



Humane Farm Animal Care
Animal Care Standards
2017 Standards

EGG LAYING HENS

EGG LAYING HENS

HUMANE FARM ANIMAL CARE

Humane Farm Animal Care is a non-profit charity whose mission is to improve the lives of farm animals by providing viable, credible, duly monitored standards for humane food production and assuring consumers that certified products meet these standards.

Humane Farm Animal Care is approved by a consortium of Animal Protection Organizations, Individuals, and Foundations, such as the American Society for the Prevention of Cruelty to Animals and the Humane Society of the United States.

The Humane Farm Animal Care Standards have been developed to provide the only approved standards for the rearing, handling, transport and slaughter of Laying Hens for use in the Certified Humane® program. These standards incorporate scientific research, veterinary advice, and the practical experience of farmers. The standards are based on the Royal Society for the Prevention of Cruelty to Animals (RSPCA) guidelines, current scientific information and other practical standards and guidelines recognized for the proper care of animals.

Animal welfare is improved when livestock managers adhere to the following:

- Access to wholesome and nutritious feed
- Appropriate environmental design
- Caring and responsible planning and management
- Skilled, knowledgeable, and conscientious animal care
- Considerate handling, transport, and slaughter

Copyright 2014 by Humane Farm Animal Care. All rights reserved.
PO Box 727, Herndon VA 20172

HUMANE FARM ANIMAL CARE'S SCIENTIFIC COMMITTEE

Leading animal scientists, veterinarians, and producers work with Humane Farm Animal Care to develop the *Animal Care Standards* for humane farming and continue to work with Humane Farm Animal Care to continually review new information pertaining to improving the lives of farm animals.

Kenneth E. Anderson, PhD North Carolina State University

Michael Appleby, PhD World Animal Protection

Richard Blatchford, PhD Asst. Coop Extension Specialist, UC Davis

Elisabetta Canali, PhD Università degli Studi, Milan, Italy

Sylvie Cloutier PhD Associate Director of Assurance, Canadian Council
of Animal Care, Ottawa, Canada

Brenda Coe, PhD Pennsylvania State University

Hans Coetzee, PhD Iowa State University

Luiz Dematte, DVM, PhD Industrial Director of Korin Ltd, and General
Coordinator Of Mokichi Okada Research Institute

Inma Estéves, PhD Research Professor, Neiker-Tecnalia University, Spain

Anne Fanatico, PhD Appalachian State University, Boone, NC

***Valentina Ferrante, DVM, PhD,
DIPL ECAWBM-AWSEL*** University of Milan, Italy

Trent Gilbery, MS North Dakota State University

Alan Goldberg, PhD The Johns Hopkins University

Temple Grandin, PhD Colorado State University

Thomas G. Hartsock, PhD University of Maryland

Jörg Hartung, DVM Institute of Animal Hygiene, Welfare and Farm
Animal Behavior, University of Veterinary
Medicine, Hanover, Germany

HFAC Standards for Production of Egg Laying Hens

<i>Patricia Hester, PhD</i>	Purdue University
<i>Brittany Howell, PhD</i>	Fort Hays State University
<i>Pam Hullinger, DVM, MPVM</i>	University of California Lawrence Livermore National Laboratory
<i>Joy Mench, PhD</i>	University of California, Davis
<i>Suzanne Millman, PhD</i>	Iowa State University College of Veterinary Medicine
<i>Malcolm Mitchell, PhD</i>	SRUC, Scotland's Rural College
<i>Priya Moutupalli, PhD</i>	IKEA Food Global Sustainable Sourcing Specialist, Sweden
<i>Ruth Newberry, PhD</i>	Associate Professor, Norwegian University of Life Sciences; Adjunct Professor, Washington State University
<i>Abdullah Ozen, PhD</i>	Professor, Firat University, Elazig, Turkey
<i>Edmond Pajor, PhD</i>	University of Calgary, Alberta, Canada
<i>Jose Peralta, PhD, DVM</i>	Western University of Health Science, College of Veterinary Medicine, Pomona, CA
<i>Rosangela Poletto, DVM, PhD</i>	Professor, Instituto Federal do Rio Grande do Sul, Brazil
<i>Martin Potter, PhD</i>	Animal Welfare Consultant, Member of FAWT, UK and Advising Member of EIG
<i>Mohan Raj, PhD</i>	Honorary Visiting Fellow, School of Veterinary Sciences, Bristol University, Bristol, UK
<i>Jean-Loup Rault, PhD</i>	Research Fellow, The University of Melbourne, AU
<i>Nancy Roulston, MSc</i>	Animal Scientist for Farm Animal Welfare, ASPCA, NY
<i>J.K. Shearer, PhD</i>	Iowa State University
<i>Marilyn M. Simunich, DVM</i>	Director, Animal Health Laboratory, Division of

HFAC Standards for Production of Egg Laying Hens

	Animal Industries, Idaho State Dept. of Agriculture
<i>Carolyn Stull, PhD</i>	Chairman, Scientific Committee University of California, Davis
<i>Janice Swanson, PhD</i>	Michigan State University
<i>William VanDresser, DVM</i>	Retired Extension Veterinarian
<i>Andreia De Paula Vieira, DVM, PhD</i>	Animal Welfare Scientist, Universidade de São Paulo, Brazil
<i>Daniel M. Weary, PhD</i>	Professor and NSERC Industrial Research Chair, Animal Welfare Program, University of British Columbia
<i>Julia Wrathall, PhD</i>	Director, Farm Animals Division, RSPCA, West Sussex, UK
<i>Adroaldo Zanella, PhD</i>	Professor, Departamento de Medicina Veterinária Preventiva e Saúde Animal\Faculdade de Medicina Veterinária e Zootecnia Universidade de São Paulo, Pirassununga, SP, Brazil

TABLE OF CONTENTS

HUMANE FARM ANIMAL CARE'S SCIENTIFIC COMMITTEE	iii
PART 1: INTRODUCTION	1
A. The Certified Humane Label	1
B. Guide to the Use of the Animal Care Standards	1
PART 2: FEED AND WATER	2
A. Feed	2
FW 1: Wholesome, nutritious feed	2
FW 2: Free access to feed	2
FW 3: Feed records	2
FW 4: Substances prohibited in feed	2
FW 5: Fresh feed	2
FW 6: Easy availability of feed	2
FW 7: Positioning feed and water stations	3
B. Water	3
FW 8: Water supply	3
FW 9: Number of drinkers that must be provided is as follows:	3
FW 10: Placement and design of drinkers	3
FW 11: Emergency water supply	3
PART 3: ENVIRONMENT	4
A. Buildings	4
E 1: Records of features of facilities that promote animal welfare	4
E 2: Facility design	4
E 3 Preventing contact with toxic substances in buildings	4
E 4: Electrical installations	4
E 5: Design of housing and equipment	4
E 6: Nearby environs	5
B. Floor and litter	5
E 7: Design of floors	5
E 8: Litter	5
E 9: Size of litter area	5
E 10: Uncontaminated litter	6
E 11: Litter Storage	6
E 12: Understanding the importance of litter	6
E 13: Electrical wires are prohibited on the litter, or across the litter	6
C. Lighting	6
E 14: Light period	6
E 15: Recording light periods	6
E 16: Light intensity	6
E 17: Sufficient light for inspection	7
D. Space allowance	7
E 18: Sufficient freedom of movement	7
E 19: Stocking density	7
E 20: Replacement Pullet Stocking Density:	7

