TECHNICAL HANDBOOK

Cage-free production systems for commercial egg laying hens

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INSTITUTO FEDERAL
Rio Grande do Sul

TECHNICAL HANDBOOK
CAGE-FREE PRODUCTION SYSTEMS FOR COMMERCIAL EGG LAYING HENS

Technical handbook for routine handling practices used with hens raised in cage-free rearing systems. This guide shows the correct management of important stages of egg laying hens rearing so that is more efficient and precise.

We developed this material to educate readers through interactive, user friendly content. Use this material creatively and apply what you can to best meet the birds' physiological and behavioral demands. Learn how to optimize and diversify the management methods you adopt in raising cage-free hens!

"THE MIND THAT OPENS TO A NEW IDEA NEVER COMES BACK TO ITS ORIGINAL SIZE."

ALBERT EINSTEIN

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Acknowledgments:

WE THANK OUR BIRDS WHO GIVE US THE OPPORTUNITY TO LEARN AND EVOLVE IN OUR KNOWLEDGE, MANAGEMENT AND PRACTICES. WE ALSO THANK YOU, WHO HAVE DEDICATED YOUR TIME TO LEARN WITH US!

TECHNICAL HANDBOOK FOR CAGE-FREE PRODUCTION SYSTEMS FOR EGG LAYING HENS

BY ROSANGELA POLETTO, ALESSANDRA DA ROSA AND CAROLINE CITTA MAZOCCO

MISSION: Promote knowledge and share information about alternative systems to raise laying birds.

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Presentation

This handbook includes the technical guidelines on basic but highly relevant handling practices not always obvious to everyone. The practices contained herein, if routinely followed and implemented, help ensure the welfare and productivity of commercial egg laying hens raised in cage-free systems. This guide is a tool designed specially but not exclusively, for farmers and consultants who provide technical assistance to production systems of cage-free laying birds, including those with access to outdoor areas.

This material is the result of the Research Support Project of *Mapeamento de Produtores de Ovos no Brasil* / Mapping, Informing and Raising Awareness - MIRA 2021/2022, and has been prepared by Prof. Rosangela Poletto, PhD, and Alessandra da Rosa, undergraduate student in Animal Husbandry, in collaboration with Caroline Citta Mazocco, Animal Husbandry engineer.

Preface

Dear reader!

The concern and demand for ethically produced products of animal origin have recently been taking a greater space in academia, the food industry and society. Today, a large portion of the consumers wants to know the origin of food coming from animals, such as meat and eggs. The way in which animals are raised and cared for in different production systems is part of the basic principles of sustainability.

Inherent in this demand, production processes follow stricter criteria in animal husbandry -in this handbook, specifically for commercial egg laying hens- and consider animal welfare practices during all stages of production. All those who handle the animals directly must know -and be familiar with- the daily management. They must understand and be able to quickly diagnose the negative consequences for animal welfare when management does not meet the physiological and behavioral needs of the birds. On that note, all practical information material becomes essential to properly train those who take care of the animals!

Prof. Rosangela Poletto, PhD

Happy reading!

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Sumário

NUTRITION

GOOD FEED AND WATER IN QUALITY AND QUANTITY

Nutrition

Photo: Poletto, R.

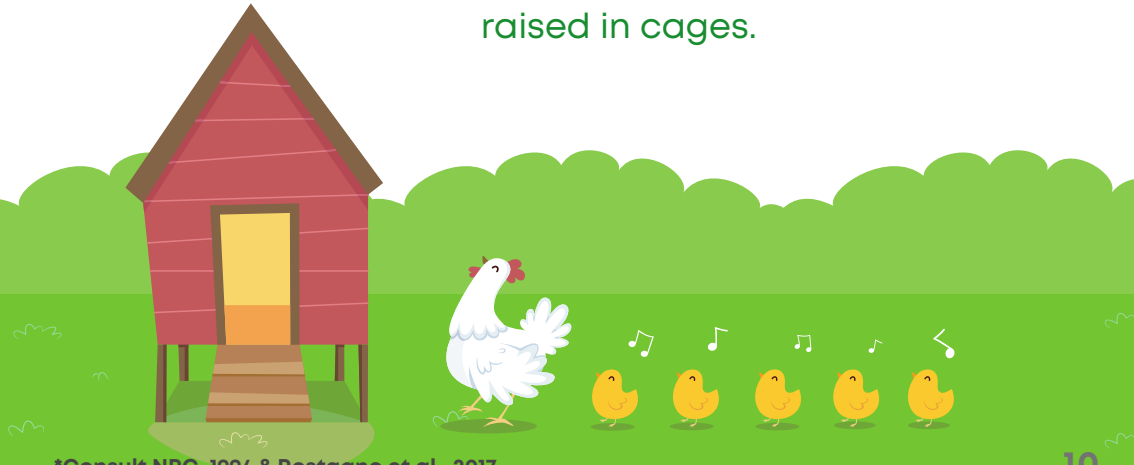
Hens eating without competition.

