



**HAL**  
open science

## Effect of genetic and rearing system of laying hens on indicators of egg quality and eggshell microbial contamination

A Chastagner, P Galliot, C Souchet, Séverine Chevalier, Tino Jamme, Sophie Jan, Valérie Lechevalier-Datin, Eve-Anne Norwood, Guillaume Gillot, Julie Evrard, et al.

### ► To cite this version:

A Chastagner, P Galliot, C Souchet, Séverine Chevalier, Tino Jamme, et al.. Effect of genetic and rearing system of laying hens on indicators of egg quality and eggshell microbial contamination. XIXth European Symposium on the Quality of Eggs and Egg Products, Sep 2023, Cracovie, Poland. . hal-04213882

**HAL Id: hal-04213882**

**<https://hal.inrae.fr/hal-04213882v1>**

Submitted on 21 Sep 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

**Effect of genetic and rearing system of laying hens on indicators of egg quality and eggshell microbial contamination**

A. Chastagner<sup>1</sup>, P. Galliot<sup>1</sup>, C. Souchet<sup>1</sup>, Séverine Chevalier<sup>2</sup>, Tino Jamme<sup>2</sup>, Sophie Jan<sup>2</sup>, Valérie Lechevalier<sup>2</sup>, Guillaume Gillot<sup>3</sup>, Julie Evrard<sup>3</sup>, Véronique Huchet<sup>3</sup>, Maylis Dop<sup>4</sup>, Eve-Anne Norwood<sup>4</sup>, Angélique Travel<sup>1</sup>

<sup>1</sup> ITAVI, centra INRAE de Tours, 37380 Nouzilly, France

<sup>2</sup> STLO, INRAE, INSTITUT AGRO RENNES-ANGERS, 35042 Rennes, France

<sup>3</sup> ADRIA Food Technology Institute, UMT ACTIA 19.03-ALTER'ix, Quimper, France

<sup>4</sup> ONIRIS-GEPEA, 44000 Nantes, France

The rearing of laying hens is in the process of transitioning to alternative systems to cage. The objective of the ELEV'OP project is to assess the impact of different rearing systems (cage, barn system and free-range) on microbiological contamination and on the macrostructure of eggs. Two strains of hens were studied at an average age of 58 weeks: 13 Lohmann Brown Classic (LB) flocks and 13 Lowmann LSL Classic (LW) flocks evenly distributed in the 3 different rearing systems. Quality of eggs was compared with a DET6000 (Digital Egg Tester). The weight of eggs and yolks showed a strong inter-farms variability with a significant difference between the 2 strains. LW eggs and yolks are on average heavier ( $p < 0.01$ ) in agreement with the reference data. We do not observe any effect of rearing system in LW whereas in LB egg and yolk weights are lower in free-range than in cage (-2.21g for egg and -0.9g for yolk). Shell resistance were stronger in LB than LW, and is also impacted by the rearing system for both strains (Cage > barn & free-range). The yolk index was impacted by age and strain hens but not by the rearing system. Haugh unit showed a strong difference between strains (LB < LW) in addition to being impacted by the rearing system (+2.18 for free-range and +2.31 for barn compared to cage farms). The microbial contamination of egg surface was evaluated by counting the total flora at 30° C, enterococci and presumed enterobacteria. There was a high variability between farms unrelated to the rearing system, but which can be attributed to the management of the farm.

Keywords : egg quality, rearing system, cage, free-range, microbiology