Effect of divergent selection for cortisol level on boar taint

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PROJET FINANCÉ PAR L'ANR - PROJECT FUNDED BY THE ANR

General objective

- Hypothalamic-pituitary-adrenocortical (HPA) axis activity is linked to animal adaptation and robustness

- What are the correlated responses of a selection on HPA axis activity on slaughter traits of interest for entire male breeding ?

Divergent selection on ACTH response

ACTH

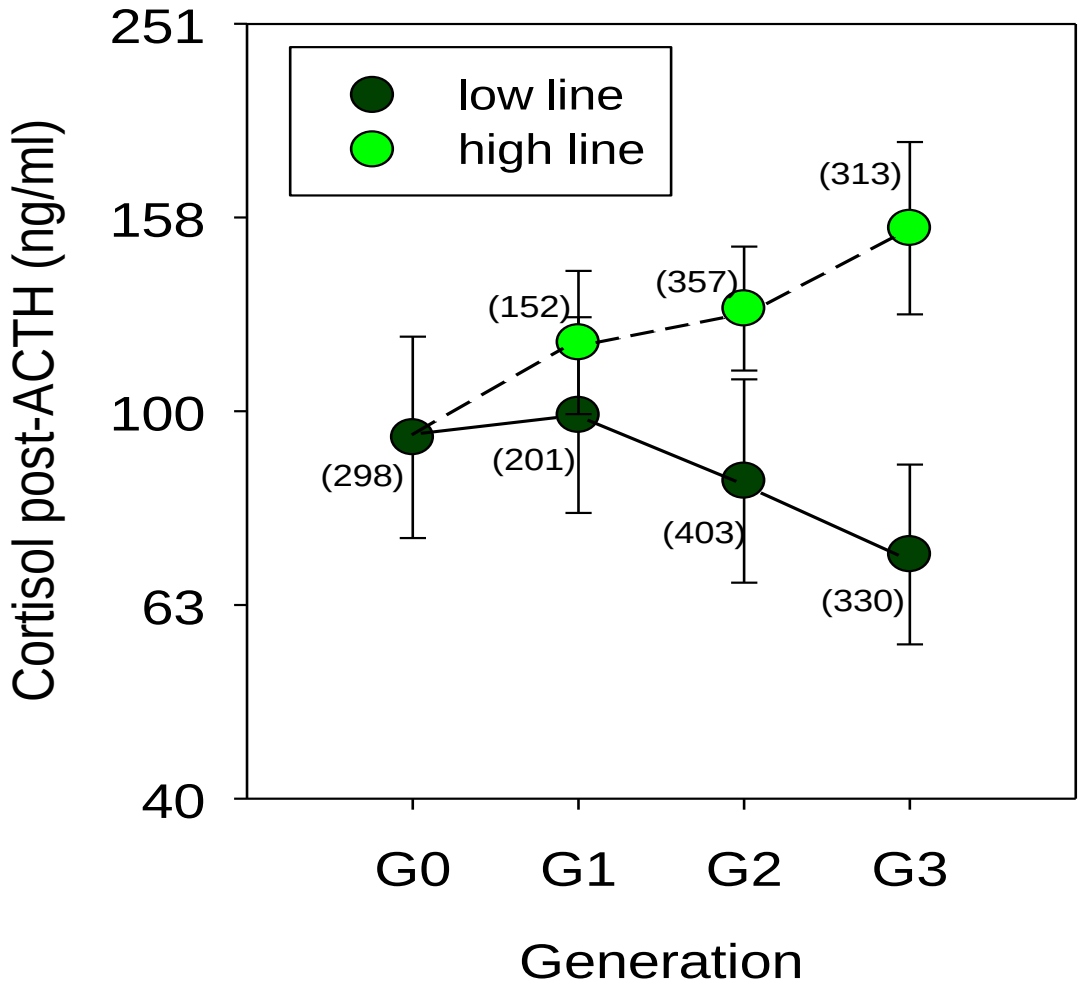
+ 1 h

[cortisol]

