Selection for residual feed intake in growing pigs: effects on sow performance in a tropical climate

D. Renaudeau\textsuperscript{1,4}, C. Anais\textsuperscript{2}, Y. Billon\textsuperscript{3}, J.L. Gourdine\textsuperscript{1}, J. Noblet\textsuperscript{4}, H. Gilbert\textsuperscript{5}

\textsuperscript{1}INRA UR143 URZ, 97170 Petit Bourg, France, 
\textsuperscript{2}INRA UE 1294 PTEA, 97170 Petit Bourg, France, 
\textsuperscript{3}INRA UE 1372 GENESI, 17700 Surgères, France, 
\textsuperscript{4}INRA UMR 1348 PEGASE, 35590 St Gilles, France, 
\textsuperscript{5}INRA UMR 144 LGC, 31326, Toulouse, France.

david.renaudeau@rennes.inra.fr
• Hot climate is a problem for pig production
  - Tropical & temperate regions
  - Concerns about the enhanced thermal susceptibility of “moderns” pigs

• Reduction in pig performance under thermal stress is directly/indirectly related to thermoregulation responses (for e.g. in lactating sows)
• Hot climate is a problem for pig production
  - Tropical & Temperate regions
  - Concerns about the thermal susceptibility of “moderns” pigs

• Reduction in pig performance under thermal stress is directly/indirectly related to thermoregulation responses (for e.g. in lactating sows)
• Hot climate is a problem for pig production
  – Tropical & Temperate regions
  – Concerns about the thermal susceptibility of “moderns” pigs

• Reduction in pig performance under thermal stress is directly/indirectly related to thermoregulation responses (for e.g. in lactating sows)

• Selection for a low residual feed intake in growing pigs reduces feed intake, increases use of body resources and litter weight gain resulting in larger lactation efficiency (Gilbert et al 2012)
• Hot climate is a problem for pig production
  - Tropical & Temperate regions
  - Concerns about the thermal susceptibility of “moderns” pigs

• Reduction in pig performance under thermal stress is directly/indirectly related to thermoregulation responses (for e.g. in lactating sows)

• Selection for a low residual feed intake in growing pigs reduces feed intake, increases use of body resources and litter weight gain resulting in larger lactation efficiency (Gilbert et al 2012)

Evaluate the consequences of selection for RFI in growing pigs on sows performance in tropical climate
• 20 gilts (10/line) from the 7th generation of selection were imported from metropolitan France to Guadeloupe, FWI

• 2 to 6 litters produced/females (n=82 in total)

• 2 seasons: Warm (23.5°C) and Hot (25.7°C), high RH (95% on average).

• Measurements
  – Sows performance (ADFI, BW loss, reproduction)
  – Litter performance (size, growth)
  – Thermoregulation traits (rectal temperature, respiratory rate).
Voluntary feed intake

Statistics: season \((P<0.01: -25\%)\); line \((P<0.01)\); season \(\times\) line \((NS)\)
Maternal BW loss during lactation

**Statistics:** season \((P=0.02): =+8 \text{ kg})\); line \((P<0.01)\); season \(\times\) line \((P=0.04)\)
Litter BW at weaning

Statistics: season ($P=0.04$: -10%); line ($P=0.03$); season × line ($P=0.10$)
Thermoregulation traits

Introduction

Materials and Methods

Results

Conclusions

Statistics: season ($P<0.05$); line ($P<0.05$); season × line ($P>0.10$)
• Effects of seasonal variations of tropical climate have strong effects on sow and litter performances

• Effects of selection for a low RFI on sow performance:

  - feed intake (-15 kg )
  - litter BW at weaning (+2/+16 kg)

  ↗ lactation feed efficiency

• Selection for a low RFI in temperate conditions did not influence lactation (improve ?) performance in HS lactating sows
Acknowledgements

• The personnel at the INRA experimental farms in Guadeloupe (K. Benony, D. Béramis, B. Bocage, M. Bructer, M. Giorgi, and F. Silou) and in Poitou-Charente (A. Priet, S. Ferchaud and Y. Billon).

• The INRA Animal Genetics division and the regional council of Guadeloupe for their financial supports.