



New strategies to improve welfare of low-input outdoor and organic laying hens

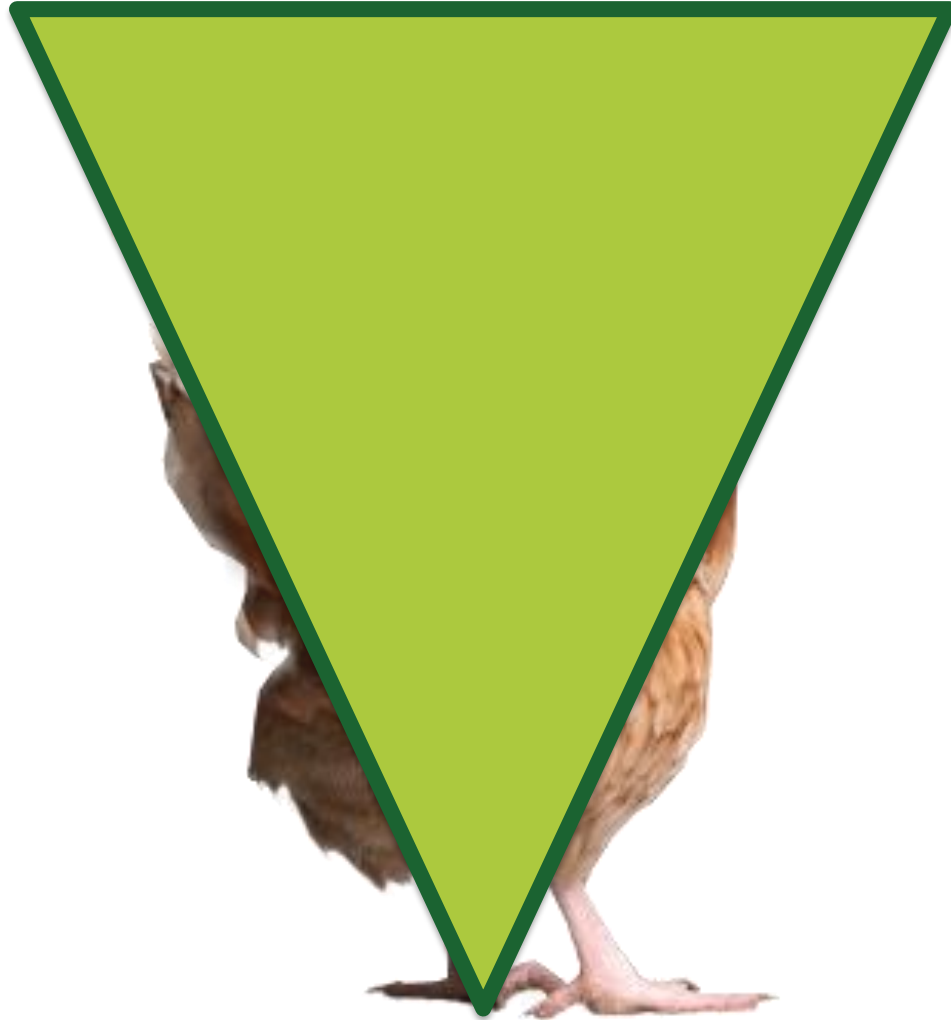
**Saskia Kliphuis**

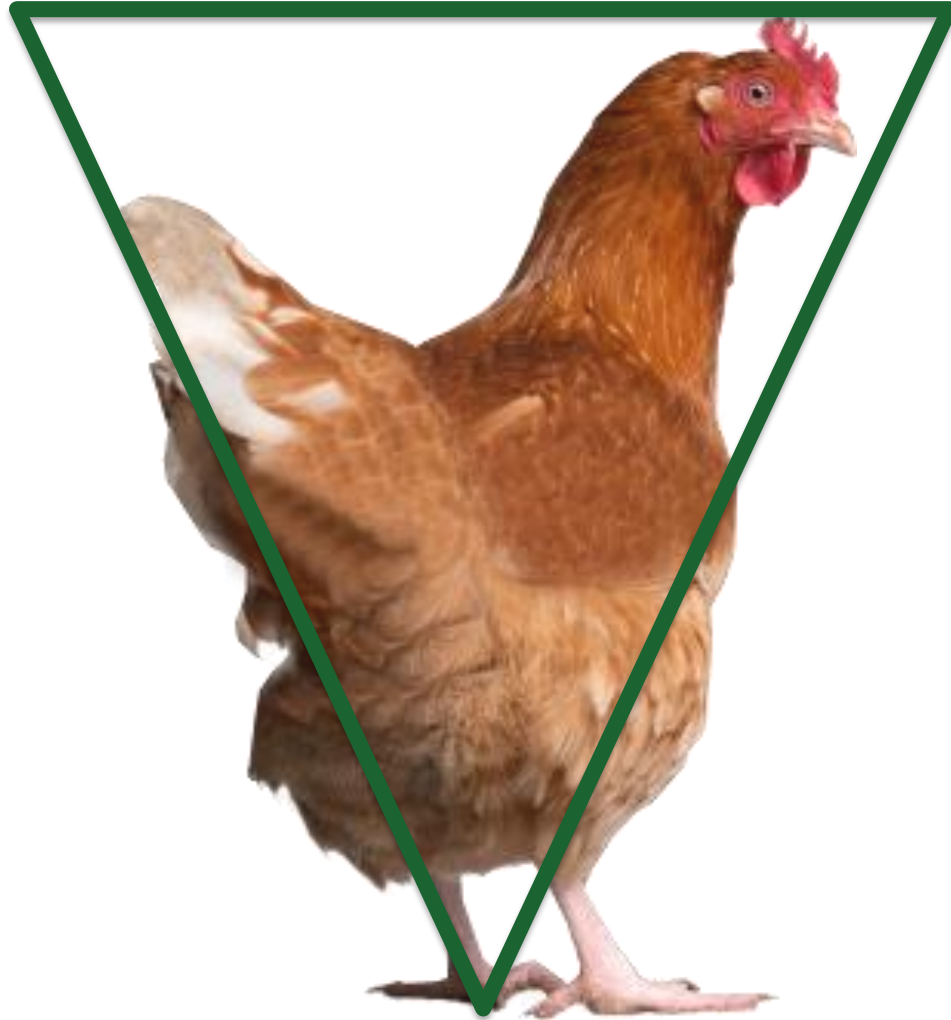


**Utrecht  
University**

**PPILOW Seminar – Wageningen  
21 May 2024**

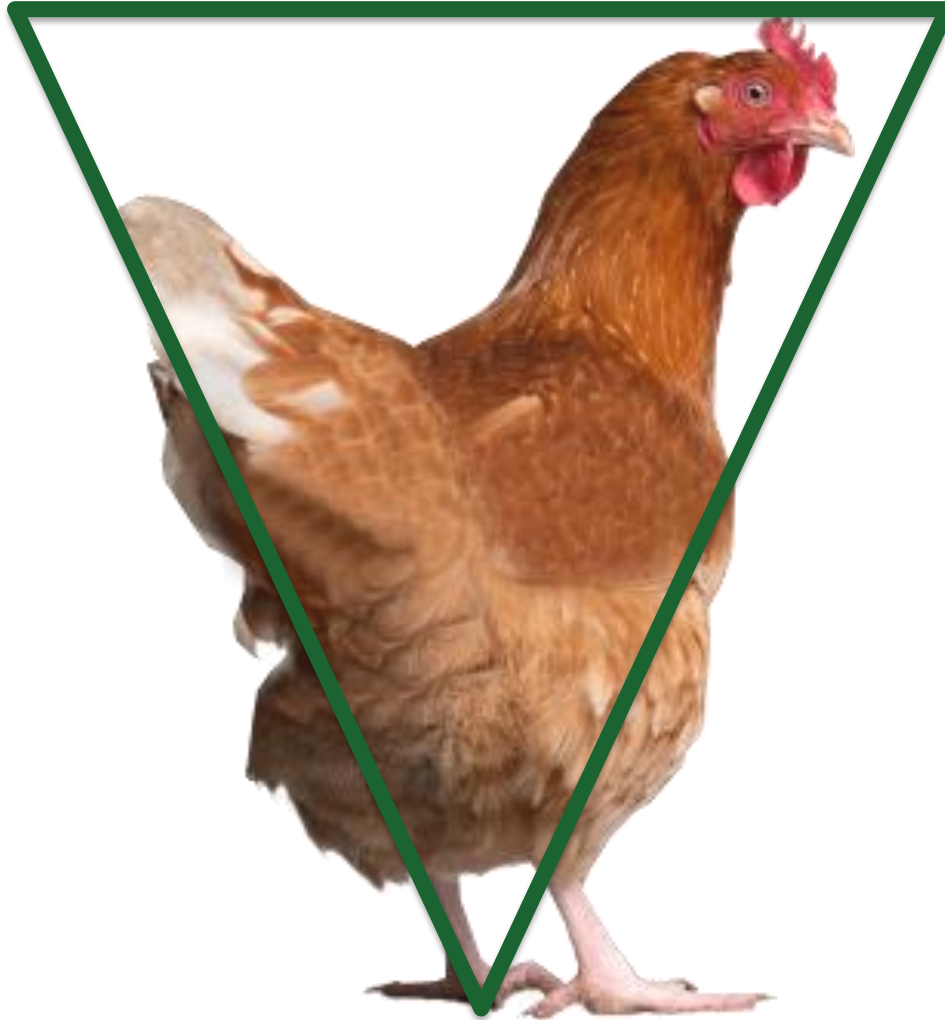






**Industry**

**Science**



**Society**



- **Understanding biology**  
behaviour, physiology, cognition
- **Optimizing environment**  
incubation & hatching conditions, housing in all life stages

# What do we know so far?

- Importance of early life for normal development (Janczak & Riber., 2015)
- Fear of humans & gentle feather pecking early age → risk FP adult age (de Haas et al., 2014)
- Green light during incubation has potential (previous presentation)
- **Environmental enrichment during rearing is key** (Campbell et al., 2018)
  - Insects are part of natural chicken diet
  - Black Soldier Fly larvae provisioning:
    - Improved health in broilers (Ipema et al. 2020)
    - Improved feather condition in older laying hens (Star et al. 2020)



# 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 Behaviour tests overview

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>Round 1</b> Jan-Jun '20	NO-1		LT		FP	COVID				NOT-2 HA	TI			VR	FS			
<b>Round 2</b> 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:

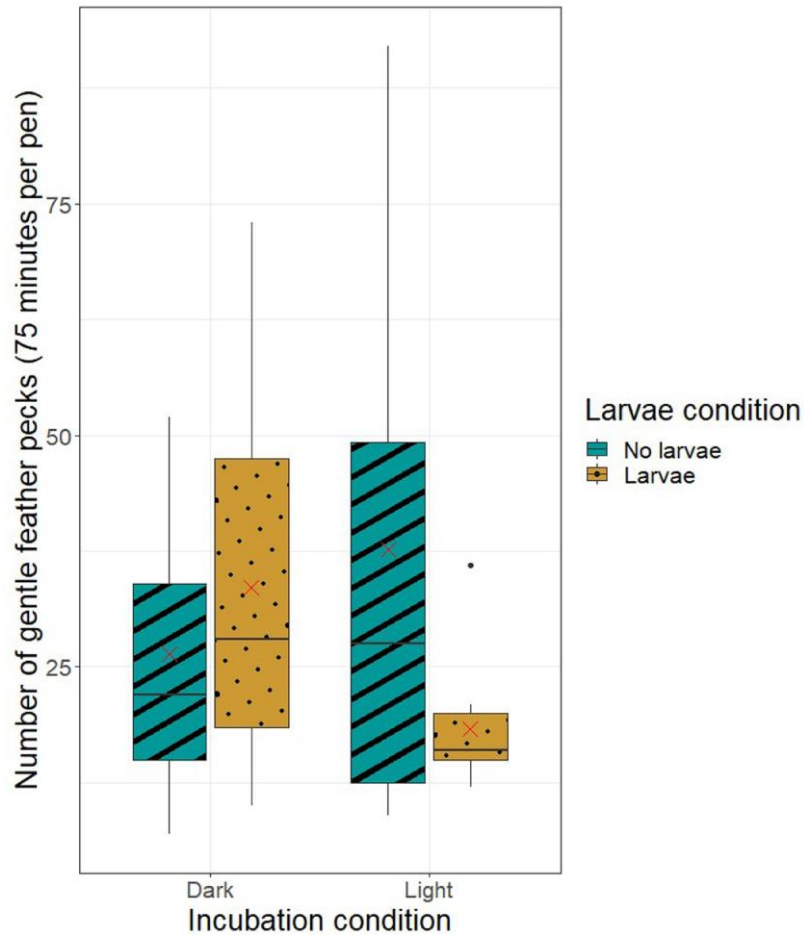
NO = Novel object test

FBO = Foraging behaviour observations

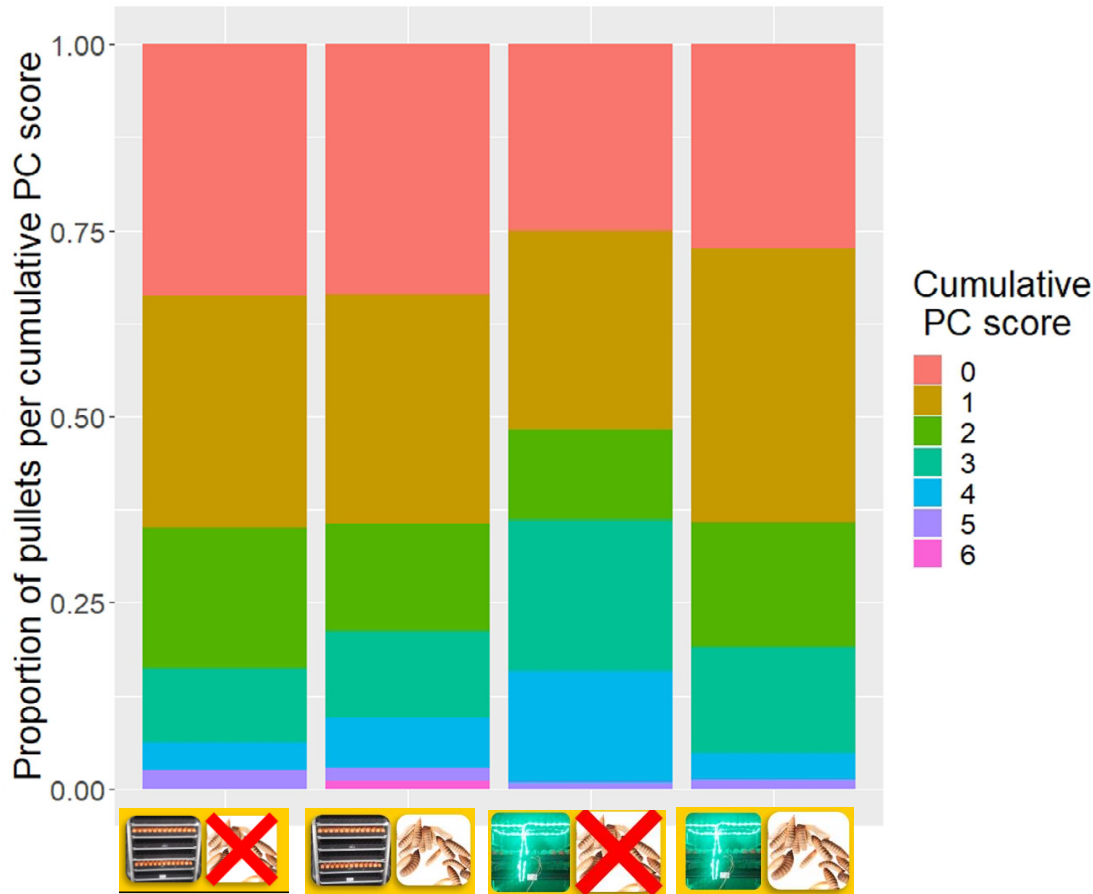
FP = Feather pecking observations

HA = Human Approach test

VR = Vaccination recovery test

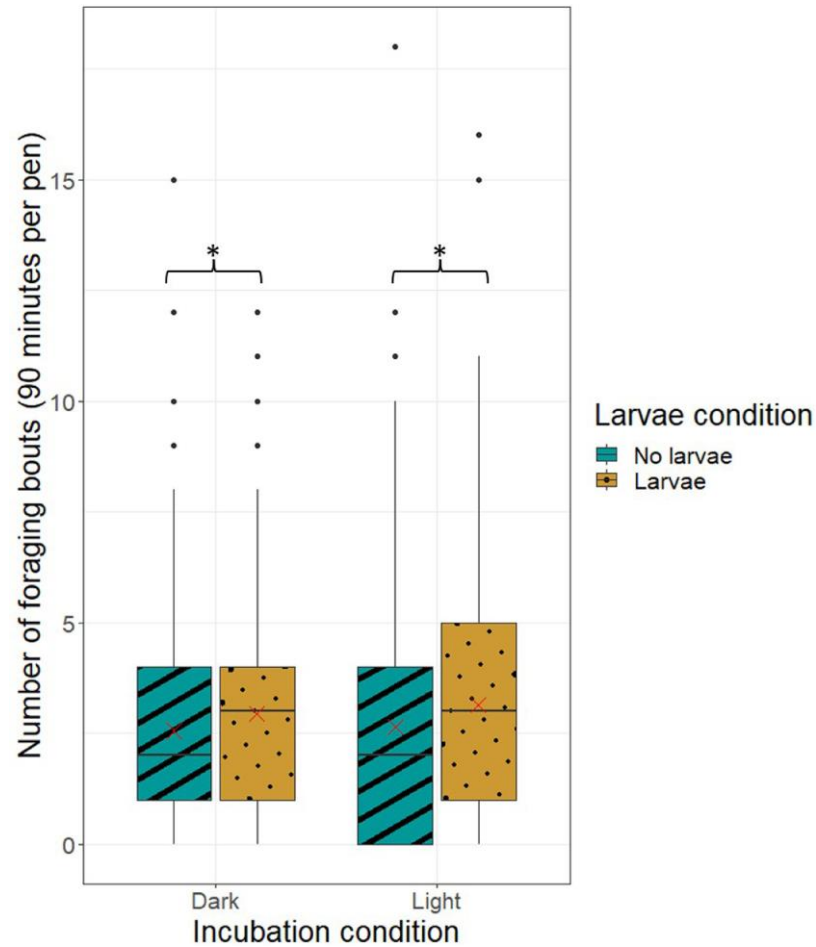


- **No effects** on gentle feather pecking
