



# 5th EURCAW-Poultry-SFA & Reflection Board meeting



16.01.2026



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AARHUS  
UNIVERSITY



# Welcome

Virginie Michel – EURCAW-Poultry-SFA



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- |       |       |   |
|-------|-------|---|
| 13:00 | 13:05 | Welcome ( <i>V. Michel</i> )  |
| 13:05 | 13:10 | Welcome ( <i>DG SANTE, to confirm</i> )   |
| 13:10 | 13:45 | Short presentation of EURCAW-Poultry-SFA and its Reflection Board ( <i>members introduction including a presentation of Mr. Juan José Pascual Amorós (ERA), RB objectives and tasks</i> ) |
| 13:45 | 15:05 | Update on the Centre's actual work + Discussion ( <i>EURCAW-Poultry-SFA</i> )   |
| 15:05 | 15:35 | Policy Indicators for Broiler Welfare: The roles of stocking density and breed ( <i>H. Lambert, Eurogroup four animal</i> )   |
| 15:35 | 15:55 | Open discussion   |
| 15:55 | 16:00 | Closure ( <i>V. Michel</i> )  |

# Welcome

Laerke TOFT HOLM, DG SANTE



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# Introduction to EURCAW-Poultry-SFA

Virginie Michel – EURCAW-Poultry-SFA



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## EU Reference Centers for Animal Welfare

Art. 95 of **'The Official Controls Regulation'**:  
*"The Commission shall, by means of implementing acts, designate European Union reference centers for animal welfare that shall support the activities of the Commission and of the Member States"*



Since October 2018



Since February 2020



Since June 2021



Since May 2024



## 5 activities (= 5 Work Packages (WP))

1. COORDINATED ASSISTANCE (WP1)
2. ANIMAL WELFARE INDICATORS (WP2)
3. SCIENTIFIC AND TECHNICAL STUDIES (WP3)
4. TRAINING COURSES (WP4)
5. DISSEMINATING RESEARCH AND INNOVATIONS (WP5)



## EURCAW-Poultry-SFA has 5 Priority areas

1. Broiler chickens on farm
2. Laying hens in alternative housing systems
3. Consciousness and welfare during stunning and killing process at slaughter and on farm
4. Rabbits on farm, with a focus on alternative housing systems
5. Turkeys on farm





Virginie MICHEL



Maryse GUINEBRETIERE



Antonio VELARDE



Aranzazu VARVARÓ



Frédérique MOCZ



Emilie NEHLIG



Aida XERCAVINS



Xènia MOLES



Leonardo J. VINCO



Clara TOLINI



Anja B. RIBER



Steen H. MØLLER Emily LEISHMAN





### Objectives:

→ *to exchange, discuss about interactions, and identify interests.*

Delegates of the reflection board: Association/institutions/entities are members EU Platform on Animal Welfare

1. Eurogroup for Animals: Maya Cygańska
2. Association of Poultry Processors and Poultry Trade in the EU (a.v.e.c.): Birthe Steenberg
3. European Rural Poultry Association (ERPA): Marie Guyot
4. European agri-cooperatives (COCEGA): Gianluca Bagnara
5. European farmers (COPA): Gianluca Bagnara
6. European Forum of Farm Animal Breeders (EFFAB): Ana Granados Chapatte
7. Federation of Veterinarians of Europe (FVE): Wiebke Jansen
8. European Rabbit Association (ERA): Juan José Pascual Amorós → Welcome!



### We propose that RB:

- Follow-up the activities of the EURCAW-Poultry-SFA
- Reflect on the activities
- Support the Centre with:
  - ✓ Technical information
  - ✓ Indicators
  - ✓ Good practices
  - ✓ Trainings
- Disseminate the activities of the Centre among stakeholders
- Improve dialogue between inspectors and operators



# Introduction of Juan José Pascual Amorós, and ERA

-  
Director of the Institute for Animal Science and Technology at  
Universitat Politècnica de València, ERA representative





EUROPEAN RABBIT ASSOCIATION



# EURCAW-Poultry-SFA Reflection Board Meeting Presentation of the European Rabbit Association

16 January 2026



# Juan José Pascual

- **Full-Professor** at the Institute for Animal Science and Technology, Universitat Politècnica de València, Spain.
- I have dedicated the last **30 years** to rabbit science.
- Editor in chief of **World Rabbit Science** journal since 2025.
- **World Rabbit Science Association**: General Secretary from 2017 to 2021 and President from 2021 to 2025.
- Scientific Spanish Association of Rabbit Farming (**ASESCU**): President from 2020 to 2024. Coordinator of “Animal Welfare Code in Rabbit Production”.
- Author in more than 130 scientific papers in rabbit science.



# Who are ERA?

- Created in 2022
- ERA is the European Association bringing together the main national or interprofessional associations involved in **rabbit meat production** from Belgium, Czech Republic, France, Germany, Hungary, Italy, Poland, Portugal, Spain and the Netherlands.
- ERA represents **the whole production chain** (production, processing and marketing of rabbit meat).
- Some key EU figures:

**Around 100 000 tons of meat produced in 2024**



## The objectives of the association are:

To promote and represent the interests of the rabbit sector

To improve the visibility of the sector at EU level

To support the continuous sustainable transition of the sector

To promote values and quality standards of rabbit meat and encourage the development of the sector in Europe



## About our sector

- EU production represents roughly 13% of the world's production
- **China produces almost half of the world's rabbit meat**
- EU is a world leader in genetics



“

**Thank you very much for  
your attention**

# Contact us

[info@europeanrabbitassociation.eu](mailto:info@europeanrabbitassociation.eu)

Rue Montoyer, 31  
Brussels (Belgium)

[european-rabbit-association.eu](http://european-rabbit-association.eu)

[@EU\\_Rabbit\\_Aссо](https://twitter.com/EU_Rabbit_Aссо)



# What's new in EURCAW-Poultry-SFA's work

Virginie Michel – EURCAW-Poultry-SFA





**Q2Es: → all Q2E answers are available online:**

<https://www.eurcaw-poultry-sfa.eu/en/minisite/sfawc/question-eurcaw-q2e>

### Latest Q2Es:

[Q2E-Poultry-SFA-2024-007](#): Piling behaviour Q1

[Q2E-Poultry-SFA-2024-008](#): Piling behaviour Q2

[Q2E-Poultry-SFA-2024-009](#): Laying hens nest depth

[Q2E-Poultry-SFA-2025-001](#): Broiler breeders platform area

[Q2E-Poultry-SFA-2025-002](#): Culling individuals

[Q2E-Poultry-SFA-2025-003](#): Second stunning of rabbits at slaughter

[Q2E-Poultry-SFA-2025-004](#): Broiler Cannibalism Causative Factors

[Q2E-Poultry-SFA-2025-006](#): Broiler Cannibalism Prevention

[Q2E-Poultry-SFA-2025-007](#): Broiler Cannibalism Emergency Measures

[Q2E-Poultry-SFA-2025-008](#): Duck catching

[Q2E-Poultry-SFA-2025-005](#): Pre-stun shocks in waterbath stunning of Poultry



## Guidance for the selection of the most appropriate depopulation method in terms of animal welfare in the event of Avian Influenza

