PPILOW

How to avoid feather pecking in non-beak-trimmed hens?

Bas Rodenburg, Maëva Manet, Emy Ridderbos, Saskia Kliphuis

Utrecht University

PPILOW seminar
22 February 2024

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 816172

PPILOW Feather pecking in laying hens

Behaviour and welfare of laying hens can be affected by conditions during different life phases:

1. Maternal conditions during egg laying (de Haas et al, 2014)
2. Conditions during incubation and hatching
3. Early-life conditions (0-17 wk of age)
4. Adult-life conditions (17-80 wk of age)

Effects on: fearfulness, stress sensitivity, feather pecking, cannibalism

PPILOW Conditions during incubation and hatching

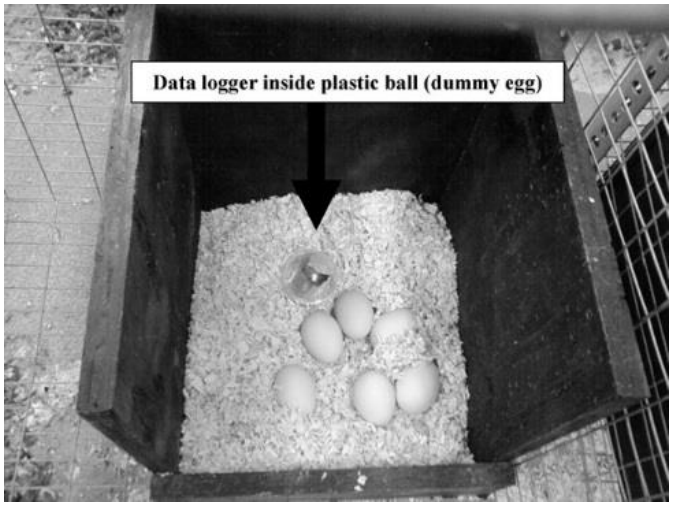
Eggs are normally incubated in darkness

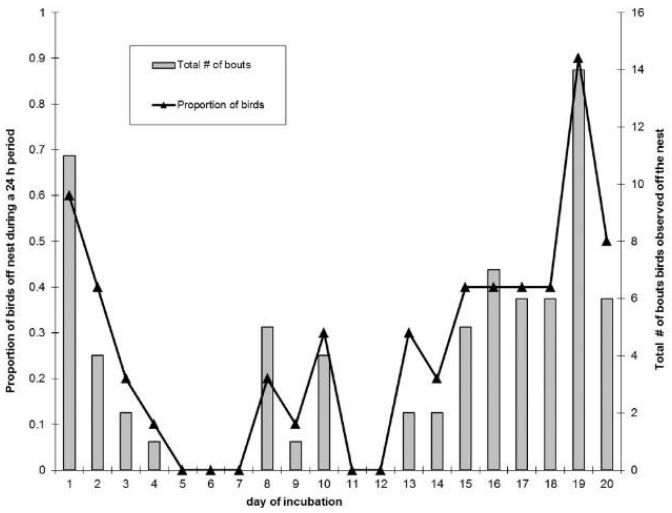
Hen also leaves the nest from time to time

Recent studies show positive effects of light during incubation in broilers (12L:12D

Mechanisms:

- Increased brain lateralisation
- Earlier onset hormonal rythms





(Archer en Mench, 2014)

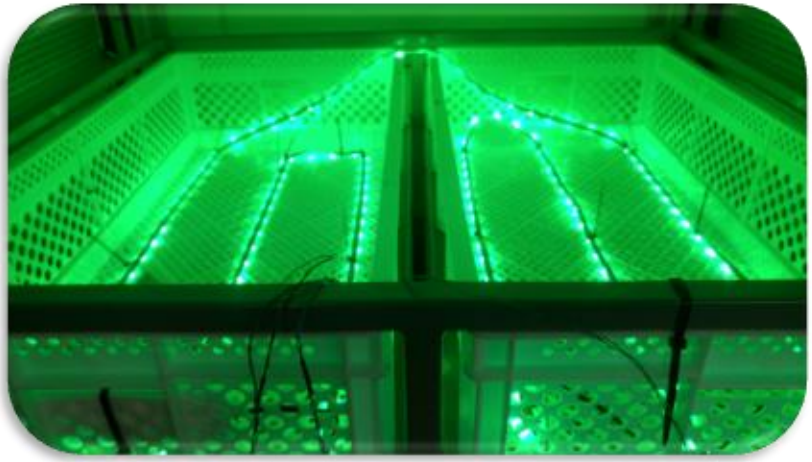
PPILOW Conditions during incubation and hatching

