Individual behavioural pattern in pigs

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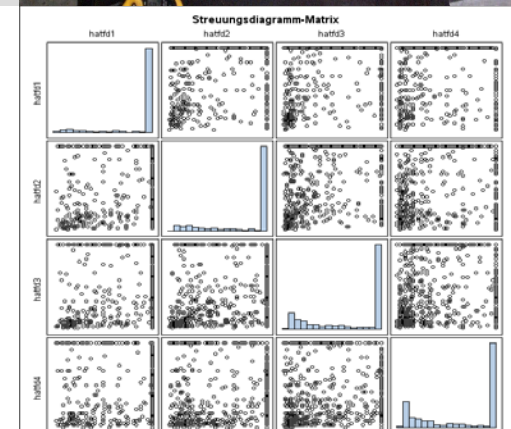Christian-Albrechts-University Kiel

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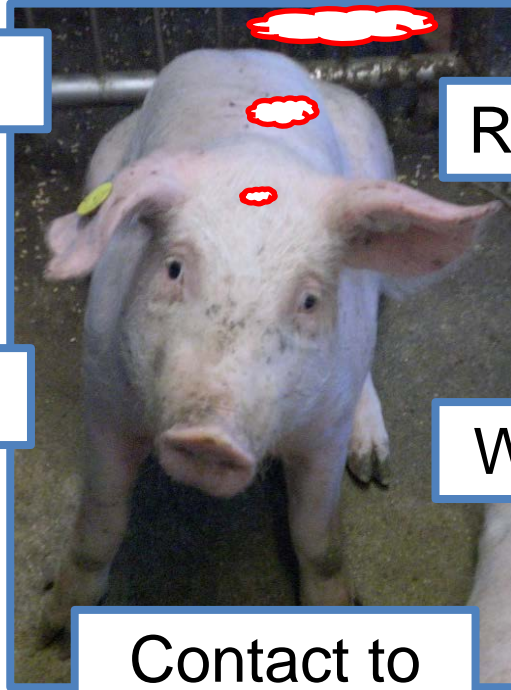
Abstract 16977

Introduction

Stress?!

Suckling order

Rank order

Cross fostering

Weaning/ Rehousing

Contact to humans

Stress is an important factor in the whole pig production

Stress is an important factor in the whole pig production

➢ Regarding animal welfare aspects the indiviual pig behaviour becomes more important

➢ Knowledge about behaviour in standardised stressful situations → Behavioural tests

Backtest

Human approach test

➢ Improvement of housing conditions

➢ Implementation in breeding programs

Aims

- Analysing individual pig behaviour in the backtest and the human approach test

- Estimation of heritabilities (h^2)

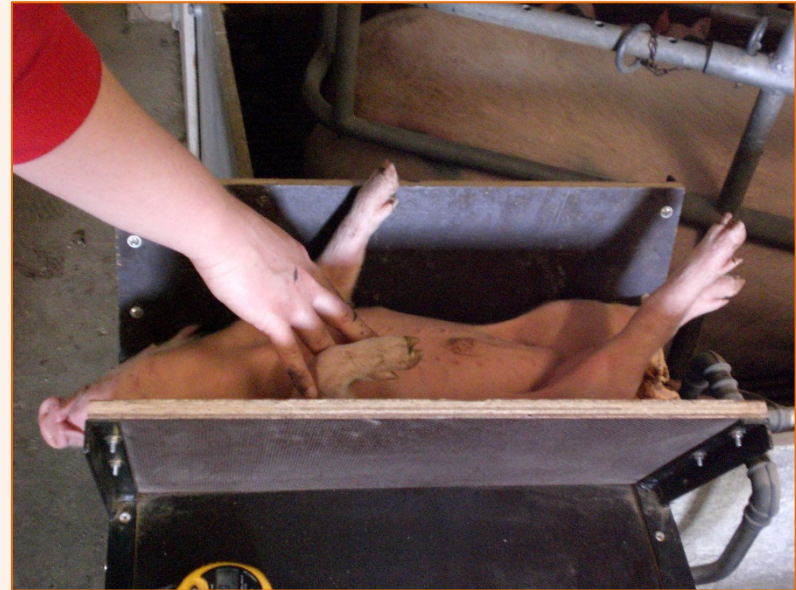- Relationship between and across behavioural tests (r_p, r_g)

