

Reducing the risk of feather pecking through light during incubation and live insect feeding during the rearing period of organic laying hens



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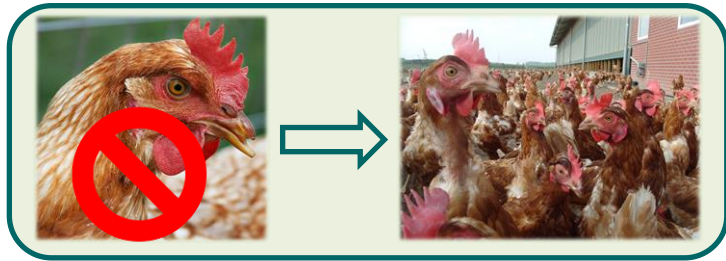


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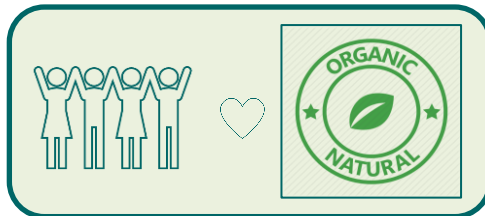
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PPILOW Background



Ban on beak trimming, increased risk of damage by feather pecking (FP)

Rodenburg et al., 2013



Adapt environment to animal behavioural needs



Prepare laying hens for outdoor life

Campbell et al., 2017

Importance of early life experiences



- **Incubation environment influences stress sensitivity**

Archer and Mench, 2014; Dayıoglu and Özkan, 2017



- **Enriched rearing environment reduces fearfulness and increases cognitive abilities**

Brantsaeter et al., 2016; Gilani et al., 2013; de Haas et al., 2014

PPILOW objective & methods

Reducing the risk of feather pecking through light during incubation and live insect feeding during the rearing period of organic laying hens

Objective & methods

- **Optimize early-life environment** to reduce fearfulness and feather pecking, resulting in more resilient birds
 - Green light-dark cycle during incubation and hatching
 - Provision of larvae as enrichment during rearing
- **2 rounds of experiments** (completed in Sept 2021)
 - Behaviour tests
 - Home pen observations
 - Physiological data (blood, feathers, brains)

2x2 factorial design, 44 pens (400 hens) in total:



Behaviour tests overview

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Round 1 Jan-Jun '20	NO-1		LT		FP	COVID				NOT-2 HA	TI			VR	FS			
Round 2 Apr-Sep '21	NO-1 FBO		LT FBO		FP	VA	FBO	OF		NOT-2 HA	TI		VR		MS FS			CFL

Individual tests:

LT = Lateralisation test

VA = Voluntary approach test

TI = Tonic immobility test

OF = Open field test

MS = Manual restraint test

FS = Feather scoring

CFL = Contrafreeloading test (pilot)

Pen level tests:

