UNIVERSITY OF LJUBLJANA | VF Veterinary Faculty

THE WELFARE AND HAIR CORTISOL OF PIGS IN MIXED ORGANIC FARMS

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INTRODUCTION – ORGANIC FARMING

- Organic farming = sustainability, biodiversity & animal welfare
  - **less than 1 %** of all pig farming in the EU (European Union, 2020)
  - organic pig and poultry production shows higher annual growth rates - respectively 6 % and 10 % (European Union, 2020)

- Different housing types:
  - Indoor with outdoor access
  - Outdoor
  - Combination

INTRODUCTION – ORGANIC FARMING

- Outdoor organic farming

  → Potential environmental stress

  – heat, cold, UV

- Indigenous breeds preferred

  (e.g. **Krškopolje pig**)

- **Hair cortisol concentration (HCC)**

  → For assessing long-term

  activity of the hypothalamic-pituitary-adrenal

  (HPA) axis

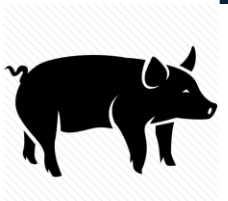
AIMS OF THE STUDY

01

To investigate if seasonality, housing systems and sex influence pigs' **hair cortisol concentration** (HCC).

02

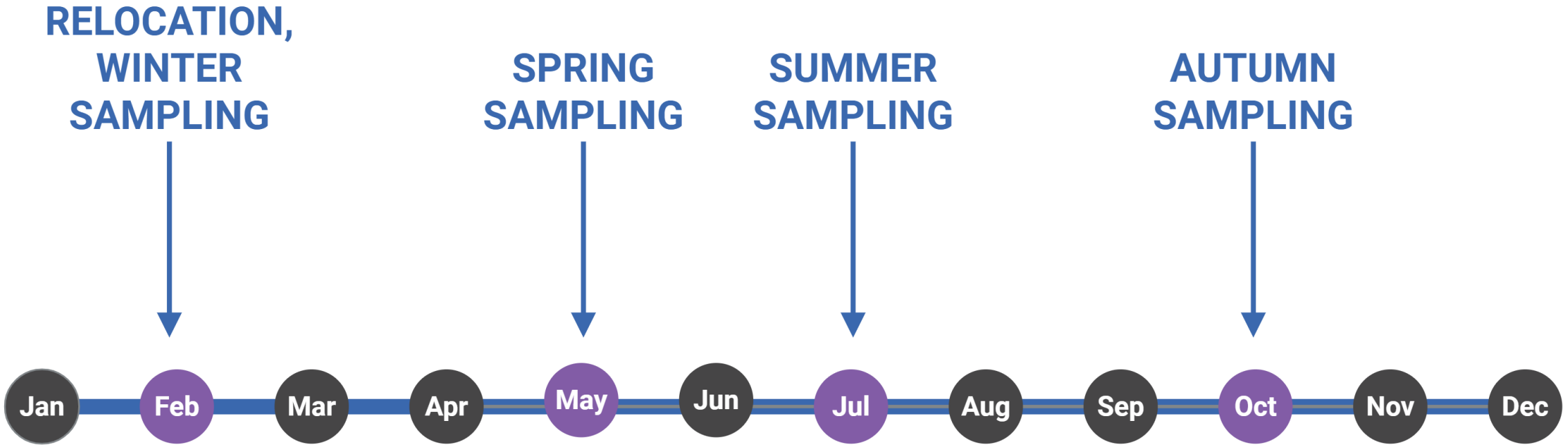
To investigate if seasonality and housing systems influence pigs' **welfare levels**.



STUDY DESIGN

- 53 pigs from the same organic farm
- At 8 weeks - divided into 3 groups and relocated
- 3 weeks between relocation and first sampling (4-9 mm of hair growth)

(Heimbürge et al., 2020)



MATERIALS AND METHODS – GROUP OUT-1

- n = 18
- Reared outdoor year-around
- 12,600 m²

MATERIALS AND METHODS – GROUP OUT-2

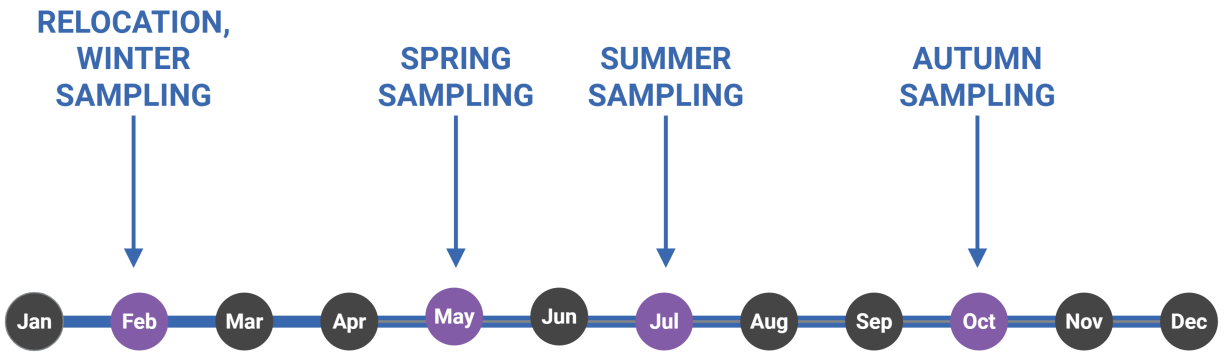
- n = 20
- Indoor in winter and let out in March
- 9,000 m²

