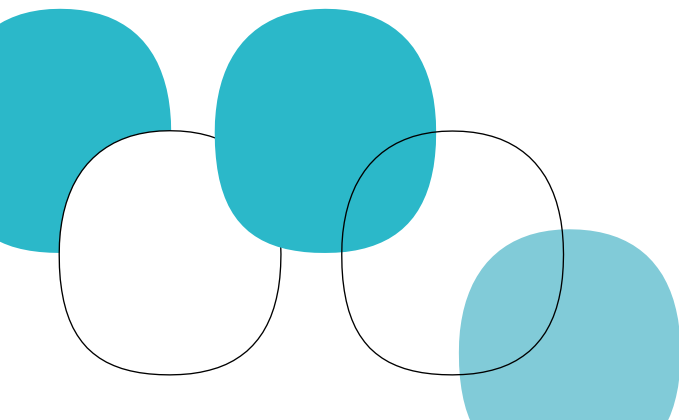




Göttingen Minipigs & Veterinary Management

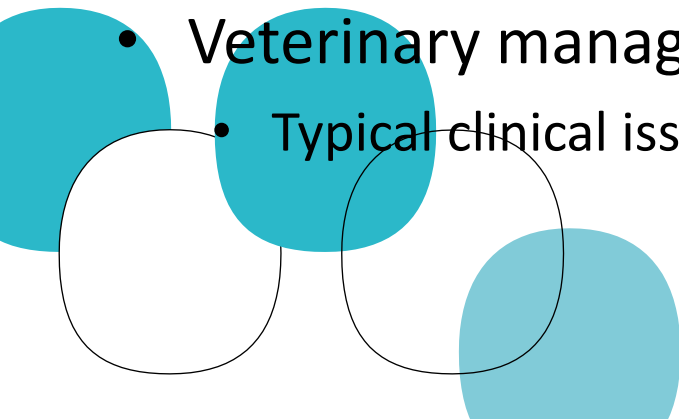
Göttingen Minipigs WebAcademy 04-03-2024



Maja Ramløse, DVM
Principal Laboratory Animal Veterinarian
mra@minipigs.dk

Agenda

- Biology of the (mini)pig
- Animal welfare
 - Acclimatisation + socialisation
 - Behavioural management
 - Habituation and training
- Veterinary management
 - Typical clinical issues

