

## Objective

Evaluate the impact of raising Ross 708 broilers in a silvopasture or open pasture system on animal welfare, production, and environmental outcomes

## Methods

### Experimental setup

Animals: 644 Ross 708 broilers (day 1 - day 42) received a commercial diet.

### Experiment:

Day 1-22: housed indoors in 12 pens (53-54 birds/pen)

Day 22: transport to Ag. Research and Ext. Center

Day 22-42: 6 open grass pasture and 6 silvopasture plots (53-54 birds/plot) of 125 m<sup>2</sup>/plot



## Animal welfare

### Range use

Birds were counted in hourly live observations on days 29, 30, 34, 35, 40, and 41 from 8AM-5PM.

### Fearfulness

Tonic Immobility test (TI) (Stadig et al., 2017)

- Broiler is placed on its back in a V-shaped cradle (max 5 min)
- Latency to righten (sec) was recorded, with longer latencies indicative of greater levels of fearfulness.

### Leg strength

Latency to lie test (LTL) (Berg & Sanotra, 2003)

- Broiler is placed in 1-3 cm of lukewarm water (max 10 min)
- Latency to lie down (sec) was recorded, with longer latencies indicative of stronger legs.

### Foot and hock dermatitis, gait

- Footpad dermatitis (FPD) and hock burn were scored on a 0-4 categorical scale (0 = no lesion, 4 = severe lesion; Welfare Quality®, 2009)
- Gait was scored on a 0-2 categorical scale (0 = balanced gait, 1 = obvious impairment, 2 = severe impairment; Webster et al., 2008)

## Production

- Feed intake: weighed feed on days 1, 15, 23, 25, 42
- Feed conversion ratio: feed consumed (kg) / body weight (kg)
- Weights (kg): individual bird weights on day 42 and cut carcass weight on day 43

## Environment

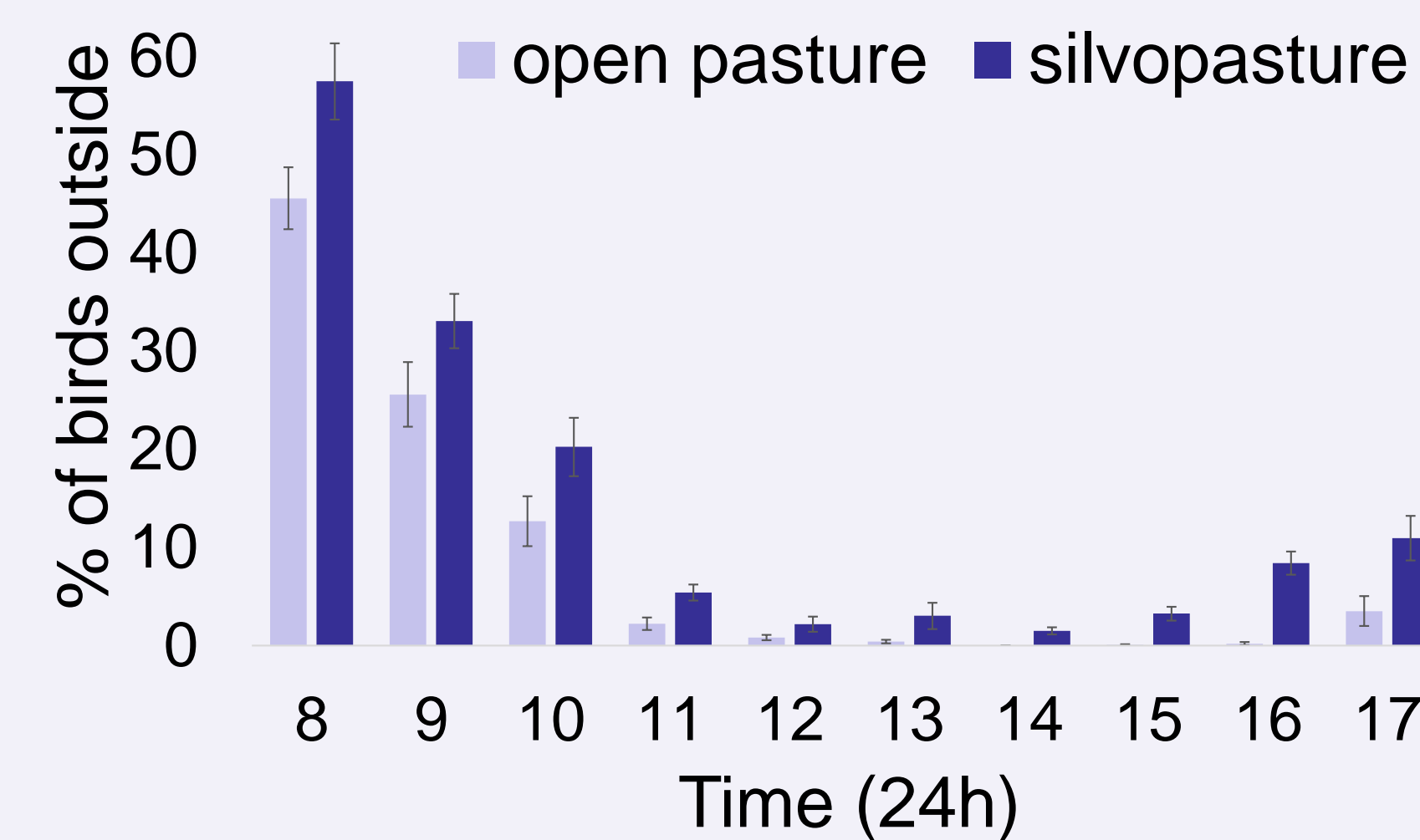
Daily recordings of coop microclimate: temperature (F) & humidity (H, %)

