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## Herd factors associated with levels of parasitism in alternative pig farms

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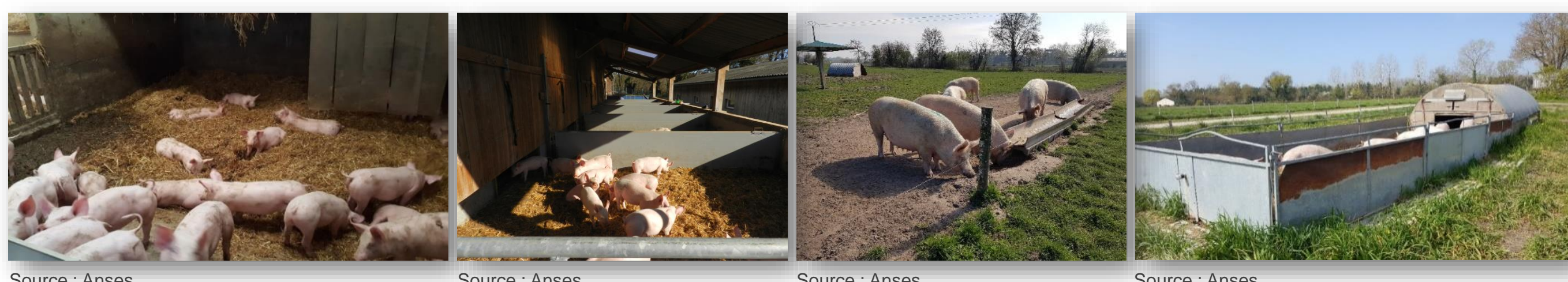
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## BACKGROUND & AIM

Pig farms on litter or with outdoor access (runs, free-range) are widely popular with consumers and citizens, particularly for reasons of animal welfare<sup>1</sup>. However, parasitism may constitute a critical point in these kinds of farms.



This study is part of a large research project (PIGAL) jointly studying animal health, biosecurity, animal welfare and veterinary public health in alternative pig farms. It aims to identify the herd factors associated with the level of parasite infestation.

## RESULTS

### Farm description:

- 80 farrow-to-finish farms, 20 fatteners and 12 farrow-to-wean herds
- 69% of the herds were organic, 16% were involved in the French quality program 'Label Rouge'.