Virginie Michel  
(Louise Kremer)





## INTRODUCTION



### Joint activity since 2023

Collaboration between the EURCAW-Poultry-SFA and the French Reference Centre for Animal Welfare



### In response to an european need

At the request of the Competent Authorities of several member states



### To promote more ethical depopulation practices in the event of Avian Influenza

Recommendation of the most appropriate depopulation method based on farm characteristics and the species concerned



## DELIVERABLES



### COMPREHENSIVE REPORT

### SELECTION GUIDE

#### Objectives

Diversity of the depopulation procedures used in the EU  
Effectiveness and impact on animal welfare

Guidance on the selection of the most appropriate depopulation method based on the specific context

#### Scope

The 11 most commonly used depopulation methods in the EU

#### Method

10 surveys  
1 workshop with 50+ experts

9 focus groups



## GENERAL CONSIDERATIONS



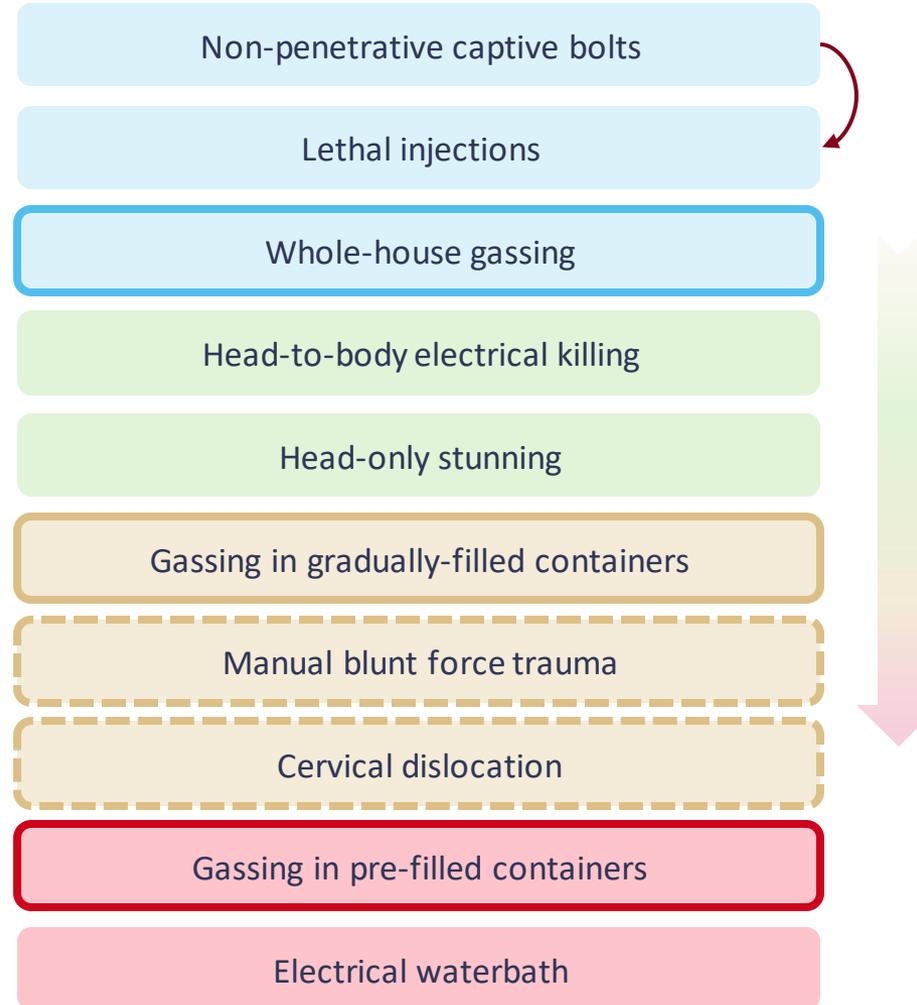
Ranking of methods based on **poultry welfare**



**Exclusion of factors** indirectly related to poultry welfare (e.g., operator safety)



A **living document** subject to updates based on scientific and technological developments





## A DYNAMIC RANKING



### Flock size

Small (hundreds of individuals)

Medium (few thousands of individuals)

Large (tens of thousands of individuals)

- **Manual blunt for trauma and cervical dislocation for small flocks only**

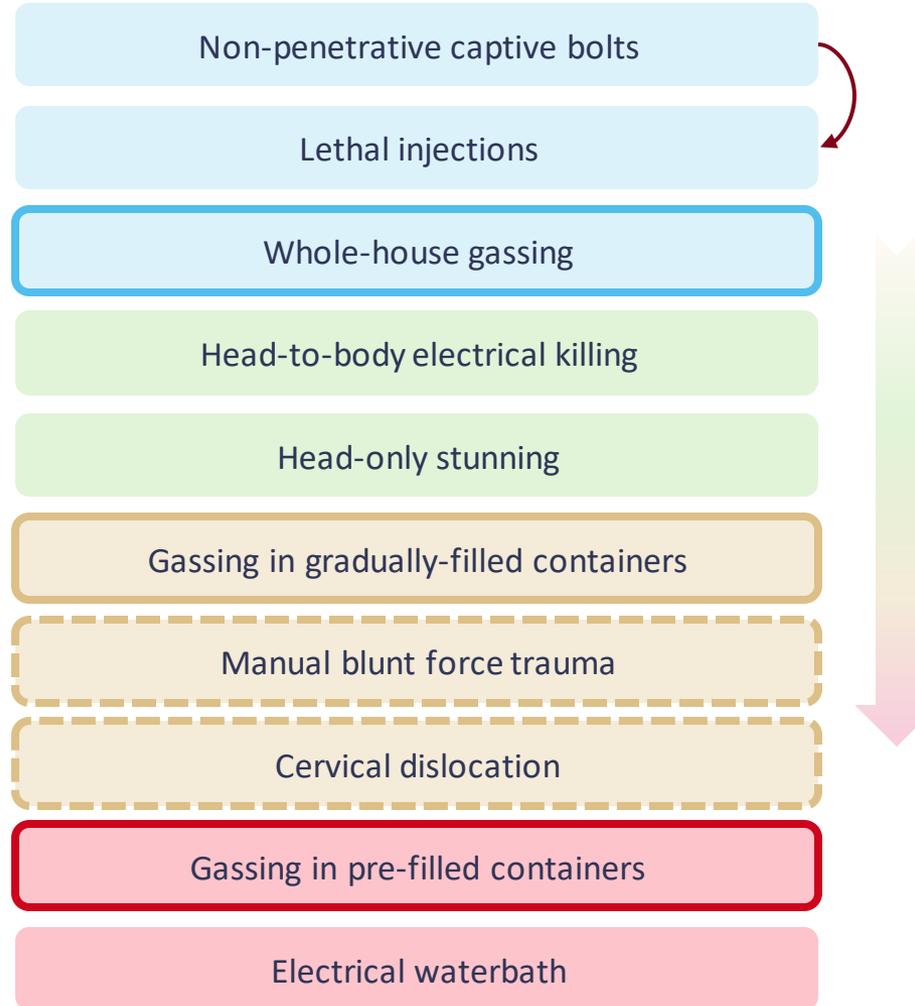


### Presence of clinical symptoms

Whole house gassing

Gassing in gradually filled containers

- **Preference for group-based methods to avoid prolonged suffering**





## A DYNAMIC RANKING



### Flock size

Small (hundreds of individuals)

