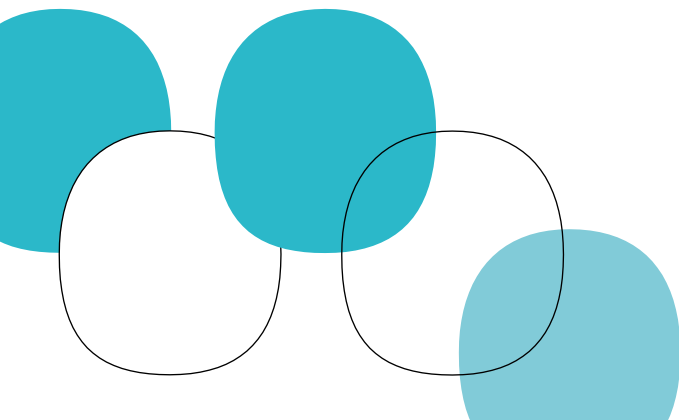




Göttingen Minipigs & Veterinary Management

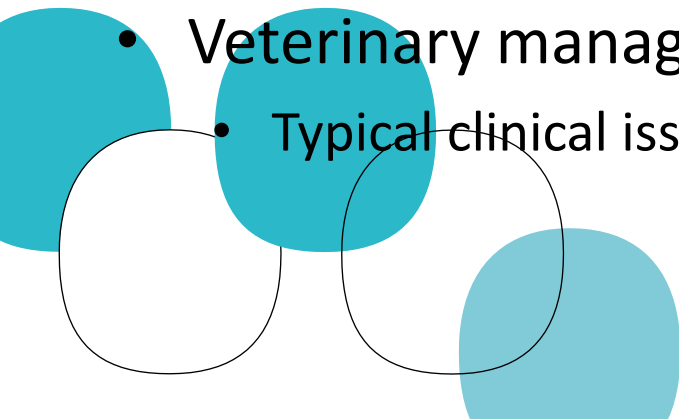
Göttingen Minipigs WebAcademy 07-10-2024