Rearing pullets and layers should be fed a wholesome diet, always in accordance with their stage of production*.

Access to feed must be free and provided at least twice a day!

ATTENTION!

Cage-free hens consume 10% to 15% more feed per day than those raised in cages.



*Consult NRC, 1994 & Rostagno et al., 2017.

Calcium Supply

Coarse calcium supply must be encouraged in addition to ground calcium. During the laying stage, it must be mixed with feed in an additional feeder and provided ad libitum.

With the use of an additional feeder, birds can regulate calcium intake based on their individual need, which aids with shell quality and bone strength.

Photo: Poletto, R.

Coarse calcium source mixed with feed.

Photo: Mazocco, C.

Additional feeder with coarse calcium provided ad libitum.

Access to Feeders

FEEDERS:

Double sided feeders: 2.0 in. (5 cm) of linear track per bird

Single sided feeders: 4.0 in. (10 cm) of linear track per bird

Circular feeders: 1.5 in. (4 cm) of perimeter track per bird

Placed at the height of the birds' crop, they allow them to feed without difficulty.

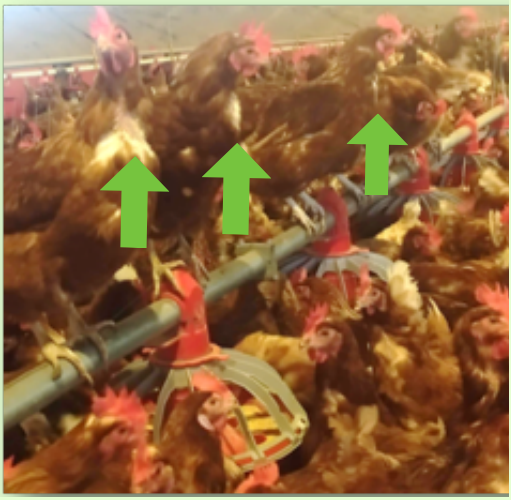
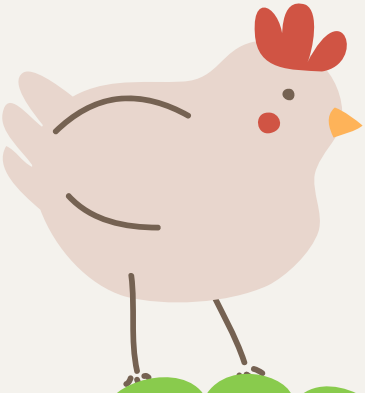


Photo: Poletto, R.

Lack of feathers in the central area of the neck indicates that the feeder may be too high.



ATTENTION!

Feeders must be placed at an ideal height for the size and age of the birds and receive regular maintenance.

Feed Management for Chicks / Pullets

FACTORS THAT IMPROVE THE DEVELOPMENT OF CHICKS IN THE FIRST DAYS OF LIFE:

Supply of additional feeders.

Feed on biodegradable paper.

Quality feed always available!

Photo: Mazocco, C. C.

Photo : Poletto, R.

Additional feeders on biodegradable cardboard with feed distributed on it.

ATTENTION!

Pullets must have immediate and easy access to feed and water sources on the day of transfer to the house. Monitor their intake the following days.

Feed Storage

FEEDER - ITS CARE IS ESSENTIAL!

Keeping **feeders clean** guarantees the quality of the feed given to the birds.

Low feeders get dirty easily with litter material and droppings and they waste feed!

