

# Measuring Latency to Feed of Broilers After Exposure to an Environmental Enrichment Device

## Abstract

Leg lameness is a prevalent welfare concern in broiler chickens, and biologically-relevant environmental enrichment designed to increase physical activity and decrease leg disorders is lacking. Therefore, a novel enrichment device was developed with the objective to motivate broilers to voluntarily move, thus improving leg health, production outcomes, and overall animal well-being. Research completed thus far has shown that the enrichment device was successful in improving performance. The work described here aims to validate that the change in these performance outcomes, particularly feed intake, was due to the enrichment itself, and to study if the device directly led to the birds to the feeder. Results show that in the first 9 days, 71% of birds went to the feeder during 4-min enrichment periods or within 5 mins following enrichment. Over weeks 1-6, 61% of birds went to the feeder during or within 5 mins after the enrichment periods. These data indicate that the environmental enrichment was successful in leading birds to the feeder and improving performance.

## Objectives

- Measure latency to feed of broilers after exposure to an environmental enrichment device.
- Contribute to a larger animal welfare study looking at environmental enrichment and broiler lameness.

## Materials and Methods

- 1200 Ross 308 broilers were exposed to a novel environmental enrichment device for 6 weeks as part of a larger study
- Bird behavior was recorded during enrichment periods (4 periods/day) on days 0-8 and once/week over weeks 1-6
- **Latency to Feed Measure:**
  - Broiler bird videos were analyzed in the ISU Animal Behavior Lab
  - One focal bird/pen (n=7) was observed
  - Focal bird behavior during 4-min enrichment periods and 5 minutes immediately following (9 minutes total/video) was recorded into one of 4 mutually-exclusive categories:
    - At feeder when enrichment period ended
    - Went to feeder within 5 minutes following enrichment
    - Went to feeder during enrichment period only
    - Never went to the feeder
- Data was converted to percent of birds in each behavioral category
- Data were analyzed categorically using PROC FREQ and CHI SQUARE (SAS Version 9.4)

## Results

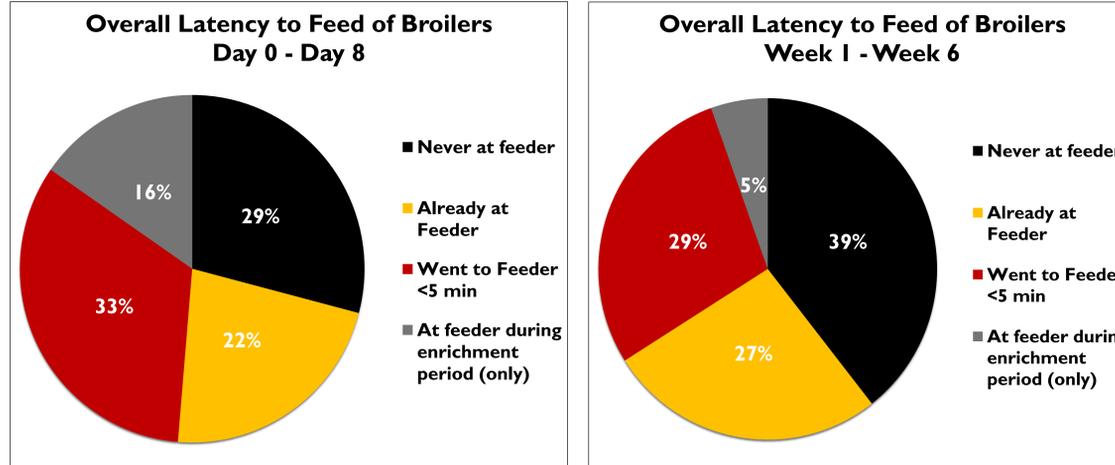


Figure 1: Mean distribution of broiler bird latency to feed categories d0-d8. Overall, 71% of birds displayed at feeder behavior in the first 9 days.

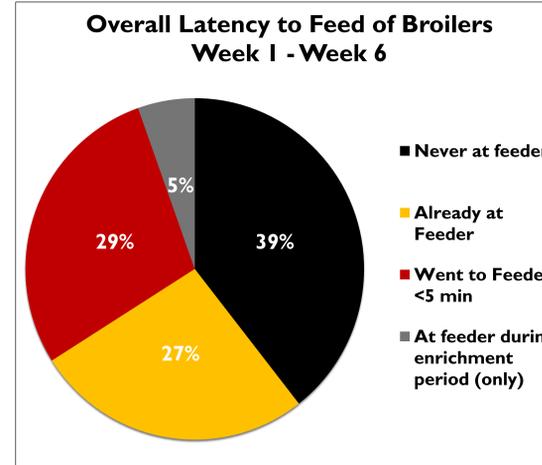


Figure 2: Mean distribution of broiler bird latency to feed categories weeks 1-6. Overall, 61% of birds displayed at feeder behavior from week 1 to week 6.