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

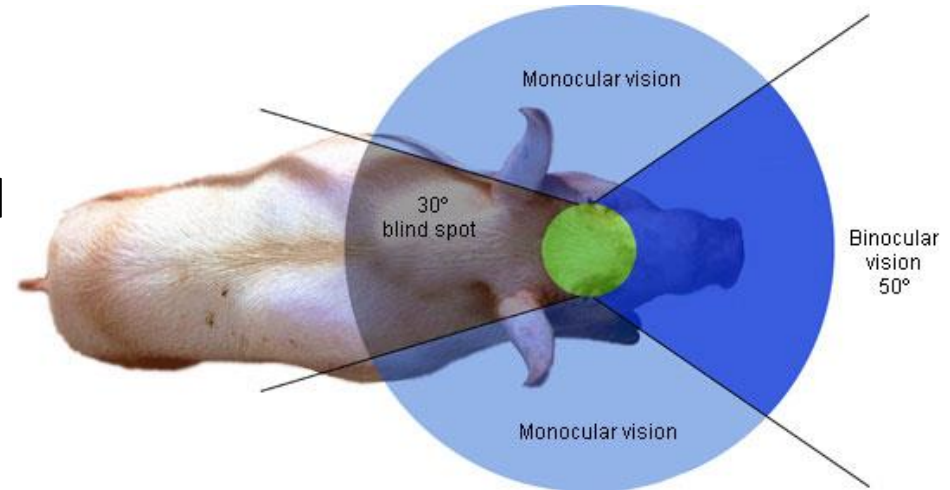


Biology of the (mini)pig



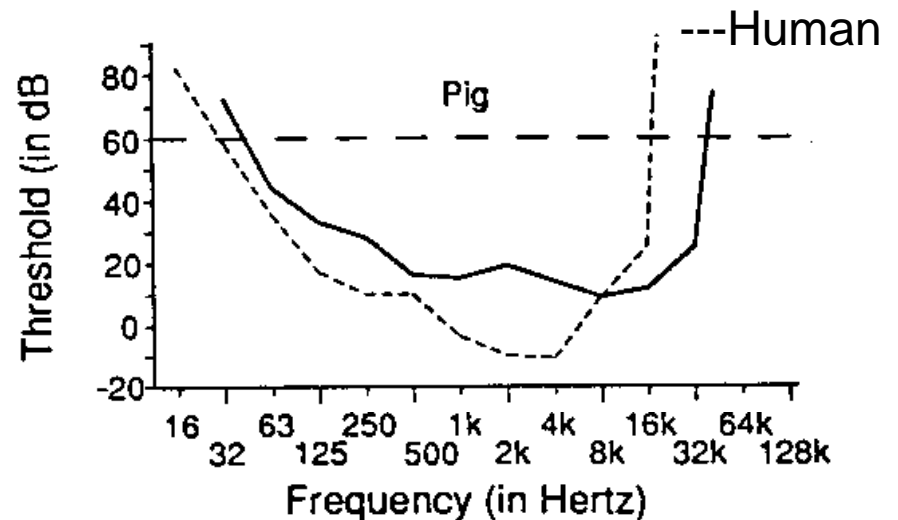
Senses

- Visual
 - Large panoramic vision, monocular vision prioritised

