

Laying hens housed in floor pens prefer different pecking blocks at different times of day

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Foraging

- Pecking and scratching to search for food
- Foraging behaviour split into 2 phases:
 - Appetitive: exploratory phase
 - Consummatory: goal is reached, food ingested (Duncan & Hughes, 1988)
- Behavioural need
 - Hens provided feed ad lib still perform scratching and pecking behaviours (Weeks & Nicol, 2006)



Feather Pecking

- Feather pecking
 - Redirection of foraging (Huber-Eicher and Wechsler, 1997)
 - Welfare and economic issues (Gunnarsson et al., 1999) (Leeson and Morrison, 1978)
- ↑ foraging opportunities may ↓ feather pecking (Dixon et al., 2010)
- Substrates that can be consumed are more effective at reducing severe feather pecking (Dixon et al., 2010)



Pecking Blocks

- Edible enrichments
 - Act as targets for hens to direct foraging behaviours
- Biological relevance
 - Provide opportunities to forage
 - Allow autonomy for choice of nutrients
 - Potential to satisfy behavioural and sensory needs (Newberry, 1995)



Photo by Madeleine McAuley

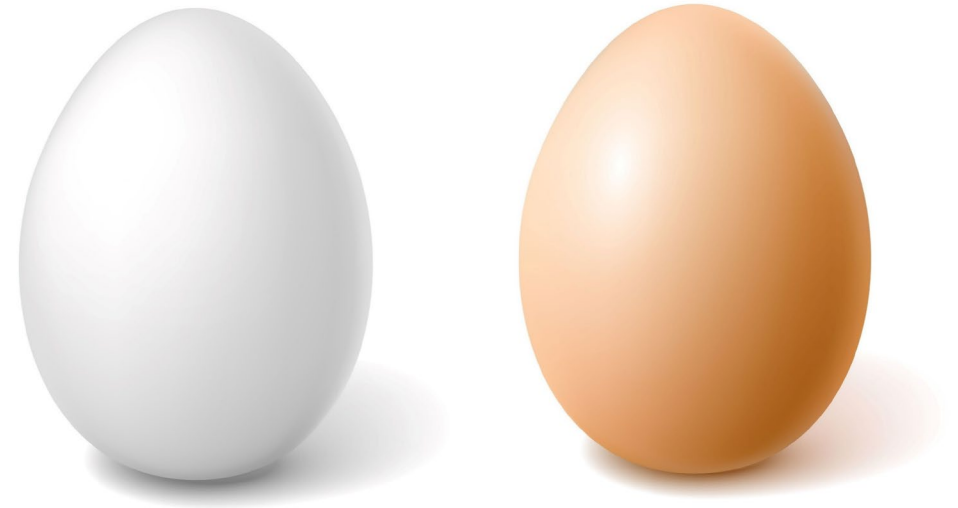
Pecking Blocks

- Commercially available pecking blocks vary in colour, density, smell, and chemical composition
 - Varying amounts of calcium



Calcium Appetite

- High calcium demand
 - Egg production
 - Bone integrity
- Hens have a specific appetite for calcium
 - Seek out and consume calcium to meet their needs (Wilkinson et al., 2011)
 - Calcium intake peaks before the dark period (Hughes, 1972)



