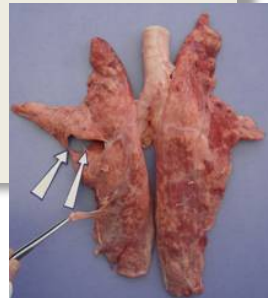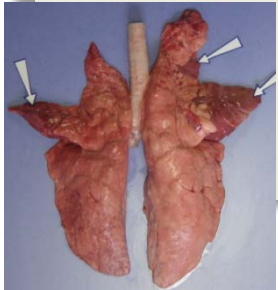# Importance of herd management and building design on respiratory diseases in pig herds
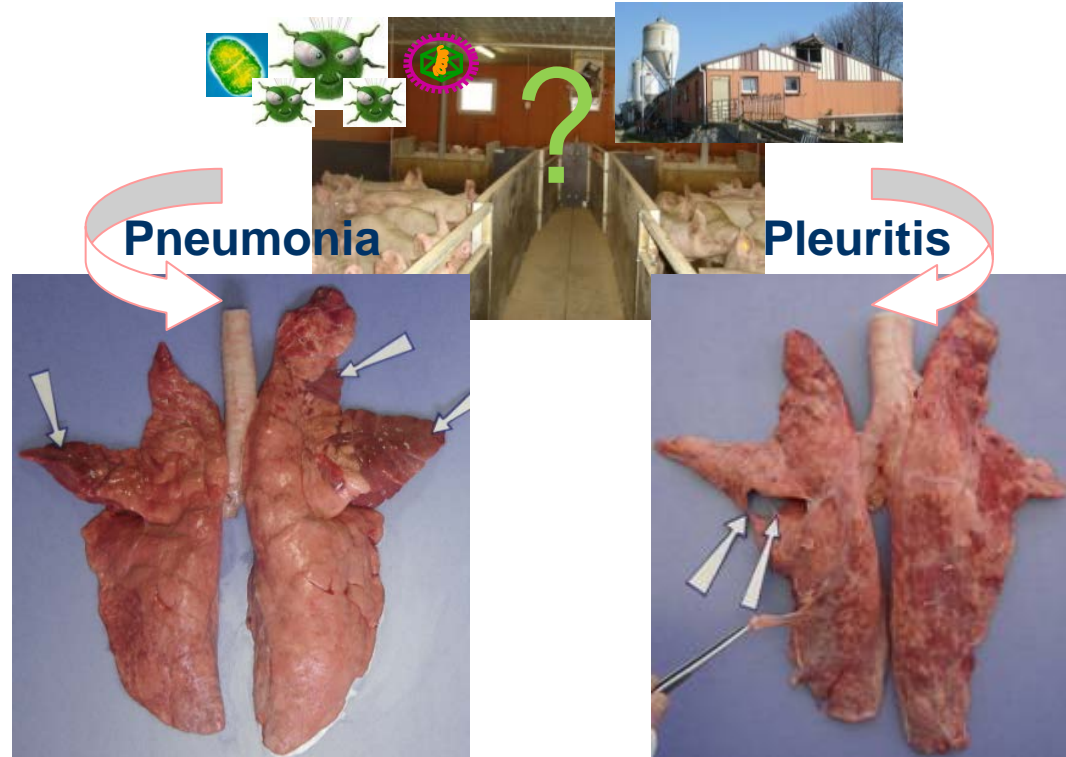
Christelle Fablet, V. Dorenlor, F. Eono, E. Eveno, J.P. Jolly, F. Portier, F. Bidan, F. Madec, N. Rose

Anses - Swine epidemiology unit

Ploufragan laboratory - France

26th August 2013 – EAAP meeting

Pneumonia

Pleuritis

↓ **Health & pig welfare**

Sorensen et al., 2006

€losses

Madec et al., 1992 ; Bouwkamp et al., 2006

" growth performance
" feed efficiency

Ostanello et al., 2007; Aubry et al., 2010

Veterinary public health

' Medication, vaccination

Christensen, 1995 ; Pagot et al., 2007 ; Ostanello et al., 2007
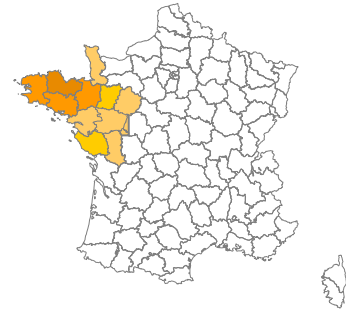
> Identify and quantify the effects of noninfectious factors associated with pneumonia and pleuritis in slaughter-aged pigs

