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Swine  
Influenza A  
Virus (swIAV)

Enzootic form in  
farrow-to-finish  
farms

Infect **weaned piglets** (possibly still having maternally derived antibodies *MDA*) at a **fixed-age** with recurrent occurrence in **successive batches**

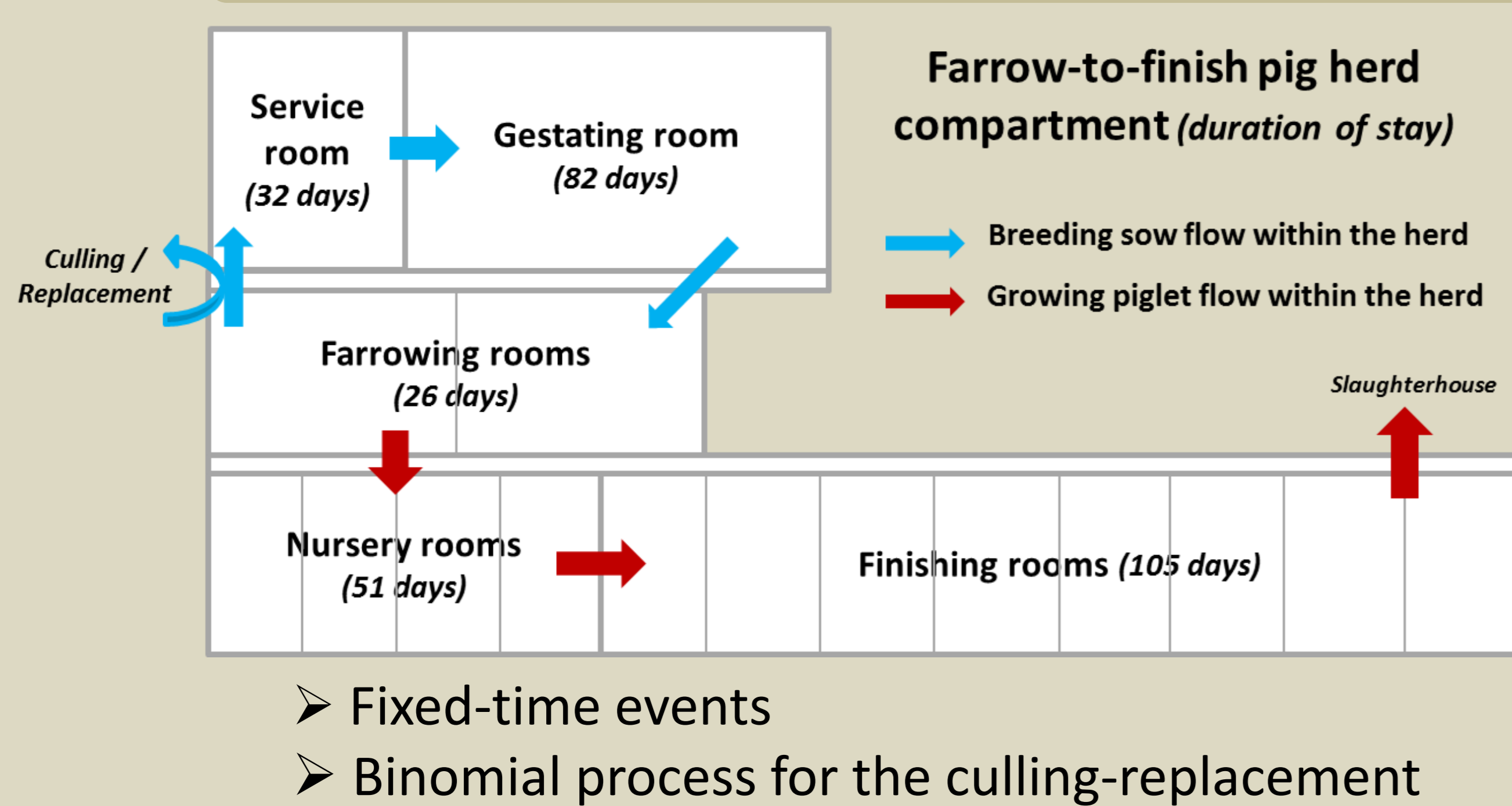
*Impact of proximity between breeding sows and growing pigs compartments on the within-herd swIAV persistence and recurrence ?*