HFAC Standards for Production of Egg Laying Hens

E 21: Records of space allowance	7
E. Air quality and thermal environment	8
E 22: Air quality	8
E 23: Ventilation.....	8
E 24: Thermal conditions.....	8
F. Nest boxes	9
E 25: Number of nest boxes.....	9
E 26: Floor substrate in nest boxes	9
G. Perches	9
E 27: Accessibility of perches	9
E 28: Types of perches	9
E 29: Design of perches	9
H. Multi-Tier systems.....	10
E 30: Inspection	10
E 31: Personnel access.....	10
E 32: Movement between tiers	10
PART 4: PASTURE RAISED AND FREE RANGE STANDARDS.....	11
A. Pasture Raised systems	11
R 1: Pasture area	11
R 2: Housing.....	12
B. Free Range systems	13
R 3: Range area.....	13
R 4: Housing.....	14
PART 5: MANAGEMENT	15
A. Managers	15
M 1: Understanding the standards	15
M 2: Management and record keeping activities.....	15
M 3: Abilities of caretakers	16
M 4: Complaints to Operators	16
B. Caretakers	16
M 5: Mitigating problems	16
M 6: Awareness of welfare problems	16
M 7: Training.....	16
M 8: Compassionate treatment	17
C. Inspection.....	17
M 9: Monitoring	17
M 10: Records of ill, injured, and dead birds	17
M 11: Quiet handling.....	17
D. Equipment.....	18
M 12: Equipment	18
M 13: Automatic ventilation systems	18
M 14: Auxiliary power supply.....	18
M 15: Using equipment	18
E. Pests and predators.....	18
M 16: Protection from pests and predators.....	18
M 17: Monitoring for rodent and fly activity	19

HFAC Standards for Production of Egg Laying Hens

F. Cleaning and disinfection.....	19
M 18: Cleaning and disinfecting before restocking.....	19
PART 6: HEALTH	20
A. Health Care Practices.....	20
H 1: Animal Health Plan.....	20
H 2: Addressing food safety	20
H 3: Preventing recurring injuries	20
H 4: Flock performance data	20
H 5: Care of sick and injured animals	21
H 6: Physical alterations	21
H 7: Prohibition of appliances to stop cannibalism	21
H 8: Selecting birds for good health	21
H 9: Genetically modified/cloned hens and offspring prohibited.	21
H 10: Prohibition of induced molting by feed withdrawal	21
B. Emergency euthanasia	22
H 11: Euthanasia.....	22
H 12: Carcass disposal.....	22
PART 7: TRANSPORTATION	22
REFERENCES	23
Appendix.....	25

PART 1: INTRODUCTION

A. The Certified Humane Label

The Certified Humane® program was developed to certify products from animals of farms that adhere to these standards. Upon satisfactory application and inspection, farmers and ranchers will be certified and may use the Certified Humane Raised and Handled® logo. Program participants are inspected and monitored by *Humane Farm Animal Care* annually. Charges levied are to cover inspections and program costs which include promotional materials which help promote the products of the producers that are Certified Humane®.

B. Guide to the Use of the Animal Care Standards

- The broad objectives of the standards are described at the beginning of each section. These objectives must be met.
- The numbered requirements are the standards, all of which must be complied with.
- These standards are written to cover facilities in varying geographic and temperature regions and facilities utilizing different systems. Therefore, not all sections in these standards will apply to each facility.
- Boxed sections provide additional information or may highlight areas where the standards will be reviewed in the future.
- Farmers must also comply with any local, state or federal mandates for egg and poultry production that affect the environment or safety of their product, as well as the Veterinary Practices Act in their state.

PART 2: FEED AND WATER

OBJECTIVES: *Hens must have access to fresh water and a diet to maintain full health and promote a positive state of well-being. Feed and water must be distributed in such a way that birds can eat and drink without undue competition.*

A. Feed

FW 1: Wholesome, nutritious feed

Hens must be fed a wholesome diet that is:

- a. Appropriate to their age, stage of production and species; as recommended by the National Research Council (NRC) and recommended for their geographic area.
- b. Fed to them in sufficient quantity to maintain good health; and
- c. Formulated to satisfy their nutritional needs.
- d. Hens must have daily access to coarse calcium, to aid with bone strength and shell quality.

FW 2: Free access to feed

- a. Hens must have free access to nutritious feed throughout each day, except when required by the attending veterinarian.
- b. Withdrawal of feed to induce a molt is not permitted.

FW 3: Feed records

- a. Producers must have a written record of the feed ingredients and nutrient content of each feed used, as declared by the feed manufacturer/supplier.
- b. Producers must make feed records available to *Humane Farm Animal Care* during inspection and at other times, upon request.

FW 4: Substances prohibited in feed

- a. No feedstuffs containing mammalian- or avian-derived protein are permitted with the exception of eggs. Animal by- products are prohibited in feed.
- b. The use of growth promoters is prohibited.
- c. Antibiotics, including coccidiostats, may only be administered for therapeutic reasons (disease treatment) and only under direction of a veterinarian.

FW 5: Fresh feed

Feed must not be allowed to remain in feeders in a contaminated or stale condition.

FW 6: Easy availability of feed

To ensure that feed is easily available to hens, producers must provide each hen with at least:

- a. 2.0 in. (5 cm) of (actual) linear track (**for double sided**)
- b. 4.0 in. (10 cm) of linear track for (**for single sided**) or
- c. 1.5 in. (4 cm) of perimeter space for **circular feeders**.

FW 7: Positioning feed and water stations

- a. Hens must not have to travel more than 8 yards (7.3 meters) in the house to reach feed and water, including in systems of more than one level.
- b. Particular attention must be given to the provision of feed and water in areas frequented by subordinate hens.

B. Water

FW 8: Water supply

- a. Hens must have continuous access to an adequate supply of clean, fresh drinking water at all times.
- b. Provisions must be made for supplying fresh water when temperatures are below freezing.

Water intake drops when the drinking water temperature rises above 80 F (27 C) or drops below 60 F (16 C). Reduced water intake lowers feed intake, which can lead to inadequate intake of important nutrients. Water temperatures above 100 F (38 C) and below 50 F (10 C) are not recommended.

FW 9: Number of drinkers that must be provided is as follows:

1. Bell: 1 per 100 hens
2. Nipple: 1 per 12 hens

FW 10: Placement and design of drinkers

To reduce water spillage and prevent consequent problems with litter management, drinkers must:

- a. Be placed at an optimum height for the size and age of the birds;
- b. Be of an appropriate design, and
- c. Be checked and maintained regularly.

FW 11: Emergency water supply

A method for providing clean, fresh water for a period of at least 24 hours during a shut off of the main water supply must be available on-site.

PART 3: ENVIRONMENT

OBJECTIVES: *The environment in which hens are kept must take into account their welfare needs and be designed to protect them from physical and thermal discomfort, fear, and distress, and allow them to perform their natural behavior. All Cages, such as battery cages, furnished or enriched cages, as well as aviary systems that are designed to confine birds such as lock back cages that would be open during the day but closed at night, are prohibited. In aviary systems, all hens must have access to all levels of the system at all times.*

A. Buildings

E 1: Records of features of facilities that promote animal welfare

A notice containing a checklist of the key points relating to welfare for each building in which birds are housed, must be available to the HFAC inspector and be amended accordingly. This must include:

- a. Total floor area available to the birds; (**does not include nest boxes or elevated perches**)
- b. Total number of birds placed in the house;
- c. Total number of drinkers and total number of feeders or total linear feeder space;
- d. Target air quality and temperature parameters;
- e. Acceptable lighting levels and regimens; and
- f. Emergency procedures (i.e. actions in the case of fire, flood, or failure of automatic equipment, and when temperatures move outside acceptable limits).

E 2: Facility design

To ensure that there are no sharp edges or protrusions likely to cause injury or distress to the birds, the interior portions of the building, including the floor, to which the hens have access must be:

- a. Carefully designed and constructed; and
- b. Well maintained.

E 3 Preventing contact with toxic substances in buildings

Hens must not come into contact with fumes, paints, wood preservatives, disinfectants or any other substances that are toxic to them.

E 4: Electrical installations

All electrical installations at main voltage must be:

- a. Inaccessible to the hens;
- b. Well insulated;
- c. Safeguarded from rodents;
- d. Properly grounded; and
- e. Tested regularly for stray voltage.