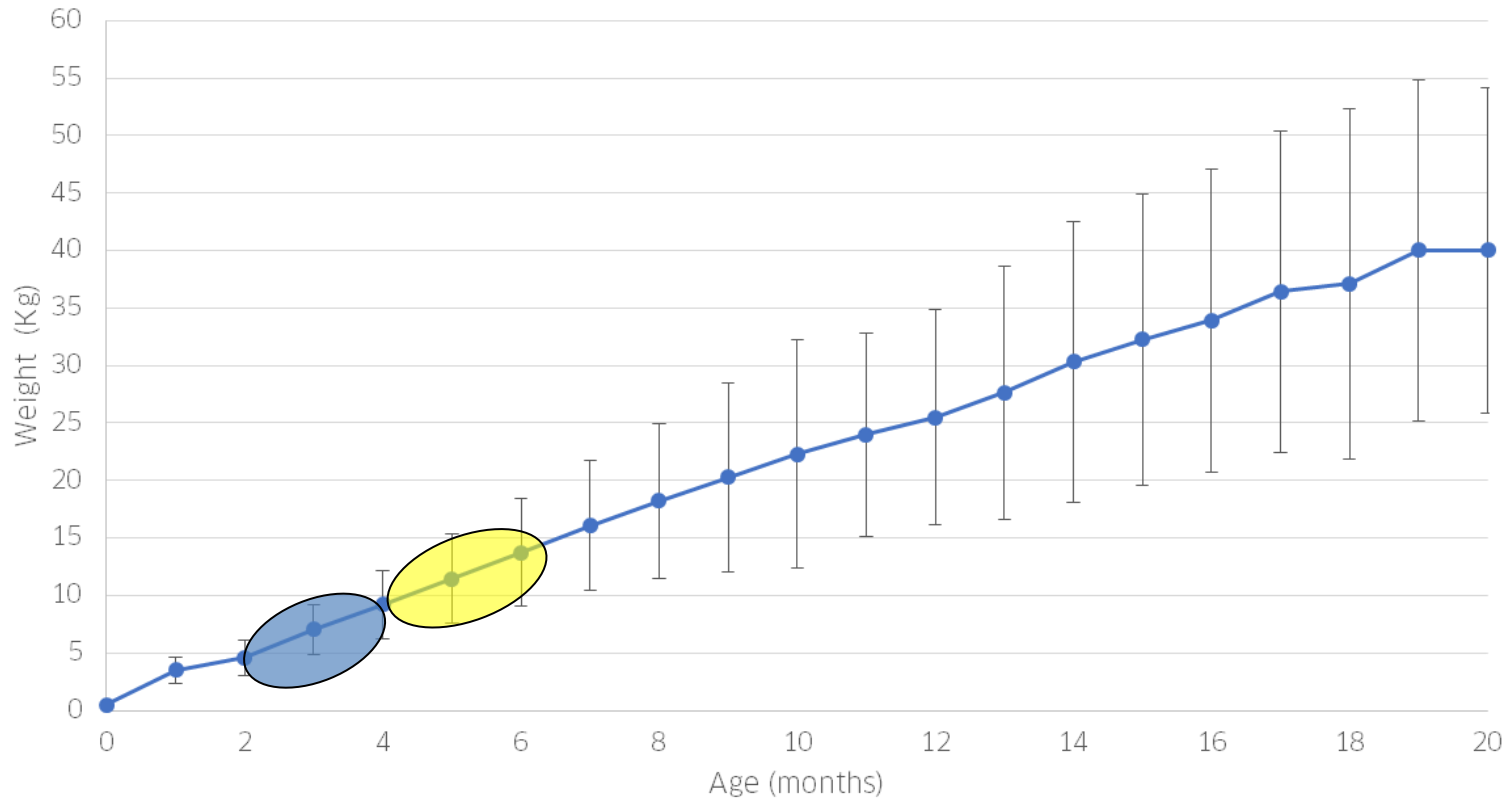


- Olfactory
 - Very sensitive
 - Pheromones

- 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

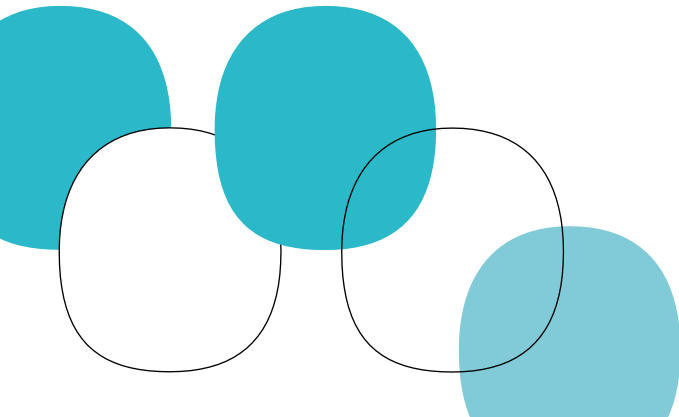
- Shy
- Curious
- Social
- Clever
- Greedy



