Food and Agriculture Organization of the United Nations

Report

DEVELOPING THE LAYER FARM ASSESSMENT TOOL (LFAT)

Improving biosecurity and management in commercial layer farms in Indonesia

DEVELOPING THE LAYER FARM ASSESSMENT TOOL (LFAT)

Improving biosecurity and management in commercial layer farms in Indonesia

FOOD AND AGRICULTURE ORGANIZATION OF UNITED NATIONS
JAKARTA, 2020

Required citation:

FAO. 2020. *Developing the Layer Farm Assessment Tool (LFAT). Improving biosecurity and management in commercial layer farms in Indonesia*. FAO Indonesia – Report. Jakarta.

Contents

Tables

Figures

Abbreviations and acronyms

ADHPI	*Asosiasi Dokter Hewan Perunggasan Indonesia* (Indonesian Poultry Veterinarians Association)
AMR	Antimicrobial Resistance
APBD	*Anggaran Pendapatan dan Belanja Daerah* (Regional Revenue and Expenditures Budget)
ASEAN	Association of South East Asian Nations
CRD	Chronic Respiratory Disease
DAH	Directorate of Animal Health
DBP	Directorate of Breeding and Production
DF	Directorate of Feed
DGLAHS	Directorate General of Livestock and Animal Health Services
DOC	Day old chick
DVPH	Directorate of Veterinary Public Health
ECTAD	Emergency Centre for Transboundary Animal Diseases
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
GAHP	Good Animal Husbandry Practice
GoI	Government of Indonesia
GPS	Grandparent Stock
HPAI	Highly Pathogenic Avian Influenza
IB	Infectious Bronchitis
IBH	Inclusion Body Hepatitis
IPB	*Institut Pertanian Bogor* (Bogor Agricultural Institute)
IPC	Infection Prevention and Control
LFAT	Layer Farm Assessment Tool
LPAI	Low Pathogenic Avian Influenza
ND	Newcastle Disease
NE	Necrotic Enteritis
NKV	*Nomor Kontrol Veteriner* (Veterinary Control Number)
Permentan	*Peraturan Menteri Pertanian* (Ministry of Agriculture Regulation)
PPN	*Pinsar Petelur Nasional* (National Layer Farmers Association)
PPP	Public-Private Partnerships
PS	Parent Stock
PVUK	*Pelayanan Veteriner Unggas Komersial* (Commercial Poultry Veterinary Services)
SSI	Semi-structured interviews

Executive summary

In order to minimise the potential spread of emerging poultry diseases and provide products that are safe, healthy, wholesome and halal, commercial layer farms in Indonesia need to ensure that they implement good farm management practices, biosecurity, and animal health protocols on their farms. Good flock management and biosecurity can also provide positive environmental outcomes and maintain the health and financial viability of farm owners and workers.

In response to this, the Food and Agriculture Organization of the United Nations (FAO) – Emergency Centre for Transboundary Animal Diseases (ECTAD) Indonesia and the Directorate General of Livestock and Animal Health Services (DGLAHS) developed a tool to assess the management of small to medium size layer farms. The layer farm assessment tool (LFAT) evaluates the work practices and characteristics of the farm and provides an objective measure of farm management and biosecurity. Not only does it allow comparison of farms but it also can be used by advisory staff to suggest improvements to reach the quality expected of highly pathogenic avian influenza (HPAI) free compartmentalisation farms and qualify for NKV (food safety) farm accreditation.

The LFAT is adapted from the HPAI-free farm certification checklist used by the DGLAHS Directorate of Animal Health (DAH). HPAI-free compartment certification is an assessment standard for poultry farms under the Indonesian Ministry of Agriculture Regulation No. 28/Permentan/OT.140/5/2008. The LFAT adaptation is meant to ensure that this tool is particularly relevant to small and medium-scale layer farms.

The LFAT consists of 50 sub-components grouped into three components - farm management, biosecurity and poultry health management. Sub-components and hence components, are ranked on a scale of zero to five with a score of 4 and above classified as ‘good’. A score between 3 and 4 as ‘average’ and below 3, the sub-component is regarded as ‘poor’. The LFAT was piloted in Blitar (East Java), Kendal (Central Java) and Purbalingga (Central Java) districts to test its usefulness and applicability to layer farms.

The pilot study has identified which sub-components and components need particular improvement in order to meet Government of Indonesia (GoI) standards. Biosecurity in Blitar and Kendal was generally poor while poultry health management was poor in Purbalingga.

The LFAT also identified that larger farms tended to be better managed than smaller ones, providing evidence that GoI programs and training should focus on these smaller farms.

The LFAT has proved to be useful in providing an objective measure on which to base advisory and farmer training programs that lead to improved farm management, reduction in disease transmission, and more efficient value chains and vaccination programs. It can also be used as the measuring tool for farmers to move towards NKV and HPAI-free compartmentalization certification.

Introduction

Background

The national poultry population in 2018 was more than 2.4 billion (DGLAHS, statistical data 2018) and the national layer chicken population was 181.7 million representing 7.4 percent of the total poultry population in Indonesia (Table 1).

Table 1: Poultry population in Indonesia, 2013-2018 (million birds)

	2013	2014	2015	2016	2017	2018
Native Chicken	276.8	275.1	285.3	294.1	299.7	310.9
Layer Chicken	146.6	146.7	155.0	161.4	176.9	181.7
Broiler Chicken	1 344.1	1 433.3	1 528.3	1 632.8	1 848.7	1 891.4
Duck	43.7	45.3	45.3	47.9	49.0	51.2

Source: Ministry of Agriculture (2019), Livestock and Animal Health Statistics 2018

Chicken egg production is an important agricultural industry in Indonesia as there is a guaranteed market, relatively small capital investment and only a small amount of land required. A layer chicken production cycle is divided into three periods; starter (0-9 weeks of age); grower (9-16/20 weeks); and layer (16/20 weeks until culling). Chickens start laying eggs at about 16 weeks and continue producing eggs for about 75 weeks. The majority of eggs are sold without treatment (no washing or disinfecting) or cold chain/refrigeration. The farmer can sell eggs through independent distributing agents or directly to retailers or consumers. Modern, larger supermarkets sometimes have additional requirements, including sourcing eggs from farms that are free from certain diseases, such as *Salmonella spp*.

The small- and medium-scale layer chicken sectors produce the majority of eggs in Indonesia. While layer farms tend to be managed as independent entities there is still a need for the sector and the government to work together to ensure that a consistent quality-assured product reaches the consumer. The industry needs to continually work with farmers to improve rearing management, productivity, biosecurity, and disease prevention and control. Currently, farmers tend to rely solely on information and advice from other farmers and the

private sector (veterinary drug and feed companies, and poultry shops) rather than provincial or district government animal health services.

Good biosecurity is at the frontline in controlling disease in layer chickens; however, in small- and medium-scale farms it is still poorly applied and understood. Good biosecurity is also required to ensure food safety and farm profitability. The government must play a role in minimizing disease load and transmission as well as providing an immediate response to outbreaks of high impact diseases. This response includes disease diagnosis and control, services not readily accessed from the private sector. This is particularly the case when there is the potential threat of re-emergence of infectious diseases in layer chickens, particularly HPAI.

Purpose and objective

To ensure layer farms improve their biosecurity and farm management, and meet the required farm and product quality standards, it is necessary to better understand the level of biosecurity adopted on these farms. FAO ECTAD Indonesia and the DGLAHS are working together to develop a certification system which will support the enactment of a regulation that will standardise the measurement of poultry farm quality in line with ASEAN Good Animal Husbandry Practice (GAHP). The ASEAN GAHP is consistent with current Indonesian regulations such as the Directorate of Veterinary Public Health (DVPH) NKV regulations, Good Farming Practice (Directorate of Breeding-DGLAHS) and feed registration and distribution standards (Directorate of Feeds-DGLAHS). The first step is to develop a Layer Farm Assessment Tool (LFAT), which can be used to objectively measure an individual farm's management and biosecurity. The LFAT is based on the assessment process developed by the DAH-DGLAHS used to declare areas/compartments HPAI-free.

The LFAT has been developed to provide some objective measurement of commercial layer farm management systems in order for them to participate in the GoI HPAI-free Compartmentalization Program and NKV Layer Farm Certification process. Farmer participation in the LFAT process will not only involve farm assessment but will also highlight what must be done with regard to on-farm biosecurity, farm/flock management and disease control to attain certification. Farmers will be encouraged to implement improvements in order for them to increase productivity and improve chicken health and, therefore, ensure a

safer and more consistent food product for consumers. The objectives of the LFAT and the accreditation process are therefore to:

- Improve layer farm management, biosecurity practices and disease control.
- Increase farm productivity and profitability.
- Reduce poultry disease threats by preventing the entry and spread of pathogens on farms.
- Support local governments in increasing the capacity/ability of veterinary service officers to assist poultry farmers to improve farm management, biosecurity and poultry health.
- Support the development of an NKV farm certification process for use as an assessment tool by auditors.
- Encourage industry stakeholders to improve the welfare and health of layer chickens, farmers and consumers.

The LFAT will be particularly useful to three stakeholder groups, these are:

- Private poultry sector stakeholders: to improve farm productivity and management.
- Government and regulators: to provide a legal basis for the enforcement of veterinary service regulations,
- Farms assessors or auditors: to help them in recognizing poultry farm best practices (management, biosecurity and animal health) and issuing farm level NKV certificates.

Methodology

The project involved a 3-stage process. First, a scoping study to get a better understanding of the characteristics of the sector, the capacity of farmers and other stakeholders, and the quality of farm management and infrastructure. Second, formulation and testing of the data collection methodology. Third, qualitative and quantitative data collection and development of the LFAT.