E 5: Design of housing and equipment

Housing and equipment must be designed so that all the hens can be clearly seen by caretakers.

Claws that have grown too long are more prone to physical damage and may diminish the welfare of the hen. Humane Farm Animal Care recommends that abrasive strips be made available, for example, attached to the front feeders if hens' claws are not adequately worn

E 6: Nearby environs

- a. The area immediately surrounding the outside of the house must be kept clean and tidy and must not offer shelter to wild birds or rodents.
- b. If the area immediately surrounding the house is covered with vegetation, the plants must be kept short and well managed.

B. Floor and litter

E 7: Design of floors

Hen house flooring must allow for effective cleaning and disinfection, preventing significant buildup of parasites and pathogens. Concrete floors are preferable to dirt floors because they can be more effectively cleaned and disinfected.

E 8: Litter

- a. Hens must be kept on, or have daily access to, well maintained loose substrate/litter.
- b. The substrate/litter must:
 1. Be of a suitable material and particle size;
 2. Be of good quality;
 3. Be managed to maintain it in a dry, friable (not caked) condition;
 4. Be a sufficient depth for dilution of feces—birds' feet and plumage should be free of excessive fecal contamination;
 5. Allow birds to dust bathe; and
 6. Be topped up daily, if necessary, with fresh litter.
- c. Replacement Pullets must have continuous access to litter.

Hens generally perform dust bathing behavior later in the day, while egg-laying behaviors are generally performed in the morning. Potential problems with hens laying eggs in the substrate can be avoided by:

- 1) Restricting access to the substrate only to the afternoon portion of the day (e.g., by use of a lid),*
- 2) Increasing the lighting above the substrate, to encourage dust bathing and discourage egg-laying.*

E 9: Size of litter area

- a. The area of substrate/litter provided must be sufficient to allow the birds to:
 1. Dust bathe; and
 2. Forage freely.
- b. For housing systems which include a completely slatted or grid floor, the opportunity to forage and dust bathe must be provided by **suitable** substrate (litter) areas distributed throughout the system of a size that allows multiple hens to dust bathe simultaneously.
- c. When hens are enclosed in a house, whether barn raised or free range when housed indoors seasonally, a minimum of 15% available floor space must be suitable substrate.

Dust bathing is one of the "comfort behaviors" that hens use to keep their feathers clean and in good condition. The hen works the material (for example, wood shavings or sand) through her feathers using movements of her legs and wings, and then shakes the dust out. Maintaining good feather condition is important because it helps to protect the hen from injury and maintain her body temperature.

E 10: Uncontaminated litter

- a. Litter must not be allowed to become wet, infested with mites, or otherwise harmfully contaminated.
- b. Litter that is wet or otherwise contaminated must not be introduced into hen housing.
- c. Wet litter resulting from accidental flooding must be replaced.

E 11: Litter Storage

- d. Fresh litter must be stored indoors in a clean vermin proof area.

E 12: Understanding the importance of litter

- a. Caretakers must be aware of the welfare problems associated with poor litter management.
- b. Caretakers must understand the factors that affect litter condition e.g. moisture, nitrogen content, ventilation, stocking density and caked litter.

E 13: Electrical wires are prohibited on the litter, or across the litter

If used for training purposes they can be used only along sidewalls of the houses in the scratch area but only for training purposes and must be removed or disconnected once birds reach 25 weeks of age.

C. Lighting

E 14: Light period

Within each period of 24 hours, the lighting system in the hen house must provide:

- a. A minimum period of 8 hours of continuous artificial light and/or daylight; and
- b. A minimum period of 6 hours of continuous darkness or the natural period of darkness, if less.

E 15: Recording light periods

Lighting patterns in all houses must be recorded and records must be made available to *Humane Farm Animal Care* during the inspection and at other times, upon request.

E 16: Light intensity

- a. Daytime light levels in the house must allow birds to see and be inspected without difficulty.
- b. Patches of high intensity artificial or natural light should be avoided within a house.
- c. Reduction of overall light levels to control cannibalism must only be used as a last resort.
- d. Monochromatic light (e.g., red light) is not permitted

Varied lighting within the environment can help encourage certain desired behaviors to take place. For example, by increasing the levels of light over the litter area, birds can be encouraged to forage and dust bathe. Also, light level over perches can facilitate daytime rest but sufficient light is needed for navigating on and off perches. Darkness inside nests may help to reduce the risk of cannibalism.

In some housing systems and some bird strains, there is a risk of hysteria and piling when the house suddenly becomes dark. Humane Farm Animal Care recommends a gradual decrease in lighting, to allow the hens to prepare for darkness. If artificial light is used, it should be switched off in a stepped or gradual manner. This allows the hens to prepare for darkness, encourages roost use and minimizes injuries, such as broken bones, from birds bumping into obstacles.

E 17: Sufficient light for inspection

When hens are housed indoors, adequate lighting, whether fixed or portable, must be available to enable them to be thoroughly inspected at any time.

D. Space allowance

E 18: Sufficient freedom of movement.

- a. All hens must have sufficient freedom of movement to be able, without difficulty, to stand normally, turn around, and stretch their wings.
- b. They must also have sufficient space to be able to perch or sit quietly without repeated disturbance.

E 19: Stocking density

The floor space allowances do not include nests/nest boxes and elevated perches. The non-elevated perches that are integrated into perforated floors are part of the floor space.

One of the following conditions must be met:

- a. In a single level, all-litter house, a minimum of 1.5 sq. ft. (0.14 sq. m) per hen must be allocated to allow normal behavior and dilute the feces.
- b. In a house with litter and a raised slatted area, with feeders, drinkers, and perching/roosting areas over a droppings pit/belt, the minimum space allowance is 1.2 sq. ft. (0.11 sq. m) per hen.
- c. In a multi-tier house with feeders and drinkers on overhead perches/platforms, and in which the overhead perches/platforms provide sufficient space for at least 55% of the hens to perch, a minimum of 1 sq. ft. (0.09 sq. m) of available space per hen must be provided.
- d. In Pasture Raised systems providing mobile housing with fully perforated flooring, the minimum indoor space requirement is 1 sq. ft. (0.09 sq. m) per hen.

E 20: Replacement Pullet Stocking Density:

- a. Birds must not be stocked at a density any greater than 20 kg/m at 16 wks of age
- b. It must not be likely to exceed 20 kg/m
 - 1. An adequate amount of space should be provided for each bird and the number of birds placed should be adjusted according to the age at which the birds will be transferred to the laying hen unit to provide sufficient space for older birds. As a guide, no more than 20% of the pullets should have live weights in excess of plus or minus 10% of the mean weight.
 - 2. The following guidelines should be used when determining the number of birds/m² to the rearing site:

Age of Pullets (weeks)	No. of Pullets/m ² / sq. ft.(1/m ² = 10.76 sq. ft.)
15 weeks:	15 birds/ 11 sq. ft. or .73 sq. ft/pullet
16 weeks:	14 birds/11 sq. ft. or .78 sq. ft/pullet
17 weeks:	13 birds/11 sq. ft. or .85/sq. ft/ pullet
18 weeks:	12 birds/11 sq. ft. or .92/sq. ft. pullet

E 21: Records of space allowance

To ensure that the maximum housing density is not exceeded:

- a. A plan of every house must be available to the inspector that indicates
 - 1. The total floor area available to the hens;
 - 2. The space allowance; and
 - 3. Maximum number of birds permitted within the house (as E1);

- b. Records must be kept that enable the space allowance to be verified easily by the producer/inspector at any time. These must include:
 1. Records of the current number of birds ;
 2. The daily mortality; and
 3. Number culled.
- c. Replacement Pullets must be moved into the layer house prior to the onset of lay, around 16 to 18 weeks of age.