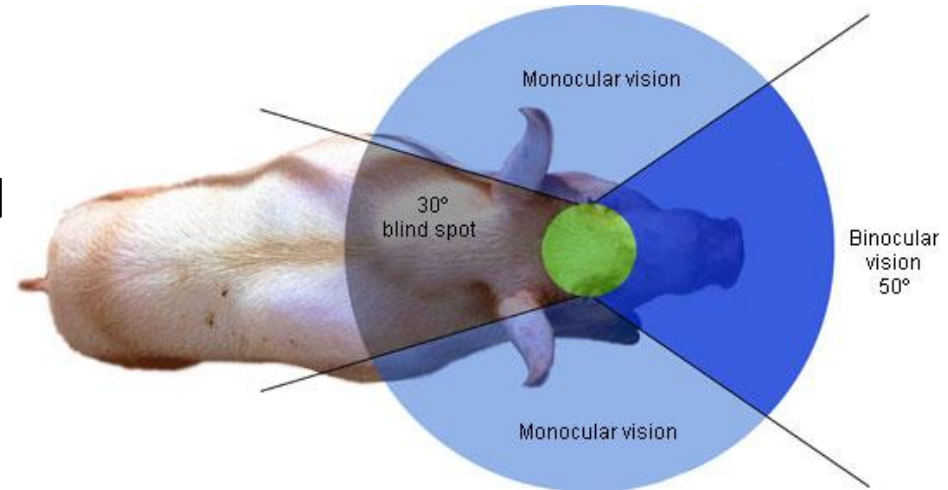


Biology of the (mini)pig



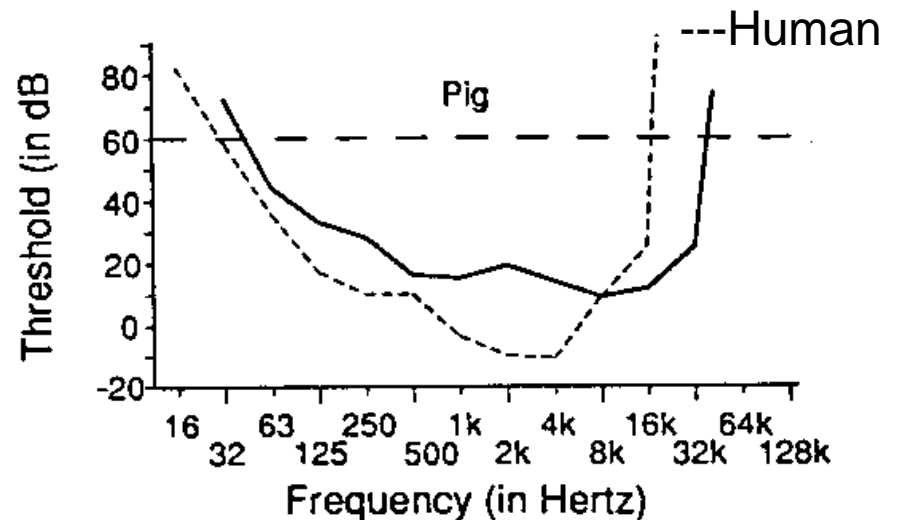
Senses

- Visual
 - Large panoramic vision, monocular vision prioritised

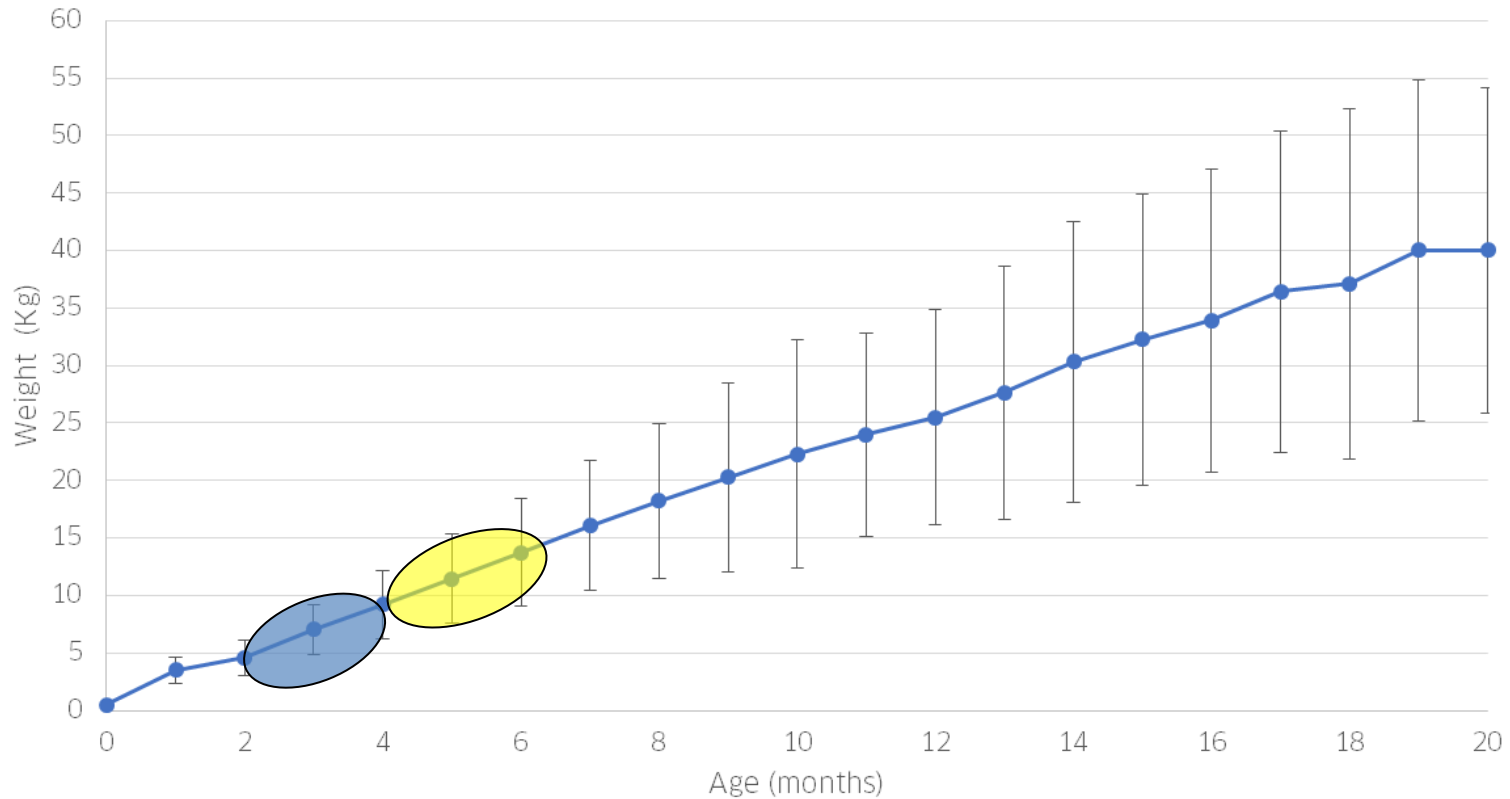


- Olfactory
 - Very sensitive
 - Pheromones

- Auditory
 - Good hearing
 - 42Hz-40.5kHz (250hZ-16kHz)



Growth rate and reproduction



- Sexual maturity

- Males: 2-4mths



- Females: 4-6,5mths



- Estrous cycle: 21 days

- Gestation: avr. 115days

Breed traits

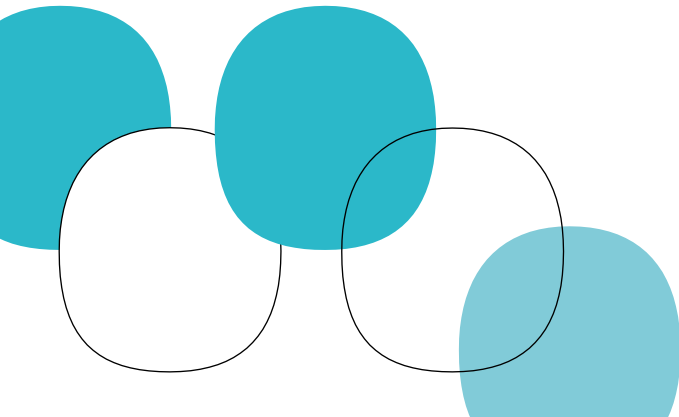
- Shy
- Curious
- Social
- Clever
- Greedy