Pure Large white piglets
6 week-old

h^2=0.68

Phenotypic evolution of cortisol



X 2.17

Experimental animals

32 entire males from G3 generation
Slaughtered at 159 days and 92 kg B.W.
2 lines x 2 slaughtering conditions

	Stressed: Preslaughter Mixing	**Unstressed: No Mixing**
High line	**8 EM**	**8 EM**
Low line	**8 EM**	**8 EM**

Measurements

- Blood (collected at sticking):

  cortisol, testosterone, estradiol

- Fat (neck):

  androstenone, skatole

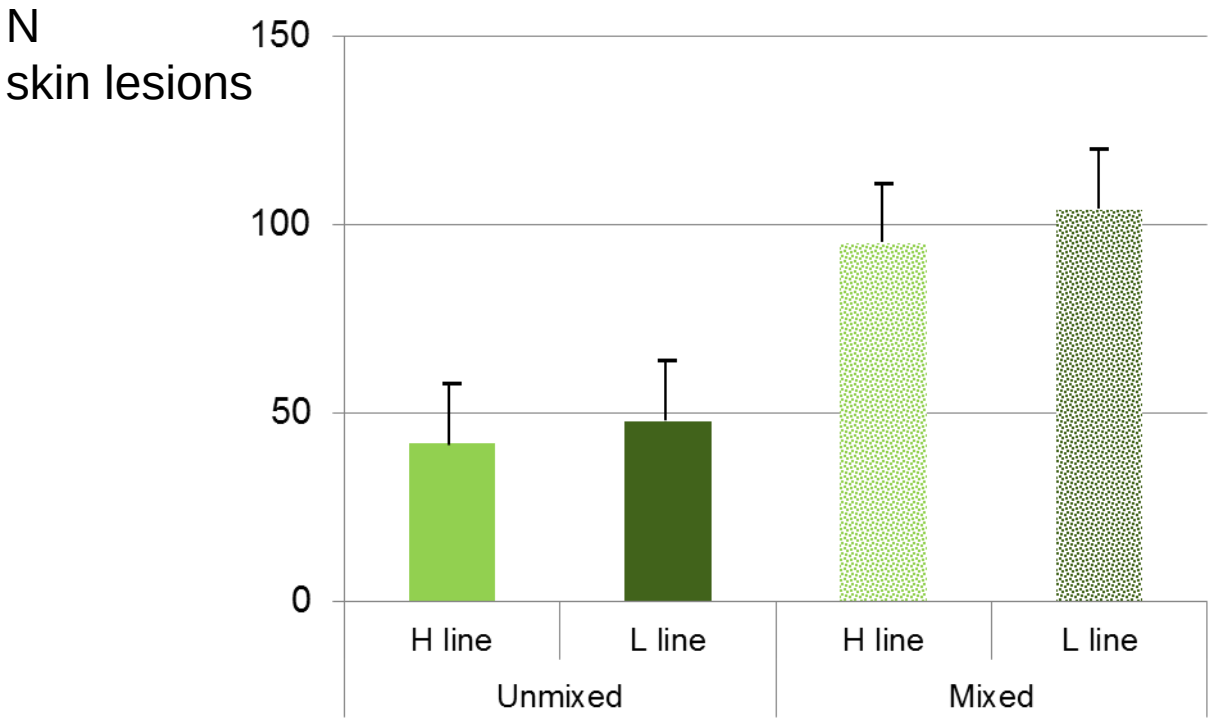
- Urine (bladder):