## Objectives

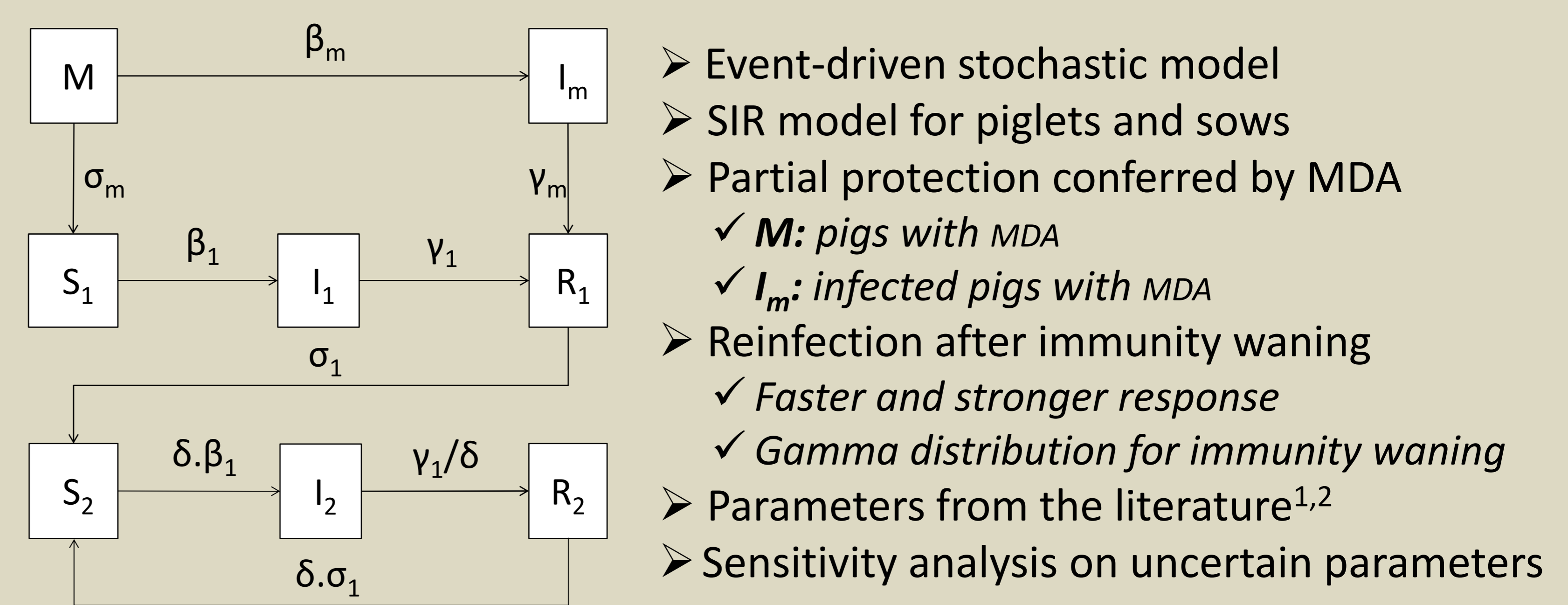
Analyze the persistence and **recurrence of swIAV in farrow-to-finish pig herds** reared with different batch-rearing systems

