

Welfare in Poultry

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Introduction

Laying hens

Meat type poultry

Broilers

Broiler parents

Turkeys

Water fowl

Conclusion

ASPA 2017, June 13-16,
2017- Perugia.
M. Gerken



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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

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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

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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)

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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)

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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

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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*)

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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*)

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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

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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*)
- Lamé 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*)

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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



Meat type poultry

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*)

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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

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