**Do laying hens have a preference
in the type of pecking block in
non-cage systems?**



Objectives

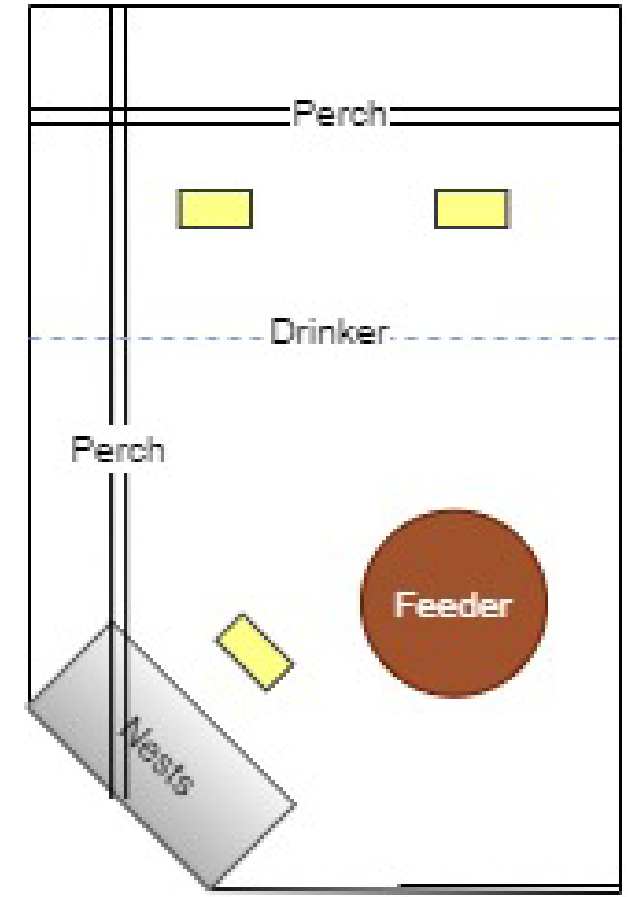
Determine preference
between three types of
commercially available
pecking blocks

Identify strain
differences between
the preference of
pecking blocks

Identify time of day
differences

Experimental Design

- 12 floor pens with 20 hens/pen
- Brown (n=6) and White (n=6) strains balanced throughout the room
- Bovans Brown
- Dekalb White

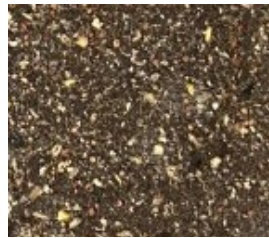


Methods

- 3 pecking blocks of varying calcium, fibre, and protein contents available simultaneously on the floor
- Cut to uniform size and shape
- Location switched weekly



A: mineral and grains
Ca (19-20%)

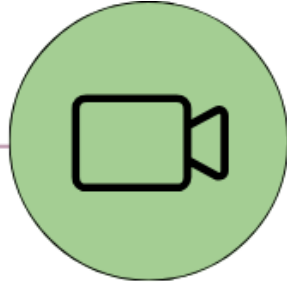


B: mineral and grains
Ca (16-19.2%)



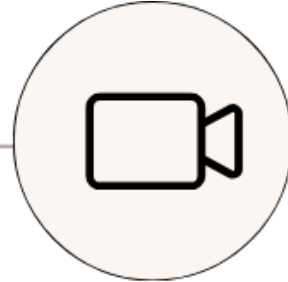
C: mineral-based
Ca (21-24%)

Weekly Timeline



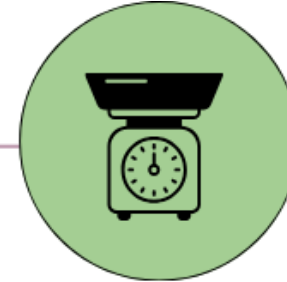
TUESDAY

Recorded 3 brown pens and 3 white pens.



WEDNESDAY

Recorded 3 brown pens and 3 white pens.



THURSDAY

Weighed pecking blocks and rotated pecking block location.

Repeated from 20 to 41 weeks of age.

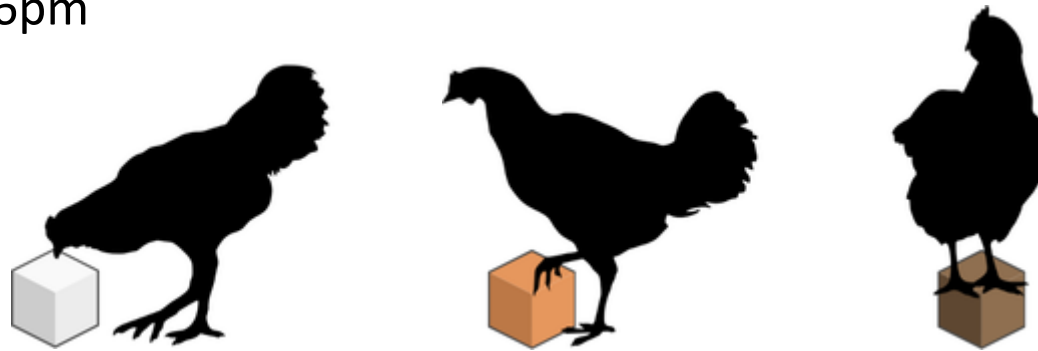
Pecking Block Disappearance

- Pecking block weights collected weekly for 21 weeks (g/day/hen)
- If 50% or more of the original weight was lost, all pecking blocks in that pen were replaced