- Hardly any severe feather pecking observed



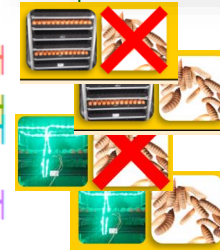
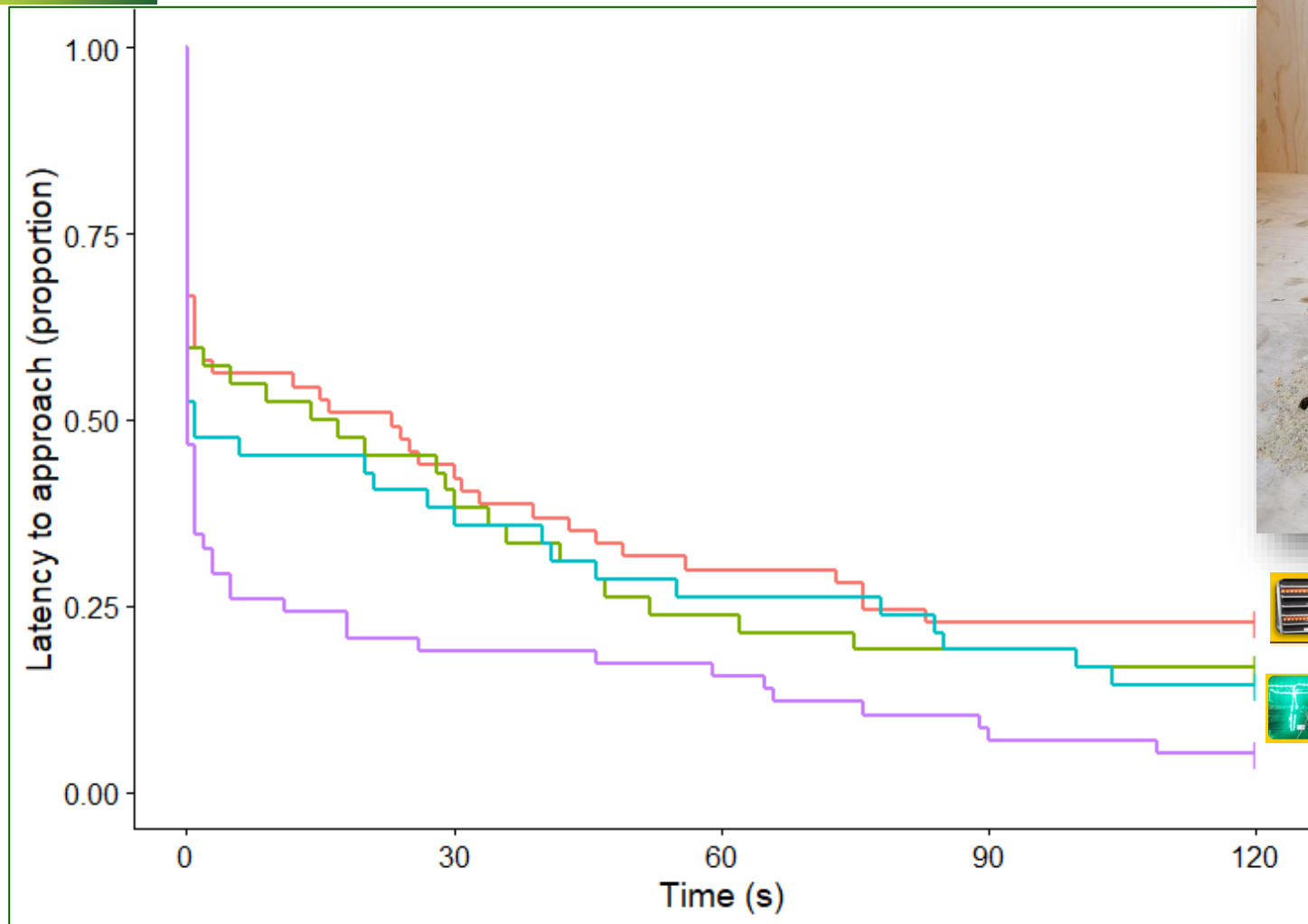
- Total score of 11 body regions (method from Bilcik & Keeling, 1999)
- Overall little feather damage
- **No effects** on plumage condition (PC) score