Light colour also plays a role

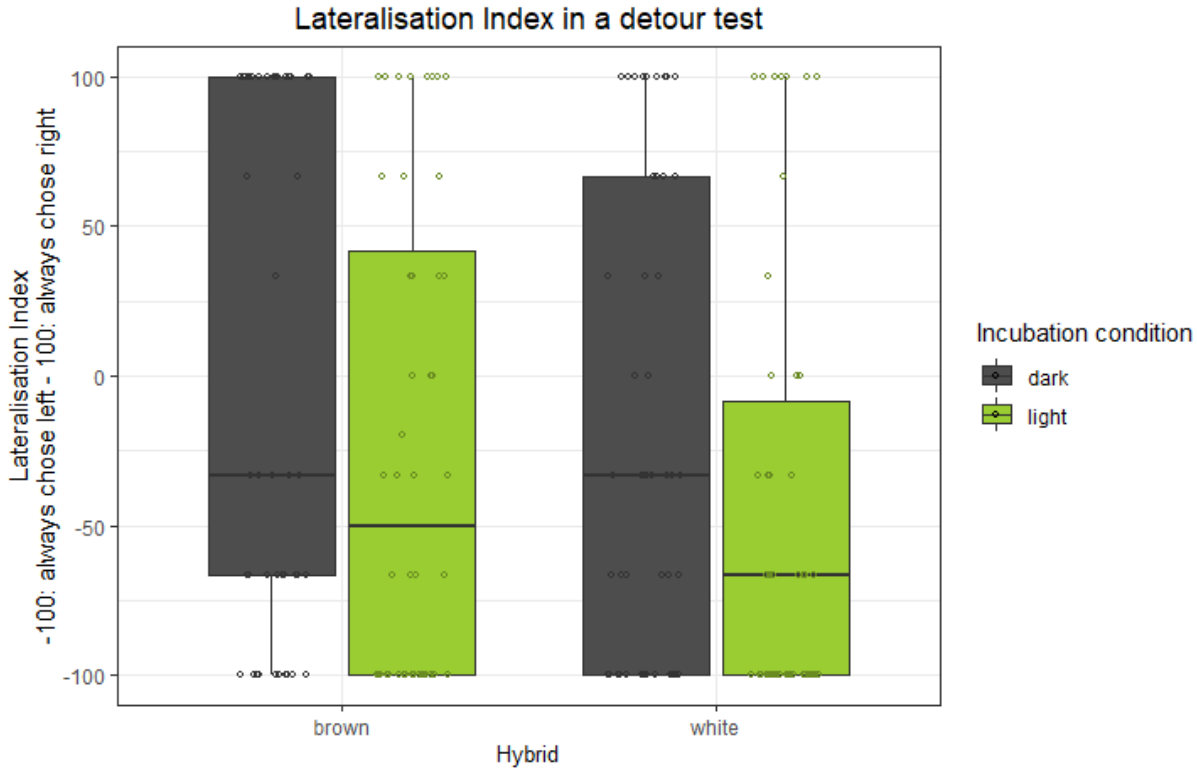
Short exposure to white light: more gentle feather pecking in young chicks (Riedstra and Groothuis, 2001)

Research with 12L:12D with white, green and no light

- White: more FP than dark
- Green: less FP than dark (Ozkan et al., 2022)