Behaviour Observations

- Quantified behaviour directed at each block by videos
 - # of pecks or scratches/10min/block
- Continuously observed 10-minutes from each time section for each pecking block
 - 9-11am, 1-3pm, 4-6pm



- Total of 21,100 minutes of videos observed
- 4 observers with an average IOR of 0.82 kappa

Videos

W-1449-1459.mp4



Playback Control



Time	Subject	Behavior	Comment
00:00.00	Start		
00:44.75	16	Container P	
00:45.14	16	Container P	
00:45.55	16	Container P	
00:45.91	16	Container P	
00:46.94	16	Container P	
01:00.21	10	Container P	

Codes

Subjects Behaviors Modifiers

Status



Choice Test 3

Block Pecking

b

Block Scratching

s

Container Pecking

v

Container Scratching

c

Block Standing

n

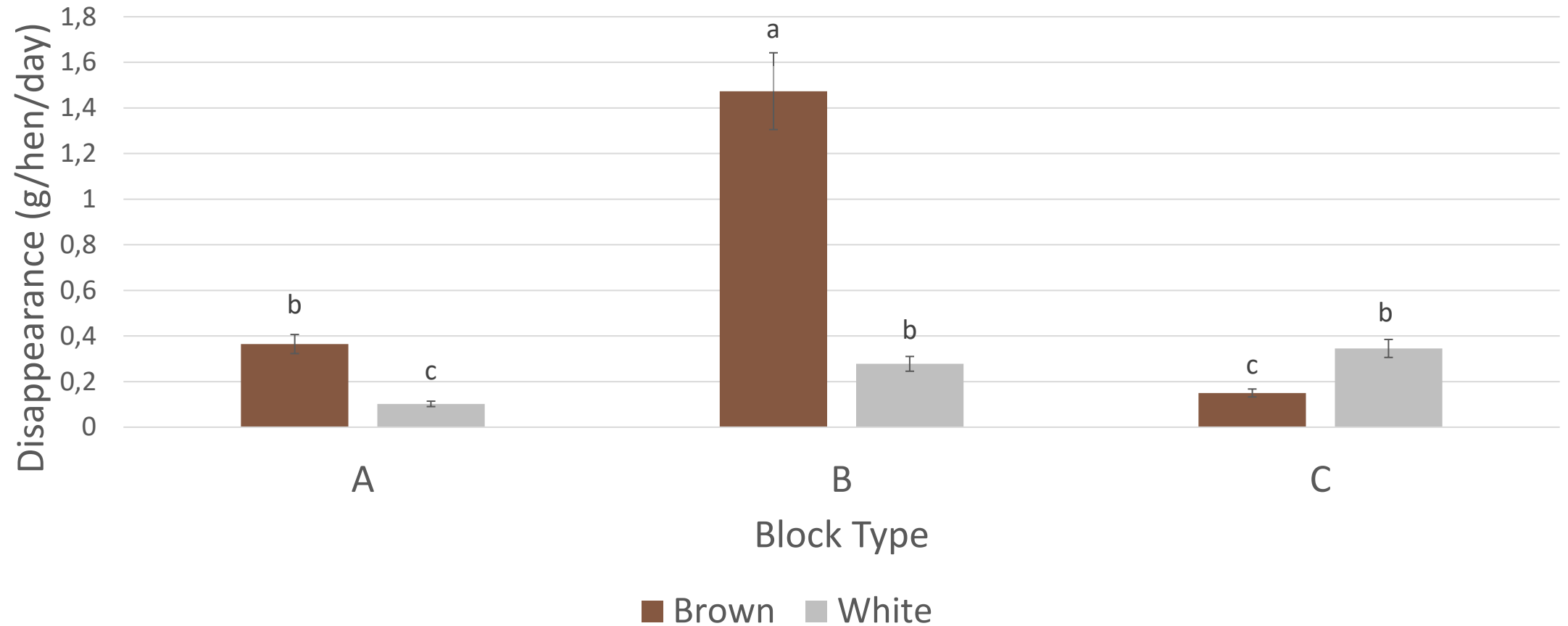
n

Statistics

- Statistical significance set at $P < 0.05$
- Experimental unit = pen
 - N=6/strain
- Block disappearance
 - Generalized linear mixed model
- Block pecking
 - Binary model to determine whether the block was pecked (yes/no)
 - Generalized linear mixed model for each strain
 - Fixed effects: block type, time of day, location and their interactions
 - Random: pen
- Block scratching
 - Descriptive analysis

