健康畜禽 Healthy Livestock

Elevated platforms as enrichment and to monitor activity and weight in broilers

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Elevated platforms

Enrichment

- Natural behaviour like roosting and exploring is supported
- Environment is structured in activity and resting areas
- Broiler prefer grids compared to perches

Improved animal health & welfare

- Reduces stocking density
- Supports activity of chicken → mobility ↑
- Improves leg health → walking ability ↑
- Dry litter and/or dry footpads → footpad health↑

Monitoring of activity and weight

by elevated platforms combined with weighing system

- Activity of chickens can be monitored by the amount of platform use
- Weight gain can be monitored

→ Changes in activity and in weight gain may indicate changes of health status

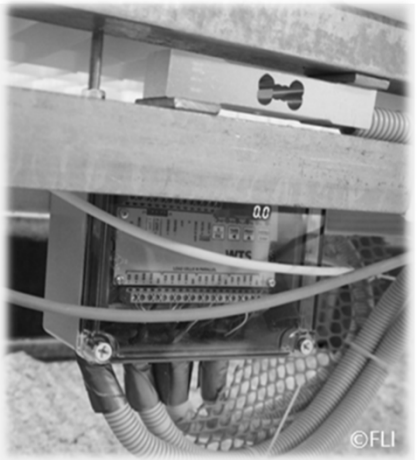
Animals & housing

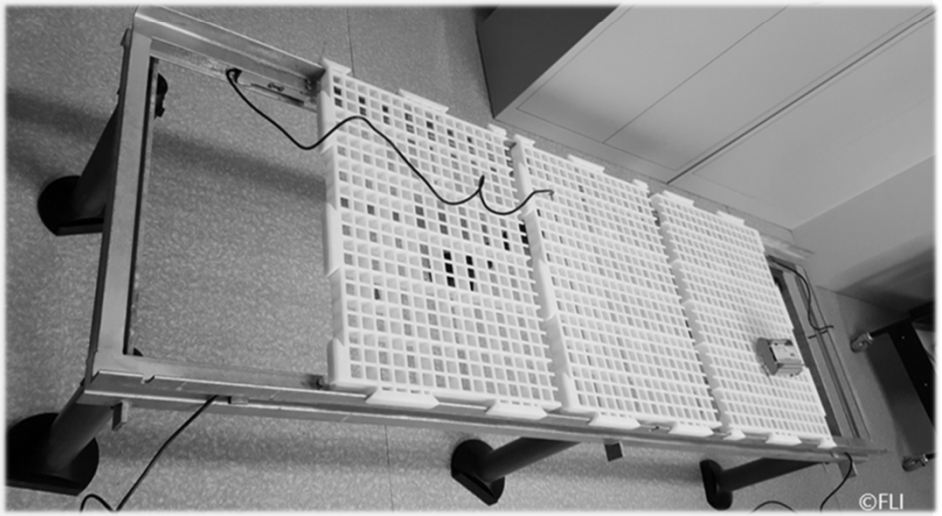
- Mixed sex Ross 308 (50:50)
- 5 weeks fattening period
- 6 pens with 200 chickens, respectively
- 3 control & 3 enriched groups (with elevated platforms)
- Pens: 3 x 5 m including 4 feeding troughs and 2 water dispenser
- Enriched pens: elevated grids (0,5 x 4 x 0,6 m) with 2 ramps

Equipment

Elevated platforms with integrated weighing system

Weighing system with four single point load cells connected with a transmitter box





Output

Continuous data (voltage) transformed into weight

Analysis and statistics

Use of structure

Video: number of chickens by scan sampling (each hour from 7 am to 5 pm for two days per week) → mean / pens / hour

