

# Nutritional Management of Free Range Laying Hens

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# Free Range Hens

- Reduced
  - flock uniformity (Sibanda et al., 2018; Golden et al., 2012)
  - egg production (Coletta et al., 2012; Fanatico, 2006)
  - egg quality (Moorthy et al., 2000; Tůmová and Ebeid, 2003; Ledvinka et al., 2004)
- Increased
  - dirty, cracked and broken eggs (Tůmová, 2003; Svobodová et al., 2014)
  - microbial contamination of egg shells (Englmaierova et al., 2014)
  - FCR (Tůmová, 2003)
  - mortality (Tůmová, 2003)

# Ranging Activity

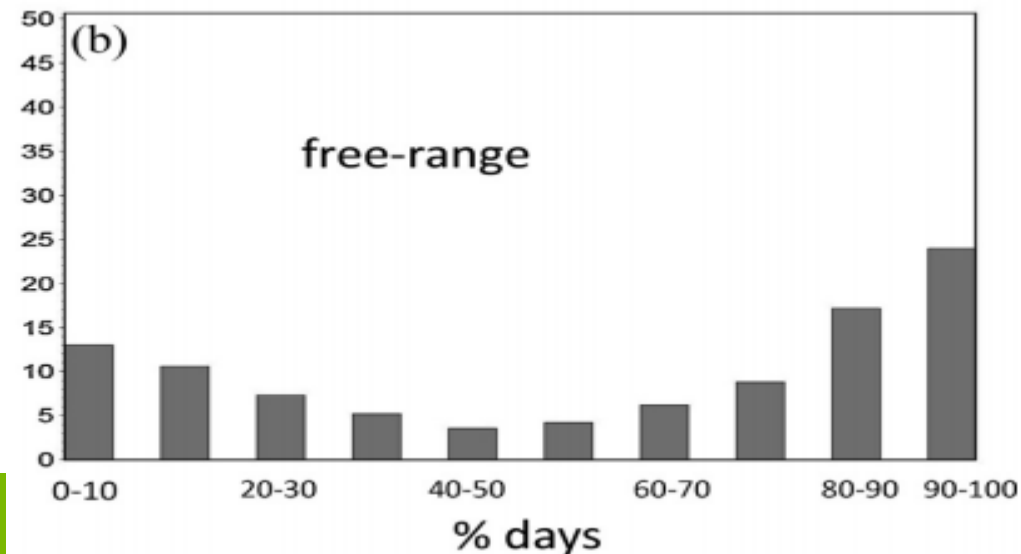
- Crucial for the definition of free-range (FCA, 2014)

