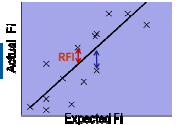


# Are responses to selection in lines divergently selected for residual feed intake in growing pigs affected by GxE interactions when bred in a tropical environment?

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## Objectives

**Hypothesis:** Selection for residual feed intake (RFI) in temperate areas affects responses to selection in a tropical environment

→ Are there GxE interactions in responses to selection in lines divergently selected for RFI when bred in a tropical environment?

## Material and Methods

**DATA:** Divergent Large White lines selected on RFI between 35 and 95 kg BW

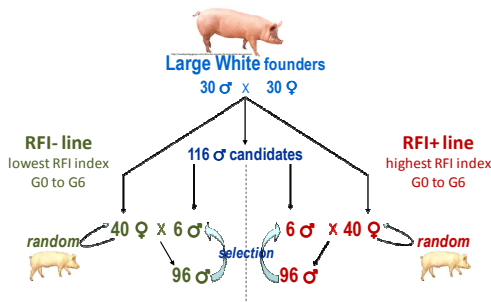
FE: 269 castrates and females, 11 batches (temperate climate)

FWI: 236 castrates and females, 5 batches, semi-open herd (tropical climate)

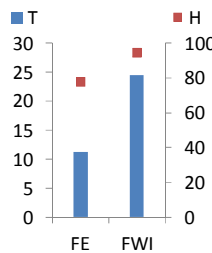
**METHODS:** Analysis of variance to evaluate G x E interactions (E= FE or FWI)

fixed effects: E(batch), sex, E, line, line(sire), line x E

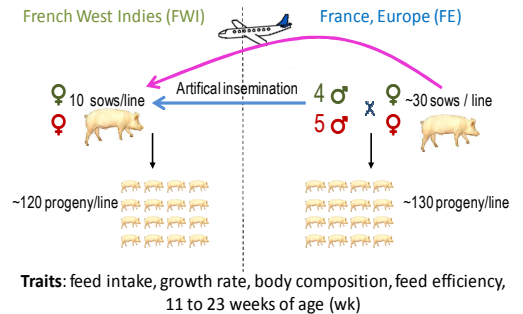
covariates: age, BW, BW x E (except for BW)



**Figure 1:** Selection of divergent lines for RFI (index = DFI - (1.24 x ADG) - (31.9 x BFT))

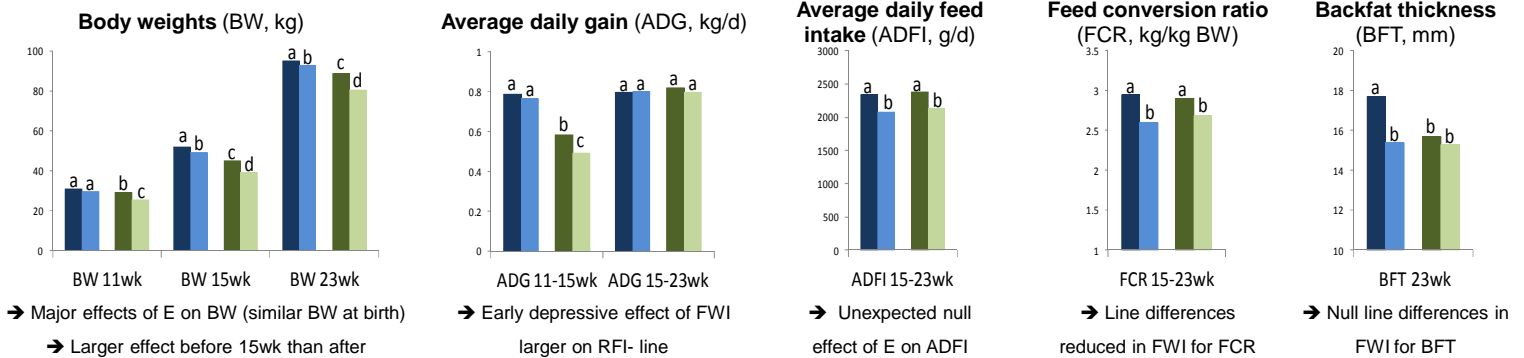


**Figure 2:** Average temperatures (T, °C) and humidity (H, %) in FE and FWI



**Figure 3:** Design to test GxE interactions in the RFI divergent lines

## Responses to selection in Europe and the French West Indies



**Figure 4:** Least square means of the line x environment interaction from the linear model. Subscript indicate values different at P<0.05 within traits

■ FE x RFI+ ■ FE x RFI- ■ FWI x RFI+ ■ FWI x RFI-

**Table 1:** Significance (P value) of the effects of line, environment (E), line x E, BW and BW x E (†:P<0.10; \*: P<0.05; \*\*: P<0.01;\*\*\*: P<0.001), and estimates of regression coefficients for the BW and BW x E

Stat	Effect	BW (kg)			ADG (kg/d)	ADFI (g/d)	ADG (kg/d)	FCR (kg/kg)	BF (mm)
		11 wk	15 wk	23 wk	11-15 wk	15-23 wk	15-23 wk	15-23 wk	23 wk
P value	Line	***	***	***	***	***	ns	***	***
	E	***	***	***	†	ns	ns	ns	ns
	Line x E	*	**	***	**	ns	ns	*	***
Estimate	BW (/kg BW)				0.008***	28.8***	0.006**	18.5***	0.06***
	BW FE vs FWI				0.006*	-11.3**	-0.005**	2.4	0.15***
RSD <sup>1</sup>		3.8	5.8	8.6	0.113	254	0.1	0.27	1.8

<sup>1</sup> RSD = residual standard deviation of the linear model

→ **Significant GxE interactions for most traits** were essentially related to a higher depressive effect of tropical environment in the early stages of growth on the RFI- pigs compared to the RFI+ pigs, without any compensation during the growing-finishing period and needs further examination

## Conclusion

GxE interactions affected most of the traits: despite the line difference for FCR being maintained in the tropical environment, **RFI- pigs had reduced ADG and similar BF compared to RFI+ pigs in FWI, which was different from responses in FE** and suggests major impacts of tropical environment on pigs metabolism.

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