E. Air quality and thermal environment

E 22: Air quality

Provisions must be made to ensure that aerial contaminants do not reach a concentration at which they are noticeably unpleasant to a human observer.

E 23: Ventilation

- a. Ventilation systems, whether natural or mechanical, must be designed to maintain air quality parameters under all foreseeable climatic conditions.
- b. The ammonia concentration at bird height should be no more than 10 ppm and must not exceed 25 ppm except during brief periods of severe inclement weather when ventilation is affected. Ammonia concentrations at bird levels should be recorded at least once every two weeks and these records made available to *Humane Farm Animal Care* during inspection and at other times, upon request.

When feasible, other air quality measures (e.g., carbon dioxide, carbon monoxide) should also be automatically or manually recorded at regular intervals, and the records made available to the Humane Farm Animal Care during the inspection and at other times, upon request.

- *Hydrogen sulfide should generally be less than 0.5 ppm and should not exceed 2.5 ppm.*
- *Carbon dioxide should generally be less than 3000 ppm and should not exceed 5000 ppm.*
- *Carbon monoxide should generally be less than 10 ppm and should not exceed 50 ppm.*
- *Dust should generally be less than 1.7 mg/m³ (for respirable dust) and 3.4 mg/m³ (for total dust) and should not exceed 5 mg/m³ (for respirable dust) and 15 mg/m³ (for total dust), averaged over an 8 hour period.*

E 24: Thermal conditions

- a. Provisions must be made to ensure that hens have access to a thermally comfortable environment at all times, so that heat/cold stress does not occur.
- b. Daily records of maximum and minimum temperatures must be kept for each house and be made available to the Inspector.
- c. In the event of feather loss, sufficient feed must be provided in cold weather to enable hens to eat more to compensate for greater heat loss.

F. Nest boxes

E 25: Number of nest boxes

One of the following conditions must be met:

- a. Individual nest boxes must be provided at not less than one per 5 hens.
- b. All community nest systems must provide an overall minimum nesting area of 9 sq.ft (0.8 sq. m) per 100 birds.

E 26: Floor substrate in nest boxes

Nest boxes must have a floor substrate that encourages nesting behavior.

Providing floor substrate, such as loose litter, in nest boxes from before the start of lay may encourage the pullets to use the nest boxes.

G. Perches

E 27: Accessibility of perches

Perches must be accessible both in the night and the daytime.

- a. Replacement pullets must have access to perches so they are prepared for introduction to the laying environment, starting before 4 weeks of age.

E 28: Types of perches

- a. Perches must be provided at not less than 6" (15 cm) per hen. This can include the alighting rail immediately in front of the nest boxes.
- b. At least 20% of the linear perch space must be elevated above the adjacent floor space to allow hens to avoid aggressors, but low enough to prevent injury. Only perches located more than 16" and less than 3.3 ft (1 m) above the adjacent floor can be calculated as part of the elevated perching space. Elevated perches must be at least 8" (20 cm) from any wall or ceiling, and allow hens to dismount at an angle of no more than 45 degrees. They must be sufficiently stable to minimize the risk of injury to hens.
- c. Perforated floors can be considered as perching space when they have perches incorporated within the floor structure or attached on top of the floor, which meet the standards of E25. The minimum space between incorporated perches must be 12 inches (30 cm) to allow birds to easily roost simultaneously.

E 29: Design of perches

- a. There must be a gap of no less than 0.5 in (1.3 cm) on either side of any perch to allow hens to grip the perches without risk of trapping their claws.
- b. Hens must be able to wrap their toes around the perch and balance evenly in a relaxed posture for an extended period. Perches must be at least 1.0" (2.54 cm) wide at the top (rounded perches must have a diameter of not less 1.0" (2.54 cm and not greater than 3" (7.6 cm)), have no sharp edges, be capped at the ends if hollow, be of a non-slip material, and be reasonably clean and dry.
- c. Perches must be positioned to minimize dirtying of any hens below and, when possible, must be over a droppings pit or manure belt.

Flattened, oval or mushroom-shaped perches reduce pressure on the foot pad compared to round perches, thereby reducing the risk of bumblefoot.

H. Multi-Tier systems

E 30: Inspection

The overall design of the system must allow for proper inspection of the birds at all levels and enable immediate access to any sick, injured, trapped or dead birds which require removal.

E 31: Personnel access

Where birds are on tiers above head height, there must be facilities provided (e.g. ladders or trolleys) to ensure that personnel involved with the catching or inspection process are able to safely and securely access all tiers.

E 32: Movement between tiers

Each tier must allow the birds to move easily between the different tiers and ensure that the birds can gain access to the entire floor area including the area under the tiers.

PART 4: PASTURE RAISED AND FREE RANGE STANDARDS

OBJECTIVES: *The Animal Care Standards for Laying Hens do not require that hens have access to outdoors, or be raised on range. This may have advantages for welfare and is encouraged. Where laying hens have access to range or the outdoors, the following definitions and standards must be met.*

Pasture Raised: *is a management system where adult birds are kept on pasture 12 months of the year, in an outside area that is mainly covered with living vegetation. The birds have access to the pasture through exits from fixed or mobile houses, and covered verandas if present. They are kept indoors at night for protection from predators but it is prohibited to keep them continually indoors 24 hours per day without access to pasture for more than 14 consecutive days. The minimum outdoor space requirement is 2.5 acres (1 hectare) per 1000 birds to meet the Animal Care Standards for Pasture Raised.*

Seasonal Pasture Raised: *Seasonally pastured hens must be outdoors for all months of the year that pasture is exposed and available for the hens and the outside temperature will not constitute a welfare concern. Hens may only be kept continually indoors 24 hours per day without access to pasture if the outside temperature is below freezing (32F or 0 degrees Celsius) and or accumulated precipitation is prohibiting the hen's ability to move freely on the pasture. The space allowance for Pasture Raised must be the same and all other standards in this guide must be met.*

Free Range: *is a management system in which adult birds are kept in houses with daily access to an uncovered outdoor area weather permitting. The minimum outdoor space requirement is 2 square feet (0.19 square meters) per bird to meet the Animal Care Standards for Free Range. All other standards must be met.*

A. Pasture Raised systems

The following standards are requirements in addition to the other applicable standards in this manual.

R 1: Pasture area

- a. Must consist mainly of living vegetation. Coarse grit must be available to aid digestion of vegetation.
- b. The pasture must be designed and actively managed to:
 1. Encourage birds outside, away from the popholes, and to use the area fully;
 2. Prevent and/or minimize heavily degraded, muddy/sodden, or worn areas;
 3. Minimize any build-up of agents (e.g., parasites, bacteria, viruses) that may cause disease;

4. Prevent hens from coming into contact with any toxic substances.
- c. The minimum outdoor space requirement is 2.5 acres (1 hectare)/1000 birds. Land used for cropping (except grass or hay) is not accepted as part of the Pasture Raised space allowance and must be excluded from space calculations.
- d. The maximum distance that a hen has to walk from the perimeter fence of the pasture to the nearest door into a fixed or mobile house must be no more than 400 yards (366 m).
- e. The pasture must be rotated periodically to prevent the land from becoming contaminated and or denuded, and to allow it to recover from use. A written rotational grazing plan must be in place. The written rotational grazing plan must be submitted with the application.
- f. Water temperature must not be less than 50° F (10 C) or greater than 100° F (38 C).
- g. Birds must be outdoors 12 months per year, every day for a minimum of 6 hours per day. In an emergency, the hens may be confined in fixed or mobile housing 24 hours per day for no more than 14 consecutive days.
- h. Shade, cover and dust bathing areas
 1. There must be sufficient well-drained, shaded areas for hens to rest outdoors without crowding together.
 2. Cover, such as shrubs, trees or artificial structures, must be distributed throughout the pasture to reduce the fear reactions of hens to overhead predators and to encourage use of the pasture.
 3. The pasture area must include patches with loose substrate suitable for dust bathing.