# PPILOW Foraging behaviour (1, 3 and 7 wks)

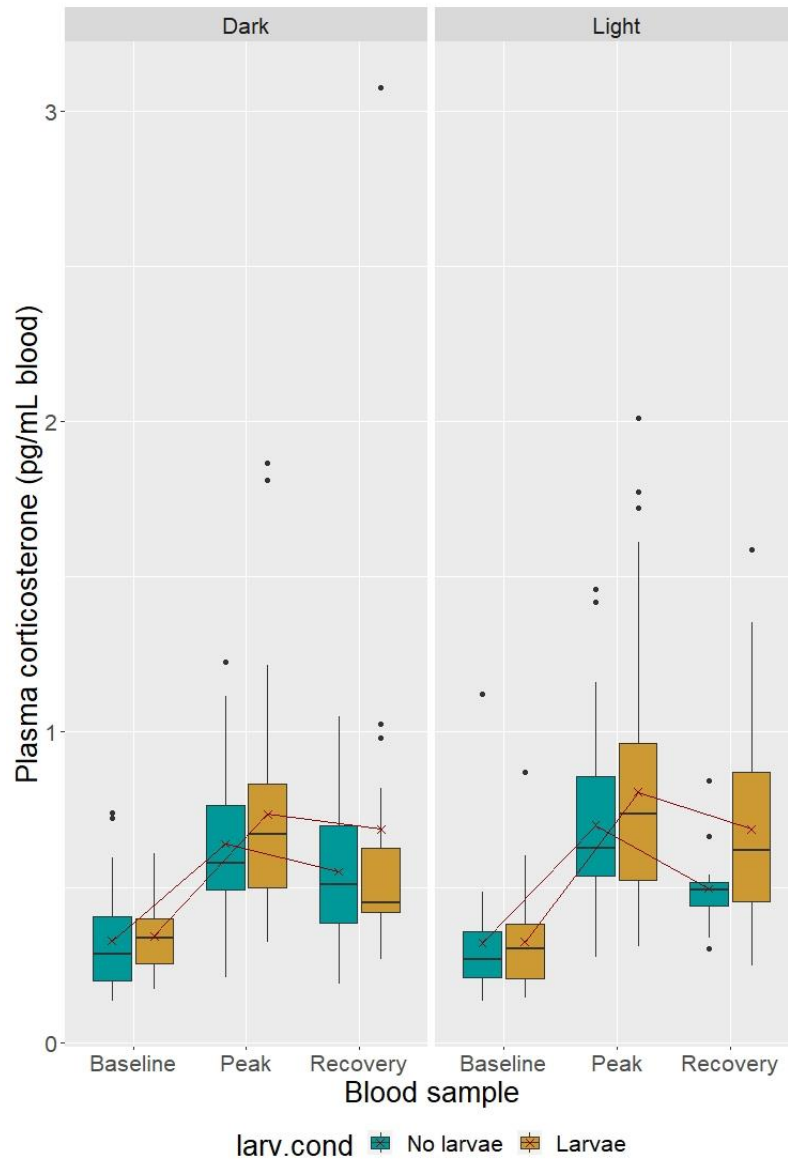


- Larvae-enriched birds **foraged more often**
- BUT: no effect on total foraging time

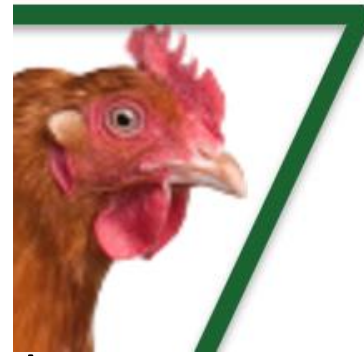
# PPILOW Fear of humans (6 wks)



- Light-incubated birds **showed less fear towards humans**
- BUT: No effects in other fear tests



**No effects** on plasma corticosterone before and after stressor



## Early-life effects

- In general, minor effects of treatments on behaviour
- Light during incubation...
  - reduced fear of humans, but only in one test
  - did not affect feather pecking
- Larvae enrichment...
  - increased foraging bouts, but not duration
  - did not affect fearfulness or feather pecking

Too enriched?  
More light exposure?  
Scattering larvae?

Long-term effects in the laying phase: Next presentation!