General behaviour

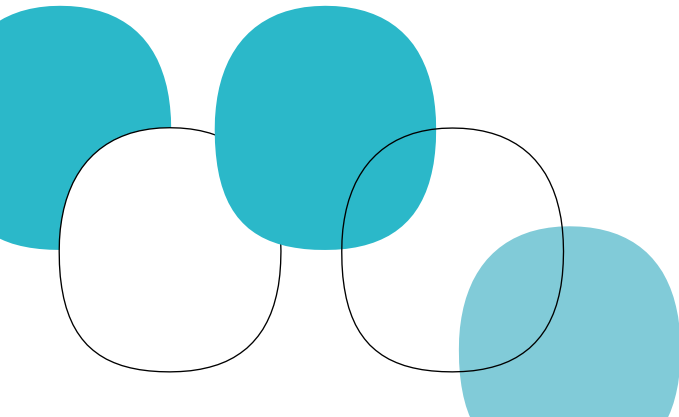
- Not strongly territorial
- Dedicated areas for rest, urination/defecation
- Thermoregulation through behaviour

Behaviour similar to other *Suidae*

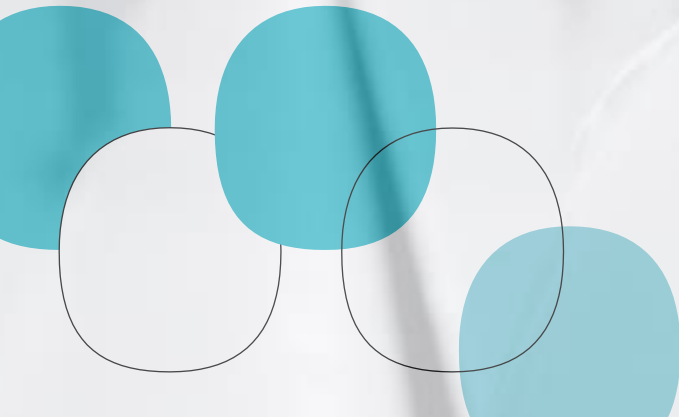


Behaviour priorities

- Food and feeding
- Nest building behaviour
- Rooting material
- Companionship

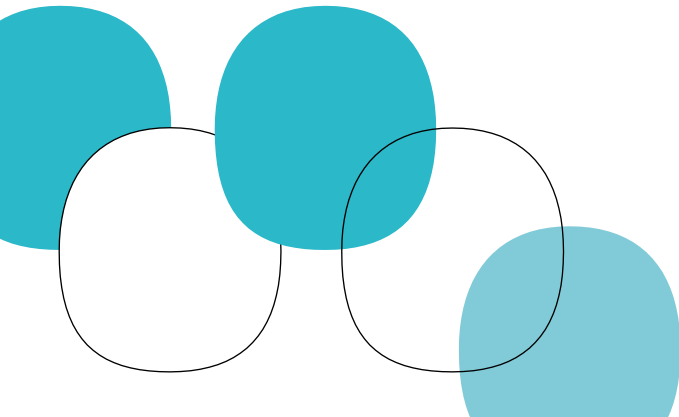


Animal Welfare



Animal Welfare

- What
- How
 - Acclimatisation
 - Socialisation
 - Behavioural management
 - Habituation and training

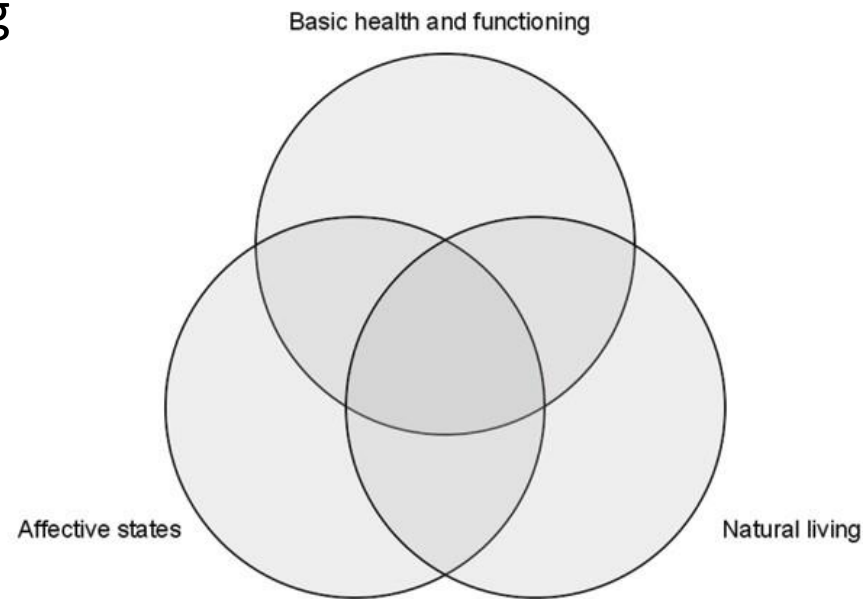


Animal Welfare= the physical and mental state of an animal in relation to the conditions in which it lives and dies (WOAH)

Prof. Fraser 2008 "Understanding Animal Welfare"

- Health and biological functioning
- Natural living
- Affective state

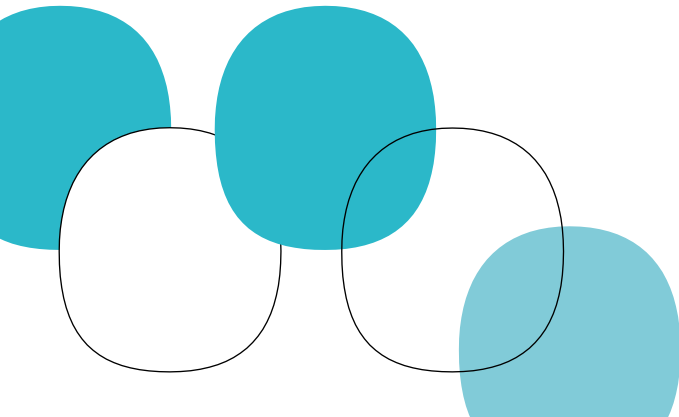
- LAS principles: 3R



Fraser (2008), Understanding animal welfare

Animal Welfare

- What
- How
 - Acclimatisation
 - Socialisation
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Acclimatisation