Medium (few thousands of individuals)

Large (tens of thousands of individuals)

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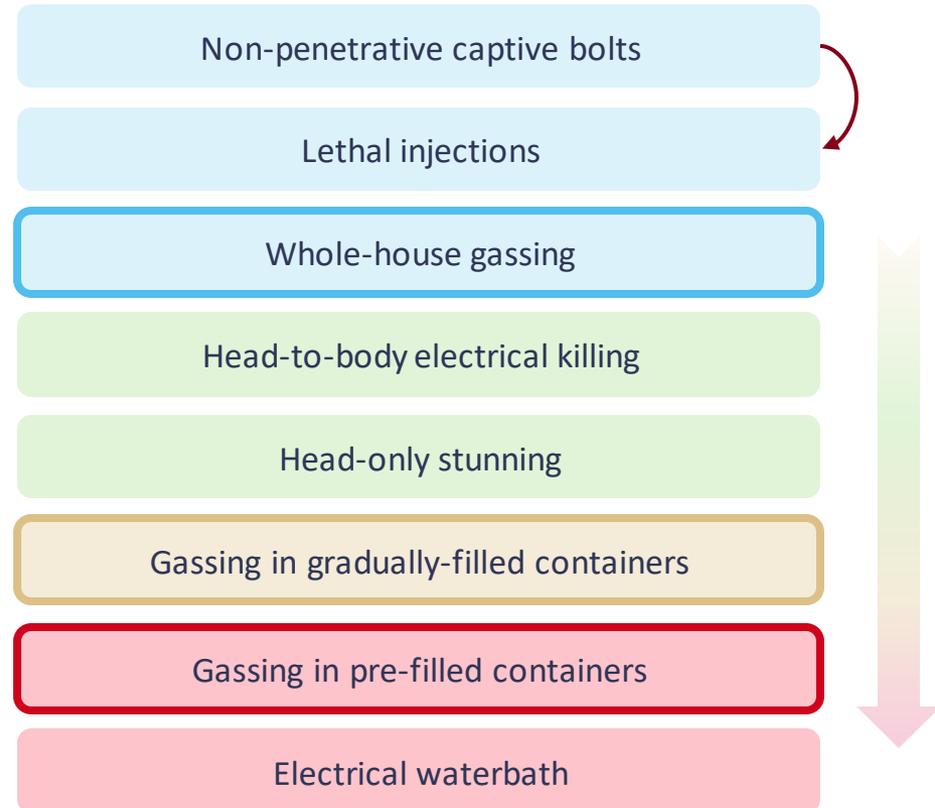
### Presence of clinical symptoms

Whole house gassing

Gassing in gradually filled containers

- **Preference for group-based methods to avoid prolonged suffering**

## Example for a flock of **medium size** without clinical symptoms





## A DYNAMIC RANKING



### Flock size

Small (hundreds of individuals)

Medium (few thousands of individuals)

Large (tens of thousands of individuals)

- **Manual blunt for trauma and cervical dislocation for small flocks only**



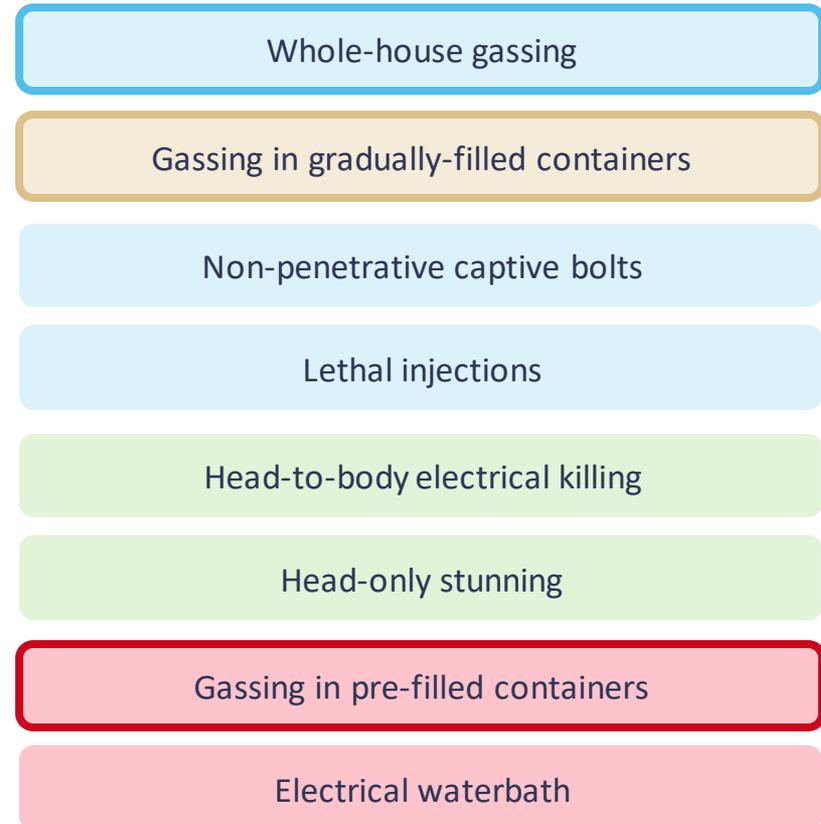
### Presence of clinical symptoms

Whole house gassing

Gassing in gradually filled containers

- **Preference for group-based methods to avoid prolonged suffering**

## Example for a flock of medium size with clinical symptoms





### WANT MORE INFORMATION?

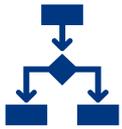


Please consult **our latest deliverable** on the matter!

<https://zenodo.org/records/14679733>



### A COLLECTION OF DECISION TREES



One decision tree per method, for a total of **11** trees



Each tree is based on **3** categories of questions that relate to human, technical and environmental resources



A method is recommended for use only if **all conditions are met to ensure poultry welfare**. Otherwise, the possibility of implementing the next best method is examined, etc.



