DETECTION OF AVIAN INFLUENZA (AI) VIRUS IN RACING PIGEONS IN TASIKMALAYA CITY, WEST JAVA

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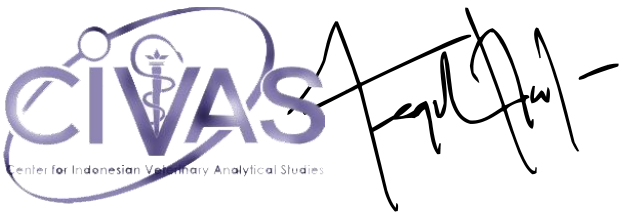
LEGISLATION

Study Title: **Detection of Avian Influenza (AI) Virus in Racing Pigeons in Tasikmalaya City, West Java.**

Approved By:



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CONTENTS

LIST OF TABLE

LIST OF FIGURES

INTRODUCTION

Background

Avian Influenza is a disease that has caused great economic loss, is dangerous for human health and could potentially cause a pandemic. Millions of birds have been killed and trillions of rupiah have been lost worldwide. The disease has also been proven to infect human and has caused 261 fatalities from 424 AI human cases globally (WHO 2009). In Indonesia, until 15 may 2009, 141 people had been infected by the disease and 115 of them had died (CFR=81.5%) (WHO 2009).

Bird is the main host of Influenza virus A/H5N1, the disease agent of Avian Influenza, and could transmit the disease to other birds or human. Several studies have shown that Avian Influenza could infect pigeons and cause death.

Racing pigeons is part of Indonesia's biodiversity and has long been part of the social cultural in Indonesia. Tasikmalaya city is one of many regions where people train pigeons to be racing pigeons. Such high enthusiasm is sometimes not followed with increased awareness of disease, particularly Avian Influenza with is a high risk disease. Disease virulence, husbandry management, biosecurity level and field conditions all play a role in the dynamics of AI transmission in racing pigeons.

In fact that when the race is going on, numbers of racing pigeons is mobilize across the sub districts, regencies, provinces or even islands in Indonesia and mixed with pigeon population from other area, this possibly potential for Avian Influenza Virus transmission inter-area.

The study was conducted to detect the presence of Avian Influenza virus in racing pigeons and identify the role of racing pigeons in AI virus transmission related to various characteristics of racing pigeon husbandry managements applied by people in Tasikmalaya.

Objective

1. Detect the presence of H5 Avian Influenza virus in racing pigeons in Tasikmalaya city.
2. Study the characteristics of racing pigeon husbandry management.
3. Measure the biosecurity level of racing pigeon's husbandry.
4. Measure the knowledge level of racing pigeon owners on Avian Influenza.

Benefits

Results from the study are expected to provide information as basis for making decisions and policies related to Avian Influenza mitigation in racing pigeons, particularly in Tasikmalaya

METHOD

Time and Place

The study was conducted from July to September 2009. Field data was collected in August 2009.

Sampling was done in 10 subdistricts in Tasikmalaya and was determined based on estimated number of racing pigeon owners in the region.

Number	Sub district	Total sample
1	Bungursari	**11**
2	Cibeureum	**6**
3	Cihideung	**4**
4	Cipedes	**7**
5	Indihiang	**7**
6	Kawalu	**3**
7	Kotabaru	**1**
8	Mangkubumi	**13**
9	Tamansari	**3**
10	Tawang	**4**
TOTAL		**59**