- Many purposes: homeostasis, habituation, establishing trust etc.
- First impressions matter and every interaction counts
- Remember-each pig is unique
- Systematization is recommendable

Table 1 Immunological responses to transport in agricultural animals

| Species | Immunological change | Reference (see text) |
|---------|--|-----------------------|
| Cattle | ↓ Percentage of lymphocyte | Kent and Ewbank 1983 |
| | ↑ Percentage of neutrophil | Tarrant et al. 1992 |
| | ↑ Neutrophil:lymphocyte ratio | Schaefer et al. 1997 |
| | | Kegley et al. 1997 |
| Goats | ↓ Percentage of lymphocyte | Murata et al. 1985 |
| | ↑ Percentage of neutrophil | Phillips et al. 1989 |
| | ↑ Neutrophil:lymphocyte ratio | Kannan et al. 2000 |
| Horses | ↑ Neutrophil:lymphocyte ratio | Stull and Rodiek 2000 |
| | ↑ White blood cell count during transport | |
| Swine | ↓ White blood cell and neutrophil counts | Dalin et al. 1993 |
| | ↓ Percentage of lymphocyte | McGlone et al. 1993 |
| | ↑ Percentage of neutrophil | |
| | ↑ Neutrophil:lymphocyte ratio | |
| | ↑ White blood cell and neutrophil counts (during transportation) | |

Obernier and Baldwin (2006) *Establishing an Appropriate Period of Acclimatization Following Transportation of Laboratory Animals*

Acclimatisation

- put it in system

Step 1 (Day 0): The new arrivals are left for a 2-5 h to settle; the technicians have minimal interaction with the new arrivals as they tend to be nervous.

Step 2 (Days 0-5): The technicians approach the pen with a food reward (diet/apples) and wait until the pigs come to them for the reward. Food reward must be used with caution. Once the Minipigs take their reward, technicians may enter the pen and let them get closer. Next step is to start touching the pigs to accustom them to physical contact with humans.

Step 3 (Days 2-8): The pigs are trained to be handled by picking them up; this is carried out in the pen and performed a couple of times a day – this gets the pig used to human interaction, touch and being handled. Each time the pig is handled it should be given a verbal and/or patting reward, and can, after a full pick up, be trained to walk up and down the stairs and onto a balance in the procedure room. A verbal reward is given when the pig is picked up.

Zeltner (2021, Technical Guide)

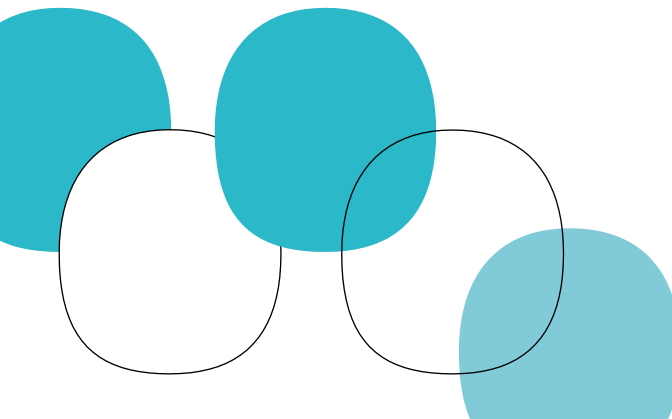
Socializing Minipigs during Acclimation **Week No.:**

Study No.: _____ Room No.: _____ Study start: _____

| Pig No. | Touching | Picking up | Behaviour | | In sling | | | | | Walking/Exploring | | | | | Remarks | | | | |
|---------|----------|------------|-----------|----------|----------|---|---|---|---|-------------------|---|---|---|---|---------|---|---|---|---|
| | | | on Arm | In Sling | M | T | W | T | F | S | S | M | T | W | | T | F | S | S |
| | | | | | | | | | | | | | | | | | | | |
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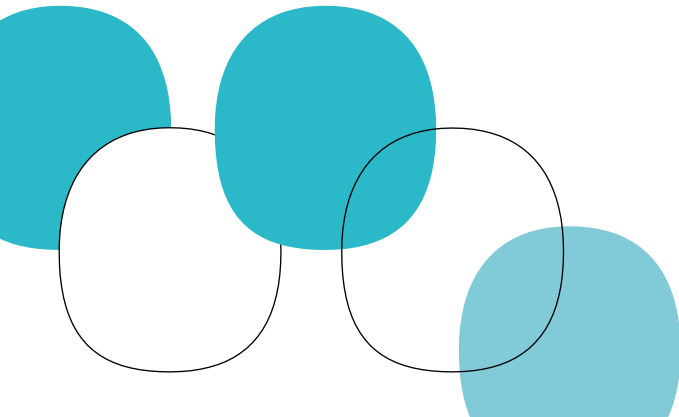
Give marks 1 to 3 every time the animals are in the respective situation!

| | | |
|--|---|---|
| <p>Touching:</p> <ol style="list-style-type: none"> actively looking for contact and likes to be touched and scratched seeking contact, accepts some touching shy, moves away when trying to touch, not seeking contact | <p>Picking up:</p> <ol style="list-style-type: none"> calm no vocalization or struggling short vocalization or some struggling strong vocalization or struggling | <p>Behaviour:</p> <ol style="list-style-type: none"> calm and relaxed during the whole procedure some struggling, but relaxing after a while fighting all the time and trying to get out of the situation. |
|--|---|---|