Lee & Hinch (2014): 11% stayers

15% on range every single day

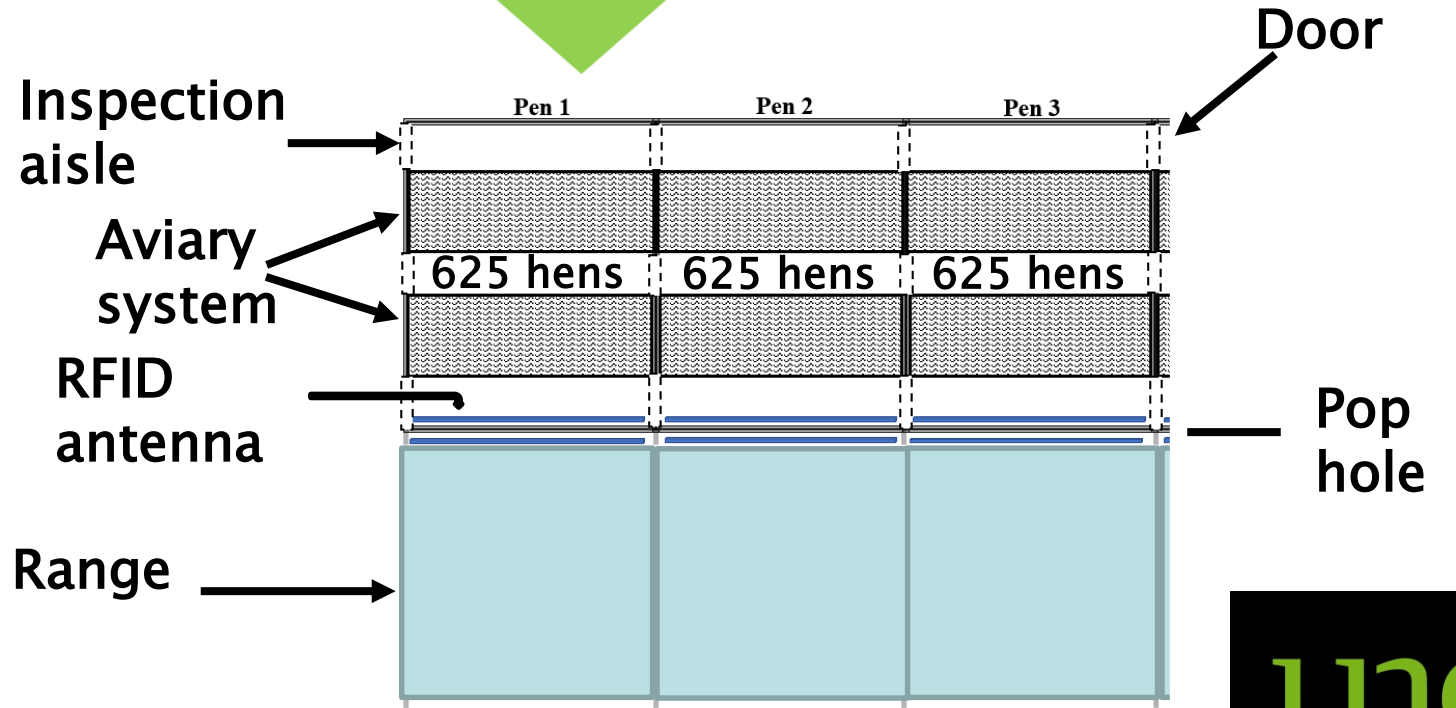
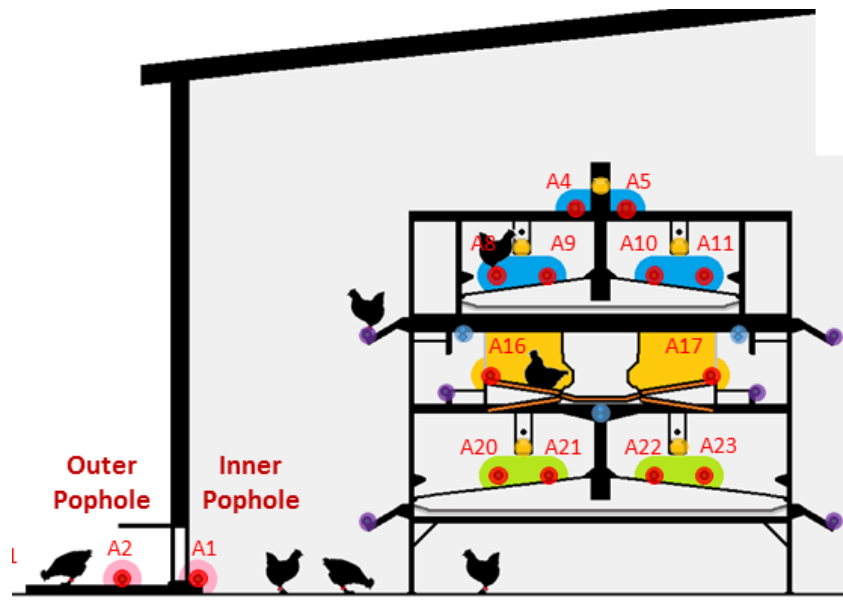
Larsen et al. (2016): 15% stayers

69% on range every single day



# Objective

- Characterise sub-populations of free-range flocks
  - Stayers
  - Roamers
  - Rangers
- Laying performance
- Nutritional needs
  - conventional conditions
  - bio-secure feeding station on range
  - additional 10% ME and amino acids