## Materials & Methods

### The stochastic metapopulation model

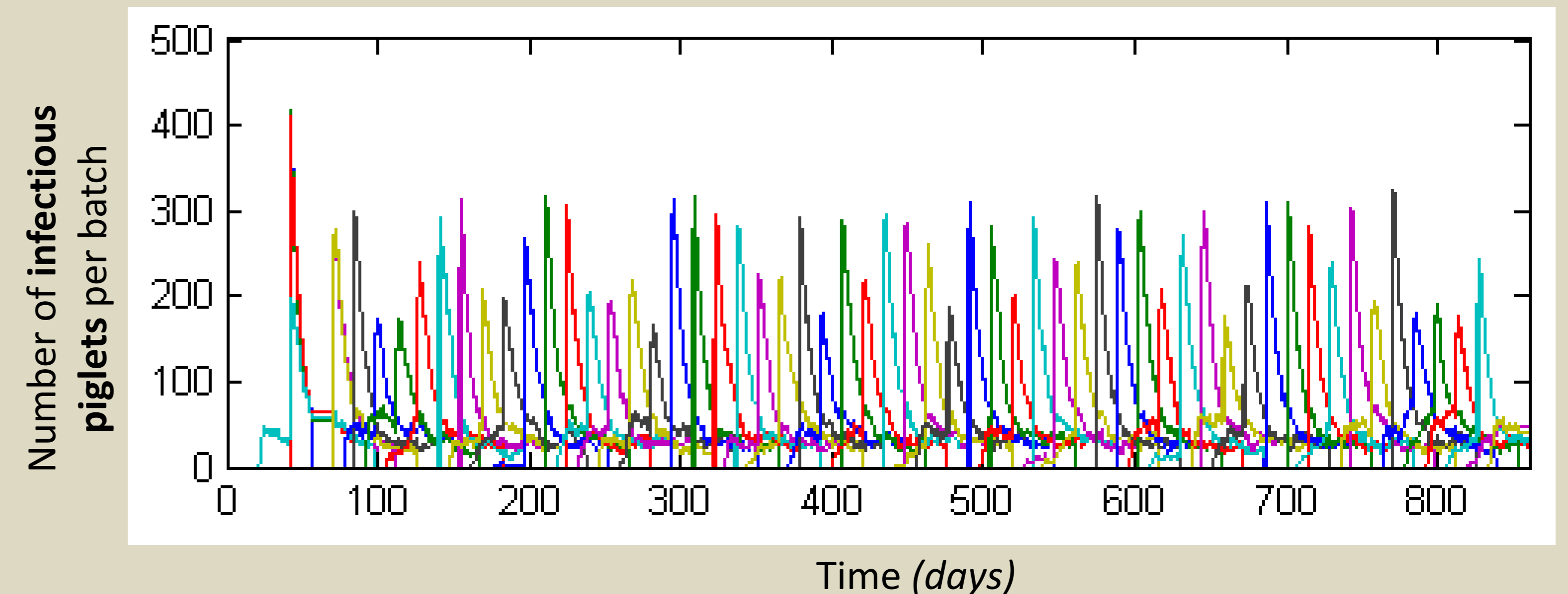
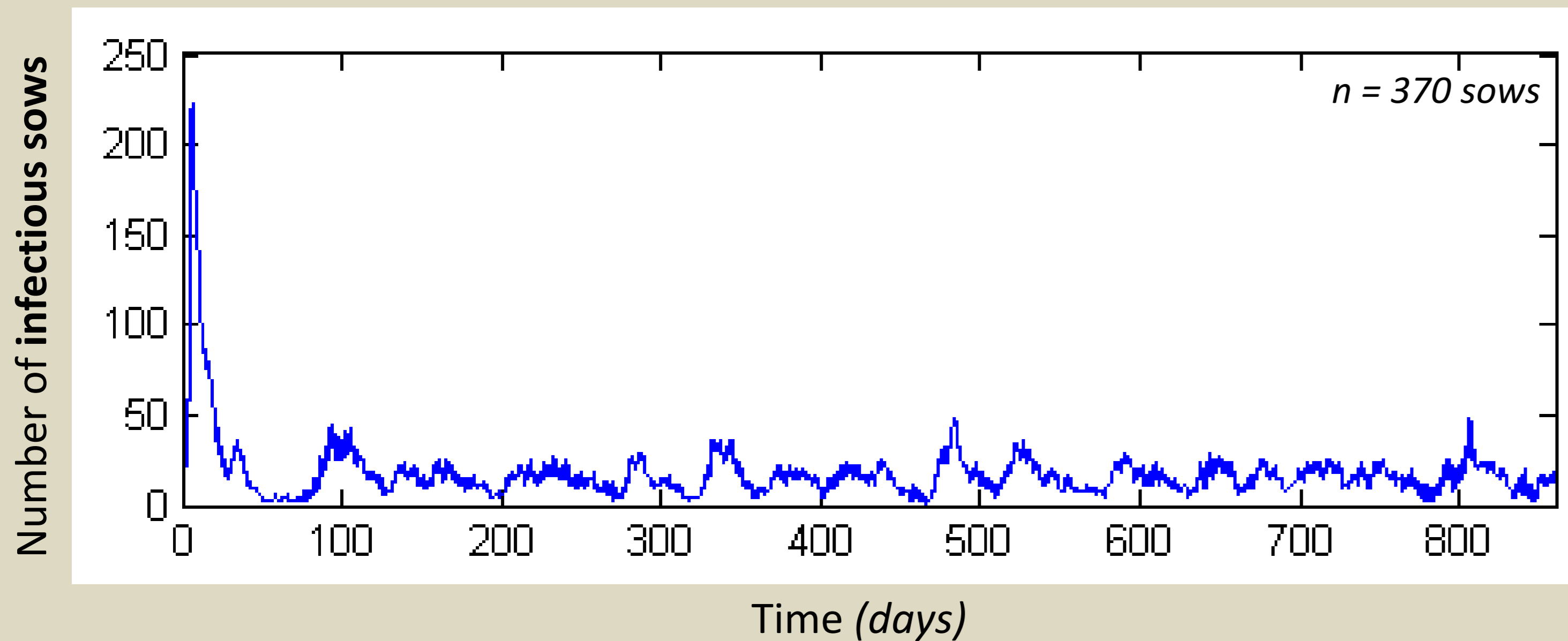


