

New Study Uncovers Possible Increased Risk of *Salmonella* in Alternative Housing Systems for Laying Hens

CHAMPAIGN, IL (April 28, 2011) – The results of a new study from researchers in Belgium suggest that any shift from conventional to alternative housing systems for laying hens should be accompanied by a keen concern for optimizing and maintaining *Salmonella* surveillance programs, due to an increased risk of bird-to-bird transmission and internal egg contamination in some non-traditional housing systems.

The study, “Effect of Housing on Transmission of *Salmonella*,” will appear in the July issue (Vol. 90; doi:10.3382/ps.2010-00944) of *Poultry Science*, said the **Poultry Science Association (PSA)**, which publishes the journal.

According to the study’s lead author, Dr. Jantina De Vylder, Department of Pathology, Bacteriology and Avian Diseases, Ghent University, the researchers sought to quantify the effect of housing systems on the spread of *Salmonella* infection within a group of layers and on internal egg contamination. They found that aviary and floor housing systems pose a greater risk of bird-to-bird transmission of *Salmonella* Enteritidis than traditional battery cages and furnished cages. The study also found a higher number of eggs that were internally contaminated by *Salmonella* in aviary systems, as compared both to cage systems and the floor system.

“We found a slightly higher bird-to-bird transmission rate in aviary systems, and an even more pronounced rate for floor systems in comparison with cage systems. Given that we controlled for a number of other variables that might impact transmission rates, we believe that differences inherent to the housing systems – such as hygienic status, air quality, and more intensive contact between birds in large group-housing – are likely responsible,” said Dr. De Vylder.

The reason for the higher incidence of *Salmonella*-contaminated eggs in aviary housing systems, the second major finding of the study, was less clear.

“We were unable to establish any relation between the significantly larger number of internally contaminated eggs in the aviary system and either the internal colonization or the faecal shedding status of hens. It’s possible that stress could play a role in the difference, but that’s still speculation at this point,” added Dr. De Vylder.

The article cites an earlier study which found that stress induces some changes in the hen’s oviduct. This, the authors of the Belgian study say, “might create an environment that is more susceptible for *Salmonella* survival and also might affect the survival of *Salmonella* in egg albumen.”

Because of their findings, Dr. De Vylder and her co-authors urge that, following a move of laying hens from conventional to alternative housing systems, it is vital for *Salmonella* control plans to be maintained and for additional care to be taken to minimize within-flock transmission of *Salmonella*.

Previous Studies

The upcoming ban in the European Union on battery cages, which takes effect next January, and broad concerns about the hygienic status of alternative housing systems, prompted a number of earlier studies that tried to determine whether infectious agents like *Salmonella* Enteritidis spread more readily in non-conventional systems than in battery cages. While most of these epidemiological studies showed a higher prevalence of the bacterium in layer flocks housed in conventional systems, there was some concern, said Dr. De Vylder, that their findings may have been influenced by any number of factors, such as farm and flock size, age of the housing system, etc.

“A more recent study controlling for such environmental factors also concluded that alternative housing systems posed no additional risk for *Salmonella* colonization of the gut and internal organs than conventional battery cages. However, in this study, all of the birds inoculated with the pathogen were given very high doses – which most likely would not reflect the actual situation in the field. To address this, our group undertook what we believed was a more realistic approach to studying transmission,” said Dr. De Vylder.

About PSA

The Poultry Science Association (PSA) is a global scientific society dedicated to the discovery and dissemination of knowledge generated by poultry research – knowledge that enhances human and animal health and well-being and provides for the ethical, sustainable, and economical production of food. Founded in 1908, PSA has a global membership of about 2,000. For more information, go to www.poultryscience.org.

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