Joint Bachelor Course on Organic Agriculture 2014

Organic Animal Husbandry (3):
Organic Pigs

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Organic Pigs: Figures

- 2011: 0.9 million organic pigs
- largest producers:
  1. Germany (173,138 heads),
  2. Denmark (171,229 heads),
  3. France (165,518 heads).
- organic pig sector still holds very minor share in the EU pig market: it is much more important in the EU-15 (0.6% of the sector) than in the EU-N12 (0.1% of the sector)

(Source: European Union (2013))
Standards

- Organic standards require animals to be kept with outdoor access.
- Outdoor runs in European countries vary:
  - From concrete and slatted floors to deep litter and open to fully covered by a roof.
  - Private regulations define even stricter rules, e.g. Soil Association (UK): organic pigs to be kept on pasture.

Foto: C. Simantke in Früh (2011)
Principles of organic pig farming

- Prevention through best practice: How is it done?
  - regulation recommends use of traditional breeds, adapted to local conditions
  - meet the animal’s natural requirements with regard to:
    - Social behaviour
    - Feeding
    - Locomotion
    - Comfort behaviour etc.
- In case animals get ill, cure them in order to avoid suffering (alternative therapies with proofed efficiency are first choice)
Breeds used in organic farming in Europe

- Regulation recommends use of traditional breeds, adapted to local conditions.
- Problems with these breeds:
  - often less productive
  - give progeny with poorer feed efficiency
  - Accumulate more fat (lower % of lean meat)
- Incentive to use the higher yielding breeds as in conventional farming.

### Breeds used in organic farms

<table>
<thead>
<tr>
<th>Country</th>
<th>Breeds used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria, Switzerland</td>
<td>Mostly conventional breeds used; sow: Large White x Landrace; boar: Pietrain (in Austria), Large White (in Switzerland); few exceptions using Duroc, Schwäbisch Hällisch or crosses of both</td>
</tr>
<tr>
<td>Denmark</td>
<td>Mostly conventional breeds; sow: Danish Landrace x Yorkshire, boar: Duroc</td>
</tr>
<tr>
<td>Germany, France</td>
<td>Mostly conventional breeds; Germany: sow: German Landrace x German Large White; boar: Pietrain or Hampshire x Duroc; France: sow: Large White x Landrace, boar: Pietrain</td>
</tr>
<tr>
<td>Italy</td>
<td>50 % conventional breeds; sow: Large White, Landrace and Duroc (and hybrids), 50 % local breeds like Mora Romagnola and Cinta Senese</td>
</tr>
<tr>
<td>Sweden</td>
<td>Mostly conventional breeds; sow: Swedish Landrace x Yorkshire, boar: Duroc or Hampshire</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Small farms often use traditional breeds. Large farms generally use special outdoor lines that were developed for the conventional outdoor sector.</td>
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</tbody>
</table>

Früh (2011)
Origin

- Natural habitat of wild boars: forest

Requirements resulting from origin:
- cover
- feeding and resting areas
- need to wallow

Consequences:
- provision of different activity areas
- facilitate climatic stimulus
Social behaviour

Characteristics:
› wild sows live in family groups
› high synchronicity of behaviour patterns
› hierarchical social structures

Consequences:
› group housing
› keep sows in family groups
› well structured pens
› enough space
Sexual Behaviour

Characteristics:
› marked mating behaviour
› synchronised suckling and oestrus

Consequences:
› natural mating
› keep bores near to sows in order to stimulate oestrus

Foto: M. Holinger, 2012
Mother-offspring relationship

Characteristics:
- isolated farrowing
- construction of a farrowing nest
- weaning period lasts several weeks

Consequences:
- individual farrowing pens
- no fixation of the sows
- make nest material available (straw)
- weaning at 6 weeks of age at the earliest

Foto: Simantke
Activity pattern

Characteristics:
▷ pigs are diurnal
▷ two peaks of activity: early morning & evening
▷ periods of feeding and rest tend to be synchronised