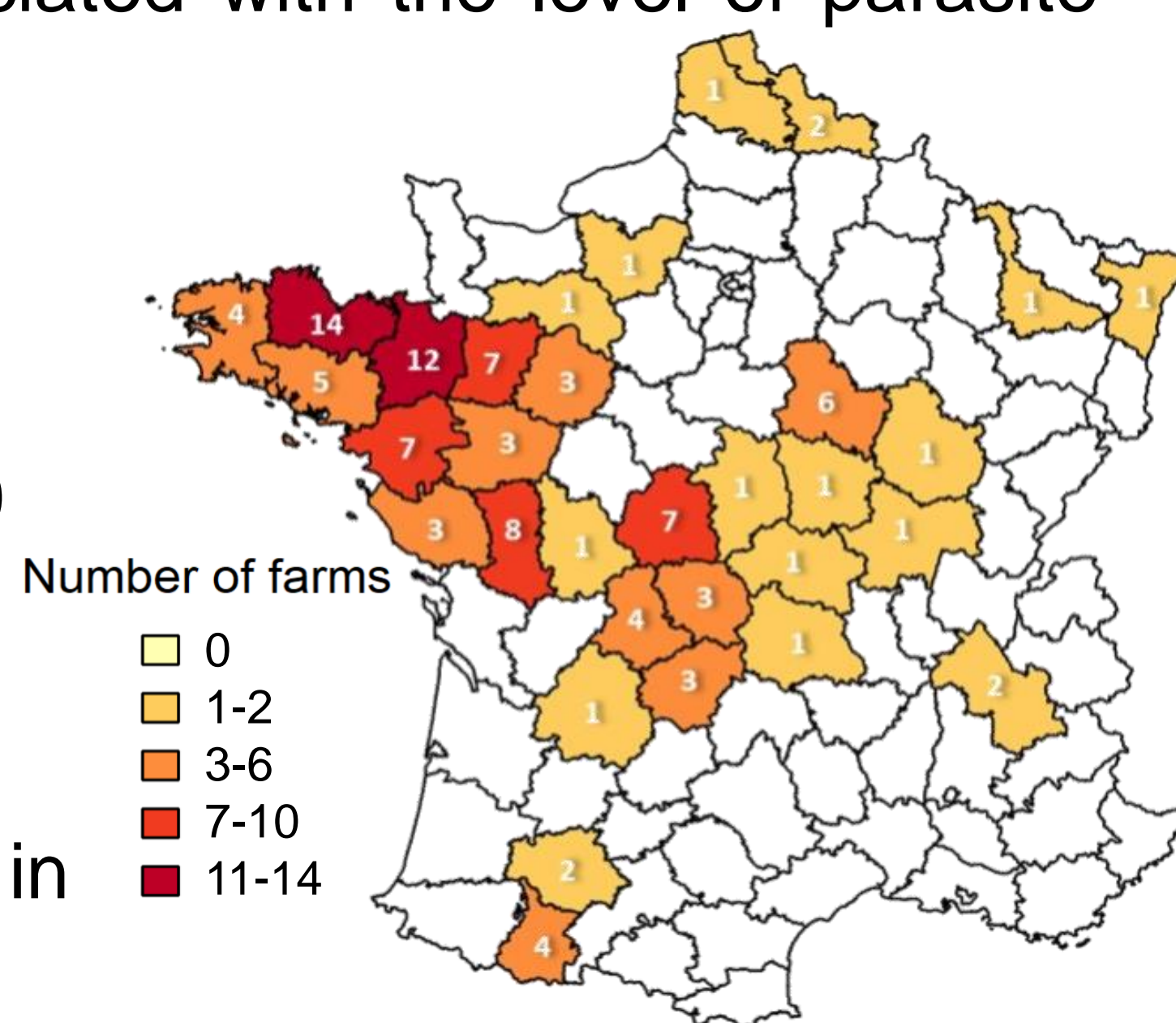


Figure 1: Distribution of farms

Coccidia oocysts were observed in pig faeces in the largest proportion of farms (84%) followed by eggs of strongyles (55%), *Trichuris suis* (32%) and *A. suum* (16%). The rates of *A. suum* and *T. gondii* seropositive farms were 89% and 71% respectively.

Hygiene and especially decontamination of facilities were factors associated with low levels of parasitism in farms (Figure 2). Conversely, keeping animals outdoors or on litter, poor building maintenance, farms with small numbers of animals and summer were parameters associated with high levels of parasitism. The use of multiple anthelmintic treatments on growing pigs was associated with low levels of *T. suis* egg infestation and high levels of *A. suum* seroprevalence.

## CONCLUSIONS

This study highlighted the internal parasite burden in alternative farms. Even if some factors are not under farmers' control (season, outdoor rearing), there is still some room for improvement via hygiene and appropriate use of treatments.

## MATERIAL & METHODS

The study was conducted in 112 alternative pig farms (size > 30 sows and/or 100 pigs), in continental France (Figure 1).

### Samples:

- Faeces from 10 sows, 10 growers (10-12 weeks old) and/or 10 finishers (≥22 weeks old)
- Blood samples from 10 sows and/or 10 finishers (≥22 weeks old)

### Laboratory analyses:

- Coprology (McMaster technique using saturated NaCl as a flotation fluid)
- Serological analysis (SERASCA® ELISA to detect IgG antibodies for *Ascaris suum* and a Modified Agglutination Test designed to detect *Toxoplasma gondii*-specific IgG<sup>2</sup>).