PPILOW Light incubated chicks more lateralised



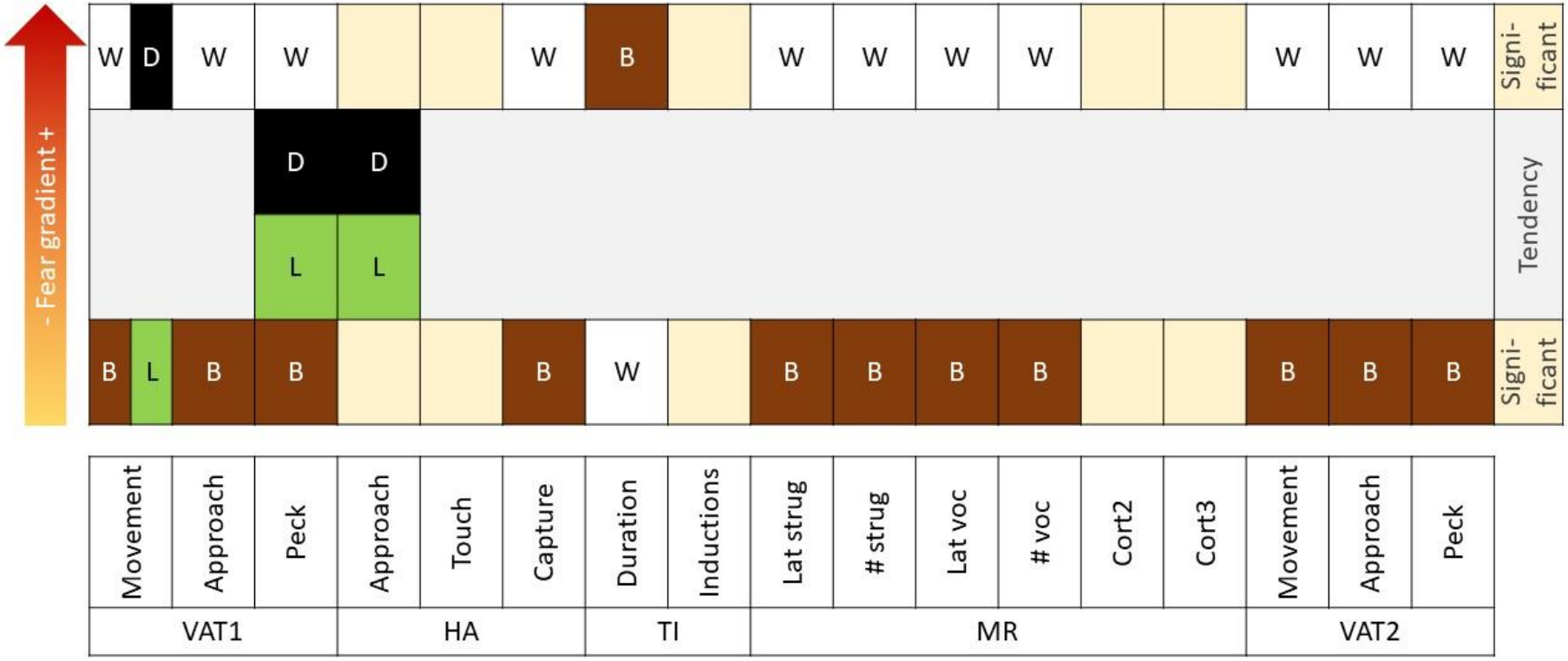
Light chicks tend to pass obstacle on the left

No difference brown and white

No effect on cognitive performance in holeboard test

(Manet et al., submitted)

PPILOW White pullets more fearful than brown pullets



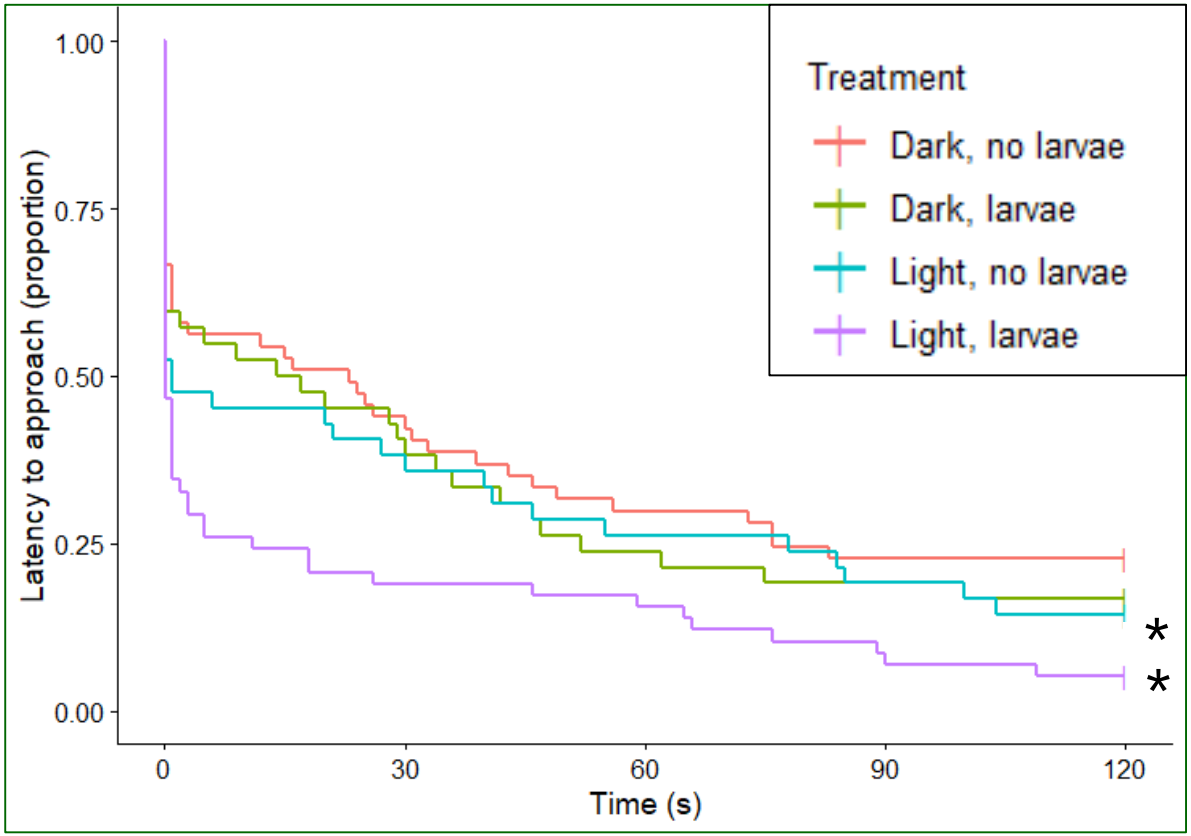
(Manet et al., 2023)