## Results

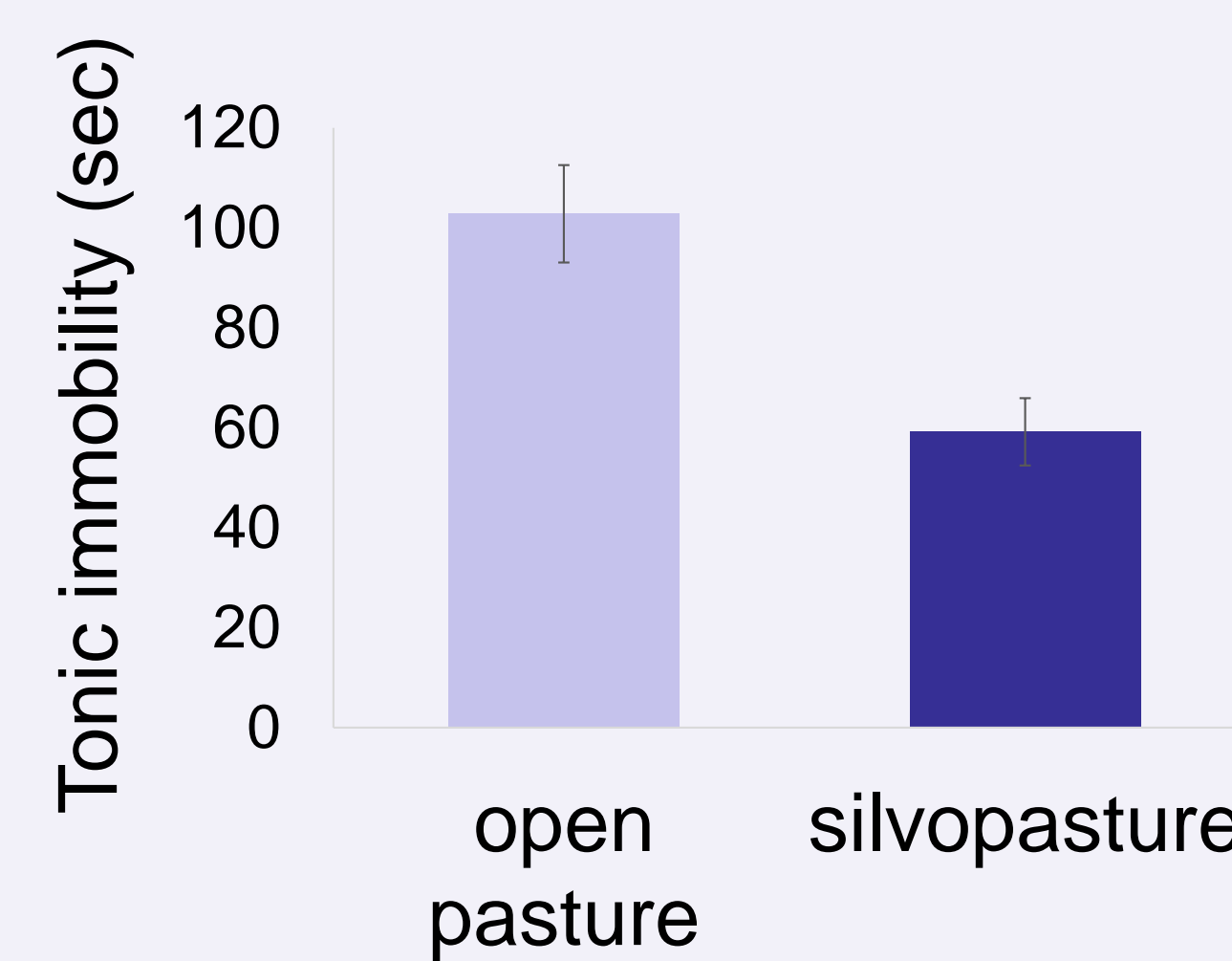
### Animal welfare

#### Range use

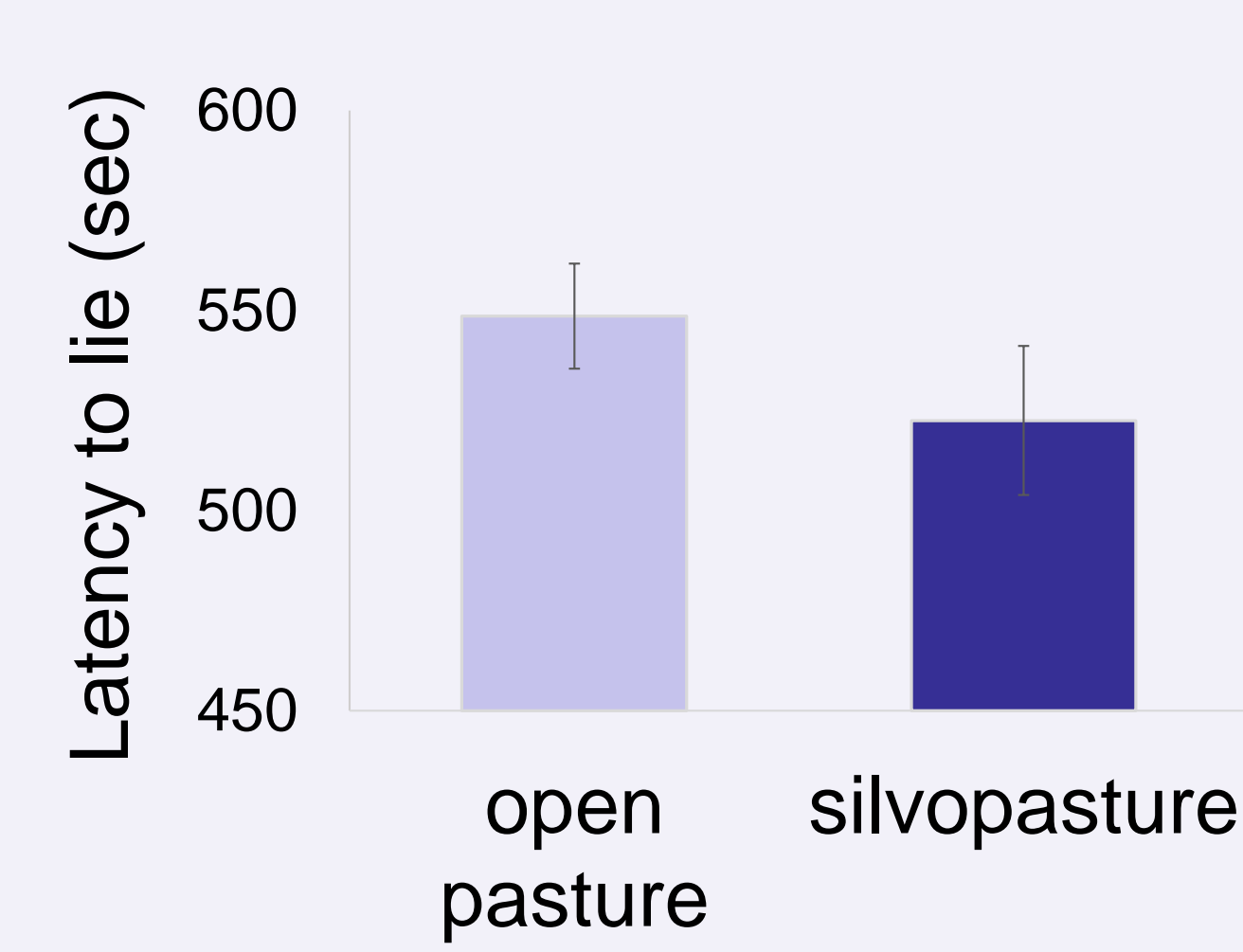
- Birds in the silvopasture system ranged more than birds in the open pastures
- Range use was most frequent from 8AM to 10AM in both treatments
- Most birds remained inside the coop between 11AM and 3PM