A pasture management plan must be developed, implemented and updated annually. The plan is to include: pasture rotation; how to prevent and/or manage heavily poached/muddy/worn areas; how to minimize any build-up of parasites or diseases; provision and appropriate distribution of natural and artificial shade/shelters and cover; and drainage improvements to prevent poached areas from developing.

R 2: Housing

- a. All birds raised on pasture must have access to fixed or mobile housing that keeps them dry and protects them from wind and from predators.
- b. Hens must have sufficient exit areas appropriately distributed around the housing (i.e. at least one exit every 50 feet (15 m) along one side of the house) to ensure that all hens have ready access to the outdoor area. Each exit area must allow the passage of more than one hen at a time.

It is recommended that exits are at least 18" (46 cm) high and 21" (53 cm) wide.

- c. Because hens are motivated to perch at night and it may be necessary to close hens indoors at night to protect them from predators or severe weather, it must be possible to place the required perch space (E27-E29) in the indoor housing.
- d. The housing must meet the standards in other parts of this manual. In the event that hens must be shut indoors for more than 24 hours, if any special provisions are needed to meet the standards, they must be described in a written emergency plan.

In mobile housing nest box space may differ from E25, provided there are no floor eggs, and no competition for nest box space and birds welfare is not otherwise affected.

B. Free Range systems

The following standards are requirements in addition to the other applicable standards in this manual.

R 3: Range area

- a. The outdoor area to which birds have access must:
 1. Consist of ground covered by living vegetation, where possible. Ground coverings such as gravel, straw, mulch or sand are examples of materials to be used when vegetation is not possible. Coarse grit must be available to aid digestion of vegetation.
 2. Be designed and actively managed in ways that minimize the risk of the range becoming damaged, contaminated, or sodden;
 3. Be managed to avoid build-up of agents (e.g., parasites, bacteria, viruses) that may cause disease.
 4. Prevent hens from coming into contact with any toxic substances.
- b. The minimum amount of uncovered outdoor area required is 2 sq. ft. per hen. (0.19 sq. m) Land used for cropping (except grass or hay) is not accepted as part of the Free Range space allowance and must be excluded from space calculations.
- c. The maximum distance that a hen has to walk from the perimeter fence of the outdoor area to the nearest door into the house must be no more than 400 yards (366 m).
- d. Rotational grazing or other disease control measures must be applied to reduce the risk of build-up of parasites or pathogens on the range. There must be a written parasite control plan for birds with outdoor access.
- e. Outdoor access must be provided for a minimum of 6 hours per day during the daytime, except during inclement weather or for veterinary or emergency reasons.
- f. Shade and cover
 1. There must be sufficient well-drained, shaded areas for hens to rest outdoors without crowding together.
 2. Cover, such as shrubs, trees or artificial structures, must be distributed throughout the range to reduce the fear reactions of hens to overhead predators and to encourage use of the range.

A range management plan must be developed, implemented and updated annually. The plan is to include: range rotation; how to prevent and/or manage heavily poached/muddy/worn areas; how to minimize any build-up of parasites or diseases; provision and appropriate distribution of natural and artificial shade/shelters and cover; and drainage.

R 4: Housing

- a. All birds must have access to housing that keeps them dry, protects them from wind and from predators, and meets the requirements in the other parts of this manual.
- b. Hens must have sufficient exit areas appropriately distributed around the building (i.e. at least one exit every 50 feet (15 m) along one side of the house) to ensure that all hens have ready access to the outdoor area. Each exit area must allow the passage of more than one hen at a time.

It is recommended that exits are at least 18" (46 cm) high and 21" (53 cm) wide.

PART 5: MANAGEMENT

OBJECTIVES: *Empathy and responsible management are vital to ensure good animal welfare. Managers and caretakers must be thoroughly trained, skilled and competent in animal husbandry and welfare, and have a good working knowledge of their system and the laying hens under their care*

A. Managers

M 1: Understanding the standards

Managers must ensure that all:

- a. Caretakers have a copy of the current *Animal Care Standards for Egg Laying Hens*;
- b. They and the caretakers are familiar with the standards; and
- c. They and the caretakers understand their content.

M 2: Management and record keeping activities

Managers must:

- a. Develop and implement a suitable training program for caretakers, with regular updates and opportunities for continuing professional development;
- b. Be able to demonstrate that staff with responsibility for animal care has the relevant and necessary skill to perform their duties. When deficiencies are noted, managers must provide appropriate training to ensure that all caretakers have the required skills.
- c. Develop and implement plans and precautions to prevent/cope with emergencies such as fire, flood, breakdown of environmental control or interruption of supplies (e.g. food, water, electricity);
 1. Provide an Emergency Action Notice Plan next to a telephone, highlighting the procedures to be followed by those discovering an emergency (e.g. fire, flood, power failure);
 2. Post emergency contact numbers by phones and entrances to buildings.
- d. Ensure that the Animal Health Plan (see H1) is:
 1. Implemented;
 2. Regularly updated; and
 3. That the required data are recorded appropriately.
- e. Maintain and make available to the *Humane Farm Animal Care* inspector records of production data and use of medications. These records must be dated and include documentation on:
 1. Incoming and outgoing birds;
 2. Egg production;
 3. Mortality (reasons should be stated, if known);
 4. Culling (reasons should be stated and recorded separately from mortality);
 5. Feed consumption;
 6. Water consumption (if possible, water meters should be fitted in each hen house);
 7. Maximum and minimum temperatures;
 8. Ventilation (including settings and any necessary changes); and
 9. Ammonia levels.

M 3: Abilities of caretakers

Managers must take into account the abilities of the caretakers when deciding on space allowances in present systems and when considering expanding the unit or installing more complex equipment.

M 4: Complaints to Operators

- a. To be certified, an Operation must maintain systems for receiving, responding to, and documenting complaints alleging the Operations' failure to comply with *Humane Farm Animal Care* standards(ISO §15).
- b. Whenever an Operator receives a complaint, the Operator must:
 1. Take appropriate action to respond to the complaint, and
 2. Correct any deficiency in the products or services that affect their compliance with the requirements for certification.
- c. Written records must be retained by the Operation for a minimum of 3 years from the date of the records' creation. Records must contain information documenting:
 1. All complaints received (written or verbal),
 2. The actions taken by the operator to respond to the complaint.
- d. These records must be made available to *Humane Farm Animal Care* upon request. *Humane Farm Animal Care* will review these records at least annually, during the Operation's annual inspection.
- e. Operators must notify *Humane Farm Animal Care* if an adverse ruling (such as suspension or revocation of certification, fine, or sanction) related to the Operation's humane management practices is levied against the Operation by another certifier or by a governmental program which regulates the industry.

B. Caretakers

M 5: Mitigating problems

- a. Caretakers must know the normal behavior of laying hens and understand the signs that indicate good health and welfare.
- b. Caretakers should be able to recognize impending trouble in its earliest stages, as this may enable them to identify the cause and correct matters promptly.
- c. When an outbreak of abnormal animal behavior occurs, it must be tackled promptly by appropriate changes in the system of management.

M 6: Awareness of welfare problems

- a. Caretakers must be aware of welfare problems, such as those associated with poor litter management (e.g. burnt hocks, footpad lesions and breast blisters).
- b. Caretakers must understand the factors that affect litter condition (e.g. moisture, nitrogen content, ventilation and stocking density)
- c. Caretakers must understand the risk of broken bones (e.g. bone fragility, hen age, catching, nutrition, bad landings when jumping from elevated structures).

M 7: Training

- a. Prior to being given responsibility for the welfare of livestock, caretakers must be properly trained and be competent to:
 1. Recognize signs of common diseases and know when a veterinarian should be consulted so that appropriate treatment may be initiated;

2. Recognize signs of normal behavior, abnormal behavior and fear;
 3. Understand the environmental requirements for hens;
 4. Handle hens in a positive and compassionate manner; and
 5. Euthanize hens when necessary.
- b. This training should be documented. The competence of caretakers must be verified.