Algorithm for estimating average bird weight

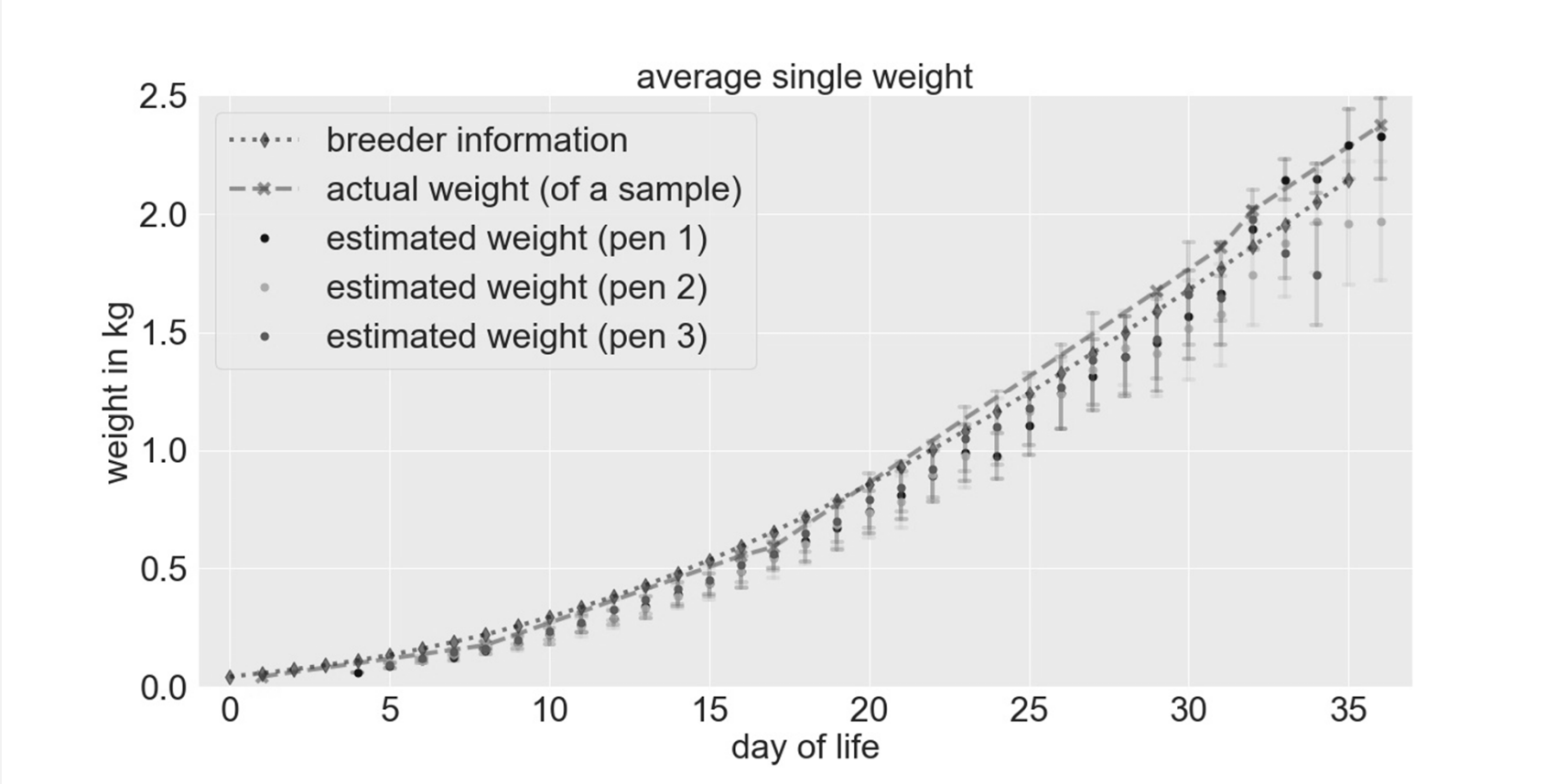
Model: $P(t) = n(t)w(t)$ → approximation by resorting to breeder specification or by analysing subsequent changes in total weight

Output: average chicken weight & number of chickens on the elevated platform

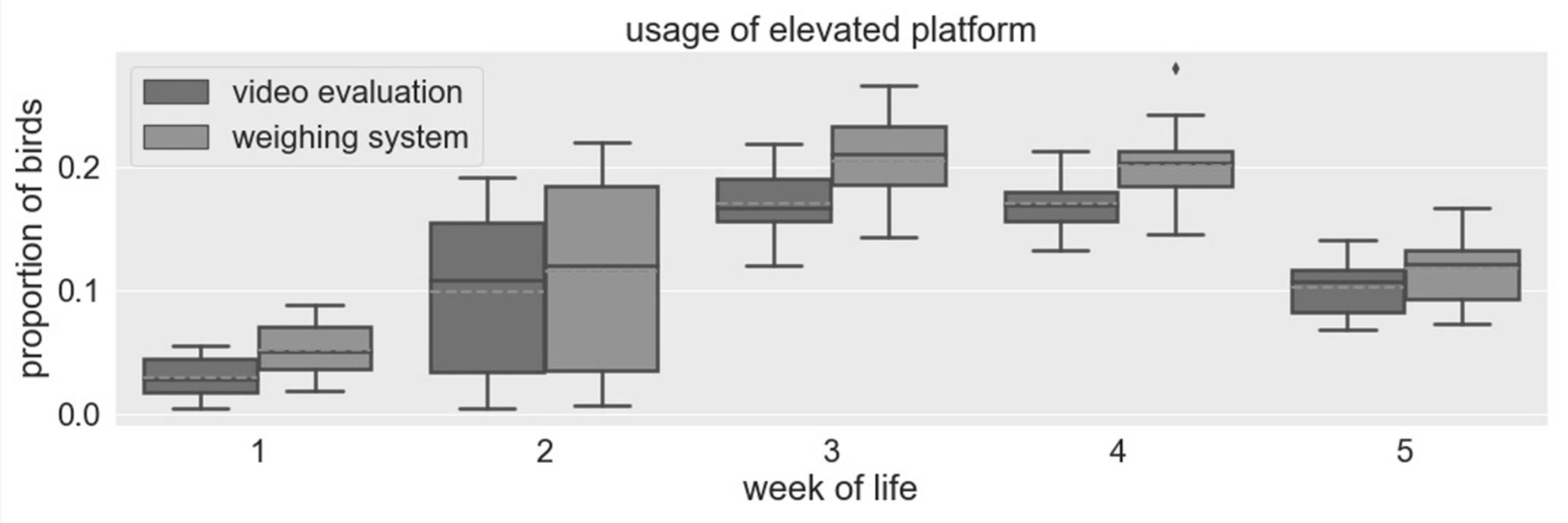
Validation of weighing system and video analyses