  cortisol, dopamine, adrenaline, noradrenaline

- Skin: lesions

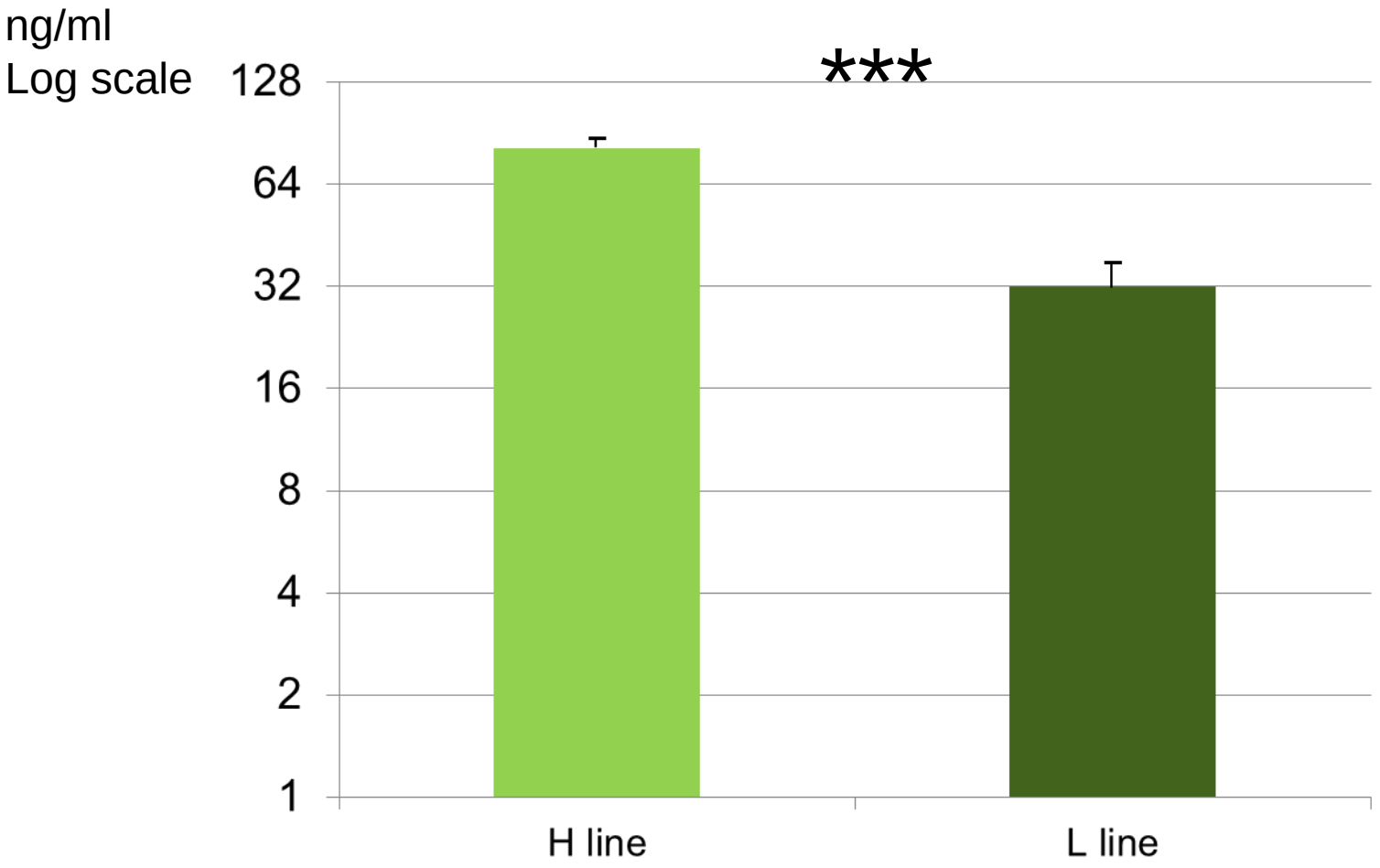
Results

- No significant interaction between line and slaughter conditions



- No line effect on: skin lesions, (nor)adrenaline
- No effect of mixing on:
  - Fat, blood and urinary measurements (except cortisol)