General behaviour

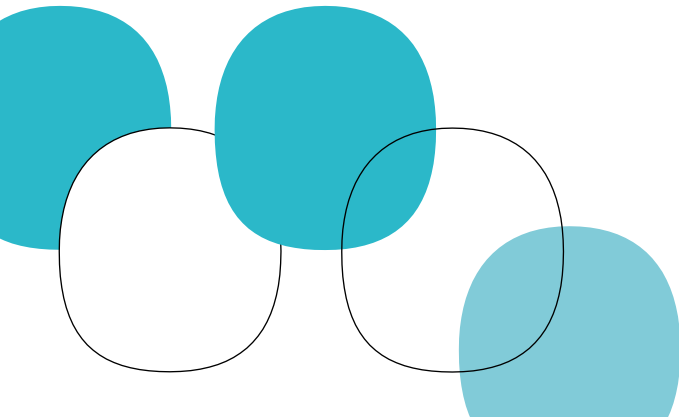
Behaviour similar to other *Suidae*

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

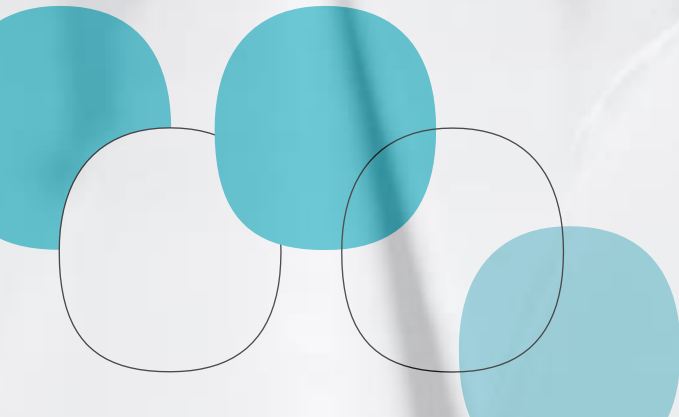


Behaviour priorities

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

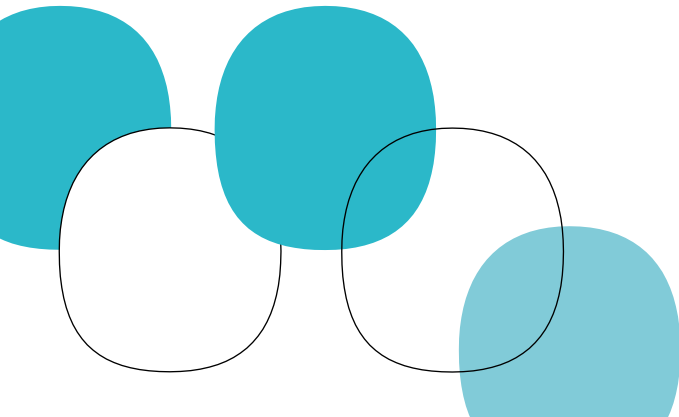


Animal Welfare



Animal Welfare

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

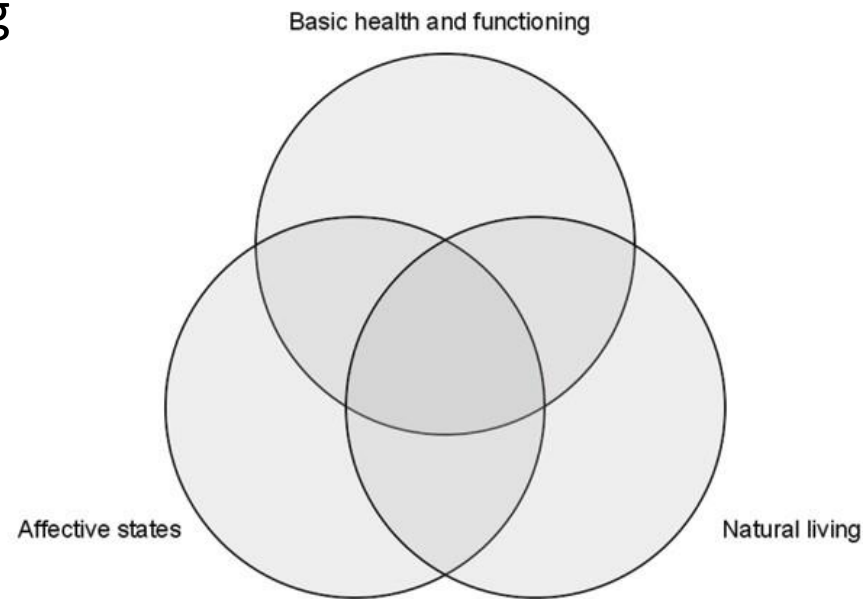


Animal Welfare= the physical and mental state of an animal in relation to the conditions in which it lives and dies (WOAH)

Prof. Fraser 2008 "Understanding Animal Welfare"

- Health and biological functioning
- Natural living
- Affective state

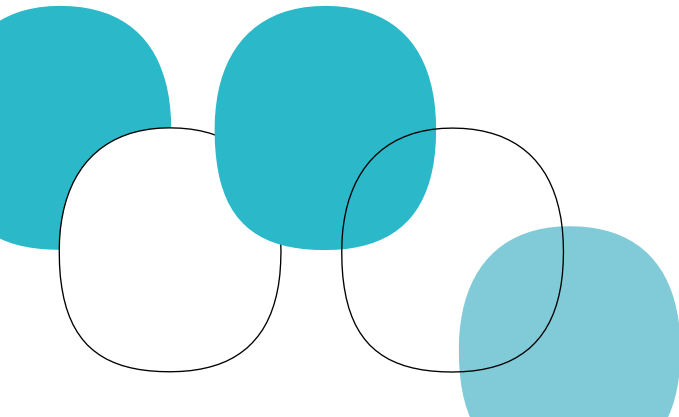
- LAS principles: 3R



Fraser (2008), Understanding animal welfare

Animal Welfare

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



Acclimatisation

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

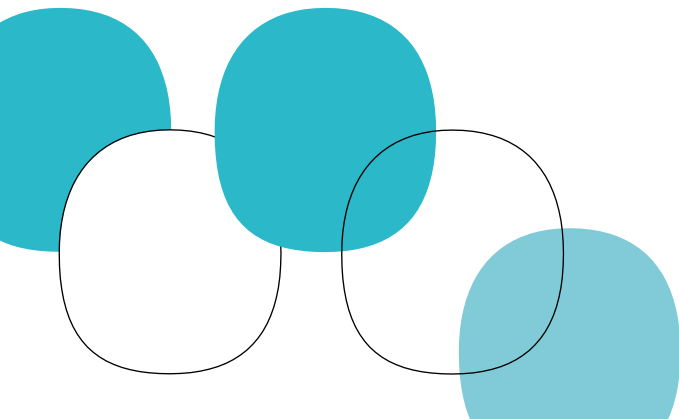
Table 1 Immunological responses to transport in agricultural animals