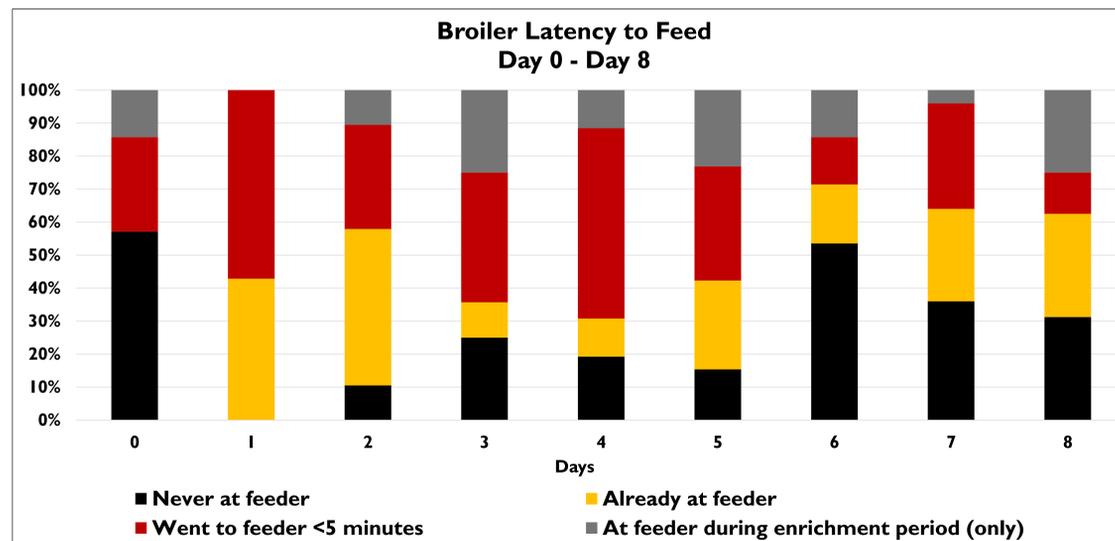


Figure 3: Mean distribution of broiler bird latency to feed by day, d0-8.

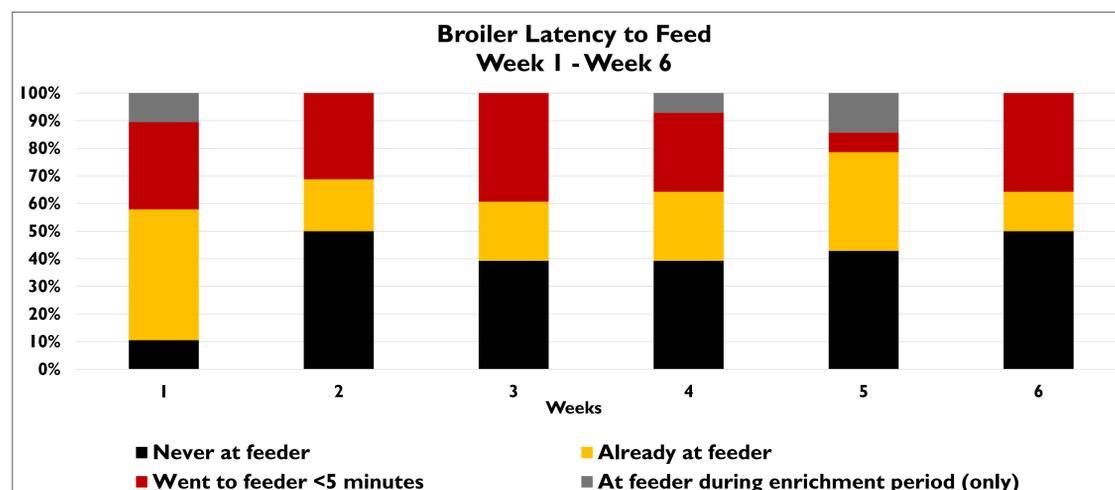


Figure 4: Mean distribution of broiler bird latency to feed by week, weeks 1-6.

## Discussion

- Averaged over days 0-8, 16% of birds were at the feeder during enrichment periods, 22% of birds were at feeder when enrichment period ceased, and 33% went to the feeder within 5 minutes following enrichment
- Overall, 71% of birds displayed at feeder behavior during the enrichment period or less than 5 minutes after the period for days 0-8.
  - These data indicate that within the first 9 days on trial, the enrichment effectively drove birds to the feeder
- Averaged over weeks 1-6, 5% of birds were at the feeder during enrichment periods, 27% were at the feeder when enrichment periods ended, and 29% went to the feeder within 5 minutes after
  - Over weeks 1-6, 61% of birds displayed at feeder behavior during the enrichment period or in less than 5 minutes following the enrichment period
  - Results indicate that enrichment-driven feeder behavior persisted over the 6-week trial
- Day (P=0.0014) and week (P=0.0303) had a significant effect on percent of birds in each category
  - \*Note: P-value is not tied to treatment (non-laser control group was not analyzed for this measure)

## Conclusion

- This enrichment device was developed with the aim to mitigate leg lameness by increasing physical activity in broilers, while improving performance and maintaining practicality for implementation in a commercial setting.
- Based on the measure described here, this enrichment successfully encouraged feeder behavior during the enrichment period or in less than 5 minutes after the period ended.
  - This is a positive outcome, particularly in the first week, as getting chicks on feed quickly is important to producers.
- Further work to validate this effect in broilers is necessary, as well as to test the enrichment in other poultry species.
- However, data presented here indicate that this easily applicable enrichment option could increase performance in broiler flocks while increasing activity.