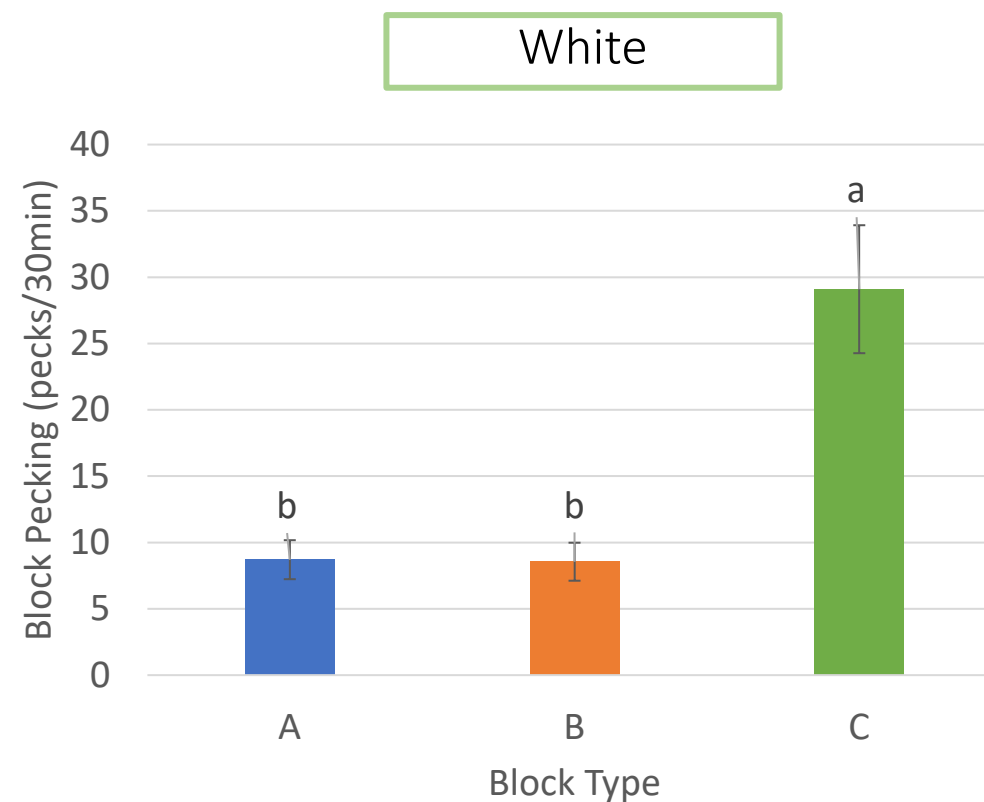
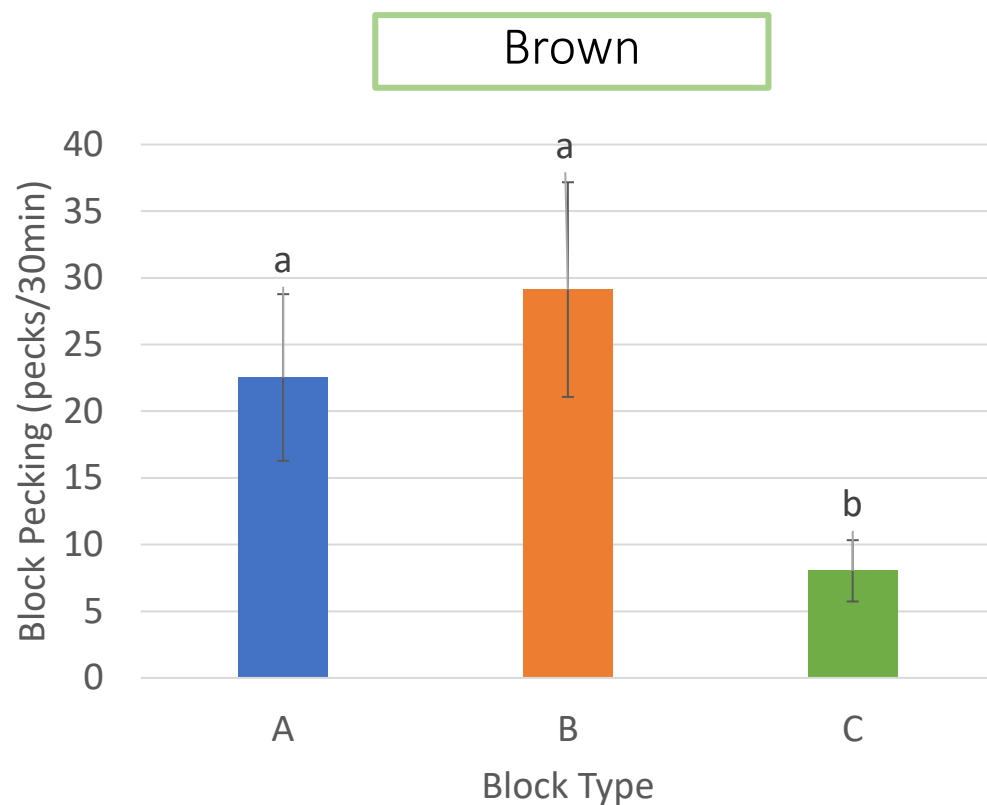