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*

Animal Welfare

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



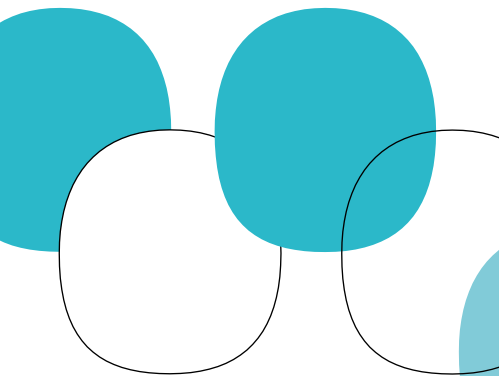
Socialisation



Socialisation

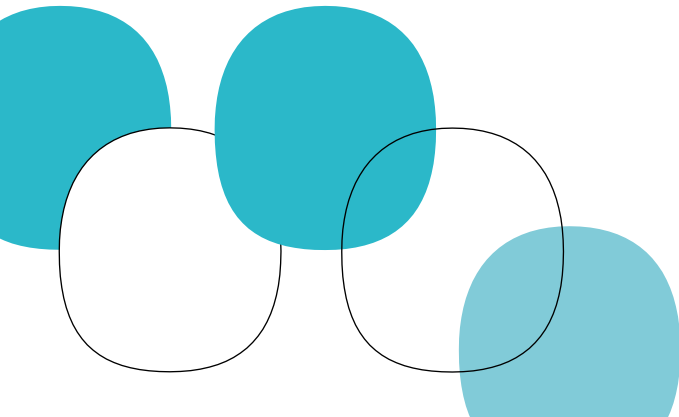
-establishing trust

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

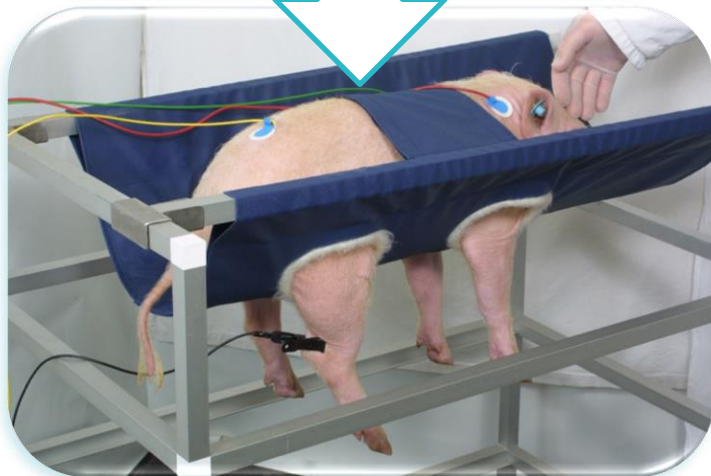


Animal Welfare

- What
- How
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 - Habituation and training



Natural behaviour in an un-natural environment



Stimulating natural behaviors



Social Housing



Housing challenges

- single housed minipigs

- Veterinary or study reasons
- Plan for single housed animals
 - Pen adaptations (see, smell, hear, touch each other)
 - Contact with conspecifics (e.g. supervised sessions)
 - 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



Environmental enrichment

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

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



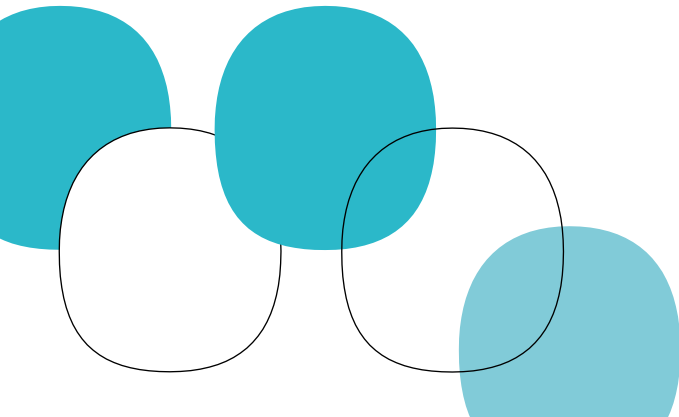
Enrichment example

- ice blocks



Animal Welfare

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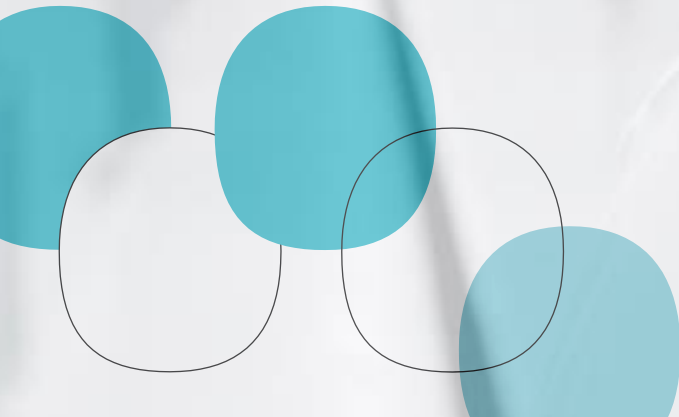


