Range use relationship with welfare and performances in four strains of organic broilers

Claire Bonnefous, Anne Collin, Laurence A. Guilloteau, K. Germain, Laure Ravon, Thierry Bordeau, Pascal Chartrin, Estelle Godet, Estelle Cailleau-Audouin, Nathalie Couroussé, et al.

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C. Bonnefous[1*], A. Collin[1*], L.A. Guilloteau[1], K. Germain[2], L. Ravon[2], T. Bordeau[1], P. Chartrin[1], E. Godet[1], E. Cailleau-Audouin[1], N. Couroussé[1], E. Raynaud[1], S. Mignon-Grasteau[1], M. Reverchon[3], S. Mattioli[4], C. Castellini[4], E. Angelucci[4], V. Guesdon[5], L. Calandreau[6], C. Berri[1*], E. Le Bihan-Duval[1*]

[1]INRAE, Université de Tours, BOA, 37380 Nouzilly, France; [2]INRAE, UE EASM, Le Magneraud, CS 40052, 17700, Surgères, France; [3]SYSAAF, Nouzilly, France; [4]Department of Agricultural, Environmental and Food Science, University of Perugia, Borgo XX Giugno 74, 06124, Perugia, Italy; [5]France Junia, Comportement Animal et Systèmes d'Elevage, F-59000 Lille, France; [6]INRAE, CNRS, IFCE, Université de Tours, PRC, 37380, Nouzilly, France; [*]Equal contribution

Corresponding author : claire.bonnefous@inrae.fr

Introduction:

Outdoor range:
- Novel environment
- Novel ressources (grass, insects ....)

→ Consequences on animal ?
- Behaviour
- Metabolism
- Performances and meat quality
- Health and welfare

JA757
734 animals,
ADG: 36 g/day,
RD: 71 days

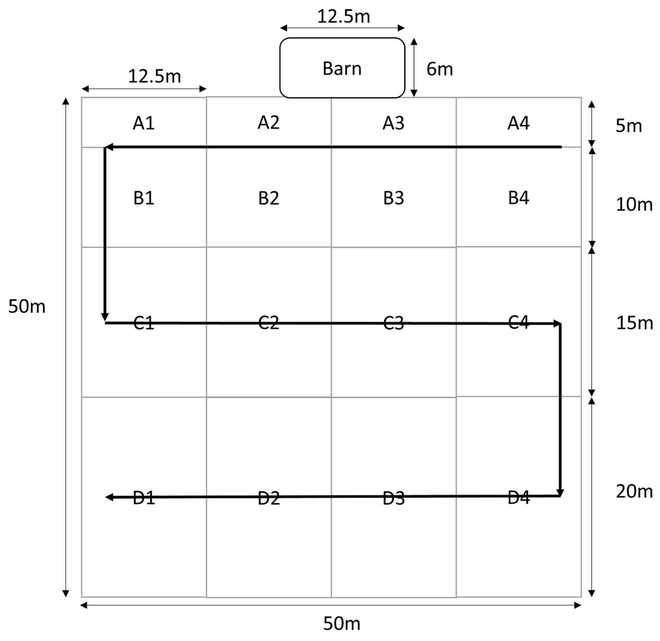
S757N
735 animals,
ADG: 26 g/day,
RD: 85 days

White Bresse
747 animals,
ADG: 23 g/day,
RD : 99 days

Dual-purpose crossbreed
771 animals,
ADG: 16 g/day,
RD: 121 days

Method:

- Four strains of different average daily gains (ADG) and rearing durations (RD)
- Range use evaluation - two groups of 25 high- (HR) and low-rangers (LR)



Range use measure:
Walking in the range following the black arrow and recording the position of animals in the range

Range use calculation:
Range use proxy $= NT_A \times 2.5 + NT_B \times 5 + NT_C \times 22.5 + NT_D \times 40$
With $NT_{(A, B, C, D)}$, number of times animal recorded in zone A, B, C or D

Statistics:

- Fisher exact test for qualitative parameters
- Student's test or Mann-Whitney-Wilcoxon test depending on the indicators normality for quantitative parameters

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Results:

Welfare indicators collected at slaughter:
- Hock burns
- Pododermatitis
- Struggling activity on the shackle line
- Total duration of wing flapping

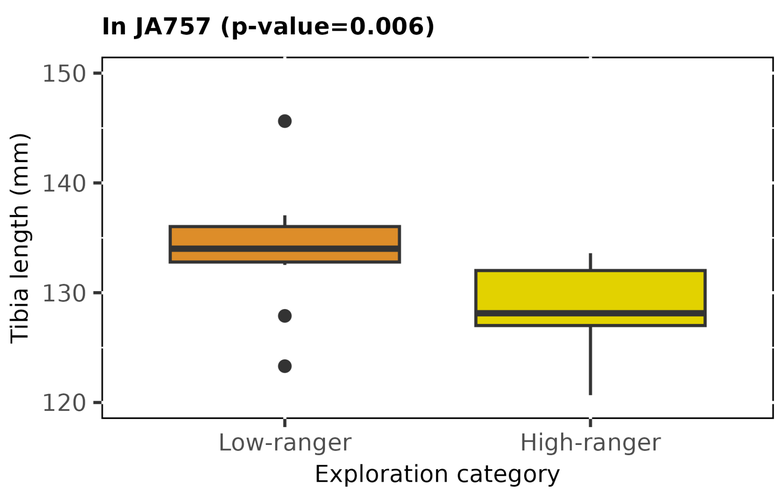
➢ did **not** differ according to range use whatever the strain

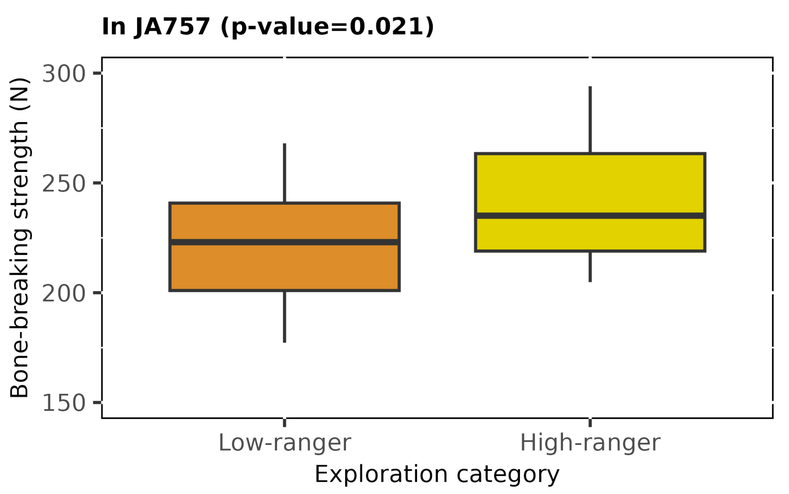
Range use reduced performances whatever the strain

Range use increased meat yellowness in JA757 and the dual-purpose strain

Tibia in the JA757 strain:
- 4% shorter
- 2% stronger

Redox status:
- Antioxidants (Vitamin E, Total antioxidants Status) decreased with range use in JA757
- Oxidants (H_2O_2) increased with range use in JA757
- Same tendencies were reported in S757N
- But not in White Bresse and dual-purpose strains





Discussion – conclusion:

No impact on welfare indicators but a positive relationship between leg health and range use in the JA757 strain with the higher growth rate

Potential impact of locomotion explaining the negative trade-off between growth performance and range use

Potential impact of locomotion explaining the beginning of an oxidative stress with higher range use

Potential impact of grass ingestion on animal's breast meat colour explaining yellower meat with range use

Leg bone health
↗ Tibial strength

Performances
↘ Muscle growth

Oxidative status
↗ Oxidants
↘ Antioxidants

← ***Supposed increased Locomotion*** ← **Increased Range use** → ***Supposed higher foraging of grass*** → Carotenoids ? → ***Meat Quality***
↗ Yellowness

Perspectives:
Better understanding of range use relationship with behaviour, metabolism, performances, meat quality and welfare
- ➢ Find biomarkers of range use before range access to predict range use
- ➢ Genetic selection to homogenize range use, limit negative impact on performances while improving health and welfare ?

PPILOW
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