Comparison of antibody titers in laying hens kept in an aviary system and in cages

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The aim of this study was to compare antibody titers in laying hens kept in an aviary system with free range and in conventional battery cages. Samples of sera were taken at regular intervals during the entire laying period in each housing system from five flocks kept consecutively in the same farm.
In total approximately 6500 sera, 1300 for each trial were tested for antibody titers against Infectious Bronchitis Virus (IBV), Newcastle Disease Virus (NDV) and Campylobacter. On average antibodies against IBV and Campylobacter were highest in hens from the aviary and lowest in battery cages. The results for antibody titers against NDV showed an opposite trend: titers were lowest in chickens in the aviary and highest in conventional cages.
Altogether the results suggest that the housing system and the space available for moving influence laying hen antibody titers against certain antigens.

Key words: antibodies; laying hens; housing systems

Introduction

The aim of this study was to compare antibody titers in laying hens kept in an aviary system with free range and in conventional battery cages. Therefore the data from five trials with three different hybrids of laying hens were analyzed.

Materials and methods

At the age of about 18 weeks hybrid hens from a single flock were housed in two different facilities: an aviary system (7.8 hens/m²) with a run (2.3 m²/hen); and battery cages (688 cm²/hen, maximum moving distance of 55 cm). Feed, water supply, management and vaccinations were identical in all groups in one trial. During the entire laying period of about 46 to 68 weeks, blood samples were taken every two to four weeks from 25 chickens in each housing system from five flocks kept consecutively in the same farm. All samples were examined for two viral and one bacterial antigens with the same batch of ELISA kits after the end of the laying period to ensure reliability of the results.

Results

In total approximately 6500 sera, 1300 for each trial were tested for antibody titers against Infectious Bronchitis Virus (IBV), Newcastle Disease Virus (NDV) and Campylobacter.

Antibodies against IBV (figure 1) and Campylobacter (figure 2) were highest in hens from the aviary and lowest in battery cages. All these differences in the titers show the same general tendency and are partly statistically significant (Scheffe-test).

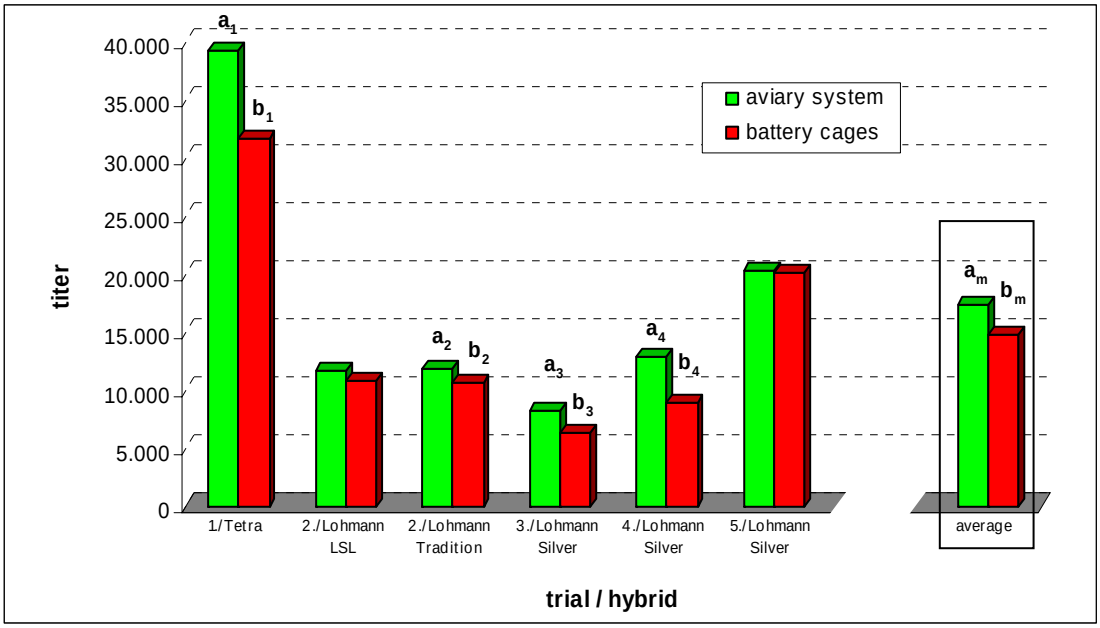

Figure 1: IBV-antibody titers (mean) kept in different housing systems from five trials