M 8: Compassionate treatment

- a. Caretakers must be able to demonstrate competence in handling animals in a positive and compassionate manner.
- b. Caretakers must also be able to demonstrate their proficiency in procedures that have the potential to cause suffering (e.g., euthanasia).

C. Inspection

M 9: Monitoring

- a. All hens must be inspected at least twice a day using a procedure that will identify all birds that are sick, injured, trapped, or behaving abnormally.
- b. Any welfare problems seen during an inspection by the caretakers must be dealt with appropriately and without delay.

Welfare problems of sufficient severity that these should have been noticed and dealt with by the caretaker on previous daily inspections will be taken by the Humane Farm Animal Care Inspector as evidence of negligence of duties by the caretaker.

M 10: Records of ill, injured, and dead birds

- a. On completion of inspection, records must be kept of sick, injured and dead birds.
- b. The records must:
 1. Be made available to *Humane Farm Animal Care* during the inspection and at other times, upon request;
 2. Be signed by the farm worker doing inspections;
 3. Contain the time of inspection;
 4. Note the causes of illness and injury, when known; and
 5. Record the reasons for culling.

M 11: Quiet handling

Work routines and practices must be developed, and when necessary modified, to ensure that hens do not become fearful and are not frightened in avoidable ways. For example, all movement throughout the unit must be slow and deliberate both to alleviate fear and reduce possible injury to the birds.

D. Equipment

M 12: Equipment

- a. Caretakers must inspect the equipment, including the automatic equipment, upon which laying hens depend at least once daily to check that there is no defect.
- b. When a defect is found (whether on inspection or at any other time):
 1. The defect must be fixed promptly.
 2. If this is impractical, such measures as are required to safeguard the hens from suffering unnecessary pain or distress as a result of the defect and must promptly be taken and maintained until the defect is fixed.

M 13: Automatic ventilation systems

Automatic ventilation systems must contain:

- a. An alarm that will give adequate warning of the failure of the ventilation system to function properly (and the alarm must operate even if the principal electricity supply to it has failed);
- b. Additional equipment or means of ventilation (whether automatic or not) which, in the event of failure of the normal/primary ventilation system, will provide adequate ventilation so as to prevent the birds from suffering unnecessary distress as a result of the failure.

M 14: Auxiliary power supply

- a. For houses with electrical equipment critical for maintaining bird welfare, an auxiliary power supply, capable of providing instant start and power supply to critical electrical equipment within the house for a 24-hour period, must be located on site.
- b. The power supply must be checked at the frequency recommended by the manufacturer, and these checks must be documented.

M 15: Using equipment

Caretakers must be able to:

- a. Demonstrate their ability to operate the equipment competently (e.g. heaters, lighting, ventilation, flaps/fans);
- b. Demonstrate their ability to carry out routine maintenance;
- c. Recognize common signs of malfunction; and
- d. Demonstrate knowledge of action to be carried out in event of failures.

E. Pests and predators

M 16: Protection from pests and predators

Humane precautions must be taken to protect laying hens from predators and pests. Specifically:

- a. The entry of wild birds into hen houses must be prevented with netting or similar material over roof ventilation ducts, windows, etc.;
- b. Predators, including dogs and cats, must not be permitted in hen houses. **There must be the ability to enclose the birds into a predator-proof area at night.**
- c. Vegetation and debris directly outside a hen house that may provide harborage for pests must be removed. It is recommended that an additional physical barrier, such as gravel, be placed around the perimeter of the house to deter rodents and soil-borne parasites.

Outdoor access areas may be enclosed with an electronet fence with a mesh size that is small enough to keep predators out. It is recommended that birds are kept in a building at night.

M 17: Monitoring for rodent and fly activity

- a. Monitoring for rodents must be conducted, and when monitoring indicates unacceptable rodent activity within a hen house, appropriate methods of rodent control must be used.
- b. Monitoring of flies must be conducted, and when monitoring indicates unacceptable fly activity within a hen house, an appropriate method of fly control must be used.

F. Cleaning and disinfection

M 18: Cleaning and disinfecting before restocking

Premises and equipment must be thoroughly disinfected and cleansed before restocking with pullets or layers.

PART 6: HEALTH

OBJECTIVES: *Hens must be protected from pain, injury and disease. The environment in which hens are housed must be conducive to good health. All producers must develop a health plan in consultation with a veterinarian.*

A. Health Care Practices

H 1: Animal Health Plan

- a. An Animal Health Plan (AHP) must be drawn up and regularly updated in consultation with a veterinarian.
- b. The AHP must include:
 1. Details of any vaccinations;
 2. Information on treatments and other aspects of flock health;
 3. Causes of morbidity and mortality;
 4. Tolerance limits on overall flock performance;
 5. Biosecurity provisions; and
 6. Cleaning and disinfection policy.

H 2: Addressing food safety

A recognized Quality Assurance Program for the control of organisms that cause food safety concerns must be adopted and followed.

H 3: Preventing recurring injuries

- a. There must be no recurring injuries attributable to physical features of the housing environment or to handling procedures.
 1. Recurring injuries are those seen on a number of birds, with sufficient similarity to suggest that they have a common cause.
 2. Injury is described as damage severe enough for the formation of granular scar tissue or defective bones or joints, and to an extent significantly greater than would be caused by minor accidental bumps or scratches.
- b. Attention must be paid to foot pad lesions and claw wear.
- c. If such injuries are found, a program of preventive action must be specified.

H 4: Flock performance data

- a. Flock performance data must be continuously monitored for indicators of disease or production disorders.
- b. If any flock performance parameters fall outside the tolerance limits identified in the AHP, a program of action must be developed to remedy the problem.
- c. Particular attention must be paid to such conditions as:
 1. Cannibalism;
 2. Significant feather loss;
 3. Fowl mite infestation;
 4. Bone fractures and keel bone deformation; and
 5. Trapping.

H 5: Care of sick and injured animals

Sick hens, and any hens suffering from injury such as open wounds or fractures, or from prolapse of the vent, must be:

- a. Segregated; and
- b. Treated without delay; or
- c. If necessary, humanely killed.

H 6: Physical alterations

In cage-free housing systems of laying hens, there is a risk of outbreaks of cannibalism. The pain and suffering of the hens that are being pecked to death is appalling and may quickly affect a considerable proportion of the flock.

The need for beak trimming is being constantly reassessed and will be thoroughly reviewed in the light of research currently being carried out.

Producers will be required to phase out beak trimming/ tipping as soon as the causes of cannibalism and ways of preventing it have been identified. See Appendix 1.

Humane Farm Animal Care is also aware that alternative methods of beak trimming, such as infrared technology, have been developed which may offer potential welfare improvements, for example a reduction in the pain caused during the procedure, as well as improving the accuracy with which the procedure is performed. HFAC will review the findings of the latest research on this technique to ensure that only the most appropriate methods are used.

- a. Debeaking (severe beak trimming) is not permitted.
- b. In flocks that are susceptible to outbreaks of cannibalism, the beaks of hens may be trimmed at 10 days of age or younger as a preventive measure.
 1. Only trained and competent operators using approved machines must do beak trimming.
 2. Only the tip of the upper mandible may be removed in order to limit the hens' capability to tear at flesh without inhibiting feeding, ground pecking or preening.
 3. The lower mandible may be "stopped" (e.g. heat treated) without any beak being removed to avoid distortion of beak formation in later life.
- c. Toe clipping, dubbing, caponization, and other surgical alterations are not permitted.

H 7: Prohibition of appliances to stop cannibalism

Artificial appliances (such as blinkers attached to the beak or nostrils, or contact lenses) designed to stop cannibalism must not be used.

