
Animal husbandry guidelines for egg-laying flocks — Cage-free



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This African Standard was prepared by ARSO Technical Committee ARSO/TC 23, *Live animals*.

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Introduction

The industrialization of animal agriculture, coupled with the need to provide protein for the growing population has facilitated the growth of the egg industry worldwide. While cages are primarily used for their efficiency and ease management, there has been growing demand for cage-free eggs in many regions of the world. This is because many consumers across the world increasingly care about animal welfare and expect improved treatment and conditions of farm animals. Hence the need to consider adopting cage-free systems for improved animal welfare, increased market access and increased product quality. This standard shall address both physiological and behavioral needs that minimize stress and promote the health and welfare of the laying poultry, and used in the succeeding certification scheme for cage-free egg production by the competent authority.

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Animal husbandry guidelines for egg-laying flocks — Cage-free

1 Scope

This Committee Draft African Standard specifies minimum requirements for cage free egg producing poultry (chickens, ducks, emus, geese, guinea fowl, ostriches, partridges, pheasants and pigeons).

This standard includes guidelines on housing and environmental requirements, farm management practices and handling of birds in cage-free production systems.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

stocking density

space allowance for birds

3.2

litter

any material (rice husk, wood shavings, hay, etc) used as bedding for poultry

3.3

brooding

period immediately after hatching when special attention is given to chicks through provision of appropriate environmental conditions including temperature, humidity and ventilation to ensure their survival

3.4

cage-free system

system where poultry is not raised in confinement or captivity

3.5

drinker

any recommended drinking vessel used to hold and provide water for the birds

3.6

feeder

any recommended feeding vessel used to hold and provide feed for the birds

3.7

nest

spot in which a bird lays and incubates its eggs and raises its young

3.8

perch

any place or object, for a bird to alight or rest upon

3.9

enrichment

items to stimulate natural behaviors like foraging, climbing, and perching

3.10

Egg production rate

the number of eggs produced divided by the number of birds, this can be calculated daily or over longer periods to determine the productivity of the farm

3.11

productivity

number of eggs laid (the farm outputs) in relation to the costs(inputs) that go into producing eggs, including feed, water, housing, equipment, health management materials, staff (the cost) can determine the farm productivity, then profit and loss

3.12

floor eggs

eggs laid outside the nest boxes in the litter area, that indicates a health or welfare problem and convenience to farmers

3.13

single tire system

non cage system where nests, perches, feed and water sources are located on only one level

3.14

multiple tires system

non cage system where nests, perches, food and water sources are located on multiple elevated tires

3.15

feather pecking

behaviour problem in domestic hens characterized by pecking or plucking the feather of the flock mates or self-pecking or plucking

3.16

feed conversion rate

weight of feed consumed divided by the weight of eggs produced, on average the flock is consuming 2 kg. of foods to produce one kg of eggs

4 Guidelines

4.1 Minimum requirements and best practices

4.1 Farm location and housing design

4.1.1 The poultry farm shall respect the minimum distances between other poultry farms and on well drained ground as stipulated by the competent authority within Member State's regulations.

4.1.2 Whatever the building style, it shall be constructed so it may be easily and thoroughly cleaned and disinfected between flocks.

4.1.3 Floor material choice shall allow easy maintenance, cleaning and disinfection.

4.1.4 The walls and roofs should contain insulation with a moisture barrier and rodent proof materials.

4.1.5 Adequate ceiling height for adequate ventilation purposes.

4.1.6 The design of the farm shall facilitate the ALL IN – ALL OUT principle of production.

4.2 Housing systems

4.2.1 All types of housing systems shall have:

- a) controlled access;
- b) exists that are wide enough for the birds;
- c) comfortable flooring or bedding for the birds;
- d) good lighting and heating system; and
- e) proper ventilation.

4.2.2 All types of housing systems shall

- a) be easy to clean; and
- b) facilitate easy egg collection.

4.2.3 The recommended width of the building should not exceed 12 m.

4.2.4 A roof slope of 45° is recommended to facilitate efficient control of temperature inside the houses.

4.2.5 Roof overhang can be used to shade the sidewalls of a building from direct and indirect solar radiation.

4.2.6 Rooftop sprinklers have proven to be efficient for substantially cooling the roof. However, material of choice in this situation shall be able to withstand the constant exposure to water.

