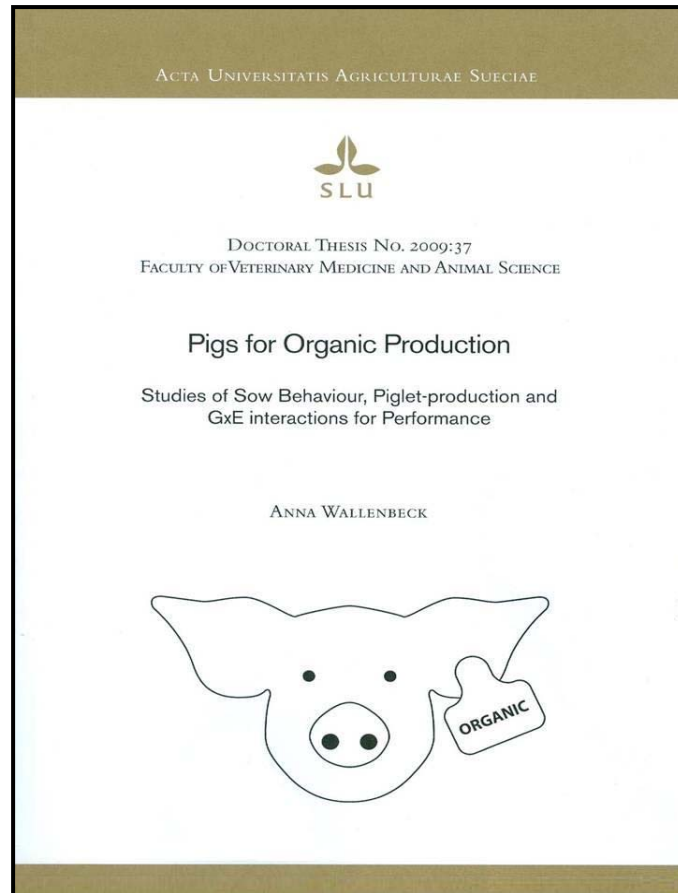


Pigs for Organic Production

- GxE interactions for performance



Outline

- The thesis
 - Purpose of the thesis
 - Studies performed
 - Publications
- GxE interactions for growth and carcass leanness
- Future breeding strategies for organic pig production?

Purpose of the thesis

Acquire knowledge concerning pigs in organic production by investigating:

- GxE interaction for growth and carcass leanness
- Sow behaviour
- Sow production
- Sow reproduction
- Herdsmen's judgement of sows

Studies

| | Research station study | Field studies |
|-------------------------------------|--|-------------------------------|
| Sows | 40 | 144 |
| Parities | 4 | 3 |
| Growing/finishing pig | - | 1805 |
| Study period | 2003-2005 | 2003-2006 |
| Sow behaviour | Videotape recordings and direct observations | Judged by the herdsmen |
| Piglet production | Registered by herdsmen | Registered by herdsmen |
| Growing/finishing pig traits | | Registered at slaughter plant |