Table 1. Sub districts in Tasikmalaya and the number of samples taken

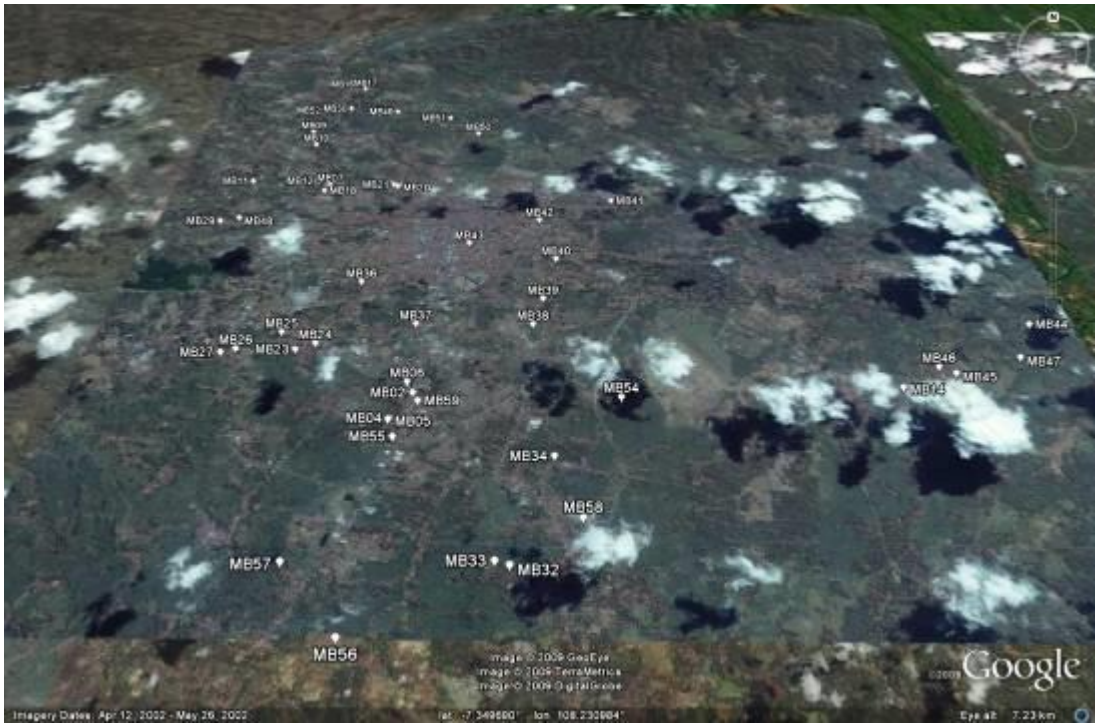

Figure 1. Distribution of Sampled Sites

Target Population

The target population of the study is racing pigeons and their owners who live in Tasikmalaya.

Sample Unit

Sample unit were:

1. Samples from a bird (cloacal and oropharyngeal swab) will be counted as one sampling unit.
2. A sample from an owner (questioner) will be counted as one sampling unit.

Sample

The sample size was calculated using Win Episcope 2.0.

1. The number of racing pigeon owners to be surveyed was calculated using the proportion estimation formula :

   With an estimated number of 400 racing pigeon owners, 95% confidence level, 5% accepted error, 5% estimated prevalence; the number of owners sampled was 60.

2. The number of birds sampled was calculated using the disease detection formula :

   With approximately 20 birds per owner, estimated number of infected birds 12, 95% confidence level; the number of samples per owner was 4 birds.

So the total number of bird samples taken in this study was 60 owners x 4 birds per owner = 240 sample, while the number of owners sampled were 60 owners.

Sample Collection

Samples collected in this study wer oropharyngeal and cloacal swab samples. The samples were packaged individually. Owners were surveyed using questionnaires.

Sample Handling and Testing

Cloacal and oropharyngeal swab samples were transported in cold conditions (4°C) to the Virology Laboratory at the Faculty of Veterinary Medicine, Bogor Agricultural University. Every 4 samples were pooled into one resulting in 60 pooled samples. Pooled samples were tested for the presence of H5N1 antigen with Reverse Transcription Polymerase Chain Reaction (rt-PCR).

Results from questionnaire and laboratory testing were analyzed descriptively.

RESULT AND DISCUSSION

Cloacal and Oropharyngeal Sample Test Results

Testing of all racing pigeon samples from Tasikmalaya city for the presence of H5 antigens of the H5N1 virus found no positive result. Testing of matrix antigens of the Influenza A virus also had similar results. Therefore further testing for N1 antigen was not needed.

It could be assumed that the disease prevalence is less than 5%, the assumed prevalence for this study. This could be related to the dry season which affects Avian Influenza dynamics in the field.

Owner Characteristic

Education Level

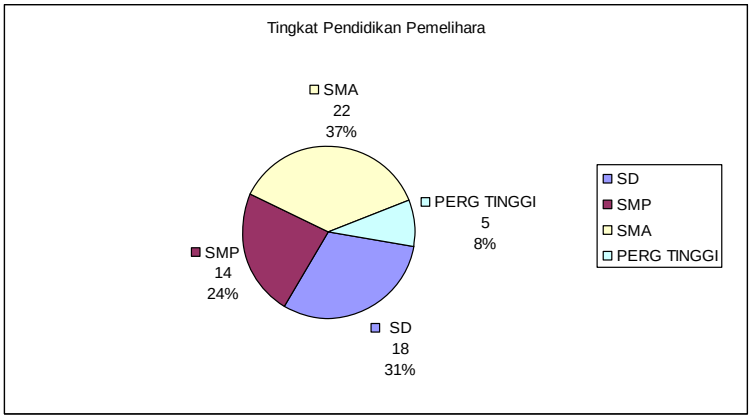

Figure 2. Education Level of Racing Pigeon Owner in Tasikmalaya

Results from questionnaires show that the education level of racing pigeon owners is: 37% for senior high school, 31% for elementary school, 24% for junior high school, and 8% for university graduates.

