Analysis of factors important for the occurrence of Campylobacter in Danish broiler flocks

For more than a decade human campylobacteriosis has been the leading zoonosis in many developed countries. Consumption of poultry or poultry products has been identified as the primary source of infection in humans. This study was conducted to identify risk factors for the occurrence of Campylobacter in Danish broiler flocks. The study was based on a large data set consisting of Campylobacter positive status for nearly 6000 broiler flocks and 43 explanatory variables. Data were obtained from the Danish Campylobacter surveillance programme in poultry and from the responses to a standardized questionnaire answered via interviews with broiler farm owners. Two hundred and forty broiler farms, comprising 539 broiler houses, were included in the study and their Campylobacter status was followed over a 2-year period (1999–2000). The large number of observations made it possible to carry out a multivariate analysis including all 43 variables. A multivariate analysis was conducted using a generalized linear model, and the correlations between the houses from the same farms were accounted for by adding a variance structure to the model. The procedures for analyses included backward elimination, forward selection and expanding of the number of observations used in the variance analysis along with the reduction of the number of parameters in the model. The unit of analysis was ‘broiler house’, meaning that all results from a broiler house were aggregated into one prevalence figure (number of positive flocks/total number of flocks delivered over the 2-year period). The following factors were found to be significantly associated with the occurrence of Campylobacter in the broiler flocks: old broiler houses, late introduction of whole wheat in the feed, relatively high broiler age at slaughter, improper rodent control, large number of chimneys on the broiler house, farm located in an area with a high density of cattle farms, having more than one broiler house on the farm, and improper storage of wheat. This large-scale study confirms several risk factors identified in previous studies. The results concerning chimneys may be explained by the easier access that flies have to the broiler houses, which seems in agreement with recent Danish studies on the significance of fly-screens to reduce Campylobacter in broiler flocks. The results of this study may be used in identification of effective interventions aimed at controlling Campylobacter in Danish broiler flocks.

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