



Enriching the sow environment and diet during gestation reduced piglet neonatal mortality

**Hélène Quesnel, Elodie Merlot, Benoit Peuteman, Armelle Prunier,
Delphine Gardan-Salmon, Marie-Christine Meunier-Salaün**





Environment and maternal stress

An impact on neonatal survival?

In intensive pig husbandry, sow environment and management during gestation can generate maternal stress.

Two group-housing systems:

French conventional system (slatted floor; 2.4 m²) vs ***Enriched system*** (deep straw bedding and 3.5 m²/sow) was associated with:

- increased sow stress,
- deleterious effects on maternal physiology,
- increased piglet neonatal mortality.

Our hypothesis: high concentrations of cortisol of sows during gestation had influenced foetal maturation.

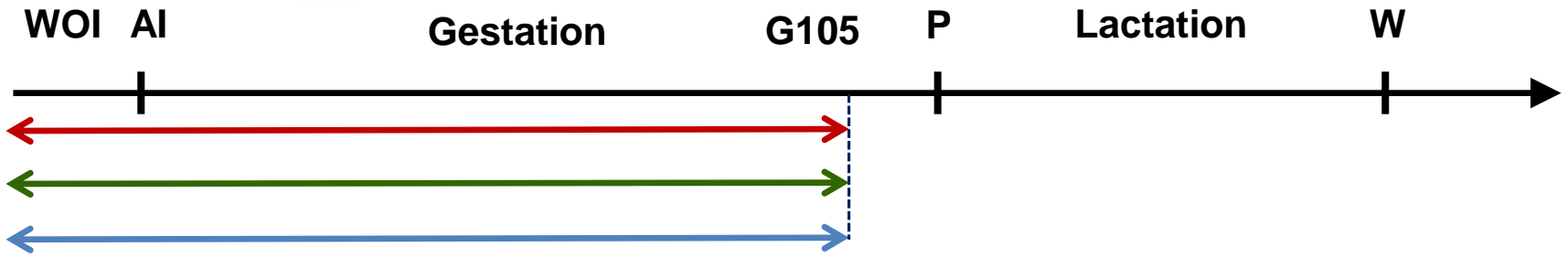
Merlot *et al*, Quesnel *et al*, *in press*



Objective

To investigate a strategy of environmental and nutritional enrichment to reduce sow stress during gestation and its consequences on piglet survival

Experimental design



Conventional **Enriched**
system **system**

Conventional system
On slatted floor,
2.4 m²/sow

On slatted floor,
2.4 m²/sow

Enriched system
On straw bedding,
3.5 m²/sow



The Conventional Enriched system

A double enrichment

Pieces of wood (oak)

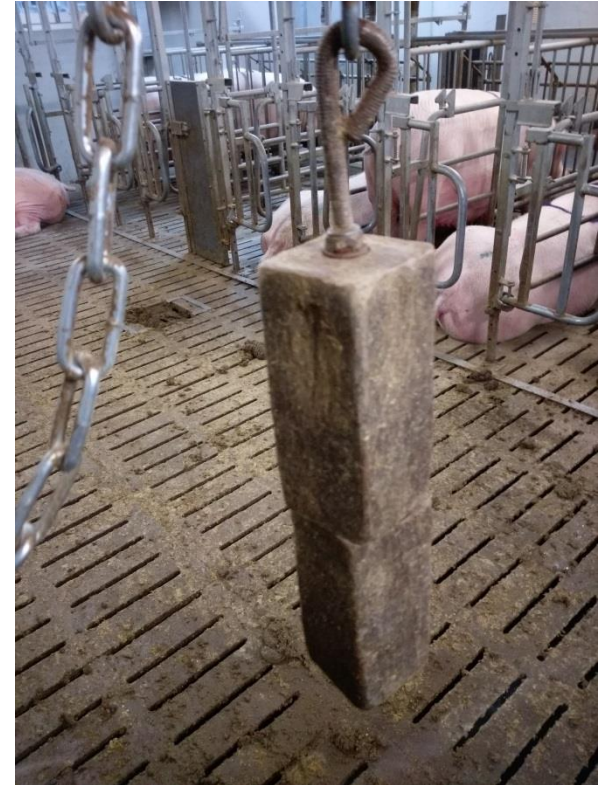
3 per pen of 12 sows

(in addition to 2 chains in C and CE)