Research station study

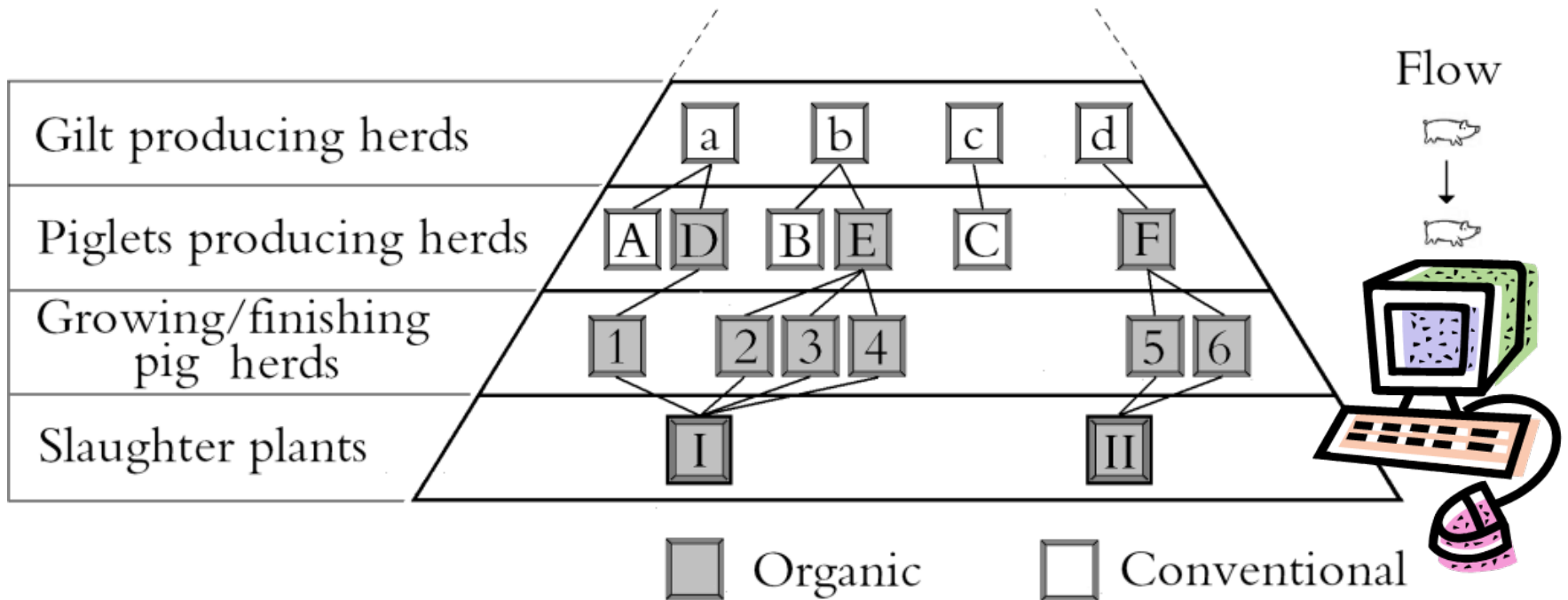
Outdoors, parity 1 & 3

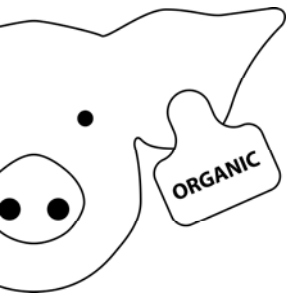


Indoors, parity 2 & 4



Field studies





Publications

- I. Nest-building and farrowing behaviour in sows: comparing farrowing outdoors in huts and indoors in pens.
- II. Maternal behaviour and performance in first-parity outdoor sows.
- III. Sow performance and maternal behaviour in organic and conventional herds.
- IV. GxE interactions for growth and carcass leanness: Re-ranking of boars in organic and conventional pig production.

GxE -paper

Aim: to answer the question

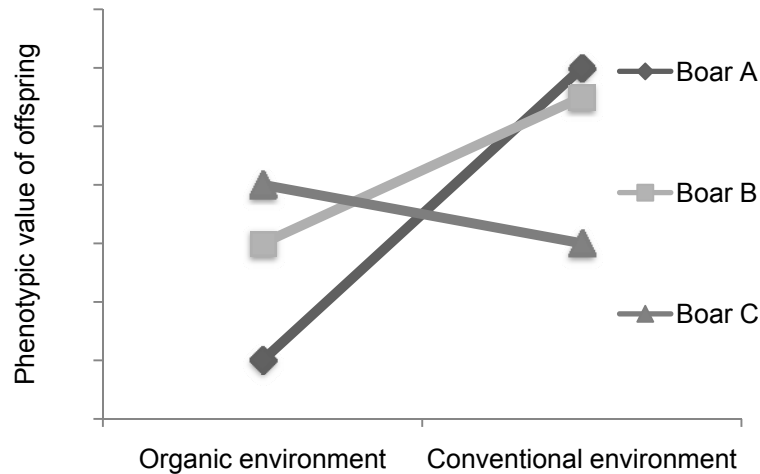
Are there GxE interactions for fattening traits in organic and conventional pig production environments?

Method

Compare ranking of boars' organic and conventional breeding values.

Background

- GxE interaction => same trait – partly different genes



- Economically important if genetic evaluation is done in only one of the environments
- Growth and backfat thickness are economically important

GxE -paper

What did we do?

- Estimation of “organic” breeding values for the AI-boars
- Conventional breeding values for the same boars, from the breeding organisation Quality Genetics

What did we find?

- Heritability
 - Growth rate until 100 kg: 0.30
 - Backfat thickness at 100 kg: 0.36
- Genetic correlation
 - -0.11

What did we find?