4.2.7 For proper ventilation control, it is required that the house be highly insulated and tightly constructed. However, the sidewall can be equipped with insulated adjustable curtains instead of solid wall for use in the cooler periods of the year or in case of power failure emergency. It is important to note that solid wall have higher insulation value than adjustable curtains.

4.2 Breeds (genetic selection)

4.2.1 Breed can affect hen behaviour and health as well as practices and profits.

4.2.2 The selection of strains or breeds of hen should be based on market requirements and preferences.

4.3 Occupational health and safety

An employer shall provide and maintain a working environment in which employees are not exposed to hazards, through:

- a) maintaining safe workplaces, plant and work systems;
- b) providing information, instruction and training enabling employees to work without hazards;
- c) consulting with employee-elected health and safety representatives and/ or other employees about occupational health, safety and welfare;
- d) providing adequate personal protective clothing and equipment; and
- e) ensuring all work procedures are undertaken without exposing workers to hazards.

4.4 Bird welfare

4.4.1 Bird welfare shall include:

- a) adequate floor space with enough headroom;
- b) nutritious feed with adequate feeding space;
- c) portable water with adequate drinking space;
- d) opportunity to associate with flock mates; and
- e) feeds and veterinary medicines/drugs in accordance with the labelled instructions paying particular attention to the withdrawal period before the chickens or eggs are consumed.

4.4.2 Advice on welfare aspects shall be sought when new equipment is being purchased, new buildings being constructed or existing buildings modified.

4.4.3 Floors, other surfaces, fittings and equipment shall be designed, constructed and maintained so as to minimize the risk of injury, parasites and diseases, and to adequately support the birds.

4.4.4 Where chickens are brooded on wire, it is recommended that temporary supportive flooring material, such as paper or matting, is provided during the early brooding period.

4.4.5 Innovative husbandry and housing systems which enhance bird welfare shall be encouraged, and applied to commercial egg production as practical.

4.4.6 Minimal acceptable housing standards including stocking densities are given in Table 1.

Table 1 — Minimum space requirements for cage-free laying hens

Stocking density	6 - 8 hens/m ² usable surface, approx. 17 - 19 birds/m ² floor space
Litter area	One third (1/3) of usable surface with minimum of 250 cm ² /hen
Feeder space	Feeding troughs/ chain feeder: 8 - 10 cm/hen; 20 hens/m trough or chain feeder if the feeder can be approached from both sides
	22 - 25 birds/pan
Drinkers	8 - 10 hens/nipple
	60 - 80 hens per hanging bell drinker
Laying nest	100 - 120 birds per m ² nest space
	5 - 6 birds per individual nest
Perches	Approx. 15 - 18 cm/hen

4.4.7 To facilitate elimination of anything that may cause discomfort and injury to birds, it is important to:

- a) understand poultry behaviour to facilitate identifying distressed, weak, injured or diseased poultry, and taking appropriate action, including seeking veterinary treatment where required;
- b) handle poultry to minimize stress, and using facilities and other equipment appropriately;
- c) undertake hygienic practices for management procedures in a manner that minimizes the risks to poultry welfare;
- d) understand and follow vaccination, chemical and medication treatment instructions for poultry;
- e) maintain appropriate records; and

- f) Understand local patterns of disease and bio-security practices to prevent disease.

4.5 Bio-security and health management

- 4.5.1** Apply stringent farm quarantine programmes.
- 4.5.2** Isolate the farm/sheds from all other poultry.
- 4.5.3** Limit and control the entrance of vehicles and visitors.
- 4.5.4** Preferred source of day-old chicks shall be from reputable suppliers.
- 4.5.5** Prevent access of wild birds, rodents and all other animals including vermin to the poultry houses.
- 4.5.6** Provide shower facilities and clean clothing for staff and visitors.
- 4.5.7** Control the movement of staff and equipment around the farm.
- 4.5.8** Provide wash facilities for staff, essential visitors and vehicles prior to entry.
- 4.5.9** Provide disinfectant foot baths at the entry to each shed and vehicle bath to the poultry farm.
- 4.5.10** Thoroughly clean and disinfect all poultry equipment and sheds between flocks.
- 4.5.11** Maintaining the flock in a good state of well-being by good stockman-ship, nutrition and housing.
- 4.5.12** Use monitoring procedures to keep a check on status of pathogens on the farm; to check on the effectiveness of cleaning and sanitation procedures; and to test the levels of immunity to diseases of importance in the flock and check the effectiveness.
- 4.5.13** Control the use of antibiotics to prevent the emergence of antimicrobial resistant pathogens in the flock.
- 4.5.14** Avoid use of hormones and unauthorized additives in the flock.