H 8: Selecting birds for good health

During selection of birds, care must be taken to avoid genetic strains with undesirable traits, particularly aggressiveness, broodiness, bone fragility, hysteria, cannibalism, and tendency to feather peck.

H 9: The use of genetically modified and/or cloned laying hens and their offspring are prohibited.

H 10: Prohibition of induced molting by feed withdrawal

Withdrawal of feed to induce hens to molt is prohibited.

B. Emergency euthanasia

H 11: Euthanasia

- a. Each farm must have provisions for prompt humane emergency euthanasia for sick or injured hens, using on-farm methods carried out by a named, trained, competent member of the staff, or a veterinarian.
- b. If there is any doubt as to how to proceed, the veterinarian must be called at an early stage to advise whether treatment is possible or whether euthanasia is required to prevent suffering.
- c. If a bird is in severe pain that is uncontrollable, then the bird must be promptly euthanized.
- d. The following methods of emergency euthanasia are permitted:
 1. Hand held electrical stunning, immediately followed by neck cutting;
 2. Cervical dislocation; to be used in an emergency or for killing a very small number of birds. Cervical dislocation must involve stretching the neck to sever the spinal cord and cause extensive damage to the major blood vessels. Equipment that crushes the neck including killing pliers or burdizzos is neither quick nor humane and must not be used;
 3. Carbon dioxide or a mixture of carbon dioxide and argon, delivered in an appropriate container at acceptable concentrations.

H 12: Carcass disposal

- a. Following a euthanasia procedure, birds must be carefully examined to ensure that they are dead.
- b. All carcasses must be disposed of through outlets or using methods according to state and local laws.
- c. Off-farm carcass disposal:
 1. Carcasses must be disposed of through approved outlets in accordance with state and local laws.
 2. A record must be kept of the name of the outlet through which all such carcasses are disposed.
- d. On farm carcass disposal:
 1. If carcasses are disposed of on farm, a record of the method of disposal must be maintained.

PART 7: TRANSPORTATION

OBJECTIVES: Animal transport systems must be designed and managed to ensure hens are not caused unnecessary distress or discomfort. The transport and handling of hens must be kept to an absolute minimum. Personnel involved in transport must be thoroughly trained and competent to carry out the tasks required of them.

The aim of the Certified Humane Raised and Handled program is to adopt a birth to slaughter policy. We recognize that at the present time this is not always possible, but will continue to work towards this objective.

REFERENCES

- Appleby, M.C, J.A. Mench, and B.O. Hughes 2004. *Poultry Behaviour and Welfare*. CABI, Wallingford, UK.
- Berg C. 2001. "Health and welfare in organic poultry production." *Acta Veterinaria Scandinavica Supplement* 95: 37-45.
- Animal Care Series: Egg-type Layer Flock Care Practices*. 1998. California Poultry Workgroup, University of California Cooperative Extension, Davis CA. Available online at http://www.vetmed.ucdavis.edu/vetext/INF-PO_EggCarePrax.pdf.
- Code of Recommendations for the Welfare of Livestock: Laying Hens*. 2002. Department for Environment, Food and Rural Affairs, London, UK. Available online at <http://www.defra.gov.uk/animalh/welfare/farmed/layers/layerscode.pdf>.
- European Commission. 1999. "Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens." *Official Journal L* 203, 03/08/1999 P. 0053 – 0057. Available online at http://europa.eu.int/eur-lex/pri/en/oj/dat/1999/l_203/l_20319990803en00530057.pdf
- Euthanasia of Poultry: Considerations for Producers, Transporters, and Veterinarians*. 1998. Center for Animal Welfare, University of California, Davis, CA. Available online at <http://animalwelfare.ucdavis.edu>.
- Report on the Welfare of Laying Hens*. 1997. Farm Animal Welfare Council, London, UK. Available online at <http://www.fawc.co.uk/reports/layinghens/lhgetoc.htm>.
- Gregory, N.G., L.J. Wilkins, D.M. Alvey, and S.A. Tucker. 1993. "Effect of catching method and lighting intensity on the prevalence of broken bones and on the ease of handling of end of lay hens." *Veterinary Record* 132: 127-129.
- Gregory, N.G., L.J. Wilkins, S.D. Eleperuma, A.J. Ballantyne, and N.D. Overfield. 1990. "Broken bones in domestic fowls: effects of husbandry system and stunning method in end-of-lay hens." *British Poultry Science* 31: 59-69.
- Groot Koerkamp, P.W., and R. Bleijenberg. 1998. "Effect of type of aviary, manure and litter handling on the emission kinetics of ammonia from layer houses." *British Poultry Science* 39: 379-392.
- Guide for the Care and Use of Agricultural Animals in Research and Teaching*. 2010. 3rd Edition. Federation of Animal Science Societies, Champaign, IL.
- Gunnarsson, S., L.J. Keeling, and J. Svedberg. 1999. "Effect of rearing factors on the prevalence of floor eggs, cloacal cannibalism and feather pecking in commercial flocks of loose housed laying hens." *British Poultry Science* 40: 12-18.
- Huber-Eicher, B., and L. Audige. 1999. "Analysis of risk factors for the occurrence of feather pecking in laying hen growers." *British Poultry Science* 40: 599-604.
- Hughes, B.O., and M.J. Gentle. 1995. "Beak trimming of poultry: its implications for welfare." *World's Poultry Science Journal* 51: 51-61.
- Kuenzel, W.J. 2007. Neurobiological basis of sensory perception: welfare implications of beak trimming. *Poultry Science* 86:1273–1282.

- Kristensen, H.H., L.R. Burgess, T.G. Demmers, and C.M. Wathes. 2000. "The preferences of laying hens for different concentrations of atmospheric ammonia." *Applied Animal Behaviour Science* 68: 307-318.
- Mench, J.A., A. van Tienhoven, J.A. Marsh, C.C. McCormick, D.L. Cunningham, and R.C. Baker. 1986. "Effects of cage and floor pen management on behavior, production, and physiological stress responses of laying hens." *Poultry Science* 65: 1058-1069.
- Muir, W.M., and J.V. Craig. 1998. "Improving animal well-being through genetic selection." *Poultry Science* 77: 1781-1788.
- National Research Council. 1994. "Nutrient requirements of chickens." In *Nutrient Requirements of Poultry*, 9th Revised Edition. National Academic Press, Washington, DC.
- Newberry, R.C. 2004 "Cannibalism" in "*Welfare of the Laying Hen*" Chapter 22. Ed. G.C. Perry. CAB International.
- Newberry, R.C., A.B. Webster, N.J. Lewis, and C. Van Arnem. 1999. "Management of spent hens." *Journal of Applied Animal Welfare Science* 2: 13-29.
- Newberry, R.C., I. Estevez and L.J. Keeling. 2001. "Group size and perching behaviour in young domestic fowl." *Applied Animal Behaviour Science* 73: 117-129.
- Pöttsch, C.J., K. Lewis, C.J. Nicol, and L.E. Green. 2001. "A cross-sectional study of the prevalence of vent pecking in laying hens in alternative systems and its associations with feather pecking, management and disease." *Applied Animal Behaviour Science* 74: 259-272.
- Raj, M. 1998. "Welfare during stunning and slaughter of poultry." *Poultry Science* 77: 1815-1819.
- RSPCA Welfare Standards for Laying Hens and Pullets*. 2011. Royal Society for the Prevention of Cruelty to Animals. Southwater, West Sussex, UK.
- Von Essen, S., and K. Donham. 1999. "Illness and injury in animal confinement workers." *Occupational Medicine* 14: 337-350.
- Wang, G., C. Ekstrand, and J. Svedberg. 1998. "Wet litter and perches as risk factors for the development of foot pad dermatitis in floor-housed hens." *British Poultry Science* 39: 191-197.
- Webster, A.B., D.L. Fletcher, and S.I. Savage. 1996. "Humane on-farm killing of spent hens." *Journal of Applied Poultry Research* 5: 191-200.
- Wechsler, B., and B. Huber-Eicher. 1998. "The effect of foraging material and perch height on feather pecking and feather damage in laying hens." *Applied Animal Behaviour Science* 58: 131-141.
- Wilkins, L.J., J.L. McKinstry, N.C. Avery, T.G. Knowles, S.N. Brown, J. Tarlton, and C.J. Nicol. 2011. Influence of housing system and design on bone strength and keel bone fractures in laying hens. *The Veterinary Record* 169: 414-420. doi: 10.1136/vr.d4831.

