Breeding pigs for the pig production systems of the future

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Topigs Norsvin and Norsvin: Has to breed for pigs that can produce well in all production environments – included Norway
Criteria for sustainable breeding

- Selection for several traits simultaneously ensures balanced biology of the animal

- Selection in a long term society perspective better ensures a balanced biology of the animal

- The recording of traits in the field ensures the adaptation of genetics to the production environment

- The effective population size must be large enough to ensure a sustainable genetic development

- Take into account the biological limitations in traits and non-linear relationships between traits
Breeding goal – to prepare us for the future?

### Key traits and genetic progress

<table>
<thead>
<tr>
<th>Trait</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litter size</td>
<td>28%</td>
</tr>
<tr>
<td>Carcass value</td>
<td>7%</td>
</tr>
<tr>
<td>Meat quality</td>
<td>5%</td>
</tr>
<tr>
<td>Finisher efficiency</td>
<td>12%</td>
</tr>
<tr>
<td>Easy in use</td>
<td>16%</td>
</tr>
<tr>
<td>Robustness</td>
<td>36%</td>
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</tbody>
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<tr>
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<tbody>
<tr>
<td>Litter size</td>
<td>10%</td>
</tr>
<tr>
<td>Carcass value</td>
<td>8%</td>
</tr>
<tr>
<td>Meat quality</td>
<td>1%</td>
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<tr>
<td>Finisher efficiency</td>
<td>43%</td>
</tr>
<tr>
<td>Easy in use</td>
<td>20%</td>
</tr>
<tr>
<td>Robustness</td>
<td>18%</td>
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</table>
What are the production systems of the future?

- In Europe? ~ 20% of the pigs
- In Asia? >60% of the pigs
- In Americas? ~20% of the pigs
- In Africa? ~5% of the pigs
Future of Asian pig production?

- Farm size:
  - Less backyard production
  - More industrialised
  - Larger farms – eg 7 floors with a total of 7500 sows in each «tower»

- Environment
  - Compared to Western Europa: less focus on animal welfare
  - Larger finisher groups

- Less influence of NGO?
Future of European Pig production?

- Farm size:
  - Will increase

- Environment:
  - Consumers awareness toward animal welfare is increasing
    - Castration
    - Tail docking
    - Free farrowing
    - Free ranging gestation
    - Larger finisher groups
Welfare and robustness: R&D and operational

- Social interactions & welfare
- Longevity
- Heat stress + day length
- Disease resistance & tolerance
- Defects
- Piglet survival
- General robustness
- Conformation
- Osteochondrosis

Operational: R & D
The recording of traits in the field ensures the adaptation of genetics to the production environment.

We need phenotypes that are

- Accurate
- Objective
- Cost effective
- High in number
- From all types of environments
Phenotypes measured on boars: Osteochondrosis
Phenotypes measured on sows: Shoulder ulcer

- Measured on the sow at weaning of first litter (SUW)
  - Measured by the farmer, N=41191
- Measuring scale:
  0: Intact skin (no ulceration)
  1: Ulcer limited to epidermis
  2: Ulcer also involving dermis
  3: Ulcer that includes the subcutaneous tissue
  4: Ulcer that exposes the bone tissue
6. General robustness

Breeding for pigs that have higher resistance, tolerance and robustness to a variety of challenges

Diseases, Heat stress, Seasonal variation, Care taker (labor) ...

Topigs Norsvin
Piglet mortality per litter (pre-birth & lactation)  
Landrace sows in nucleus & multiplier
Shoulder ulcer at weaning
Landrace sows in nucleus & multiplier

YEAR OF BIRTH, SOW

POINTS, SHOULDER ULCER

Genetic trend
Phenotypic trend
Are we set for the future?

• Breeding goal will be expanded
  – Social interactions?
• Must develop better ways to gather phenotypes
  – Lisette will present tomorrow