PPILOW PPILOW experiment: light during incubation and enrichment with insect larvae during early life

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

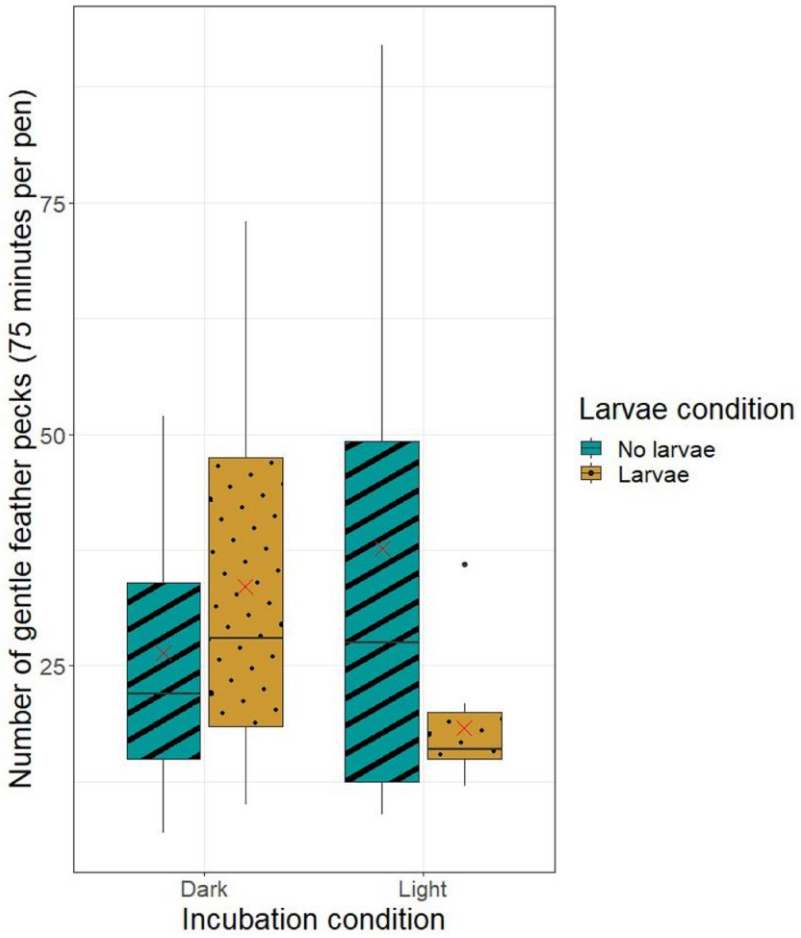
Light-Dark – No larvae	Light-Dark – Larvae	Dark - Larvae	Dark – No larvae

PPILOW Fear of humans (6 wks)



