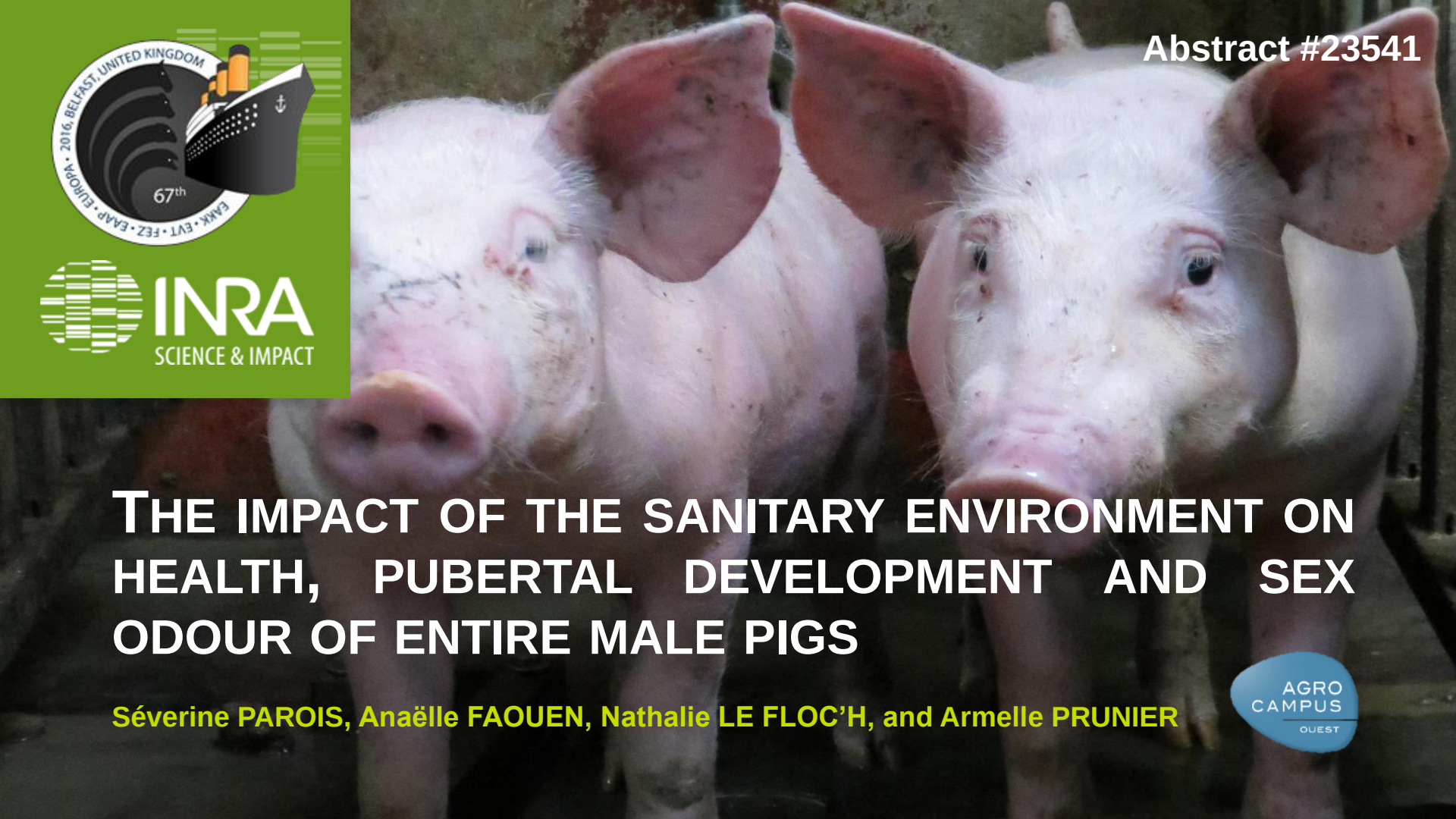


Abstract #23541

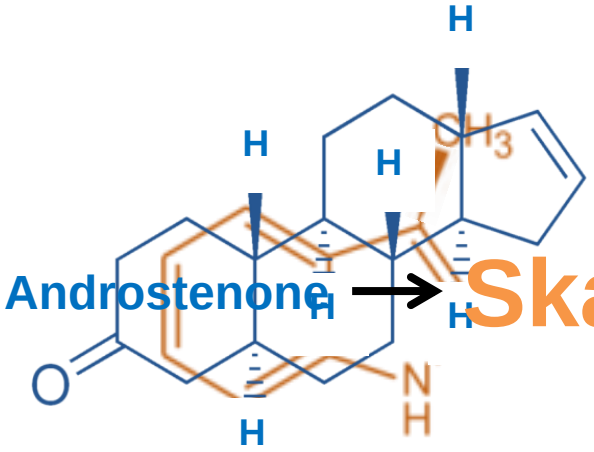
The impact of the sanitary environment on health, pubertal development and sex odour of entire male pigs