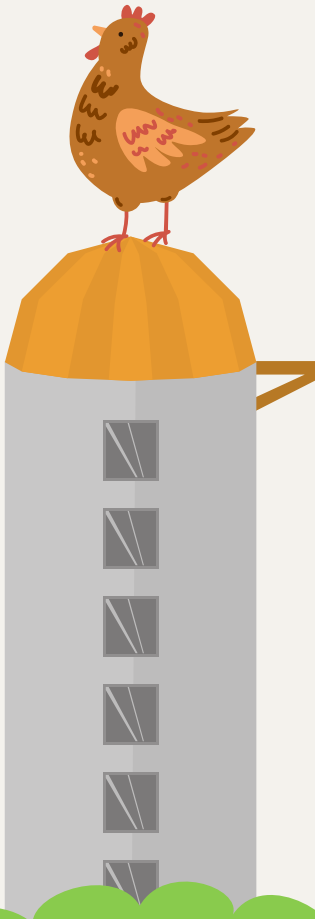
SILOS – PROPER FEED STORAGE

Feed must reach the animals with all its **nutritional properties intact**.

Feed nutritional levels must be evaluated via **bromatological studies** to verify if the formula is reaching the feeder.

Feed must be kept away from changes in temperature, humidity, mold, rodents, and wild birds.

The storage capacity must meet the farm's demand!



***Certified Humane, 2018 e Silva et al., 2020.**

Access to Drinkers

Drinking water must be fresh, clean, and always available!

Birds notice differences in water temperature up to 35 °F (2°C) and **prefer water that is 75°F (24°C) or cooler.**

In the laying stage, at least **8.5 oz (250 ml) water/bird** must be provided per day (an average of twice the volume of feed ingested).

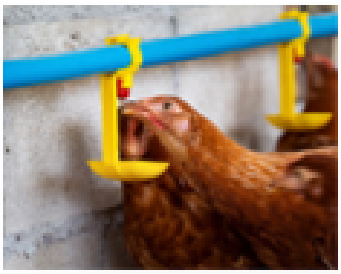
THE MINIMUM NUMBER OF DRINKERS AVAILABLE TO THE BIRDS SHOULD BE:

Bell: 1 per 100 hens.

Nipple: 1 per 12 hens.

rough: ½" (1.27 cm) per bird.

BELL



NIPPLE

TROUCH

Photo : Poletto, R.

ATTENTION!

LEVELING THE DRINKERS!

Not so low that they make it difficult to drink and wet the litter, but not so high that they make it difficult for birds to access them!

Hydrometers are essential for record keeping of water daily consumption.

Photo : Poletto, R.

*Certified Humane, 2018 e Silva et al., 2020.

The Importance of Water

ATTENTION! Birds that drink less also consume less feed, which DECREASES production.

Poor quality water harms gut health, not BENEFITING enough from food nutrients.

Pullets prefer drinking water temperatures of 68-77 °F (20-25 °C) while adult birds enjoy 59-68 °F (15-20 °C).

REDUCED water intake is often the first sign of disease problems within the flock and production reduction.

ATTENTION!

ENSURE THAT BIRDS HAVE AT LEAST 24 HOURS OF STORED WATER ON THE FARM DURING A SHUT OFF OF THE MAIN SUPPLY.

Water Quality

Water quality testing* must be part of the farm routine!

The laboratory's guidelines regarding the collection of the water to be tested must be thoroughly checked.

The interpretation of results will indicate whether the water is safe for birds to drink!

Important Parameters for Water Quality Assessment	
Total dissolved solids	1000 mg/L
pH	6,3 – 7,5
Total hardness	< 60 mg/L de $CACO_3$
Chloride	≤ 500 ppm
Nitrate	< 10 mg/L
Nitrite	< 1 mg/L
Sulfate	< 250 mg/L
Iron	< 2 mg/L
Manganese	< 0,1 mg/L
Total coliforms	< 1.000/100 mL

ATTENTION!

Chlorination is essential to keep water suitable for birds to drink. However, excessive rain must be closely monitored. Water quality must be checked at least once a year!

***Normative Ruling 56 of the Ministry of Agriculture of Brazil[MM1] - Establishes standards for the quality of the water that must be supplied to the animals.**

Water Management for Chicks / Pullets

WATER FACTORS THAT IMPROVE THE DEVELOPMENT OF CHICKS IN THEIR FIRST DAYS OF LIFE:

Quality water supply.

Availability of appropriate size drinkers for chicks.

Make sure that the cups of the nipple drinkers have water when birds are transferred to the house so that they learn how to use them.

ATTENTION!

Backpack sprayers and water buckets can be used to fill nipple drinker cups, ensuring water availability for pullets in the house, especially when beak was infrared trimmed at hatchery.