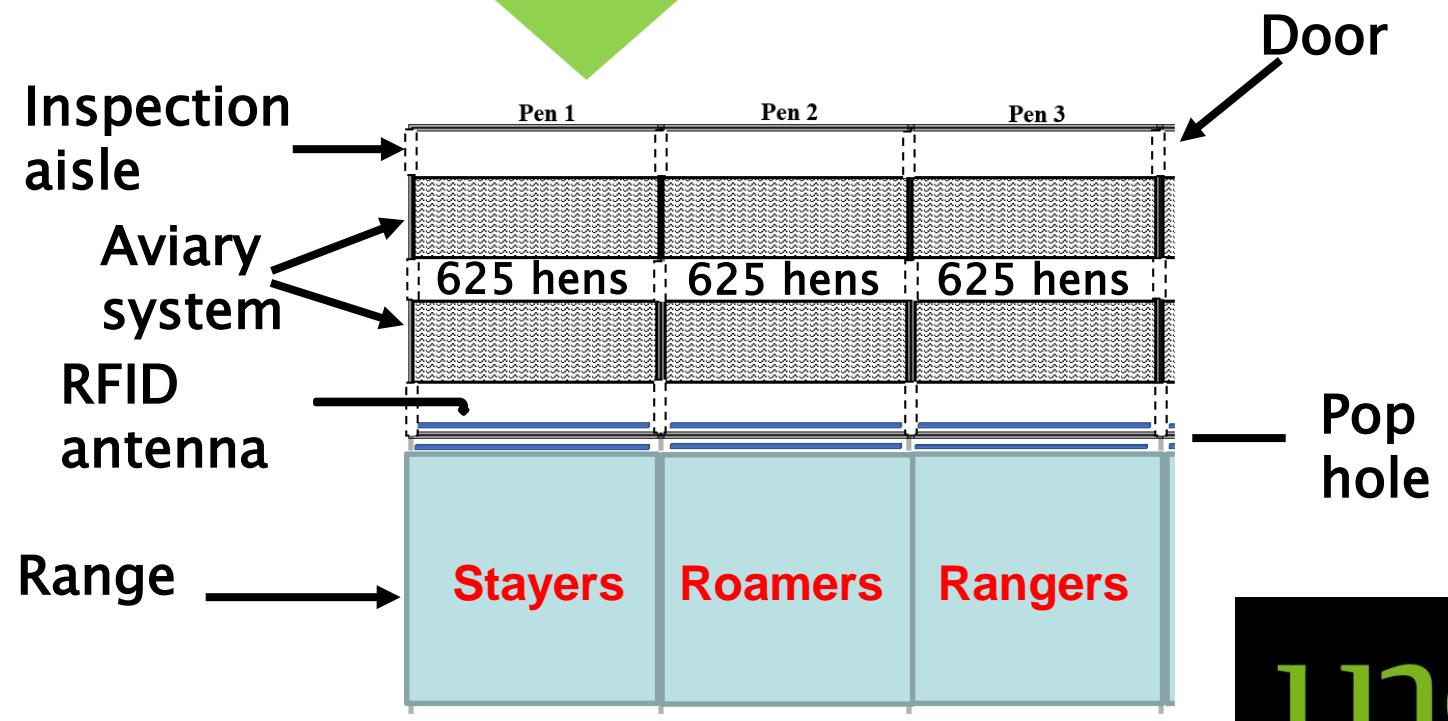
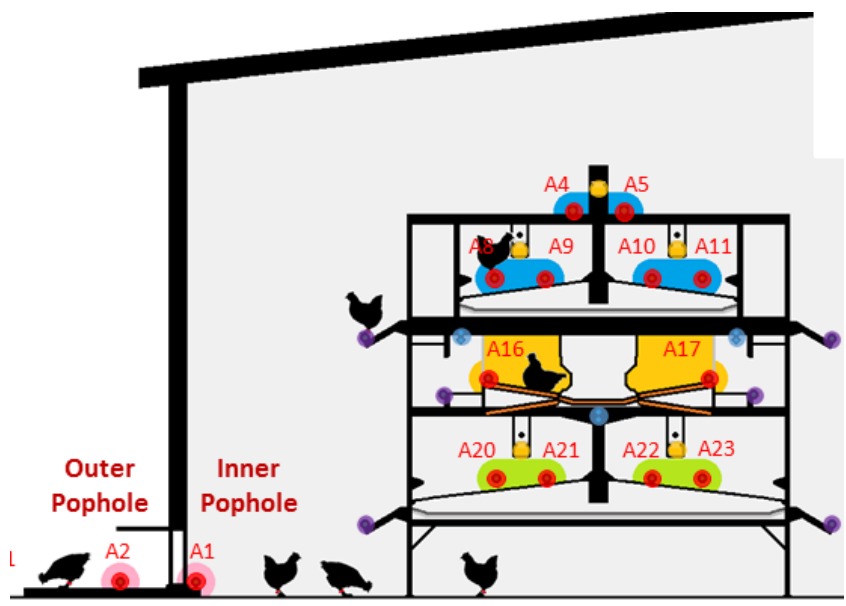
# Materials & Methods

- 1875 hens, individually identified
  - body weight 16 weeks of age & 22 weeks of age
  - ranging activity 16–21 weeks of age