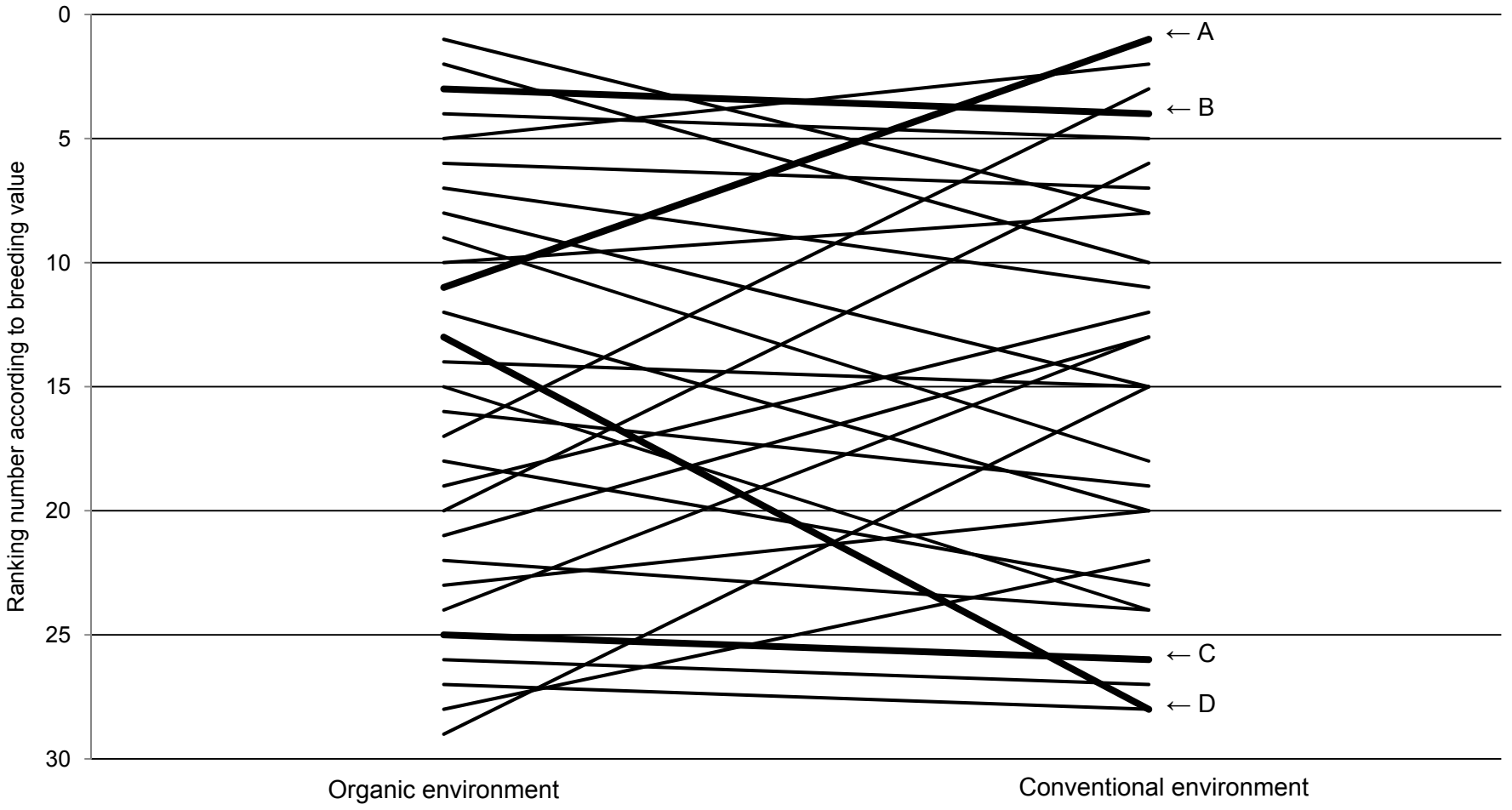
Spearman rank correlations between organic and conventional breeding values (N=29)

| | p-values | | |
|-------------------|-------------|---------|---------|
| | r | H0: r=0 | H0: r=1 |
| Growth rate | 0.48 | 0.009 | 0.001 |
| Backfat thickness | 0.42 | 0.022 | 0.001 |

GxE -paper

What did we find?