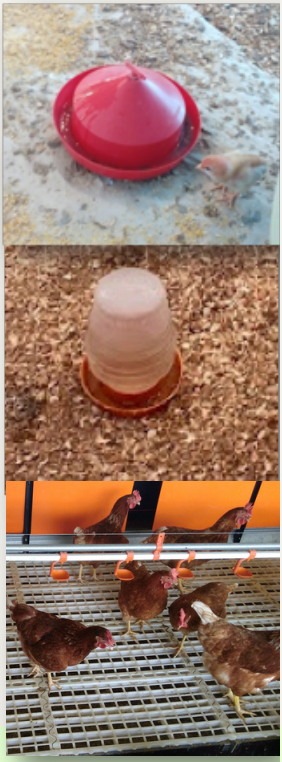


Photo: Poletto, R.

Photo: Mazocco, C. C.

Photo: Poletto, R.

Appropriate size drinkers for chicks and nipple drinkers with cups.

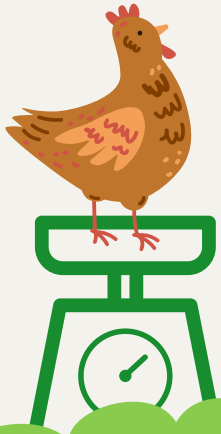
Weight for Pullets and Egg laying Hens

The birds' body weight **must** be monitored weekly until their transfer to the laying house; every two weeks until they are 30 weeks old and monthly, afterwards.

At least 1 to 5% random weighing of the flock.

Birds must always be weighed during the coolest hours of the day.

It is important that weighing records are reliable.



ATTENTION!

Weight is a nutrition and health indicator and helps prevent abnormal behavior such as cannibalism!

Weight for Pullets and Egg laying Hens

FACTORS THAT IMPACT FLOCK PERFORMANCE:

Quality of chicks and pullets.

Inadequate environmental and nutritional management.

Water and feed quality.

Overpopulation.

Health challenges.

Monitoring flock weight uniformity must be constant throughout the ENTIRE PRODUCTION CYCLE!

Body Weight Uniformity Calculations

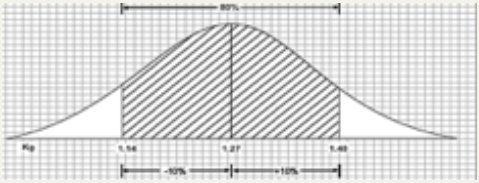
Birds should be selected when the flock has less than 80% uniformity:

Example: pullets 8 weeks of age with a standard weight of 1.48 lbs. (670 g), birds should be separated by weight category:
Heavy: 1.48 lbs. (670 g) +10% =>> weight range 1.62 -1.65 lbs. (737 – 747 g*)
Average: 1.45 - 1.48 lbs. (660 - 670 g)
Light: 1.48 lbs. (670 g) -10% =>> weight range 1.31 - 1.33 lbs. (593 – 603 g*)

*To determine the weight range, add (heavy) or subtract (light) 0.02 lbs. (10 g) from the average weight obtained.

Example: CV%*	Uniformity (+/- 10% of average) *
5	95,4
6	90,4
7	84,7
8	78,8
9	73,3
10	68,3

*Based on the Hy-Line Brown Breed Manual.



Weight distribution in 80% uniformity range

ATTENTION!

At least 80% of birds are expected to be within ±10% of average weight!
* OBSERVE the breed manual as a reference of the standard weight per age category.

ENVIRONMENT

THERMAL COMFORT, GOOD LITTER AND AIR QUALITY, AND ADEQUATE LIGHTING

Verification of Facilities

Farm caretakers MUST inspect the houses and the equipment the birds depend on daily!

The sooner a problem is identified, the sooner it can be resolved!

DAILY CHECK POINTS:

Equipment not working properly.

Facilities that are unsafe for caretakers and birds.

Shaded natural pasture areas: check the quality of the vegetation.

Shaded artificial pasture areas: preserve the condition of the material used to avoid damage to production, among others.

Photo: Poletto, R.

*Silva et al., 2020.

Condition of the litter access to birds

WHAT IS LITTER?

Organic material that covers the ground or floor within a poultry facility.

WHAT IS IT FOR?

Absorb moisture and dilute bird droppings, feathers, and feed debris.

Control the inside temperature of the building and provide thermal comfort to the birds.

Allow birds to dust bathe, which is a natural and highly motivating behavior.

Photo: Poletto, R.