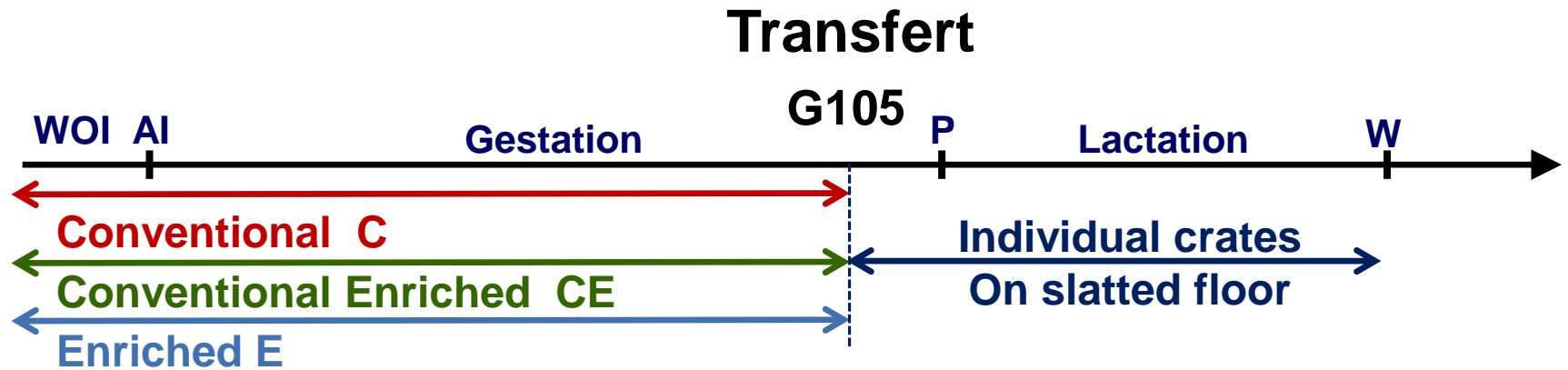
Straw pellets

- 200 g/d from 3 to 30 d of gestation;
- 400 g/d from 31 to 104 d of gestation.

In the trough after each meal (2x/d)



Experimental design



83 Landrace x Large White sows

Performance of reproduction

	Treatment			Effect
	C	CE	E	
No. of sows	26	30	27	
No. piglets / litter				
Total born	15.4	15.7	15.2	NS
Born alive	13.8	14.7	14.2	NS
Stillborn	1.7	1.1	1.0	0.05
Piglets at birth				
Body weight, kg	1.46	1.43	1.53	NS
% piglets < 1.0 kg	15.3	16.3	12.6	0.14
% piglets > 1.8 kg	16.3^a	18.7^a	28.2^b	<0.001