NO = Novel object test

FBO = Foraging behaviour observations

FP = Feather pecking observations

HA = Human Approach test

VR = Vaccination recovery test

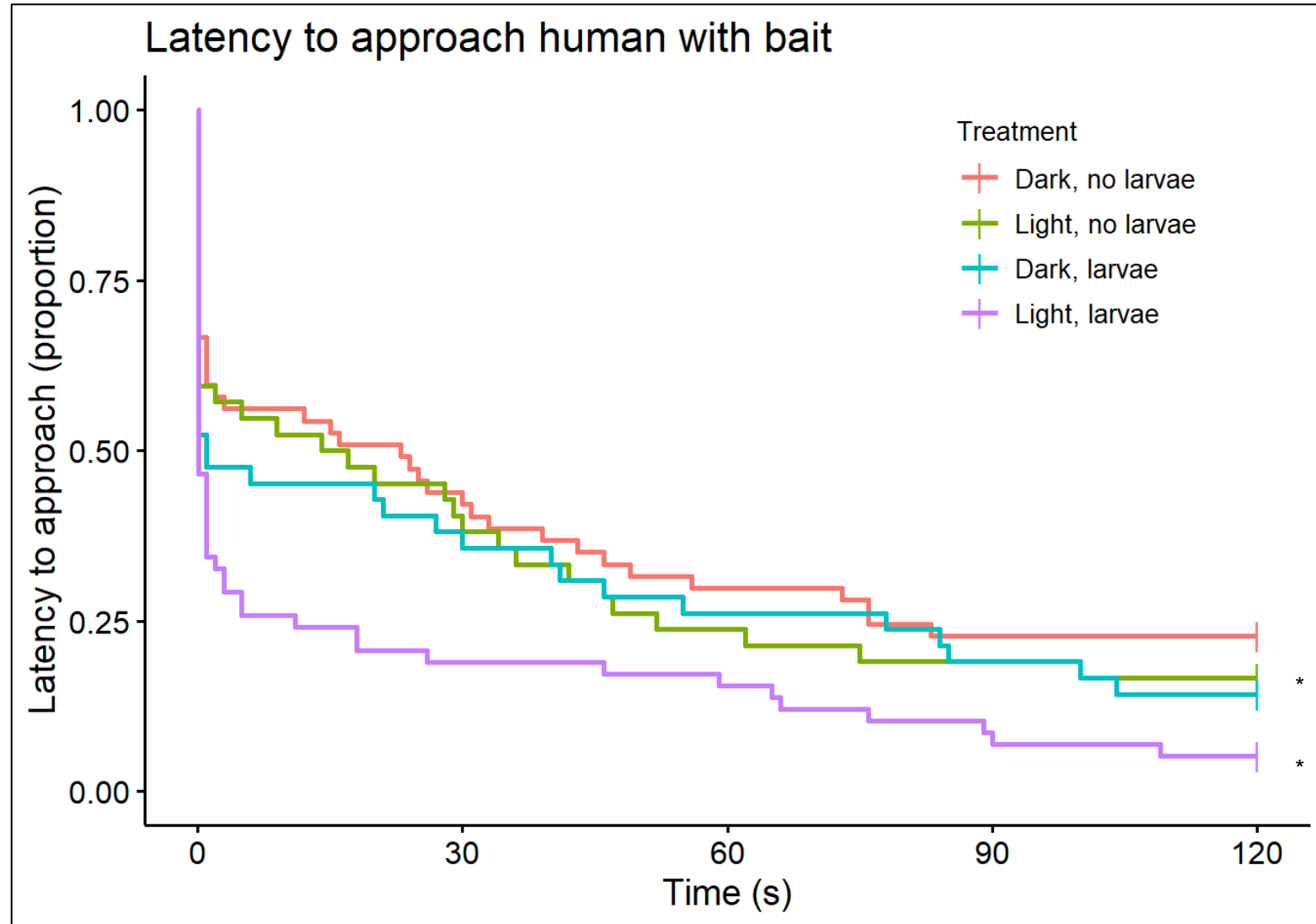