### The swIAV epidemiological model



## Results & conclusions

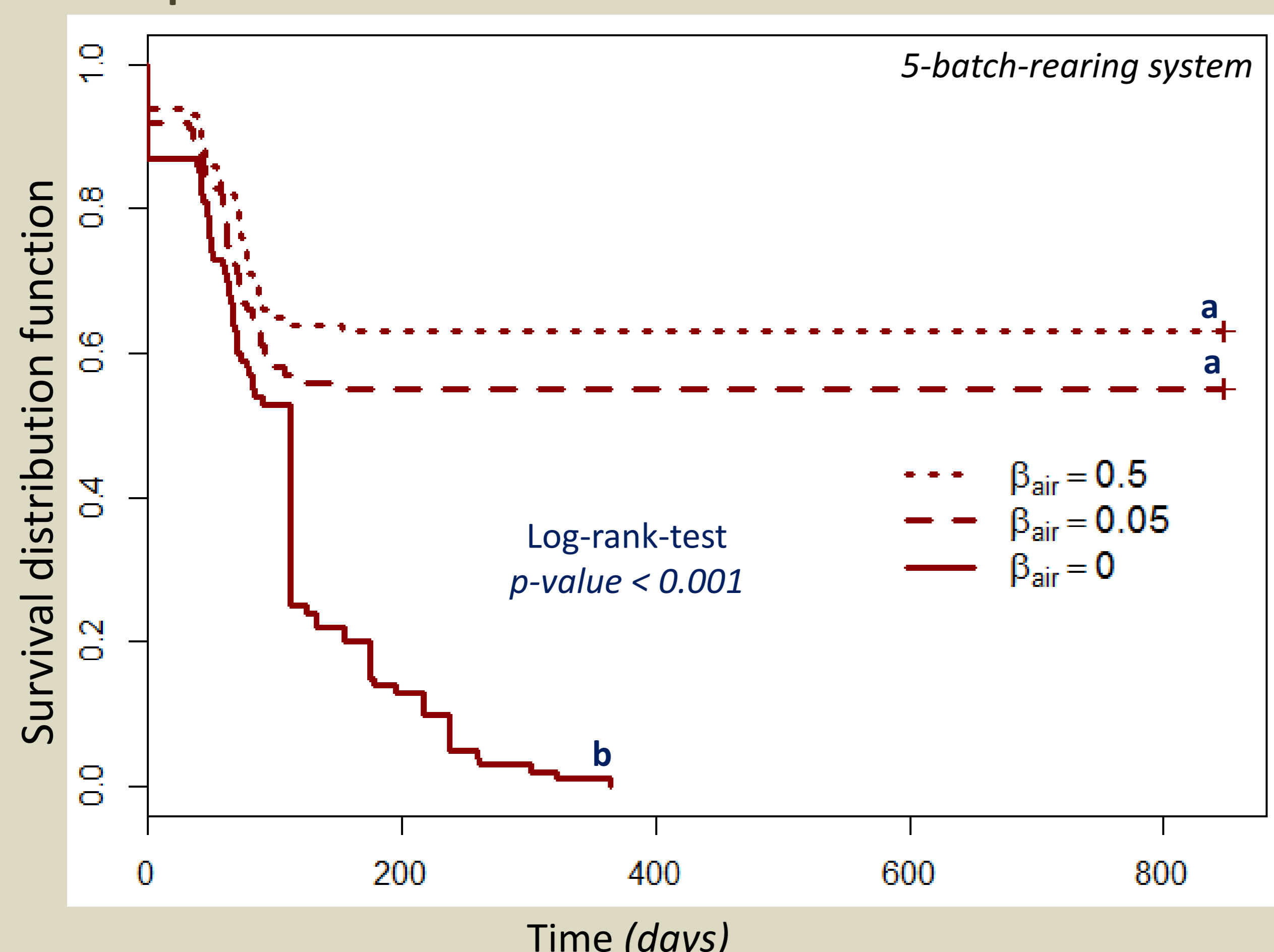
### Simulated dynamics (10-batch-rearing system, $\beta_{air} = 0.5$ , 100 simulations)



⇒ Recurrent swIAV outbreaks in sow & piglet compartments as observed in field conditions<sup>2</sup>