Consequences:
▷ provision with daylight
▷ feeding pigs at least twice a day
Exploratory behaviour

Characteristics:

▷ pronounced exploratory behaviour → 70% of actively spend daytime

▷ pigs use the discs of their snouts for sniffing, searching and rooting

Consequences:

▷ rich environment

▷ rooting material

Foto: J. Baumgartner
Locomotion behaviour

Characteristics:

› active animals with quick moves (walk, galopp)
› during periods of activity most of the time is spent looking for food

Consequences:

› run area
› wide spaced housing
› outdoor housing
› pasturing
› good quality of floors (sure-footed, abrasion of hooves)
Food intake behaviour

Characteristics:
› pigs are omnivores
› pronounced search and rooting for food (70% of the active time)
› food competitors
› Sucking water intake

Consequences:
› provision of roughage and materials with high occupational value
› several feeding events per day
› separate and spacious feeding places
› provision of bowl drinkers

Foto: M. Holinger, 2013
Resting behaviour

Characteristics

- approx. 80% of 24 hours
- resting period is synchronised
- main resting time: at midday & at night
- lying position depends on weather conditions: cold → huddling, nest construction
  warm/hot → lying in the shadow
- protected place

Consequences

- enough space
- structured pens
- provision of bedding material
Excretion behaviour

Requirement

➢ pigs have natural habit of defecating always in the same area, they separate excretion from lying areas

Consequences

➢ establish separated excretion and lying areas
➢ Try to avoid wet area near drinking water (incentive to defecate)
Comfort behaviour

Characteristics

- need to scrub
- pigs have very few sweet glands (only at the tip of the snout), no thick hair cover and fat deposition for insulation

Consequences

- provide installations where pigs can scrub (e.g. brushes, trees)
- warm weather: provision of pig wallows
- cold weather: group keeping so that pigs can huddle to keep warm, provide straw/huts

Foto: J. Baumgartner
Husbandry systems for organic pigs

- Three major organic pig husbandry systems
  1. Indoor housing
  2. Outdoor housing
  3. Mixed housing

Factors determining the husbandry system

1. Organic standards
   - EU Regulation
   - Private national regulations
2. Animals
   - Expression of natural behaviour
   - Health
3. Farmer
   - Economy
   - Work schedule
   - Investment costs
4. Environment
   - Risk of nutrient leaching
5. Climate
   - Precipitations
   - Snow
   - (Cold) Winter temperatures
6. Consumer expectations
   - Meat quality
   - Taste
   - Animal welfare
7. Soil and land
   - Available land surface
   - Soil properties (soil structure)

Früh et al. 2011
Indoor housing

- Pigs housed mainly indoors with access to a concrete outside run (e.g. Austria, Germany, Switzerland)
- wide range of barn types: from heated building with artificial ventilation to uninsulated barns with open front

**Challenges:**
- provision of a pen that allows sows and piglets to express natural behaviour
- provision of individual temperatured zones for sows, piglets, weaners and fatteners depending on their individual requirement

Foto: https://www.uni-hohenheim.de/uploads/pics/Neuer_Sauenstall_Liegeberchie__9__1824x1368.jpg
Indoor housing: Pros and Cons

**Advantages**
- suited for areas with harsh climatic conditions in winter
- moderate land need
- efficient monitoring of animals possible
- little negative environmental effect from manure (if distributed properly)

**Disadvantages**
- high costs (building, energy, equipment)
- does not satisfy consumer expectations of organic
- restricts natural animal behaviour
- high animal density increases risk of disease infections
- limited production flexibility concerning amount of sows and fatteners that can be kept
- high requirements on hygiene management due to pigs of different ages
- oral iron preparations or injections for piglets shortly after birth to prevent anaemia
Outdoor Housing

- sows housed outdoors all year round with huts or natural shelter (e.g. Denmark, Italy, UK)
- mixed with: weaning and fattening pigs are kept inside

Challenges:
- organisation of pasture rotation to maintain vegetation cover
- ensure biosecurity
- identify and treat health problems
- organise in a way to keep work load low

Outdoor housing systems allow pigs to express their natural behaviour at comparatively low investment costs.