Scoping Mission

Aims

Baseline information collected from layer farmers in Blitar provided a realistic picture of layer farm management and biosecurity implementation. Expected results from the scoping study were:

- an understanding of biosecurity status, farm management and disease control in commercial poultry layer farms;
- an understanding of the technical assistance needed by layer farmers regarding biosecurity, farm management and disease control strategies, and;
- an understanding of the level at which questions should be addressed to farmers in the LFAT.

District selection

Blitar district in East Java Province was selected as the area in which to undertake a scoping study to better understand the layer farm sector for the following reasons:

- It is a major layer farm area with good access to large urban markets in Java. There are approximately 15.2 million layer chickens in Blitar, which is 33% of the total East Java Province layer population and 9% of the total Indonesian layer chicken population. There are approximately 4 800 layer farmers in the district.
- The problems facing farmers are similar in all layer farming areas. These include disease threats [HPAI, low pathogenic avian influenza (LPAI), Infectious Bursal Disease (IBH), Infectious Bronchitis (IB), Newcastle Disease (ND-G7), Coryza, Necrotic Enteritis (NE), Coccidiosis] and non-technical problems [fluctuations in feed prices, availability of raw material for feedstuffs, day-old-chick (DOC) quality and fluctuation of egg prices] that threaten the viability of poultry farm businesses.
- The availability of trained government poultry specialists. In 2012, four veterinary service officers (VSO) from Blitar were trained as Commercial Poultry Veterinary Specialists (PVUK); this ensured the availability of Blitar district government staff who can support poultry industry development in Blitar.

Results and information gained

Initial district sampling recognised three layer farm sizes: small, medium and large-scale farms. A small farm was defined as a farm with a layer chicken population of less than 10 000 birds, a medium size farm was between 10 000 and 20 000 layers and a large farm had more than 20 000 birds. The scoping mission identified that only 5 to 10% of the farms would be classified as large. The scoping mission identified that there were low levels of biosecurity, farm management and disease control in small scale commercial poultry layer farms. Biosecurity was better in larger layer farms with some already obtaining NKV farm certificates from the government.

Small-scale farmers tend to use lower input feeding and management systems with minimal use of animal health advisers. They tend to have a greater reliance on poultry shops or other farmers and poultry breeders for their technical advice. To improve productivity these smaller scale farmers require more technical support regarding on-farm biosecurity, disease control strategies and farm management.

Constructing the LFAT

Initial layer sector information collection

The first step in constructing the LFAT was to conduct a focus group discussion and workshop with resource persons from the university (IPB), the Indonesian poultry veterinarians association (ADHPI) and auditors involved in the HPAI-free compartmentalization program and NKV farm certification process. This ensured that the LFAT was consistent with existing DAH certification processes. The LFAT was adapted to suit the characteristics of small to medium scale layer farms and took into account the lessons learned and baseline information collected during the Blitar scoping study.

The LFAT form

The LFAT consists of three components with each component consisting of several sub-components or criteria assessments. The first component, farm management has 20 sub-components. These include the location of the farm, type of chicken house, water source, feed compounding, record keeping and availability of veterinary advice.

The second component, biosecurity, has 21 sub-components and evaluates the farmer's ability to control disease transmission through hygiene practices, effluent and rodent control, egg storage and movement control, and movement of people onto and through the farm.

The third component, poultry health management, consists of nine sub-components and evaluates the flock vaccination program, and use and storage of drugs and medicines. A final farm score is generated by averaging the activity scores of each component.

Responses are scored between zero and five, with a low score (<3) meaning poor farm management implementation or failing to meet the standards required by good poultry health practices, or having the potential to amplify and transmit disease. A high score (>4) implies good farm/flock management and the farm meets the established standards, and can provide protection against disease and support farm productivity. A score between 3 and 4 represents an average score.

A final score is then generated for each farm with regard to each component and an overall farm average. Individual farms can be compared to other farms and also with district averages. Likewise, districts can be compared with other districts. Access to farm scores can assist district level VSOs to better understand farm management and disease issues and provide more targeted, useful advice on what needs to be improved.

This assessment form is designed to be easily used by field staff as it is a simple checklist that does not require quantitative assessments. Each question states clearly what situation or condition of the farm is being assessed and provides a guideline as to how it is measured. The LFAT forms are shown in Appendix 1.

The assessment form contains sections that capture the assessor data, the time of the assessment, general information about the farm, the farmer and general production indicators.

Assessor training

The LFAT was used by veterinary service officers (VSOs) with PVUK (commercial poultry service) skills. The PVUK VSOs have the responsibility of advising farmers with regard to farm productivity, disease control and biosecurity in order to produce clean and healthy poultry products on farms in their districts.

Effective training is needed for VSOs to ensure their capacity as assessors and to determine sampling strategy (number of samples and selection of farmers to be assessed). Training requirements for assessors are as follows:

- In each district/city, there should be at least one assessor who is a veterinarian responsible for conducting the farm assessment.
- Training in farm assessment must be completed before using the LFAT in the field.
- The training is for a minimum of two days and covers theoretical (classroom) and practical (in the field) aspects.
- The VSOs who use the LFAT must have PVUK competence (training materials as provided in Appendix 2).

Selection of pilot study areas and farms

Farm selection was based on convenience sampling in three districts in Blitar (East Java province) and in the Kendal and Purbalingga districts in Central Java Province. The farms were selected based on the willingness of the farm owners to move towards NKV certification. Other factors considered were:

- high risk area for HPAI;
- high layer chicken population;
- adequate veterinary service officers (having PVUK competence);
- commitment and support from district/ provincial governments to facilitate activities implementation.

District descriptions

There are 21 sub-districts in Blitar; the sub-district with the largest layer chicken population is Ponggok where there are 3.8 million layers and 1 100 farmers. The second largest sub-district Kademangan (2 million layers, 770 farmers) followed by Srengat (1.1 million layers, 340 farmers) and Wonodadi (1.2 million layers, 278 farmers). The survey of layer farmers was undertaken in June 2018. A total of 111 farms were surveyed in 12 sub-districts. The location of the surveyed farms and the characterisation of the survey areas with regard to density and farm size is shown in Figure 1.

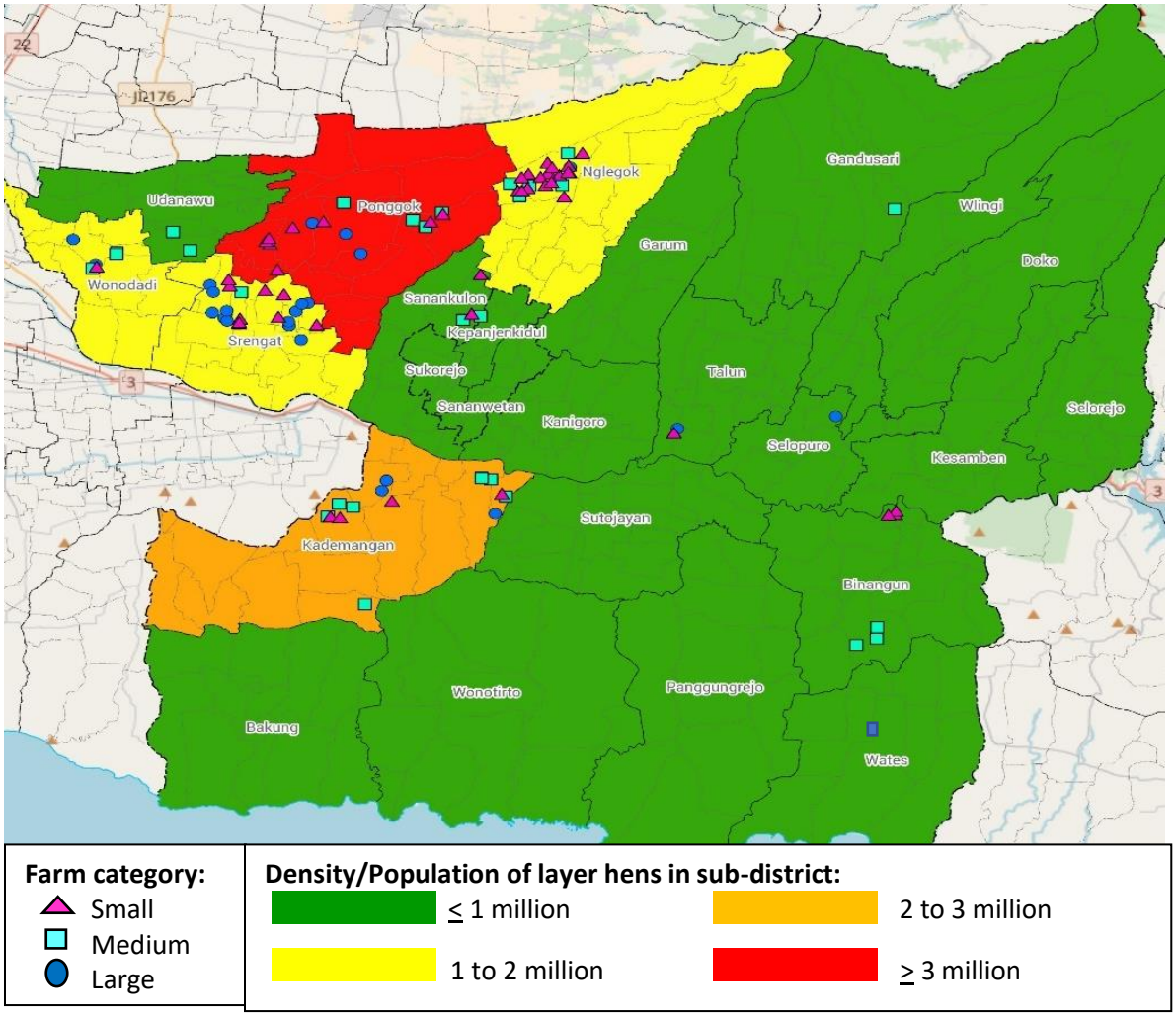

Figure 1: Farm assessment locations and layer density - Blitar

There are approximately 22.5 million layer chickens in Central Java Province. Kendal district has the highest population of layers (3.8 million) while in Purbalingga district there are 775,000.