Industry



Science

## On-farm studies





 **HERENBOEREN**  
SAMEN DUURZAAM VOEDSEL PRODUCEREN



**Challenges:**

- Predation
- Avian Influenza
- Feather pecking

# Four Herenboeren farms in NL



Layer hybrid (h)

**VS**



Dual purpose (dp)

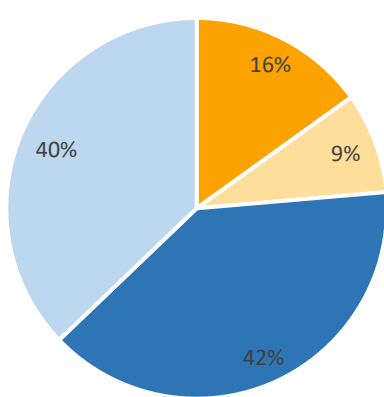


**VS**



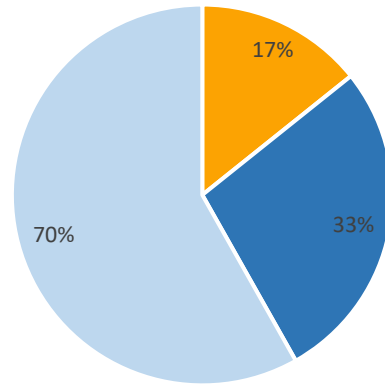
Student: Emy Ridderbos

Dual purpose chickens showed much more foraging behaviour



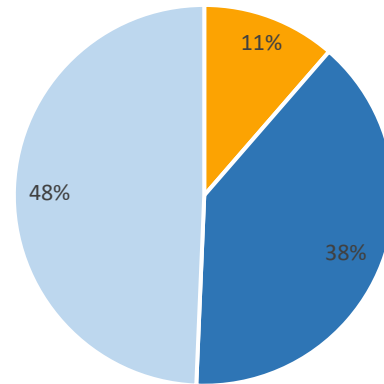
■ H1 ■ H2 ■ DP1 ■ DP2

morning



■ H1 ■ DP1 ■ DP2

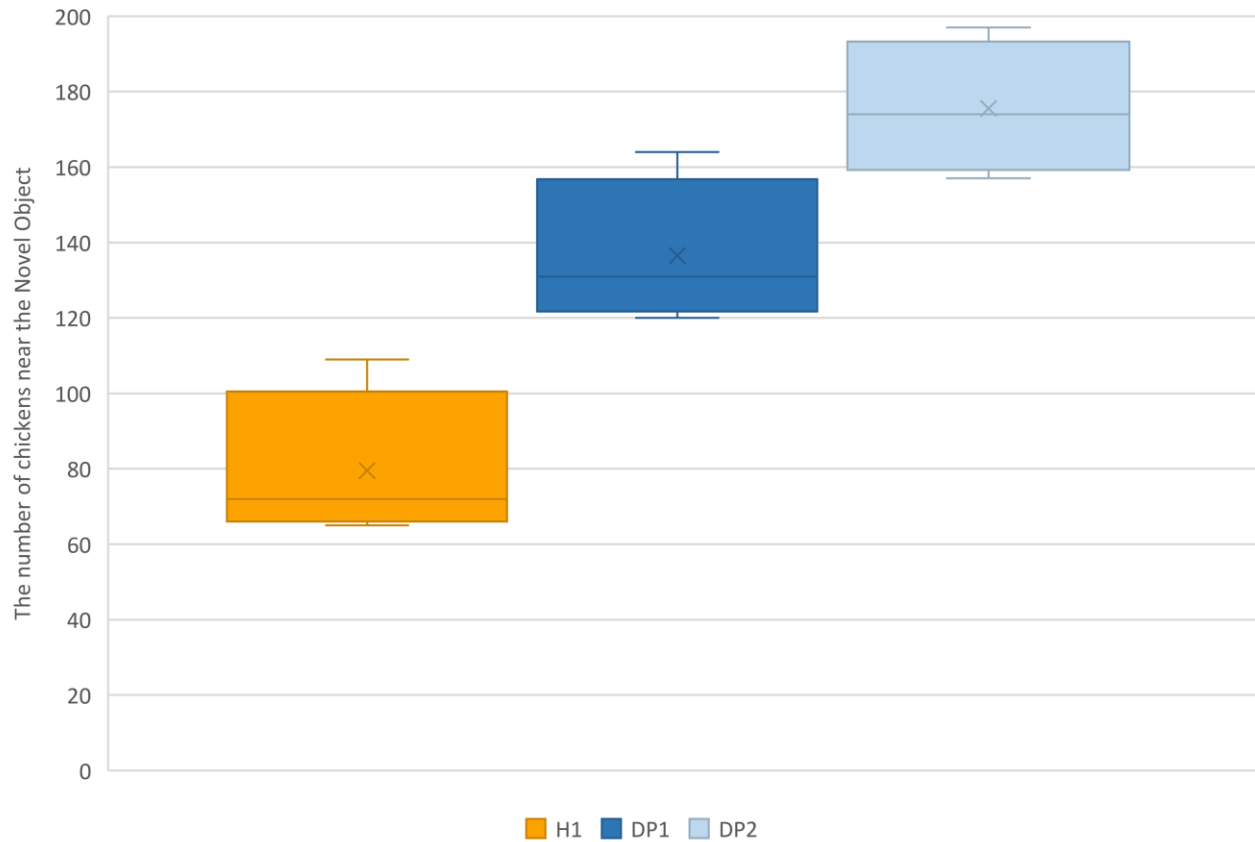
afternoon



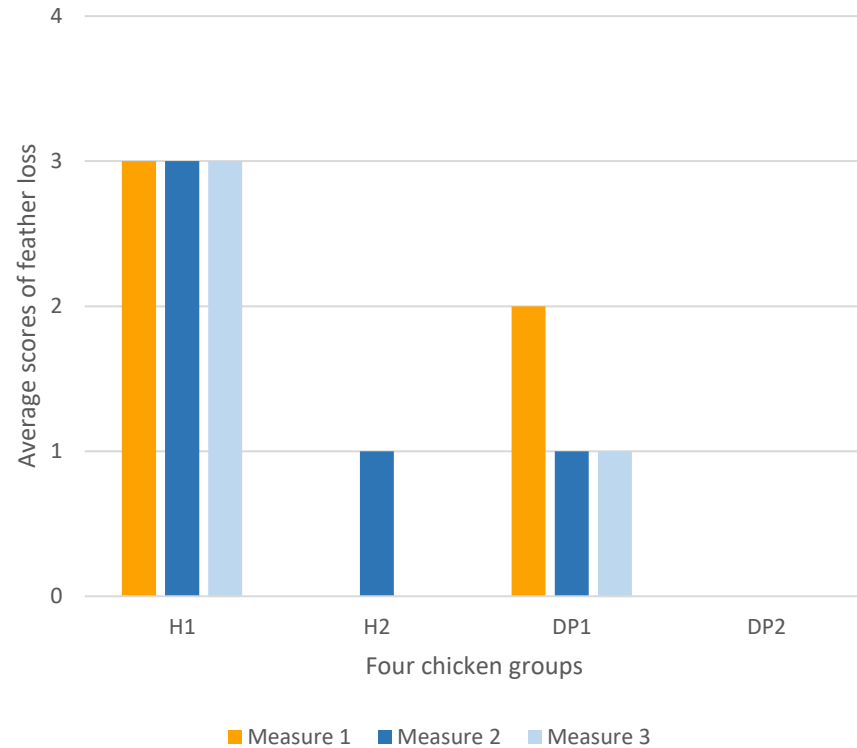
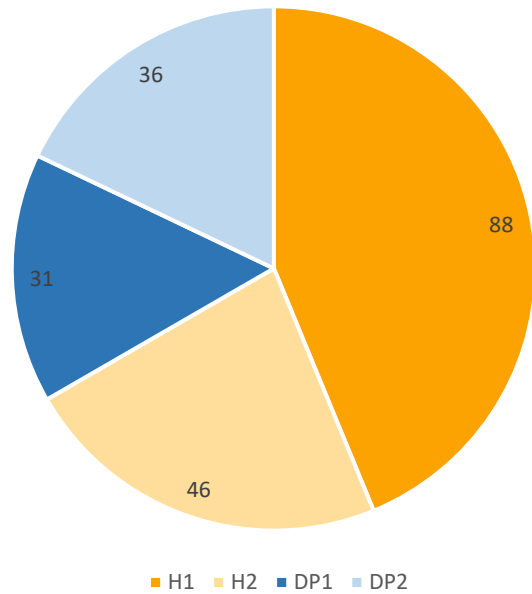
■ H1 ■ DP1 ■ DP2

evening

## Dual purpose chickens were less fearful towards a novel object



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