Foto: B. Früh in Früh (2011)
Outdoor housing: Pros and Cons

Advantages
› little or no building costs
› meets consumer expectations
› better expressions of natural animal behaviour possible with positive effect on health & welfare
› low animal density and good air quality possible positive health effect
› access to natural light
› efficient use of manure if husbandry integrated into crop rotation
› vegetation and soil provide significant quantity of minerals & vitamins to the animals (especially iron for piglets!)

Disadvantages
› risk of nitrogen leaching due to excessive stocking density of 15 sows/ ha *a on outdoor areas
› management logistics during cold and wet climates can be laborious
› reduced biosecurity (contact to wildlife disease reservoirs and to soil with potential risk to take in parasites)
› greater difficulty to identify and treat sick animals
› supervision around birth is more challenging when lactating sows are outdoors
› young piglets may be subject to predation by ravens, foxes or even badgers

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# Performance of conventional indoor and outdoor breeding herding in the UK

<table>
<thead>
<tr>
<th></th>
<th>Outdoor</th>
<th>Indoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sow mortality (%)</td>
<td>3.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Replacement rate (%)</td>
<td>45.8</td>
<td>47.7</td>
</tr>
<tr>
<td>Conception rate (%)</td>
<td>82.2</td>
<td>81.6</td>
</tr>
<tr>
<td>Litters per sow and year</td>
<td>2.19</td>
<td>2.25</td>
</tr>
<tr>
<td>Liveborn piglets per litter</td>
<td>10.9</td>
<td>11.4</td>
</tr>
<tr>
<td>Stillborn piglets per litter</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Morality of piglets born alive (%)</td>
<td>12.3</td>
<td>13.0</td>
</tr>
<tr>
<td>Pigs weaned/sow*a</td>
<td>20.9</td>
<td>22.4</td>
</tr>
</tbody>
</table>

**Outdoor:**

- Slightly better health → reflected by mortality and replacement rate
- Poorer reproductive performance → reflected by litters/sow*a, litter size (but not conception rate)
- Farrowing & post farrowing disorders might be slightly reduced → reflected by stillborn piglets, piglets survival to weaning, although the latter might also reflect the difference in initial litter size

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BPEX, 2008
Mixed Housing Systems

- combination of indoor & outdoor housing systems (e.g. France, Sweden)
- allow to combine advantages of both systems
- practicability depends on:
  - climatic conditions
  - historic development
  - farm specific conditions

Sows:
- on pasture during pregnancy or group suckling
- indoors in individual pens for forrowing and within 10 days are moved to group pen in a barn or group on pasture with huts

Weaners and fatteners:
- usually kept in barn in large group pens with concrete outdoor run
- in summer: access to a pasture or moved to huts on pasture
Mixed housing systems: Pros and Cons

**Advantages**

› indoor farrowing facilitates supervision on newborn piglets and sows around farrowing

› moving sows and piglets in group pens (outdoor) within 10 days pp → stimulus for the sow and cooler environment = feed intake↑→ beneficial for milk production

› keeping pigs in huts during summer has hygienic advantages, as it makes it easier to clean the barn and keep pens empty for some weeks

**Disadvantages**

› moving sows from outdoor to an indoor farrowing pen may create climatic stress for the sow

› lactating sows in groups require mobile facilities to feed them individually
Summary Pigs

Organic pig production represents a minor part of the whole pig production.

Germany and Denmark have the highest number of organic pigs.

Production features vary greatly between countries in the EU.

Most striking difference to be found in the housing systems:
- UK: organic pigs can be outdoors on pasture for their whole life
- Germany: most organic pigs are always indoors with access to an outdoor run

Organic pig farming aims at meeting the wide range of natural requirements of the animals, e.g. with regard to their activity pattern, social behaviour, comfort behaviour etc.
Literature

Acknowledgement

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