Appendix



Scientific Outreach Newsletter #1

Managing cannibalism in laying hen flocks

We have received questions from some egg producers on our program about the issue of cannibalism. After consultation with the laying hen specialists on our Scientific Committee, most especially Dr. Ruth Newberry, we are happy to provide you with the following information in an effort to help you manage cannibalism in your flocks. Most of these recommendations are incorporated within existing HFAC Animal Care Standards for Laying Hens. However, further background information is given here.

Cannibalism

Cannibalism is the act of consuming tissues of other members of the same species and is a common problem in poultry. In laying hens, cannibalism may be directed towards different tissues, from eggs to feathers. The most serious concern for welfare comes from the cannibalistic pecking and tearing of skin, and internal organs of birds. Severe pecking of the tail feathers results in blood, which stimulates further pecking. Accidental injuries which cause bleeding can also stimulate cannibalistic behavior. Cloacal cannibalism (vent pecking) is the most severe and fatal form, where pecks at the cloaca can proceed to the removal and consumption of intestines. This form of the behavior generally occurs after the onset of lay.

In commercial practice, pecking and cannibalism is primarily controlled by beak trimming, and often also reduced lighting programs within the houses. Unfortunately, there are adverse welfare consequences associated with both of these practices:

Beak Trimming

In an effort to reduce or eliminate cannibalism, some producers have their birds beak re-trimmed at 5 – 7 weeks old because early beak trimming (less than 10 days of age) can result in some re-growth of the beaks.

Beak trimming causes additional pain when performed after 10 days of age.

For this reason, HFAC animal care standards do not permit this practice to be carried out on birds older than 10 days.

Although beak trimming reduces the opportunity for birds to cause injuries to flock-mates, it does not eliminate the motivation to peck at other birds.

Lighting

Birds need good visibility to be able to feather-peck, and cannibalism increases with light intensity.

Using reduced light to control cannibalism, by rearing chicks in permanently dim or monochromatic lighting, or fitting hens with colored contact lenses or goggles, is questionable because vision impairment has been associated with eye disorders, elevated mortality and reduced productivity.

Also, when birds are kept in dim light, it is necessary to raise the light intensity for daily bird and equipment inspection, and this routine may trigger cannibalism.

Cannibalism is notoriously unpredictable and has been reported in all types of housing systems, including barns, aviaries and free-range systems. However, research has identified several risk-factors affecting both the motivation and the opportunity of birds to perform cannibalism.

Current research is working towards identifying genetic strains of birds less prone to exhibit cannibalistic behavior; however, the practical outcome of these studies is not likely to be seen on farms for some time. **Control of behavior** is likely to be most effective, in combination with **housing design features and husbandry techniques**.

The following are some suggestions based on scientific research on how to reduce or eliminate cannibalism in your flocks. Please note that a number of these factors are designed to be **preventative** and should be integrated into husbandry practices, wherever possible:

1. **Delay the onset of first lay until hens are at least 20 weeks old.**

- In flocks exhibiting cannibalism, the increase in mortality due to cannibalism typically starts around the time of sexual maturation. Delaying the start of lay until after 20 weeks of age can reduce the risk of cannibalism.

2. **Provide attractive foraging materials.**

- Birds deprived of litter for the first 4 weeks after hatching may show increased cannibalism as adults.
- Rearing pullets without litter, or on poor foraging litter types such as wood shavings, increases the risk of feather pecking and cannibalism.
- Pecking at flock-mates may represent misdirected ground pecking behavior that occurs in the absence of adequate ground pecking substrate.
- Keep litter dry. The use of hanging bell drinkers over litter, which can result in wet litter conditions making the litter less attractive as a foraging material, has been correlated with increased cannibalism.
- Less cannibalism occurs when chicks are given long-cut straw bundled in sheaths rather than short-cropped straw, and polystyrene blocks rather than polystyrene beads.

3. **Meet nutritional requirements**

- Cannibalism has been correlated with nutritional deficiencies, including minerals, protein, and energy, especially with regard to a low-sodium diet. As rations change with each stage of production, ensure that nutritional content is maintained at an adequate level. Any factor that reduces feed intake (e.g., hot weather, reduced water intake, novelty due to a change in diet or environment, feed contamination, introduction of new birds, presence of predators or other fear-inducing stimuli, illness) can increase the risk of nutritional deficiencies.

4. Provide feed in small-particle form

- Considerably less cannibalism occurs when hens are fed an unpelleted (mash) diet rather than a pelleted diet, or crumbles rather than large pellets (possibly because it takes hens longer to consume an equivalent amount of feed in small-particle form).
- Lower mortality due to cannibalism has been observed in hens fed a diet high in insoluble fiber than in those fed a commercial diet (possibly because the birds spend longer feeding to meet their energy needs.)
-
- Phase feeding involves changes from nutrient-dense diets to more dilute diets as hens age. If the dilute diets are less preferred, this could explain why frequent diet changes are correlated with increased cloacal cannibalism in commercial flocks.

5. Minimize opportunities for birds to learn cannibalistic behavior

- Housing should be designed in such a way that prevents accidental bleeding injuries, and any injured or dead birds should be immediately removed from the flock.

6. Allow sufficient access to all resources for all birds

- Victims tend to have lower body weights than other birds in the flock. There has been a reported correlation between inadequate feeder space and cannibalism which may result from lack of uniformity of growth among the flock.
- Cannibals are attracted to victims that appear less fit than other hens as a result of lower body weight, disease, bleeding injury, trapping, or damaged plumage.
- Risk of cannibalism is lower in flocks with high body weight uniformity, body condition, health, and plumage quality.

7. Provide perches that are high enough to provide refuge from birds on the floor

- Provision of perches reduces the risk of cannibalism, both during rearing and in adulthood. Access to perches by 4 weeks of age results in a reduced risk of cloacal cannibalism in adult hens.
- Perches provide hens with an opportunity to avoid or escape cannibalistic attacks.
- Effectiveness of perches as refuges is increased if hens are reared with perches from an early age.
- Training of birds to ensure perch use is also recommended.
- To be effective, perches should be 16 inches or above from the floor to prevent birds on the floor from reaching up and pecking the perching birds. However, perches should not be so high that hens are injured when landing after jumping off perches.

8. Provide nests to minimize visibility of the cloaca during egg laying

- Provide nests that are enclosed and relatively dark rather than open or provided with supplementary lighting.
- If the cloaca is exposed and visible during oviposition, it can be an attractive stimulus for birds to peck at.

The information in this document is excerpted from Chapter 22 "Cannibalism" by R.C. Newberry in "Welfare of the Laying Hen" (Ed. G.C. Perry), published by CAB International 2004. The full PDF version of this chapter, including all scientific references of studies mentioned is available to producers on request.



Pasture: 108 sq. ft/bird outdoors all year around -



Free Range Chickens: Min. 2 sq. ft/hen – outdoors – weather permitting



Cage free/barn raised 1.5 sq. ft/bird



Exit from barn to winter garden



Barn raised birds in front of nest box



Barn Raised – aviary system



Barn Raised Birds in winter garden....



Humane Farm Animal Care
Animal Care Standards
2017 Standards

Copyright 2017 by Humane Farm Animal Care.
PO Box 727, Herndon VA 20172
All rights reserved.