Habituation and training



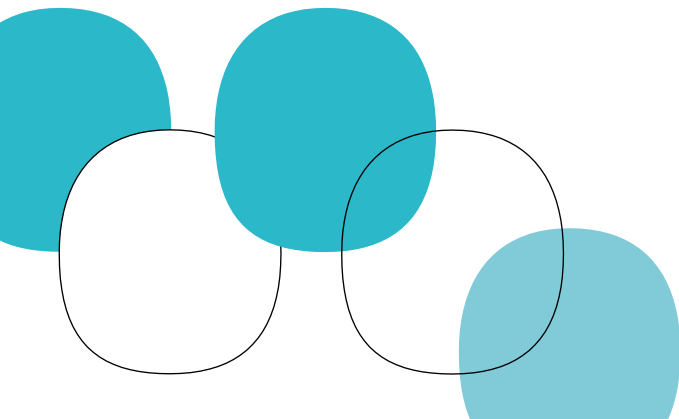
Veterinary Management

Clinical issues



Clinical issues in Göttingen Minipigs

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



Skin injuries

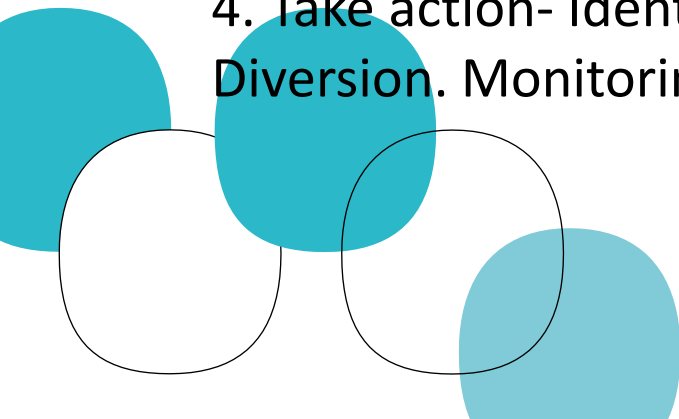
- background

- 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

Tail bites

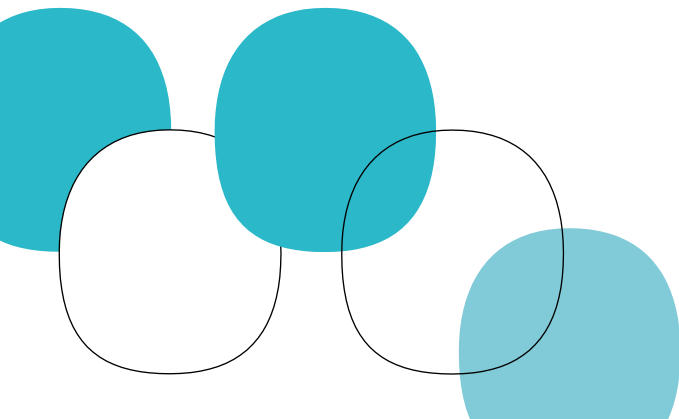
- Management issue!
- Spot problems early
- Action plan
 1. Identify perpetrator
 2. treat victims (depends on severity)
 3. trouble shoot reasons
 4. Take action- Identified causes?
Diversion. Monitoring