MATERIALS AND METHODS – GROUP IND

- n = 15
- Indoor
- 50 m²
  - 2.5 m² floor area per pig

MATERIALS AND METHODS: HAIR CORTISOL ANALYSIS

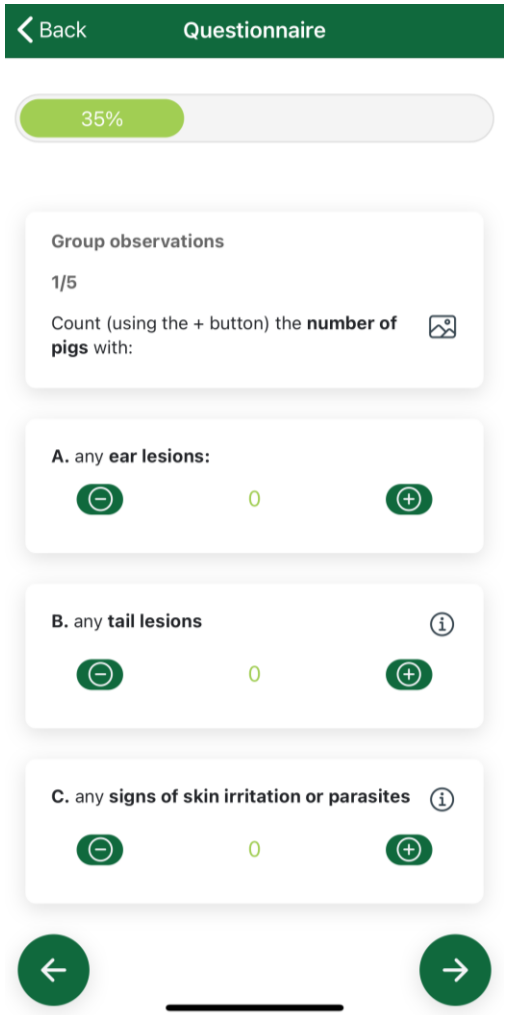
- Hair sampled from the **withers area**
- Approx. 3 cm long, 4 times per pig (212 samples)
- Black or white hair
- Cortisol ELISA , HCC expressed as ng/g

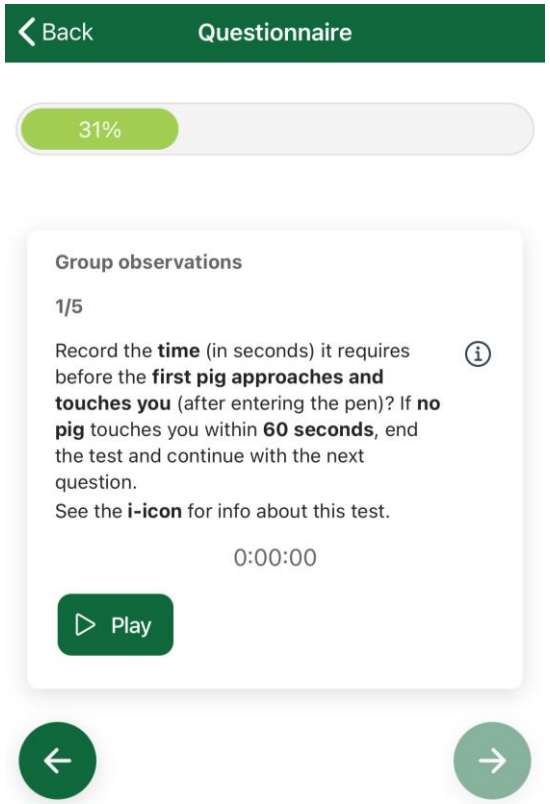


MATERIALS AND METHODS: PIGLOW MOBILE APPLICATION

UL VF

- **PARAMETERS OBSERVED**:
  - General Management (10 questions)
  - Painful Husbandry Procedures (3 questions)
  - Good Housing (11 questions)
  - Good Feeding (5 questions)
  - Good Health (10 questions)
  - Appropriate Behaviour (5 questions)





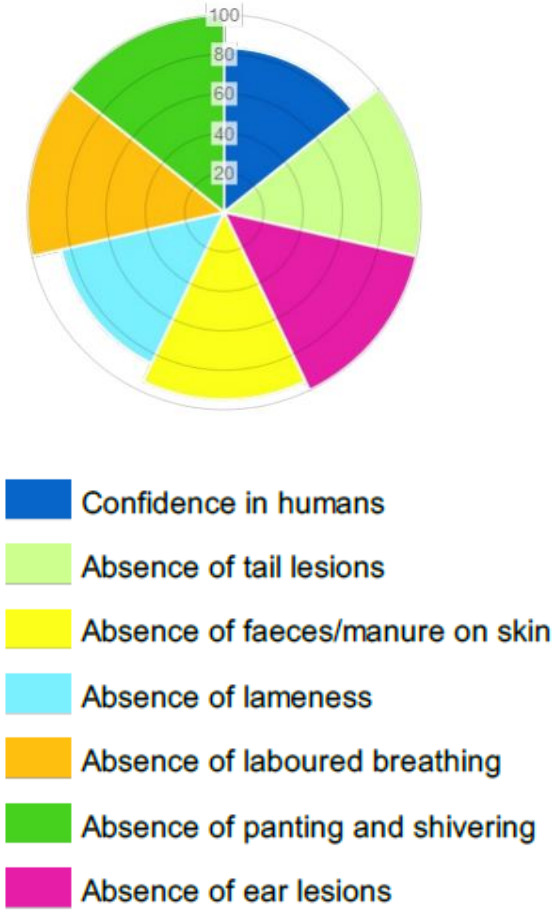
Poultry and Pig Low-input and Organic production systems' Welfare project