4.6 Litter material and management / environmental enrichment

- 4.6.1** Remove litter from houses at the end of each batch.
- 4.6.2** Litter shall be of sufficient depth (1 cm - 5 cm new litter at the start of the flock) for dilution of faeces and shall be dry and friable to stimulate foraging and dust-bathing behaviours.
- 4.6.3** Partially removing the litter or changing the complete litter (followed by providing fresh litter substrate) is also a form of enrichment as it reactivates the pullets' curiosity to explore the newly provided litter and provides further positive association with the caregiver when this practice is performed with care.
- 4.6.4** Good ventilation is important in litter management.
- 4.6.5** Leakages of waterlines and drinkers shall be repaired immediately as these may also cause wet litter, and expose the birds to high levels ammonia and diseases (e.g. coccidiosis) which are detrimental to poultry. High levels of ammonia is detrimental to worker health too.
- 4.6.6** The litter should not accumulate above 15 cm in depth. Litter that is too deep is a risk for increased floor eggs; high ammonia and fine dust levels, adverse working conditions; wet litter and litter plaques.

4.6.7 Timely removal of litter should be part of the farm management to keep it in good condition and at an appropriate depth (5 cm - 10 cm).

4.6.8 Litter/manure moisture content can be managed by:

- a) preventing water from rain, irrigation sprinklers and surface water from entering poultry houses and storage facilities;
- b) preventing overstocking in houses/sheds;
- c) covering litter with fresh absorbent materials;
- d) removing wet patches of litter/manure;
- e) ensuring drinker nipples are close with a positive action and do not leak;
- f) adjusting drinkers regularly to suit the height of the birds;
- g) adjusting fogging systems for cooling so that the droplet size is not too large (if the droplets are too heavy, they will reach the litter and make it wet);
- h) maintaining feeders to minimize spillage; and
- i) using well formulated nutritious feed so as to avoid passage of excessive wet faeces.

4.6.9 The following may assist in good litter management:

- a) fresh shavings shall be dried and friable;
- b) bedding shall be of a suitable material and particle size;
- c) bedding shall be stored in dry, hygienic, rodent-proof premises;
- d) avoid introducing wet or damp shavings into rearing house;
- e) avoid wet or caked litter;
- f) good litter should stick together slightly when pressed in the hand and break up as the hand is released; and
- g) The litter temperature should be approximately 30 °C at the time the chicks are placed onto the floor. This is very important for the development of the chick in the first few days as they cannot self-regulate their body temperature until approximately 7 days.

4.7 Perches

Perches improve welfare by allowing the bird to express its natural behaviour. If perches are provided all birds should have the opportunity to roost if that is their preference.

4.7.1 Ensure that they are constructed, positioned and maintained to be raised above and not flush with floor areas allow birds to access them at all times, other than during the first week of life, on the day of pick-up or during litter conditioning allow birds to perch in a normal posture provide appropriate support for the bird's feet minimize the risk of injury minimize vent pecking by birds below and/or behind minimize soiling of birds below.

4.7.2 Available linear perches shall allow not less than 15 cm per hen.

4.7.3 Perches shall be without sharp edges, and shall be positioned to minimize fouling of any birds below.

4.7.4 The horizontal distance between the perches shall be at least 30 cm but not more than 1m, and the horizontal distance between perch and the wall shall be at least 20 cm.

4.7.5 Slatted or wire mesh perching areas shall provide a minimum of 450 cm² per bird.

4.7.6 Recommended horizontal distance between perches is 30 cm –70 cm, 20 cm between perch and wall, vertical distance 30 cm –50 cm, and angles of <45 degrees and recommended perch diameter of 3 cm – 5 cm.

4.7.7 Perches shall be made of durable material without sharp edges that could injure hens or workers.

4.7.8 Cracks, crevices and other narrow spots in the system shall be closed off to prevent ectoparasites from manifesting themselves near the hens.