- During avian influenza outbreak, covered veranda is important for birds to express 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 Ongoing study: Effect of bedding in covered veranda on fearfulness, FP and footpad lesions



Students: Koen Riep and Jeroen Imholz

# PPILOW Opportunities and barriers to enhance laying hen welfare in low-input and organic farming

Kliphuis et al. (in prep)

Industry

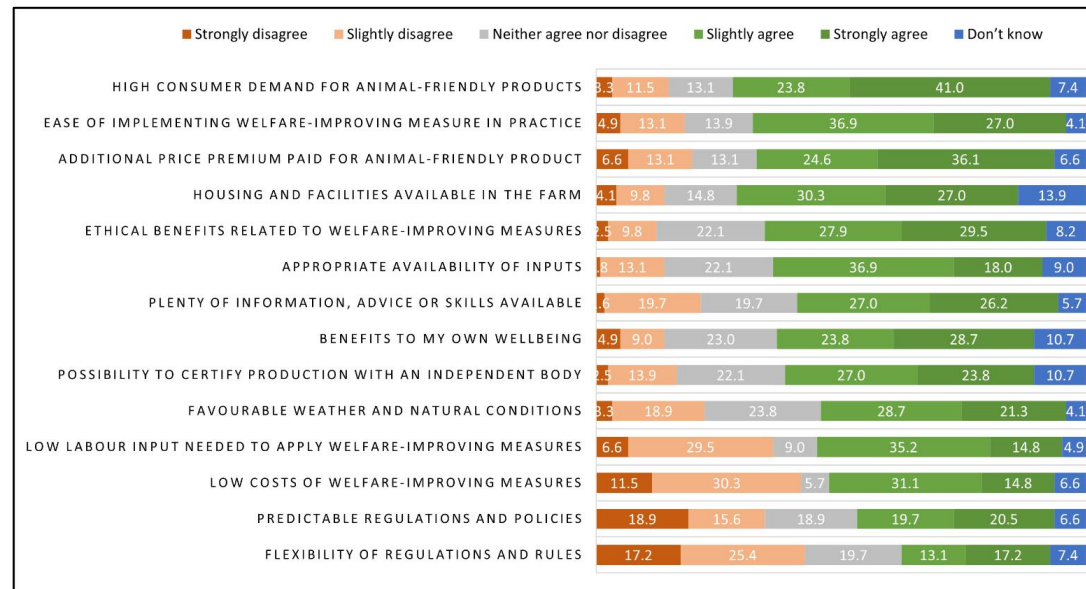


Science

Survey targeting farmers, veterinarians, advisors etc. across 9 European countries

Views on welfare-improving management practices such as:

- In ovo sexing
- Dual purpose breeds
- Outdoor shelter opportunities
- Prohibiting routine mutilations
- Vaccinations



“Are the following factors an opportunity to improve laying hen welfare?”

