

Comparison of transmission rates of *Salmonella enteritidis* between pair-housed and group-housed layer hens

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A major aim of transmission experiments is to estimate transmission rates, which can be used in mathematical models to evaluate surveillance or control programmes. Although animals are usually housed in groups, transmission experiments are often performed with pairs. This design increases the number of independent observations, but may reduce the accuracy of the estimate: the contact process in pairs or groups may be different, resulting in different transmission rates. The aim of this study was to compare results of transmission experiments in pairs and groups of laying hens. In 60 experimental groups of 2 hens (pairwise experiments), and 3 groups of 200 hens (group experiments), we inoculated 1 and 4 hens with *Salmonella Enteritidis*, respectively. The hens were housed at similar densities. Regular fecal samples were taken to test for the presence of *S. Enteritidis*, indicating excretion and colonization. Transmission parameters estimated from the pairwise experiments were used for simulations of the group experiments, which were compared to the actual experimental results. Although differences in dynamics (eg, prevalence in time) were observed, we can show that these differences were more likely due to differences in properties of diagnostic tests than to differences in transmission rates. This finding suggests that the transmission parameter estimates from small-scale experiments might indeed be extrapolated to the field situation.