## SELECTION GUIDE: OUR ONLINE TOOL



The screenshot shows the top of a website. On the left is the logo for the French Reference Centre for Animal Welfare, which consists of a stylized circular graphic in purple, teal, and pink. To its right is the text 'French Reference Centre for Animal Welfare'. On the right side of the header is the EURCAW Poultry SFA logo. Below the header is a large photograph of two brown chickens. In the bottom right corner of the photograph, there are three circular icons: a white chicken on a white background, a teal chicken on a teal background, and a dark blue chicken on a dark blue background. Below the photograph, the text 'Selection of the most appropriate depopulation method for the welfare of poultry' is centered. At the bottom of the screenshot is a purple button with the text 'START HERE' in white.

[poultree.cnr-bea.fr](http://poultree.cnr-bea.fr)

# **Fitness for Transport in laying hen**

Antonio Velarde –EURCAW-Poultry-SFA





## ¿What is the objective?

**Provide guideliness for the assessment of FFT of end-of-lay hens during pre-transport inspections.**

## ¿What has already been done?



- **2022 and 2023: Workshops to approach this topic + survey for CAs** (to know the current situation)
- **2024: Extensive Review about the fitness for transport assessment for end-of-lay hens**

For each indicator, a brief definition, the methods available for their assessment, the criteria used to decide the fitness for transport of birds and the knowledge gaps encountered were included



## ¿Why is it important?

### State of the art: EoL hens

- ❖ Poorly feathered owing to wear and tear feather loss in cage systems and to injurious pecking in all systems (more sensitive to cold)
- ❖ Metabolically exhausted with few body reserves (prolonged hunger)
- ❖ Still laying eggs of high-water content (prolonged thirst)
- ❖ Osteoporosis (bone lesions)





## ¿Why is it important?

### Description EFSA (2022)

- ❖ Making sure that animals are fit for transport before departure is of utmost importance (Grandin, 2001; Cockram, 2019).
- ❖ A scientific definition of “fitness for transport” does not exist (Herskin et al., 2021).
- ❖ Unfit often relates to health impairment, but also cover certain age groups or physiological stages.
- ❖ Challenges associated with transport are greater for weak or vulnerable animals (less able to cope with hazards).



## Inspection EFSA (2022)

- ❖ Birds unfit for transport should receive appropriate treatment or be immediately humanely killed.
- ❖ To minimize the risk of birds becoming unfit for transport between the last inspection and the time of catching, the final inspection should be as close to the time of catching as possible (a maximum of 12 h prior to catching).
- ❖ Birds must also be inspected during catching and crating.
- ❖ Birds injured during the catching process should not be loaded.
- ❖ The fitness for transport is difficult to assess during catching and once the birds are in containers.



## ¿What are we planning now?

- **Field visits to get photos, as examples for the guidelines or for training**
  - **Focus groups to discuss how to approach the gaps of knowledge in the guidelines to harmonize the text and find a consensus**
- Severe Open wounds
  - Prolapses
  - Severe Lameness
  - Broken bones and dislocations
  - Keel bone damage
  - Emaciation and cachexia
  - Evident signs of illness
  - Poor feather cover and wet plumage
  - Assessment strategy and logistics



## ¿What are we planning now?

**After we publish the final document, we will also organize **online training** to help understand the guidelines (2027)**

**Proposal about the final format of the guidelines:**

- **For official veterinarians, as detailed as possible, complemented by photos**
- **Discussion of grey cases: during the online training session**



## ¿Questions to the Board

**Do you think is rellevant?**

**Do you have prevalences about animals not fit for transport?**

**Do you have information about how the fitness assessment is done? And who is doing the assessment?**

**Are you aware of any guidance about the assessment of FFT?**

**Do you miss any indicator?**



# Guidance stunning equipment

Antonio Velarde  
EURCAW-Poultry-SFA





# Guidance for the assessment of the stunning equipment

*"Products marketed or advertised as restraining or stunning equipment shall only be sold when **accompanied by appropriate instructions** concerning their use in a manner which ensures optimal conditions for the **welfare of animals**. Those instructions shall also be made **publicly available by the manufacturers via the Internet**.*

*Those instructions shall in particular specify:*

- (a) the species, categories, quantities and/or weights of animals for which the equipment is intended to be used;*
- (b) the recommended parameters corresponding to the different circumstances of use, including the key parameters set out in Chapter I of Annex I;*
- (c) for stunning equipment, **a method for monitoring the efficiency of the equipment as regards compliance with the rules laid down in this Regulation;***
- (d) the recommendations for maintenance and, where necessary, calibration of the stunning equipment."*



# Guidance for the assessment of the stunning equipment

Aim of the Guidance:

**to provide scientific support to check the compliance with the requirements of the aforementioned regulation.**



# Guidance for the assessment of the stunning equipment

## MAIN DOCUMENT:

**Common general part** (i.e. introduction + checklist of product description + key parameters and specific requirements for each stunning system).

**Mostly from Regulation + some recommendations**

## NEXT STEPS: ANNEXES

- **Complete and update the list of indicators**

**For each stunning method and species**

**Based on the EFSA reports + adding any modification or recommendation from EURCAWs** (for example, we refined the list of indicators based on the results from our studies in EURCAW)



## Questions to the Board

**Do you think is relevant?**

**Are you aware of any guidance on the topic?**



# Study on consciousness assessment in ducks' slaughterhouses

Leonardo James Vinco

EURCAW-Poultry-SFA



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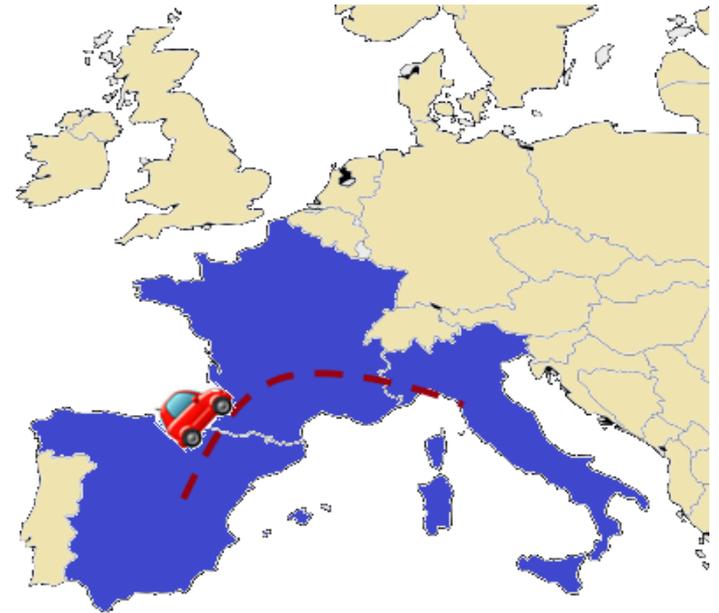
## ➤ Study on consciousness assessment in ducks' slaughterhouse