4.7.9 The preferred shape of the perch is rectangular with rounded edges or mushroom shaped and this should be the same as hens are used to during rearing.

4.7.10 Strategically placed, elevated perches offer the opportunity for the hens to perform their behaviours.

4.8 Nest areas

4.8.1 Laying hens shall be provided with at least one nest box for 7 hens or, for colony (multiple bird) nests, at least 1 m² of nest box area per 120 hens. Nests shall be designed to provide seclusion from the flock, away from direct light (using blinders) and have a floor substrate that encourages nesting behaviour. A high incidence of 'floor eggs', that is eggs laid outside the nests, may indicate failure to meet the above conditions or the need for husbandry changes, in which case corrective action should be taken. The following guidelines will facilitate good welfare and safe conditions for the laying birds:

- a) nest litter, where used, should be kept clean, dry, friable and moisture absorbent. Nest liners should be kept clean and dry;
- b) the laying nest should be an attractive, comfortable, easily accessible and clean place for the hens to lay their eggs;
- c) nest boxes should not be so high above the floor level that birds may be injured when ascending or descending;
- d) hens prefer a darkened nesting area. Only 1 lux of light in the nest is sufficient for the hens to perform their nesting behaviour and comfortably lay their egg;
- e) flaps or curtains in front of the nest (not closing the nest completely) make the nest an enclosure, which the laying hens experience as a safe place to lay their eggs; and
- f) this prevents hens from sleeping in the nests and soiling the nest during the night. However, the nests have to be opened again well before the hens wake up.

4.9 Beak trimming

4.9.1 Beak trimming should be performed only by trained personnel.

4.9.2 Do not beak trim when the birds are not healthy or when reacting to vaccinations.

4.9.3 Add vitamin K to the drinking water to prevent haemorrhages.

4.9.4 Ensure that the temperature of the blade for trimming is 600°C - 650°C.

4.9.5 Replace blade with frequency specified by equipment manufacturer, do not trim with dull blade.

4.9.6 Follow recommendations from the manufacturer when using beak trimming equipment.

4.10 Light management

4.10.1 The recommended lighting schedule for birds from day one is as shown in Table 3.

4.10.2 In the first week of life, the chicks should be provided with an intermittent dark and light cycle which stimulates feeding and resting. A 4-hour light and 2-hour dark cycle is recommended.

4.10.3 After the first week, day length should gradually be reduced from 20 h to 10 h of light per day at 7 weeks of age.

4.10.4 Follow the breed recommendations on light management, but in general for adult laying hens, a light-dark schedule of 14 h -16 h light and 6 h - 8 h dark will promote egg production. Strategically placed, translucent windows in sidewalls and/or above 5% - 10% of the scratching area may provide natural daylight.

4.10.5 Light intensity at floor level should be 20 lux - 40 lux.

4.10.6 The light source should be dimmable LED and/or high frequency tube luminescent lights with warm white colour of light (3 000 K – 3 500 K).

4.10.7 A house with no daylight during rearing, with a covered veranda (covered outdoor run) where daylight can be dimmed is recommended.

4.10.8 Provide equal distribution of light over the house or smooth transitions of light intensity in different zones to prevent overcrowding and wet litter spots.

4.10.9 In the morning the lights should be gradually switched on over 10 min.

4.10.10 In the evening dim the lights over 15 min -30 min, depending on the type of rearing system. In aviary rearing systems always first switch the lights off in the scratching area, followed by the lights within the tiered system (from the floor upwards). In this way, the pullets are stimulated to move to the night perches. Dimmable dawn/dusk lights can also be used over the A-frame of perches or the top tier of an aviary system.

4.10.11 Dimming lights is a measure for managing stress sensitivity of the flock and helps to prevent smothering and feather pecking. This dimming should not be standard practice from the start but should only be implemented if feather pecking or significant smothering events start to develop. There should be no beams of light or shadowy areas in the litter area and these should also be kept to a minimum on the slatted areas. The light intensity in the litter area should be around 40 lux.