Block Disappearance



Means with the same letter are not significantly different ($p < 0.05$)

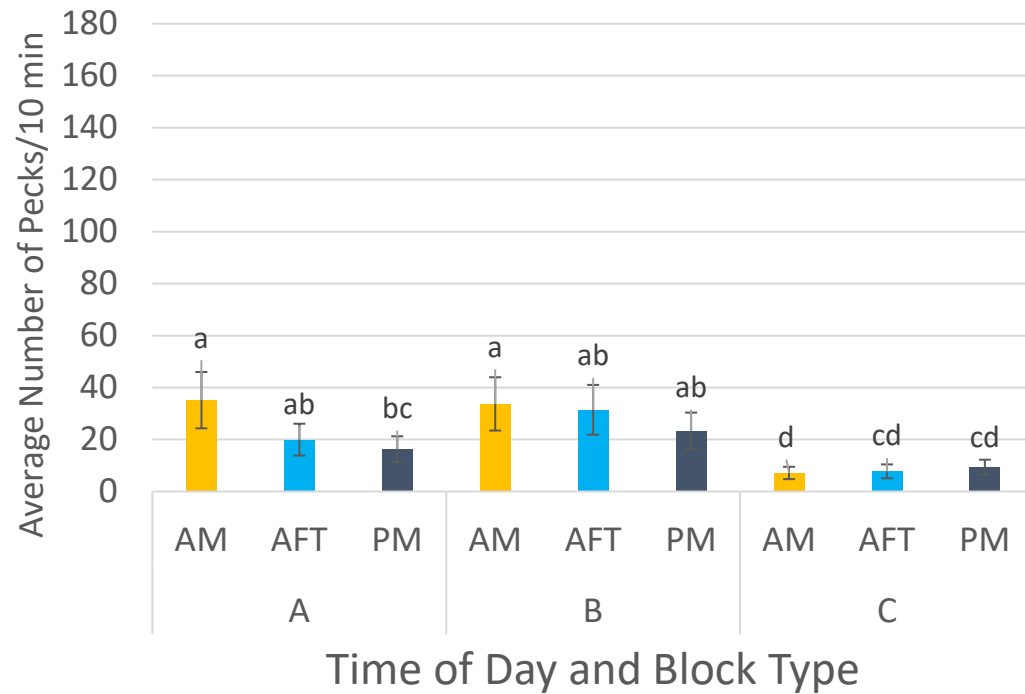
Block Pecking



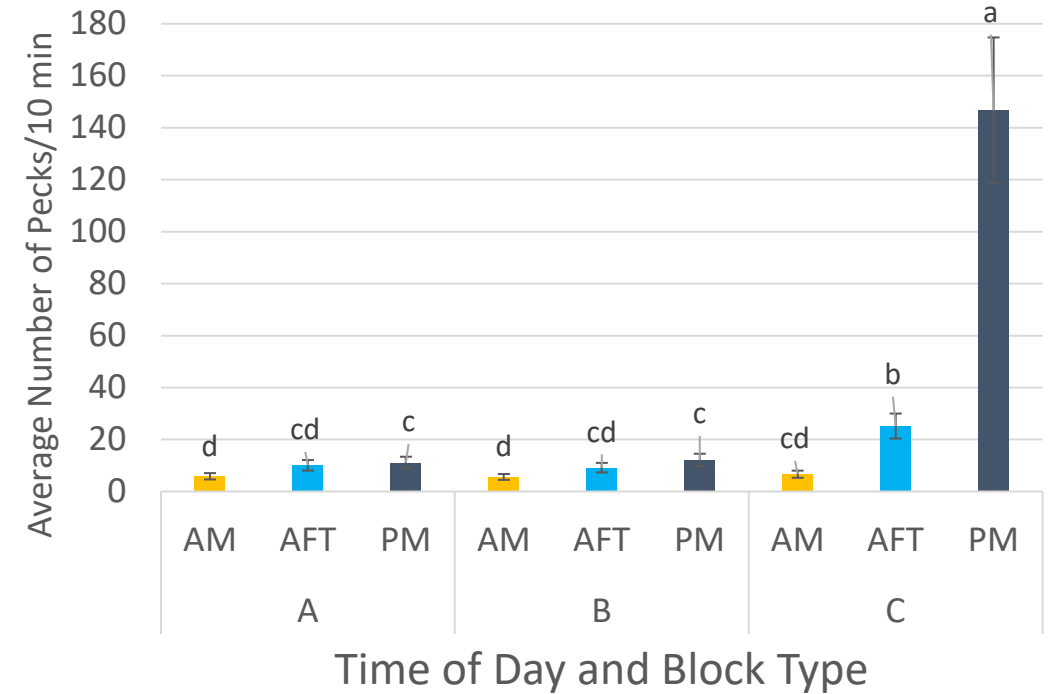
Means with the same letter are not significantly different ($p < 0.05$)