Spearman's rho test performed in R

Algorithm for estimating average bird weight



Comparison of data from weighing system and video analyses



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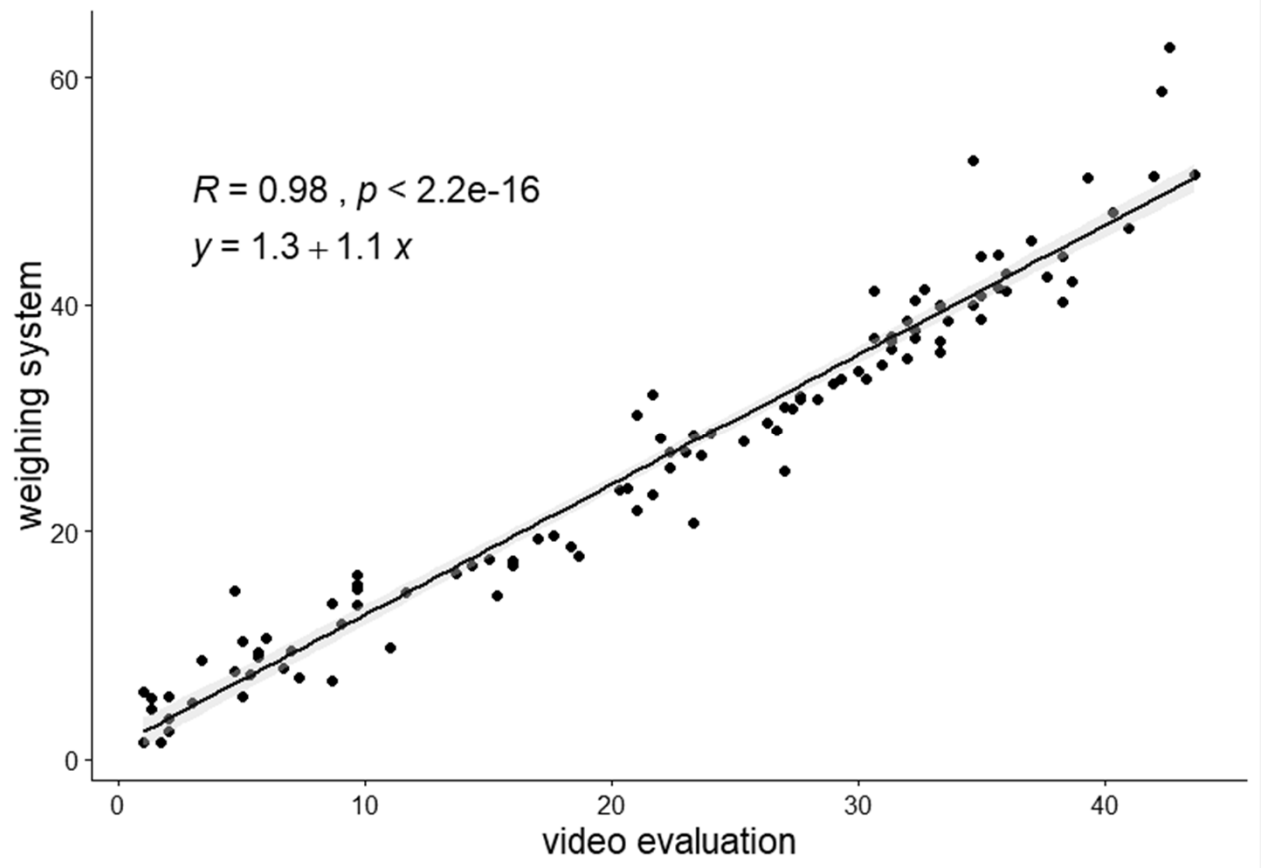
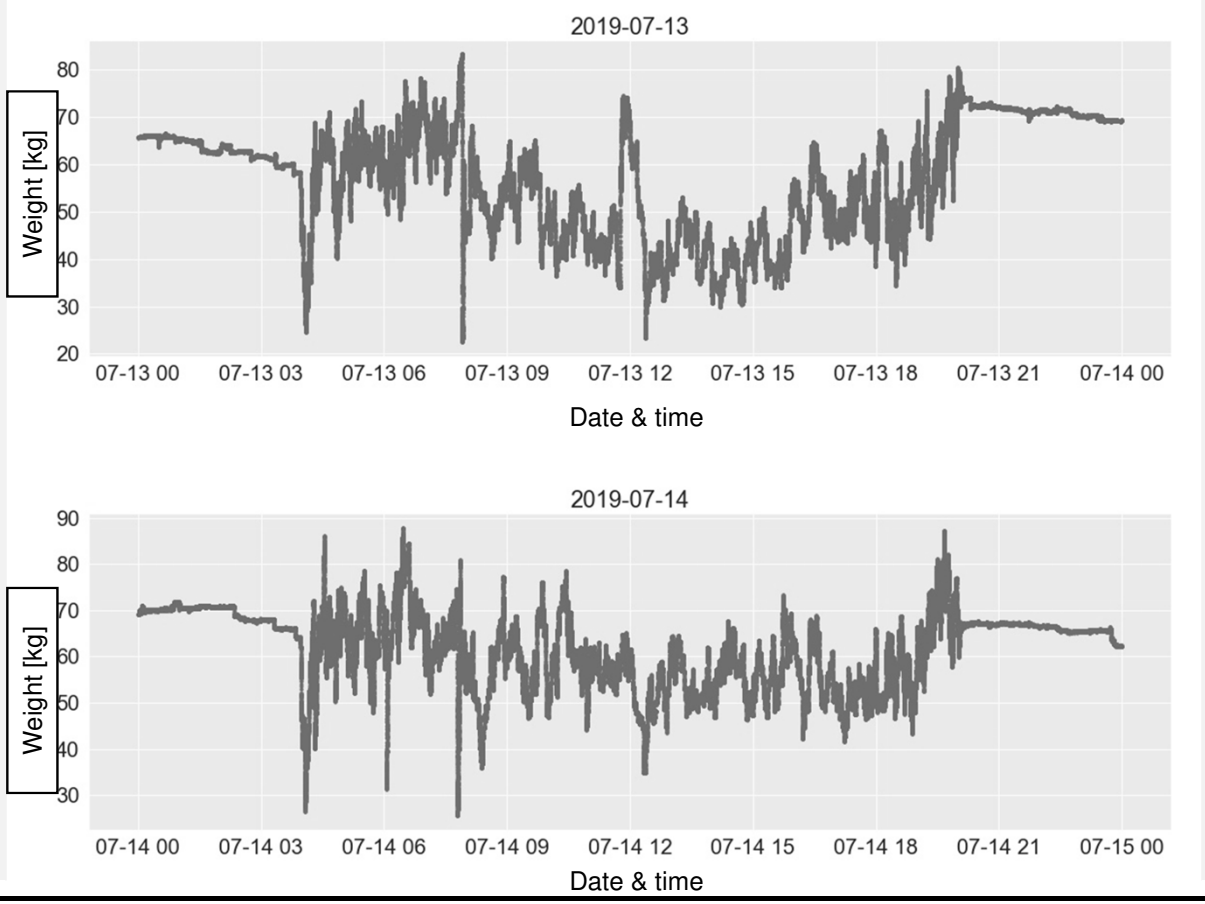


Circadian course of the use of elevated platform (by weighing system)



Use of elevated platforms

- depends on age, physical ability, and weight gain
- about 20 % of broiler chicken use platforms (3rd/4th week of age) in this experiment

Algorithm for estimating average bird weight

- growth performance of individual groups can be monitored and compared with the standard curve of breeding company
- signal-to-noise ratio is sufficient after 5 days of life → accuracy of about 200 g

technical problems still to be addressed:

- tara values may change over time and differ between platforms

Elevated platforms with integrated weighing system

- **A simple system that can support to monitor the weight gain (and activity) of broiler chicken.**
- **Future work**
  - **will address algorithms to automatically detect significant changes in the use of elevated platforms and weight gain and**
  - **will correlate these automatic measures with health problems.**

Thanks for your attention!