Age

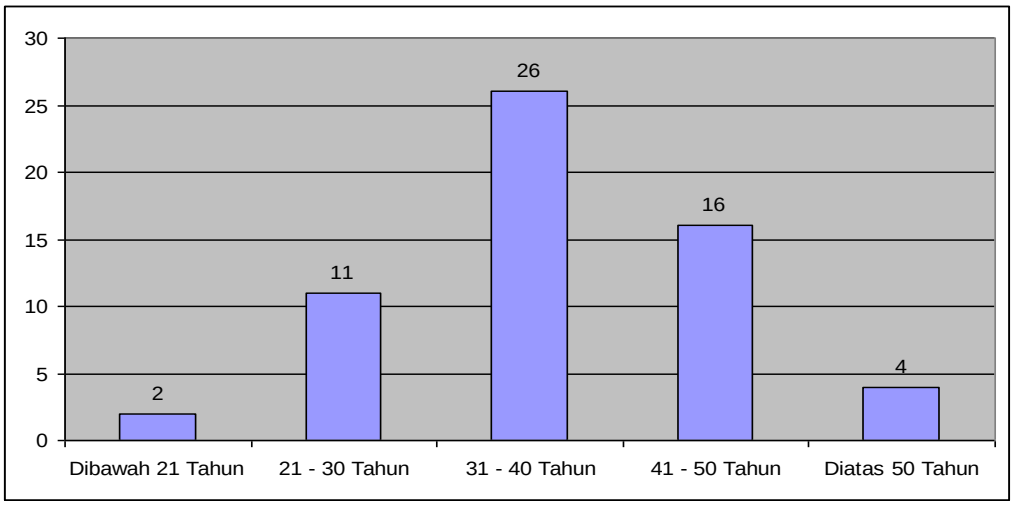

Figure 3. Age of racing pigeon owners in Tasikmalaya city

Racing pigeon owners in Tasikmalaya are 90% in the productive age between ages 21 to 50 years old, 3% under the age of 21 years old and 7% over the age of 50 years old. In the productive age category, 44% of respondents were between 31-40 years old, 27% were between 41-50 years old and 19% were between 21-30 years old. The age distribution above indicates that racing pigeon farms in Tasikmalaya is mainly practiced by people in the productive age category.

Farming experience

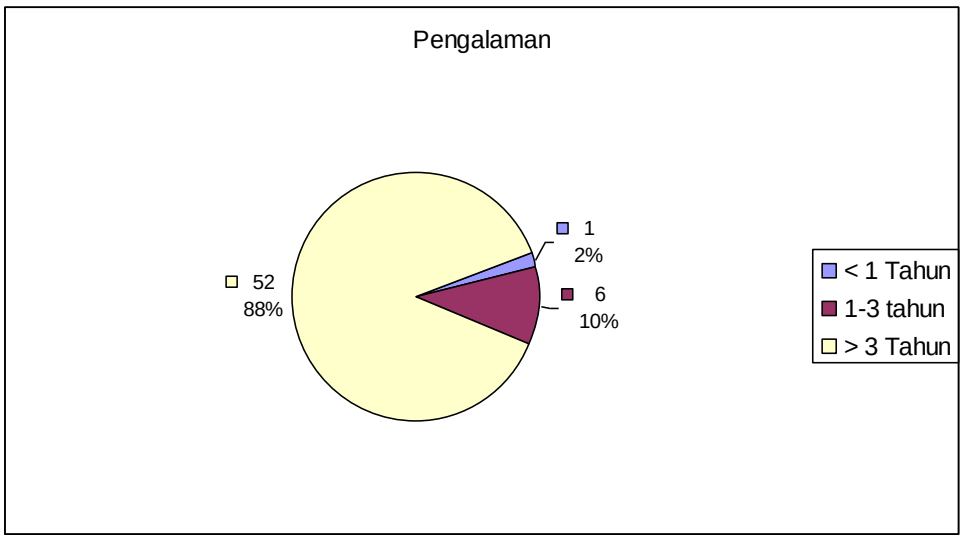

Figure 4. Farming experience of racing pigeon owners

In terms of experience, 88% of respondents have over 3 years of experience and 10% have 1 to 3 years of experience. Only 2% of respondents have less than one year of experience.

Racing Pigeon Farming

Land and Housing

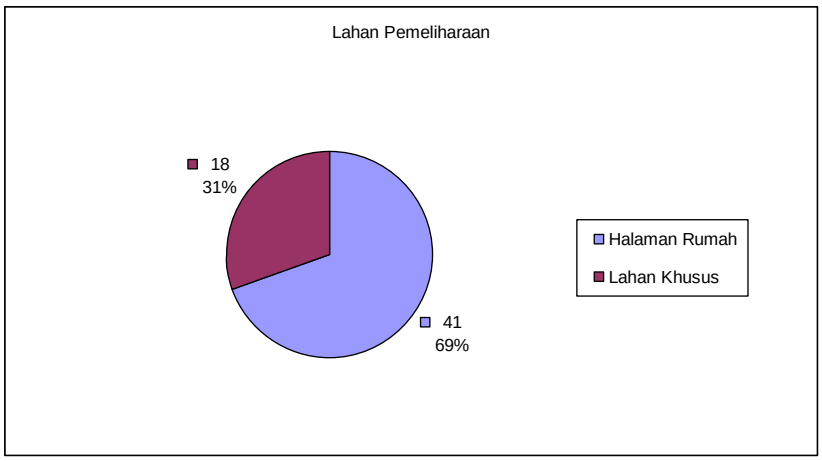

Figure 5. Land use for racing pigeon farming

For racing pigeon farming, owners commonly use the backyard or empty lots near their house or a special lot separated from their house. About 69% of respondents farm racing pigeons in their own backyard and 31% of respondents have special separated lot for pigeon farming.