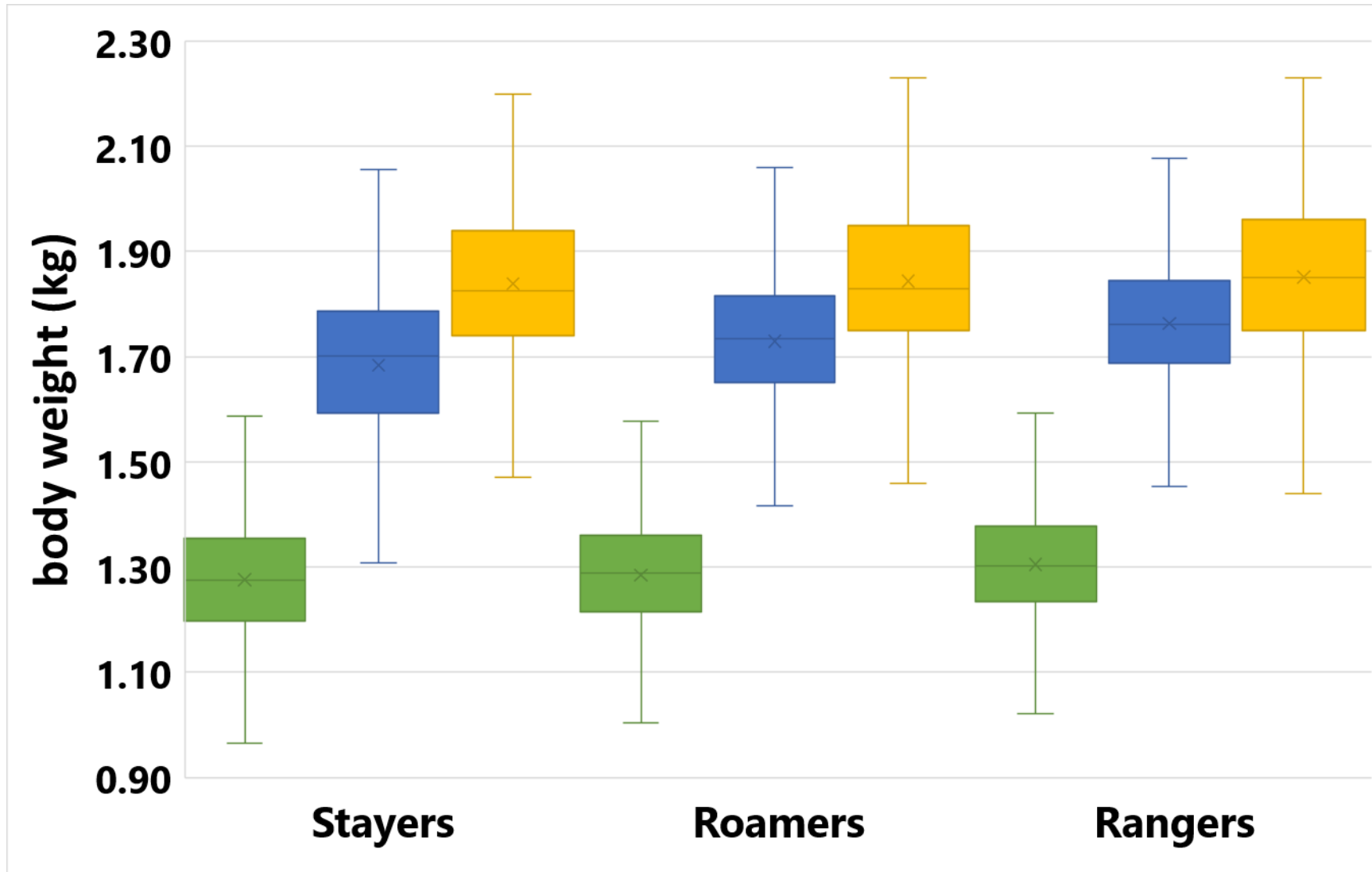
# Materials & Methods

- 1875 hens, individually identified
    - body weight 16 weeks of age & 22 weeks of age
    - ranging activity 16–21 weeks of age
  - Stayers: < 17 % days ranging of available days,  $\bar{x}$  0.5%
  - Roamers: hens not classified as stayers or rangers
  - Rangers: > 50 % days ranging of available days,  $\bar{x}$  74.4%
  
  - 625 hens/pen = stayers
  - 625 hens/pen = roamers
  - 625 hens/pen = rangers
- } x 3 replicates (sheds)
- Every 10 weeks: egg collection until 72 weeks of age