The survey of layer farmers in Kendal district was undertaken in January 2019. A total of 60 farms were surveyed in seven sub-districts: Sukorejo, Patean, Pageruyung, Boja, Limbangan, Pegandon and Kaliwungu Selatan (Figure 2). Sukorejo is the sub-district with the largest layer population in Kendal.

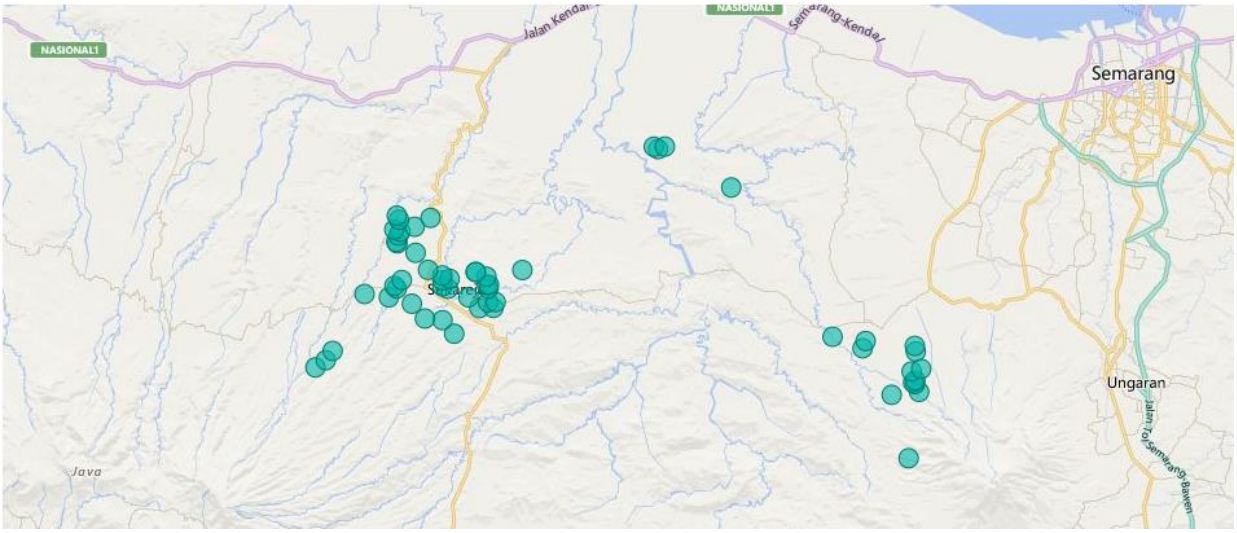

Figure 2: Farm assessment locations in Kendal

The LFAT was trialled in Purbalingga district in November 2018 in eight sub-districts: Bobotsari, Bukateja, Kaligondang, Kejobang, Kutasari, Mrebet, Padamara and, Pangadegan (Figure 3). A total of 74 layer farms were surveyed in Purbalingga district where the layer population is spread evenly between sub-districts.

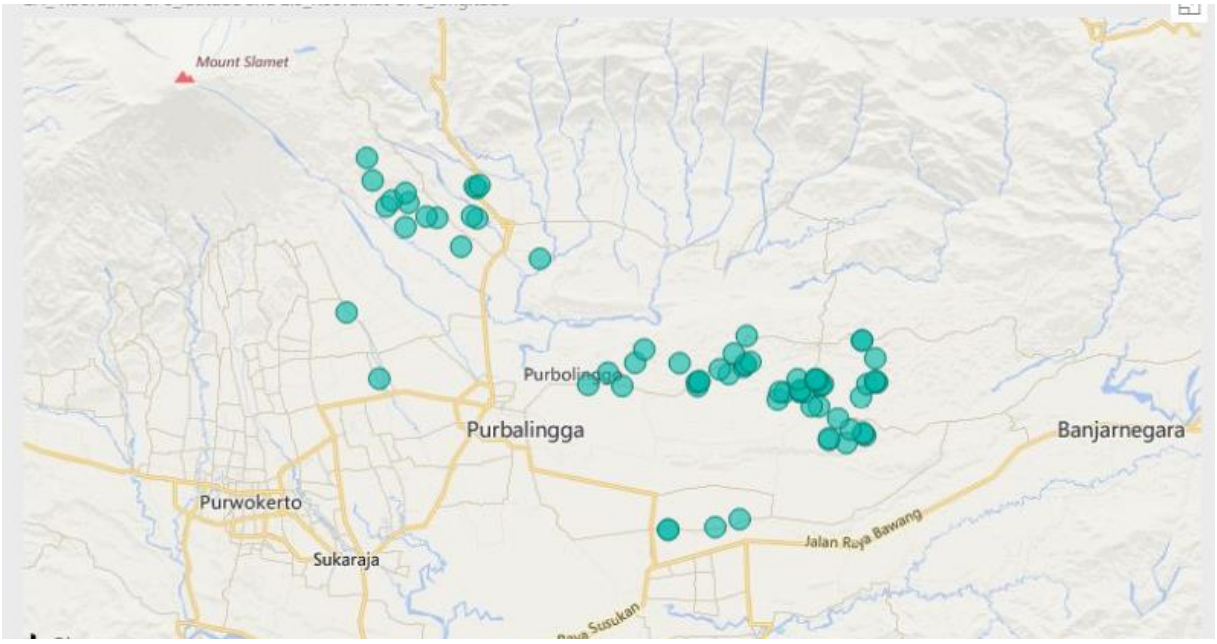

Figure 3: Farm assessment locations in Purbalingga

Farm and farmer baseline information

Farmers, on average had good experience in layer chicken management. In Blitar they had an average of 14 years' experience, while in both Kendal and Purbalingga they had been managing layer farms for, on average, 10 years.

The sector is dominated by independent farm management systems with all farmers in Kendal and Purbalingga and 95% of farmers in Blitar making their own decisions with regard to inputs and marketing activities (Table 2). The majority of farms are small or medium in size with only 8% being classified as large farms. There are slightly more large farms in Kendal, but there is probably not a significant difference between districts. Education levels are also similar with the majority of respondents having at least a high school education. Maybe surprisingly, around 20% also have a university education.

Table 2: Basic characteristics of respondents

Characteristics	Blitar (%)	Kendal (%)	Purbalingga (%)
Ownership			
Contract	5	100	100
Independent	95	0	0
Educational Background			
Elementary	14	14	25
Junior High School	23	14	13
Senior High School	46	46	49
Universities	17	26	13
Population			
≤ 10,000	82	74	88
10,000 – 20,000	10	14	8
≥ 20,000	8	12	4
Farm Type			
DOC	52	38	38
Production (Pullet)	24	42	42
DOC & Pullet	25	20	20

Farm issues identified by farmers

The most common issue faced by farmers in Blitar was declining egg production with nearly 50% identifying this as the major problem (Figure 4). Many factors may cause declining egg production including poor farm management, feed quality and disease especially caused by H5N1 clade 2.3.2 or H9N2 low pathogenic avian influenza. Further research is required to adequately understand what the real factors are that influence declining egg production. The other important issues identified were all related to poultry diseases such as chronic respiratory disease (CRD), ND, Coryza and IBD.

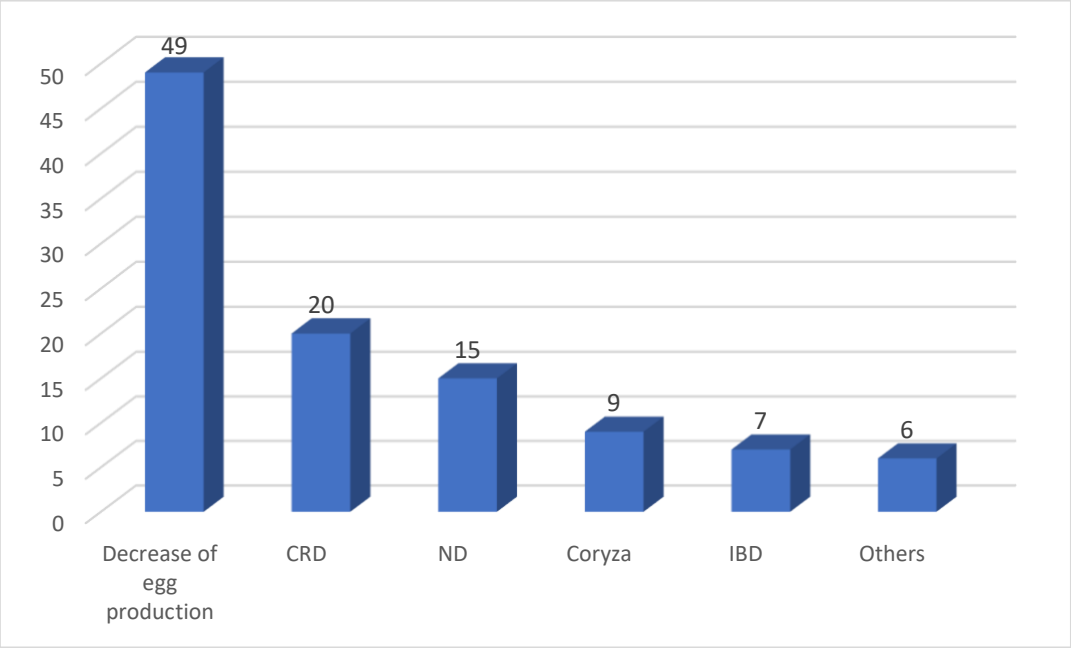

Figure 4: Major layer farm issues identified by farmers in Blitar, East Java

The survey found that, on average, chickens began laying at 19 weeks, with peak production at 30 weeks. Layers were generally culled at 100 weeks of age.