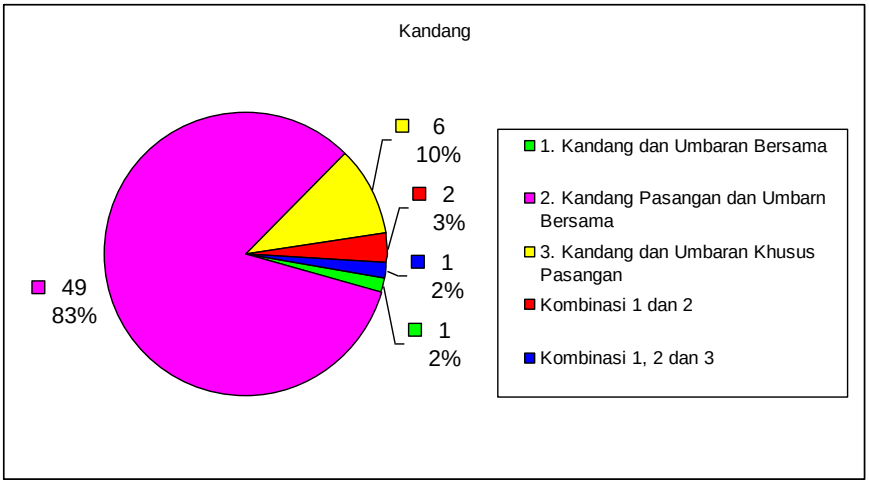

Figure 6. Housing system for racing pigeons

For the housing system, 83% of respondents apply a system where ever pair of pigeon has its own pen with a communal enclosure (flypen) used by many pairs of pigeons; this way there is interaction with other pigeon couples. About 10% of respondents apply a system where every pair of pigeon has its own pen with its own private enclosure separated from other pigeons. While 2% of respondent respondents apply a system where there is only one pen and one enclosure used by all pigeons; this allows high interaction between each individual pigeon.

Besides that 19% respondent farm other birds or poultry together with racing pigeons. This allows interaction between different species and possible transmission of pathogen (AI virus) among the birds. As much as 15% of respondents farm other birds but were separated from racing pigeons and 66% of respondent did not farm other birds besides racing pigeons.