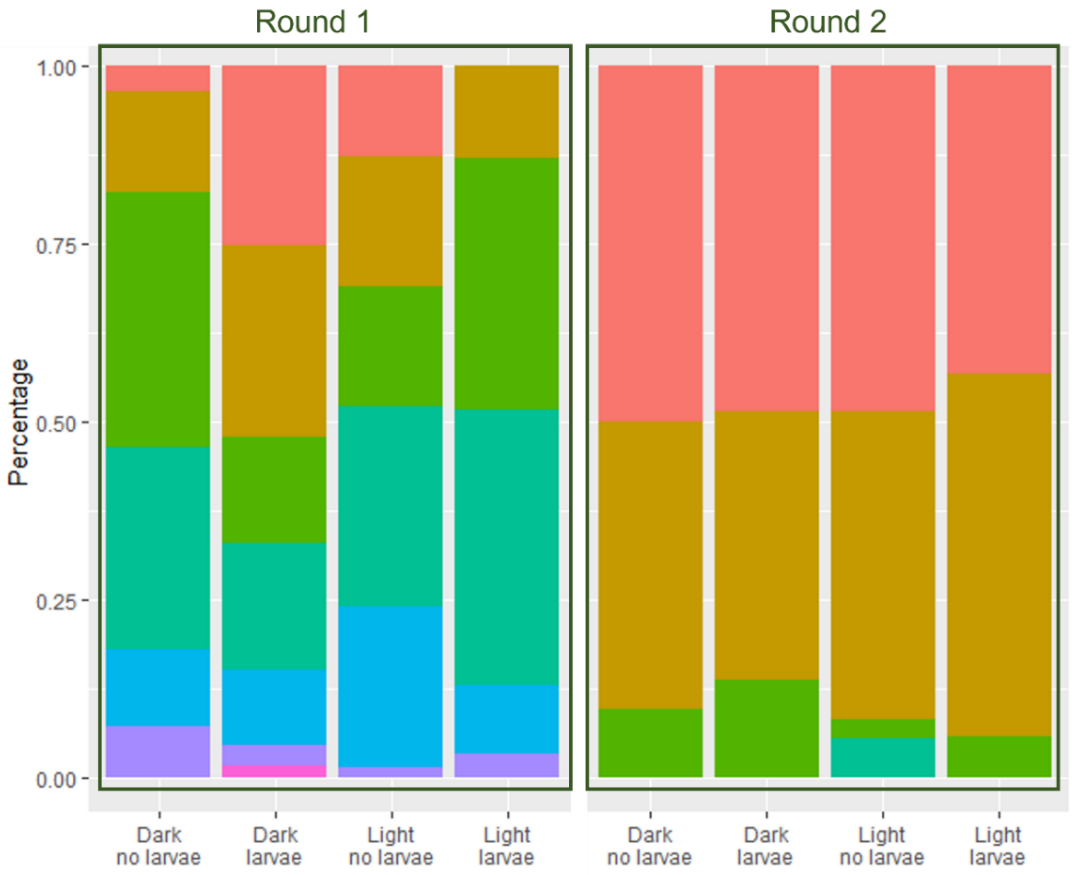
- Light-incubated birds approached 1.29 times faster than dark (95% CI 0.09-0.99, p<0.05)
- However: No effects found in other fear tests

PPILOW Feather pecking (5 wks)



- No effect of light-incubation and larvae on number of gentle FP
- 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)

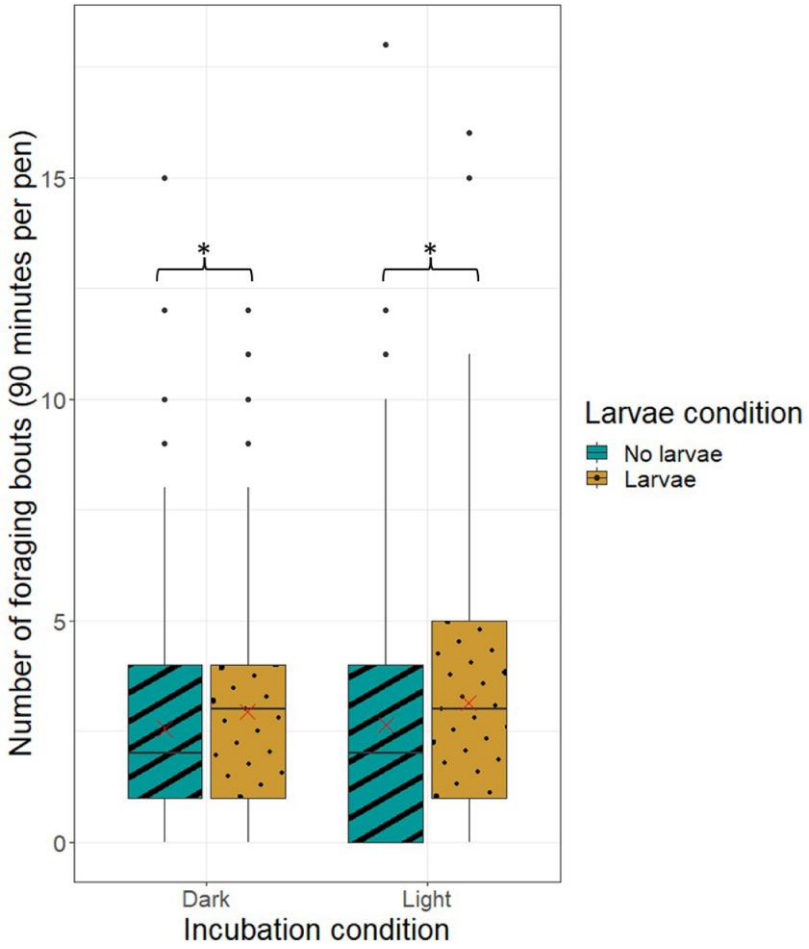
PPILOW Highlights per task - Feather scoring (15 wks)