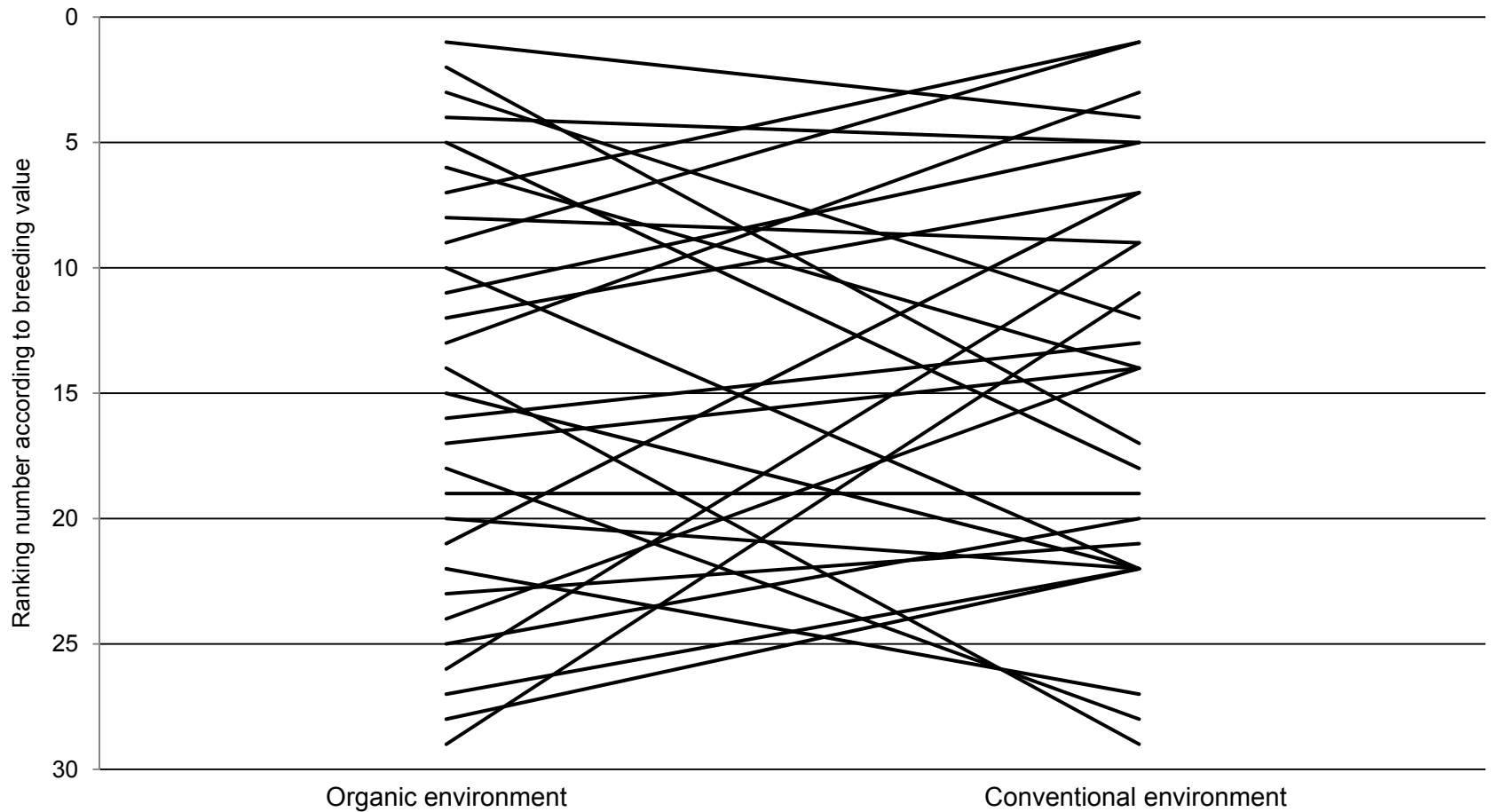
Differences in ranking of breeding values: Growth rate



GxE -paper

What did we find?