4.10.12 Near the drinking line the light intensity should be around 20 lux.

Table 3 — Lighting duration and intensity in relation to age of birds and seasons

Production in dark laying houses			
Age (days)	Duration of lit period temperate season (hrs)	Hot season (hrs)	Intensity lux
1 - 3	22	22	22 -40
4 - 7	20	20	15 - 30
8 - 14	18	18	10 - 20
15 - 21	16	16	5 - 10

Production in dark laying houses			
Age (days)	Duration of lit period temperate season (hrs)	Hot season (hrs)	Intensity lux
22 - 28	15	15	5 - 10
29 - 35	13	14	5 - 10
36 - 42	12	13	5 - 10
43 - 49	11	12 hrs 30 minutes	5 - 10
After 49	10	12	5 - 10
119	12	14	5 - 15
126	12 hrs 30 minutes	14 hrs 30 minutes	5 - 15
133	13	15	5 - 15
140	13 hrs 30 minutes	15 hrs 30 minutes	5 - 15
147	Increase by 30 min / week		
	So as to have 15 to 16 h at 50 % production		

4.11 Brooding management and rearing

4.11.1 For brooding, both whole-house heating and spot heating can be applied.

4.11.2 Chick guard is the best solution for managing chicks under spot brooding. It prevents chick from straying away from heat supply.

4.11.3 A diameter of 3 m to 4 m (at maximum) is recommended, with no less than 25 cm² per chick.

4.11.4 The guard should be located 150 cm to 200 cm from the heat source. In hot temperatures enlarge the diameter so that chicks do not get too hot.

4.11.5 Regarding the heat source: a 250-watt infra-red bulb can accommodate approximately 75 chicks.

4.11.6 Provide at least two 4-litre waterers and two 30-cm or 45-cm feeders for every 100 chicks.

4.11.7 Enlarge the area after one week and continue to expand the diameter each day (at approximately a 20% -25% increase) until the chicks are 14 days of age to prevent overheating.

4.11.8 After 5 weeks of age, when most pullets are perching, the brooder can be removed.

4.11.9 Temperatures and ventilation should be managed well to avoid stressing the chicks.

4.11.9.1 Preheat the building for 24 h to 36 h before the chicks arrive to obtain a litter temperature at 28 °C to 31 °C.

4.11.9.2 Indications of uniform temperature and relative humidity, throughout the building in the room indicate the temperature requirements.

- a) if they are evenly distributed throughout the building, the temperature is perfect;
- b) if the chicks crowd together under the brooder: temperature is too low; and
- c) if the chicks are close to the surround: the temperature is too high.

4.11.10 Cage-free layers should be reared from day-old chicks in a cage-free environment. This ensures that the birds are well trained and adapted for the cage-free housing system during the production period, ultimately improving welfare, health and production.

4.12 Feed and water

4.12.1 A balanced diet is important to maintain laying hen health and productivity and to prevent feather pecking and cannibalism.

4.12.2 Feed form (feeding a coarse mash or crumble) reduces feather pecking compared to feeding pellets. This is because birds spend more time pecking in the feeder with mash or crumble, reducing their pecking motivation.

4.12.3 The mash or crumble should be homogenous to prevent selection of preferred feed particles. Furthermore, providing a coarse mash stimulates the development and activity of the gizzard. Improved digestion due to the gizzard activity increases gut health and makes the birds more resistant against possible infections.

4.12.4 Poultry shall have access to sufficient potable water to meet their physiological requirements.

4.12.5 Measures shall be taken to ensure poultry, other than those newly hatched, are not deprived of water for more than 24 h.

4.12.6 The height of the feeders and drinkers should be adjusted for the age of the birds.

4.12.7 Table 4 shows recommendations regarding maximum stocking density and space of drinkers and feeders at 0 - 1 week of age, 2 weeks to 5 weeks of age and 6 weeks to 17 weeks of age.

Table 4 — Stocking density, feeder and drinkers space

Facilities	Age of the birds		
	0-1 week	2 to 5 weeks	6 to 17 weeks
Stocking density	25 chicks/m ²	15 pullets/m ²	8 - 10 pullets/ m ²
Starter drinkers	1 for 70 chicks	-	-
Bell drinkers	1 for 150 chicks	1 for 75 chicks	1 for 75 chicks
Hanging drinkers	1 for 75 chicks	1 for 75 chicks	1 for 75 chicks
Nipple drinkers	1 for 10 chicks	1 for 10 chicks	1 for 10 chicks
Starting feeding pas	1 for 50 chicks	-	-
Linear chain feeders	2.5 cm/chick	4 cm/pullet	6 cm/pullet
Pan feeders	1 for 30 chicks	1 for 25 chicks	1 for 25 chicks

4.13 Ventilation and air quality

Adequate ventilation should be provided in order to prevent the build-up of heat, humidity, dust and noxious gases to levels that are harmful or can cause pain, distress or diseases to the hens.