PPILOW Data collection



PPILOW Results

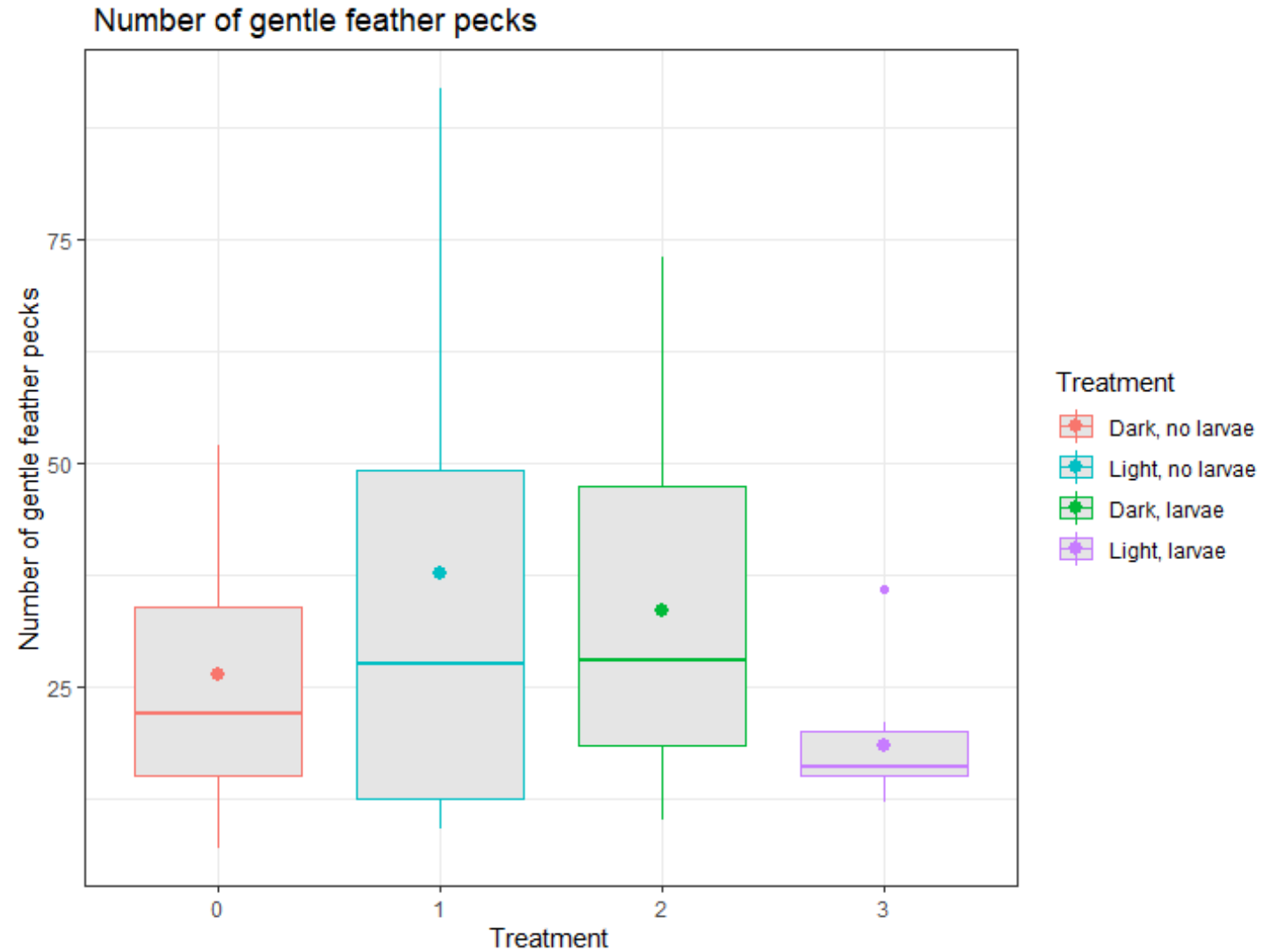
Light-incubated birds approached 1.29 times faster than dark

(95% CI 0.09-0.99, $p < 0.05$)



