|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Opportunity test | Output variable | Measure | Final models | Model |
| Food opportunity 1 | Proportion of eaten mealworms | Average per pen per social condition (Individual/Trio) | Early + Late + Early\*Late +  Social condition (Individual/Trio) + Pen ID (random effect) | LMM (sqrt) |
| Food opportunity 2 | Proportion of eaten mealworms | Proportion per pen per repetition | Early + Late + Early\*Late +  Test period (Rearing/Laying) + Pen ID (random effect) | LMM |
| Novel pen opportunity | Latency to feed | Latencies for 1st and 5th bird to be seen pecking in feed in each pen | Early + Late + Early\*Late +  Bird order (1st/5th) + Pen ID (random effect) | LMM (log) |
| Latency to be in litter | Latencies for 1st and 5th bird to be seen in the litter in each pen | Early + Late + Early\*Late +  Bird order (1st/5th) + Pen ID (random effect) | LMM (log) |
| Latency for a bird to be on an elevated structure | Latency for the 1st bird to be seen on an elevated structure in each pen | Early + Late + Early\*Late | LM |
| Proportion of birds on opposite site of pen to initial placement per scan | Proportion per pen each 2-minute scan | Early + Late + Early\*Late + Early\*Phase (1st-3rd 20 minutes)+Late\*Phase + Early\*Late\*Phase+ Pen ID (random effect) | LMM |
| Nest opportunity | Proportion of eggs in specific locations | The average proportion of eggs laid in colony nests/elevated nests/floor (litter and slats) per pen per 24-day period (1st/2nd/3rd) | Early + Late + Early\*Late + Egg location (colony/elevated/floor) + 24-day period (1st/2nd/3rd)  + Egg location\*Early + Egg location\*Late + Egg location\*Early\*Late + Egg location\*24-day period+ Pen ID (random effect) | LMM |
| Number of eggs laid per bird | Average number of eggs per hen in each pen and day | Early + Late + Early\*Late + 24-day period (1st/2nd/3rd) + Pen ID (random effect) | LMM |
| Weight per egg | Average egg weight in each pen and day | Early + Late + Early\*Late +24-day period (1st/2nd/3rd)+ 24-day period\*Early + 24-day period\*Late + 24-day period\*Early\*Late +  + Pen ID (random effect) | LMM |
| Litter opportunity test | Latency to enter a test litter box | Average latency for the first bird to be seen in a test litter box of each degree of familiarity (Current/Familiar from rearing/Novel)in each pen | Early + Late + Early\*Late + Early\*Familiarity (Current/Familiar from rearing/Novel)+Late\* Familiarity + Early\*Late\*Familiarity+ Pen ID (random effect) | LMM |
| Proportion of birds foraging in a test litter box per scan | Average proportion of birds foraging in a test litter box of each degree of familiarity (Current/Familiar from rearing/Novel) in each pen per 1-minute-scan | Early + Late + Early\*Late + Early + Familiarity (Current/Familiar from rearing/Novel) + Pen ID (random effect) | LMM (sqrt) |
| Outdoor opportunity | Latency to observe first bird on the outdoor range | Latency for first bird to be seen outside in each pen (nearest 30-minute interval, range 0-12.5) | Effects of Early, Late and Early\*Late separately in three tests | Kruskal Wallis |
| Number of birds on the outdoor range | Average per pen per scan | Early + Late + Early\*Late | LM (log) |

Supplementary Material

# Supplementary Table

*Supplementary Table 1. Overview of the different statistical models. Model abbreviations: LMM= Linear mixed model, LM=Linear model, including specification of response variable transformations where needed: sqrt=square root, log=log transformation. Further descriptions of these models are found in the manuscript.*