Skin injuries

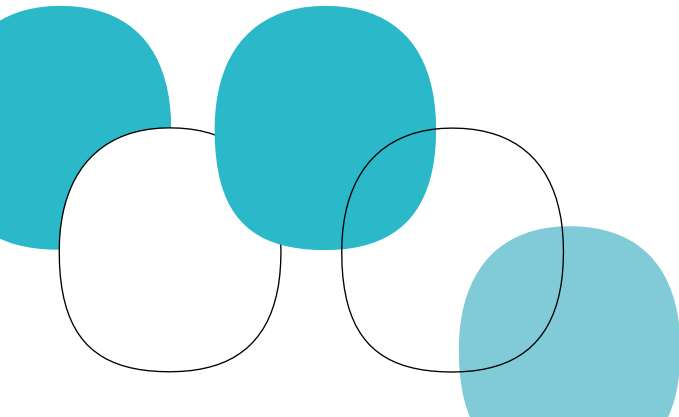
Bruising and abrasions

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



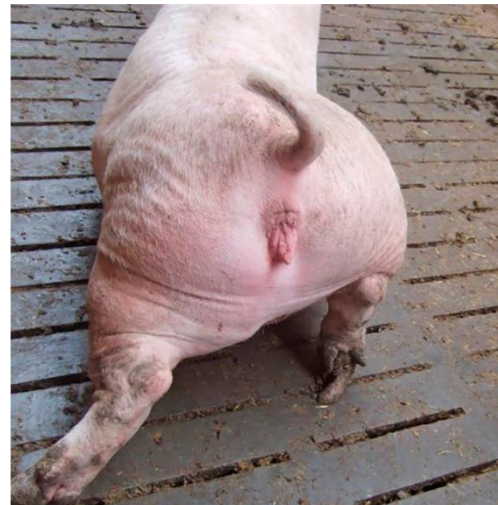
Clinical issues in Göttingen Minipigs

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Lameness

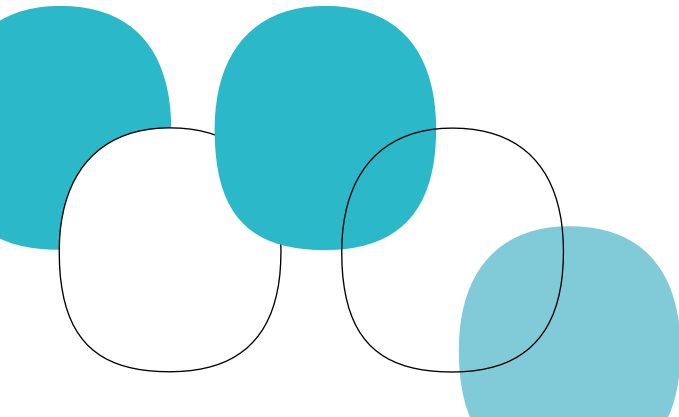
- Many possible etiologies
 - Infectious (e.g. wounds from equipment)
 - Non-infectious (e.g. acute trauma, mechanical)
 - Weight
 - Nutrition



Lameness

- prevention

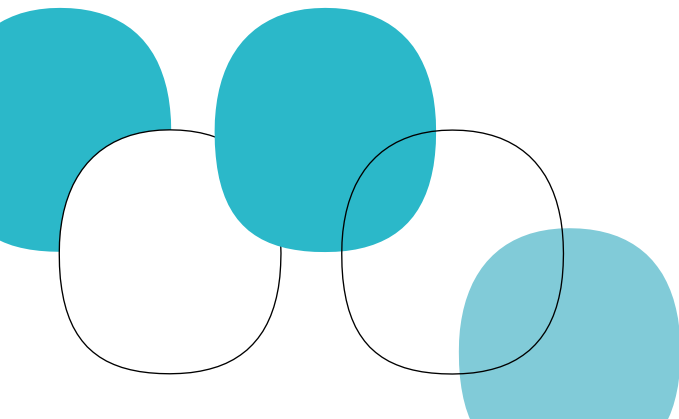
- Management
 - Optimal pen design and flooring
 - Handling
 - Avoid skin barrier lesions
 - Weight
 - Hygiene
 - Hoof inspection and trimming