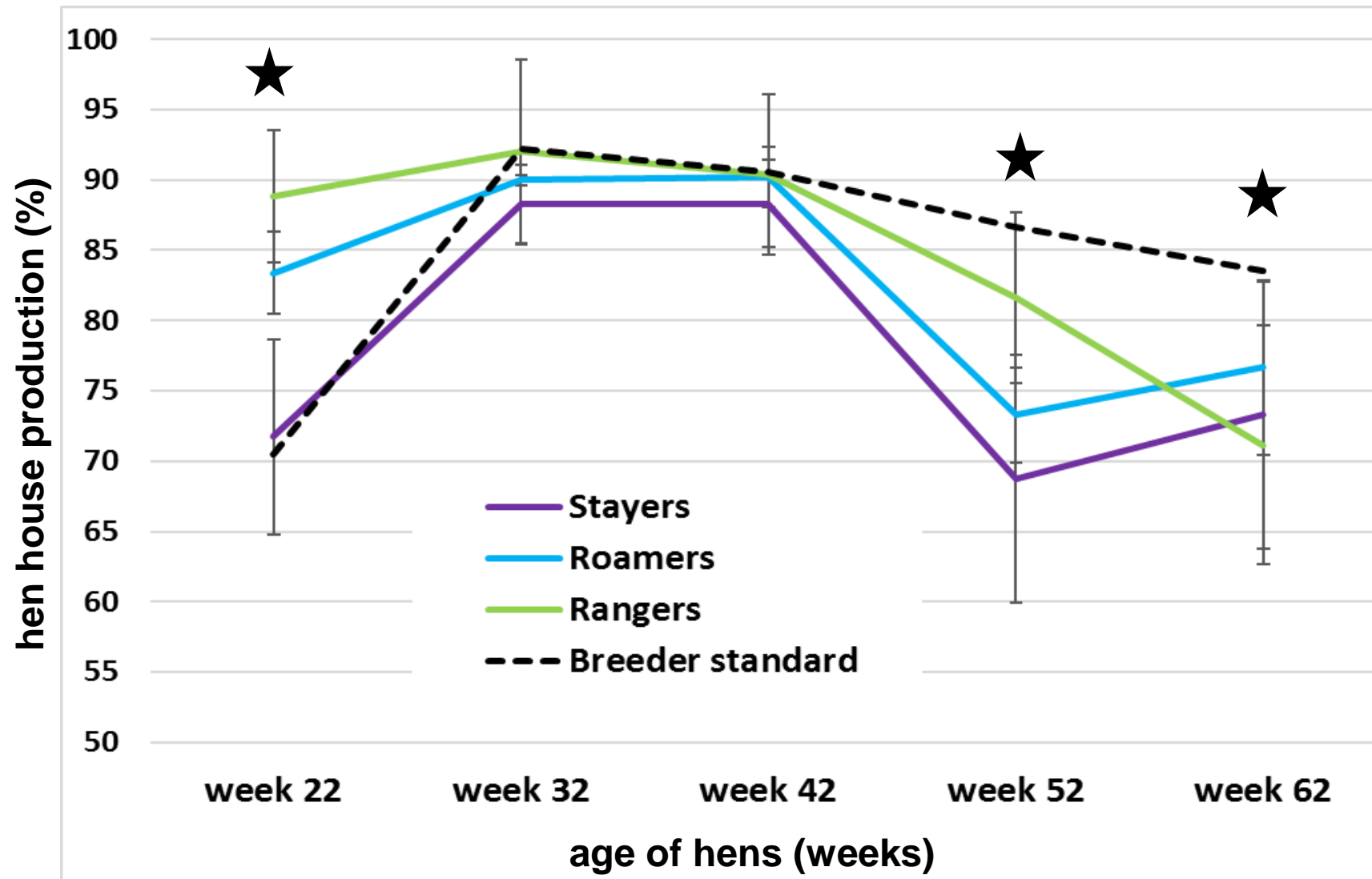
# Results

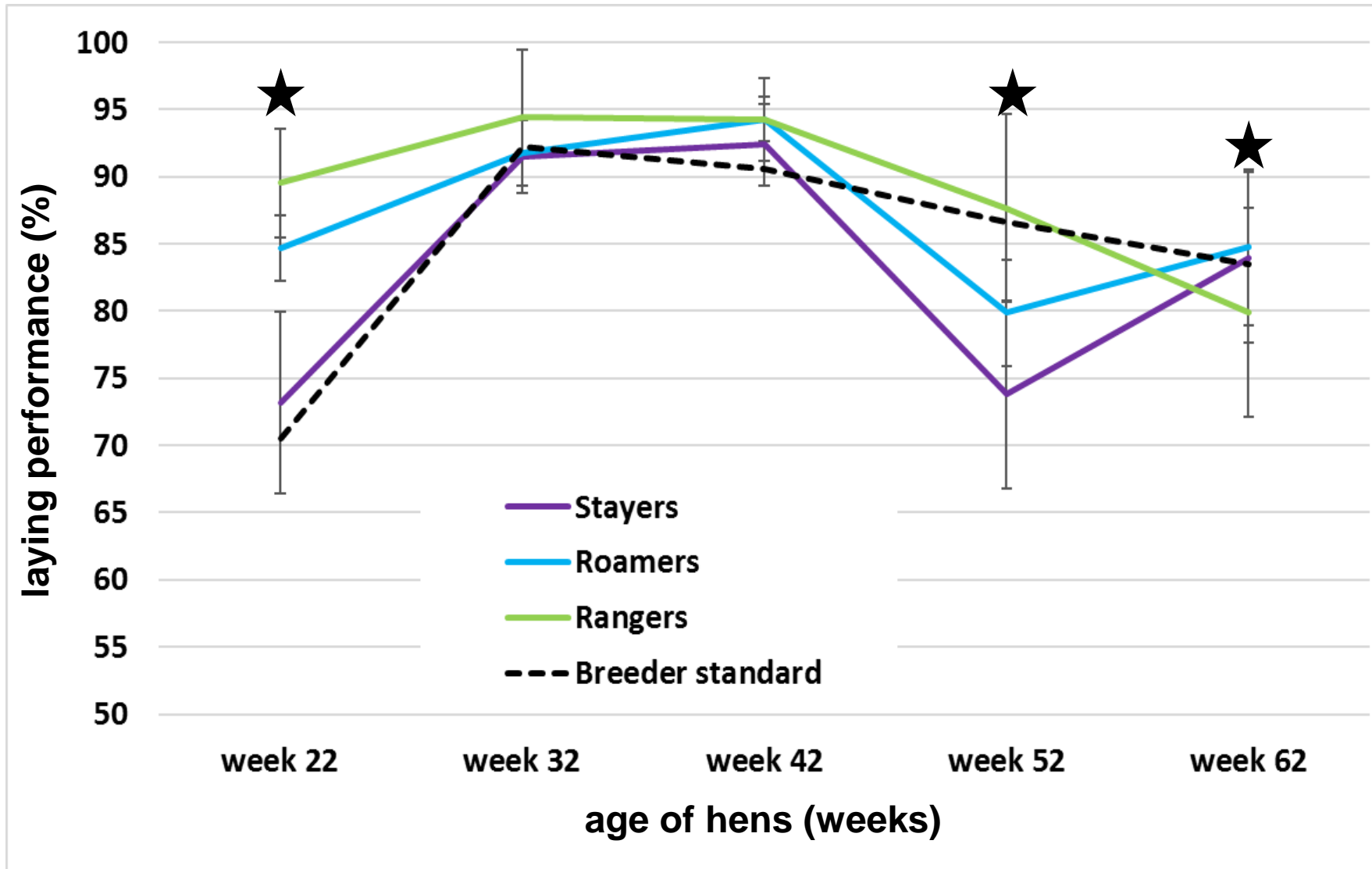


72 weeks of age

22 weeks of age

16 weeks of age





# Conclusion (1)

- Ranging hens
  - Heavier body weight
  - better egg production
- Why?
  - beneficial fibre?
  - exposure to sunlight?
  - metabolic activity?
  - Impact of pullet body weight/ behaviour?



