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# Health Management and Disease Control of Layers in Pullet Phase with a Box Cage System at Tandjaja Farm Kediri

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**ABSTRACT:** Laying hens have a longer production phase than other poultry, so they require strict health care. The purpose of this study was to determine how far a farm provides comfort to livestock in terms of health in order to maximize their productivity in the form eggs that are safe for consumstion by consumers. Therefore, research was conducted at Tandjaja Farm Kediri to find out how health management and disease control are there. This type of research is qualitative. There are two data collected, namely primary data and secondary data. The primary data was obtained from interviews and observations, while the secondary data came from the SOP/manual book of the company's maintenance management. Data were analyzed by descriptive method. The results showed that Tandjaja Farm Kediri implemented biosecurity, medication, and vaccination programs for laying hens in the pullet phase. So this research shows that Health Management and Disease Control at Tandjaja Farm Kediri has been going well.

**KEYWORDS:** Biosecurity, Healthy, Medication, Pullets, Vaccination

## INTRODUCTION

Meat and eggs are one of the sources of protein with the highest demand and are expected to continue to increase (FAO, 2015; Augere-Granier, 2019). So that public concern about intensive production management has also increased (Augere Granier, 2019; Koutsoumanis *et al* ., 2019) because it has a major impact on livestock, human and environmental health (Murphy *et al* ., 2017; Augere-Granier, 2019). This concern makes animal welfare an important component of production management (Mellor, 2016; Buller *et al* ., 2018). Production management often makes livestock experience negative experiences that interfere with their welfare (Nazar *et al* ., 2022). The principle of freedom in animal welfare, namely livestock must be free 1) from hunger and thirst, 2) from fear and stress, 3) from discomfort, 4) from pain, injury, and disease and 5) to express natural behavior ( Broom, 2011).

High poultry production depends on environmental conditions, disease outbreaks, breeding processes, and management (Lashari *et al*., 2018). One management that needs to be considered is health management. The purpose of this study was to determine directly the condition of health management and disease control in laying hens reared in the pullet phase with a box cage system at Tandjaja Farm Kediri.

## MATERIALS AND METHODS

### Materials

This research was carried out at Tandjaja Farm located in Lamong Village, Badas District, Kediri Regency for four months starting in February-May 2024. The material used in this study was 5,000 laying hens with *ISA Brown strain* which were reared during the pullet period with box cage system.

### Methods

This type of research is qualitative, namely research that is used to examine the condition of natural objects, where the researcher is the key instrument (Sugiyono, 2005). The data required must be accurate so as to obtain relevant data. Data collection techniques used are primary data and secondary data. Primary data is data obtained through observations covering the general condition of the company, work internships and direct interviews from respondents such as company managers and company employees. Secondary data is data obtained indirectly from the source. Secondary data is taken from books, records obtained while in the company and journals related to the company's practice activities.

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The method used is the method of observation and interview. The observation method is carried out by direct observation of every activity at the company's location. The interview method is carried out by interviewing and discussing directly with employees in the room or in the field. This activity is carried out during the implementation of activities, free time after work, and discussions with employees on the sidelines of work to complete data that is considered important.

Documentation activities are carried out on every process of health management and disease control in laying hens in the pullet phase at Tandjaja Farm. Documentation aims to complete information and validate the activities carried out. The analysis used in this activity is descriptive analysis, namely statistical analysis techniques used to analyze data by describing, simplifying and presenting sample data into an orderly form for easy understanding.

## RESULTS AND DISCUSSION

### Farm Location Overview

Tandjaja Farm is a local company engaged in laying hens. The company is located at Jalan Kutilang Dusun Mangiran, Lamong Village, Badas District, Kediri Regency. The area of the farm is about 1 hectare. Tandjaja Farm has 8 permanent employees, starting from the manager, administration, production and expedition departments. The livelihoods of the community around the company are laying hens who are also farmers because the majority also own rice fields. This farm is equipped with a number of Important facilities and infrastructure include 3 units of box system pullet cages, 5 units of layer phase layer chicken coops ,2 units warehouse feed, 1 units warehouse egg, 1 units office, 3 units employee mess and 1 OVK warehouse . The entire company area is surrounded by surrounded by walls for guard security, especially when evening.

**Figure 1. Box System Cage**

Tandjaja Farm has a population of purebred chickens 10 000 layer layers and 5,000 pullets . This laying chicken belongs to the type of medium laying hens or brown laying hens with a strain that is *ISA brown* . If observed from the physical appearance, strain *ISA brown* colored chocolate with body a bit slim. Laying hens strain *ISA brown* started the first production at the age of 18 week. Peak production is reached at the age of 26 weeks reached 95%. Strains *ISA Brown* production period 18-80 weeks with an average egg weight of 63.2 g (Hendrix, 2007).