Lameness

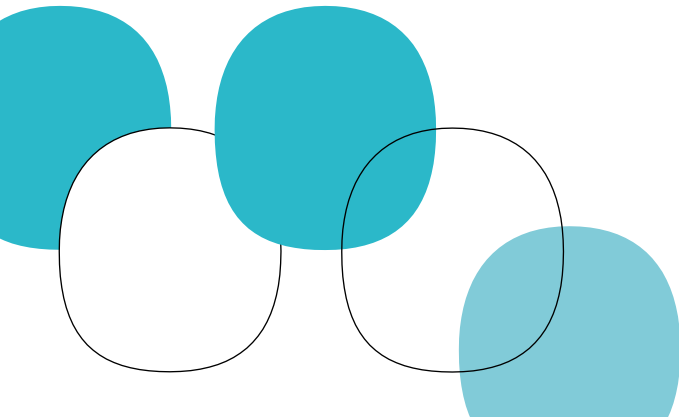
- treatment

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



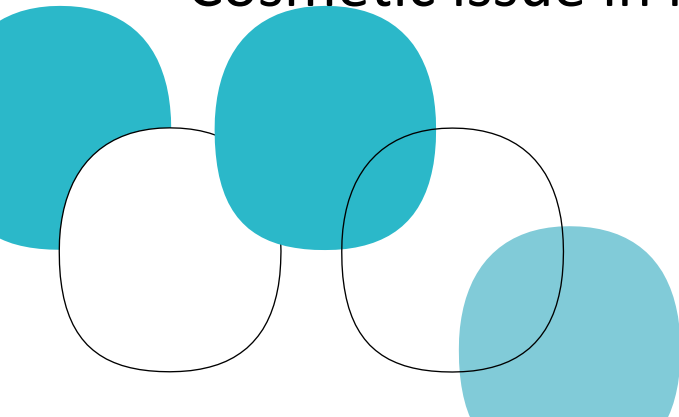
Clinical issues in Göttingen Minipigs

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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

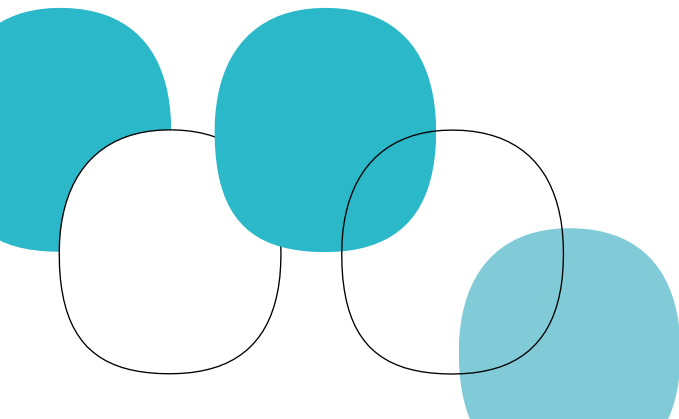
- treatment

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



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!



Cold
Spring
Harbor
Laboratory



bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

New Results

 [Follow this preprint](#)

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

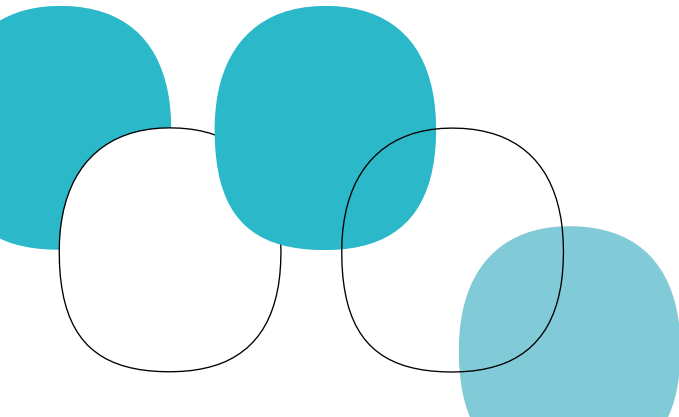
Hina Jhelum,  Nanna Grand, Kirsten Rosenmay Jacobsen, Sabrina Halecker, Michelle Salerno, Robert Prate, Luise Krüger, Yannik Kristiansen, Ludwig Krabben, Lars Möller, Michael Laue,  Benedikt Kaufer, Kari Kaaber, Joachim Denner

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?].

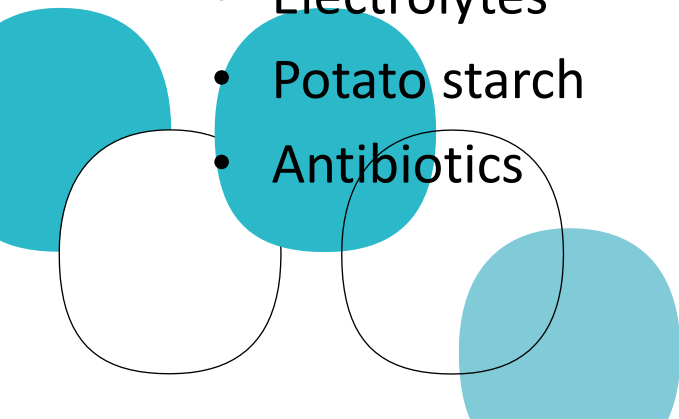
Clinical issues in Göttingen Minipigs

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Gastrointestinal issues

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



Questions?



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Academy: academy@minipigs.dk