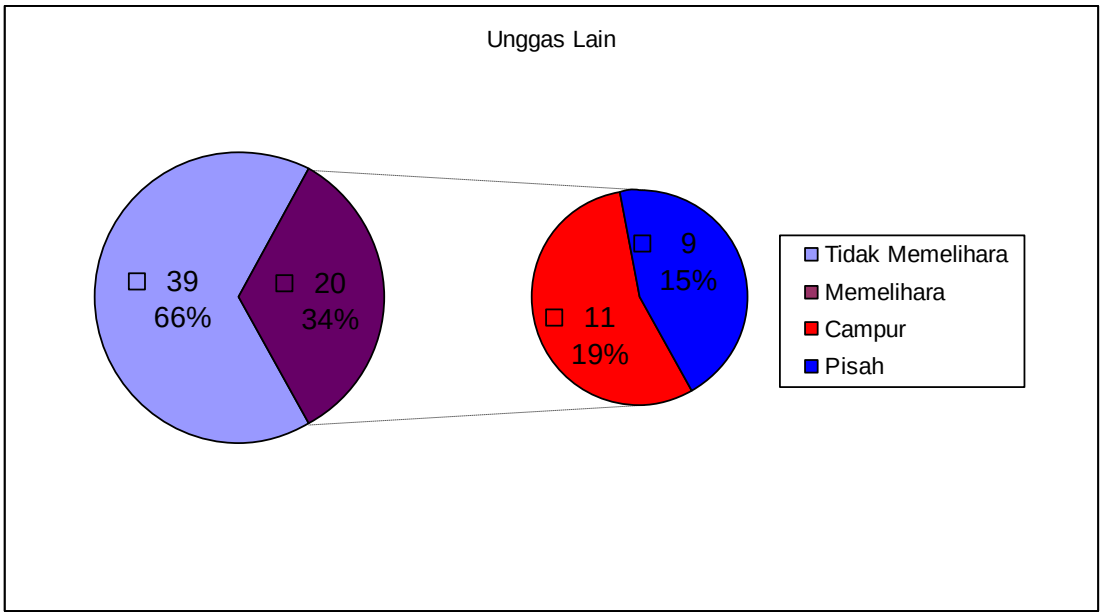

Figure 7. Farming of other bird species

Racing Pigeon Population

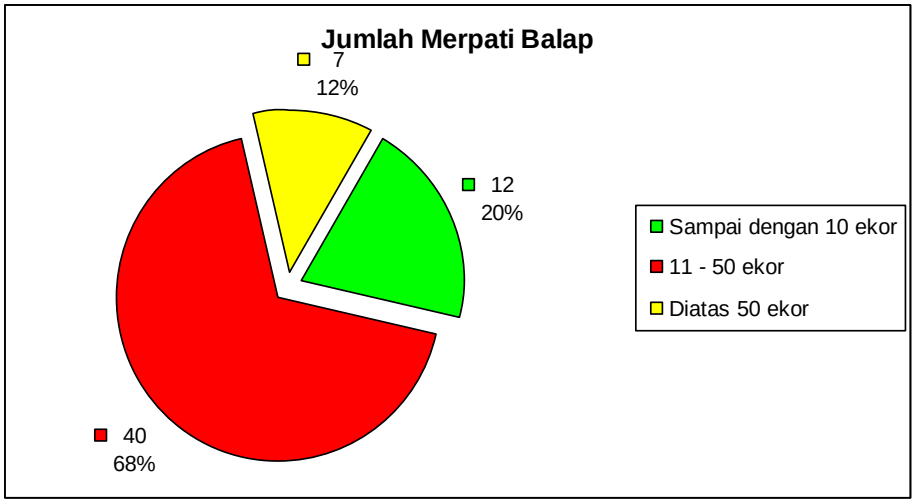

Figure 8. Racing pigeon population

Regarding pigeon population, 20% of respondents had a population of 10 birds or less (small scale), 68% had 11 to 50 pigeons (medium scale) and 12% respondent had over 50 racing pigeons (large scale).

Several purpose farming racing pigeons were to train and compete pigeons without breeding the pigeons (49%) or with breeding the pigeons (49%). Only 1% of respondent just bred pigeons without any training or competing activities.

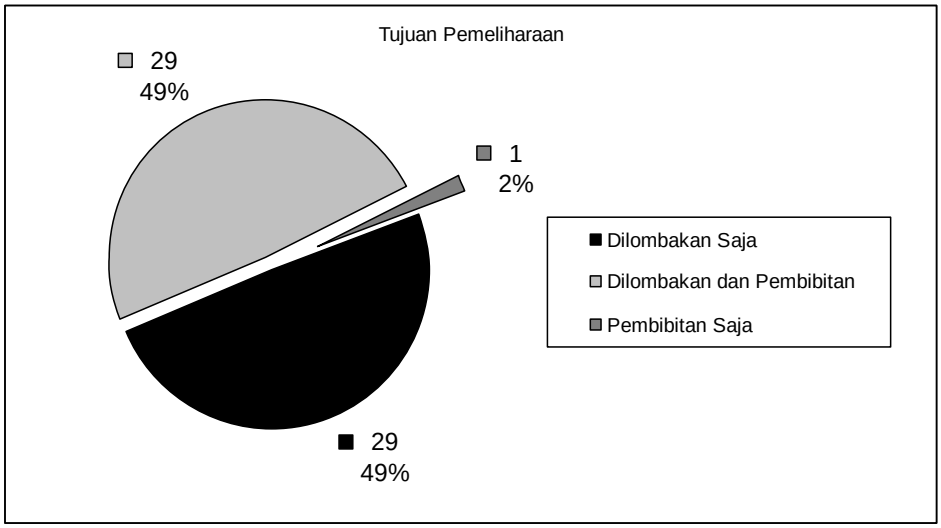

Figure 9. Purpose of Racing Pigeon Farming

Sources of Young Racing Pigeons

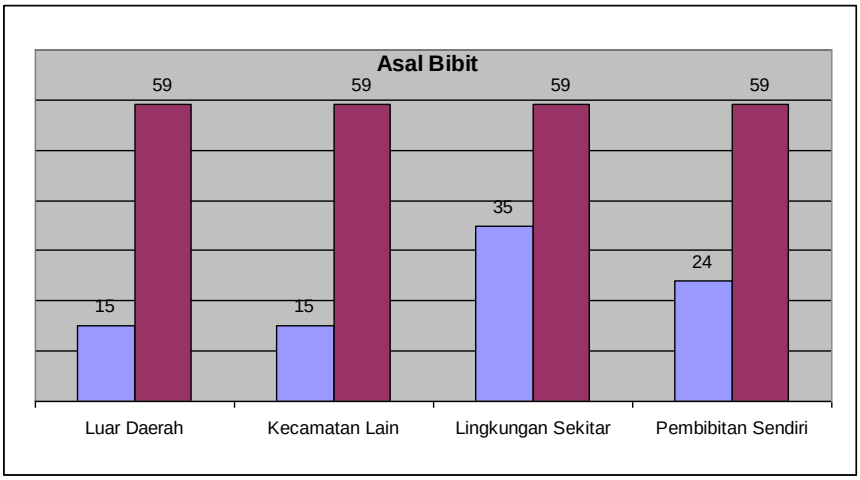

Figure 10. Source of Young Racing Pigeons

For the source of young racing pigeons, owners have several alternatives on how to acquire them, from outside of Tasikmalaya ciy, from other sub districts in Tasikmalaya city, from other pigeon owners in the neighborhood (in the same sub district), or by breeding their own pigeons.