Health management and disease control implemented at Tandjaja Farm Kediri are as follows:

### Biosecurity

*Biosecurity* is all measures that aim as the first line of defense in controlling outbreaks and preventing all possible transmission or contact with infected livestock with the aim of minimizing the spread of infectious agents. According to (Samanta *et al* ., 2018) the *biosecurity* applied to livestock is divided into three areas including the red zone, namely the dirty zone, the boundary between dirty environments such as reception areas, this area has the potential for disease contamination. While the yellow zone is the transition from the red zone to the green zone, this area is limited to trucks, rations, DOC, eggs, this area is only allowed for cage workers, while the green zone is a clean zone in which there are poultry. In this area, it is mandatory to apply standard operating procedures for sanitation (Meirhage *et al* ., 2019; Gblossi *et al* ., 2020). This is in line with Grimes and Jackson (2015) that the application of biosecurity in the laying poultry industry includes:

- There is control of the movement of poultry, humans, equipment, transportation means both vehicles between and into the livestock area.
- Separate livestock from other poultry species and non-avian bird species including wild birds, rodents and other animals and insects that can transmit disease.

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- Minimizing aerosol spread through geographic isolation
- Vaccination to improve and optimize poultry immunity
- Practice good hygiene and implement proper disinfection procedures to reduce infection rates
- Provide the right treatment
- Application of HACCP ( *Hazard Analysis Critical Control Point* ) or identification of CCP ( *Critical Control Point* )

The application of *biosecurity* is carried out so that livestock are protected from disease. *Biosecurity* is a leading system in livestock, namely to protect livestock from various diseases, the application of *biosecurity* can reduce costs on livestock health (Mappanganro *et al* ., 2018). Aspects of the *biosecurity program* include the costs of disease prevention, eradication, and control. The number of chickens that are sick and placed in one cage are usually susceptible to disease attacks (Trijaya, 2017).

The biosecurity at Tandjaja Farm is divided into 3 levels, namely:

- *Biosecurity Conceptual* , which is the basis or basis of the entire program disease control which includes the location of the cage and setting the age of the livestock.
- *Structural Biosecurity* , namely matters relating to the layout of the cage or layout (distance between cages, distance to feed warehouses, distance to offices), electrical installations, water separating farm unit boundaries.
- *Operational Biosecurity* , is the implementation of management procedures for disease control in the company, especially how to deal with an infectious disease infection. This biosecurity includes routine livestock raising, disinfection and sanitation activities.

**Figure 2. Spraying (Sanitation)**

Spraying is one of the sanitation activities carried out using 2 types of disinfectants alternately. The two types of disinfectants contain different active substances. Thing This is intended to prevent resistance to certain types of outbreaks in the area farm. Spraying is done every day during the pullet period. The type of disinfectant used for spraying activities are desgrin and BKC. Desgrin is a type of disinfectant that contains 260 ml *benzalkonium chloride* and 70 ml *glutaraldehyde* in 1 liter desgrin. For spraying sanitation routine, dose which used is 1ml: 1 liter of water. BKC is wrong one type disinfectant which inside it contain *benzalkonium chloride* with concentration tall. The difference with desgrin, In BKC there are no other active ingredients other than *benzalkonium chloride* . Dose use BKC is 250 ml : 500 liter water or 1 ml BKC : 2 liters water.


**Figure 3. Sweeping**

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Separating sick chickens (*isolation*) and removing dead chickens from the holding cage is very useful in preventing disease transmission (Sukada *et al* ., 2010). Disposing of dead chickens is done by burning or burying them in a safe place. Every morning after being fed the pullet chickens will be *sweping* to determine whether or not the chickens are dead and sick. Dead chickens will be removed from the cage and recorded how many died or errors and placed in a carcass basket in front of the cage to be taken by officers and collected in a landfill to be burned. Meanwhile, sick chickens will be transferred to quarantine cages so that they can be controlled by the cage staff.

**Medication**

*Medication* is giving vitamins and medicines to chickens. Administration of drugs must be in accordance with the method of application of the dose. Drugs have an important role in stimulating growth and improving efficiency in the digestive tract (Daud, 2005). Various kinds of drugs are given one of them by mixing them into feed and drinking water. The use of drugs is needed to overcome disease, increase immunity, and support livestock growth (Aziz, 2009).

The *medication* program implemented at Tandjaja Farm includes the provision of herbs or herbs, antibiotics, and vitamins. According to Haniarti *et al* ., (2019) herbal ingredients as feed additives can be given in the form of a drinking water solution and in the form of flour mixed in the ration. Livestock herbs derived from a combination of medicinal plants contain active substances that are useful as antiviral, anti-bacterial and antibiotic (Vinus *et al* ., 2018). Herbs that are often used are turmeric. Supplementation of 1% turmeric can increase productivity without having a negative effect on the digestive tract of laying hens (Ooi *et al* ., 2018).


