Welfare in Poultry

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Introduction

Laying hens

Meat type poultry
  - Broilers
  - Broiler parents
  - Turkeys
  - Water fowl

Conclusion

From the 1950s:

progress in application of genetic theory
  - rapid increase in productivity
  - development of specialized fowl lines for meat and egg production

Intensification of management conditions

public concern about poultry welfare:
  - keeping of laying hens in conventional cages
  - intensive meat type production
Laying hens

Housing: conventional cages

Key features of welfare concern about conventional cages for laying hens:

- limited space for escape
- limited space for expression of behavior
- lack of features to fulfill behavioural needs (e.g., nest building, foraging and dust bathing)
- deprived birds exhibit signs of frustration

(Wood-Gush and Gilbert, 1969)

development of new housing systems

ban of conventional cages in the EU from 2012
Laying hens

Furnished cages:

Intermediate level of complexity

**Pro:**
- access to nest sites
- dustbathing facilities
- perches

**Challenges:**
- some behaviours still prevented or inhibited (depending on cage design, number of hens in the cage)
- bone strength may be impaired (insufficient opportunity for exercise)
- increased risk of social aggression in large groups (*Lay et al., 2011*)
Laying hens

Non cage systems (e.g., aviaries, free range)

Pro:
- more space
- more complex environment

Challenges:
- higher risk of diseases (e.g., endo and ectoparasites)
- predation
- climate
- increased incidence of bone fractures (adequate design of perches and distances between tiers)

(Lay et al., 2011; Sandilands and Hocking, 2012)
**Laying hens**

**Major behavioural problem:**

*Injurious pecking (featherpecking, FP)*

Routine alleviation of FP:
Beak trimming of laying hens

Mutilation impairs sensory input and may cause painful neuromas
*(Gentle, 2011)*

Initiatives of several European countries to ban beak trimming
Laying hens

**Major behavioural problem:**

*Injurious pecking (featherpecking, FP):*
  
gentle and severe FP, vent pecking and cannibalistic pecking

Redirection of normal behavior towards conspecifics, related to feeding and foraging behavior

Social transmission:
more difficult to control in larger groups such as large furnished cages or non-cage systems (*Zeltner et al.*, 2000)
Laying hens

Major behavioural problem:

Injurious pecking (featherpecking, FP)

- Multifactorial process influenced by many genetic, behavioural and management factors (Buitenhuis et al., 2003; Rodenburg et al., 2013)

- Chickens are sensitive to UV radiation
- Reflected cues from the plumage possibly used for recognition of conspecifics
  - commercial poultry: houses artificial light without UV radiation and of low intensity
  - impairment of eye development (Bright, 2007)
Major behavioural problem:

Injurious pecking (featherpecking, FP)

Reducing the risk of injurious pecking:

- early access to litter for foraging
- control of fear and stress levels
- pecking material
  
  (Rodenburg et al., 2013)

Proactive individuals:
increased psychomotor activation possibly mediated by serotonin neurotransmission
  
  (van Hierden et al., 2002)

Automatic registration of locomotor activity?
Meat type poultry

The long-term selection for high growth intensity and improved feed conversion ratio is accompanied by a number of welfare problems
*(European Commission, 2000; Bessei, 2006; de Jong et al., 2012)*

Growth rate of broilers:
more than doubled over the last 50 years

Intensified management:
changes in feeding and housing

Comparable conditions occur across different species
(broilers, turkeys)
Meat type poultry

Behavioural changes:

- Feeding behaviour:
  higher rate of food consumption in broilers (increased appetite)

- Locomotion:
  over the whole growing period broilers may spend more than 75% of the time sitting, compared to less than 30% in laying strains (Gerken et al., 2003)

  – lack of exercise: effect on bone mass and strength
  – main cause of leg weakness
**Behavioural changes:**

Increase in time spent sitting with age:

Skin lesions and contact dermatitis on poor litter conditions

Skin diseases: breast blisters, hock burns and footpad dermatitis have increased most over the last 4 decades *(de Jong et al 2012)*

Development of footpad dermatitis scoring systems (broilers, turkeys)
Meat type poultry

Pathological disorders:

Accelerated skeletal growth:

- Increased incidence of bone disorders, most resulting from growth plate pathologies (e.g., tibial dyschondroplasia) (Rath et al., 2000)

- Lame birds:
  - less locomotor activities
  - reduced walking abilities
  - Inflammation is painful (Danbury et al., 2000).

Emphasis on breeding for high amount of breast muscle:
- broader breast
- shift in broiler’s centre of gravity

Development of gait scores for on farm evaluation (broilers, turkeys)
Meat type poultry

Metabolic disorders:

Intensive metabolic processes involved in rapid growth:

- Problems with heat dissipation
  - high ambient temperature and crowding
  - Panting (Gerken et al., 2006)

- Increase of oxygen demand intensifies the activity of the cardio-pulmonary system

Lack of oxygen:
major problem in the aetiology of ascites and sudden death syndrome (SDS) (Julian, 1998; EFSA 2010)
**Meat type poultry**

*Broiler parents*

Antagonistic relationship between growth and reproduction:

Application of severe feed restriction in broiler parents: birds very hungry

Major concern in animal welfare (*EFSA, 2010b*)
**Meat type poultry**

*Turkeys*

Comparable conditions occur including musculoskeletal defects (leg problems), and skin lesions as in broilers.

**Behavioural problems:**

Injurious pecking (FP) sincere welfare issue

Routine alleviation of FP:
Beak trimming of turkeys

Environmental enrichment may reduce injurious pecking (*Martrenchar et al., 2001*)

Initiatives of several European countries to ban beak trimming in turkeys.
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Waterfowl

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Waterfowl

- Access to open water
- Foot pad lesions (litter quality)
- Force feeding (geese, ducks: foie gras)

Muscovy ducks:

- Feather pecking
- Beak trimming
Meat type poultry

Solutions:
growth rate and locomotion

Management

- Nutrition
- Lower stocking density
- Litter quality
- Environmental enrichment (de Jong et al. 2012)
Meat type poultry

Solutions: growth rate and locomotion

Genetic approaches:

Slow growth rate:

- Modulation of the growth curve
- Development of slow growing lines

(EFSA, 2010a; Tixier-Boichard et al., 2012)
Meat type poultry

Solutions: growth rate and locomotion

Genetic approaches:
Development of dual purpose fowls
   Laying hens: egg production
   Progeny: both sexes used for meat production

No killing of male day old chicks in layer strains
(Damme et al., 2015)
Conclusions

**Scientific contributions:**
- Theoretical framework for evaluation of animal welfare (e.g., frustration, behavioural needs, ethological and physiological parameters)
- Animal-based measures to assess welfare on farms (scores for: e.g., gait, footpad scores, feather condition)

**Legislation:**
- EU welfare legislation
  (long way to put scientific evidence into practice, ban of cages in EU in 2012 only)
- National initiatives

**Citizen-consumer gap**
- Role of farmers (integrated farms)
- Role of supply chains
Thank you for your attention
References