The most common problems or diseases identified by farmers in Kendal were cough and runny nose, respiratory disturbance, swollen face around the eyes, green faeces, white stools, diarrhoea, lameness, drop in egg production (> 40%) as shown in Figure 5 and 6. Farmers in Kendal and Purbalingga identified a variety of problems, mostly respiratory issues. This is because in general, farmers cannot explain or specifically name duck diseases; they can only explain the symptoms or signs that are seen when the duck is sick.

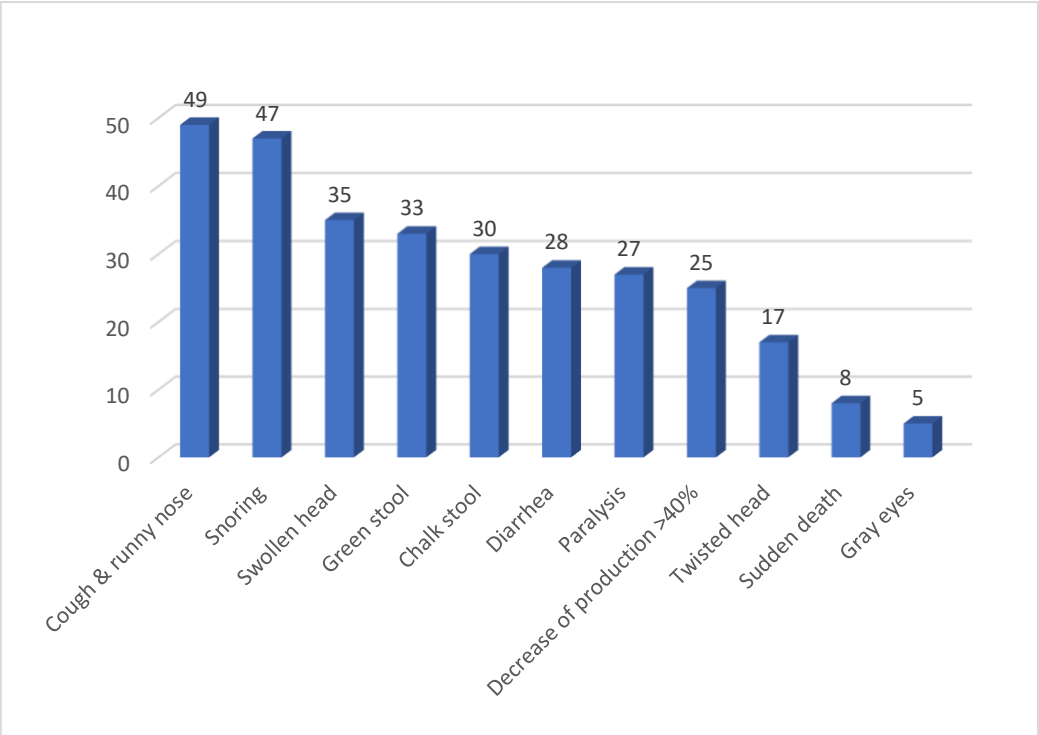

Figure 5: Major layer farm issues identified by farmers in Kendal, Central Java

Layer chickens in Kendal on average start laying at 19 weeks of age, with peak production reached at 27 weeks. Spent layers are culled at 91 weeks. Layers in Kendal tend to reach peak egg production earlier than in Blitar and Purbalingga.

The most common problems or diseases faced by farmers in Purbalingga are torticolis (twisted head/neck) and declining egg production. Other important issues include diarrhoea, respiratory disturbance, lameness and swollen face (eyes area) as highlighted in Figure 6. Farmers in Purbalingga had a greater variety of issues than farmers in Blitar. However, declining egg production seemed to be a major concern in all areas.

In Purbalingga the survey found that chickens began to lay at 18 weeks, reaching their peak at 30 weeks of age before being culled at 97 weeks. Layers in Purbalingga tend to start producing 1 to 3 weeks earlier than layers in Blitar and are kept longer than layers in Kendal.

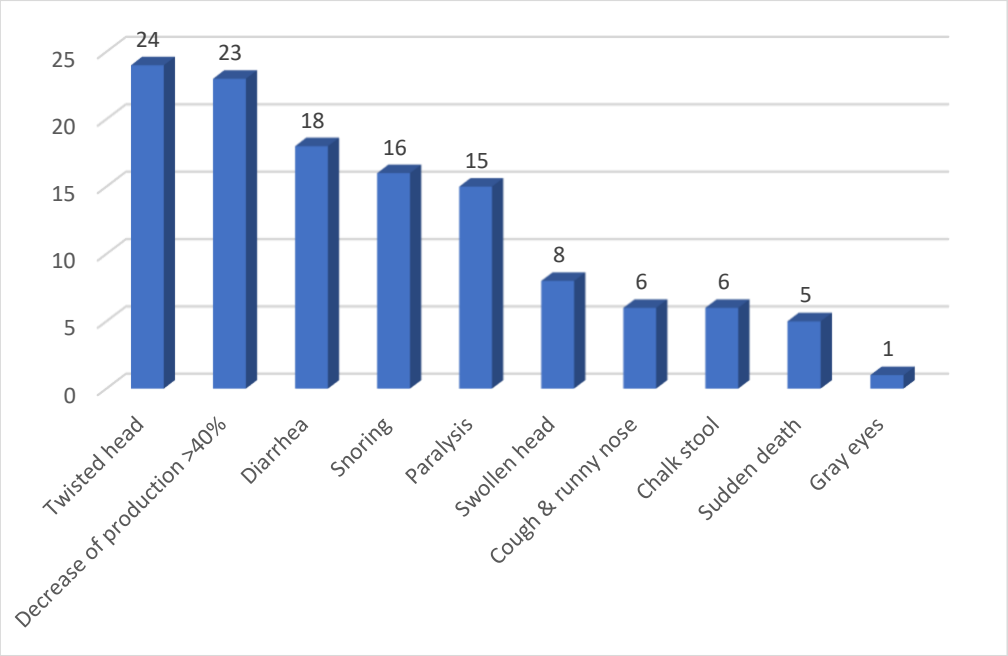

Figure 6: Major layer farm issues identified by farmers in Purbalingga, Central Java

Piloting the LFAT in Blitar, East Java

LFAT component scores in Blitar

Farm management

Twenty characteristics of the farm and the farm management system were evaluated. While some of these were beyond the ability of the farmer to influence e.g. the distance from the farm to the market or road, there were other management factors that could be influenced.

On the positive side, most farms were well located away from markets (a potential source of disease), had good clean water supplies and external farm fences (Table 3). Another positive aspect was the short period between feed arrival/mixing and use. This helps to minimise the chances of contamination and rodent access. On the other hand, although a good water source was available there was insufficient water quality testing or treatment if required. The farms and houses in Blitar tended to be closer together, as did the external fences and chicken sheds. There also needed to be better use of veterinarians and recording/monitoring of production. This would allow speedier resolution of any animal health issues.

Table 3: Farm management scores - Blitar

No	Farm management activities	Score
1	Distance between farm and market/slaughter house	4.9
2	Storage time of ready-to-use feed	4.8
3	Water source	4.4
4	Height of fences	4.0
5	Farm access road	3.9
6	Feed storage	3.6
7	Age variation on farm	3.4
8	Available buildings (poultry houses, workers mess, egg storage, feed storage, office)	3.1
9	Feed source	2.9
10	Distance between farm and other poultry farms	2.8
11	House design	2.7
12	Distance between poultry houses and fences	2.7
13	Distance between houses	2.4
14	Source of standby electricity (diesel generator)	2.3
15	Feed transportation	2.2
16	Recording of farm production	2.2
17	Availability of veterinarian on the farm	2.2
18	Water treatment: (chlorination/disinfection/filtration/UV)	2.0
19	Distance from farm to nearest village/residence	2.0
20	Water quality test in last year	1.8

Note: Good = >4, Average = >3 and <4, Poor = <3

Biosecurity

Biosecurity in Blitar was generally poor (Table 4) with no biosecurity activities rated as 'good' and only three rated as 'average'. It will require hard work and significant changes in biosecurity to reduce the incidence of disease in these systems. At present, there is a clear absence of physical restrictions between clean and dirty areas, special footwear for workers and guests is not available, as well as the absence of washing and disinfection of egg crates used to collect eggs from the sheds. The only aspects of biosecurity that were average were the absence of other birds (wild and domestic) from around the sheds, handling of dead birds and the cleanliness of the drinking water equipment.

Improvements need to be made in training of farm staff, better control of people moving around the farm through developing SOPs for staff, visitors and vehicles, monitoring visitors and providing clean clothing for staff and visitors.

Table 4: Biosecurity scores – Blitar

No	Biosecurity activities	Score
1	Presence/absence of other birds (as pets) on this farm	3.5
2	Dead bird management	3.4
3	Cleanliness & cleaning of water drinkers	3.1
4	Pest control program (flies & rodents)	2.9
5	Egg storage hygiene	2.7
6	Hygiene of poultry houses	2.3
7	Cleanliness & cleaning of feeder pans	2.3
8	Special conveyance (egg, feed and chicken) availability	2.3
9	Farm environmental hygiene	2.2
10	Manure management	2.1
11	Washing and disinfection of conveyance on farm	2.0
12	Biosecurity training for farm workers	1.9
13	Using different egg trays for in-house use and external sales	1.9
14	In-house egg tray cleaning & disinfection	1.5
15	Facility for cleaning and disinfecting vehicles and equipment which enter the farm	1.4
16	Facility for cleaning and disinfecting workers/guests (shower, disinfection gangway, dip bath, hand washing facilities)	1.3
17	Availability of cleaning/disinfection facility before entering the house (foot dipping, hand washing)	1.3
18	Availability of biosecurity SOP for workers, visitors and vehicles	1.2
19	Separating clean and dirty areas with clear physical boundaries	1.2
20	Availability of special clothes and footwear for visitors/workers	1.2
21	Availability of visitors book	1.1

Note: Good = >4, Average = >3 and <4, Poor = <3

Poultry health management

Layer farmers in Blitar used the correct vaccines (Table 5) and vaccination scheduless for diseases, other than HPAI, were undertaken at approximately the correct frequency. There were, however, issues with the implementation of the vaccine programs with poor vaccine handling and application of the vaccines. There was also poor recording of the vaccines and drugs used, and sick birds were not adequately separated from healthy birds. Once again, it seems that training has been insufficient as some of these issues could be easily rectified with simple training programs and improving the availability of vaccine storage and handling facilities.