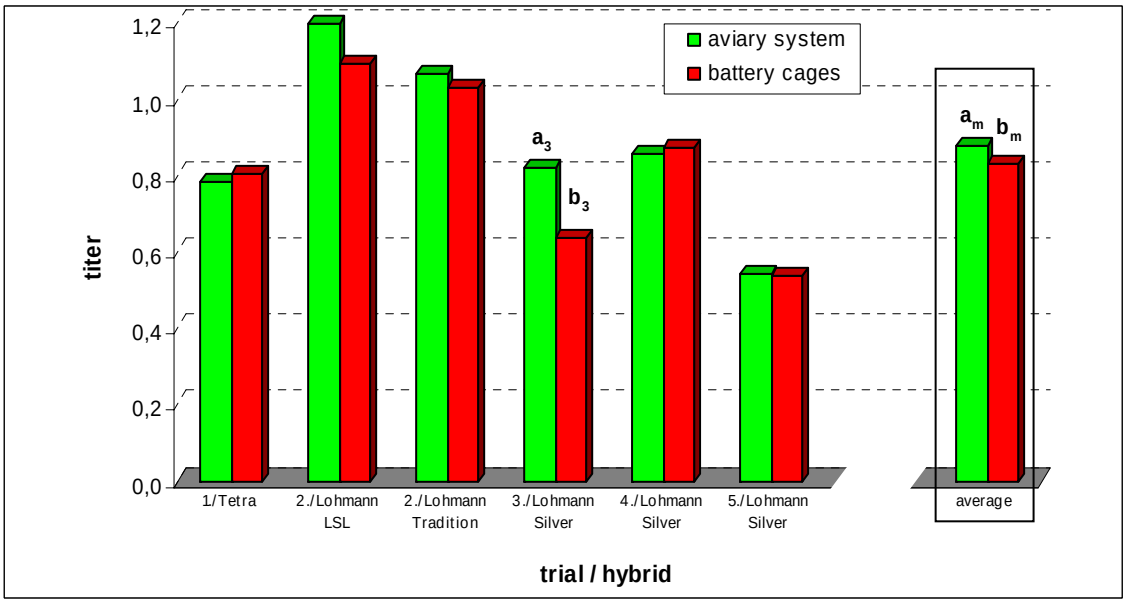

Figure 2: Campylobacter-antibody titers (mean) kept in different housing systems from five trials

The results for antibody titers against NDV (figure 3) showed an opposite significant trend: titers were lowest in chickens in the aviary and highest in conventional cages.

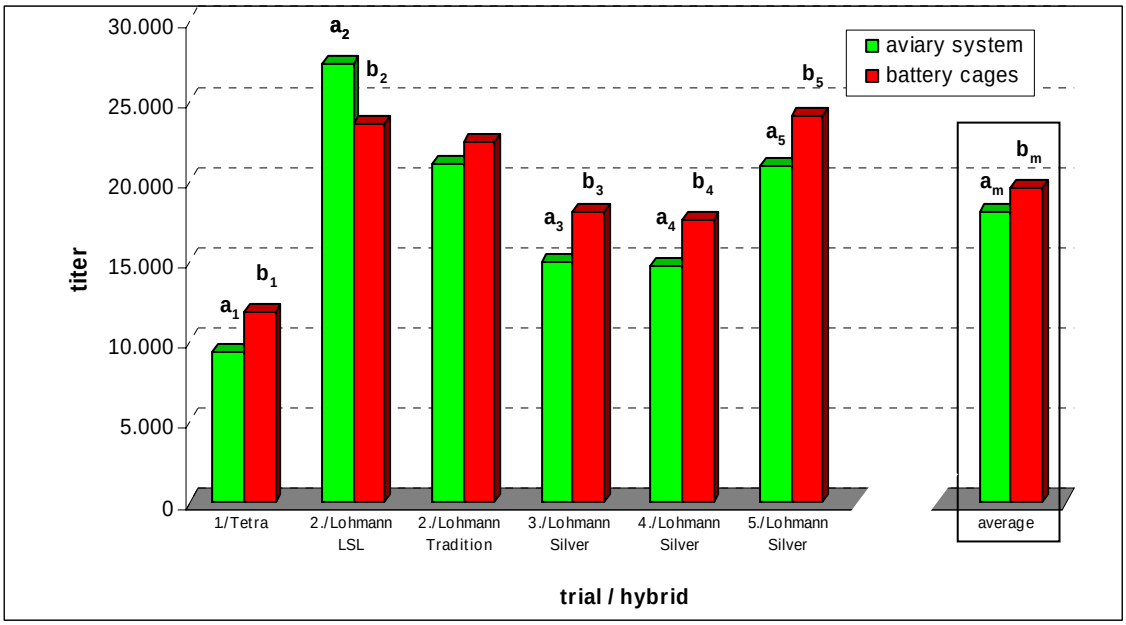

Figure 3: NDV-antibody titers (mean) kept in different housing systems from five trials

Conclusions

Antibodies titers against IBV and Campylobacter increased significantly in chickens with increasing housing space available per bird. The opposite trend was observed for antibodies against NDV.

Altogether the results suggest that the housing system and the space available for moving influence antibody titers from laying hens against certain antigens. It seems to be independent from genetic lines.