Low-cost monitoring of campylobacter in poultry houses by air sampling and quantitative PCR.

The present study describes the evaluation of a method for the quantification of Campylobacter by air sampling in poultry houses. Sampling was carried out in conventional chicken houses in Poland, in addition to a preliminary sampling in Denmark. Each measurement consisted of three air samples, two standard boot swab fecal samples, and one airborne particle count. Sampling was conducted over an 8-week period in three flocks, assessing the presence and levels of Campylobacter in boot swabs and air samples using quantitative real-time PCR. The detection limit for air sampling was approximately 100 Campylobacter cell equivalents (CCE)/m(3). Airborne particle counts were used to analyze the size distribution of airborne particles (0.3 to 10 μm) in the chicken houses in relation to the level of airborne Campylobacter. No correlation was found. Using air sampling, Campylobacter was detected in the flocks right away, while boot swab samples were positive after 2 weeks. All samples collected were positive for Campylobacter from week 2 through the rest of the rearing period for both sampling techniques, although levels 1- to 2-log CCE higher were found with air sampling. At week 8, the levels were approximately 10(4) and 10(5) CCE per sample for boot swabs and air, respectively. In conclusion, using air samples combined with quantitative real-time PCR, Campylobacter contamination could be detected earlier than by boot swabs and was found to be a more convenient technique for monitoring and/or to obtain enumeration data useful for quantitative risk assessment of Campylobacter.

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