Table 5: Poultry health management scores - Blitar

No	Poultry health management	Score
1	Type of AI vaccine used in farm	4.9
2	Vaccination program implementation (IBD, IB, ND, AI, EDS)	3.8
3	Frequency of HPAI vaccination in production (laying) period	3.2
4	Frequency of HPAI vaccination before laying period	3.1
5	Vaccine handling before use	2.7
6	Vaccination execution	2.4
7	Monitoring of antibody titre after vaccination	2.1
8	Recording of drugs, vaccines & disinfectants used	2.1
9	Separation of sick from healthy chickens	2.0

Note: Good = >4, Average = >3 and <4, Poor = <3

Total LFAT component scores

The aggregated results of the layer farm assessment in Blitar district are presented in Figure 7. Layer farms in Blitar had average scores for implementation of farm and poultry health management systems, but low levels of effective biosecurity.

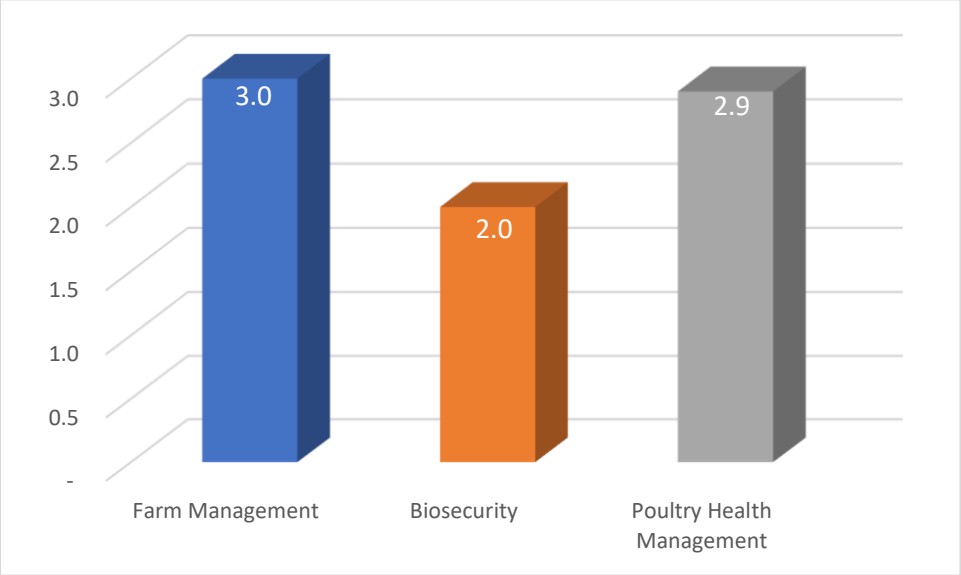

Figure 7: Farm assessment results for the three components in Blitar district

LFAT scores based on farm size

When comparing the LFAT results based on farm size in Blitar it is clear that the larger farms perform better than the smaller farms (Figure 8). It may be that the larger the farm, the higher the value of the asset and hence, a greater dependence by farmers on this enterprise for their

livelihood may lead to a greater investment in both capability (e.g. farmer skills and training) and infrastructure. There is a greater difference between medium and large size farms in these three components than there is between small and medium size farms. However, at all farm scales, it is clear that the implementation of biosecurity is low compared to the other two components. This confirms that for all farm sizes, biosecurity implementation on farms must be improved.

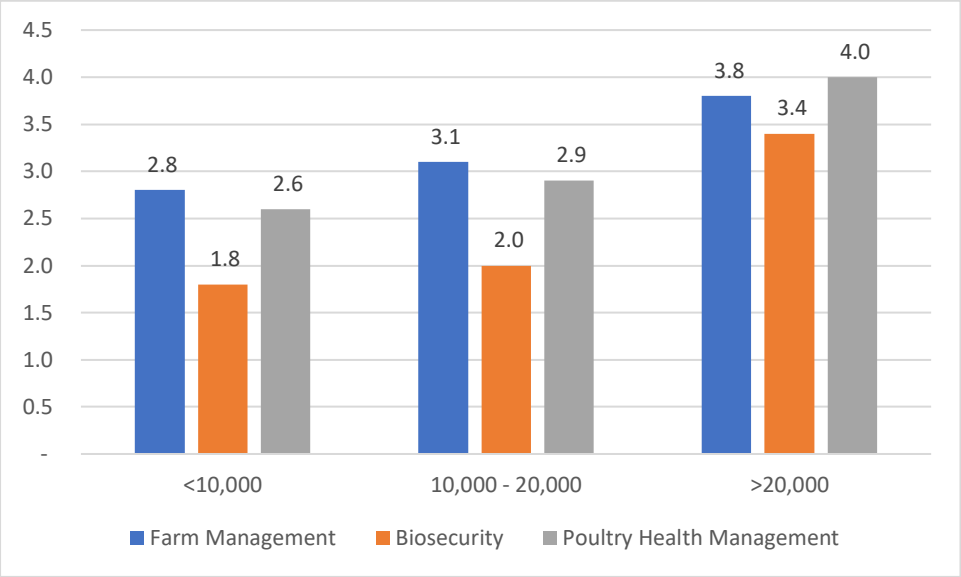

Figure 8: Farm assessment results based on farm size in Blitar district

One aspect worth noting in the Blitar analysis is that there were three farms that already had NKV certificates. These three farms were included in the category of large-scale farm (population > 20,000 layers). The LFAT results for these three farms all indicate that they were implementing good management techniques. For each component they all returned scores of greater than 4.4 for management and greater than 4.6 for biosecurity and poultry health management. This indicates that the LFAT is consistent with the HPAI-free compartmentalization program in commercial poultry farms and also will support farms to advance towards NKV layer farm certification. Farmers, who would like to receive an NKV certificate, can use the LFAT as a basis for identifying the things that need to be improved.

Piloting the LFAT in Kendal

LFAT component scores

Farm management

As with Blitar the farms are situated a good distance from markets and feed is managed quickly and efficiently. They are the only two farm management characteristics that can be classified as good (Table 6).

Table 6: Farm management scores - Kendal

No	Farm management activities	Score
1	Distance from farm to market/slaughter house	4.8
2	Storage time of ready-to-use feed	4.2
3	Height of fences	3.9
4	Variation of age in farm	3.7
5	Feed source	3.7
6	Food storage	3.6
7	Water source	3.6
8	Road access to farm	3.3
9	Distance from farm to nearest village/residence	3.2
10	Distance from farm to other poultry farms	3.0
11	Available buildings (poultry houses, worker mess, egg storage, feed storage, office)	3.0
12	Distance from poultry houses to fence	2.7
13	Recording of farm production	2.7
14	Distance between poultry houses	2.6
15	House design	2.5
16	Source of standby electricity (diesel)	2.1
17	Availability of veterinarian on the farm	2.1
18	Water treatment: (chlorination/disinfection/filtration/UV)	2.0
19	Feed transportation	1.9
20	Water quality test in last year	1.6

Note: Good = >4, Average = >3 and <4, Poor = <3

While there are not many good management activities there are a lot that are average or acceptable. In Blitar there are 12 characteristics that are classified as poor, while in Kendal there are nine. Once again water treatment and quality testing are poor as is the design of the poultry sheds and access to veterinary assistance. The farms in this district do appear to be more spread out than in Blitar and this will certainly minimise the transmission of disease between farms.

Biosecurity

The implementation of biosecurity activities in Kendal is poor (Table 7). There are only four activities, which are well implemented, all the rest are below average or poor. Once again, this survey and the construction of the LFAT is able to identify the individual characteristics that need to be improved in order to improve overall biosecurity. In Kendal, the water drinkers are generally clean, and the chicken manure is properly managed and removed hygienically. These farmers are also able to minimise the movement of other birds around and into the chicken sheds.

Table 7: Biosecurity scores - Kendal

No	Biosecurity activities	Score
1	Cleanliness & cleaning of water drinkers	3.9
2	Manure management	3.9
3	Using different egg trays between in-house use and use for sales	3.6
4	Presence of other birds (as pets) on this farm	3.5
5	Cleanliness & cleaning of feeder pans	2.9
6	Dead bird management	2.8
7	Hygienic conditions of poultry houses	2.8
8	Egg storage hygiene	2.5
9	Pest control program (flies & rodents)	2.4
10	Special conveyance (egg, feed and chickens) availability	2.4
11	In-house egg tray cleaning & disinfection	2.2
12	Farm environmental hygiene	2.2
13	Washing and disinfection of conveyance on farm	2.0
14	Biosecurity training for farm workers	1.6
15	Facility for cleaning and disinfecting vehicle and tools which enter the farm	1.6
16	Availability of special clothes and footwear for visitors/workers	1.4
17	Facilities for cleaning and disinfecting workers/visitors (shower, disinfection gangway, dip bath, hand washing basins)	1.3
18	Separation between clean and dirty areas with clear physical boundaries	1.3
19	Availability of cleaning/disinfection facility before entering house (foot dip bath, hand washing basins)	1.3
20	Availability of biosecurity SOPs for workers, visitors, vehicles	1.2
21	Availability of visitor book	1.0

Note: Good = >4, Average = >3 and <4, Poor = <3

Poultry health management

The poultry health component is similar to Blitar although in Kendal the vaccines tend to be managed more efficiently and safely (Table 8). It appears that preparation for vaccination

tends to be effective, but the actual vaccination program implementation, data analysis and monitoring still needs to be improved in Kendal.