As much as 25% of respondents obtain young pigeons from outside of Tasikmalaya city, 25% of respondents obtain it from other sub districts inside Tasikmalaya city, while 60% of respondents get young pigeons from breeders in the neighborhood and 40% of respondents breed the pigeons themselves.

Pigeon Training/Race

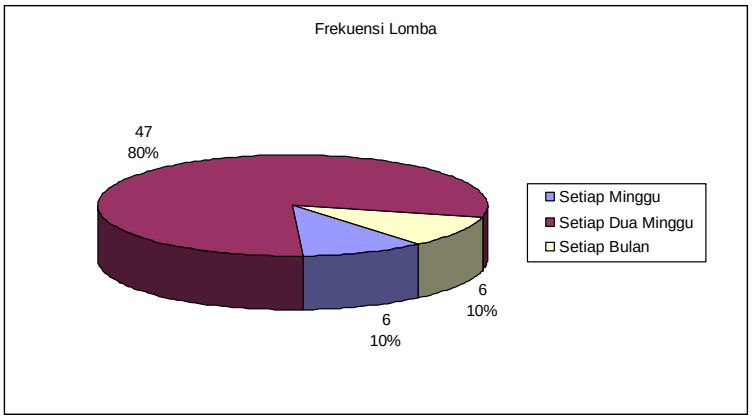

Figure 11. Race Frequency

In training or races, pigeons are compelled to fly faster than other pigeons. With the gathering of racing pigeons from various places with different husbandry backgrounds, such activities could spread Avian Influenza among the pigeons. There is high risk that pigeons could be infected during the intensity of the race.

As much as 10% of respondent participate in races or training once a week, 80% of respondents race or train once every two weeks and 10% of respondents race or train once a month.

Around 68% of respondents did not separate pigeons after a race or training session from other pigeons in the pen, while 22% of respondents separate the pigeons using partitions in the same pen, 7% put the pigeons in separated pens nearby, and 2% put the pigeons in a different area from the normal pigeon lofts.

This is related to the application of biosecurity practices where pigeons coming in from outside must separate from other pigeons in the farm. Most owners do not apply such practice hence increases the risk of AI infection from pigeons that often participate in races.

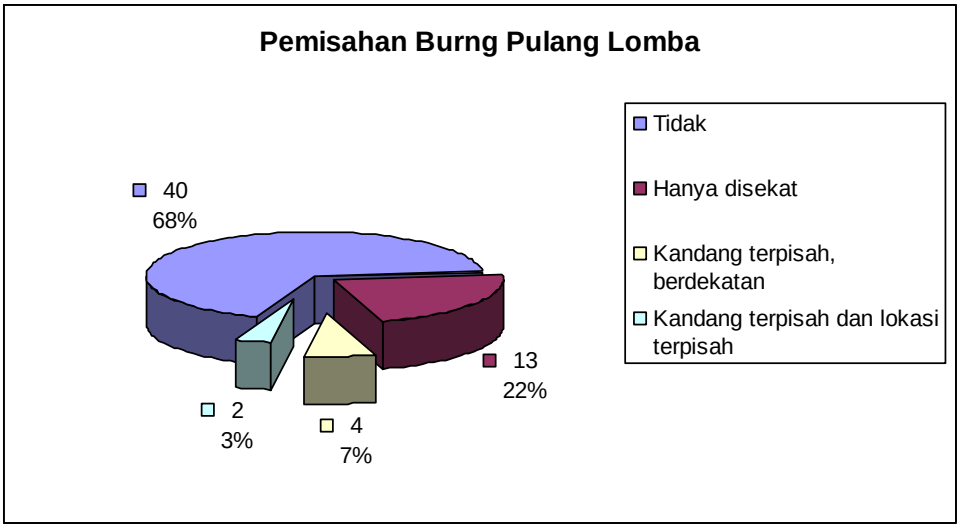

Figure 12. Bird separation after racing or training

Sanitation

The cleanliness of pens and tools are also a factor in the occurrence of a disease. The dirtier the higher risk of a disease to occur.