Loose and dry litter allows birds of all ages to dust bathe; thus, "holes" are seen in the area.

LITTER PHYSICAL FEATURES

Material varies by region and availability. Typically, wood shavings and rice hulls are used in litter.

The minimum litter depth must be 2 in. (5 cm) when birds are transferred to the house.

ATTENTION! Well-maintained litter is key to flock health and for birds to express their natural behaviors!

Litter Management

Ventilation must be regulated to reduce the relative humidity of the air and, consequently, of the litter.

BEWARE of the number of birds per square meter so that there is no overcrowding.

The pressure and height of the drinkers must be adjusted according to the age of the birds.

BEWARE of dripping water drinkers and sprayers!

Roofs/cladding must be in good condition to prevent rainwater from dripping.

Large and heavy "hen shoes" after a long period of contact with wet litter.

Clods due to poor management of wet litter.

Caked, hard and wet litter.

Photo : Poletto, R.

ATTENTION!

Dry and loose litter is a determining factor for good results and health in raising hens! Wet areas must be removed or replaced.

Access to Perches

They must be placed at least 8 in. (20 cm) from any wall or ceiling.

Birds should be able to wrap their toes around the perches and balance evenly in a relaxed posture.

Hens that do not have access to perches perch on feeder and drinker lines, which causes problems!

The frequency birds use perches has to do directly with their habit using them during the rearing stage, and with the perches' angle of inclination and models used during laying.

Photo: Poletto, R.

Perches can have the shape of a sawhorse leaning on the house walls and be made of metal and wood. Round perches should be at least 1 in. (2,52 cm) and not greater than 3 in. (7,6 cm) in diameter to make it easier for birds to perch.

***Certified Humane, 2018.**

Access to Perches

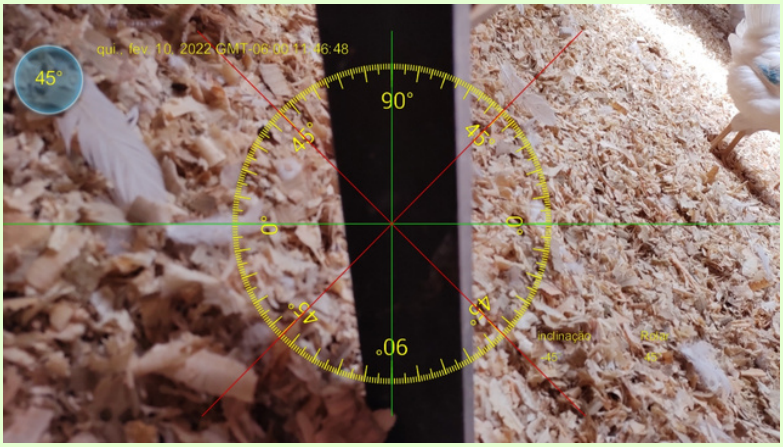


Photo: Poletto, R.

Perches must have an angle of no more than 45 degrees to encourage their use.
Perches with a very high inclination make it difficult for birds to climb on and jump between them.

ATTENTION!

Perches teach birds to jump and fly from an early age, making it easier for them to access the nests and vertical structures in the house.

Importance of Outdoor Cover

It avoids direct solar radiation.

It is an innate protection from overhead predators.

It promotes well-being through thermal comfort.

It stimulates foraging.

ATTENTION!

IT IS NOT ENOUGH TO OPEN THE DOORS FOR THE HENS TO GO OUTSIDE. IT IS ESSENTIAL TO EVALUATE IF THE ENVIRONMENT GUARANTEES ADEQUATE WELFARE!

Photo: Poletto, R.

***ABNT NBR 16437, 2016.**

Factors that Influence the Use of Outdoor Areas

CLIMATE | SEASONS |
AGE OF BIRDS | FLOCK SIZE |
TIME OF DAY

The covered outdoor area can be:

Natural: shrubs, tall vegetation, or fast-growing native non-fruit trees.

Artificial: zinc roofs, polyethylene mesh (solar retention greater than 80%).

Access to natural cover.

Birds dust bathing outdoors.

Access to artificial cover.

Photo : Poletto, R.

ATTENTION! These structures avoid direct solar radiation outdoors, especially during the hottest hours of the day, between 10 am and 3 pm.

Outdoor Water Drainage

GOOD OUTDOOR WATER DRAINAGE IS ESSENTIAL AND PREVENTS:

Flock infection caused by unwanted flies and parasites.