Table 8: Poultry health management scores - Kendal

No	Poultry health management activity	Score
1	Type of AI vaccine used on farm	4.8
2	Frequency of AI vaccination in production phase (laying period)	3.9
3	Frequency of AI vaccination before laying period	3.3
4	Vaccine management before use	3.3
5	Vaccination program implementation (IBD, IB, ND, AI, EDS)	3.1
6	Vaccination execution	2.5
7	Recording of drugs, vaccines & disinfectants used	2.4
8	Separation of sick from healthy chickens	2.4
9	Monitoring of antibody titres after vaccination	1.7

Note: Good = >4, Average = >3 and <4, Poor = <3

Total LFAT component scores

When the individual activities are amalgamated into component scores, it is clear that in Kendal district the adoption of biosecurity activities is below average and below the other two components (Figure 9).

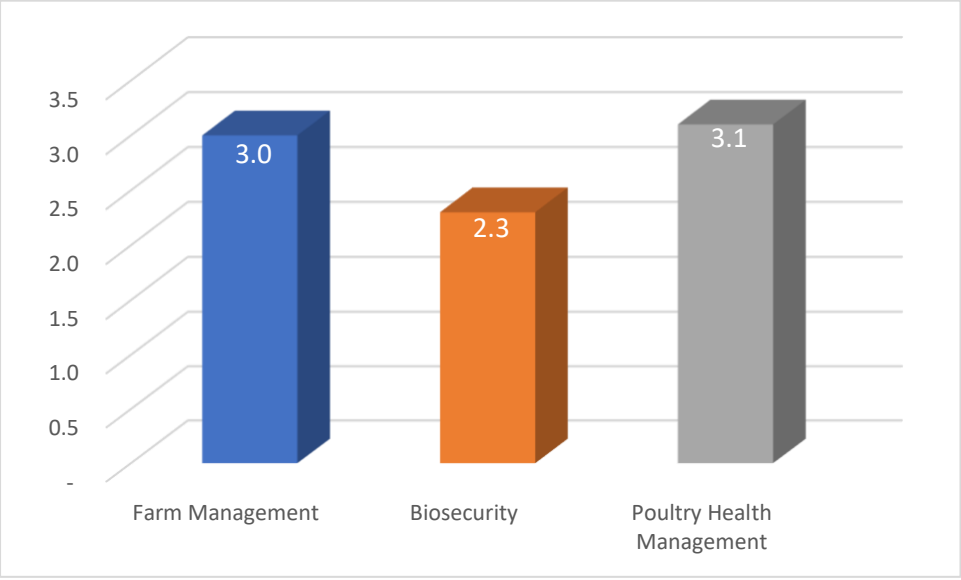

Figure 9: Farm assessment results for the three components in Kendal district

LFAT scores based on farm size

Figure 10 provides a comparison of LFAT component scores based on farm size. While biosecurity, as discussed above, is generally poor, it tends to be that the larger the farm the better the biosecurity, farm management and poultry health management. So, while most improvement is required on the smaller farms, biosecurity improvements still need to be made on all farms, irrespective of size.

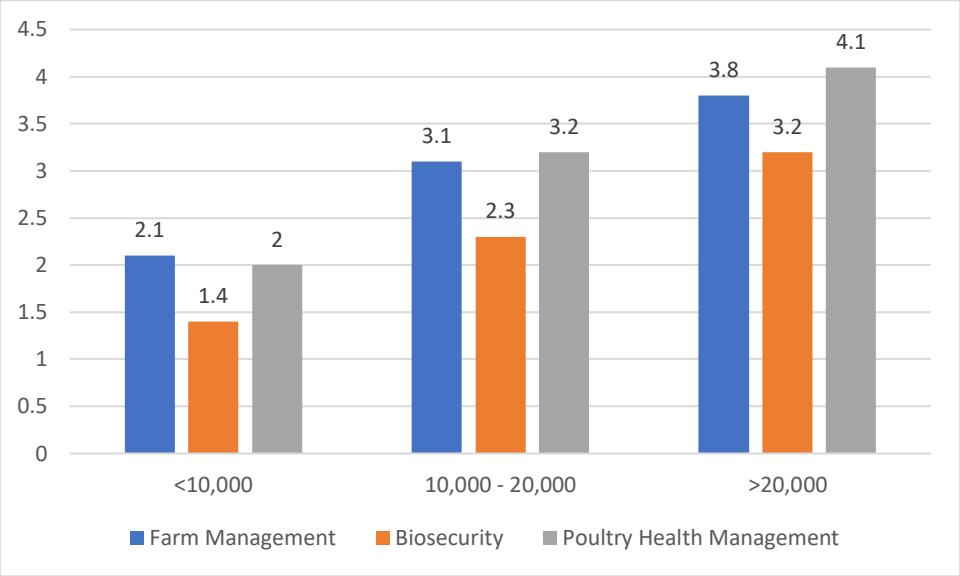

Figure 10: Farm assessment results based on farm size in Kendal district

Piloting the LFAT in Purbalingga

LFAT component scores

<u>Farm management</u>

As with the other districts, the farms in Purbalingga tend to be located well away from markets, and the farmers mix and provide feed without significant storage times (Table 9). There are, however, significant infrastructure issues as farms tend to be close to other farms, and houses and sheds are close to the farm boundary fences. Fences do not appear to be adequate in this district. There is also a continuing lack of access to veterinary care and a potential issue with the transport of feed. Like any commodity entering the farm, there needs to be strict guidelines as to how the feed is transported and stored on the farm. The survey tool identified a number of problems with farmers and their management practices in Purbalingga.

Table 9: Farm management scores - Purbalingga

No	Farm management activities	Score
1	Distance from farm to market/slaughter house	4.7
2	Storage time of ready-to-use feed	4.5
3	Distance between farm and other poultry farms	3.9
4	Variation of bird ages on farm	3.8
5	Feed storage	3.7
6	Water source	3.5
7	Feed source	3.4
8	Available buildings (poultry houses, workers' mess, egg storage, feed storage, office)	3.3
9	Height of fences	2.9
10	Road access to farm	2.7
11	Distance between houses	2.7
12	House design	2.6
13	Water treatment: (chlorination/disinfection/filtration/UV)	2.4
14	Recording of farm production	2.4
15	Distance from poultry houses to fences	2.3
16	Source of standby electricity (diesel)	2.3
17	Distance from farm to nearest village/residence	2.0
18	Availability of veterinarian on the farm	1.9
19	Water quality test in last year	1.9
20	Feed transportation	1.7

Note: Good = >4, Average = >3 and <4, Poor = <3

Biosecurity

The adoption of biosecurity activities in Purbalingga tends to be better than in the other two districts (Table 10). The water drinkers and farm equipment are kept very clean and there are a further seven activities that are acceptable or average. One set of egg trays are used for egg collection from the poultry sheds and another set of trays used when the eggs leave the farm. This means that the farmers have more control over the cleanliness of the trays that come into contact with the layers. Farmers here are also quite good at keeping their feeders clean, and have adequate manure and dead bird disposal processes. As with the other districts, layer farmers are not adequately trained and hence do not implement adequate protocols for movement of staff and equipment safely around the farm. They have not adequately developed protocols or infrastructure for guests and visitors moving onto and around the farm, and appear to have insufficient procedures for handling pests and rodents. The assessment tool was able to identify both the activities that have been conducted well, and the adjustments that need to be made to improve on-farm biosecurity.

Table 10: Biosecurity scores - Purbalingga

No	Biosecurity activities	Score
1	Cleanliness & cleaning of water drinkers	4.5
2	Use of different egg trays between in-house use and for external egg sales	3.9
3	Cleanliness & cleaning of feeder pans	3.6
4	Manure management	3.6
5	Dead bird management	3.2
6	In-house egg tray cleaning & disinfection	3.0
7	Presence of other birds (as pets) on this farm	3.0
8	Egg storage hygiene	3.0
9	Hygienic conditions of poultry houses	2.9
10	Special conveyance (egg, feed and chicken) availability	2.7
11	Washing and disinfection of conveyances on farm	2.7
12	Farm environmental hygiene	2.7
13	Pest control program (flies & rodents)	2.2
14	Separation between clean and dirty areas with clear physical boundaries	1.8
15	Facility for cleaning and disinfecting vehicles and equipment that enter the farm	1.7
16	Biosecurity training for farm workers	1.4
17	Availability of cleaning/disinfection facility before entering shed (foot bath, hand washing basins)	1.4
18	Facility for cleaning and disinfecting workers/visitors (shower, disinfection gangway, dip bath, hand wash basins)	1.3
19	Availability of biosecurity SOP for: 1. Workers; 2. Visitors; 3. Vehicles	1.2
20	Availability of special clothes and footwear for visitors/workers	1.1
21	Availability of visitors book	1.1

Note: Good = >4, Average = >3 and <4, Poor = <3

Poultry health management

While farmers in Purbalingga, as in the other districts, have access to and use good vaccines, the actual management of the vaccination program is quite poor (Table 11).

Table 11: Poultry health management scores - Purbalingga

No	Poultry health management activity	Score
1	Type of AI vaccine used on farm	4.9
2	Separation of sick from healthy chickens	3.4
3	Vaccination administration	3.1
4	Frequency of AI vaccination in production phase (laying period)	2.8
5	Vaccination program implementation (IBD, IB, ND, AI, EDS)	2.7
6	Vaccine management before use	2.6
7	Frequency of AI vaccination before laying period	2.4
8	Recording of drugs, vaccines & disinfectants used	2.3
9	Monitoring of antibody titres after vaccination	1.5

Note: Good = >4, Average = >3 and <4, Poor = <3

While sick chickens tend to be separated from healthy ones, and vaccines can be administered efficiently to the chickens, ensuring correct vaccine storage and management before use, as well as implementing the required vaccination regime in a timely manner is poor. Monitoring the success of the program and recording results is very poor.

