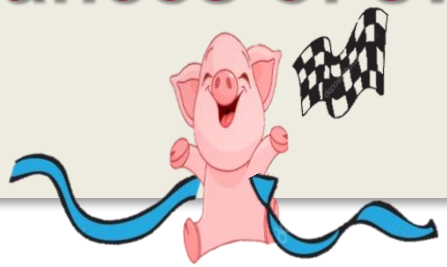
anses
French agency for food, environmental and occupational health & safety

Investigate, evaluate, protect

Herd level and serological indicators associated with the growing-finishing performances of swine herds



Christelle Fablet[1], N. Rose[1], B. Grasland[1], N. Robert[2], E. Lewandowski[2], M. Gosselin[3]

[1] *Anses, Ploufragan laboratory - France*

[2] *Boehringer Ingelheim - France*

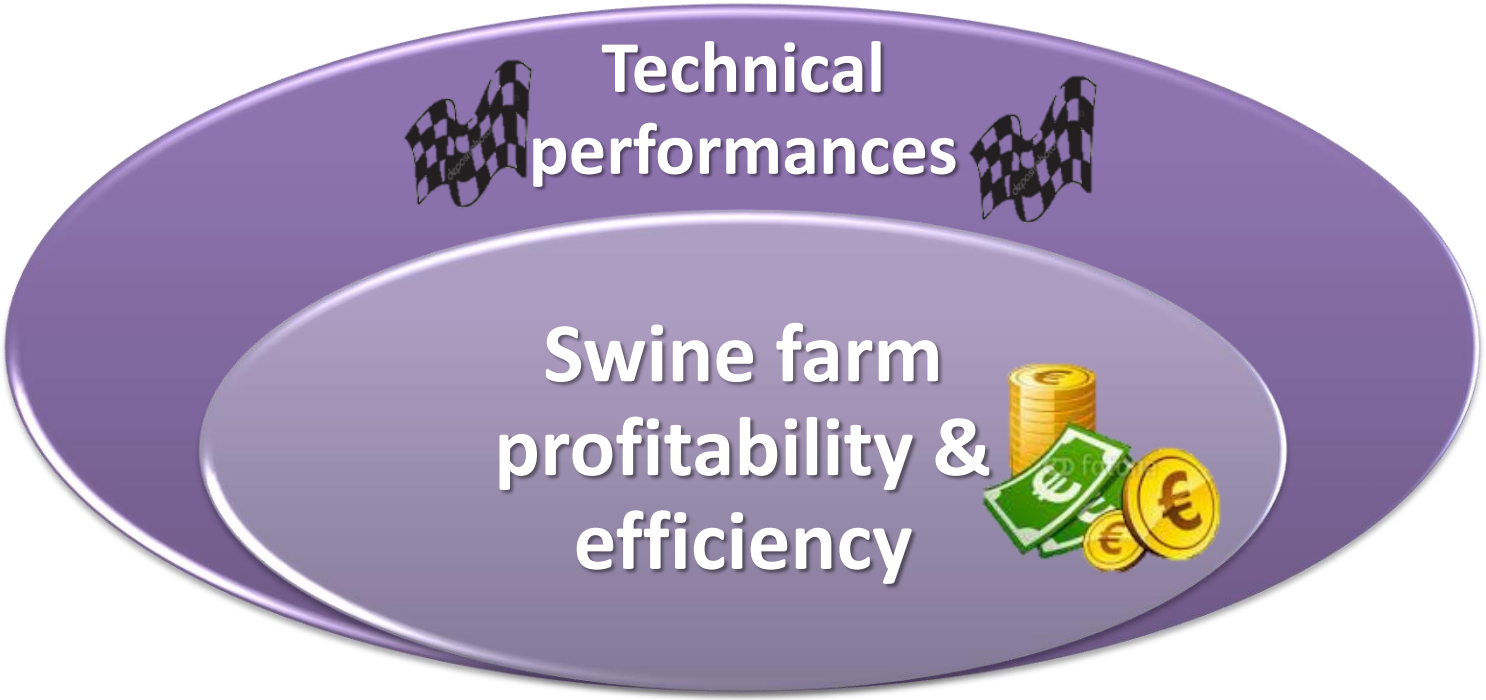
[3] *Univet Santé Elevage - France*

30th August 2018 – EAAP meeting

Introduction

Swine farm profitability & efficiency

Introduction



Introduction

Pig health & welfare

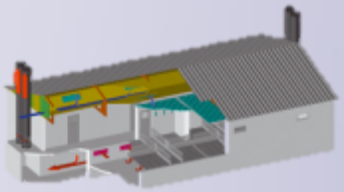
- **Herd health status**

?? Main respiratory and digestive infectious pathogens

? - **Non infectious factors**
  - Diet, climatic conditions
  - Management, husbandry, biosecurity, housing…

?? ? ?? ?