"Hen shoes" accumulated on the birds' feet.

Ingestion of contaminated water.

Sanitary problems caused by pathogens.

CONSEQUENT DAMAGE TO ANIMAL WELFARE.

WHAT TO DO?

Do not pour contaminated water outdoors.

Drain water dripping from the roof.

Drain rainwater.

Level the ground and fix any damaged areas.

Cover holes with fine gravel. ALWAYS Keep proper plant coverage!

Photo: Mazocco, C. C.

Poor outdoor water drainage is a health risk for the birds.

Nest boxes

What Are They?

Areas for birds to express their natural egg laying behavior.

It must offer more protection and comfort.

Community nest systems or individual nest boxes.

Minimum nesting area of 9 sq ft (80 cm^2) per 100 birds or one nest per 5 hens, to prevent them from competing.

Access must be free during daylight!

Without feeders, drinkers or perches that limit or block the passage of birds into the nest boxes.

Manual nest with good quality substrate and always in the right quantity.

Automatic community nest (inside and outside view).

Photo : Poletto, R.

ATTENTION: Hens choose cleaner nests with less light, where they feel safer.

Monitoring the Environment for Birds

Heat stress in laying birds is one of the most critical points that can affect their productive performance and welfare.

High temperatures can cause a reduction in feed consumption, poor quality eggs, high mortality rate and a lower production.

Fans must be placed correctly to guarantee a constant air flow.

Fans must work properly ALWAYS.

Fans must have a protection grid on both sides.

IDEAL TEMPERATURE FOR EGG LAYERS: 64 -75 °F (18 to 24°C) / IDEAL RELATIVE HUMIDITY: 40-70%

Photo: Poletto, R.

Sprayers help maintain the room temperature.

Sprayers must not be turned on when humidity ↑70%.

Sprayers may be high or low pressure.

Sprayers have a great evaporation capacity, preventing the birds from getting wet.

Thermal Discomfort

Why Avoid It?

It causes negative consequences, such as:

Lower production and shell quality.

High risk of abnormal behavior.

Decrease in feed consumption.

Fast heart rate.

Lower growth rate.

Higher incidence of soft-shelled eggs.

Deaths caused by heat stress.

It can be identified when the bird:

Normally drinks more water than it consumes feed.

Moves less.

Holds wings up.

Breathes heavily with her beak open to reduce heat.

Photo: Poletto, R.

Environmental Enrichment

Methods for a more conducive, challenging, and appealing environment, improving the animals' quality of life.

Photo: Mazocco, C C.

BANANA STALKS are used to control endoparasites.

Photo: Big Dutchmann

STONES are used to wear down the beaks.

VEGETABLES, HAY, and TOYS are used for environmental enrichment.

ATTENTION!

Birds get used to environmental enrichment and items utilized must be changed frequently.

Photo: Wiley Online Library

Photo : Poletto, R.

Photo: Pawsitive Thinking

Photo: The open sactuary Project

HEALTH

GOOD HEALTH, PROPER BEHAVIOR, PREVENTION AND BIOSECURITY

Overcrowding in Layers

Overcrowding is an unusual behavior caused by a factor intrinsic to the house.

It is a multifactorial and undesirable behavior.

The birds' behavioral sequence leading to death begins with **overcrowding and piling, climbing on top of each other**, followed by subsequent suffocation. When they are on top of each other, some suffocate.

However, overcrowding does not always lead to death if the **environment is constantly inspected**, and the causes or factors of this predisposition are prevented.

Adapted from Gebhardt-Henrich; Stratmann (2016)

Overcrowding in Layers

Overcrowding can occur in three ways:

Occasionally in nest boxes

Within nests boxes, on grids, or in front of automatic nests.

Mainly at the beginning of laying.

Enough nest boxes contribute to an effective reduction of this behavior.

Hysteria

Due to a sudden "fright".

Presence of predators inside or outside the house, light spots, noises, feeding time delay and outdoor schedule delay.

Recurring

The most worrying. It can happen during brooding and rearing and continue until the egg laying stage.

Birds repeat learned behavioral patterns.

ATTENTION!

Overcrowding seriously harms the flock, so PAY ATTENTION to predisposing factors to prevent them!

Beak Care!

WHY PERFORM BEAK TRIMMING*?

It lowers the consequences of poor handling when birds peck their feathers, which may lead to cannibalism.

PROCEDURE CARE! *

Must be done **up to 10 days** of life at the hatchery or on the farm.