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

- Overall little feather damage (max score = 54, our birds had max 6)
- No effects of light or larvae on feather damage
- Slightly more feather damage in round 1

PPILOW Foraging behaviour (1, 3 and 7 wks)



- Larvae-enriched birds foraged 1.19 times more often than birds that did not receive larvae (no effect on total foraging time) (95% CI 1.02-1.29, p=0.008)

PPILOW Conclusions experimental work

Effects of light during incubation seem stronger in broilers than in laying hens

Positive effects on brain lateralisation and on fear of humans, but no effect on other fear tests

Comparison white and brown strains shows how different these are in fearfulness: useful for practice

Environmental enrichment with insect larvae stimulates foraging in pullets – could help to reduce risk feather pecking

PPILOW Adult phase: on-farm observations

Collaboration with Dutch farms that work with small mobile houses for laying hens

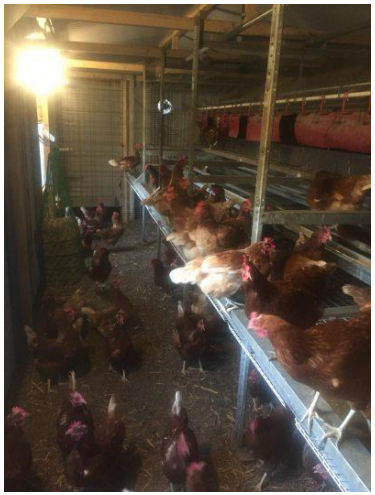
During avian influenza: birds restricted to covered veranda

PPILOW Adult phase: on-farm observations

Four farms (two different types of mobile house):

- Two farms with layer hybrid
- Two farms with dual-purpose hybrid

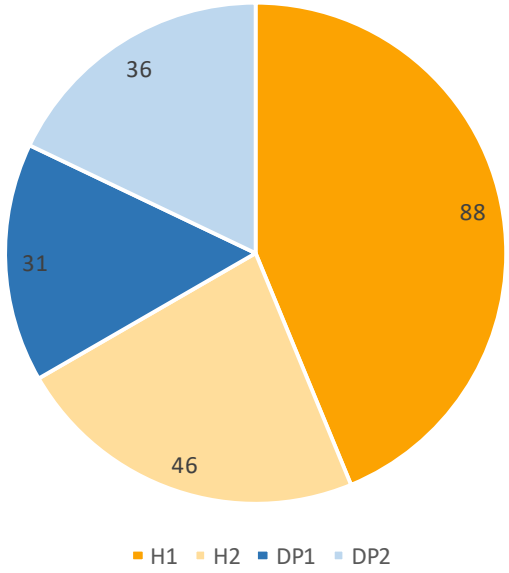
- Variation in quality of environmental enrichment in the covered veranda (only haybale or more variation)

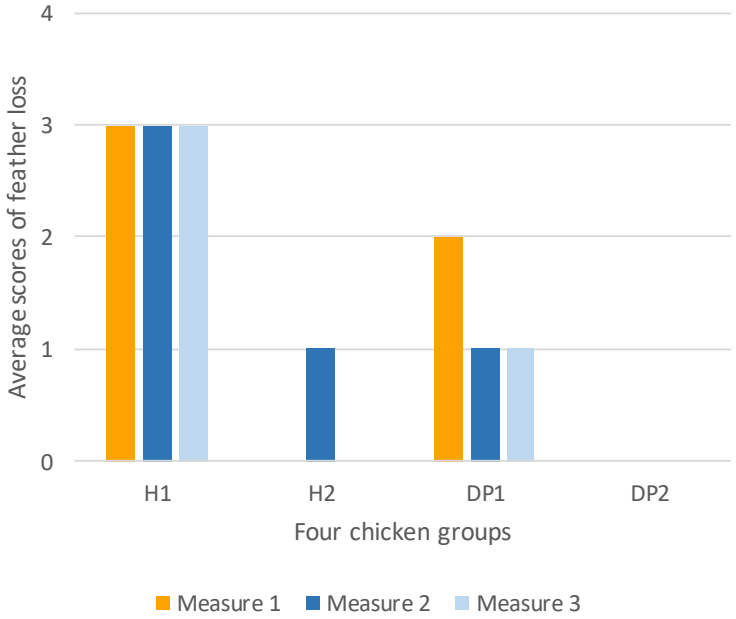


PPILOW Adult phase: feather pecking and damage

Four farms (two different types of mobile house):