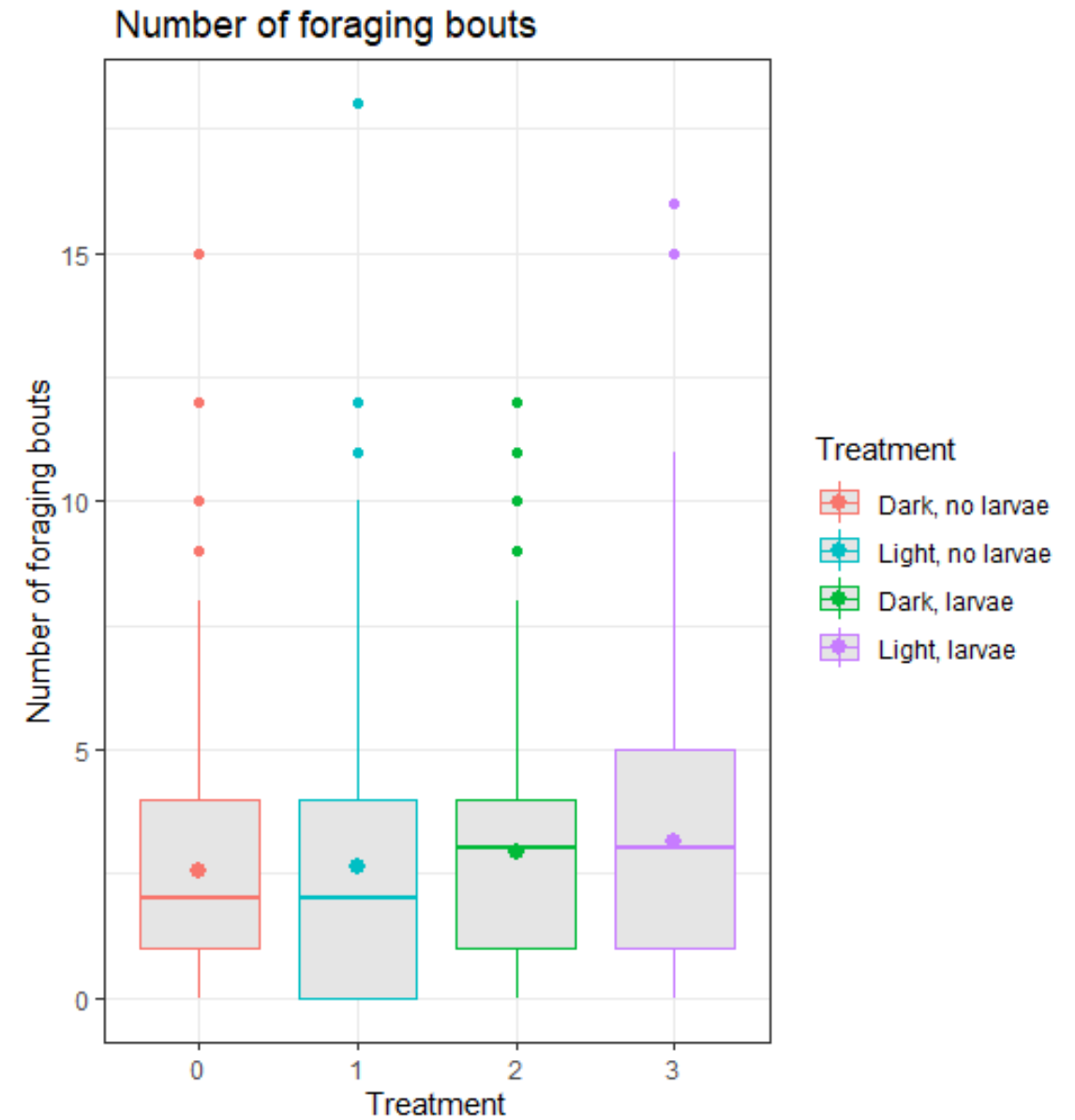
PPILOW Results

- No effect of light-incubation and larvae provisioning on number of gentle FP (see figure)
- Hardly any severe FP observed
- Gentle FP 1.34 times more often in round 1 compared to round 2
(95% CI 0.27-0.44, $P < 0.0001$)



PPILOW Results

- Larvae-enriched birds foraged 1.19 times more often than birds that did not receive larvae (95% CI 1.02-1.29, $p=0.008$)
- **Note:** pen level data only scored in round 2, so low sample size