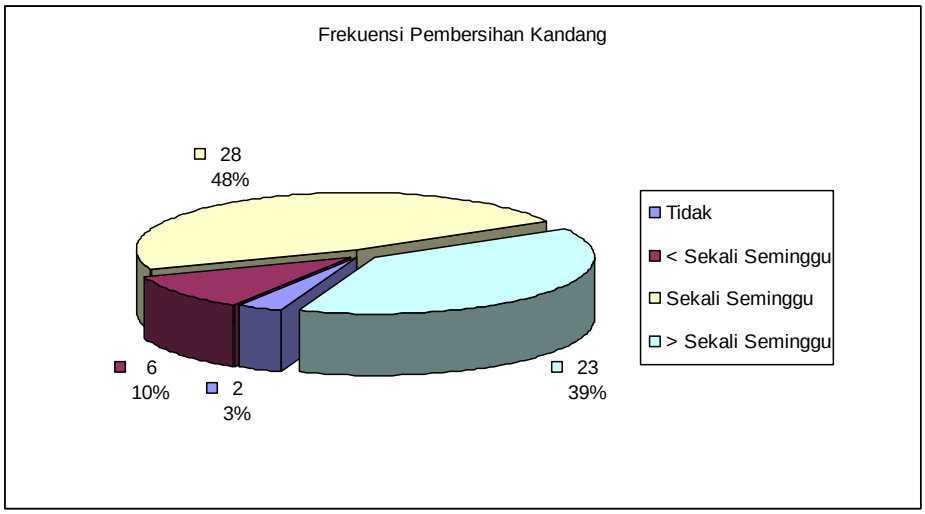

Figure 13. Frequency of pen cleaning

About 10% of respondents clean the pens less than once a week, while 48% clean the pens once a week, 39% clean the pens more than once a week. There are also 3% of respondents never clean up the pigeon pens.

From respondents that clean pens routinely, 23% of them cleaned the pens only sweeping and removing the feces, while 32% besides sweeping and removing feces also washed the pens with water. Most respondents (45%) clean pens by sweeping and removing feces then wash the pens using soap or disinfectant.

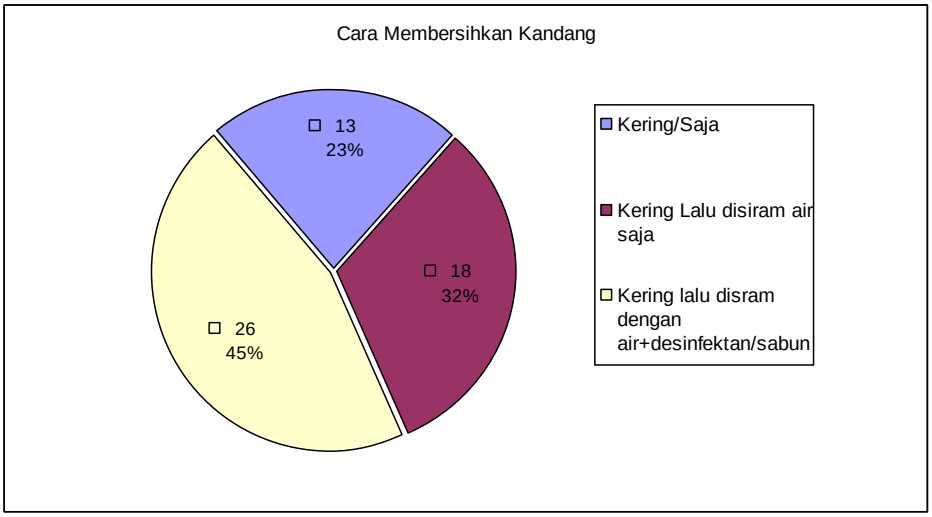

Figure 14. Cleaning Methods

Vaccination

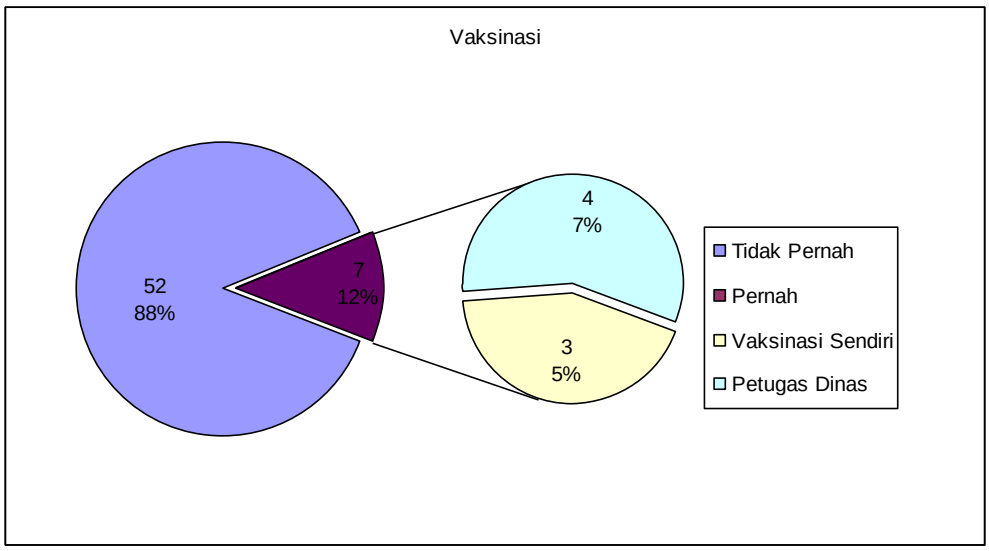

Figure 15. Vaccination in racing pigeons

Avian Influenza vaccination in birds is aimed to give immunity against AI, this way it can minimize the effect of the disease. About 88% of respondents in Tasikmalaya city never vaccinate their birds against AI, while 5% self-vaccinate their birds and and 7% had AI vaccination done by the local livestock service officer.