# Conclusion (1)

- Ranging hens
  - heavier body weight
  - better egg production
- Why?
  - beneficial fibre?
  - exposure to sunlight?
  - metabolic activity?
  - Impact of pullet body weight/ behaviour?



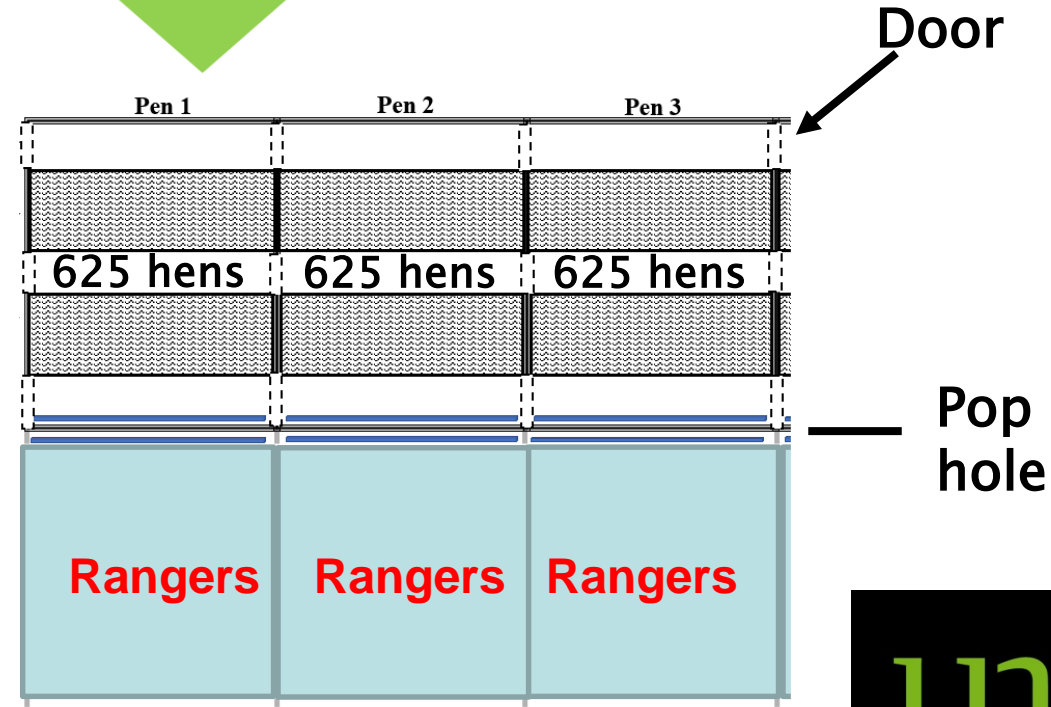
→ are stayers the true reason for overall reduced laying performance of free range flocks rather than the housing system as such?