**Figure 4. Administration of Vitamin**

*Antibiotics* is substances which generated by body tiny, which usually utilized for turn off seeds disease. *Antibiotics* work with hinder growth or turn off seeds disease (Anonymous, 1976). One of the most frequently used *antibiotics* at Tandjaja Farm is *amoxycillin* for digestive cases and *doxycycline* for respiratory cases. For complex respiratory cases, Tandjaja Farm usually performs mass injections using *Vetstrep* 125 grams + *Vitamin B Complex* 500 ml + 100 grams *Lincospect-200* for 1,000 chickens. *Vitamins* are organic substances that are very important for maintaining health and survival, including production and reproduction in laying hens. This *vitamin* must be given post-vaccination for 3 consecutive days.

**Table 1. The Pullet Phase Layer Medication Program at Tandjaja Farm Kediri**

| Day | Medication Program | Dosage |
|---|---|---|
| 1 | Citric Acid + Baking Soda + Palm Sugar | 1 gram + 1 gram + 10 gram per liter air |
| 2-3 | Multisol | 1 gram/liter |
| 4-5 | Erydocal | 1 gram/2 liter |
| 6-8 | Paragin | 1 gram/2 liter |
| 10-11 | Kalzuril | 1 gram/2 liter |
| 12-13 | Rennil | 1 gram/liter |
| 19-20 | Multisol | 1 gram/liter |

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|---|---|---|
| 24-25 | Rennil | 1 gram/liter |
| 29-31 | Paragin | 1 gram/2 liter |
| 33-34 | Amoxycillin | 1 gram/2 liter |
| 36-38 | Paragin | 1 gram/2 liter |
| 43-44 | Multisol | 1 gram/liter |
| 49-51 | Antiheatstress | 1 gram/liter |
| 56-58 | Herbal | 15 gram/liter |
| 61-62 | Erydocal | 1 gram/2 liter |
| 64-65 | Multisol | 1 gram/liter |
| 71-73 | Paragin | 1 gram/2 liter |
| 78-80 | Paragin | 1 gram/2 liter |
| 84-86 | Herbal | 15 gram/liter |
| 92-94 | Paragin | 1 gram/2 liter |
| 99-101 | Paragin | 1 gram/2 liter |
| 106-108 | Paragin | 1 gram/2 liter |

**Vaccination**

*Vaccination* is one of the prevention efforts against virus attacks, according to the live nature of the infectious agent, *vaccines* are classified into two, namely: the first group is an *active vaccine* containing a virus that has been attenuated and functions as a stimulus for the formation of local immunity on the mucosal surface more quickly, this vaccine includes *active vaccine*, *live vaccine* (Poudel *et al* ., 2020). The other group is inactivated *vaccines* which contain infectious agents that have been killed but are still able to stimulate the formation of antibodies, this group of *vaccines* includes *killed vaccines* and *inactivated vaccines* (Dharmayanti *et al* ., 2014).

Tandjaja Farm implements a *vaccination* program laying hens strictly according to the program . The *vaccination* program planned not to be missed because of the risk of disease infection high, especially very deadly diseases such as bird flu ( *Avian influenza* ) and ND ( *Newcastle Diseases* ).

**Table 2. The Pullet Phase Laying Chicken Vaccination Program at Tandjaja Farm Kediri**

| Week | Day | Vaccine | Application | Dosage per head |
|---|---|---|---|---|
| | 1 | MD<br>Cevac Ibird | Subcutaneous Injection (SC) Hatchery<br>Eye Drops (IOc) | 1 drop<br>(0.03 ml) |
| I | 7 | Caprivac NG-K<br>NBR | Subcutaneous Injection (SC)<br>Nose Drops (IN) | 0.15 ml<br>1 drop |
| II | 12 | Medivac Gumboro A | Mouth Drops (IOr) | 1 drop |
| III | 18 | NDR | Eye Drops (IOc) | 1 drop |
| IV | 23 | Medivac Gumboro A | Mouth Drops (Ior) | 1 drop |
| | 28 | Caprivac NDAIK<br>NBR | Right Breast Injection (IM Right Breast)<br>Nose Drops (IN) | 0.3 ml<br>1 drop |
| V | 35 | Cevav Coryza | Right Thigh Injection (IM Right Leg) | 0.5 ml |
| VI | 42 | Pox | Wing Skewer (WW) | |
| VIII | 56 | Caprivac NDR | Left Breast Injection (IM Left Breast) | 0.3 ml |
| IX | 63 | Cevac ILT | Nose Drops (IN) | 1 drop |
| XI | 77 | NDAIG7 Medion | Left Thigh Injection (IM Left Leg) | 0.5 ml |
| XII | 84 | Caprivac NBR | Nose Drops (IN) | 1 drop |
| XIII | 91 | Cevac Coryza | Right Thigh Injection (IM Right Leg) | 0.5 ml |
| XV | 105 | NBA-K | Left Thigh Injection (IM Left Leg) | 0.3 ml |
| XVI | 112 | Caprivac NBE-K | Right Thigh Injection (IM Right Leg) | 0.3 ml |

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## CONCLUSIONS

Based on the results of the study, it can be concluded that health management and disease control at Tandjaja Farm Kediri have been running well. This is based on the fact that the farm has implemented several programs such as *biosecurity, medication, and vaccination.*

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