Séverine PAROIS, Anaëlle FAOUEN, Nathalie LE FLOC'H, and Armelle PRUNIER

Context – *Boar taint*

Boar taint = unpleasant smell emitted when cooking

2 molecules involved in it: androstenone and skatole



Androstenone → Skatole

5α-androst-16-en-3-one

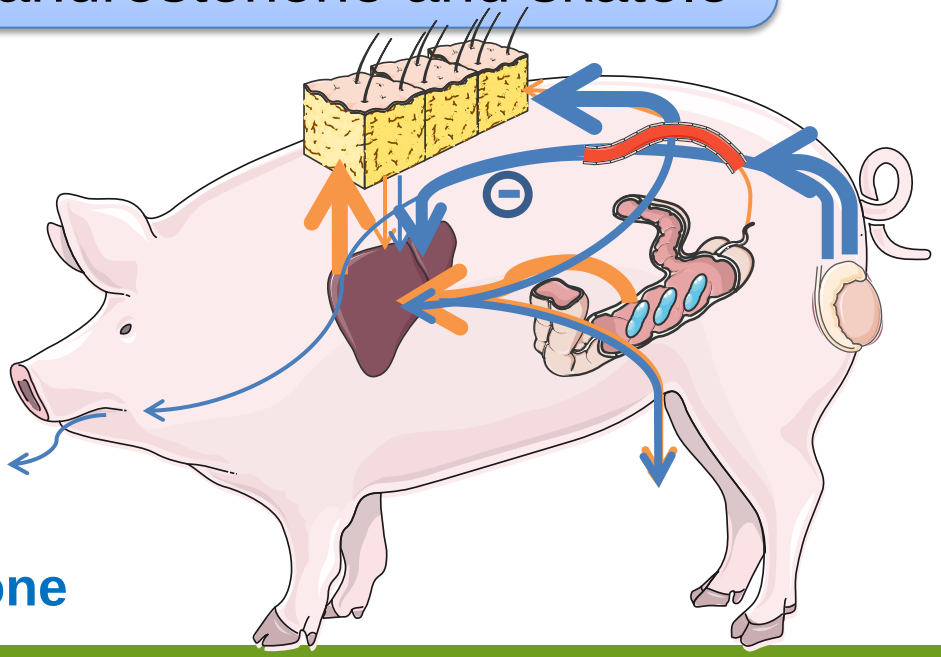