The caretaker in charge must be properly trained to perform the procedure.

Approved and regulated equipment must be used. Attention must be paid to the most pigmented beaks, which tend to be “harder”.

Only the tip of the upper mandible must be removed! **DO NOT PERFORM V-shaped** cut of the beak as it is an aggressive method.

Photo: Poletto, R.

Infrared beak trim at hatchery; on average, they fall between 10 to 14 days of age.

The lower mandible may be "stopped" without any beak being removed!

*** P.G. de Abreu, H. Mazzucco, I.J.O. da Silva. Práticas de debicagem de poedeiras comerciais. Concórdia:Embrapa, Suínos e Aves, 2018.**

Pecking / Cannibalism Are Abnormal Animal Behaviors

It is the act in which a bird pecks another, or herself, initially causing feather damage and loss in the affected area.

Main affected areas: head, neck, wing tips, back and cloaca.

Pecking and cannibalism indicate poor environmental, equipment, feed and/or nutrition management practices, and insufficient resources for the total number of birds.

Photo : Poletto, R.

To prevent them, it is important to understand the physiological requirements of the breed.

Caretakers must be able to understand what hens need just by looking at them!

Pecked birds must be segregated in a suitable place to recover.

.

ATTENTION!

When abnormal behavior persists and the number of visible injuries increases, a more severe stage of cannibalism sets in, making its control more difficult and challenging!

Feather Loss Caused by Pecking / Cannibalism

Feather loss and exposed wound caused by pecking and cannibalism.

Different stages of pecking with dorsal reddening of the skin.

Feather loss caused by pecking.

Photo : Poletto, R.

ATTENTION!

Attentive and constant monitoring guarantees an early diagnosis of any bird abnormal behavior!

Care of Sick, Injured and Weak Birds!

Weakened, sick, pecked hens with open wounds or fractures must be:

Segregated.

Treated immediately.

Humanely sacrificed, if necessary.

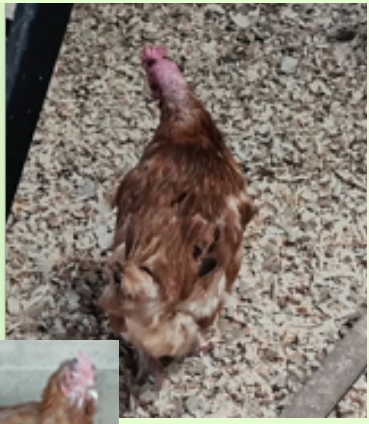


Photo : Poletto, R.

Weak hens that require caretakers' special attention.

ATTENTION!

The farm must have a hospital area equipped with all the resources needed, including nest boxes and perches, with no access to healthy birds! One hospital area per house is recommended.

Care of Sick, Injured and Weak Birds!

In general, birds that are not doing well stay below the feeder lines, nest boxes or in the highest areas of the perches.

HOW TO IDENTIFY THIS?

Common signs to look out for:

Pecked birds.

Lethargic birds.

Broody birds.

Birds unable to move or disoriented.

Respiratory or ocular discharge.

Small and pale comb.

Feet and legs with strong or pale coloring.

Low water and feed intake.

Care of Sick, Injured and Weak Birds!

HOSPITAL AREAS: MANAGEMENT AND IMPORTANCE

Farms must have at least one hospital area per house.

This area must be kept clean, with enough drinkers and feeders, and access to nest boxes and perches for birds to protect themselves from others.

The hospital area mesh must be high and closed enough to prevent the entry of healthy birds.

Hospital area with resources for the recovery of rearing pullets.

Photo : Poletto, R.

Access to perches is important for submissive and pecked birds.

Mortality Monitoring

HOSPITAL AREAS: MANAGEMENT AND IMPORTANCE

MORTALITY is a great indicator of health, quality of bird handling and animal welfare!

Daily deaths must be recorded for better monitoring, separating the number of **BIRDS FOUND DEAD FROM SLAUGHTERED BIRDS.**

This record keeping must be done daily!

Photo: Poletto, R.

ATTENTION!

CAUSES of deaths and culling must also be recorded to assess the flock and mitigate or prevent problems and challenges!

Control measures for predators, pests, and parasites

Health measures must be adopted to protect laying hens, among others:

The entry of wild birds in the house must BE AVOIDED, using meshes or similar materials.

Predators, including cats and dogs, should not have free access to the house surroundings.

