Coccidiosis is a common disease in poultry industry caused by *Eimeria* spp. Due to increasing resistance of *Eimeria* spp. against anticoccidials, and legislative restrictions against medicated feed in the EU, new control measures against coccidiosis should be developed or optimized. The clinical manifestation of coccidiosis depends on the dynamics of *Eimeria* in a flock. The dynamics depend on interactions between intracellular parasite stages and the bird’s immune system, excretion, previous exposure and contact structure between birds. Consequently, *Eimeria* infections can give complicated, unpredictable dynamics (Klinkenberg and Heesterbeek, 2007). Obtaining insight into the dynamics of *Eimeria* in a population is essential for planning, optimizing and evaluating control strategies in poultry.

For this purpose a transmission experiment was carried out, in a group of 20 SPF broilers. One broiler chick was orally inoculated at 2 days of age (D2) with a gelatinous capsule containing 5 sporulated *E. acervulina* oocysts. At D3, the inoculated bird was housed in a 1000 cm$^2$ litter pen with 19 non-inoculated contact birds. From D7-D31, each chick was placed individually in a cage for one hour per day, to produce a faecal dropping. Number of oocysts per gram faecal droppings (OPG) was determined, using the McMaster counting technique. Sedimentation flotation technique was applied when samples were negative in McMaster (Long et al., 1976).

The inoculated chick shed oocysts on D7 and tested negative from D8 to D17. Oocyst excretion in contact birds started between D12 and D18. Oocyst excretion of the inoculated bird most likely resulted in infection of 14 contact birds. The remaining five contact birds, that started excretion from D17 onwards, were probably infected by the first generation of infected contact birds. These data will be used in a mathematical model to quantify transmission characteristics of this parasite.

These results show that the infection cycle in a flock can start with a low grade infection in one chick, and is transmitted quickly to “first generation” contact birds. Contact infected birds excreted higher number of oocysts per bird than the inoculated bird. This will result in an accumulation of high numbers of infectious oocysts in the litter which can result in high infectious doses for following generations of contact birds and might cause severe clinical signs in naïve birds. These results have increased understanding of infection dynamics of *Eimeria* in a population, which can be used in future experiments or mathematical models for studying intervention strategies.