➢ **143 farrow-to-finish herds** in western France

- • Sampling base of 494 herds *(18 pig producer organisations)*

- • Herd size > 100 sows

- • Knowledge of the respiratory status

  → Level of clinical signs and former lung lesion scores

  ↪ **Stratified random sample**

   . presumed respiratory status group *(3 levels)*
   . pig producer organisation size

➢ Farm

  • Questionnaire

     . Herd characteristics

     . Biosecurity measures

     . Management and housing conditions

  • Measurements

     ▪ *Climatic conditions*

     . T°, humidity

     . Gazes: CO_2, NH_3

     . Respirable dust *(<5 µm)*

➢ 1 batch of nursery pigs

➢ 1 batch of finishing pigs

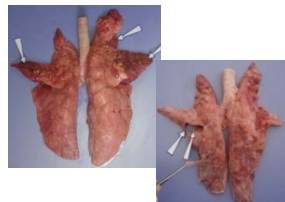✓   ✓

➢ Slaughterhouse

  • Pneumonia-like gross lesions *(0→28 points)*

  • Pleuritis *(0→4 points)*
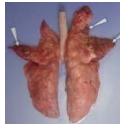
     Madec et Kobisch, 1982

  Random sample of 30 pigs

➤ Logistic regression: **2 outcomes**

• Pneumonia median score

MedPneu ≤ 0.5 0.5< MedPneu ≤ 3.75 MedPneu >3.75

• Extended pleuritis (score >2; *scoring 0→4*)

0 pig with a score >2 ≥ 1 pig with a score >2
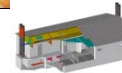
➤ **Explanatory variables**

➤ Climatic parameters

– *T°, humidity*
– *Gazes: CO_2, NH_3*
– *Dust*

➤ Questionnaire

– Management & housing conditions
– Herd characteristics, biosecurity measures

··· Univariable analysis (p<0.25)·····································

*Multicolinearity analysis
(p<0.05)*

Multivariate analysis

Multinomial model (p<0.05)
. Reference category: median score $\leq$ 0.5

Binary model (p<0.05)

➤ Multinomial model

Pneumonia-like gross lesions median score

]0.5; 3.75]

Interval between successive batches <4 weeks

OR = 4.5
95% CI: 1.5-13.6

Finishing room size >90 pigs

OR = 4.3
95% CI: 1.6-11.6

Mean CO_2 concentration in the finishing room >1600 ppm

OR = 4.2
95% CI: 1.6-11.3

➢ Multinomial model

Pneumonia-like gross lesions median score

> 3.75

Interval between successive batches <4 weeks

OR = 5.9
95% CI: 1.5-23.3

A direct fresh air inlet from outside or from the corridor in the post-weaning room

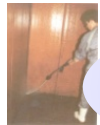**OR = 5.1**
95% CI: 1.4-18.8

Finishing room size > 90 pigs

OR = 3.9
95% CI: 1.2-12.5

Mean CO_2 concentration in the finishing room >1600 ppm

OR = 4.9
95% CI: 1.6-15.2

➢ Binary model

≥ 1 pig with a score>2

No disinsection of the farrowing room

OR = 2.7
95% CI: 1.2-5.8

Herd size >200 sows

OR = 3.1
95% CI: 1.4-6.9

Tail docking >1.5 days old

OR = 2.6
95% CI: 1.2-5.7

Range of temperature values for the ventilation control rate in the farrowing room d 5°C

OR = 2.7
95% CI: 1.2-5.9

Castration >14 days old

OR = 2.7
95% CI: 1.1-6.8

Mean temperature in the finishing room d 23°C

OR = 3.0
95% CI: 1.3-6.8

Conclusion

➢ Identification of critical control points **/ herd management**

➢ Practical preventive action-levers

f Housing conditions

f Hygiene
f Surgical procedures
f Climatic conditions inside the room

➢ *Fit-out of the buildings*
➢ *Long term investments*

➢ *Correcting husbandry practices*
➢ *Housing & ventilation modifications*

Transversal approach

Zootechnics

Building engineering

Veterinary medicine

Thanks for your attention

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Thanks to the farmers