Animal Welfare

- What
- How
 - Acclimatisation
 - Socialisation
 - Behavioural management
 - Habituation and training



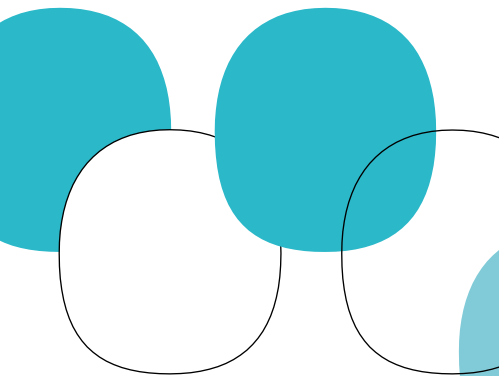
Socialisation



Socialisation

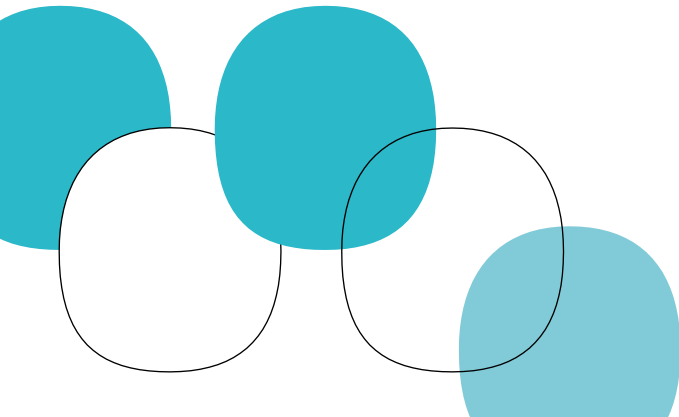
-establishing trust

- As soon as possible
- As often as possible
- Best quality possible

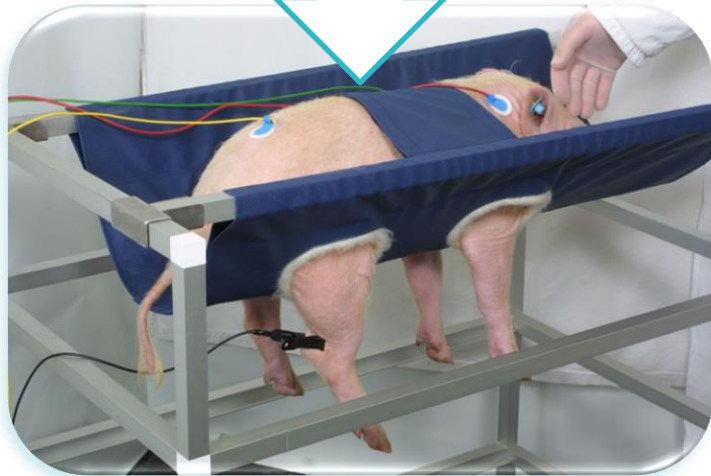


Animal Welfare

- What
- How
 - Acclimatisation
 - Socialisation
 - Behavioural management
 - Habituation and training



Natural behaviour in an un-natural environment



Stimulating natural behaviors



Housing

- social when possible



Housing challenges

- single housed minipigs

- Veterinary or study reasons
- Plan for single housed animals
 - Pen adaptations
 - Contact with conspecifics
 - Extra socialization
- If possible: Involvement of animal welfare officer



Housing challenges

- regrouping minipigs

- Both females and young males
- Tips for successful regrouping
 - Space and barriers
 - Distractions
 - Neutral pen
 - Supervision
 - Pre-acquaint the minipigs



Environmental enrichment

- Appropriate/tailored enrichment
- Rotate toys frequently
- Soiled enrichment is not attractive
- Ensure accessibility
- Evaluate new enrichment*

*<https://www.nc3rs.org.uk/3rs-resources/evaluating-environmental-enrichment>



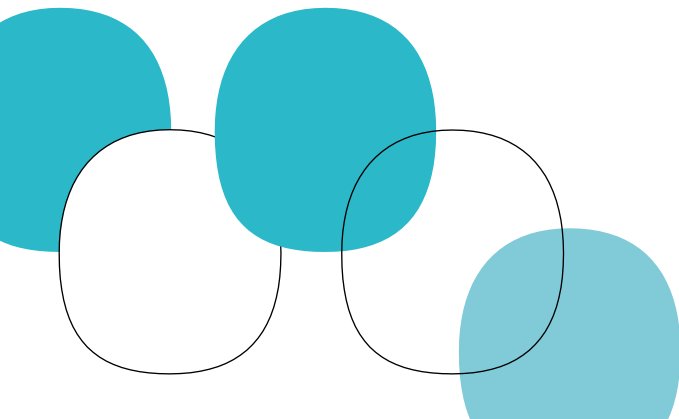
Enrichment example

- ice blocks



Animal Welfare

- What
- How
 - Acclimatisation
 - Socialisation
 - Behavioural management
 - Habituation and training