Data on the facilities and management of the farm were collected during an on-farm visit and were analyzed using multiple correspondence analysis to determine farm profiles regarding infestation and farm characteristics.

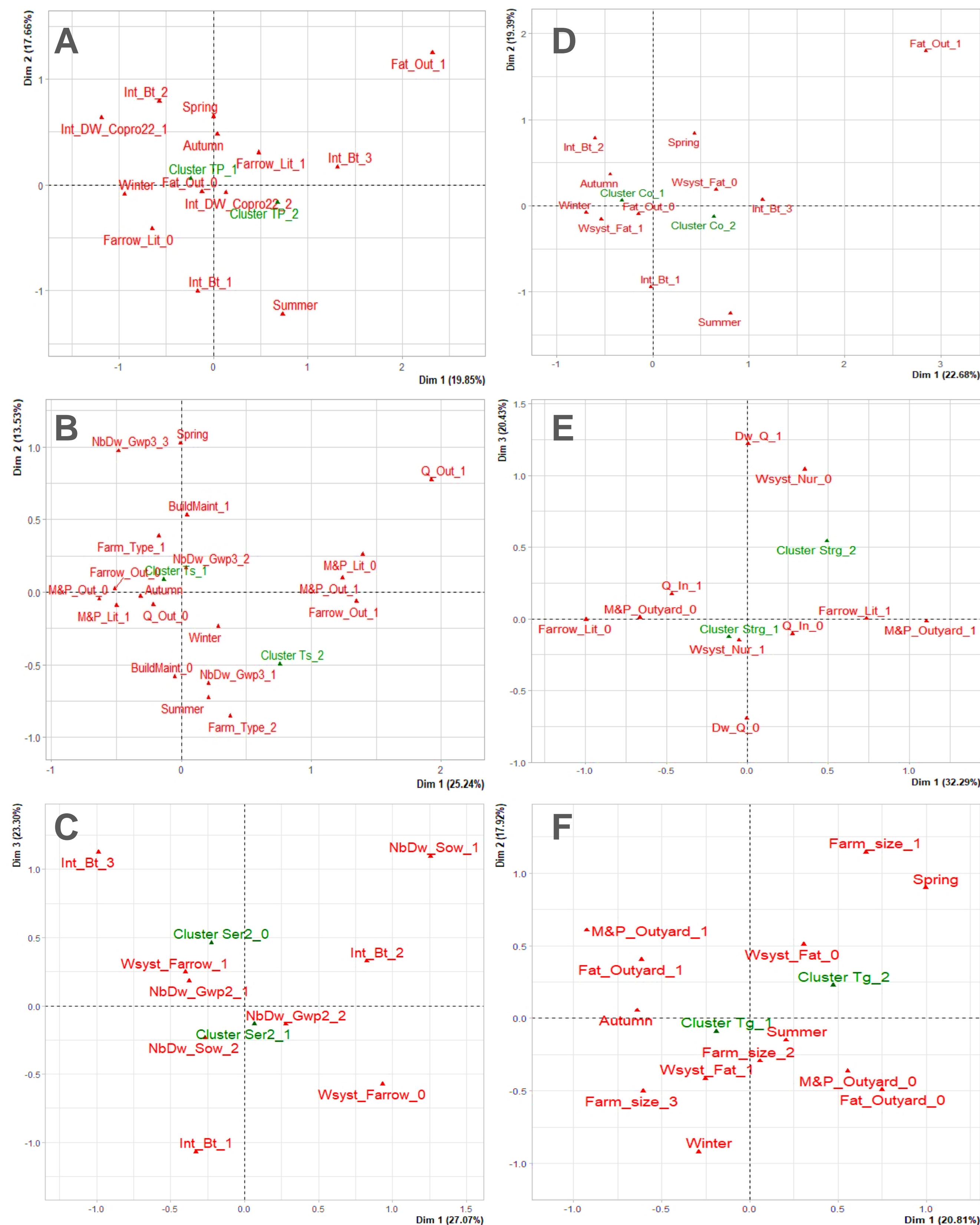


Figure 2: Results of the multiple correspondence analysis between the descriptive variables of the farm, the season during which the visit was made and the classification of the farms according to (A) their level of parasitism, (B) their level of parasitism with regard to strongyles, (C) to *Trichuris suis*, (D) to coccidia, (E) to their level of seropositivity to *Ascaris suum* or to (F) *Toxoplasma gondii* on animals.