Vold, 1970

Patterson, 1968

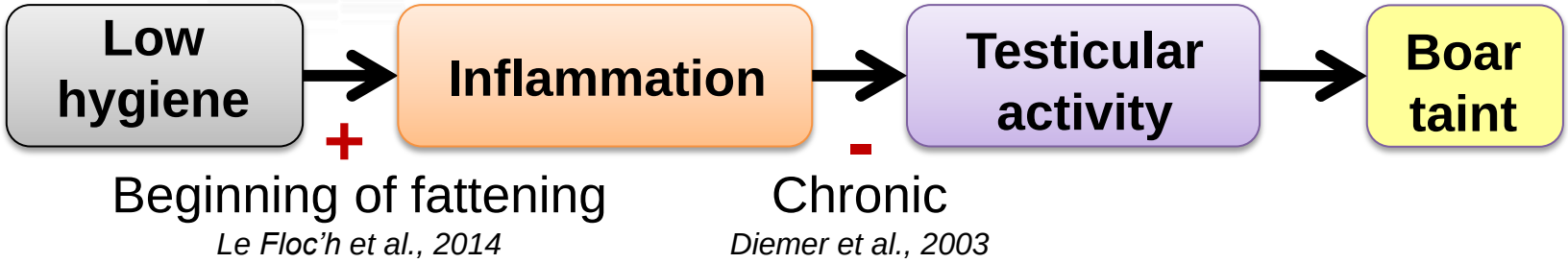
3-mernylindole

Androstenone

Skatole



Hypotheses and Objectives



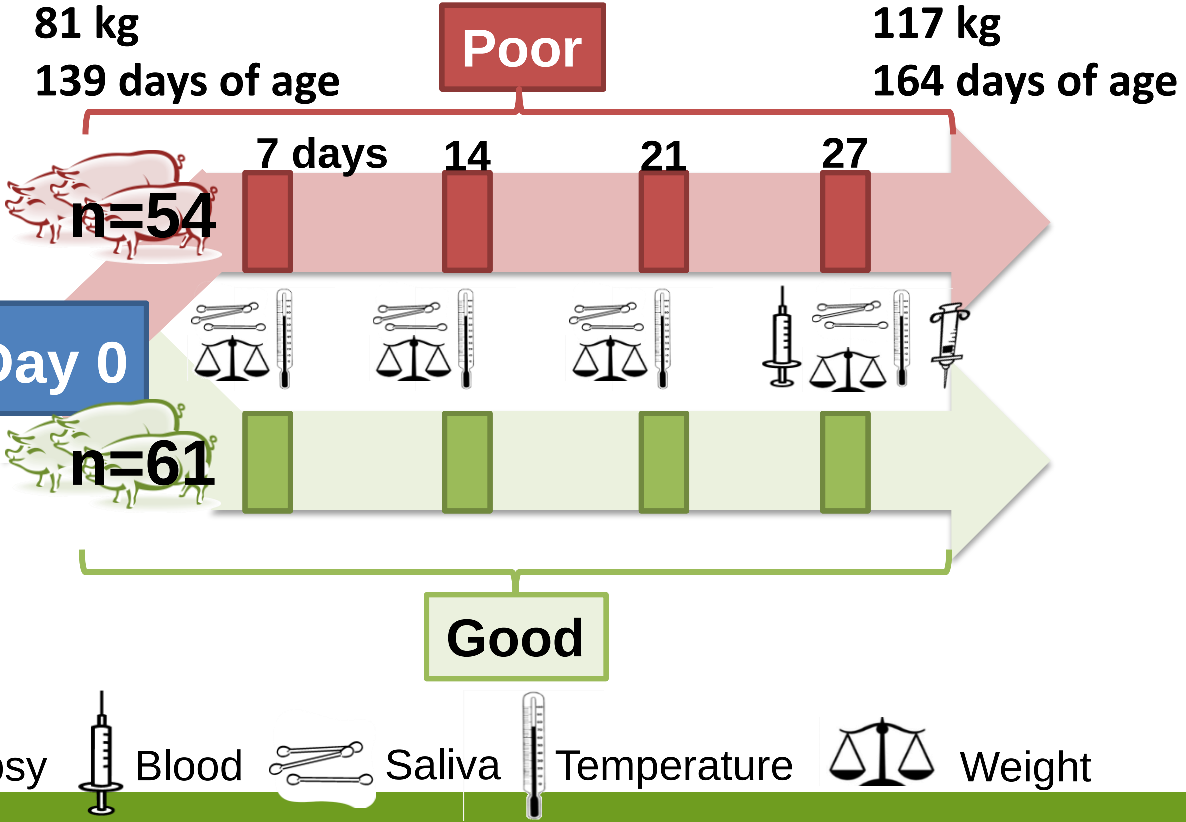
PRINCIPLE – Use a degraded sanitary environment to induce a weak chronic inflammation to mimic health problems in farms