### The Team:



3 observers from:  
IZSLER, ANSES and IRTA

### Duck slaughterhouses (SHs):

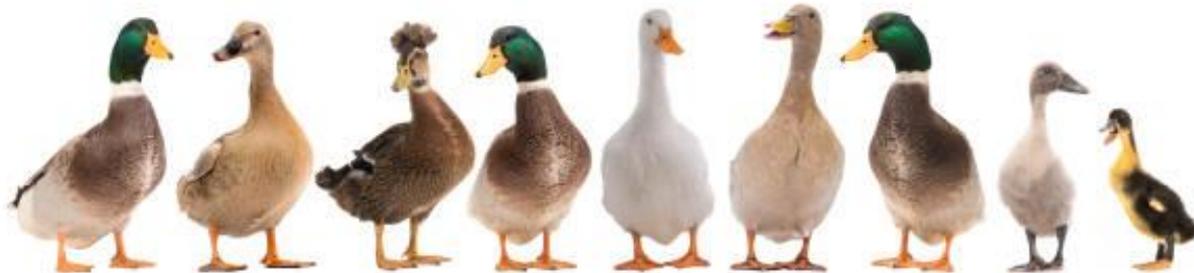


6-12 different SHs  
from three duck producer  
countries in the EU

### ➤ Study on consciousness assessment in ducks' slaughterhouse

#### General objective:

Identify a refined **list of indicators** that can be used to assess the state of consciousness of **electrically waterbath stunned ducks** in commercial slaughterhouses to ensure consistency of controls and to evaluate the efficiency of induction of unconsciousness



### ➤ Study on consciousness assessment in ducks' slaughterhouse

#### Specific objectives:

1. Assess the **inter-observer repeatability** of the most valid and feasible indicators of consciousness according to the EFSA
2. Elucidate the **association** among the indicators
3. Assess **efficiency of stunning**
4. Find **key factors** that contribute to effective stunning
5. **Other welfare issues**
  - Shackling
  - Pre-stun shocks
  - Re-stunning
  - Line stop



### ➤ Study on consciousness assessment in ducks' slaughterhouse



#### What has been done so far?

- 9 Slaughterhouses visited
- France, Italy, and Spain
- Foie and meat purpose
- Small and large SH
- Around 2.000 ducks assessed

#### What is planned for the future?

- 2 further assessments in January 2026  
before analysing all the data



## ➤ Study on consciousness assessment in ducks' slaughterhouse



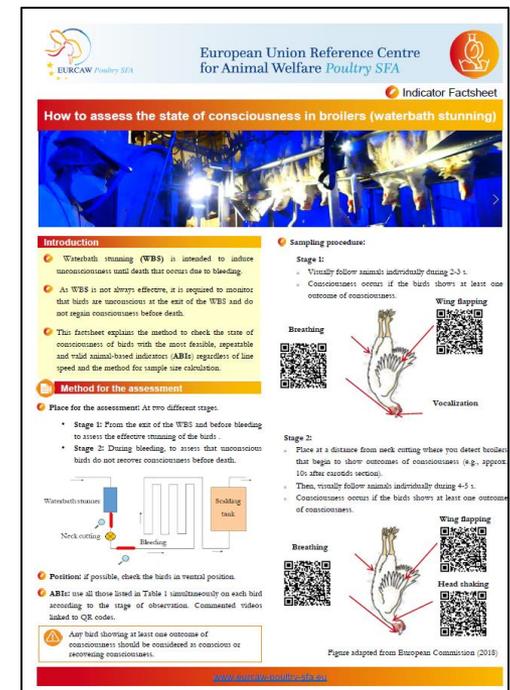
**REPORT:** May 2027



**WEBINAR:** May 2027



**FACTSHEET:** September 2027





## ¿Questions?



# Rabbits on farm: gnawing material

Clara Tolini  
EURCAW-Poultry-SFA





## WP3 Review on enrichments for farmed rabbits



- Relevant enrichments for rabbit welfare
- Gap of knowledge and recommendations



- Thematic Factsheet



<https://zenodo.org/records/18259438>



## Type of enrichments for rabbits

- Social
- Physical/structural
- **Occupational**
- **Nutritional**
- Sensory





## Gnawing material

- **Occupational** and **nutritional** enrichment
- It facilitates the expression of **species-specific behaviours** (Baumans, 2005; Huang et al., 2021)
- Rabbits consistently spend more time in environments where gnawing substrates are available (Princz et al., 2008)
- In its absence, rabbits frequently develop **abnormal behaviours**, including stereotypies and aggression (Verga et al., 2004; Princz et al., 2007, 2008, 2009; Bozicovich et al., 2016)
- The provision of gnawing material slightly reduced aggressive behaviour in **does** kept in a part-time housing system (Van Damme et al., 2024)





## Example of Gnawing Materials

- **Straw:** >12-week-old rabbits (Lidfors, 1997) and breeding does (Rommers, 2014a)
- **Wooden sticks:** growing rabbits (Bozicovich et al., 2016; Princz et al., 2008)
- **Pressed hay cubes:** >12-week-old rabbits (Lidfors, 1997); breeding does (Van Damme et al., 2024); growing rabbits (Birolo et al., 2022)

## Position in the cage:

- **Growing rabbits:** sticks should be mounted horizontally on the cage (Princz et al., 2007) better than suspended (Luzi et al., 2003)
- **Does:** gnawing material should be put on the platform (Rommers et al., 2014b)





# Recommendations

- Special attention to the **position** of the gnawing materials in order to ensure **accessibility** and **hygiene** (EURCAW Poultry SFA, 2022).
- **High stocking densities**, can restrict individual access to gnawing materials, potentially leading to abnormal behaviours such as stereotypies and aggression.
- The presence of **influencing factors** such as group size, physiological status, housing design, and individual behavioural traits on gnawing material can influence the use of gnawing material and rabbit's behaviour.



