Influxed insects as Vectors for Campylobacter jejuni and Campylobacter coli in Danish Broiler Houses

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The vector potential of flies (Diptera: Brachycera) for spread of Campylobacter jejuni and Campylobacter coli on 5 Danish broiler farms was evaluated in a longitudinal field study from April to November 2004. First, the prevalence of C. jejuni- and C. coli-positive flies was determined in 2,816 flies captured from farm surroundings. Each individual fly was macerated, preenriched in Bolton broth for 24 h at 42 degrees C, streaked onto modified Campylobacter blood-free selective agar and incubated under microaerobic conditions for 48 h at 42 degrees C. Second, the influx of insects to broiler houses was estimated by trapping of insects (n = 5,936) in ventilation vents. In total, 31 flies (28 of which were of the Muscidae family) caught in farm surroundings were Campylobacter spp.-positive (C. jejuni, n = 7; C. coli, n = 23; other Campylobacter spp., n = 1). Musca domestica (L) (house fly) was more frequently (P <0.0376) positive than other fly species collected. Other positive fly species were Stomoxys calcitrans (L) (stable fly; n = 4), Muscina stabulans (Fallen) (false stable fly; n = 1), Mesembrina meridiana (L) (noon fly; n = 1) and Hydrotaea sp. (black dump fly; n = 1). One Lucilia caesar (L) (green bottle fly) of the Calliphoridae family and 2 flies of unidentified species were also positive. The prevalence of Campylobacter spp.-positive flies varied from 0.0 in April to a peak of 16.3% in July and decreasing to 2.0% in October on a farm with pig production. On 4 broiler farms without other livestock, the prevalence was constantly below 1.0%. The average influx of insects per broiler rotation was estimated to be 30,728 +/- 2,443 SE (range 2,233 to 180,300), of which 21.4% were flies. The influx of insects correlated with the flow (m(3)/h) of ventilation air (P <0.0078) and with the outdoor temperature (P <0.0032). We conclude that the influx of large numbers of flies to broiler houses constitutes a considerable risk for infection of broilers with C. jejuni and C. coli.

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