



Behavioural tests: suitable indicators for measuring the affective state of growing pigs?

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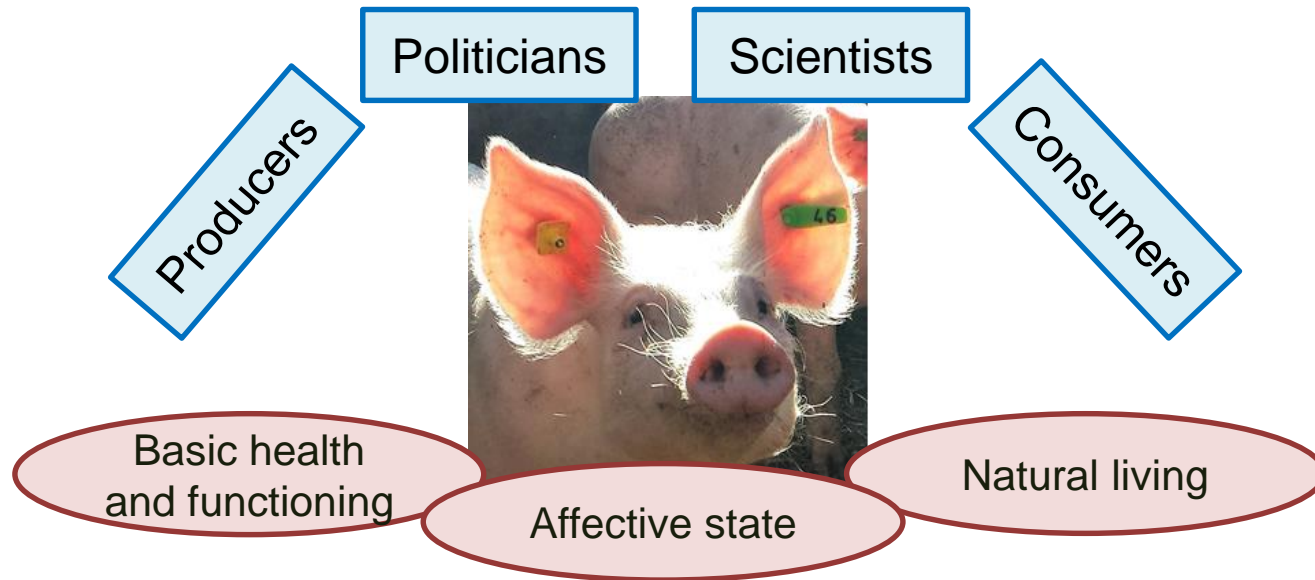
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Are HAT and NOT suitable indicators?

- Necessity: Establishment of objective measurements for animal welfare
→ Especially for the positive affective state (Marcet Rius et al., 2018)



- Behavioural tests for assessing the level of anxiety in animals
(e.g. Murphy et al., 2014; Hemsworth and Coleman, 1998)



Animals and housing

- Data collection: November 2016 – September 2017
- 297 fattening pigs (LW x LR x Pi)
- Two batches
- Two different housing systems (three farms)

Barren
habitat



- Housing systems differ respecting availability of:
 - Barren or enriched habitat
 - Space/animal (m²/pig)
 - Climatic conditions

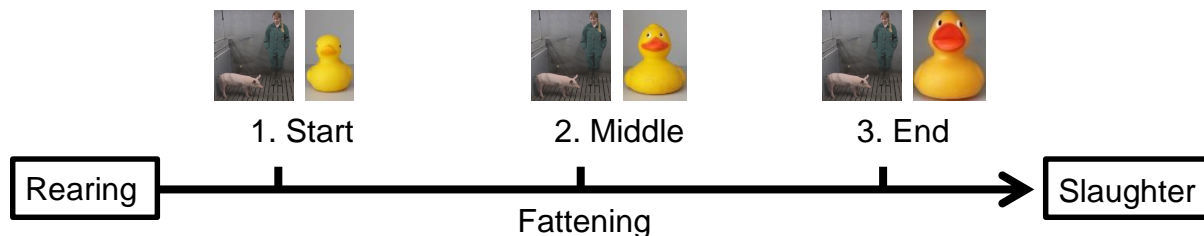
Enriched
habitat





Implementation of HAT and NOT

- Each pig separate in the home pen
- Two minutes for acclimation
- Three minutes of test time
- Notification of physical contacts:
 - Approach latency (AL) (s)
 - Duration of contacts (DC) (s)
 - Number of contacts (NC)
- Points of test (Pot): Three times during fattening