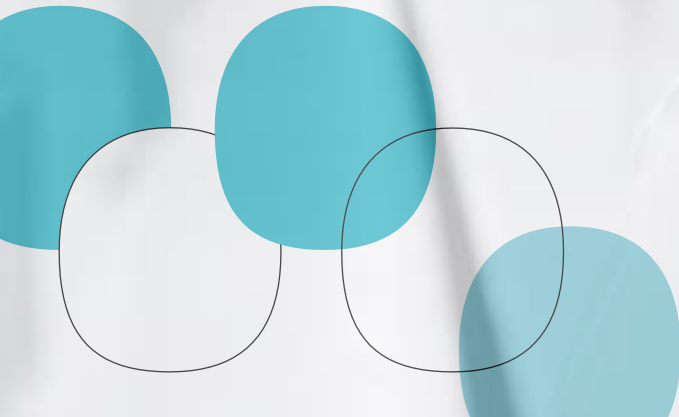


Habituation and training



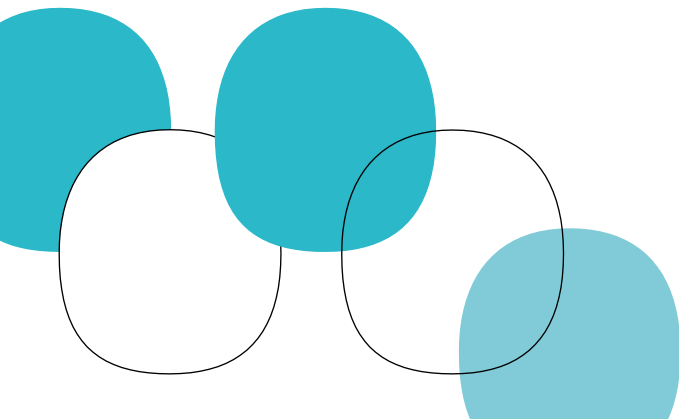
Veterinary Management

Clinical issues



Clinical issues in Göttingen Minipigs

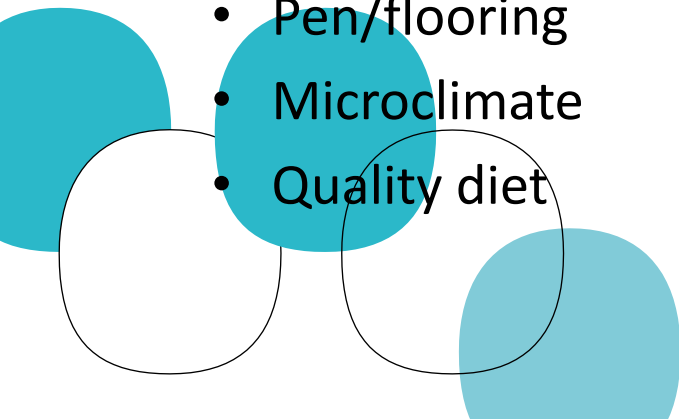
- Skin injuries
- Lameness
- Periorbital crusts
- Dippity Pig
- Gastrointestinal issues



Skin injuries

- background

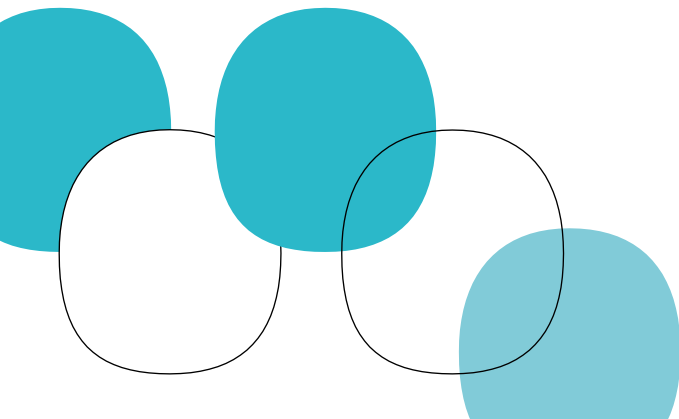
- Causes: Agnostic behaviour, play, sexual, pen deficits, nutrition
- Prevention
 - Stable groups
 - Resources (food, shelter, space, enrichment)
 - Lab setting effects (handling, analgesia etc)
 - Pen/flooring
 - Microclimate
 - Quality diet



Skin injuries

- clinical presentations

- Tail bites
- General abrasions/bruising



Skin injuries

Tail bites

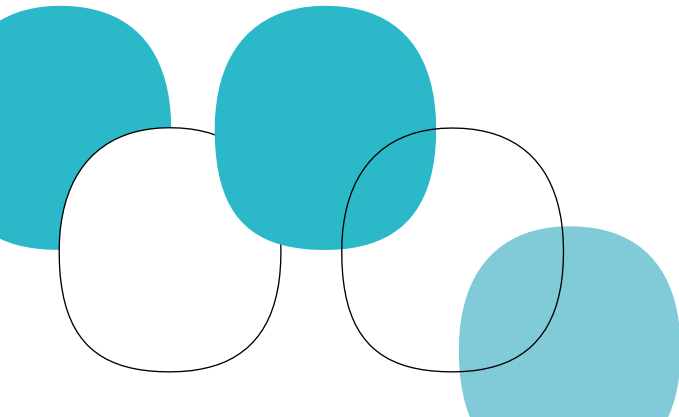
- Management issue!
- Spot problems early
- Action plan
 1. Identify perpetrator
 2. treat victims (depends on severity)
 3. trouble shoot reasons
 4. Take action- Identified causes?
Diversion. Monitoring



Skin injuries

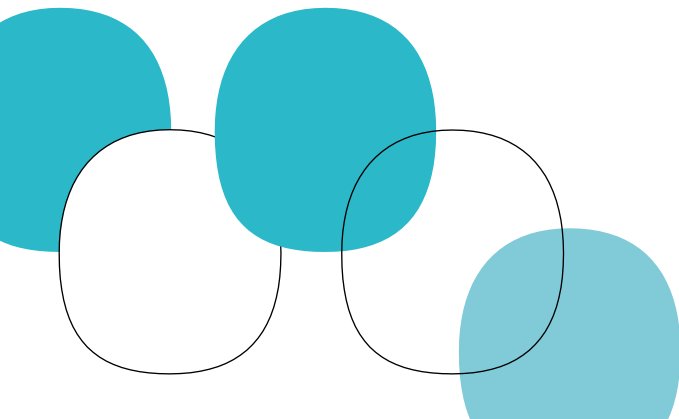
Bruising and abrasions

- Often occurs during fighting, mounting etc
- Most often limited to superficial pyoderma
- Treatment
 - Wound care
 - Medicated shampoo wash
 - (Antibiotics)
 - (Analgesics)