Disease outcome

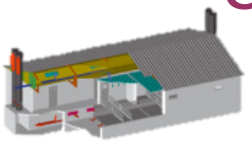


Technical performances

Swine farm profitability & efficiency

Aim

- Identify & quantify the effects of **infectious** & **non-infectious** factors associated with the growing & finishing performances of swine herds



Material & Methods
Data collection

➢ 41 farms in western France

Involved in a study on the course of PCV2 infection *(subclinically PCV2-infected herds)*

- **Questionnaire**
  - . Management
  - . Biosecurity measures
  - . Husbandry
  - . Main technical performances (2014)

Average daily weight gain (ADG)
Feed conversion ratio (FCR)
Mortality (MORT)
} *from 8 to 115 kg*
Carcass slaughter weight (CSW)

- **Blood samples**

. 20 pigs, 2 batches (10/batch)
- 10 to 12 weeks old
- ≥ 22 weeks old

➢ Laboratory analyses

. Antibodies

- *PRRSV (ELISA, IDEXX PRRS X3 Ab Test)*
- *PCV2 (SERELISA® PCV2 Ab Mono Blocking)*
- *swIAV (ELISA, ID Screen® Influenza A antibody competition)*
- *M. hyopneumoniae (ELISA, OXOID)*
- *Lawsonia intracellularis (ELISA, SVANOVIR L.intracellularis /Ileitis-Ab)*

➢ Outcome: the level of herd growing-finishing performances

- Clustering analysis
  - *Average daily weight gain (ADG)*
  - *Feed conversion ratio (FCR)*
  - *Mortality (MORT)*
  - *Carcass slaughter weight (CSW)*

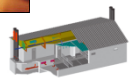
  } *from 8 to 115 kg*

→ **2 groups of herds**

	Group 1 (24 herds)		Group 2 (17 herds)		p-value
	Mean	sd	Mean	sd	
ADG (g/day)	781.08	26.28	715.76	26.50	<0.01
FCR (kg/kg)	2.48	0.08	2.60	0.14	<0.01
MORT (%)	4.09	0.93	6.79	2.03	<0.01
CSW (kg)	121.22	5.21	117.75	3.58	<0.01

➢ Explanatory variables

- Questionnaire

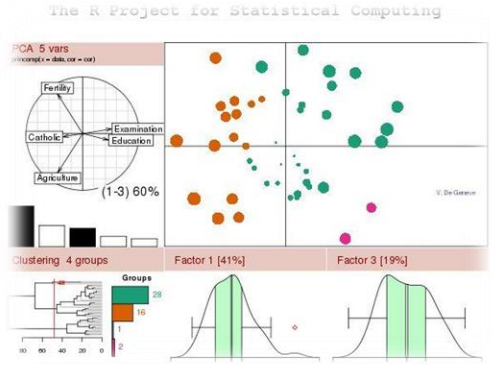
  – Management
  – Biosecurity measures
  – Husbandry

- Serological results

  + or -

  % of pigs with high antibodies titers

Univariable analysis (p<0.15)