OBJECTIVE – Reveal the effect of subclinical health disorders on the pubertal development and boar taint

Material & Methods *1/2*

2 re
Indiv

Saliva sample



ored Pig
ra
(La
L

Blood sample

Biopsy of fat

Material & Methods *2/2*

	"Good"	"Poor"
		
Cleaning between batches	√	×
Everyday cleaning	√	×
Ventilation	Normal	Minimal
Hygiene measures	√	×
Animal occupancy	Half	Full

ANOVA	Matrix	D0	D7	D14	D21	D27	Slaughter
NH_3	Air	NS			**P>G**		
H_2S	Air		*P>G*		**P>G**		
Dirtyness	Skin	NS	**P>G**	**P>G**	**P>G**	**P>G**	**P>G**

"G": Good sanitary conditions"; "P": Poor sanitary conditions; **P>G**: P<0.05 – *P>G*: P<0.1

Results & Discussion – *Health*

ANOVA	Matrix	D0	D7	D14	D21	D27	Slaughter
Weight		NS	NS	NS	NS	NS	NS
Temperature		NS	**P>G**	**P>G**	NS	NS	
CRP	Plasma	NS				NS	
CRP	Saliva	NS	NS	**P>G**	NS	NS	
Haptoglobin	Plasma	NS				NS	
% Leucocytes	Fresh blood	NS				NS	
Lung & snout	Score of lesions						NS

- Animals were too old (**acquired immunity** too developed) to be strongly affected ?
- The « Good » room was not secured with **antibiotics** ?

Results & Discussion – *Pubertal development*

ANOVA	Matrix	D0	D7	D14	D21	D27	Slaughter
Testosterone	Plasma	*P>G*				NS	
Estradiol	Plasma	NS				NS	
Estrone	Saliva	NS	NS	NS	NS	*P>G*	
Androstenone	Fat Biopsy and Carcass					NS	NS
Testes & Cowper glands	Weight						NS

- No significant effect on pubertal development
- Re-analyse the data according to the inflammatory status of each pig in order to test the hypothesis of a detrimental effect of chronic inflammation on testicular activity

Results & Discussion – *Boar taint*

ANOVA	Matrix	D0	D7	D14	D21	D27	Slaughter
Androstenone	Fat Biopsy and Carcass					NS	NS
Skatole	Fat Biopsy & Carcass					**P>G**	**P>G**
Indole	Fat Biopsy & Carcass					**P>G**	**P>G**

↗ Skatole and indole in the “Poor” room *Hansen et al., 1994*

- Absorption via the skin and/or the lungs *Hansen et al., 1994* ?
- Change in the intestinal microbiota *Montagne et al. 2010; Le Floc’h et al. 2014* due to manure intake ?

Conclusions

Impact of the sanitary environment on health, pubertal development and sex odour of entire male pigs ?

- High differences in air quality and dirtiness of the pigs
- **BUT weak differences** regarding the inflammatory status of fattening boars
- **AND no difference** on sexual development including androstenone
- **Strong effect** of a soiled environment on **fat skatole and indole** levels

Perspectives

Influence of the inflammatory status on pubertal dvlpt. ?

- Use of a PCA to categorize animals according to their inflammatory status

→ No significant effect

→ *Parois S., Faoüen A., Le Floc'h N., Prunier A. Influence of the inflammatory status of entire male pigs on their sexual development and fat androstenone. Submitted to Animal.*

Origin of the change in skatole and indole ?

- Qualitative characterisation of microbiota

→ Different profiles of gut microbiota

→ *Parois S., Zemb O., Prunier A. Influence of hygiene housing conditions of boars on skatole production in the gut and skatole storage in fat tissue. In preparation for Animal.*

Funding

This study has been funded by the INRA.

Acknowledgements

Staff of the experimental pig unit of PEGASE

J. Delamarre, P. Knapen and P. Roger

Staff of the Research Unit PEGASE

R. Comte, S. Jaguelin, M. Lefèbvre, F. Thomas

Staff of the Research Unit GenPhySE

B. Gabinaud


THANK YOU FOR
YOUR ATTENTION