Differences in ranking of breeding values:
Backfat thickness



GxE -paper

Conclusion

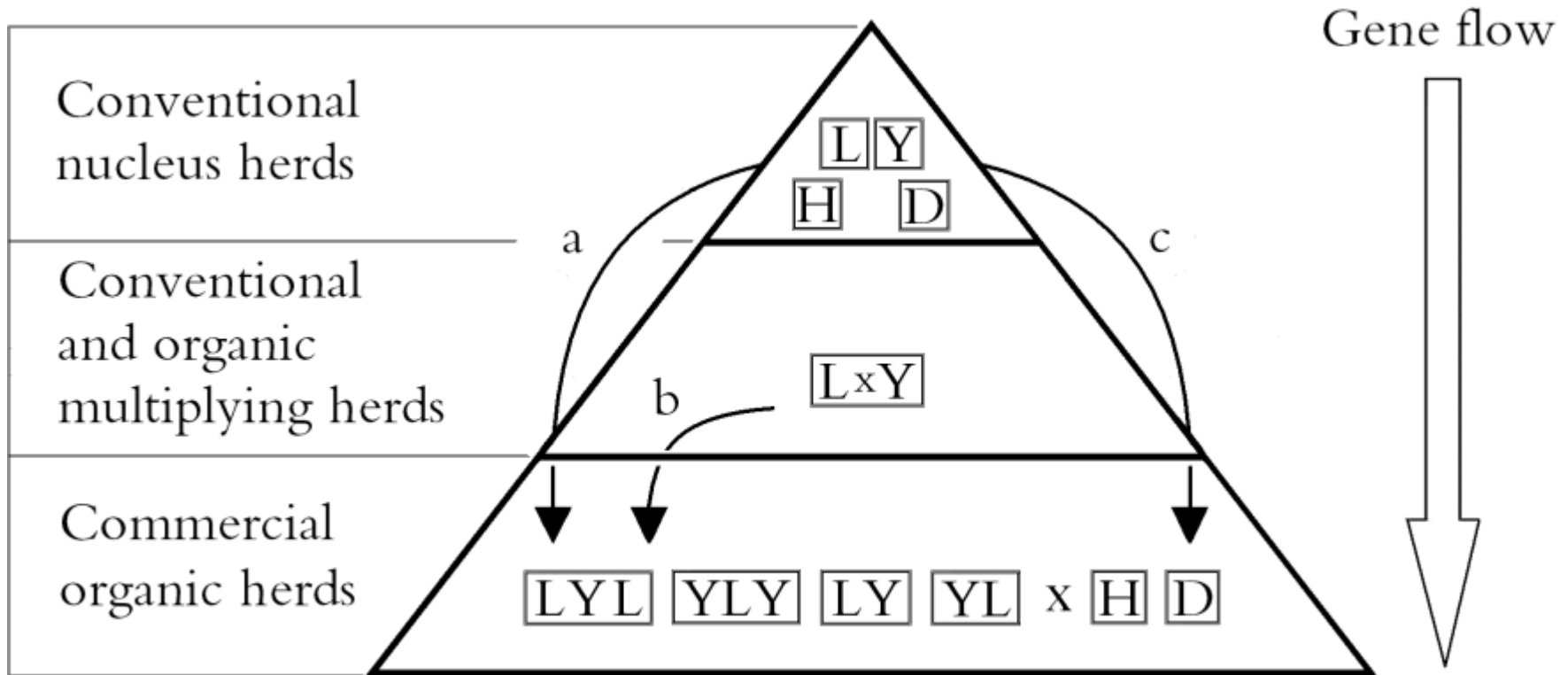
There are weak GxE interactions for growth rate and backfat thickness in organic and conventional production environments

GxE -paper

Implications

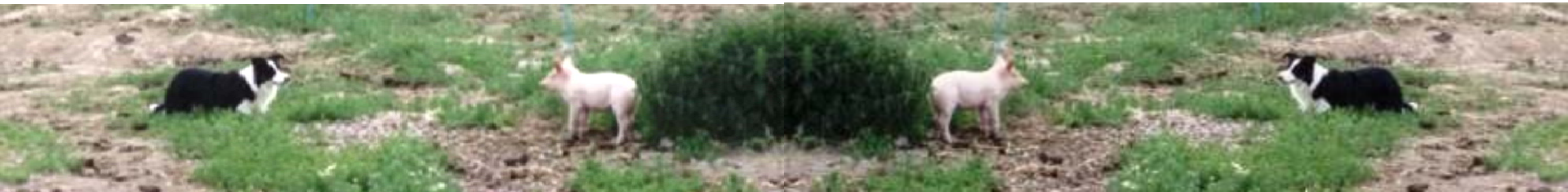
- No strong GxE interactions => no separate organic breeding program needed
- Further research of the relative importance of different traits in organic production is needed. Different economic weights?
- Organic breeding index within conventional breeding program

Future breeding strategies for organic pig production?



Recommendations to organic piglet producers

- Select dams for the replacement gilts based on careful documentation of sow performance and behaviour during the different stages of lactation
- Select sires for the replacement gilts on the basis of their breeding values for specific traits complementary to the dam's traits
- Select sires for the growing/finishing pigs according to their breeding values for the specific traits important in your herd



Further steps

- Farmers (and other stakeholders) preferences for traits important in organic production
- GxE interactions for these traits between different production environments (not necessarily certified org./conv.)
- Market and non-market values
- Organic breeding index?

Thank you for your attention!