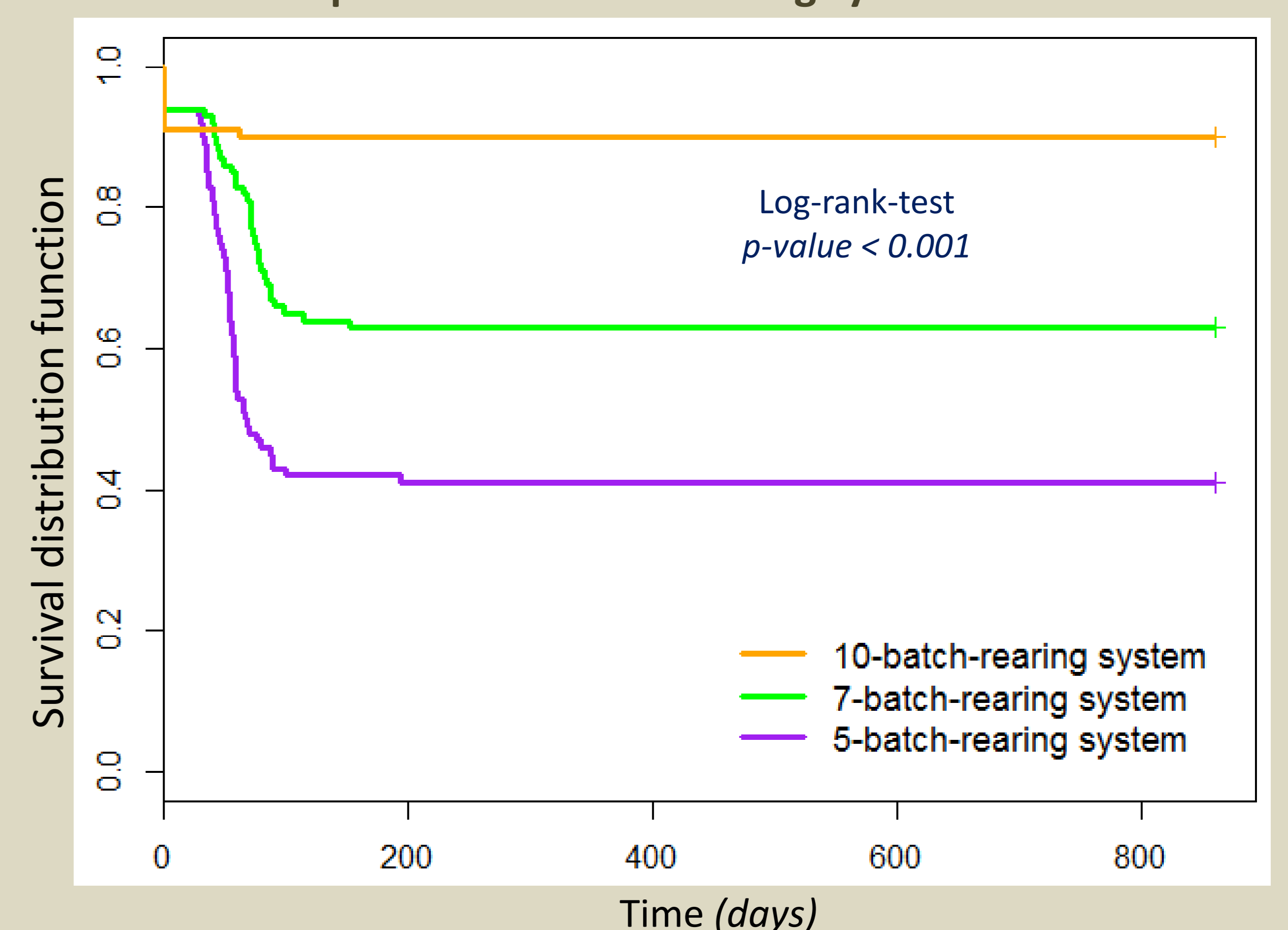
### Survival analysis of swIAV within-herd persistence (100 simulations per scenario)

#### Impact of the airborne between-batch transmission rate



$\beta_{air} = 0.5$

#### Impact of the batch-rearing system



⇒ Restriction of air-flows between herd-premises

⇒ Short time-intervals (10 batches) more at risk

## Perspectives

- Perform a sensitivity analysis on the duration of active immunity ( $1/\sigma$ ) and the memory effect of the immune system  $\delta$
- Taking into account the circulation of several subtypes and the generation of **reassortants** potentially more pathogen and zoonotic