4.14 Inspections

Young birds in brooders should be inspected at least twice every 24 h and action taken to correct deficiencies in husbandry should such occur. The frequency and level of inspection should be appropriate to the welfare risk of the birds, but a thorough welfare inspection shall be performed at least once each day. Inspections are best made separately to other management practices. Under certain circumstances more frequent inspections may be required, such as during hot weather or during outbreaks of disease or cannibalism.

4.14.1 Pay attention to bird health, injury, behaviours indicative of a problem, feed, water, ventilation and lighting during inspections.

4.12.2 Dead and injured birds should be removed for disposal or appropriate treatment without delay. In the case of poultry in cages the daily inspection shall specifically include checking for entrapment and checking of the manure areas under cages for escaped birds.

4.14.3 Checks should also be made of the effectiveness of any automated feeding or watering systems where these have been installed.

4.15 Catching and transporting birds / Handling and staff behaviour during transportation

4.15.1 Catching of pullets and hens shall be done in a manner that avoids crowding or piling in corners, which could result in suffocation of birds. Sudden loud noises and other disturbances alarming to birds shall be minimized.

4.15.2 To minimize the risk of bone breaks and other injuries, all people involved in catching and transportation shall be trained, knowledgeable and skilful in handling hens.

4.15.3 Crews shall be supervised by experienced personnel.

4.15.4 When catching birds, use the lowest light level possible that will not impinge on worker safety, or use blue lights that will calm the birds while providing better visibility for catchers. If possible, catch the birds at night.

4.15.5 Hanging racks shall not be used to move birds.

4.15.6 Birds shall be caught individually and held in a comfortable upright position with both hands as they are transferred directly into or out of a transport container. If this is not possible, birds shall be carried by both legs with no more than three birds in each hand.

4.15.7 Hens shall not be carried solely by a single leg or wing, or by the head, neck or tail. Whenever possible, passing birds from one person to another or transferring birds from one container to another shall be avoided.

4.16 Training

Birds may need training to use the nests by slowly and quietly walking through the shed in the morning (when most hens laying their eggs), encouraging hens to move towards the nest boxes and promptly removing eggs from the floor.

4.17 Egg collection

4.17.1 Eggs should be collected frequently and not left on the floor, this will help to prevent more eggs from being laid in the same place.

4.17.2 This should be done more regularly when the birds first start laying and are still learning to use the nests.

4.18 Emergency or contingency planning

4.18.1 The farm responsible person should have an emergency plan to address any event which could result in a potentially significant welfare impact on the hens.

4.18.2 Alternative means of maintaining ongoing environmental control and provision of food and water should be available in case of emergencies, including power or computer failure or mechanical breakdown.

4.18.3 Appropriate fire prevention measures and a documented emergency plan should be in place.

4.19 Labelling

4.19.1 Labels should adhere to the relevant provisions of the ARSO of table eggs specifications.

4.19.2 Only eggs coming from farms or production units certified by the competent authority should be labelled as "cage-free".

4.19.3 Labelling requirements shall comply with the relevant provisions of the food safety on labelling and fair packaging.

4.20 Traceability and records keeping

Clear and accurate records relevant to the particular species used in the activity/s should be readily available for the farm production and financial interaction. The following records shall be available on demand:

- a) animal identification records (e.g. number of each species kept in each house);
- b) dates and sources of acquisition;
- c) disposal details and dates;
- d) feeding logs (times/amount);
- e) maintenance of electrical equipment;
- f) names, dosage, dates of any chemicals administered and veterinary treatment provided;
- g) emergency contacts and procedures;
- h) daily temperature and humidity;
- i) program of vaccination (name, type, dose, expired date);
- j) mortality rate;
- k) eggs production rate;
- l) average egg weight; and
- m) feather condition.

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