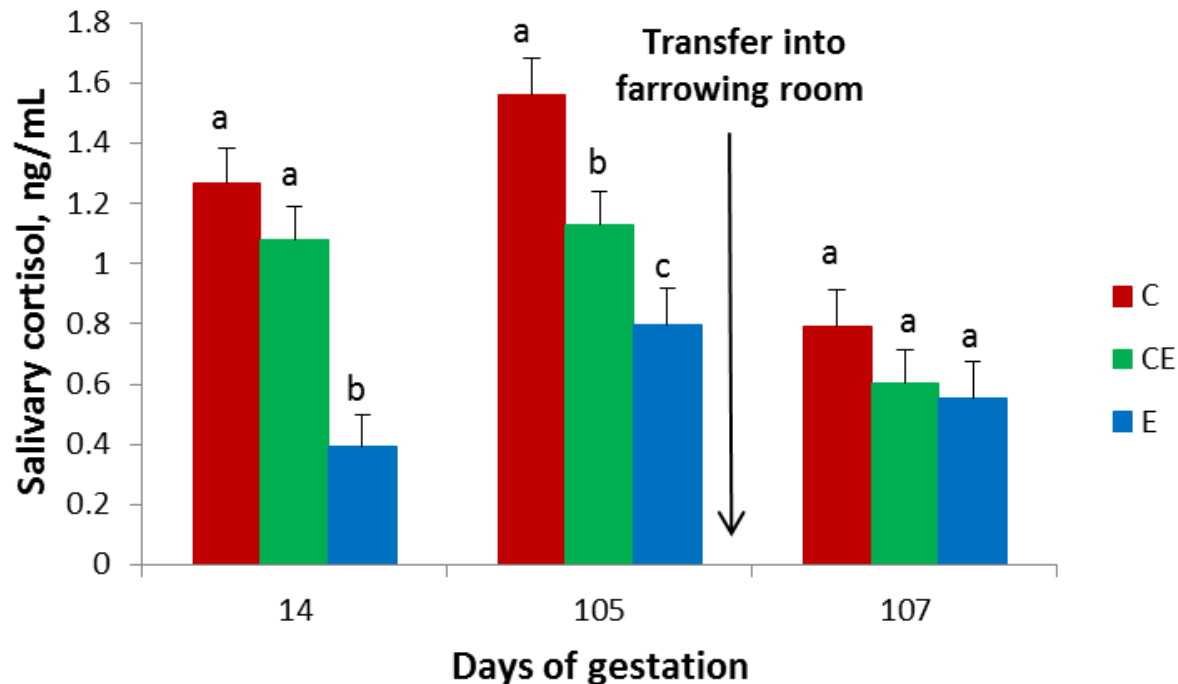
Rates of piglet mortality

	Treatment			Effect
	C	CE	E	
No. of litters	26	30	27	
Mortality rates, %				
Very early (birth + < 12 h)	11.1 ^a	6.6 ^b	6.3 ^b	0.03
Early (12 h-72 h pp)	11.1	10.2	10.0	NS
Late (72 h pp – weaning)	3.0	3.0	3.9	NS
Overall (birth-weaning)	23.2	19.1	19.3	0.35

The enrichment reduced very early mortality.

Sow concentrations of cortisol in saliva

Treatment x Day interaction: $P < 0.01$



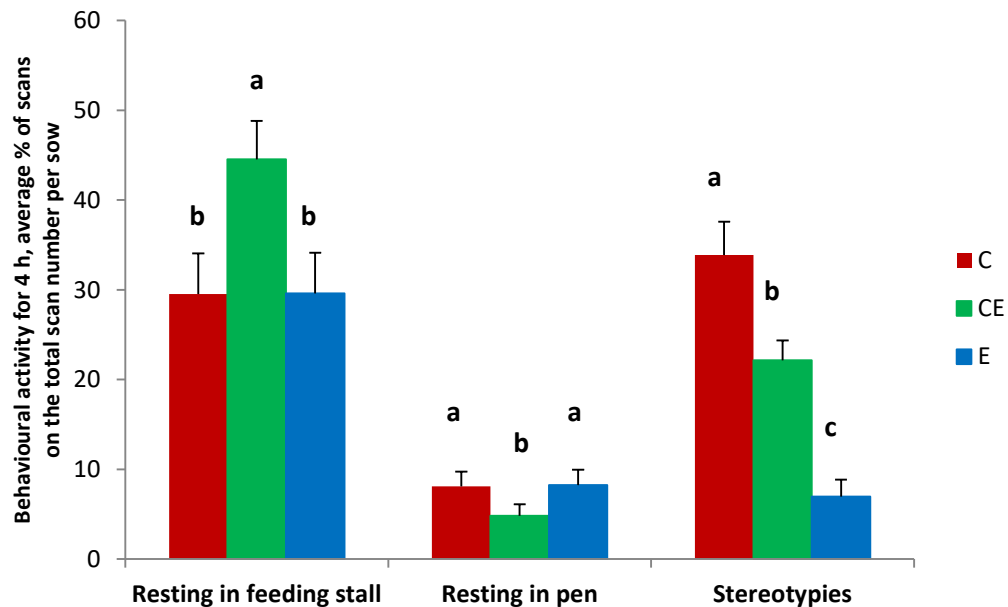
The enrichment reduced salivary cortisol.

Sow behavioural activity

On day 101 of gestation

Scan sampling for 4 h

08.30-10.30 ; 13.30-15.30



The enrichment reduced sow stereotypes.

Investigative activity towards substrates

On day 101 of gestation

Continuous recording for 4 h

08.30-10.30 ; 13.30-15.30

	Treatment			Effect
	C	CE	E	
Sows involved in investigative sequences	17 / 26 ^a	< 29 / 30 ^b	= 26 / 26 ^b	< 0.001
Manipulable substrate				
Pen	0.62 ^a	> 0.15 ^b	> 0.10 ^c	< 0.001
Chain	0.38 ^a	< 0.42 ^b	-	< 0.001
Wooden object	-	0.41	-	-
Straw	-	-	0.90	-

*The enrichment increased sow investigative behaviour.
Specific attraction for straw and objects.*



Conclusions

Enriching the sow diet with straw and their environment with manipulable objects improved sow welfare; This effect was accompanied by a decrease in mortality of piglets at and just after birth.

→ Improving sow welfare during gestation should be considered to reduce piglet mortality in pig farms.



- Many thanks to the staff from*
- ✓ *INRA*
 - ✓ *CCPA group*
 - ✓ *Chambre d'Agriculture de Bretagne*



Thank you for your attention!



PROHEALTH