# Gap of Knowledge

- There is gap of knowledge regarding the safety and usefulness of **not edible occupational enrichments** in promoting on-farm rabbit welfare.
- **No studies** have yet assessed rabbits' motivation to access gnawing materials using validated methods such as **willingness-to-pay** or other **motivation-based tests**

## Questions?



# Good practices

Emilie Nehlig  
EURCAW-Poultry-SFA





## Good Practices:

DL coding	title	Links
GPFS-Poultry-SFA-2024-02-EN	Automatic assessment of footpad dermatitis	<a href="https://zenodo.org/records/13860108">https://zenodo.org/records/13860108</a>
GPFS-Poultry-SFA-2024-03-EN	Early litter access for pullets housed in aviary systems	<a href="https://zenodo.org/records/13860273">https://zenodo.org/records/13860273</a>
GPFS-Poultry-SFA-2024-04-EN	Preventing heat stress in layer systems with covered veranda and outdoor access	<a href="https://zenodo.org/records/13860386">https://zenodo.org/records/13860386</a>
GPFS-Poultry-SFA-2024-05-EN	Outdoor rearing of rabbits	<a href="https://zenodo.org/records/13860676">https://zenodo.org/records/13860676</a>
GPFS-Poultry-SFA-2025-01-EN	Use of sick pens in turkey farming	<a href="https://zenodo.org/records/15358077">https://zenodo.org/records/15358077</a>
GPFS-Poultry-SFA-2025-02-EN	Elevated platforms in broiler chicken barns	<a href="https://zenodo.org/records/17962691">https://zenodo.org/records/17962691</a>

- Do you have examples of good practices that you would like to promote?
- Note: No advertisement of company.



**Dissemination:**

**Knowledge pill**



<https://www.youtube.com/watch?v=cRzrWv29CcQ>



## Dissemination:

The **scientific overview** page permits to download a list of all the outputs produced by the Centre since its creation, by topics: slaughter and killing, broiler chicken, laying hen, turkey, rabbit. This page is updated regularly.

EUROPEAN UNION REFERENCE CENTRE FOR ANIMAL WELFARE FOR POULTRY AND OTHER SMALL FARMED ANIMALS



Identify 

HOME SERVICES **OUTPUT** TOPICS TRAINING GOOD PRACTICES TRANSLATION KNOWLEDGE BASE NEWS ABOUT EXTERNAL LINKS ROADSHOWS

Scientific output overview

Factsheets

## SCIENTIFIC OUTPUT OVERVIEW

Search a document

Title :

**SEARCH**

Summary Deliverables - Slaughter and killing

Document Links, Published on 04/01/2025

 **DOWNLOAD**

POULTRY RABBIT



## Dissemination:

- **4 newsletters** were published in 2025.



Sign-up here:

<https://sitesv2.anses.fr/en/minisite/sfawc/subscribe-eurcaw-poultry-sfas-newsletter>

- The EURCAW-Poultry-SFA proudly presents its **infographics**, issued respectively from Q2E answers, created in collaboration with ***La Chaire bien-être animal***:

- **Outdoor access for pullets** (available in ENG and FR)
- **Pullets access to litter for dustbathing** (available in EN and FR)



- **10 factsheets** were translated into **5 languages** during 2025
- **6** in **DE, ES, FR, IT**
- **4** in **NL** (thanks to the Flemish AW NRC)

- **The EURCAW-Poultry-SFA LinkedIn account was created:**  
<https://www.linkedin.com/company/eurcaw-poultry-sfa>

# Policy Indicators for Broiler Welfare: The roles of stocking density and breed

(H. Lambert, Eurogroup four animal)



# **Policy Indicators for Broiler Welfare:**

The roles of stocking density and breed

Dr Helen Lambert, Consultant

16 - 01 - 2026





## Outline

1. Why policy indicators matter
2. What makes an indicator fit for regulation
3. Stocking density as a welfare indicator
  - a. Evidence base, thresholds, and policy relevance
4. Broiler breed as a welfare indicator
  - a. Evidence base, interaction with management, and policy relevance
5. Integrating indicators for policy use
6. Conclusions and recommendations

# The need for robust welfare indicators

Effective welfare policy depends on indicators that are:

- **Biologically meaningful and predictive of welfare outcomes**
- **Measurable, auditable, and enforceable** in commercial systems
- Able to **capture systemic welfare risk**, not isolated events
- Applicable for **harmonised assessment across production systems**
- Suitable for **monitoring, benchmarking, and regulatory oversight**

Indicator choice has **normative implications for welfare protection.**



## Upstream determinants of welfare outcomes

---

- Welfare is shaped by **system-level design choices**, not only daily management
  - Some parameters act **upstream**, constraining welfare outcomes
  - These influence health, behaviour, and scope for positive welfare
  - **Breed and stocking density** function as *predictive welfare risk indicators*
-

# How upstream and animal-based indicators work together

## Animal-based indicators

- Detect realised welfare harm and validate on-farm outcomes

## Upstream indicators

- Regulate structural welfare risk before harm occurs

## Effective welfare policy

- Requires both, applied at different points in the system

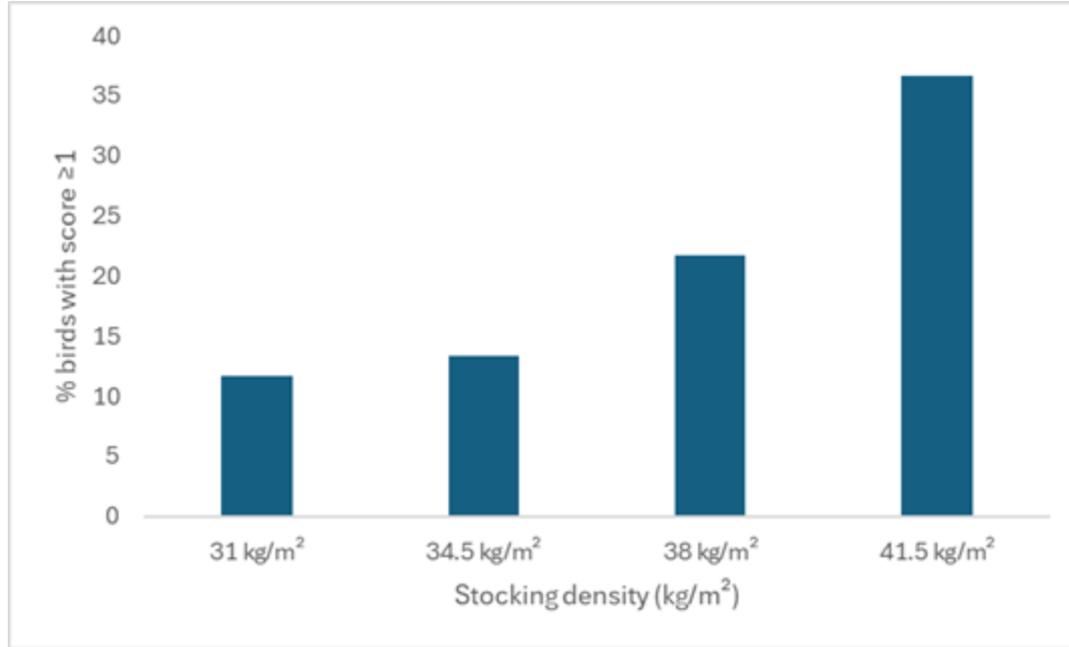


# Stocking density: Definition and policy context

- Expressed as kg live weight per m<sup>2</sup>
- Accounts for variation in growth rate, breed, and end weight
- Central, regulated parameter in EU broiler legislation
- Interacts directly with breed choice