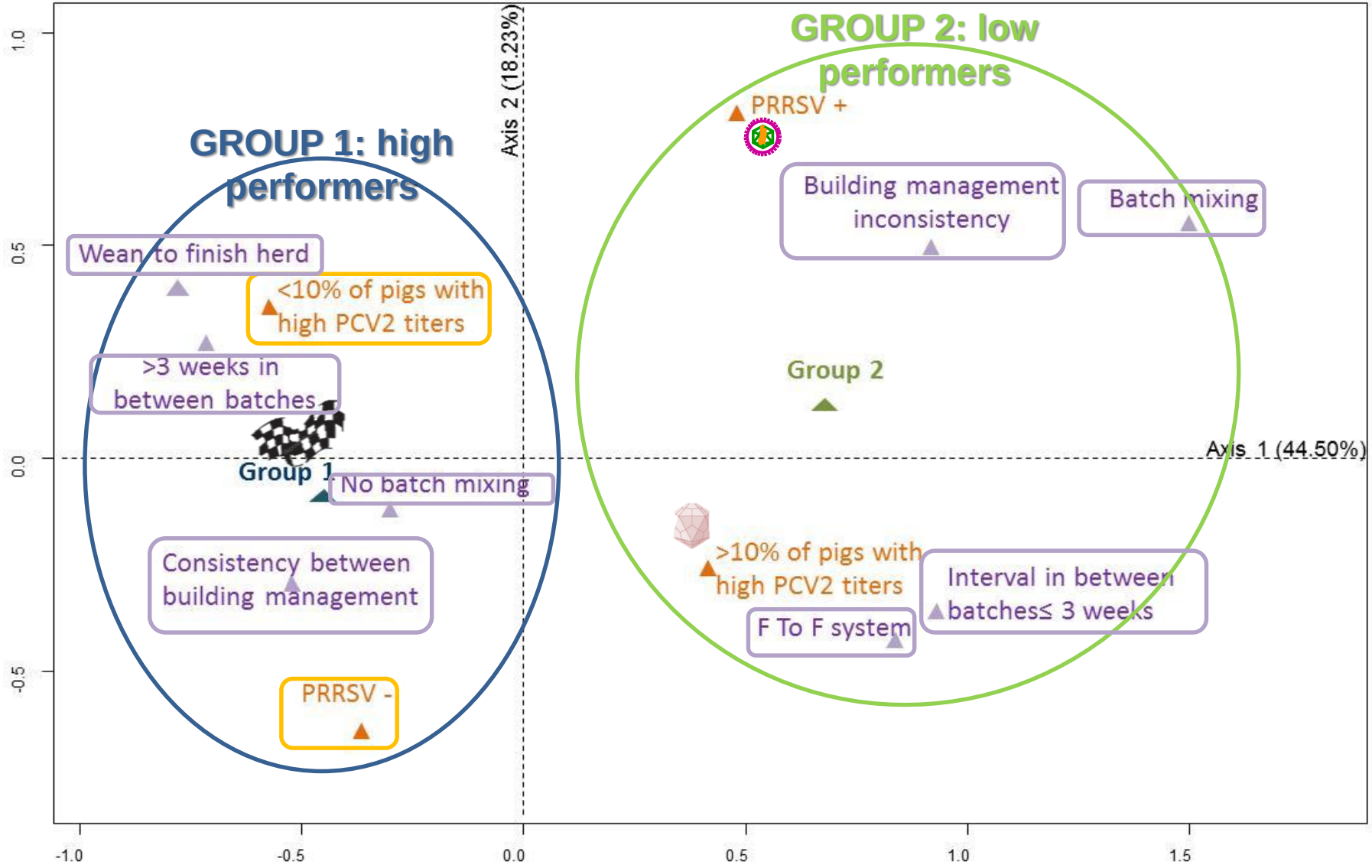
Multicolinearity analysis
(p<0.05)

Multivariate analysis

➢ Multiple correspondence analysis

➢ Logistic regression model
(p<0.05)

➢ Multiple correspondence analysis



➢ Logistic regression model

	% of herds identified as low performers (Group 2)	OR	95% CI	p
Herd type				0.04
Farrow-to-finish	65.0	5.1	1.1-23.8	
Wean-to-finish	19.1	-		
PRRSV serological status of growers & finishers				0.01
Negative	26.1	-		
Positive	61.1	8.8	1.8-41.7	

Discussion

➢ Reduced growing-finishing performance

Herds without obvious clinical signs of PCVD and without PCV2 vaccination of piglets

- **Viral infections**
  - → ***PRRSV*** *Stronger impact*
  - → ***PCV2***

    Holtkamp et al., 2013; Alarcon et al., 2013

- **Non infectious fa**

  → ***Farm charac*** ***ractices***

  . Farrow-to-finish herd typ *management*

  ➢ *Close contact between* *hing steps*

  ➢ *Continuous flow manag* *t batches*

  contacts of pigs of ≠ imm *ns*

  . Short interval in betwee *Cleveland-Nielsen, et al., 2002; Fablet et al., 2013&2016*

Risk factor for pneumonia: Fablet et al., 2012

➢ *High animal movement frequency*

➢ *↑ mixing of pigs with ≠ immune & infectious statuses*

➢ *↑ direct contacts between pigs with ≠ immune & infectious statuses*

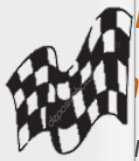
➢ *Regrouping pigs → fights → stress*

➢ Areas for improvement

Management practices

↓ occurrence of viral infections

↓ spread of pathogens within a herd



↑pathogen transmission ***Immune responses***

Health & welfare levels

Thanks for your attention

ISAH 2019

Thanks to the farmers