PIGLOW

METHOD: PIGLOW MOBILE APPLICATION

- Results: report and pie charts

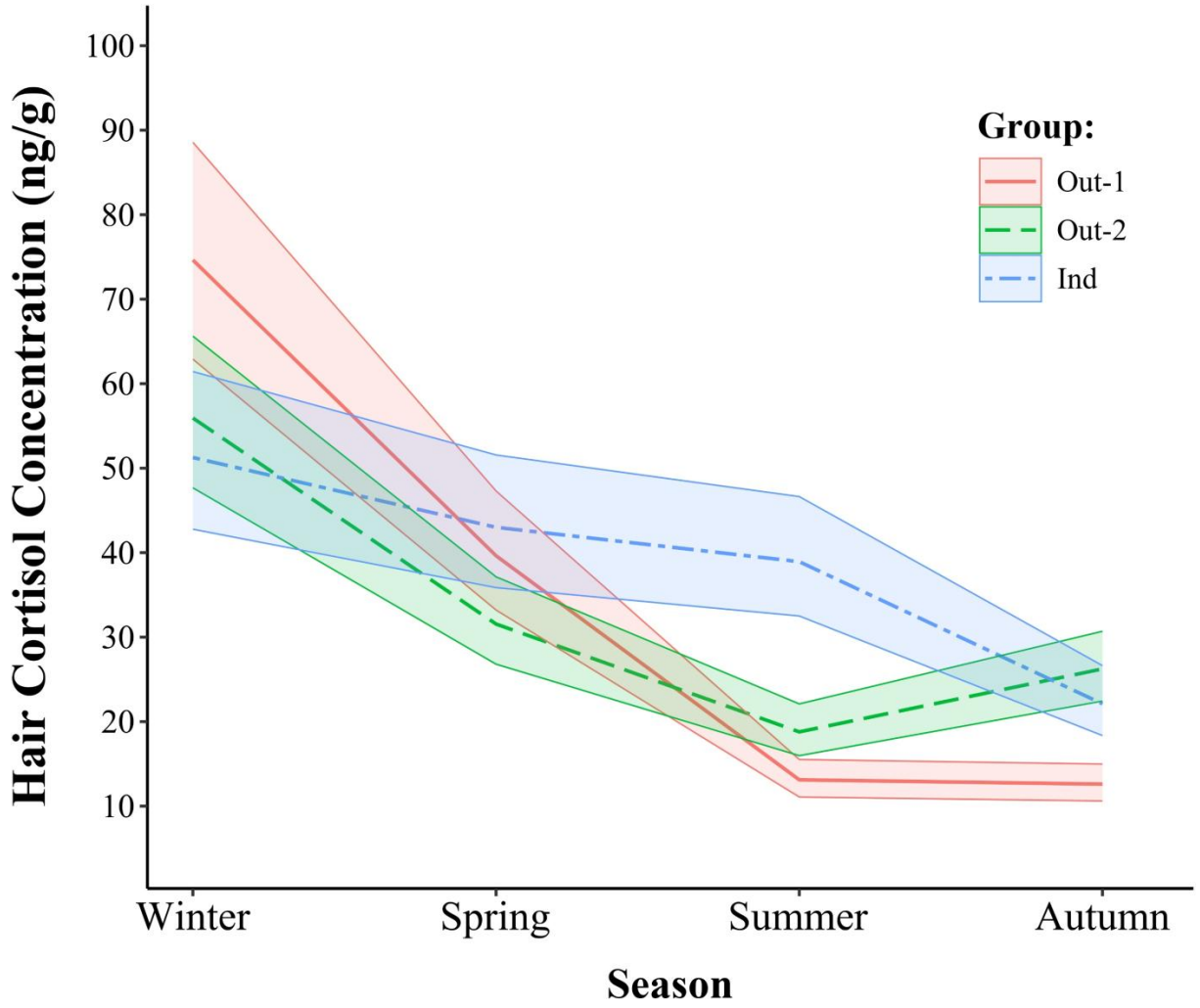
Good Health	
average mortality rate in grower phase (on a yearly basis)	**3%**
pigs in bad general state	**0 %**
pigs with laboured breathing (pumping)	**0 %**
pigs that are much smaller than group members	**11,8 %**
pigs that are obviously lame	**0 %**
pigs with signs of skin irritation or parasites	**11,8 %**
pigs with skin wounds larger than 5 cm (flank, legs)	**70,6 %**
signs of sunburn (at any point in time during the year)	**No**
groups with signs of liquid faeces	**0 %**