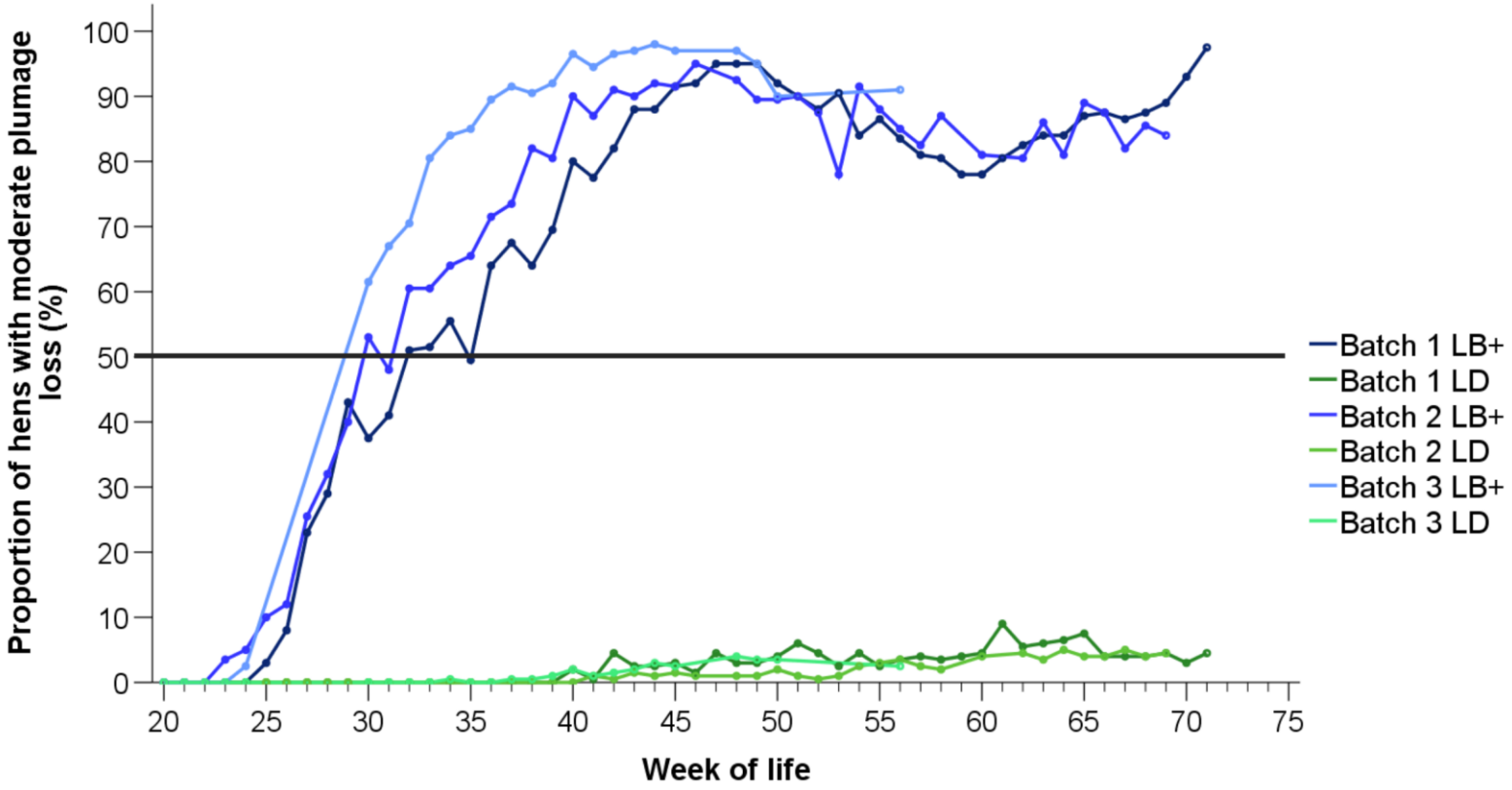
- Most feather pecking and feather loss in one of the layer hybrid flocks (H1), which also had the poorer environment





PPILOW Adult phase: feather damage

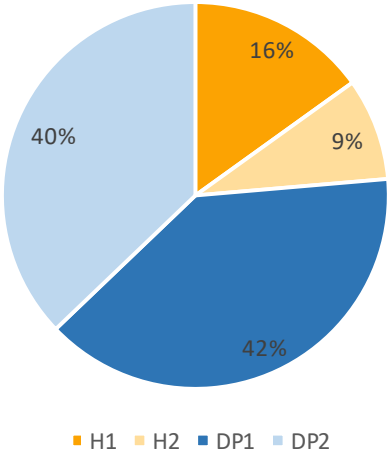
Confirmed in scientific studies (Giersberg et al, 2020):