Statistical analysis

- SAS® 9.4 (SAS Institute Inc., 2017)
- Log10 (x+1) transformation of the data
- Linear mixed model (PROC MIXED):

$$y_{ijklmn} = \mu + F_i + B_{ij} + Pot_{ik} + G_l + ani_{ijlm} + e_{ijklmn}$$

y = nth observation of test behaviour

μ = general mean

F_i = fixed effect of ith farm (i = 1-3)

B_{ij} = fixed effect of jth batch (j = 1,2) within the ith farm (i = 1-3)

Pot_{ik} = fixed effect of kth point of test (k = start, middle, end) within the ith farm (i = 1-3)

G_l = fixed effect of lth gender (l = female, male)

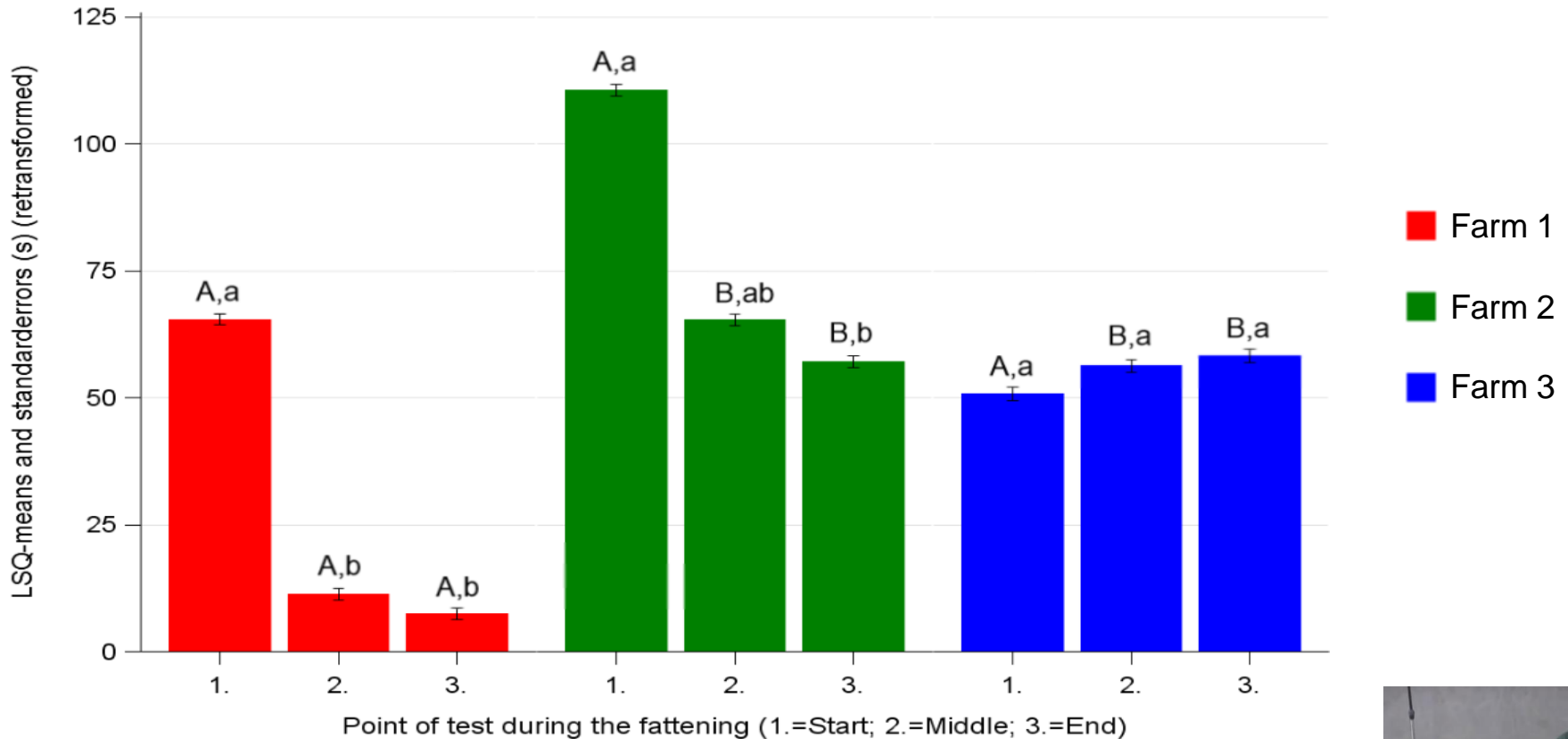
ani_{ijlm} = random effect of mth animal within the ith farm, jth batch (j = 1,2) and lth gender

e_{ijklmn} = random residual errors

- Statistical significance at $p < 0.05$

HAT approach latency (AL) (s)