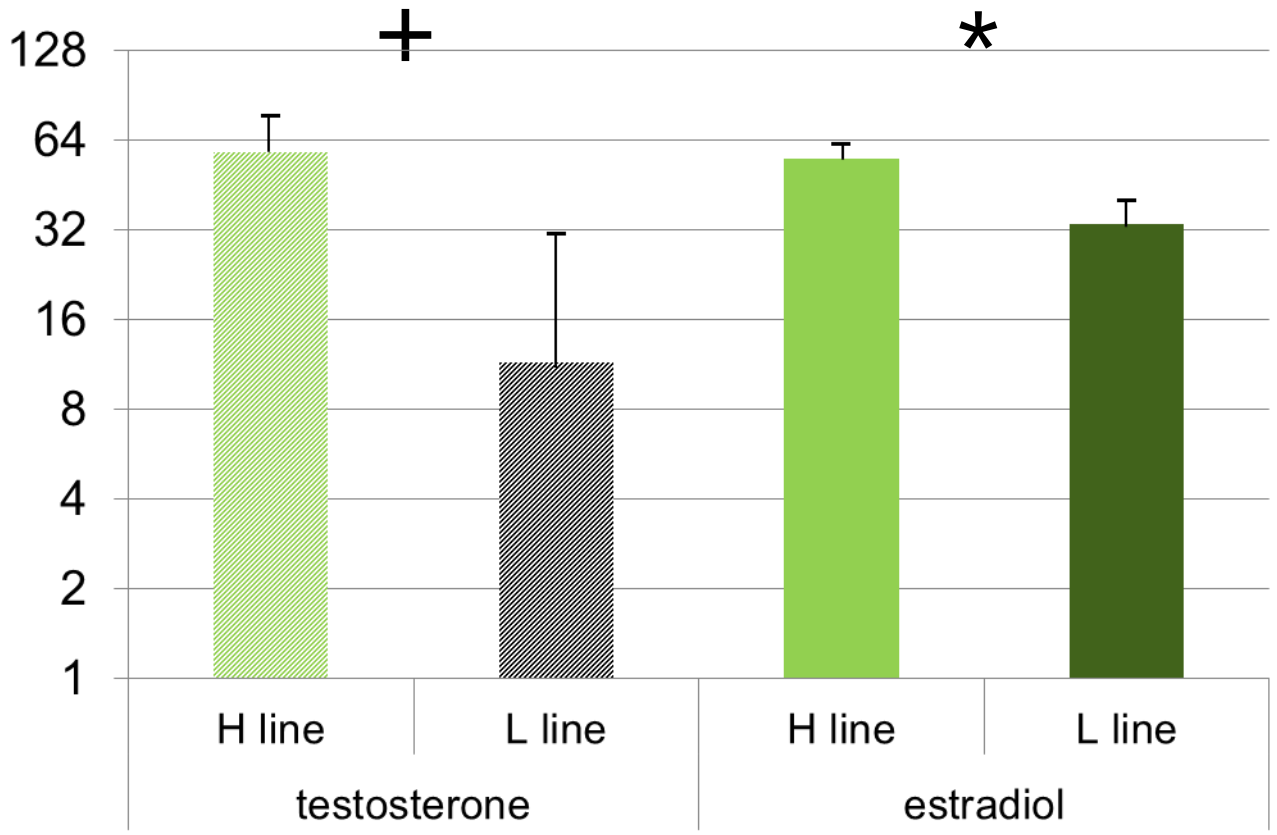
Results : plasma cortisol



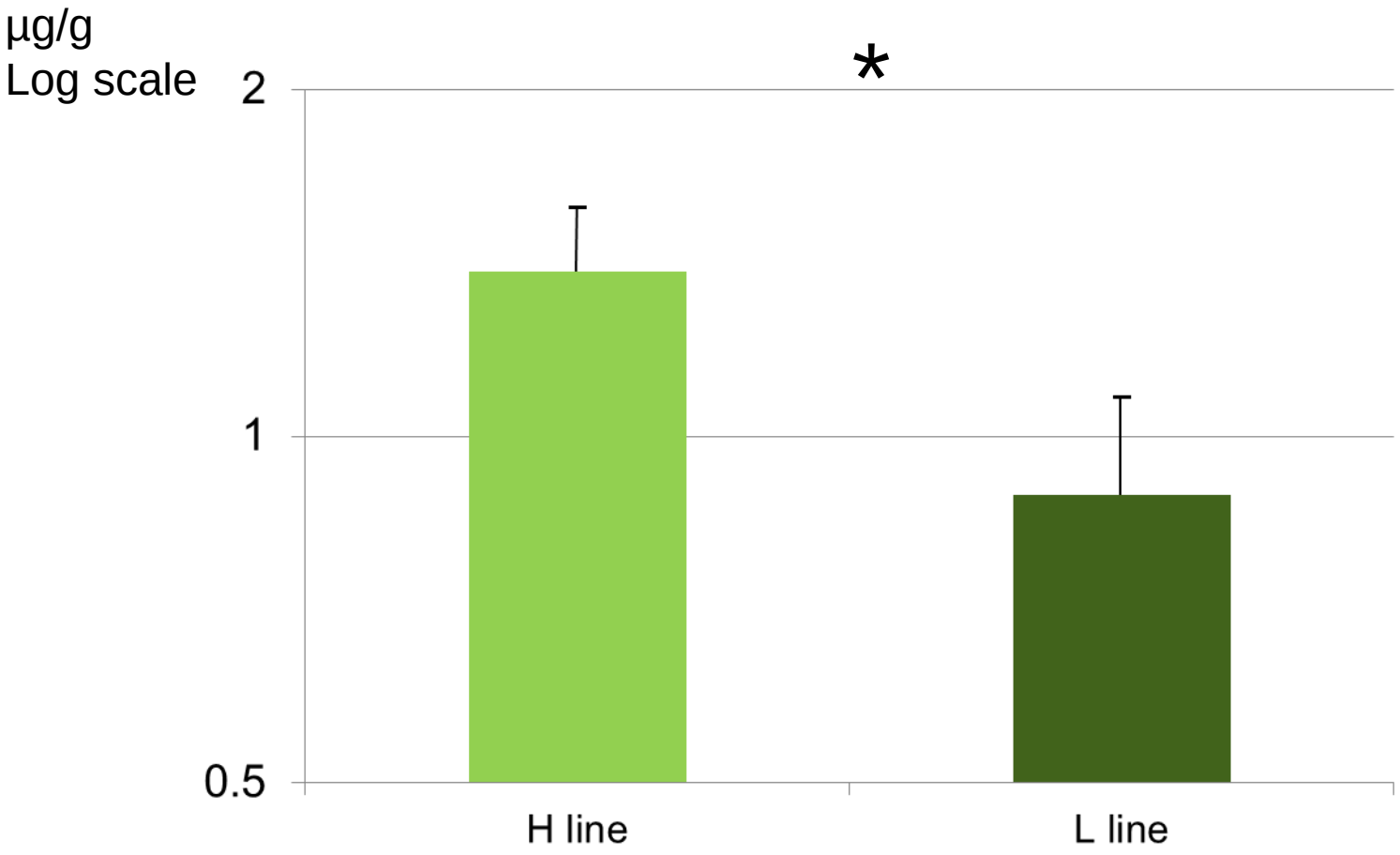
Results: plasma sex hormones

T = ng/ml
Log scale

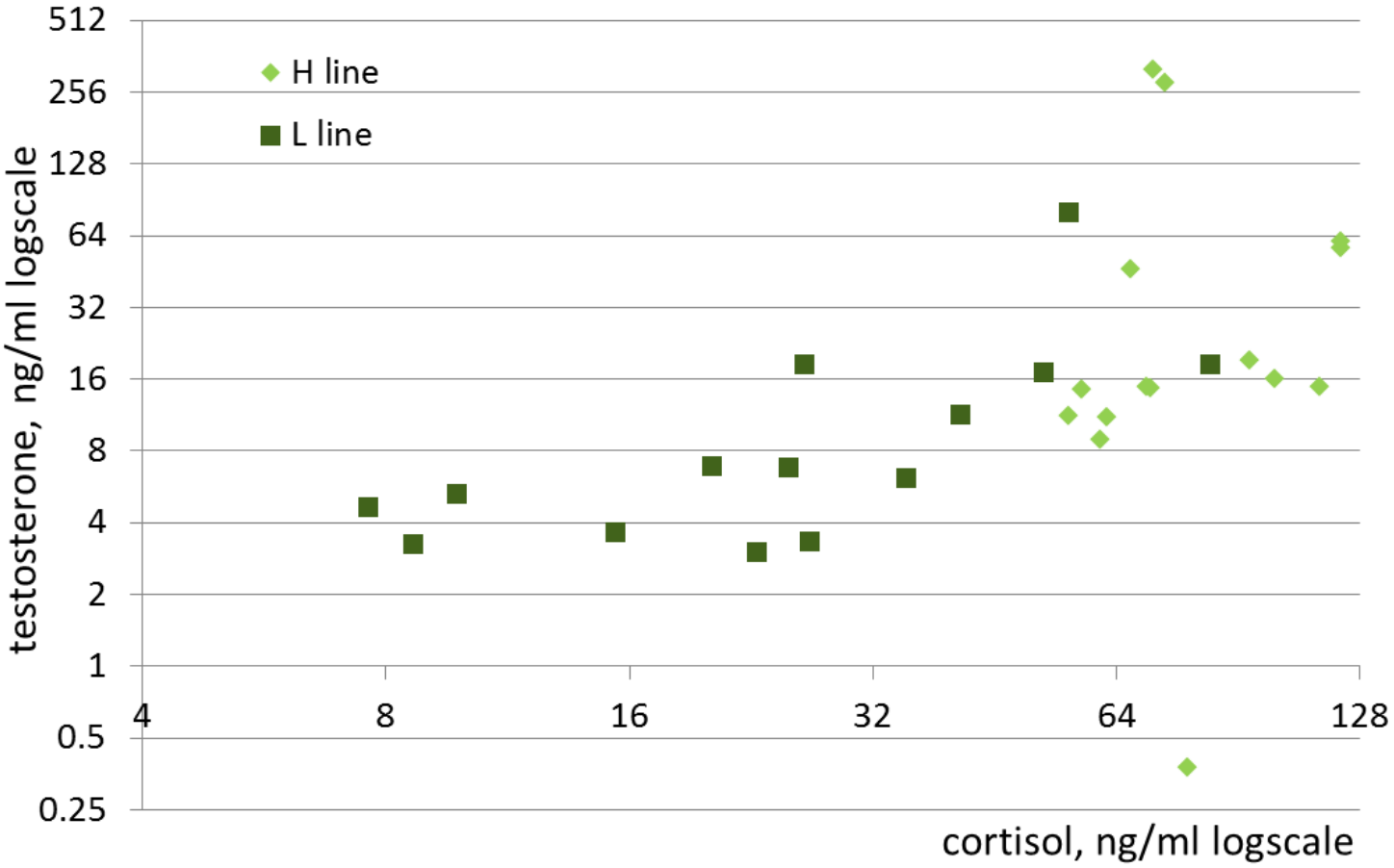
E = pg/ml