Total LFAT component scores

The aggregation of individual activities into the three components of the LFAT in Purbalingga provided different results to Kendal and Blitar (Figure 11). Unlike the other two districts, the worst component is poultry health management, while biosecurity implementation is slightly better than in the other areas.

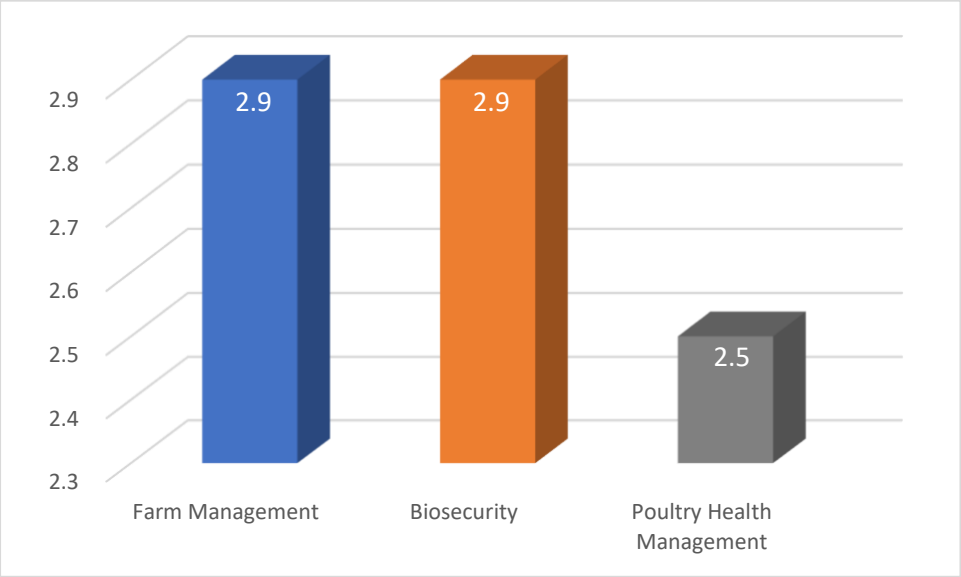

Figure 11: Farm assessment results for the three components in Purbalingga district

In general, implementation of poultry best practice is still low even though farm management and biosecurity are better than poultry health management. Therefore, efforts to improve implementation of poultry farm best practices on layer farms in Purbalingga is still required.

LFAT scores based on farm size

Figure 12 provides a summary of the LFAT component scores based on farm size. While larger farms in Purbalingga tended to have higher scores than smaller ones, they are still only average. The smaller farms have low scores for all three components, apart from farm management on medium scale farms. The results show that all farms in this district need to

make significant improvements in farm/flock management, biosecurity and poultry health management.

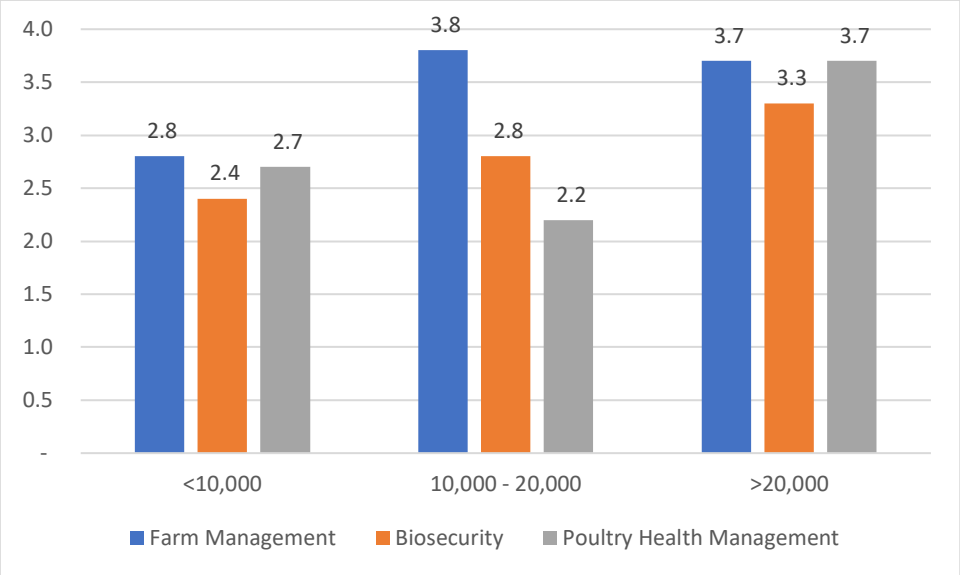

Figure 12: Farm assessment results based on farm size in Purbalingga district

The results of the LFAT are consistent with what you would expect from the different farm sizes. It would be expected that the larger farms, which tend to be wealthier and have closer ties with companies, and supply poultry products to higher value markets, would have better management and biosecurity.

Conclusions

To improve disease control in commercial layer farms in Indonesia it is important to develop an objective means of evaluating farm management (including infrastructure), biosecurity and poultry health management. This can assist the government develop HPAI-free compartments and expand NKV certification to layer farms. The LFAT has been successfully developed and tested in three important layer farming districts (Blitar, Purbalingga and Kendal) in Java.

The LFAT consists of 50 activities or sub-components grouped into three components. These components are Farm Management (20 sub-components), Biosecurity (21 sub- components) and Poultry Health Management (nine sub-components). Each sub-component received a ranking of between 1 and 5, where a ranking of less than three was regarded as ‘poor’,

between 3 and 4 was 'average' and above 4 was considered 'good'. Farms that received an aggregated score of above 4 could be NKV certified or part of the HPAI-free Compartmentalization Program. These good farms are those that generally have good farm management, effective biosecurity including the adoption of the '3-zones' biosecurity concept. HPAI vaccination will be carried out in accordance with the principle of '3-rights' (right vaccines, right schedule and right application) with post-vaccination monitoring and evaluation. These farms should be in good locations separated from other houses and farms, have implemented SOPs for visitor and vehicle movement, and pest control, and also have and use a good farm recording system.

Farms that score below 4 will need to improve particular aspects of their management identified by the LFAT in order to be certified. This may require guidance from PVUK poultry health officers and the local *Dinas* animal health service to improve the implementation of best practice in layer farming. Activities improvement that might be carried out could include farmer or farm worker training on poultry health best practices and direct technical assistance on farm.

The development and application of the LFAT has identified that implementation of poultry farm best practices in all pilot areas (Blitar, Purbalingga and Kendal districts) is generally poor with similar low to average scores in all areas. The LFAT identified that improvement is needed in the implementation of poultry farming best practices, especially farm biosecurity, in these three districts.

The LFAT can also be used to evaluate farm types using different criteria. For example, the LFAT identified that larger farms have better management and biosecurity than smaller farms. This may be due to the fact that the need for higher levels of capital investment ensures larger-scale farmers are more determined to improve management and biosecurity. Access to knowledge may also be limited for small farmers, as they usually rely on obtaining relevant information from other farmers.

The LFAT will be an important tool to be used by Livestock and Animal Health Service (*Dinas*) officers in order to identify production and health issues on layer farms and the remedial activities required to lead to NKV accreditation.

Recommendations

Recommendation 1: Ensure the LFAT is compatible with and integrated into existing measurement and certification tools such as the HPAI-free compartmentalization program and the NKV certification system.

Recommendation 2: Develop training programs with Livestock and Animal Health Service (*Dinas*) staff on the use of the LFAT and how it can be used to evaluate layer farm management, biosecurity and poultry health management, and become a basis for recommending improvements to existing practices.

Recommendation 3: Make poultry health improvement plan activities a part of *Dinas* work plans and programs, which are adequately funded through annual budgets.

Recommendation 4: Strengthen coordination and collaboration with the private poultry sector to jointly assist layer farmers by providing technical assistance for small, medium and large poultry farms.

Recommendation 5: When developing new chicken farms, the licensing process should ensure that farms meet LFAT technical criteria.

References

ASEAN-Australian Aid. 2016. *ASEAN Good Animal Husbandry Practices for Layers and Broiler*s - Food Safety Module. [online]. [Cited 24 January 2020]. https://www.asean.org/wp-content/uploads/images/Community/AEC/AMAF/OtherDocuments/ASEAN%20Food%20Safety%20Module%20GAHP%20For%20Layers%20and%20Broilers.pdf

Central Java Province Bureau of Statistics. 2017. *Poultry Populations by Regency/Municipality and Poultry type in Central Java Province 2016*. [online]. [Cited 24 January 2020]. https://jateng.bps.go.id/statictable/2017/10/27/1548/populasi-unggas-menurut-kabupaten-kota-dan-jenis-unggas-di-provinsi-jawa-tengah-2016.html.

Directorate of Veterinary Public Health. 2006. *Guidelines of Veterinary Control Number for Animal-Origin Food Business Units*. Directorate General of Livestock and Animal Health Services, Ministry of Agriculture. Jakarta, Indonesia.

Ministry of Agriculture. 2019. *Livestock and Animal Health Statistics 2018*. Directorate General of Livestock and Animal Health Services, Ministry of Agriculture. Jakarta, Indonesia.