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- Characterise sub-populations of free range flocks
  - Stayers
  - Roamers
  - Rangers
- Egg performance
- **Nutritional needs**
  - conventional conditions
  - bio-secure feeding station on range
  - additional 10% ME and amino acids



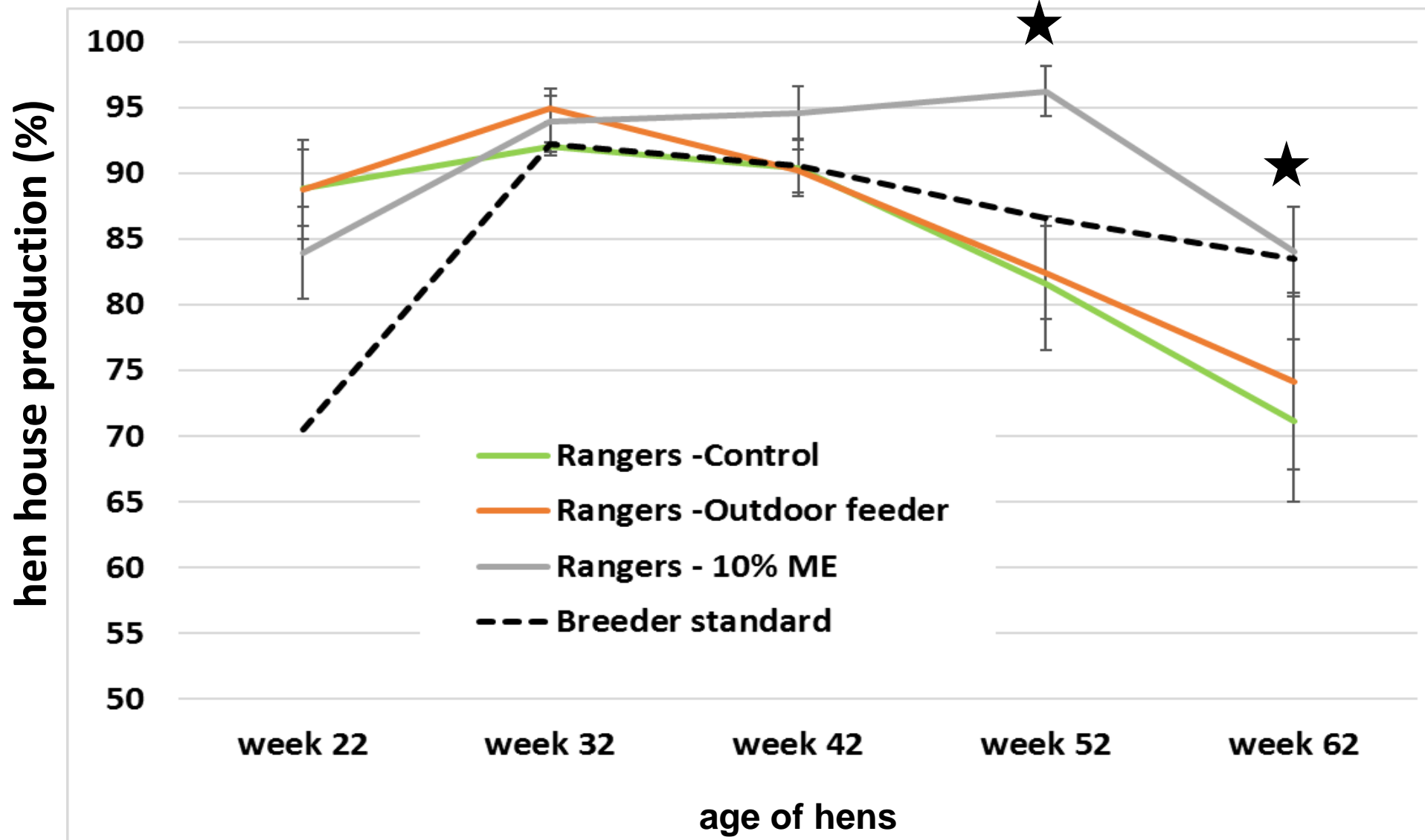
Range Area

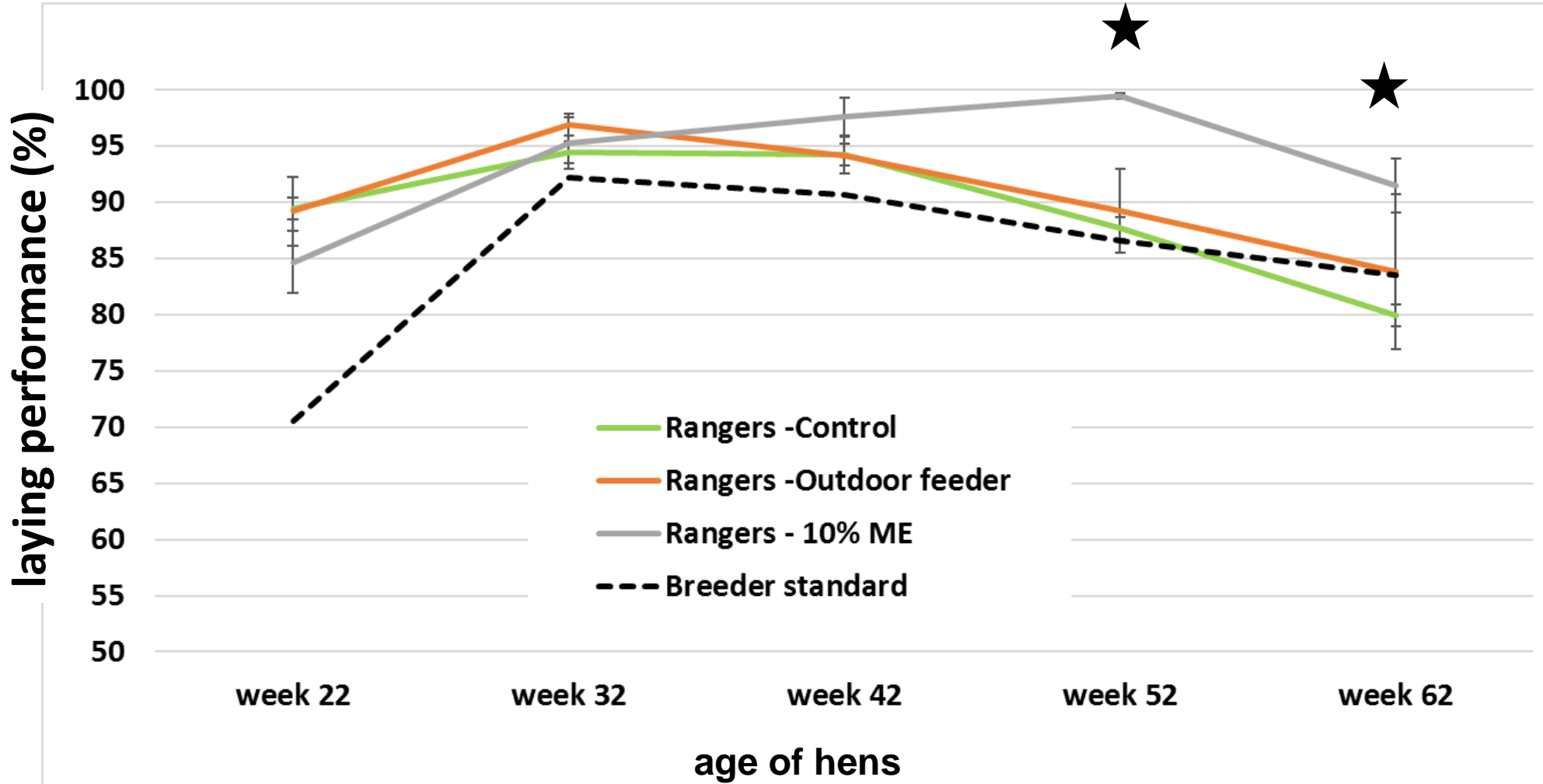


# Materials & Methods

- 1875 hens, individually identified
    - body weight 16 weeks of age & 22 weeks of age
    - ranging activity 16–21 weeks of age
  - Rangers: > 50 % days ranging of available days
  - 625 hens/pen = rangers, conventional system
  - 625 hens/pen = rangers, feeder on range
  - 625 hens/pen = rangers, + 10 % energy/amino acids
- } x 3 replicates (sheds)
- Every 10 weeks: egg collection until 72 weeks of age







# Conclusion (2)

- Sub-populations of free-range laying hens require **individual nutrient support to achieve outstanding performance**
- **Performance-based feeding** allows for an more efficient use of hens