Human approach test - approach latency (s) at the different points of test



A,B,C: Indicate significant differences between the farms within each point of test ($p < 0.05$)

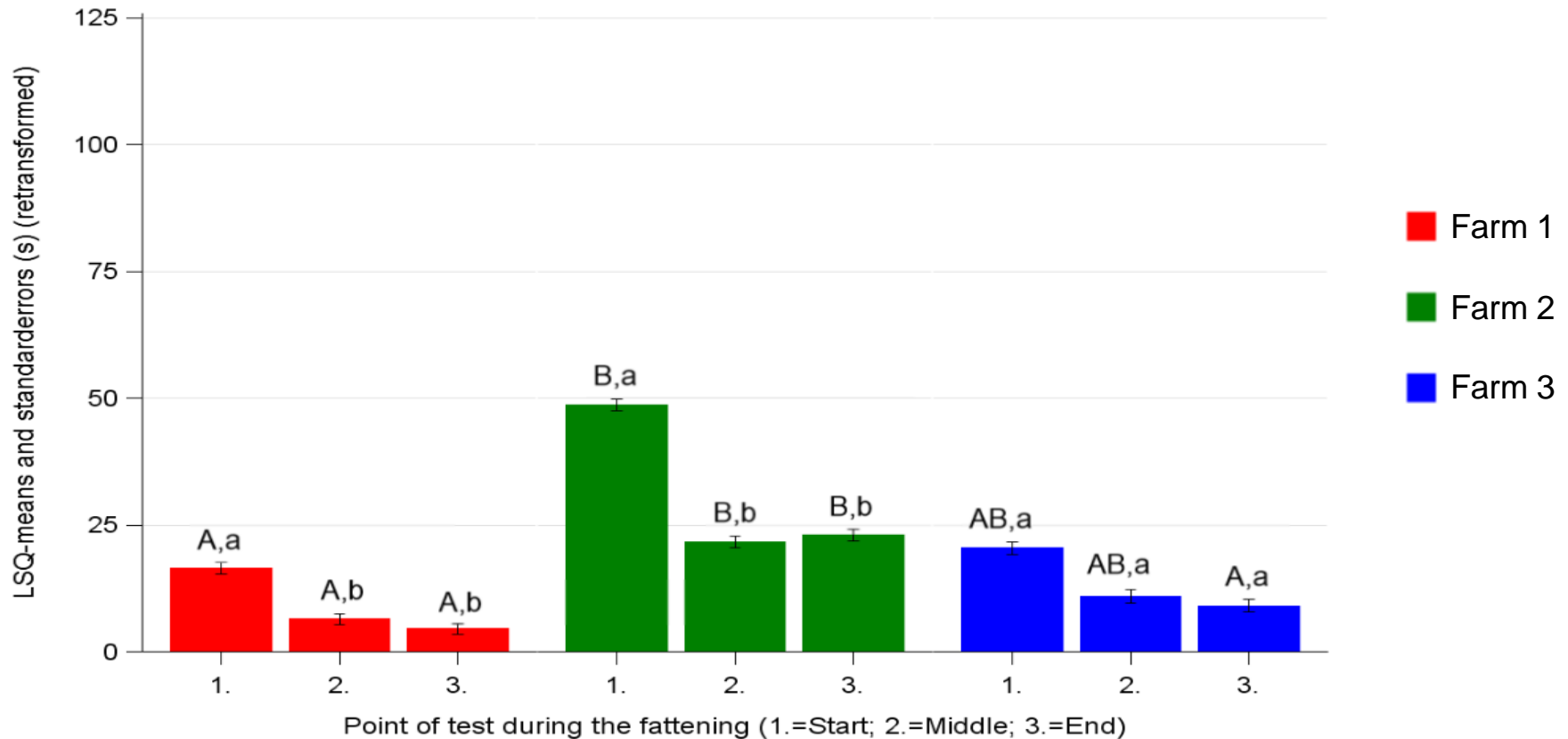
a,b,c: Indicate significant differences between each point of test within the farms ($p < 0.05$)





NOT approach latency (AL) (s)