#### Fearfulness



#### Leg strength



- Birds from open pastures were more fearful than those from silvopastures
- Birds in both treatments had stronger legs (longer latencies) than commercially-raised broilers (mean latency of 299 sec in birds with balanced gait) (Webster et al., 2008)

### Footpad dermatitis, hock burns, and gait

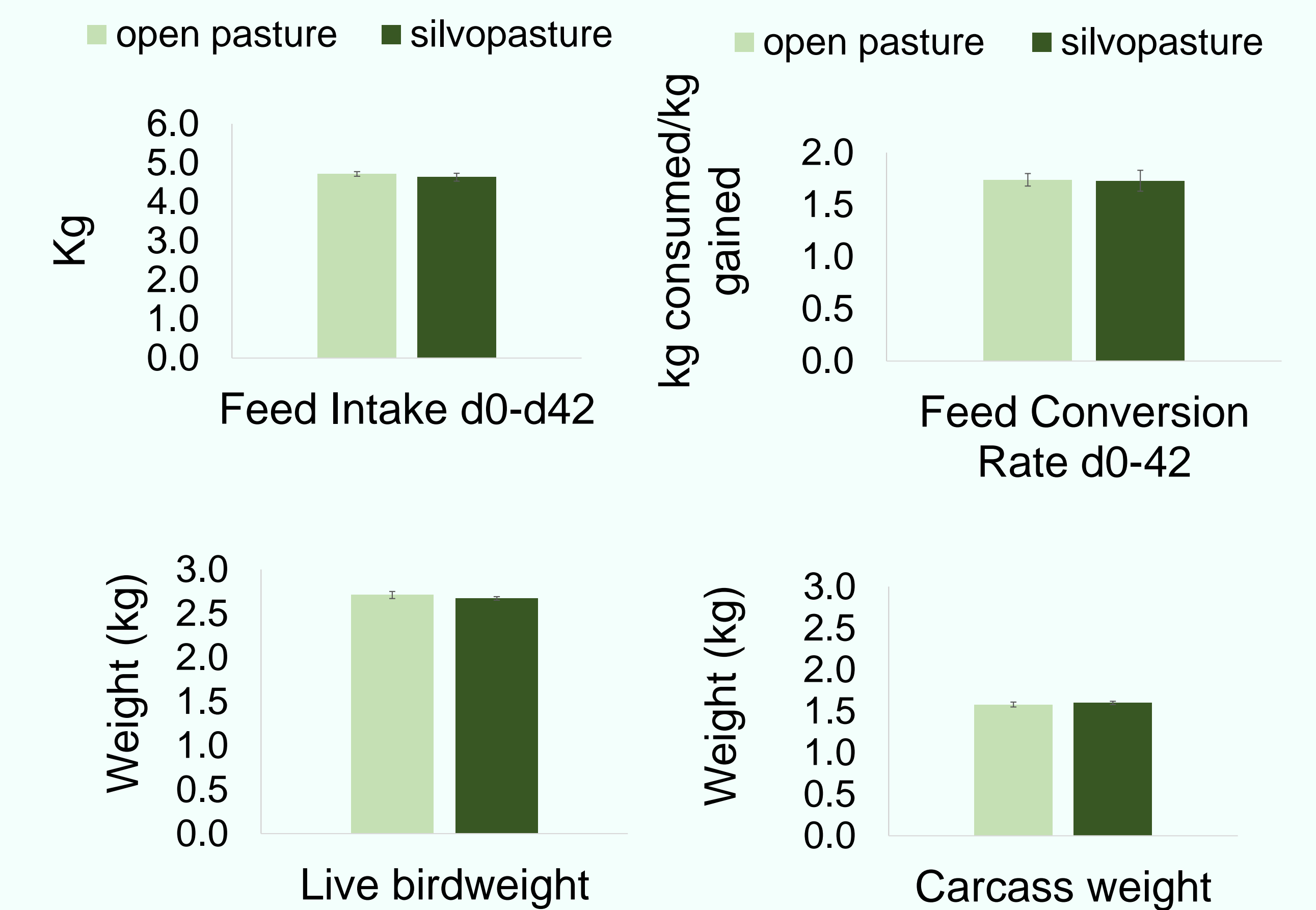
|              | Footpad dermatitis (score 0-4; % birds) |                           |         |         |         |
|--------------|---|---------------------------|---------|---------|---------|
|              | Score 0                                 | Score 1                   | Score 2 | Score 3 | Score 4 |
| Open pasture | 66                                      | 19                        | 14      | 0       | 0       |
| Silvopasture | 85                                      | 14                        | 1       | 0       | 0       |
|              | Hock burns (score 0-4; % birds)         |                           |         |         |         |
|              | Score 0                                 | Score 1                   | Score 2 | Score 3 | Score 4 |
| Open pasture | 91                                      | 9                         | 0       | 0       | 0       |
| Silvopasture | 97                                      | 3                         | 0       | 0       | 0       |
|              |   | Gait (score 0-2; % birds) |         |         |         |
| Open pasture | 90                                      | 10                        | 0       |         |         |
| Silvopasture | 95                                      | 5                         | 0       |         |         |

