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Genetic parameters of rectal temperature in sows in a tropical humid climate

Preliminary results

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ALIMENTATION
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Introduction

> Tropical conditions : high ambient temperature ± humidity

> Animal performance are dependent on their ability to tolerate heat

> References available on genetic variation of thermoregulation traits are scarce in pigs

> Rectal temperature (RT) : good indicator of inner temperature of homeothermic animals

Material and methods

Herd management

> INRA Experimental farm – Guadeloupe (FWI)

> Large White lactating sows between 1999 and 2005

> Lactation length : 4 weeks

> Lactation diet :

formulated to meet requirements for all nutrients

sows were fed *ad libitum* from day 6 *post-partum*

> Litter size : standardized at 10 or 11 piglets

Data collected

> Sow body weight :

the day after farrowing and at weaning

> Individual piglet liveweight :

each week, from birth to weaning

> Sow daily feed intake

> Rectal temperature (RT) :

twice daily (0700 and 1200)

every Monday and Thursday during lactation

Data analysed

> RT_7 : rectal temperature during lactation measured at 0700

> RT_{12} : rectal temperature during lactation measured at 1200

> dRT : $RT_{12} - RT_7$

> DFI : daily feed intake during *ad libitum* period in lactation

> LGR : litter growth rate

> BWL : sow relative body weight loss during lactation

Statistical analyses

> (Co) variance components by VCE program

(Kovac et al., 2002)

> Univariate animal models :

fixed effects : batch-season-year, parity (1,2,3 and > 3)

stage of lactation for repeated data (RT and DFI)

> Multivariate animal models :

15 successive bivariate analyses

Results

Summary of traits analysed	N. Obs	Mean ± S.D.
Lactating traits		
DFI, kg/d	7,082	4.7 ± 1.3
LGR, kg/d	356	1.9 ± 0.4
BWL	356	0.07 ± 0.03
Rectal temperature, °C		
RT_7	2,647	38.5 ± 0.6
RT_{12}	1,219	39.6 ± 0.7
dRT	1,219	1.0 ± 0.3

Genetic parameters

Traits analysed	heritability
RT_7	0.28 ± 0.03
RT_{12}	0.32 ± 0.05
dRT	0.49 ± 0.14
DFI	0.01 ± 0.03
LGR	0.00 ± 0.00
BWL	0.14 ± 0.10

Genetic parameters

Traits analysed	heritability
RT_7	0.28 ± 0.03
RT_{12}	0.32 ± 0.05
dRT	0.49 ± 0.14
DFI	0.01 ± 0.03
LGR	0.00 ± 0.00
BWL	0.14 ± 0.10

Genetic correlations

> Caution about interpretation of genetic relationships between RT and performance during lactation :
estimations with large standard errors

> But negative genetic correlations between rectal temperature and litter growth performance

	Genetic correlation
LGR-RT_7	-0.12
LGR-RT_{12}	-0.26
LGR-dRT	-0.63

Conclusion

> Existence of a genetic variability for thermoregulation :

There is space for breeding methods

> This is a preliminary study :

Additionnal studies and observations are required

Other thermoregulation traits than RT must be studied

(residual feed intake, respiration rate, …)