Log scale



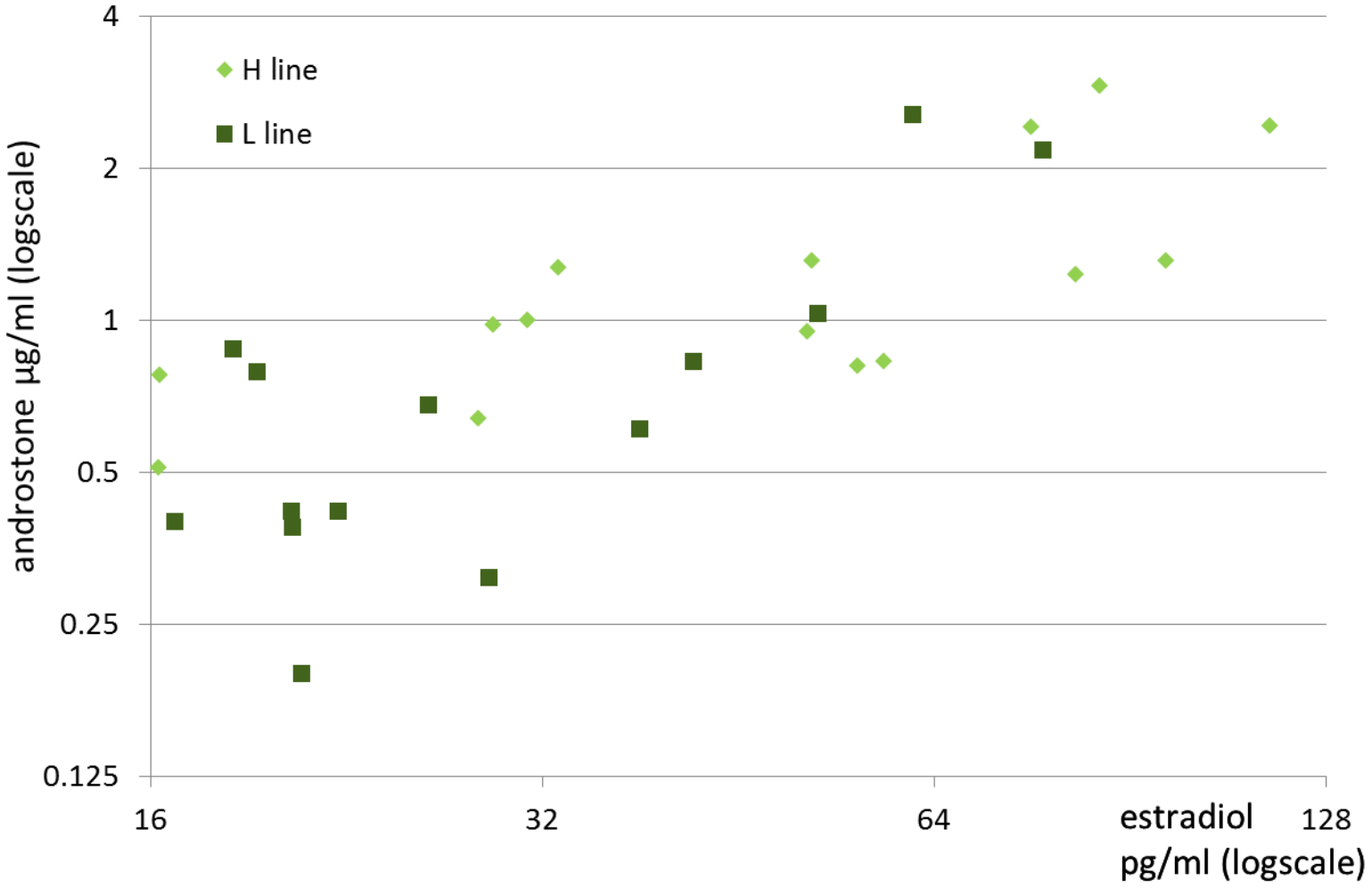
Results: fat androstenone



Cortisol/testosterone relationship



Androstenone/estradiol relationship



Conclusions

- The study provided evidence that selection for cortisol level influences steroidogenesis in entire male pigs.
  - Testosterone
  - Estradiol
  - Androstenone
- Improving robustness by increasing HPA axis activity might have detrimental effect for entire male breeding
- Genetic relationships between cortisol, estradiol and androstenone should be further explored.

Thanks for your attention

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