Block Pecking

Brown

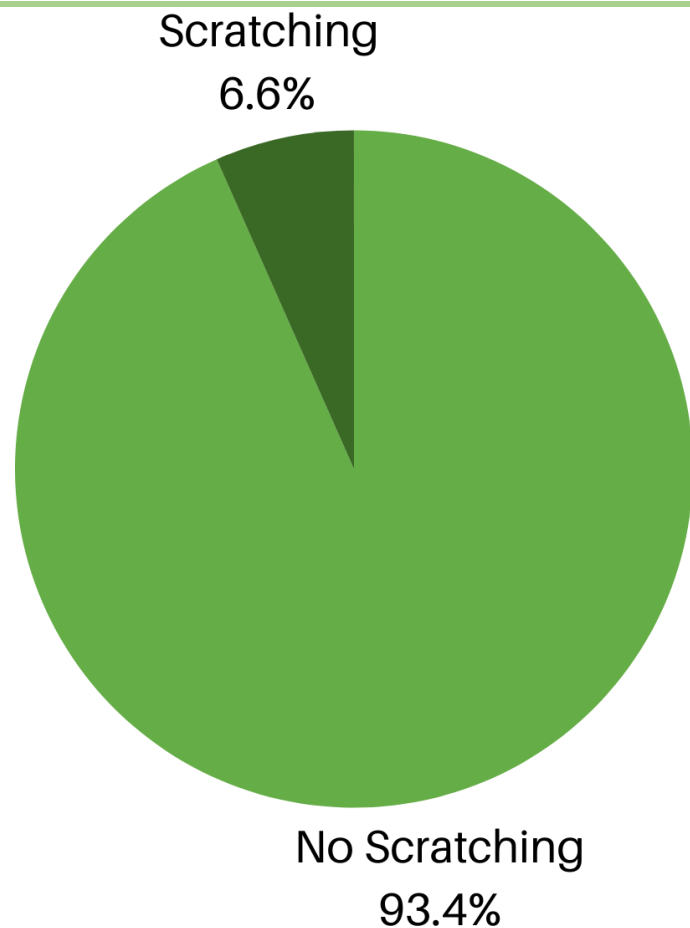


White

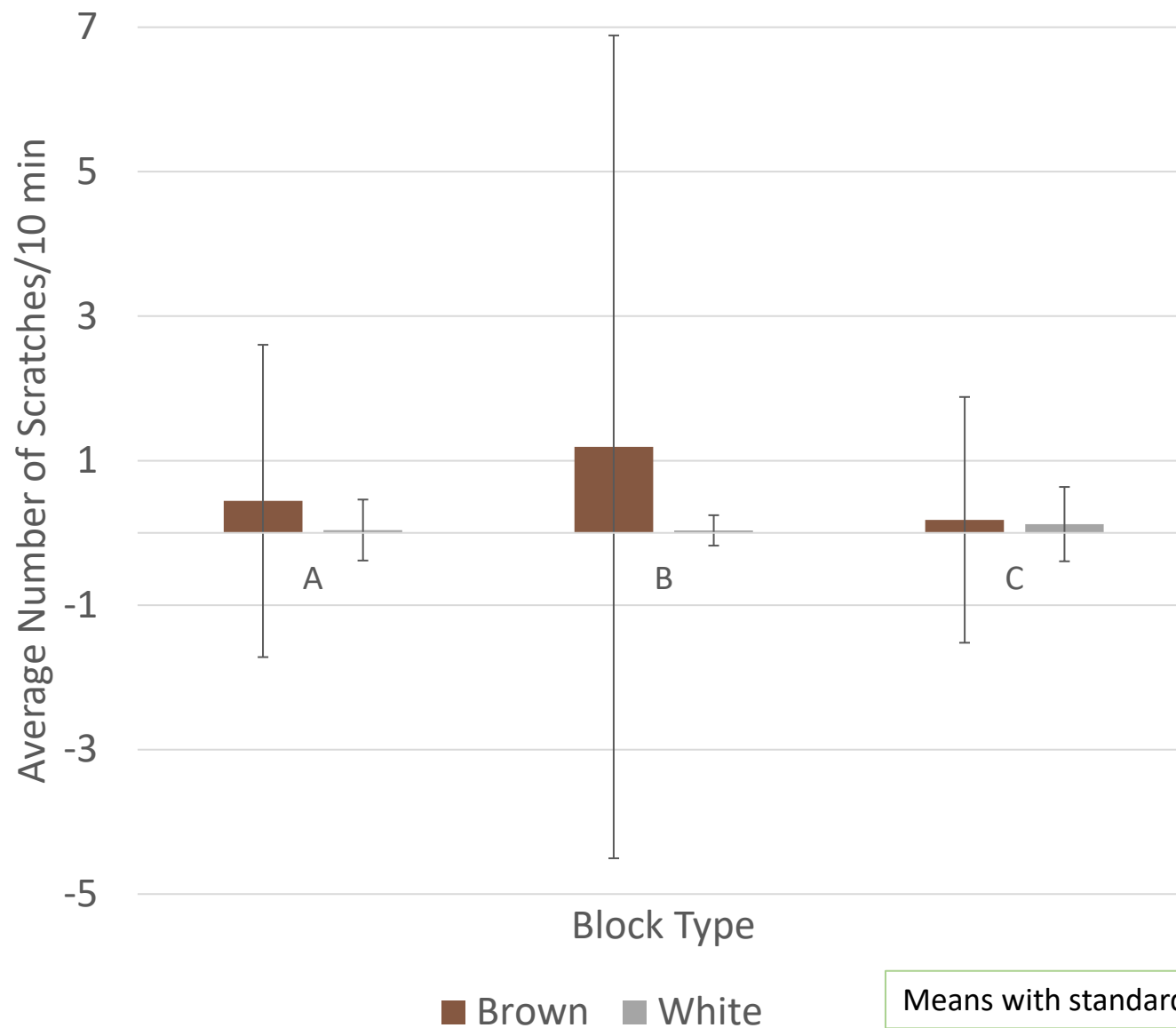


Means with the same letter are not significantly different ($p < 0.05$)

Block Scratching



- Out of 2,110 videos, scratching was observed in 140



Conclusions

- Different strains preferred different blocks
 - Browns block disappearance and block pecking was highest for A and B
 - Whites block disappearance was highest for B and C and block pecking was highest for C
- Behaviour directed at the blocks varied depending on time of day
 - Browns pecking behaviour was relatively uniform throughout the day
 - Whites pecking behaviour increased before lights out, especially with block C



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Thank you for listening!

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