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Breeding sites of main Bluetongue virus vectors in Belgian cowshed

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Bluetongue (BT) is an emerging vectorborne disease of ruminants that was reported in August 2006 in northern Europe. Since 2007, BT virus (BTV) serotype 8 continued its spread across Europe and caused considerable economic losses. This observation indicates possible overwintering of the vector from year to year. The biological vectors of BTV are biting midges of the genus *Culicoides*. Breeding sites of bluetongue vector species have been found near farms (e.g. silage residues) and in neighboring meadows (e.g. cattle dung) but never inside sheds.

We conducted a study in five cattle farms in Belgium during February–October 2008. Three samplings were performed and each soil sample collected inside cowsheds was incubated to enable adult midges to emerge. Among 15 soil biotopes sampled, only one showed the emergence of adult *Culicoides* biting midges: dried dung adhering to walls inside animal enclosures and resulting to the partial removal of used animal litter. It was a breeding site for the *C. obsoletus*/*C. scoticus* species. Physico-chemical characteristics showed that midges of this complex are more prevalent in soil samples with a high carbon:nitrogen (C:N) index. So *Culicoides* biting midges are able to complete their life cycle in animal enclosures.

We identified a breeding site for the primary BTV vector in a cowshed in northern Europe. These observations could explain the persistence of BTV from year to year despite fairly harsh winters. Hygienic measures on farms could reduce biting midges populations and so improve efficacy of vaccination campaigns against BT in Europe.

Key words: Culicoides, Bluetongue, Schmallenberg, Vector, Breeding site, Cowshed, *C. obsoletus*, *C. scoticus*, C:N index, Hygienic measures.