Quantification of transmission of Eimeria acervulina in broilers: a one-to-one transmission experiment

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Development and evaluation of new strategies against coccidiosis, e.g. vaccination, is necessary, because of increasing resistance of Eimeria spp. against anticoccidials, objections of consumers and legislative restrictions against medicated feed in The Netherlands. Transmission experiments for evaluation of intervention strategies have not been described for protozoan infections, like coccidiosis, and therefore a one-to-one transmission experiment was carried out.

SPF broiler chicks were orally inoculated at 6 days of age (D6) with 50 (Group 1; n=17) or 500 (Group 2; n =10) sporulated E. acervulina oocysts and were housed in a 1000 cm² litter pen. On D7, each inoculated chick was joined with a non-inoculated (susceptible) bird. From D10-D36, each chick was daily put in a cardboard box during one hour to produce a single dropping. Number of oocysts per gram of droppings (OPG) of the single dropping was determined.

Inoculated chicks of group 1 shedded oocysts from on average D11 (range D10-D14) to D28 (D25-D31). Susceptible chicks of group 1 produced oocysts from D16 (D14-D18) to D28 (D20-D31). In all inoculated chicks of group 2 oocyst production started on D10 and ended on D29 (D25-D36). Susceptible chicks of group 2 shedded from D16 (D15-D17) to D29 (D18-D32). In both groups, oocyst excretion of inoculated chicks showed a higher second excretion peak, which coincided with start of shedding (D16) of susceptible chicks.

Transmission of E. acervulina from inoculated to susceptible animals was successful for both inoculation doses in all pairs. Quantification of transmission parameters of E. acervulina, is currently in progress.