- Birds from silvopastures had healthier footpads and hocks compared to the birds from open pasture
- There was no discernible difference in gait scores between treatments

## Results Continued

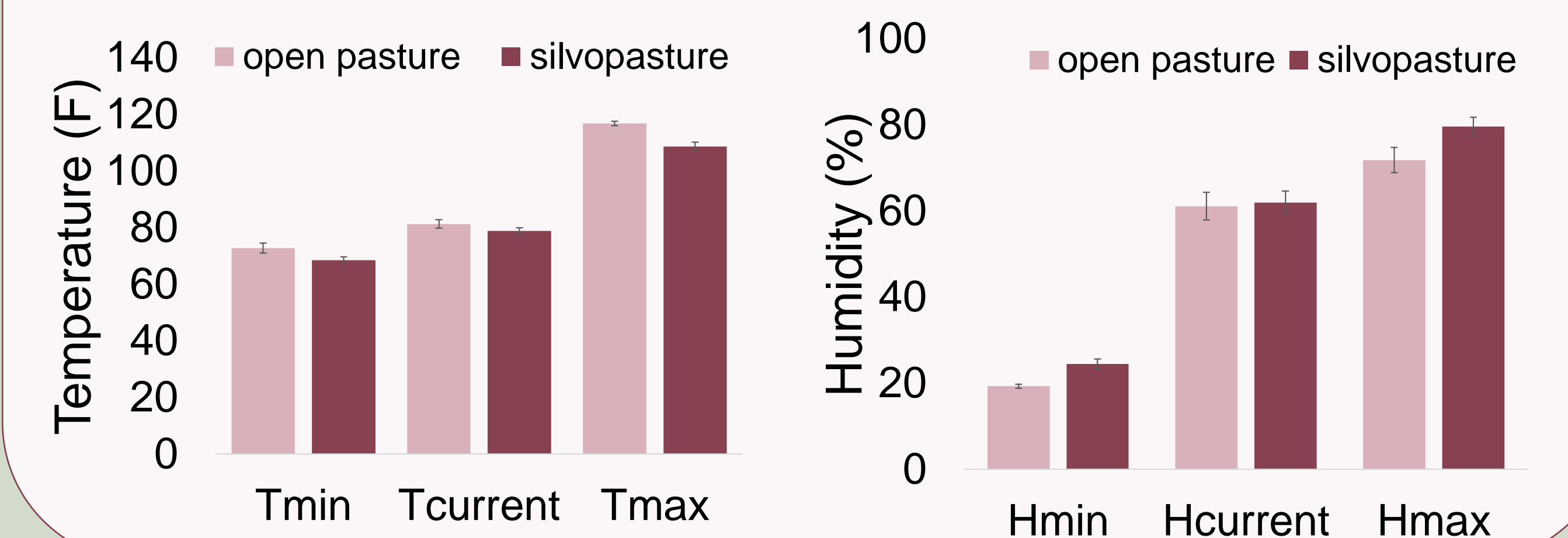
### Production

- Birds in both treatments had similar feed intake and feed conversion ratios
- Mean live bird weight on day 42 (open pasture **2.71kg**; silvopasture **2.67kg**) is comparable to conventionally raised broilers (Clauer, 2012)



### Environment

- Max. coop temperatures were lower in silvopastures than open pastures
- Min. coop humidity was higher in silvopastures than open pastures



## Conclusion

Broilers in the silvopasture system showed improved welfare outcomes, as they ranged more, displayed less fear, and had better footpad and hock health than those on open pasture. Production and environmental measures were comparable for birds in both treatments.

## References

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