Backtest

➢ 12th and 19th day of life

➢ Duration 1 minute

➢ 1,383 animals

➢ Traits:

Number of escape attempts (NEA)

Duration of escape attempts (DEA)

Latency to the first escape attempt (LEA)

Human approach test

- ➤ 2 x Suckling piglets (n = 1,319)

- ➤ 4 x Weaned pig   (n = 1,318)

- ➤ 1 x Gilts   (n =   272)

- ➤ Duration 1 minute

- ➤ Trait:

    Latency to the first contact with the stockperson (LC)

Model: Backtest

NEA (number of escape attempts): Poisson- Distribution

DEA (duration of escape attempts): Poisson- Distribution

LEA (latency to escape attempt):   Binary- Distribution

Fixed effects:	*Random effects:*	*Covariate:*
• Batch • Test number	• Litter • Animal • Permanent environmental effect	• Weight at birth

Model: Human approach test

$LC_{Suckling\ piglets,\ weaned\ pigs}$ – Binary- Distribution

LC_{Gilts} – Normal distribution

	Fixed effects:	Random effects:	Covariate:
$LC_{Suckling\ piglets}$	• Batch • Test number • Gender	• Animal • Litter • Permanent environmental effect	-
$LC_{Weaned\ pigs}$	• Batch • Test number • Gender • Category of the pen	• Animal • Litter • Permanent environmental effect	-
LC_{Gilts}	• Batch	• Animal • Litter	• Weight at rehousing

Results- Backtest

Heritabilities (diagonal), genetic correlations (above diagonal) and phenotypic correlations (below diagonal) of backtest traits

	NEA	DEA	LEA
NEA (number of escape attempts)	**0.19**	0.99	n.c.
DEA (duration of escape attempts)	0.73	**0.10**	-0.99
LEA (latency to escape attempt)	n.c.	-0.64	**0.18**

n.c. not converged

Heritabilities (diagonal), genetic correlations (above diagonal) and phenotypic correlations (below diagonal) of the trait latency (LC) of human approach tests with suckling piglets, weaned pigs and gilts

	LC$_{Suckling\ piglets}$	LC$_{Weaned\ pigs}$	LC$_{Gilts}$
LC$_{Suckling\ piglets}$	**0.07**	0.75	-0.06
LC$_{Weaned\ pigs}$	0.18	**0.17**	0.36
LC$_{Gilts}$	0.00	0.17	**0.58**

Phenotypic (r_p) and genetic correlations (r_g) between backtest traits and the trait latency (LC) of the human approach test with suckling piglets, weaned pigs and gilts

	LC$_{Suckling\ piglets}$		LC$_{Weaned\ pigs}$		LC$_{Gilts}$	
	r_p	r_g	r_p	r_g	r_p	r_g
NEA (number of escape attempts)	-0.08	-0.84	-0.03	0.01	-0.01	-0.06
DEA (duration of escape attempts)	-0.07	-0.90	-0.03	0.00	-0.03	-0.21
LEA (latency to escape attempt)	0.15	0.94	0.07	0.25	0.05	0.10

Discussion

- **Medium heritabilities of both behavioural tests (h^2 = 0.07 - 0.58)**

    - Backtest: Velie et al. (2007): h^2 = 0.31 - 0.53

    - Human approach test: Hemsworth et al. (1990): h^2 = 0.38

- **Very high genetic (r_g = 0.99) and phenotypic (r_p = -0.64 - 0.73) correlations between backtest traits**

    - Regarding time effort and standardisation it is sufficient to record only number of escape attempts (NEA)

- **Higher genetic and phenotypic correlation between human approach tests with smaller time differences**

  – Behaviour in tests depends on age of animals

    (effect of habituation)

- **No/ small genetic and phenotypic relation between backtest and human approach tests**

  – Behaviour of pigs in the different tests depends on different genetic effects

  6 Exception: High genetic correlation between backtest and human approach test with suckling piglets → Trait with small frequency and small heritability

Thank you for your attention!

PHÄNOMICS // KOMPETENZNETZ DER AGRAR - UND ERNÄHRUNGSFORSCHUNG