RESULTS AND DISCUSSION: HCC

WINTER

- Highest HCC levels in the study
- High variability



RESULTS AND DISCUSSION: HCC

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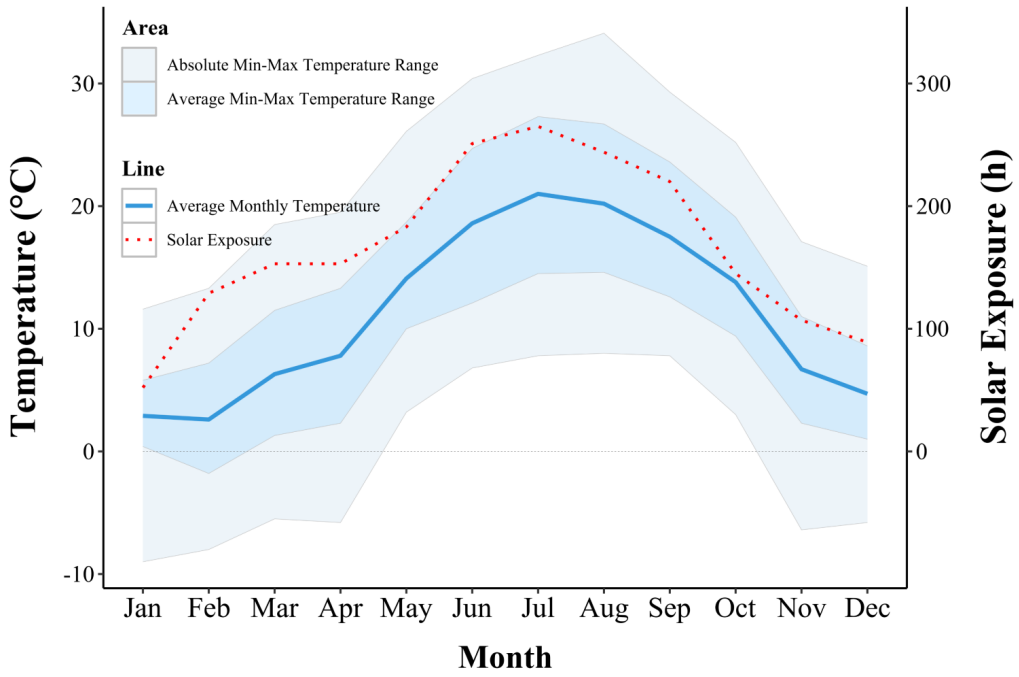
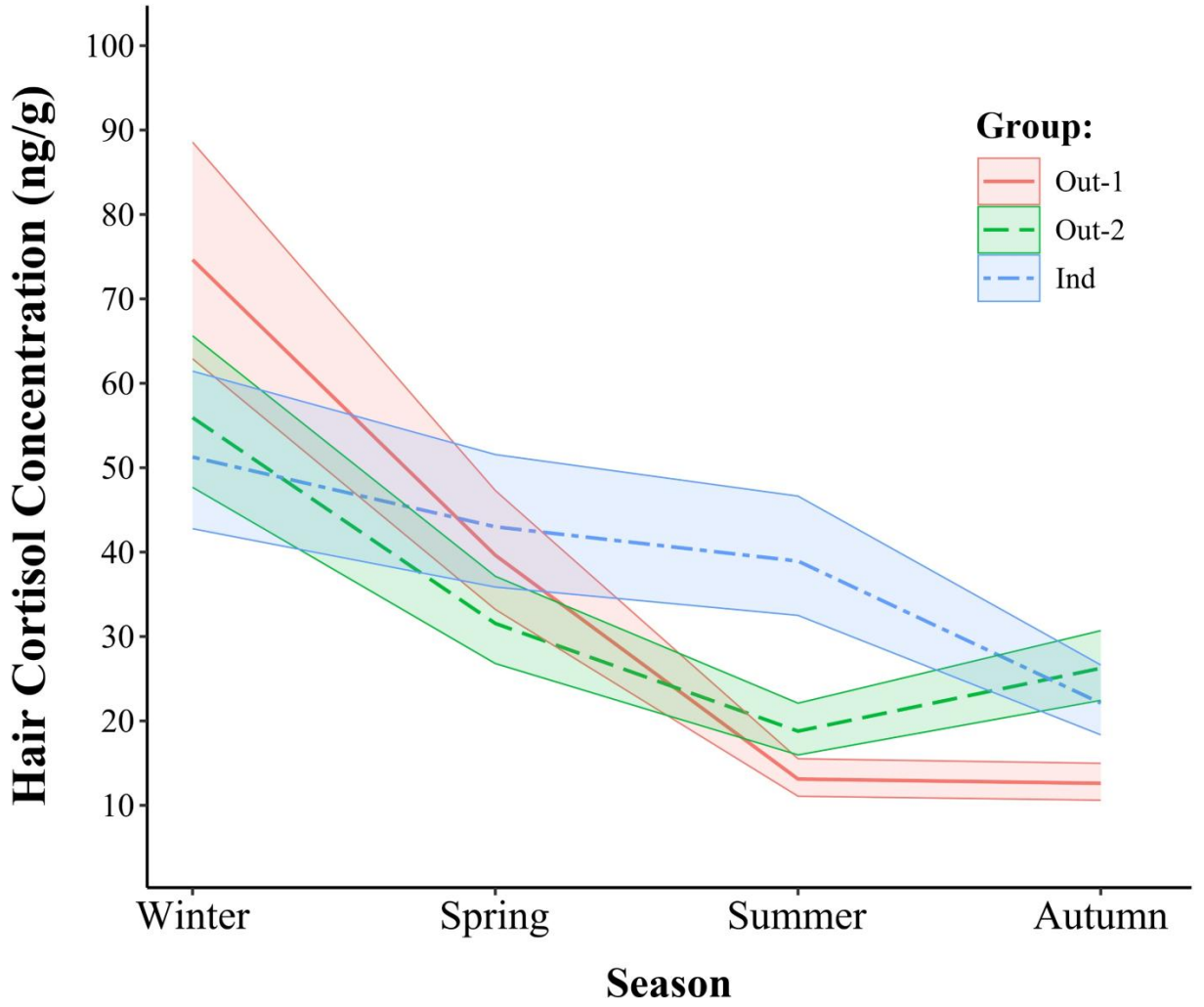
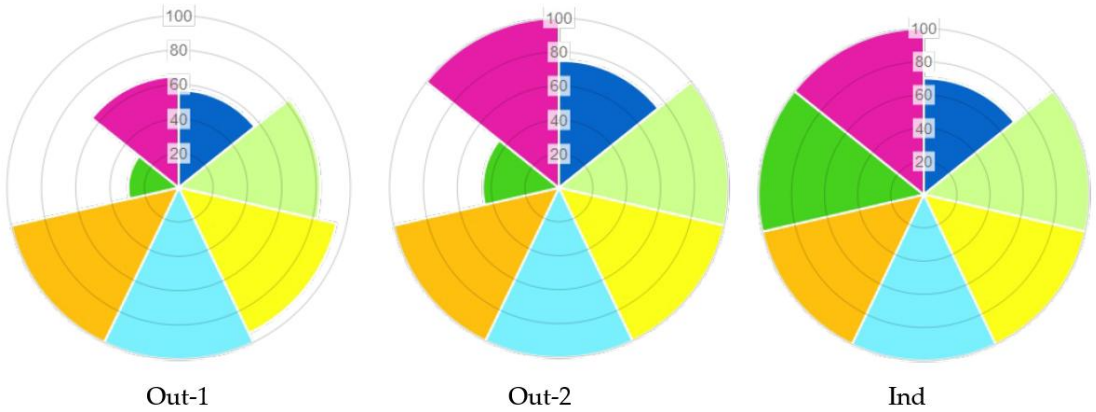