**Abbreviations:** **Cluster TP:** 1, low level of parasitism; 2, high level of parasitism; **Cluster Strg:** 1, low level of strongyles; 2, high level of strongyles; **Cluster Ts:** 1, low level of *T. suis*; 2, high level of *T. suis*; **Cluster Co:** 1, low level of coccidia; 2, high level of coccidia; **Cluster Ser2:** 0, low level of seropositivity to *A. suum*; 1, high level of seropositivity to *A. suum*; **Cluster Tg:** 1, low level of seropositivity to *T. gondii*; 2, high level of seropositivity to *T. gondii*; **BuildMaint:** correct maintenance of farm building (0, No; 1, Yes); **Dw\_Q:** deworming in quarantine (0, No; 1, Yes); **Farm\_size:** farm size (1, ≤50 sows; 2, between 50 and 100 sows; 3, >100 sows); **Farm\_Type:** Type of farm (1, Farrow-to-finish; 2, Partial farrow-to-finish); **Farrow\_Lit:** presence of litter in farrowing pens (0, No; 1, Yes); **Farrow\_Out:** farrowing outdoors (0, No; 1, Yes); **Farrow\_outyard:** farrowing indoors with an outdoor courtyard (0, No; 1, Yes); **Fat\_Out:** fatteners units outdoors (0, No; 1, Yes); **Fat\_Outyard:** fatteners units indoors with an outdoor courtyard (0, No; 1, Yes); **Int\_Bt:** interval in weeks between batches of animals (1, <5 weeks; 2, 5 or 6 weeks; 3, >6 weeks); **Int\_DW\_Copro22:** Interval in weeks between faecal samples taken from finishers and the last deworming treatment administered to these animals (1, <6 weeks; 2, ≥6 weeks); **M&P\_Out:** mating and pregnancy outdoors (0, No; 1, Yes); **M&P\_Outyard:** mating and pregnancy outdoors with an outdoor courtyard (0, No; 1, Yes); **M&P\_Lit:** mating and pregnancy on litter (0, No; 1, Yes); **NbDw\_Gwp2:** number of deworming treatments on grower/finisher pigs (1, ≤1; 2, ≥2); **NbDw\_Gwp3:** number of deworming treatments on grower/finisher pigs (1, ≤1; 2, 2 and 3, ≥3); **NbDw\_Sow:** number of deworming treatments on grower/finisher pigs (1, ≤1; 2, ≥2); **Q\_In:** indoor quarantine (0, No; 1, Yes); **Q\_Out:** quarantine outdoors (0, No; 1, Yes); **Season:** the season in which the visit and the samples were taken; **Wsyst\_Nur:** nursery rooms washed systematically between each batch (0, No; 1, Yes); **Wsyst\_Fat:** fatteners rooms washed systematically between each batch (0, No; 1, Yes); **Wsyst\_Farrow:** farrowing rooms washed systematically between each batch (0, No; 1, Yes).



<sup>1</sup> DELSART M., POL F., DUFOUR B., ROSE N., FABLET C. (2020) Pig Farming in Alternative Systems: Strengths and Challenges in Terms of Animal Welfare, Biosecurity, Animal Health and Pork Safety. *Agriculture* 10(7), 261

<sup>2</sup> DUBEY J.P., DESMONTS G. (1987) Serological responses of equids fed *Toxoplasma gondii* oocysts. *Equine Vet. J.* 19(4), 337-339