Appendices

Appendix 1: Layer Farm Assessment Form

Biosecurity Assessment Form In Layer Chicken

A. Enumerator Data

Farm Visit Date (Date – Month – Year)	☐☐ — ☐☐ – ☐☐☐☐	**Code of Assessment Form**
Name of Enumerator:	**Gender:** ☐Male ☐Female	**Signature:**

B. Farm Profile

1. Province : CENTRAL JAVA	**2.** District / City:	**3.** Sub District:
4. Village:	**5.** Address: (Street name, etc.)	
6. ***If available***, GPS coordinate — **Latitude**	☐☐☐☐☐☐☐☐☐☐	
Longitde	☐☐☐☐☐☐☐☐☐☐	

7. Full name of owner :

7.1 Farming experience: _____ years

7.2 Age: _____ years

7.3 Gender: ☐Male ☐Female

7.4 Education: Elementary School/Junior High School/High School/Diploma or Bachelor-Doctor **)*

**) or equivalent and choose one*

8. Pattern of Farm

☐ Independent farm

☐ Contract Farm : _____ **)*

**)* Name of Company

9. Status of Respondent ☐ Owner ☐ Manager ☐ Labor

9.1 Name of Respondent	
9.2 Telephone number of Responden	☐☐☐☐☐☐☐☐☐☐☐☐

10. Number of Population during visit: ☐☐☐ ☐☐☐ ☐☐☐ ekor

11. Farm's Population Capacity: ☐☐☐ ☐☐☐ ☐☐☐ Ekor

12. Type of layer rearing ☐ Layer, buy pullet ☐ From DOC

13. Indicators of production (general)

13.1. Recent feed cost per Kg Rp_____

13.2. First age to lay egg: _____minggu

13.3. Age of peak production: _____ minggu

13.4. Age for culling: _____minggu

House No.	Age (Week)	HD	FCR
1			
2			
3			
4			

14. Vaccination

14.1 Type of vaccination in farm (**before** laying period)

a. ND	e. Coryza	i. MG/CRD
b. AI	f. ILT	j. AE
c. IBD	g. Pox	k. Others _____
d. IB	h. EDS	

14.2 Type of vaccination in farm (**Laying** period)

a. ND	e. Coryza	i. MG/CRD
b. AI	f. ILT	j. AE
c. IBD	g. Pox	k. Others _____
d. IB	h. EDS	

14.3 Clinical symptoms that have occured :

a. Decrease of production >40%	e. Paralysis	i. Swollen head	
b. Sudden death >5% in a week	f. Twisted head	j. Green stool	
c. Gray eyes	g. Cough, runny nose	k. Lime streak	
d. Diarrhea	h. Snoring	l. Others: _____	

14.4 History of occured diseases (in the past year)

a. LPAI/H9N2	e. Pox	i. CRD/MG
b. HPAI/H5N1	f. IBD	j. IBH
c. ND	g. Coryza	k. ILT
d. IB	h. Marek's Disease	l. Others_____

C. Farm Management

No	Observation Item	1	3	5	Score	Note
1	Road access to farm	Dirt road	Gravel road	Paved road		
2	Height of fences	No fence	< 1 m	>1 m		
3	Distance between poultry houses to fences	No fence (jarak 0 m)	< 5 m	>5m		
4	Distance between farm to nearest village/residence	< 10 m	10 – 100 m	>100 m		
5	Distance between farm to market/Jarak dengan pasar/slaughter house	<100 m	100 - 250 m	>250 m		
6	Distance between farm to other poultry farms	< 5 m	5 – 100 m	>100 m		
7	Distance between houses	< 2 m	2-5 m	> 5 m		
8	Available building (poultry houses, worker mess, egg storage, feed storage, office)	Only poultry houses, no others building.	Some of building available	All building available and separate		
9	House design	Open house, not permanent	Open house, permanent (Cage inside the building/ door separated)	Closed house		
10	Source of electricity reserve (diesel)	No reserve	Yes, there is. But	Yes, there is.		

			unmaintained			
11	Water source	Surface water (river, lake, pond)	Open well, buy (unknown source)	Municipal supply		
12	Water quality test in last a year	Never	Not routine	At least once a year		
13	Water treatment: (chlorination/disinfection/filtration/UV)	No treatment	Yes, there is. Not consistent	Yes, there is. Routine and measured treatment		
14	Variation of age in farm	Multiage in one house, there are DOC rearing	Multiage in one house, no DOC rearing	Same age in one house, no DOC rearing		
15	Feed source	Self-mixing (using > 3 ingredients)	Self-mixing with 3 ingredients (concentrate/ commercial feed, corn, bran)	Commercial feed		
16	Food storage	Together with house	Together with other function	Separate building		
17	Storage time of feed that ready to use	>2 weeks	1-2 week(s)	<1 week		
18	Feed transportation	Open vehicle	Semi-closed vehicle	Closed vehicle		
19	Recording of farm production	None	Yes, there is. Simple	Yes, there is. Complete		
20	Availability of veterinarian in the farm	Not available	Available, non-employed veterinarian	Available, employed veterinarian		

D. Biosecurity

No	Observation Item	1	3	5	Score	Note
1	Availability of guest book	Not available	Available, but not using it routinely	Available		
2	Separating between clean area and dirty area with clear physical boundaries	No zone partition	Zone available, but there is no clear boundary	Zone available, clear boundaries		
3	Facility for cleaning and disinfecting vehicle and tools which enter the farm	Not available	Available, not feasible	Available and well-function		
4	Facility for cleaning and disinfecting worker/guest (shower, disinfection gangway, dipping pond, hand wash tap)	Not available	Some of facilities available	All facilities available		
5	Availability of special clothes and footwear for guest/worker	Not available	Available, but minimal (only footwear)	Available, complete, and in the right area		
6	Availability of cleaning/disinfection facility before enter the house (foot dipping, washing hand)	Not available	Available, not used	Available, used (well-function)		
7	Availability of SOP biosecurity for: 1. Worker; 2. Guest; 3. Vehicle	Not available	Available, limited (minimal)	Available, completed		
8	Have special conveyance (egg, feed and chicken)	No, have not	Yes, limited	Yes, feasible		

9	Washing and disinfection of conveyance in farm	Never	Rarely	Routine		
10	Using different egg tray between in-house use and for selling use	No differentiation	Same egg tray, with cleaning process	Different egg tray		
11	In-house's egg tray cleaning & disinfection	Never	Rarely	Routine		
12	Farm environmental hygiene	Dirty	Clean	Clean and neat		
13	Egg storage hygiene	Dirty	Clean	Clean and neat		
14	Hygiene condition of poultry houses	Dirty (muddy, spider web, mess)	Rather clean	Clean (dry, organize)		
15	Cleanliness & cleaning of feeder pan	Dirty	Rather clean, rarely cleaned	Clean, feeder pan clean everyday		
16	Cleanliness & cleaning of water drinker	Dirty	Rather clean, rarely cleaned	Clean, water drinker clean everyday		
17	Pest control program (flies & rodents)	No program	Yes, there is. Not optimal	Yes, there is. Optimal		
18	Presence of other birds (for pet) in this farm	Yes, hanging around	Yes, caged	None		
19	Manure management	Manure put into sack by buyer, vehicle enter the farm	Manure put into sack by buyer, vehicle outside the farm	Litter put into sack by farm worker, saved outside the house		
20	Dead bird management	Dispose dead bird to outside the farm without any handling	Dispose dead bird to outside the farm with handling (burned/boiled)	Buried or burned dead bird inside farm		
21	Biosecurity training for farm worker	Never	Ever, some of farm worker	Ever, all of farm worker		

E. Poultry Health Management (Disease Control)

No	Observation Items	1	3	5	Score	Notes
1	Vaccination program implementation (IBD, IB, ND, AI, EDS)	Yes, limited, not recorded	Yes, limited, recorded	Yes, programmed, complete, recorded.		
2	Vaccine handling before use	None	There is refrigerator, but not specific for vaccine	Special refrigerator only for vaccine		
3	Vaccination execution	Contract vaccinator	Vaccinator from farm, not as team (only one vaccinator)	Vaccinator team from farm		

4	Type of AI vaccine that used in farm	Illegal vaccine	Mix (Legal and illegal)	Legal vaccine		
5	Frequency of AI vaccination before laying period	< 2 times	2 times	minimal 3 times		
6	Frequency of AI vaccination in production time (laying period)	No vaccination	One time	Minimal 2 times		
7	Monitoring of antibodies titer after vaccination	No monitoring	Sometimes	Routine		
8	Recording of drugs, vaccines & disinfectants use	No recording	Yes, there is. Simple	Yes, there is. Complete		
9	Separation for sick chickens	Not available	Available, but in the same house	Available, separate house		

Note: As supporting information/attachment, take some pictures.
e.g.: treatment recording/program pictures, farm situation pictures, etc.
Other notes:

Appendix 2: Training Curriculum for Layer Farm Assessors

No	Topic	Duration (minutes)
1	Update on the Indonesian poultry industry (Production, egg and poultry meat consumption, market potential)	45 minutes
2	Layer farm assessment and certification program	45 minutes
3	Review of the implementation of 3-zone biosecurity on layer farms	60 minutes
4	Review of HPAI vaccination in layer farms (Tips and commonly occurring mistakes)	60 minutes
5	Review of farm management (brooding, litter, vermin control, lighting and modern management methods)	60 minutes
6	Closed housing	60 minutes
7	Review of important and common layer diseases	90 minutes
8	Chicken necropsy refresher	90 minutes
9	AMU and AMR for layer farms	90 minutes
10	The process of making drugs (CPOHB: how to make good animal medicines)	60 minutes
11	Poultry husbandry practical	180 minutes
12	Pre and Post Training Tests @30 min	60 minutes
Total training time		**900 minutes**

Emergency Centre for Transboundary Animal Diseases (ECTAD) Indonesia

Ministry of Agriculture
Building C, 6th Floor, Room 615
Jalan Harsono R.M. Kav. 3
Ragunan, Jakarta Selatan 12550

+62 21 780 3770

Food and Agriculture Organization of the United Nations
Representation in Indonesia

Menara Thamrin Bld. 7th floor
Jalan M.H. Thamrin Kav. 3
JAKARTA 10250

fao-id@fao.org

+62 21 2980 2300

CB0630EN/1/08.20