EFSA, 2023

# Stocking density and footpad dermatitis



Incidence of FPD rises sharply as stocking density increases, illustrating a direct, measurable link between stocking density and welfare (Shynkaruk et al., 2023)

# Stocking Density: Effects on Behaviour, Mobility, and Stress

## Behavioural effects:

- Reduced locomotion and space use (Evans et al., 2023; van der Eijk et al., 2022)
- Restricted access to feeders and drinkers (Evans et al., 2023; Sanotra et al., 2002; Shynkaruk et al., 2023)
- Increased inactivity and resting time (Mocz et al., 2022; Shynkaruk et al., 2023).
- Impacts on fear levels (Jones, 1996)

## Effects on stress physiology:

- Elevated stress indicators (e.g., H:L ratio, corticosterone) (Kim et al., 2024; Nasr et al., 2021; Petek et al., 2010; Yu et al., 2021)
- Chronic stress linked to density and reduced behavioural freedom (Evans et al., 2023; Nasr et al., 2021; Yu et al., 2021)



Heat stress & ventilation challenges amplify physiological strain (Lara and Rostagno, 2013; Phillips and Heins, 2021; Sánchez-Casanova et al., 2020).

# Stocking Density and Heat Stress: System Mechanisms

- Stocking density is a key driver of cumulative metabolic heat load (EFSA, 2023; Najafi et al., 2015)
- As birds approach slaughter weight, heat production rises while behavioural and physiological heat dissipation declines (EFSA, 2023)
- High densities reduce effective airflow at bird level, even in mechanically ventilated systems (Saeed et al., 2019)
- At higher densities, opportunities for effective mitigation via ventilation or management become structurally constrained (Abudabos et al., 2013; Son et al., 2022)



# Stocking density as a policy indicator

## Scientific basis:

- Strong, consistent welfare associations
- Multiple welfare pathways affected

## Policy relevance:

- Already regulated, recorded, and enforceable under the Broiler Directive
- Easy to audit
- Comparable across systems
- Sensitive to thresholds



# Broiler breed as a Welfare Indicator

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## Definition/ Scope:

Genetic growth rate and body conformation

## Why it matters:

Sets physiological and behavioural constraints

EFSA, 2010, 2023



# Broiler breed: health outcomes

Fast-growing broilers are associated with:

- Increased lameness and leg disorders (Abdourhamane and Petek, 2023; Dixon, 2020; Kestin et al., 2001; Rayner et al., 2020)
- Higher incidence of contact dermatitis and breast lesions (Allain et al., 2009; Ask, 2010; Haslam et al., 2007; Kjaer et al., 2006; Santos et al., 2022)
- Heat stress (Nielsen, 2012; Mahmoud et al., 2015; Tickle et al., 2018; Steinfeldt et al., 2019)
- Cardiovascular disease and sudden death syndrome (Hartcher and Lum, 2019; Siddiqui et al., 2009)
- Increased mortality (EFSA, 2023; Nicol et al., 2024)



# Broiler breed: behavioural outcomes

**Faster-growing breeds → higher welfare risk**

Fast growing breeds are associated with:

:

- Reduced locomotion and activity (Bessei, 2006; Bokkers and Koene, 2003; Dawson et al., 2021; Dixon, 2020)
- Less foraging, preening, dustbathing, and perching (Bokkers and Koene, 2003; Dawson et al., 2021; Dixon, 2020)
- Reduced use of space and limited engagement with enrichment (Dawson et al., 2021)
- Increased inactivity and sitting (Bessei, 2006)



# Broiler breed as a policy indicator

## Scientific basis:

- Predictable population-level welfare effects
- Effects consistent across management systems
- Impacts multiple welfare domains

## Policy relevance:

- Breed information increasingly captured in monitoring/assurance schemes
- Measurable at flock level
- Can be used to set thresholds or guide breeding/production choices
- Uses routinely collected data under existing regulatory requirements

## Existing policy reference points:

- Recognised in organic legislation
- Defined by EPRS and the Commission
- Operationalised via ECC breed lists
- Increasing uptake in corporate reporting
- Compatible with compliance monitoring and enforcement at Member State level



# Stocking Density & Broiler Breed:

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Key drivers that predict welfare risk



## **Stocking density → environmental constraint**

- Physical lesions, behavioural restriction, physiological stress, heat load

## **Breed → biological constraint**

- Growth rate, leg health, cardiovascular health, activity, mortality

Both are measurable and evidence-based

Together, they explain a substantial proportion of welfare risk



# From Indicators to Legislation

Both stocking density and breed are measurable, evidence-based, and already embedded in regulatory frameworks and commercial reporting

Breed: referenced in organic legislation, ECC breed lists, corporate benchmarking schemes

Stocking density: widely monitored under Broiler Directive; linked to welfare compliance thresholds

Using these indicators together allows regulators to track compliance, guide welfare-aligned production choices, and assess policy impact without new reporting burden



# Conclusion

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As system-level indicators, stocking density and breed offer a practical, evidence-based route to proactive broiler welfare policy.





THANK  
YOU

# Reference List

- ects of Range Access on Behavioral-Based Welfare Indicators and Foot Health Condition of Slow- and Fast-Growing Broiler. *Acta Vet Eurasia* 49, 75–81. <https://doi.org/10.5152/actavet.2023.22094>
- E.O.S., Al-Ghadi, M.Q., Al-Atiyat, R.M., 2013. Impacts of Stocking Density on the Performance and Welfare of Broiler Chickens. *Italian Journal of Animal Science* 12, e11. <https://doi.org/10.4081/ijas.2013.e11>
- M., Le Bouquin, S., Lupo, C., Michel, V., 2009. Skin lesions in broiler chickens measured at the slaughterhouse: relationships between lesions and between their prevalence and rearing factors. *British Poultry Science* 50, 1080/00071660903110901
- dermatitis in broilers. *Poultry Science* 89, 866–875. <https://doi.org/10.3382/ps.2009-00496>
- review. *World's Poultry Science Journal* 62, 455. <https://doi.org/10.1079/WPS2005108>
- ur of fast- and slow growing broilers to 12 weeks of age and the physical consequences. *Applied Animal Behaviour Science* 81, 59–72. [https://doi.org/10.1016/S0168-1591\(02\)00251-4](https://doi.org/10.1016/S0168-1591(02)00251-4)
- ards, A.M., Torrey, S., 2021. In pursuit of a better broiler: a comparison of the inactivity, behavior, and enrichment use of fast- and slower growing broiler chickens. *Poultry Science* 100, 101451.
- the race: The behaviour and welfare of commercial faster growing broiler breeds compared to a commercial slower growing breed. *PLoS ONE* 15, 1–20. <https://doi.org/10.1371/journal.pone.0231006>
- uence of genetic parameters on the welfare and the resistance to stress of commercial broilers. *EFSA Journal* 8, 1–82. <https://doi.org/10.2903/j.efsa.2010.1666>
- al Health and Welfare), Nielsen, S. S., Alvarez, J., Bicot, D. J., Calistri, P., Canali, E., ... & Michel, V. (2023). Welfare of broilers on farm. *EFSA Journal*, 21(2), e07788.
- campbell, A.M., Jacobs, L., 2023. Environmental Complexity and Reduced Stocking Density Promote Positive Behavioral Outcomes in Broiler Chickens. *Animals* 13, 2074. <https://doi.org/10.3390/ani13132074>
- selection of broilers and welfare consequences: a review. *World's Poultry Science Journal* 76, 154–167. <https://doi.org/10.1080/00439339.2019.1680025>
- Wilkins, L.J., Kestin, S.C., Warriss, P.D., Nicol, C.J., 2007. Factors affecting the prevalence of foot pad dermatitis, hock burn and breast burn in broiler chicken. *British Poultry Science* 48, 264–275.