Novel object test - approach latency (s) at the different points of test



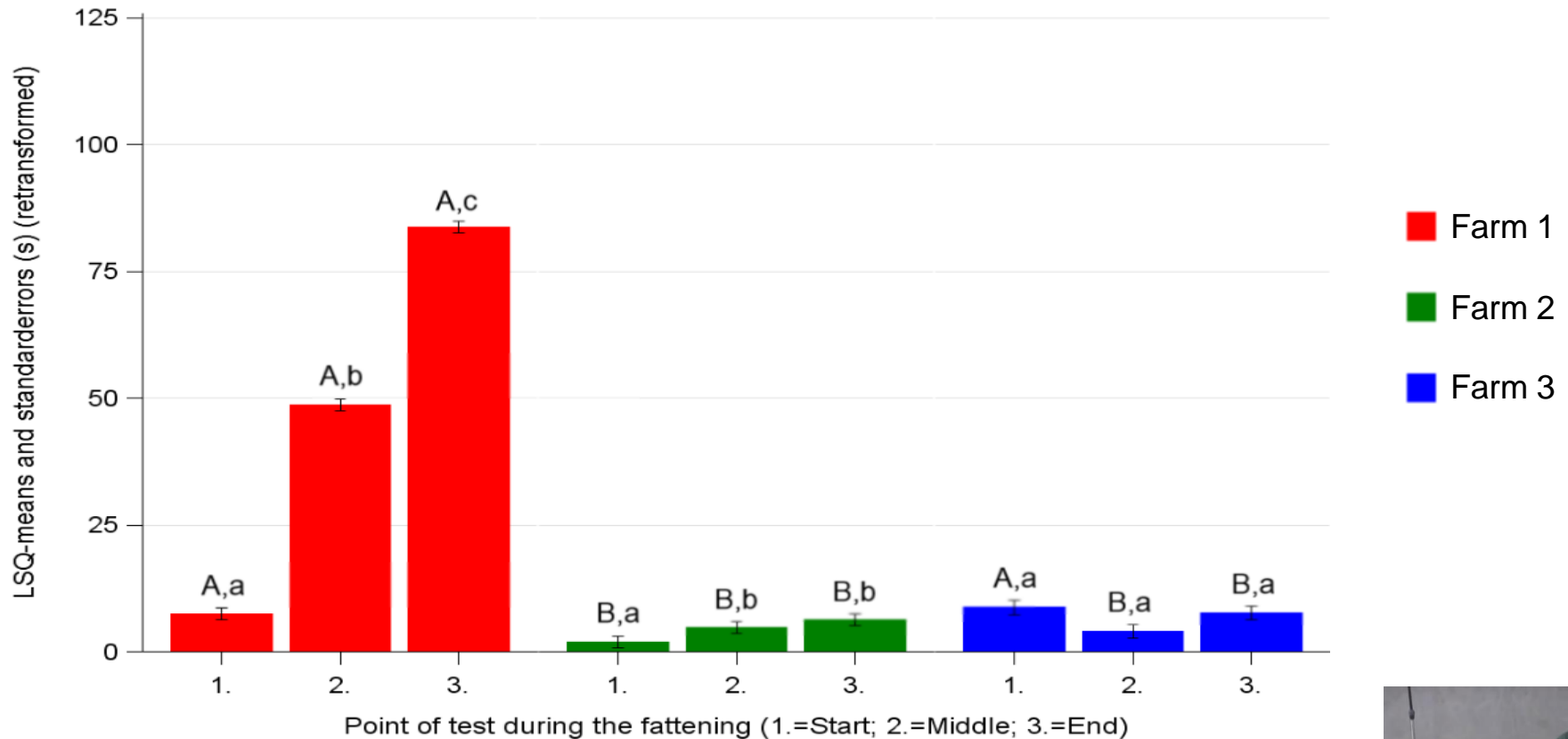
A,B,C: Indicate significant differences between the farms within each point of test ($p < 0.05$)

a,b,c: Indicate significant differences between each point of test within the farms ($p < 0.05$)



HAT duration of contacts (DC) (s)

Human approach test - duration of contact (s) at the different points of test



A,B,C: Indicate significant differences between the farms within each point of test ($p < 0.05$)