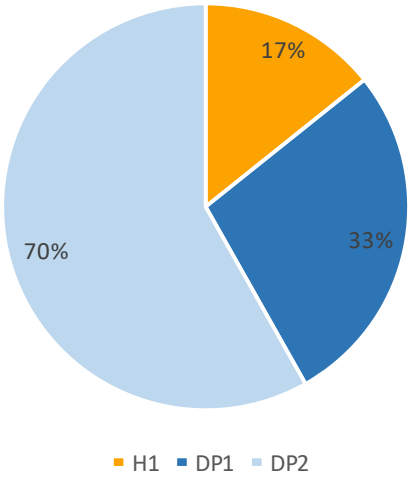


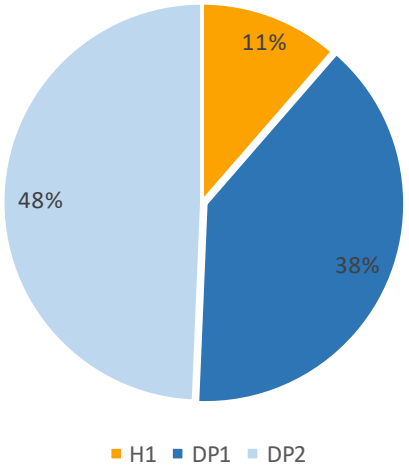
PPILOW Adult phase: foraging

Four farms (two different types of mobile house):

- Dual-purpose flocks showed much more normal foraging behaviour (both during morning, afternoon and evening)



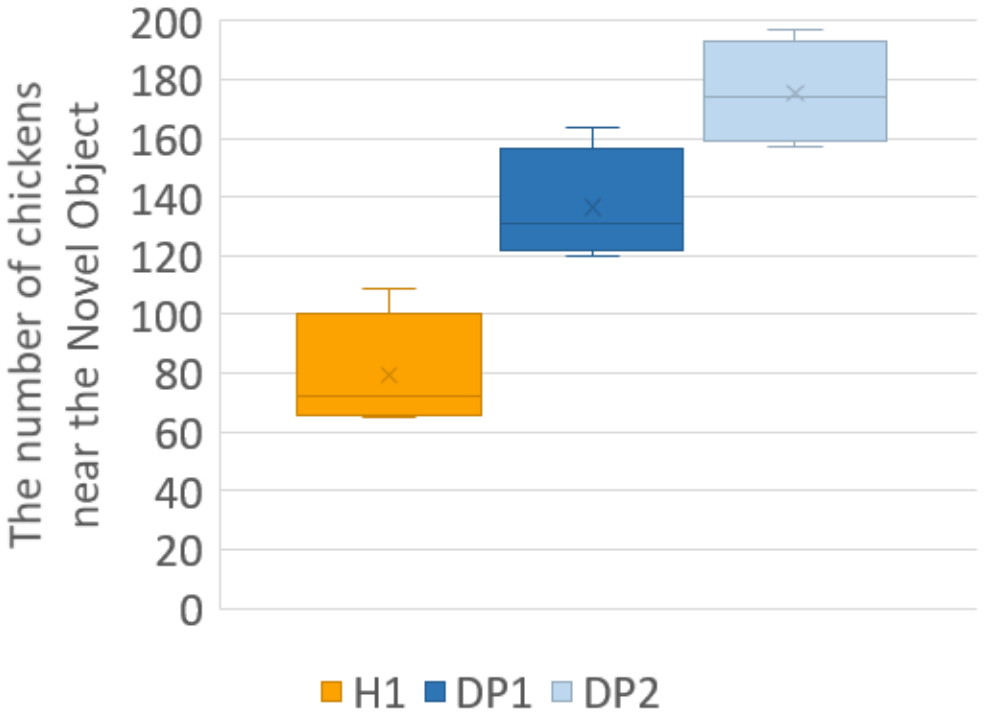




PPILOW Adult phase: fearfulness

Four farms (two different types of mobile house):

- Dual-purpose flocks less fearful of a novel object
- Number of birds approaching



PPILOW Conclusions

Conclusions on-farm observations:

- During avian influenza outbreak, covered veranda is important for birds to show foraging (helps to prevent FP)
- Good quality environmental enrichment important: alfalfa bales, fresh greens, hay, straw, pecking blocks
- Dual-purpose birds seem less at risk to develop FP and show more normal foraging behaviour, less fearful – opportunity for small-scale producers?

PPILOW **PARTNERS**

Thank you for your attention

www.ppilow.eu

PPILOW

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 816172