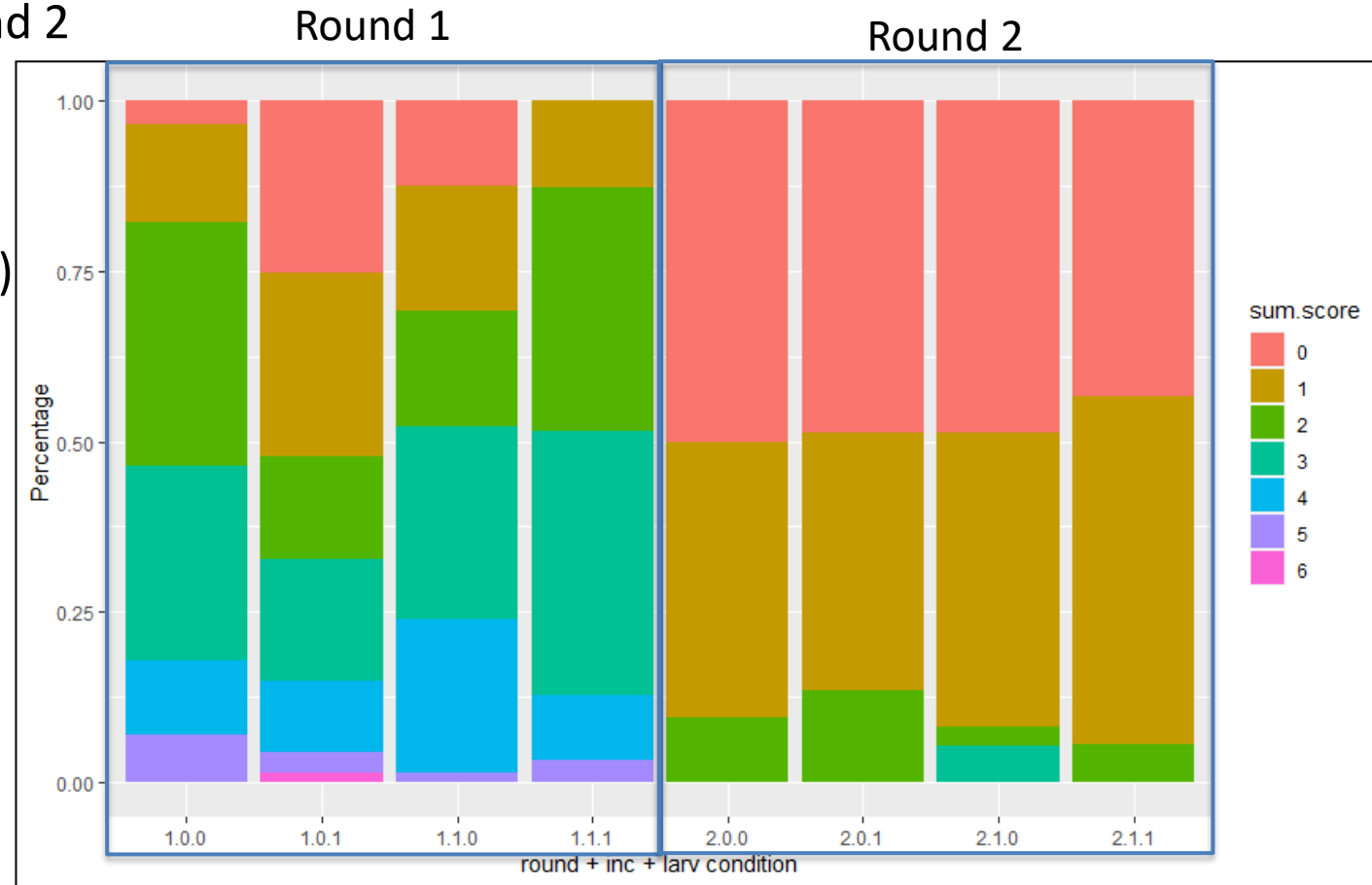


Round effect in some tests

- Longer latency to approach novel object in round 2
- More gentle feather pecks observed in round 1
- Slightly more feather damage in round 1 (figure)



Novel object test, round 2



Total score of 11 body regions; 0 = no damage, 6 = most damage (method from Bilcik & Keeling, 1999)

Early-life effects

- In general, minor effects of treatments on behaviour
- Light during incubation reduced fear of humans in voluntary approach test
- Larvae provisioning slightly increased foraging behaviour (though low sample size)
- Larvae provisioning did not affect fearfulness or FP
- Round effects in some tests, from early age onwards (week 1), reasons unclear
- Many tests only performed in round 2 due to COVID-19 restrictions
- Physiology and tracking data → analysis ongoing

Long-term effects

Follow-up study in progress, results expected in 2023
(effect on FP and free-range use)



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Thank you!



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