High *Brachyspira* colonization rates of Belgian layer flocks and boiler hen carcasses

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Brachyspira intermedia, *B. alvinipulli* and *B. pilosicoli* have been associated with diarrhea, fecal eggshell-staining and reduced egg production in laying hens. *B. pilosicoli* has also been associated with enteric disease in humans.
We screened Belgian layer flocks for the presence of *Brachyspira* spp. and studied contamination of boiler hen carcasses with these bacteria as a possible source of human infections.

In 2008- 2009, 5 chickens per flock from 18 Belgian layer flocks (13 production and 5 rearing flocks) with symptoms as described above, and 10 chickens per flock from 10 randomly selected layer flocks at slaughter age, were screened for the presence of *Brachyspira* sp. by culturing cecal content.
In 2009-2010, carcass (n=110) rinse samples, from 11 batches of boiler hens bought in Belgian supermarkets, were investigated.

Nine of the 13 production flocks were positive for *Brachyspira* sp. opposed to none of the rearing flocks. On average 66% of the birds in an infected flock were positive, with an increasing morbidity rate with increasing bird age. At slaughter age, 9/10 flocks were positive for *Brachyspira* and within flocks multiple species were identified. Five of the 10 flocks were positive for *B. intermedia*.
Cultures of carcass rinse samples demonstrated the presence of *Brachyspira* spp. in all batches. *B. intermedia* (7/11 batches) and *B. pilosicoli* (1/11 batches) were present at high numbers as shown by quantitative-PCRs. Multilocus sequence typing demonstrated the presence of 13 different sequence types in B. intermedia on the carcasses.

In conclusion, the number of *Brachyspira* positive layer flocks and the colonization rates within positive flocks increased with age. The poultry pathogenic species *B. intermedia* was commonly found with a marked genetic diversity. Contamination of boiler hen carcasses with high numbers of *Brachyspira* spp., including the zoonotic agent *B. pilosicoli*, was highly prevalent.

In: ISVEE – Book of Abstracts 2012: p. **181**