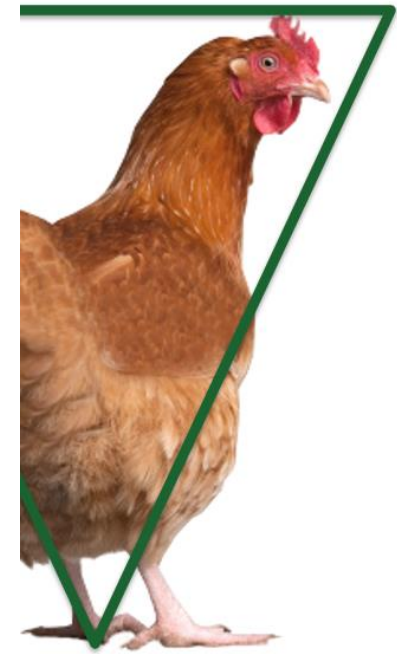


- The greatest barriers and opportunities are related to the market and to policy development
- A product price premium and EU subsidies are both needed to finance welfare-improving practices
- Inform consumers about egg industry → probably higher willingness to pay price premium
- Re-evaluation of current organic regulations → remove barriers and stimulate innovation
- Collaboration with farmers is essential for implementing affordable and practical welfare-improving practices

## Consumer survey:

Harju et al., (2023)

Consumers' views on egg quality and preferences for responsible production – results from nine European countries

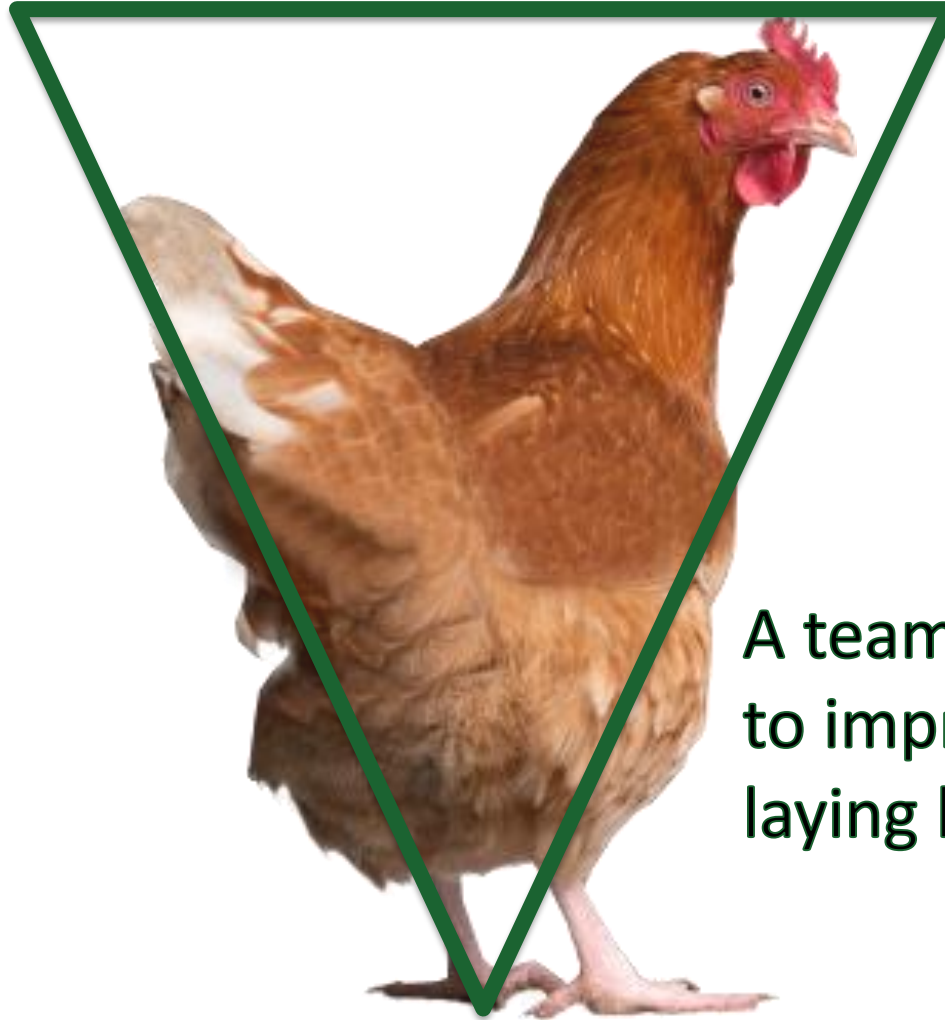


Science

Society

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A team effort is needed to improve welfare of laying hens

**Society**

# Acknowledgements



## Wageningen team

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- Emy Ridderbos
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## On-farm work

- All farmers
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- Marjon Wijdeven
- Monique Bestman
- Han Swinkels



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## ILVO team

- Frank Tuytens
- Charlotte van den Hole
- Michael Plante-Ajah

## All animals



# PPILOW PARTNERS



*Thank you for your attention*

[www.ppilow.eu](http://www.ppilow.eu)