in conventional cages, whereas hens housed in enriched cages and aviaries laid eggs with a higher yolk index ($P < 0.001$). The housing system significantly ($P < 0.001$) influenced the total count of bacteria on the egg surface and the microbial contamination of Enterococcus and Escherichia coli. The lowest values for the total count of bacterial contamination ($P < 0.001$) were found in eggs from conventional cages (4.05 log colony-forming units (CFU)/egg) and enriched cages (3.98 log CFU/egg). Eggs from aviaries had 5.49 log CFU per egg, and the highest level of contamination was observed in eggs that were laid on litter (6.24 log CFU/egg). The level of the microbial contamination of egg shells from litter and aviaries was by 2 log CFU higher than in eggs from cages. It could be concluded, from the viewpoint of egg safety, a more suitable substitute for conventional cages are enriched cages and aviaries than litter.

Keywords:

cage; aviary; litter; egg production; egg shell; bacterial contamination

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