Disinfection of workers

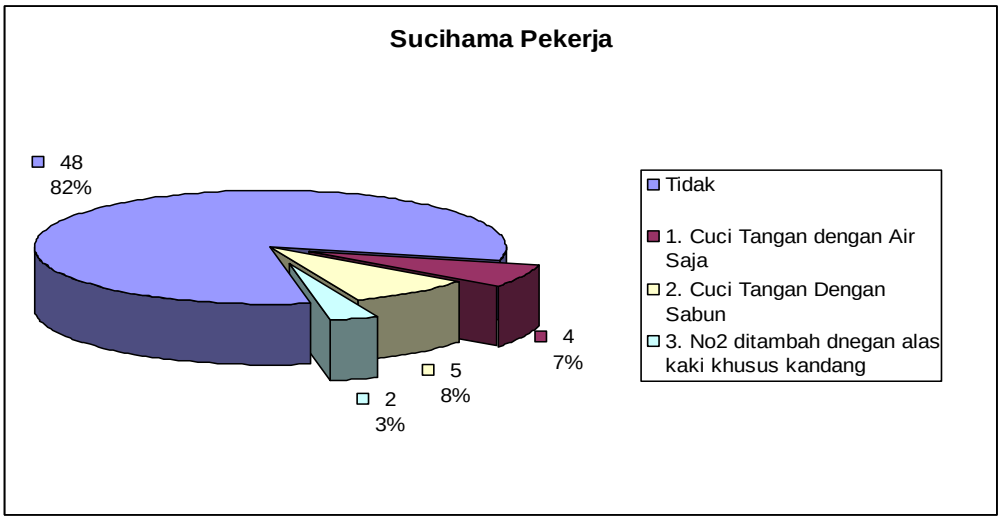

Figure 16. Disinfection of workers

Disinfection for people entering and exiting pigeon farms is also important in disease transmission. As much as 82% of respondents do not disinfect people entering or exiting farms while 7% only use water. About 5% of respondents disinfect using water and soap and 3% also apply disinfection with water and soap added with the use of special footwear within the farm.

Knowledge Level of Racing Pigeon Owners on AI

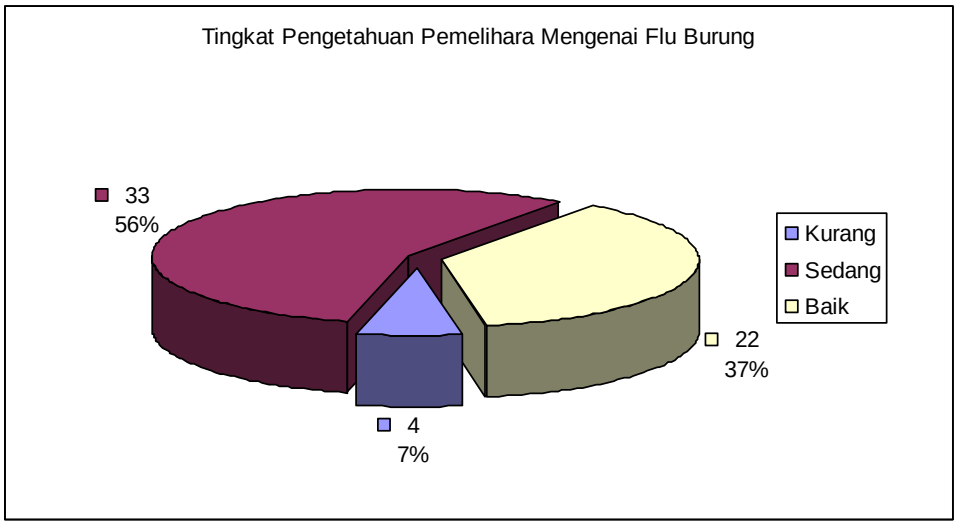

Figure 17. Knowledge Level of Racing Pigeon Owners on AI

From the data collected from racing pigeon owners in Tasikmalaya, 7% of the respondents have poor knowledge on AI, 56% have average knowledge on AI and 37% respondent have good knowledge on AI.

CONCLUSION

1. Oropharyngeal and claocal swab samples collected from racing pigeons in this study were all tested negative.
2. Most racing pigeon owners in Tasikmalaya city were in the productive age between 21 and 50 years old with a majority between 31 to 40 years old and evenly distributed education levels (elementary, junior high and senior high school).
3. Regarding characteristics of pigeon farming, most owners use their own backyards and apply a housing system where each pair of pigeon has its own pen with a communal enclosure. Racing pigeons were mainly separated from other birds with an average population of 11-50 pigeons. Young pigeons are commonly obtained from breeders in the neighborhood and pigeons are kept to be trained or raced every two weeks.
4. Owners are very aware of pen cleanliness and pens were cleaned more than once a week using disinfectants or soap. Birds were not vaccinated, and pigeons coming home from races were not separated from the other birds in the farm. There was also no disinfection of people entering or exiting the farm. The biosecurity level is still very low.
5. The knowledge level of racing pigeon owners is moderate.

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