RESULTS AND DISCUSSION: PIGLOW APP

- **The lowest welfare score in winter**
- Lowest welfare score: group Out-1



Confidence in humans

Absence of tail lesions

Absence of faeces/manure on skin

Absence of lameness

Absence of laboured breathing

Absence of panting and shivering

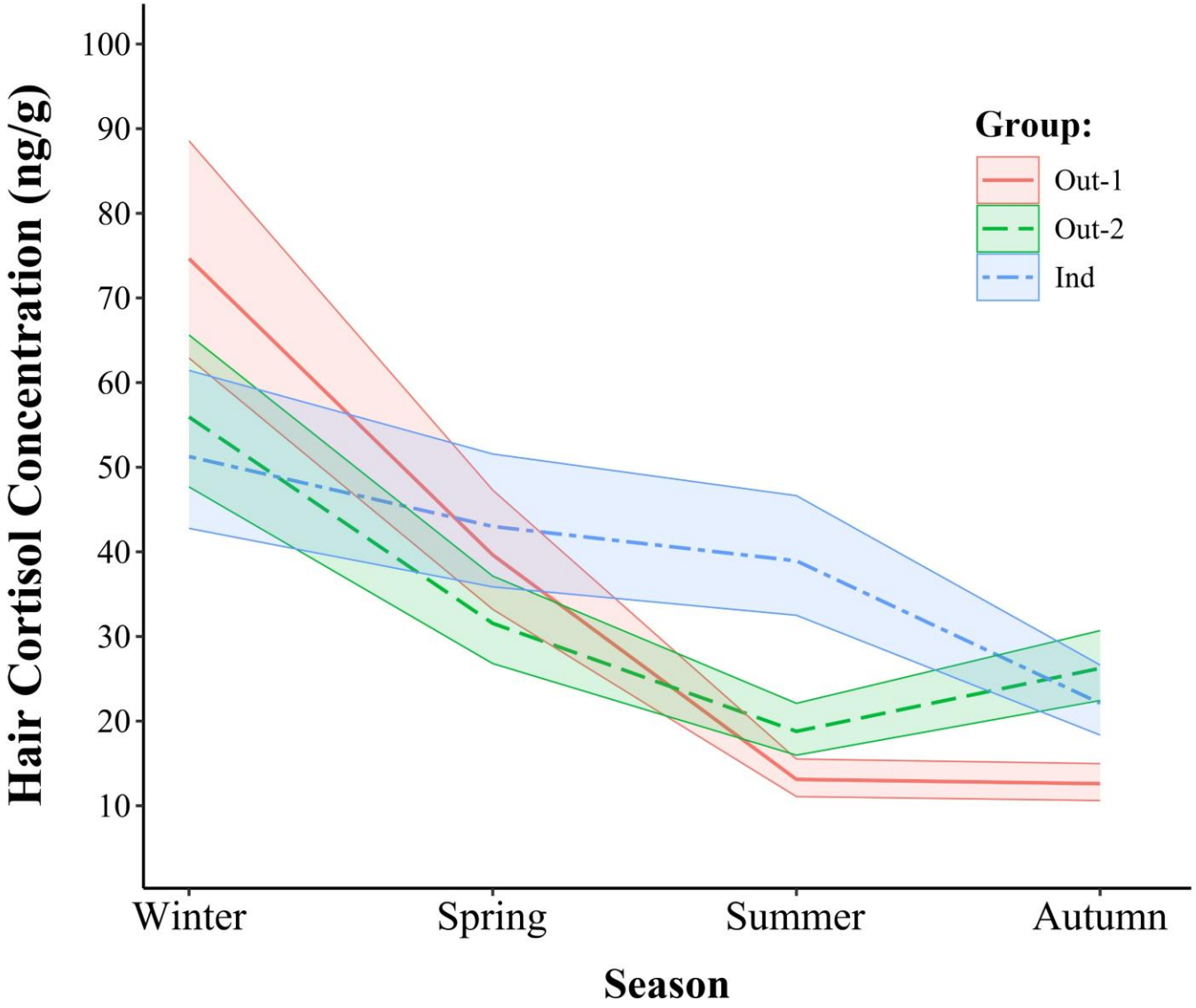
Absence of ear lesions

RESULTS AND DISCUSSION: HCC

SPRING

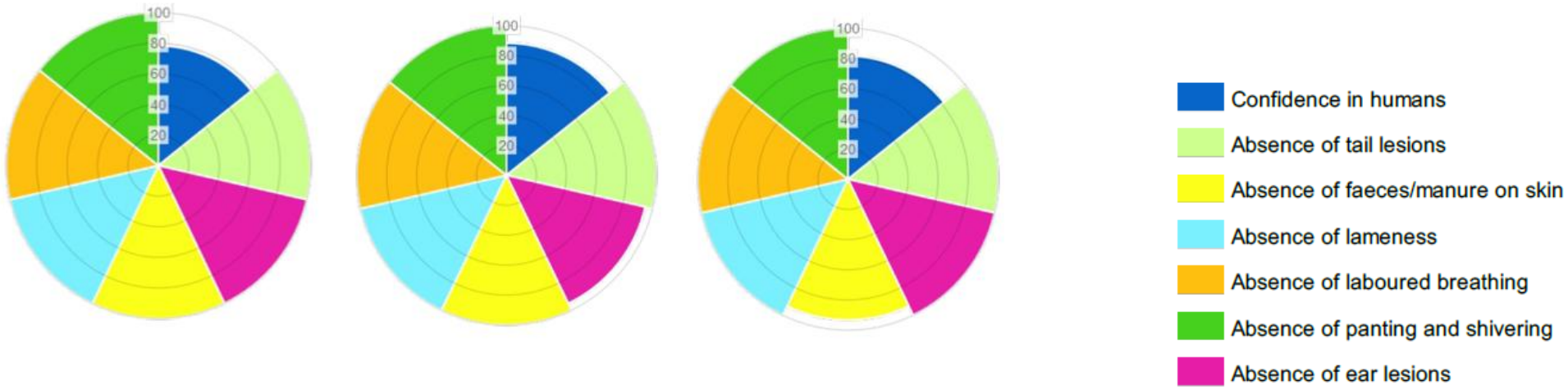
- **High variability**
- Significant difference:

  → Out-2 vs Ind



RESULTS AND DISCUSSION: PIGLOW APP

- **SPRING**
  - No significant differences between groups
  - **No skin lesions visible in group Out-1**



Out-1 Out-2 Ind

RESULTS AND DISCUSSION: HCC

SUMMER

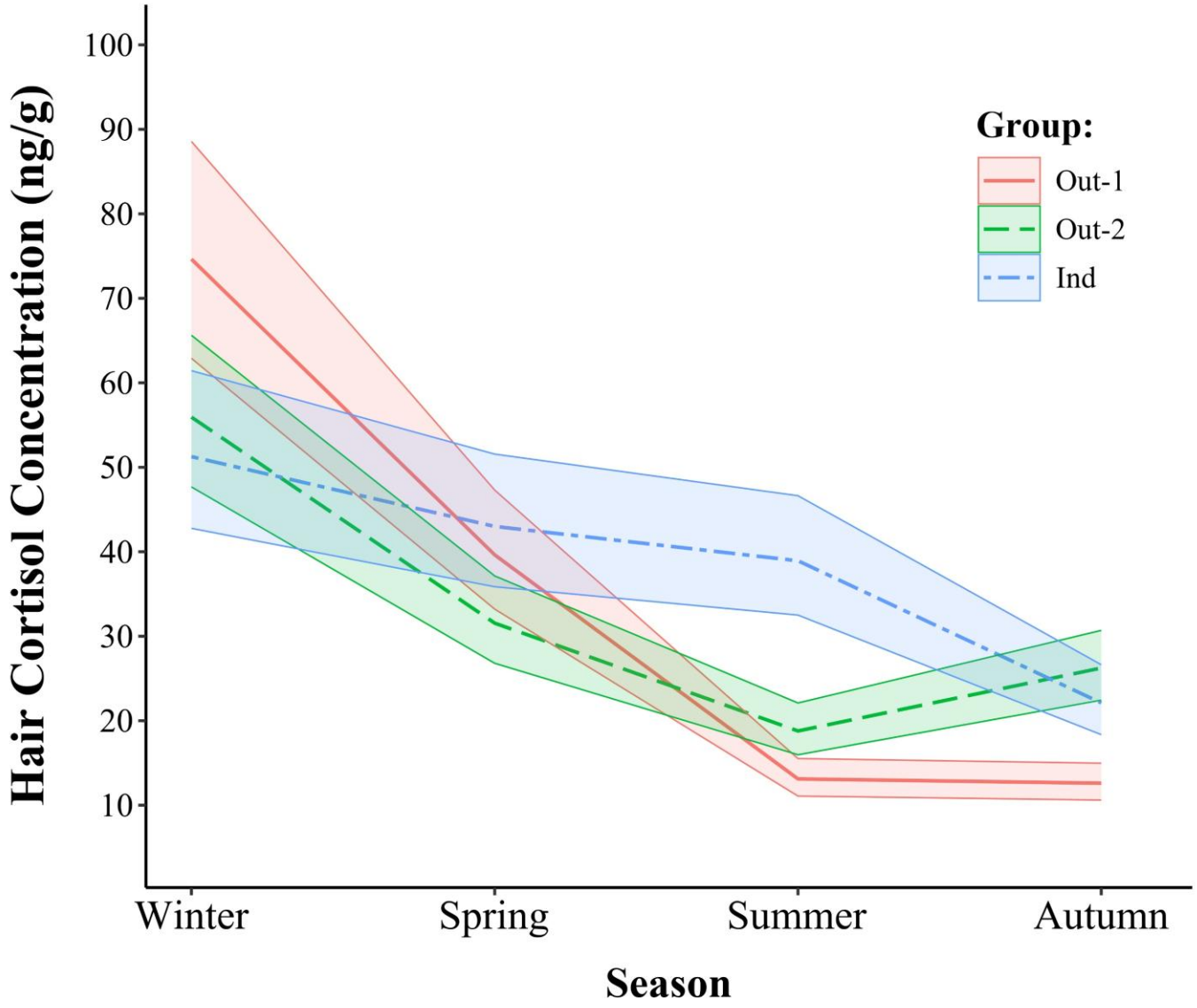
- Significant difference:

  → Ind compared to outdoor groups

AUTUMN

- Significant difference:

  → Out-1 compared to Out-2 and Ind

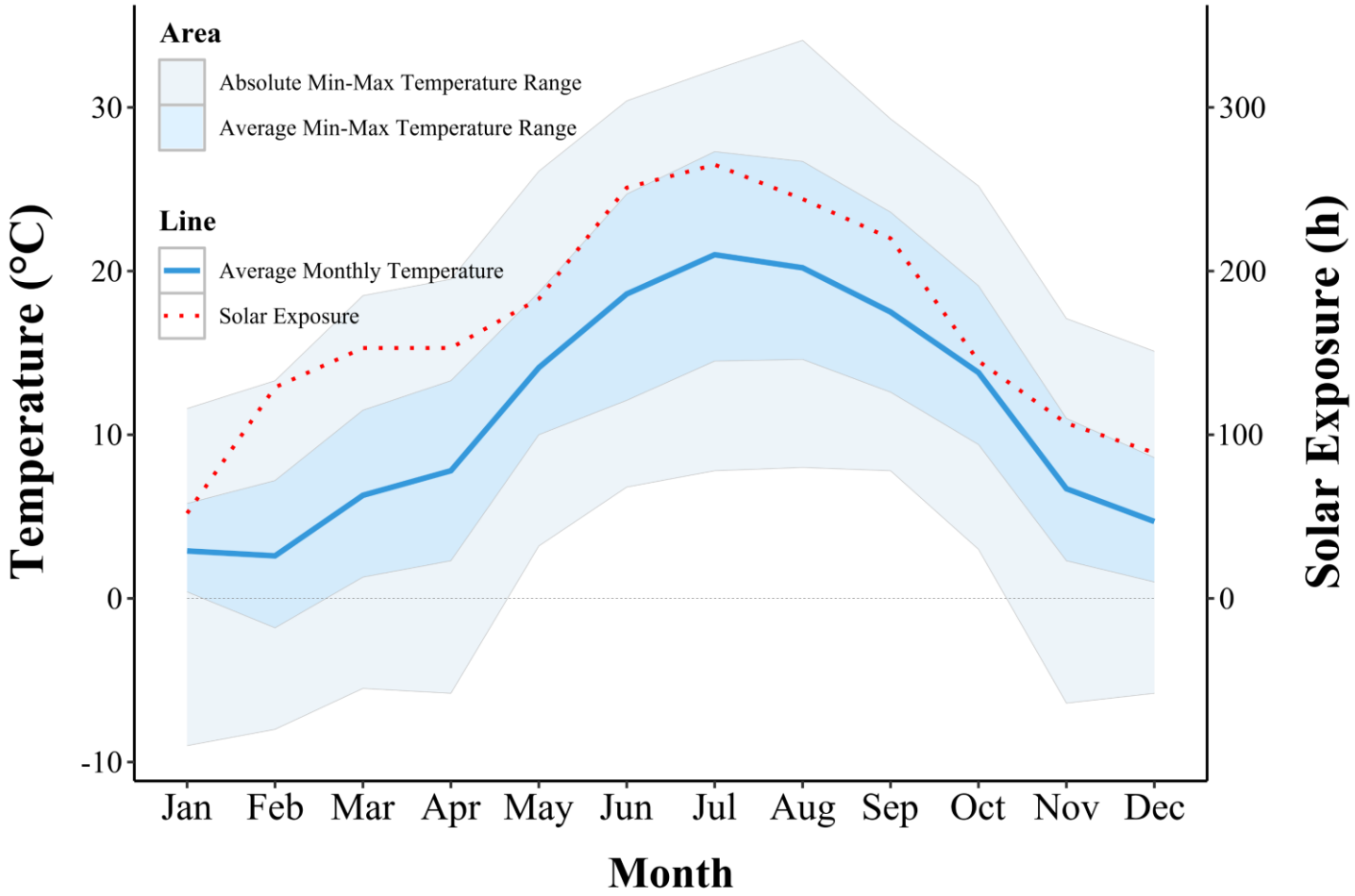


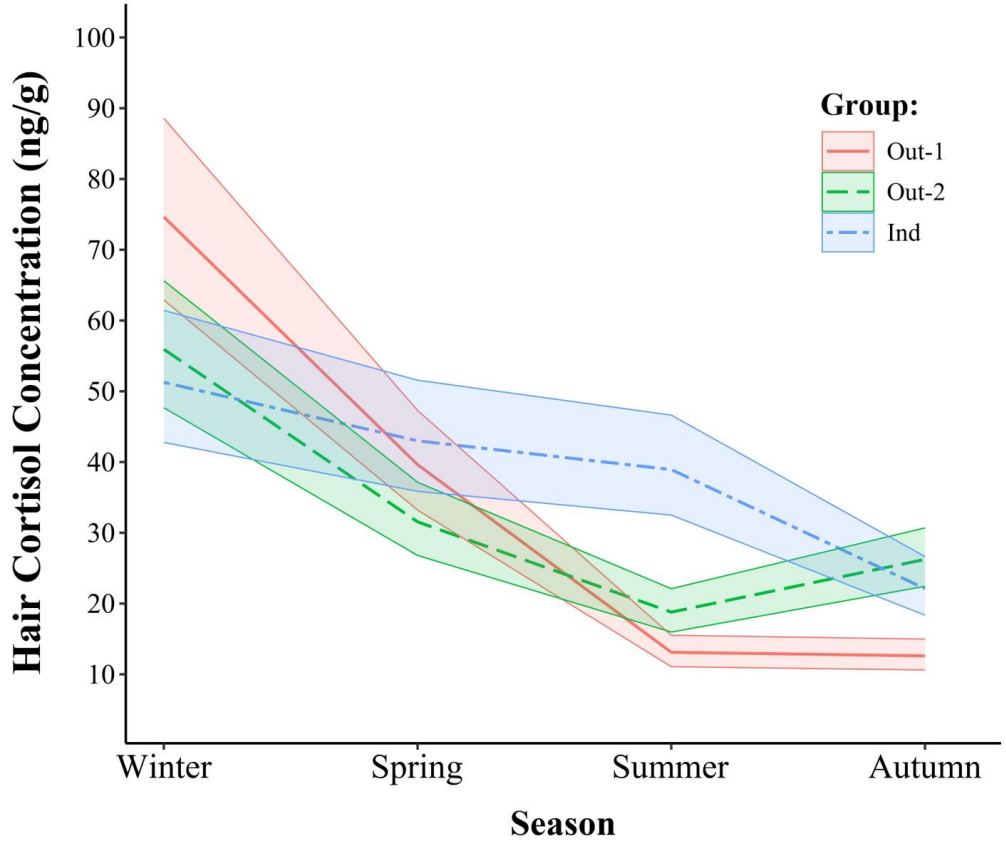
RESULTS AND DISCUSSION: PIGLOW APP

- **SUMMER AND AUTUMN**
  - **Sunburn** → summer and autumn: Out-1, Out-2
  - **Limping** → autumn: all groups

RESULTS AND DISCUSSION: PIGLOW APP

- **SUMMER AND AUTUMN**





RESULTS AND DISCUSSION: PIGLOW APP

- **SUMMER AND AUTUMN**

› Animal. 2021 Jun;15(6):100230. doi: 10.1016/j.animal.2021.100230. Epub 2021 May 25.