Rodent monitoring must be frequent, adopting efficient control methods; infestation is a public health risk.

Access areas to facilities must be closed and protected with the use of meshes and fences in good condition.

Birds must remain indoors at night!

Photo : Poletto, R.

Internal and External Parasites

INTERNAL:

Intestinal tract damage, reducing the absorption of nutrients.

Monitoring of culled birds by necropsy and microscopic examination of the feces for worm eggs counting.

Decreased productivity and ruffled feathers.

Photo : Poletto, R.

Hen with ruffled feathers - indicative of parasitosis.

Visible lice infestation of the cloaca.

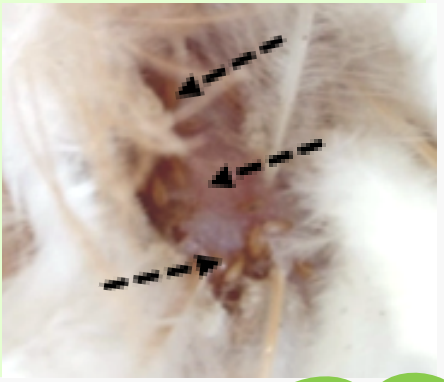


Photo : Poletto, R.

Internal and External Parasites

EXTERNAL:

They are nocturnal.

They suck blood.

They cause great irritation, weight loss, anemia and can even cause death.

One control method is the application of pesticides at night, when they are more active.

Most common: lice (Dermanyssus gallinae)

ATTENTION!

Multiple hens "cleaning" their feathers or pecking at each other simultaneously may indicate that the flock is infested with ectoparasites!

Transport of Culled Birds

Birds must have access to water until the catching team begins to catch them.

The catching team should not prioritize speed over bird welfare.

Birds must be grasped by the back with both hands and NEVER by the legs, neck, or wings!

The person responsible for transport must be trained in animal welfare procedures.

Unnecessary and prolonged stops must be avoided, as well as sudden braking during the journey.

Photo: Poletto, R.

ATTENTION!

It is important to have a depopulation action plan that guides the handling of birds when catching them!

PEOPLE MANAGEMENT AND TRAINING

GOOD RECORDS, MANAGEMENT, PEOPLE AND OBSERVATION

People Management and Training

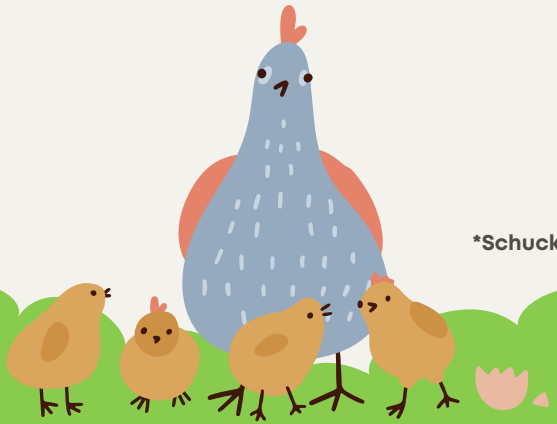
Caretakers must be **trained** at any stage of production.

They must be properly trained to be able to deal with day-to-day farm situations and handle birds calmly.

Caretakers must be aware of the birds' natural **behaviors** and physiological needs and be able to detect the early onset of abnormal behaviors.

Caretakers must **understand the record logs**.

Hens are SENTIENT BEINGS that feel pain and distress!



*Schuck-Paim et al., 2021.

Working Knowledge of Managers and Caretakers

Be **able** to identify any physical or behavioral changes in birds.

Be attentive to any equipment change or failure.

Find quick and efficient solutions.

Be familiar with biosecurity measures and respect them.

Quickly diagnose diseases and injuries and identify old and unproductive birds.

Solve problems without delay or know how to seek help to do so.

Seek veterinary or zootechnical consultation and help to **PREVENT** losses in production and animal welfare at any stage of production.

Importance of Production Records

WHAT IS THE IMPORTANCE OF RECORD KEEPING?

No matter what method is used, records are a must!

By keeping them handy, the flock is tracked step by step and recurring issues may be detected.

Records of the entire flock must always be kept and available!

WHAT TO RECORD?

Production data.

Bird mortality and culling.

Water and feed consumption.

Daily minimum and maximum temperatures.

Use of medications and vaccines.

Segregated birds and causes.

Incidents and corrective actions.

ATTENTION! Records must be educational and easy to understand and use!

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