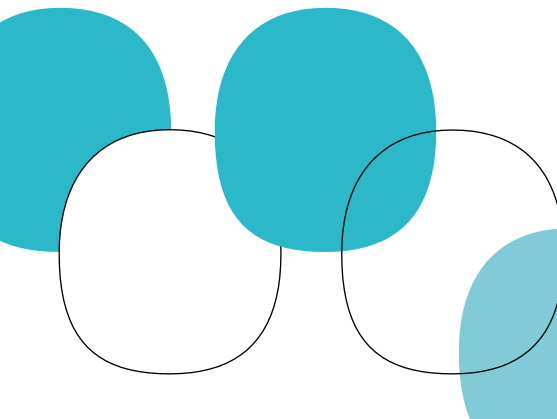
Clinical issues in Göttingen Minipigs

- Skin injuries
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Lameness

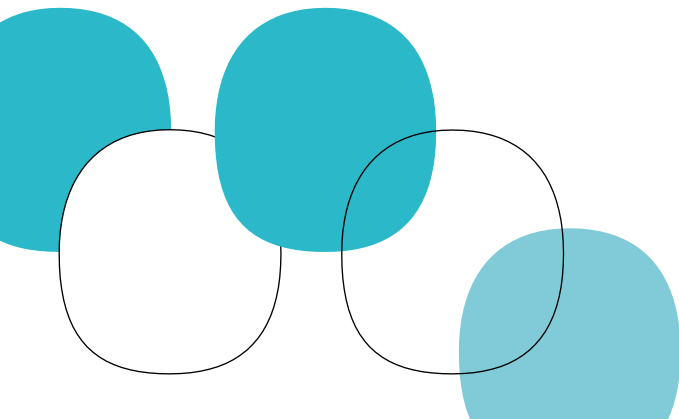
- Many possible etiologies
 - Infectious (e.g. wounds from equipment)
 - Non-infectious (e.g. acute trauma, mechanical)
 - Weight
 - (Nutrition)



Lameness

- treatment

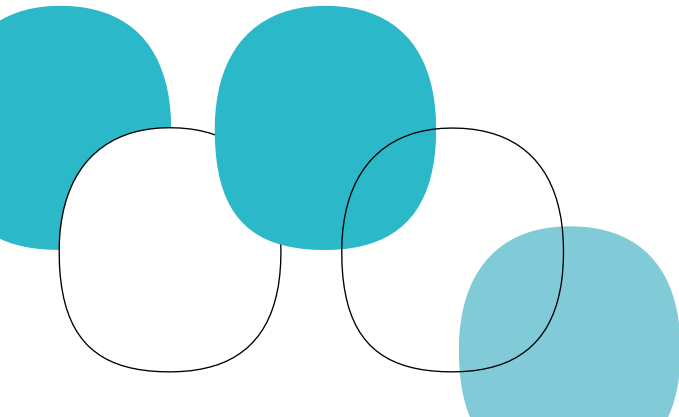
- Depends on ethiology and condition
 - Analgesia
 - Wounds: Clean and dress
 - Infectious cause: Antibiotics
 - Euthanasia
 - (Hospital pen)



Lameness

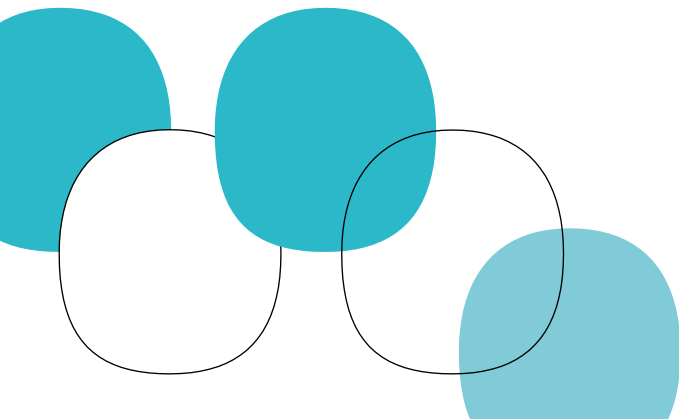
- prevention

- Management
 - Optimal pen design and flooring
 - Handling
 - Avoid skin barrier lesions
 - Weight
 - Hygiene
 - Hoof inspection and trimming



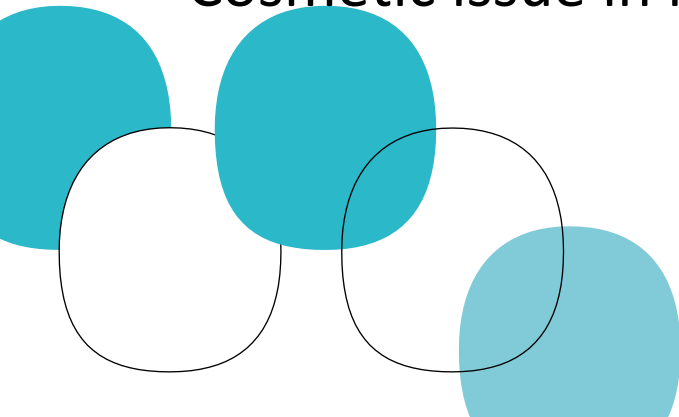
Clinical issues in Göttingen Minipigs

- Skin injuries
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Periorbital crusts

