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Breeding for a better survival of piglets in organic farming: consequences on maternal cortisol and neonate metabolic status

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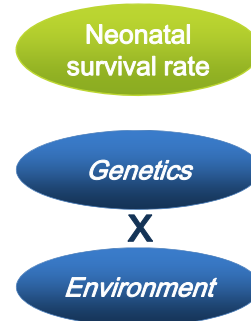
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Breeding for a better survival of piglets in organic farming: consequences on maternal cortisol and neonate metabolic status



The high neonatal mortality in organic pig farms (sometimes > 35%) is in conflict with the high welfare principles of organic farming.



Major causes of mortality:

- . Weakness
- . Starving
- . Crushing

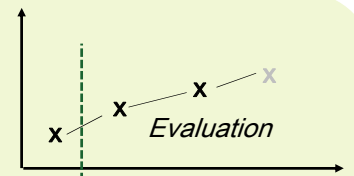
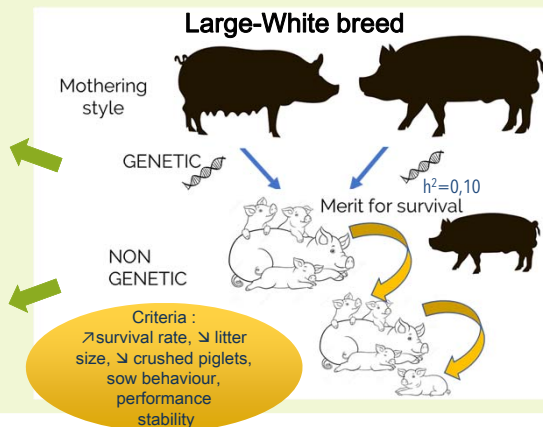
Main levers of improvement:

- . Sow maternal ability
- . Piglet potential of survival
- . Sow capacity of adaptation
- . Housing

Selective breeding strategy

Principle:

- Sows inseminated over successive generations with semen from boars with a high genetic merit for piglet survival
- Boars reared in conventional farms of 2 French selection companies
- Daughters from best dams, reared in organic conditions, chosen as future reproducers



Conventional farming vs Organic farming Restrained 5d vs. loose at farrowing

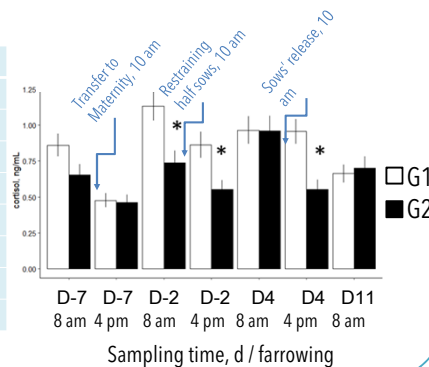
48 sows / generation (G)

Mothers

Reproduction data:

Variable	G1	G2	SD
Gestation Length, d	113.8 ^a	114.7 ^b	0,3
Piglets born Alive	15.3	15.3	0.7
Stillborns	1.08	0.91	0,23
Crushed piglets	1.98	1.94	0,35
Survival rate D2	84.7	84.0	2,7
Survival rate D21	73.4	67.9	4,8
Survival rate D49	70.86	67.04	3
Litter weight D0, kg	23.6	23.5	9,4

Salivary cortisol, ng/mL:



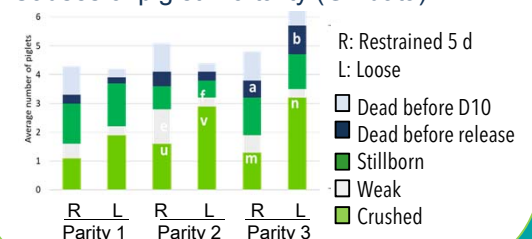
Piglets

Plasma indicators of robustness and maturity at 1d of age:

Plasma variable	G1	G2	SD
IgG, g/L	23.3	24.6	2.8
Lactate, $\mu\text{mol/L}^{*\#}$	4029	4343	208
Glucose, mg/L ^{*#}	991	917	54
Albumine, g/L [*]	9.13 ^a	9.86 ^b	0.23
dROM, CARRU [*]	152 ^a	189 ^b	5
FRAP, molar Trolox eq./L	61.1 ^a	49.2 ^b	2.0

*Positively correlated with piglet weight at 24h
Blocking sows induced lower lactate in G1 only (P<P.05), and lower glucose in males only (P<0.05).

Causes of piglet mortality (G1 data):



Conclusion

Selective breeding for a better survival of piglets seems to have :

- An effect on neonatal mortality too small to be detected on G2,
- Decreased dams' secretion of cortisol, an hormone fundamental to the control of energy metabolism and stress response,
- Favoured a better metabolic maturity in piglets at birth.
- These results are to be confirmed on the G3 generation.



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