# Reference List

- in poultry: insights, implications and imperatives. *World's Poultry Science Journal* 52, 131–174. <https://doi.org/10.1079/WPS19960013>
- P., 2001. Relationships in broiler chickens between lameness, liveweight, growth rate and age. *Veterinary Record* 148, 195–197. <https://doi.org/10.1136/vr.148.7.195>
- Leon, J.H., 2024. Animal welfare indicators and stress response of broiler chickens raised at low and high stocking density. *Journal of Animal Science and Technology*. <https://doi.org/10.5187/jast.2024.e64>
- P., 2006. Foot pad dermatitis and hock burn in broiler chickens and degree of inheritance. *Poultry Science* 85, 1342–1348. <https://doi.org/10.1093/ps/85.8.1342>
- Heat Stress on Poultry Production. *Animals* 3, 356–369. <https://doi.org/10.3390/ani3020356>
- Darwish, M.H.A., Applegate, T.J., Cheng, H., 2015. Behavioral changes and feathering score in heat stressed broiler chickens fed diets containing different levels of propolis. *Applied Animal Behaviour* 1016/j.applanim.2015.03.003
- J.-P., Keita, A., Ribet, A.B., Guinebretière, M., 2022. Positive Effects of Elevated Platforms and Straw Bales on the Welfare of Fast-Growing Broiler Chickens Reared at Two Different Stocking Densities. *Animals* 12/050542
- Al-Nasser, A.S., Ramiah, S.K., Amir, A.A., O'Reilly, E., Eckersall, D., 2015. Environmental temperature and stocking density effects on acute phase proteins, heat shock protein 70, circulating corticosterone and melatonin. *Avian Pathology* 59, 1577–1583. <https://doi.org/10.1007/s00484-015-0964-3>
- Al-Nasser, A.A.I., Hafez, A.-E.S.E., Hussein, M.A., 2021. Potential impact of stocking density on growth, carcass traits, indicators of biochemical and oxidative stress and meat quality of different broiler breeds. *Poultry Science* 1016/j.psj.2021.101442
- Al-Nasser, A.A.I., 2024. An analysis of the welfare of fast-growing and slower-growing strains of broiler chicken. *Front. Anim. Sci.* 5. <https://doi.org/10.3389/fanim.2024.1374609>
- Effect of stocking density, temperature and early open-field response on the behaviour, feed intake and growth of fast- and slow-growing broiler strains. *Animal* 6, 1460–1468. <https://doi.org/10.1017/S1751731112000353>
- Al-Nasser, A.A.I., Aydin, C., Gezen, S.S., 2010. The influence of different lighting programs, stocking densities and litter amounts on the welfare and productivity traits of a commercial broiler line. *Veterinaria et Zootechnika* 51, 36–40.
- Effect of indoor Stocking Density on Growth, Feather Damage and Behavior of Slow-Growing Free-Range Broilers. *Animals* 11, 688. <https://doi.org/10.3390/ani11030688>

# Reference List

- S., 2020. Slow-growing broilers are healthier and express more behavioural indicators of positive welfare. *Scientific Reports* 10, 1–14. <https://doi.org/10.1038/s41598-020-72198-x>
- oh, A.A., Abd El-Hack, M.E., Khafaga, A.F., Chao, S., 2019. Heat stress management in poultry farms: A comprehensive overview. *Journal of Thermal Biology* 84, 414–425. <https://doi.org/10.1016/j.jtherbio.2019.07.025>
- L., Phillips, C.J.C., Zulkifli, I., 2020. Do free-range systems have potential to improve broiler welfare in the tropics? *World's Poultry Science Journal* 76, 34–48. <https://doi.org/10.1080/00439339.2020.1707389>
2022. Influence of light-dark schedules and stocking density on behaviour, risk of leg problems and occurrence of chronic fear in broilers. *British Poultry Science* 43, 344–354. <https://doi.org/10.1080/00071724.2023.23611>
- erin, M.T., Edwards, A.M., Torrey, S., 2022. In pursuit of a better broiler: walking ability and incidence of contact dermatitis in conventional and slower growing strains of broiler chickens. *Poultry Science* 101, 101768. <https://doi.org/10.1093/poultry/ckab289>
- n-Lardner, K., 2023. Impact of stocking density on the welfare and productivity of broiler chickens reared to 34 d of age. *Journal of Applied Poultry Research* 32, 100344. <https://doi.org/10.1016/j.japr.2023.10.0344>
- g, undefined, 2009. Sudden death syndrome—an overview. [veterinaryworld.org](http://veterinaryworld.org) 2.
2022. Effects of Stocking Density on Growth Performance, Antioxidant Status, and Meat Quality of Finisher Broiler Chickens under High Temperature. *Antioxidants* 11, 871. <https://doi.org/10.3390/antiox11050871>
19. Effects of choice feeding and lower ambient temperature on feed intake, growth, foot health, and panting of fast- and slow-growing broiler strains. *Poultry Science* 98, 503–513. <https://doi.org/10.3382/ps/pey323>
8. Energy allocation and behaviour in the growing broiler chicken. *Sci Rep* 8, 4562. <https://doi.org/10.1038/s41598-018-22604-2>
- Riel, J.W., de Jong, I.C., 2022. Reducing stocking density benefits behaviour of fast- and slower-growing broilers. *Applied Animal Behaviour Science* 257, 105754. <https://doi.org/10.1016/j.applanim.2022.105754>
- Choi, W.J., Kil, D.Y., 2021. Effects of stocking density and dietary vitamin C on performance, meat quality, intestinal permeability, and stress indicators in broiler chickens. *J Anim Sci Technol* 63, 815–826. <https://doi.org/10.5713/ajas.20.088>



# Meeting wrap-up

**Thank you for your attention**



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## Closure



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