The dark side of white hair? Artificial light irradiation reduces cortisol concentrations in white but not black hairs of cattle and pigs

W Otten [1], T Bartels [2], S Heimbürge [3], A Tuchscherer [4], E Kanitz [3]

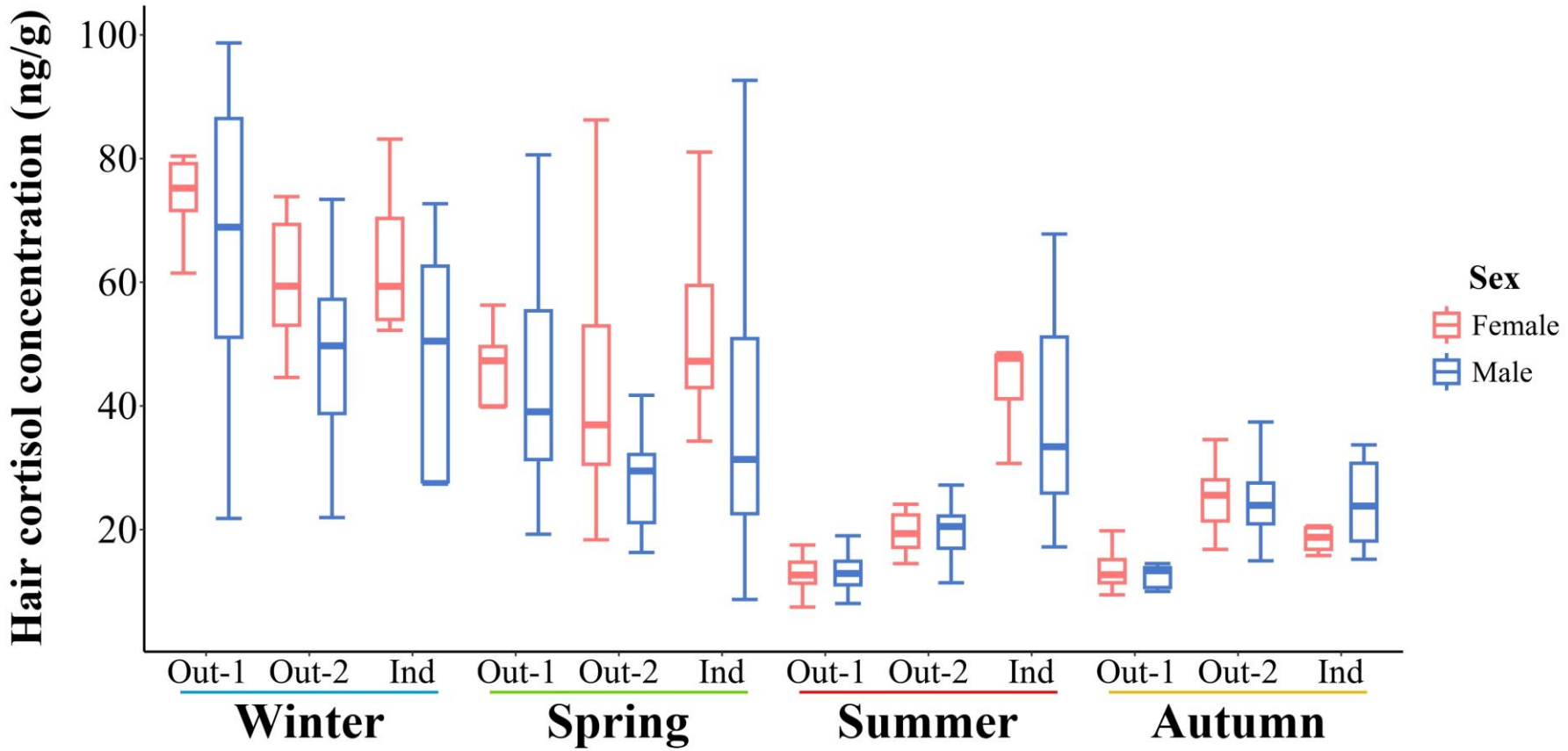
Affiliations + expand

PMID: 34049109 DOI: 10.1016/j.animal.2021.100230

Free article

RESULTS AND DISCUSSION: SEX DIFFERENCES IN HCC

- 27 females
- 26 castrated males



CONCLUSION

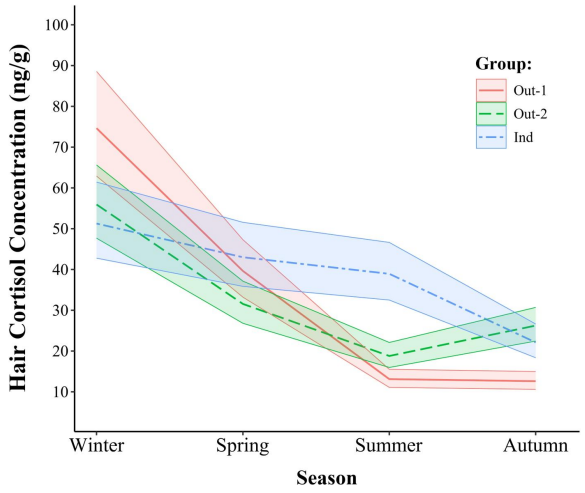
- Cold stress likely severely affected Out-1 in winter
- UV light exposure may have reduced HCC
- High welfare standards likely minimized the housing impact
- Seasonality significantly affected HCC and was more pronounced in pigs reared outdoors.

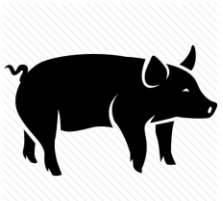
01

Seasonality and housing systems influenced HCC.

02

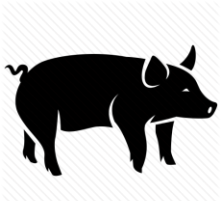
Seasonality affected welfare levels.





The study was a part of the project ROAM-FREE

RObust Animals in sustainable Mixed FREErange systems, CORE Organic Cofund



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- Ana Šket
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- Farmers
- Farm veterinarians

THANK YOU FOR YOUR ATTENTION