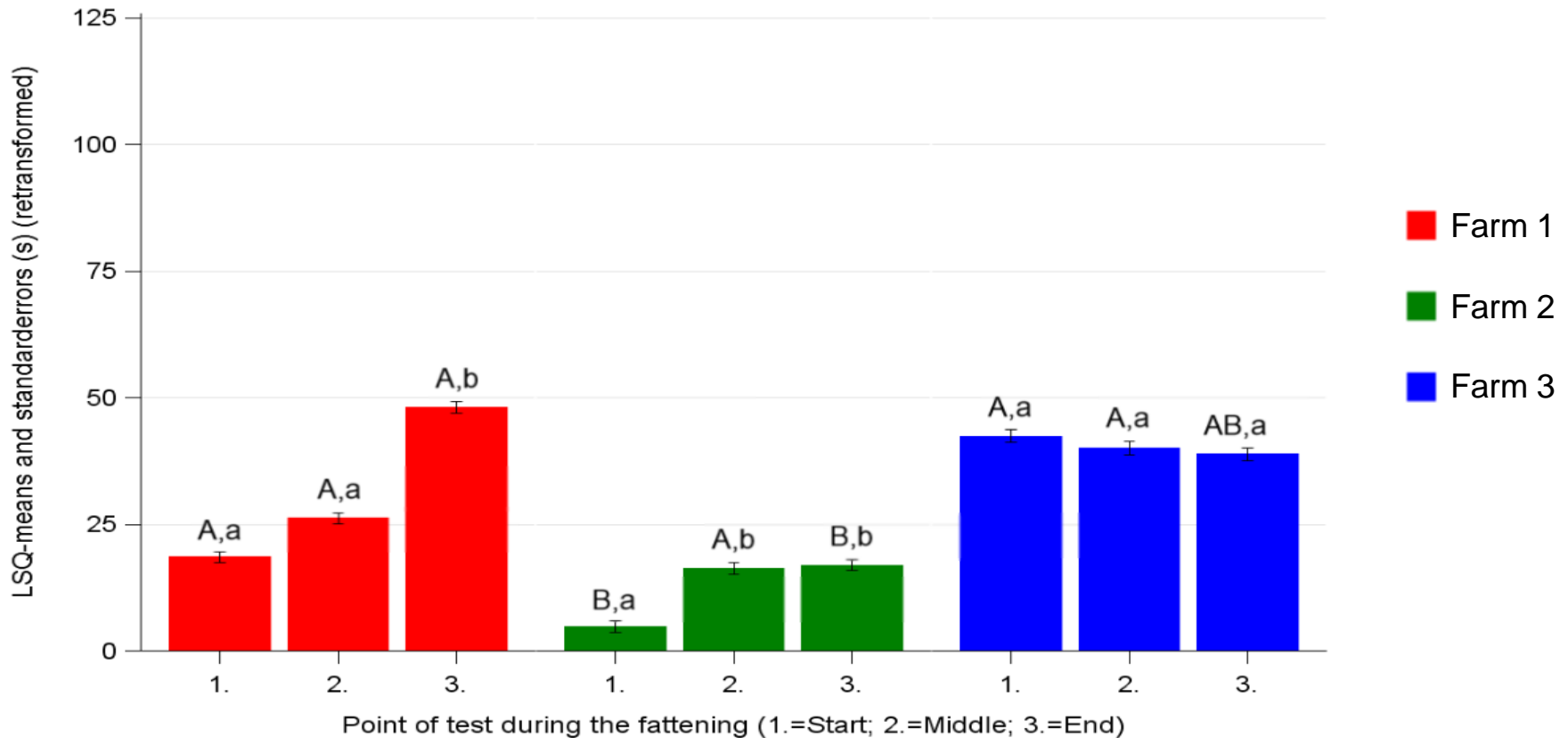
a,b,c: Indicate significant differences between each point of test within the farms ($p < 0.05$)





NOT duration of contacts (DC) (s)

Novel object test - duration of contact (s) at the different points of test



A,B,C: Indicate significant differences between the farms within each point of test ($p < 0.05$)

a,b,c: Indicate significant differences between each point of test within the farms ($p < 0.05$)





Are HAT and NOT suitable indicators?

Approach latency (AL) (s):

- HAT → Lower AL (s) in the barren housing system (2./3. Pot)
- NOT → Lower AL (s) in the barren housing system (3. Pot)
(e.g. Casal-Plana et al., 2017; Bracke and Spooler, 2008; Stolba and Wood-Gush, 1980)



Duration of contact (DC) (s):

- HAT → Longer DC in the barren housing system (2./3. Pot)
- NOT → Similar DC on Farm 1 and Farm 3 (1.-3. Pot)
→ Lowest DC on Farm 2 (1.-3. Pot)

(e.g. Bracke and Spooler, 2008; Wemelsfelder et al., 2000)





Are HAT and NOT suitable indicators?

- HAT and NOT to assess the level of anxiety
(e.g. Murphy et al., 2014; Hemsworth and Coleman, 1998)
 - HAT and NOT do not measure the same animal characteristics (Boivin et al., 1992)
 - HAT and NOT might be suitable to show the level of motivation to explore?
(Stolba and Wood-Gush, 1980)
 - High/low level of motivation to explore = negative/positive affective state?
- HAT and NOT \neq autonomous reliable indicators for identifying positive emotions





Thank you for your attention!

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References

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