- Fungal overgrowth (Candida) + bacteria
- Etiology partly idiopathic/multifactorial- hormonal, stress, dust
- Primarily older animals
- Cosmetic issue in mild cases



Periorbital crusts

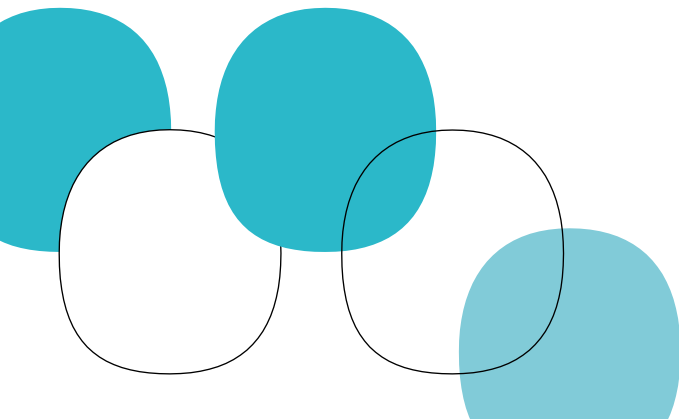
- treatment

- Treatment: Only for severe cases or inflamed skin.
 - Saline
 - Antifungal + antibacterial + steroid suspension
- Treatment effect is often temporary



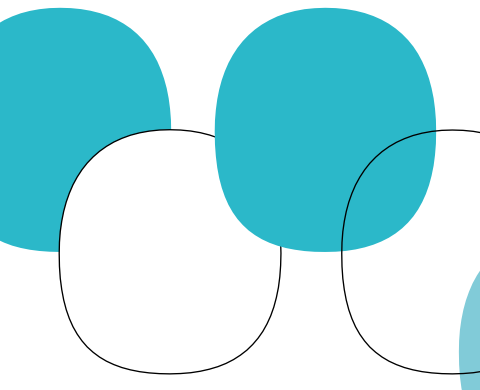
Clinical issues in Göttingen Minipigs

- Skin injuries
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Dippity Pig

- Acute dermatitis
- Characteristic lesions with exudation
- Painful condition → dip in hind legs (=dippity pig), depression, anorexia, "neurological" symptoms



Dippity Pig

- Idiopathic ethiology- multifactorial?
- Self-limiting
- Analgesia!





bioRxiv
THE PREPRINT SERVER FOR BIOLOGY

New Results

 [Follow this preprint](#)

First virological and pathological study of Göttingen Minipigs with Dippity Pig Syndrome (DPS)

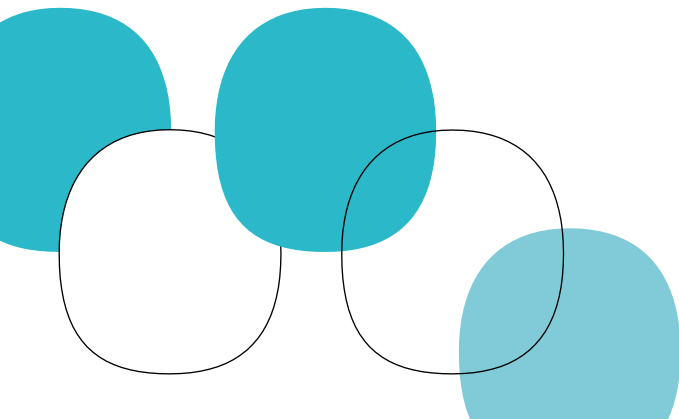
Hina Jhelum,  Nanna Grand, Kirsten Rosenmay Jacobsen, Sabrina Halecker, Michelle Salerno, Robert Prate, Luise Krüger, Yannik Kristiansen, Ludwig Krabben, Lars Möller, Michael Laue,  Benedikt Kaufer, Kari Kaaber, Joachim Denner

doi: <https://doi.org/10.1101/2023.01.26.525667>

This article is a preprint and has not been certified by peer review [what does this mean?].

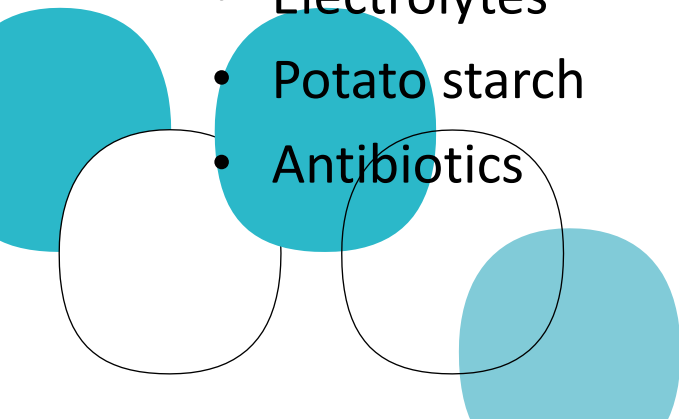
Clinical issues in Göttingen Minipigs

- Skin injuries
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Gastrointestinal issues

- Most often within the first 2 weeks after arrival (diarrhea)
- Causes: New environment + diet
- Prevention and treatment:
 - Biosecurity
 - (Vaccination)
 - Probiotics (Lactobacillus, Acidophilus, Pediococcus)
 - Electrolytes
 - Potato starch
 - Antibiotics



Questions?



Newsletter QR code
mra@minipigs.dk