Guinea fowl production provides huge opportunities for food and income security in northern Ghana and is a potential export commodity. Guinea fowl rearing requires minimum capital since they have the propensity to scavenge and fend for themselves.

The common systems of rearing in Ghana are the extensive and semi-intensive. Most farmers allow their birds to scavenge while some supplement in a form of grains is provided especially in the evening. Hatchability is low and mortality is high during brooding stages. Interventions adduced to increase hatchability and to reduce keet mortality have not sunk down well with farmers. Market for the meat and eggs is disorganized and it is difficult to estimate supply and demand requirements. There are many "Guinea fowl joints" in almost all towns and cities in Ghana, and guinea fowl meat is gaining considerable market. Guinea fowl eggs are also widely marketed at road sides especially in the villages and towns of the 3 northern regions; however the technical know-how for improved production in commercial quantities of both meat and eggs to meet the increasing demand for local and foreign market is below average. With the increasing demand and the interest generated in guinea fowl production, it is important to prepare a manual like this to ensure that the requisite knowledge and skill are transferred to Agricultural Extension Agents (AEAs), farmers and other stakeholders in the industry.

B. Asare-Mensah
Director, Animal Production Directorate
Acknowledgement

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Table of Contents

1.0 Introduction .............................................. 1
2.0 Dominant breeds in Ghana .......................... 1
3.0 Management system ...................................... 1
3.1 Extensive system (free range) .................. 2
3.2 Semi-intensive system ................................. 2
3.3 Intensive system ........................................... 2
4.0 Housing ..................................................... 2
4.1 Importance of housing ................................. 2
4.2 Important features of a good housing ........... 3
4.3 Types of housing structures ....................... 3
4.4 Factors to consider in housing .................... 3
4.4.1 Site selection ......................................... 3
4.4.2 Materials for consideration .................... 3
4.6 How to construct a guinea fowl house ........ 5
4.5.1 Steps for construction ........................... 5
4.5.2 Space requirement .................................. 6
5.0 Equipment required ...................................... 6
5.1 Space requirement for watering and feeding .... 7
5.1.1 Water space .......................................... 7
5.1.2 Feed space ............................................ 7
6.0 Raising of birds ........................................... 7
6.1 Preparation for keets ................................... 7
6.1.1 Steps to follow ...................................... 7
7.0 Biosecurity measures .................................. 9
8.0 What to do after brooding ......................... 9
9.0 Feeding of guinea fowls ............................... 9
9.1 Compounded feed ....................................... 10
10.0 Health management .................................... 12
10.1 Signs of ill health in guinea fowl .......... 12
10.2 Causes of disease conditions of guinea fowl ... 13
10.3 Medication/vaccination .............................. 14
11.0 Breeding .................................................. 15
11.1 Egg handling .......................................... 15
11.2 Incubation .............................................. 16
12.0 Record keeping .......................................... 17-18
1.0 Introduction
Local poultry contribute significantly to household incomes (GH¢ 455.2m/annum) and are a source of protein for many households in Ghana, particularly in the rural areas. Local poultry are relatively hardier than the exotic and therefore easier to keep. They are more tolerant to disease conditions and subsist on minimal feed supplementation.

Local poultry comprise of the domestic chicken, guinea fowls, ducks and turkeys. In Ghana, more attention has traditionally been paid to the domestic fowl than the guinea fowl despite the numerous advantages that the guinea fowl has. The Guinea fowl (Numida meleagris) is believed to have originated from Africa and derives its name from the Coast of Guinea.

In Ghana guinea fowls were traditionally reared in the three northern regions (Upper East, Upper West, and Northern) until recent times when it was introduced to other parts of the country like the Volta, Brong Ahafo Ashanti and Greater Accra Regions. Increasingly guinea fowl meat has become a delicacy relished by Ghanaians and other nationals due to the lean nature of the meat (contains 4% fat as against 7% for chicken) and its characteristic flavour and taste. With the increasing demand and the interest generated in its production a manual like this would ensure that the requisite knowledge and skill is transferred to farmers, AEAs and other stakeholders in the industry.

2.0 Breeds of Guinea fowl in Ghana
There are exotic and local breeds in Ghana but the Numida meleagris is the most dominant, they are all characteristically red wattled. The grey variety is characterized by shanks of slate grey colour and a more or less grey-blue plumage with many rounded small white spots. Adult birds may weigh about 1.5 - 2kg.

3.0 Management Systems
Poultry management systems in Ghana are differentiated on the basis of input-output relationships. These are the extensive, semi-intensive and intensive management systems.
3.1. Extensive System (Free range)
Under this system, no standard poultry management practices are followed. It is characterized by minimum inputs, no investments beyond the foundation stock with birds scavenging and sleeping in bushes or on trees around dwelling places.

3.2. Semi-intensive System
The semi-intensive poultry management system refers to the provision of permanent housing for birds at night. Birds are let out during the day to access the surrounding environment to pick some greens and insects. They are however given supplementary feed and water. Diseases are controlled to enhance productivity. This system is widely practiced by guinea fowl farmers in Ghana.

3.3. Intensive System
The intensive system refers to a system where birds are confined in appropriate poultry houses. Here standard poultry management practices such as feeding, disease control programmes and bio-security measures are followed. In Ghana this is practiced by a few commercial guinea fowl farmers.

4.0 HOUSING
4.1 Importance of housing
The under listed reasons give credence to the importance of livestock housing:

• Housing systems offer protection from weather (rain, cold, heat), predators (snakes, thieves etc), straying, accidental injuries, and many diseases that are carried by wild animals and micro-organisms.

• Housing systems also allow larger numbers of birds to be more easily handled to receive proper nutrition/feeding and clean water as well as individual and consistent care by farmers.

• Efficient housing and handling systems allow a higher quality and consistent product to be produced at a lower price to consumers.

Housing systems allow effective disposal and proper use of manure.

4.2 Important features of a good house
• The orientation of the house should be east - west
• Should have a firm floor with a slope of 1% towards outlet points of the house. (This is to allow free flow of water naturally towards the outlet after washing/scrubbing)
• Should be well ventilated
• Access to light
• Compacted floor with adequate floor space
• Good roofing
• Easy to clean

4.3 Types of housing structures
• Cages
• Deep litter house

4.4 Factors to consider in guinea fowl housing
4.4.1 Site selection
• The house should be built on well drained site preferably on a higher ground to prevent flooding
• Structures should be closer to a permanent source of drinking water
• Site should be easily accessible

4.4.2 Materials for construction
Consideration should be given to cost, availability and durability in the selection of construction materials for guinea fowl housing. The following materials can be considered:

• Thatch/grass
• Rafters
• Mud
• Tree branches
• Bamboo
• Sorghum stalks
• Iron sheet
• Wood scantlings/Boards
• Cement/Bricks
• Wire mesh
The floor of the house can be constructed with appropriate soil or sand/stone mixture and cement.

- Make an appropriate thatch roofing to cover the wooden frame.
- Put some wood (tree branches) on top of the beam as support for the roof.
- Make an appropriate thatch roofing to cover the wooden frame.
- The floor of the house can be constructed with appropriate soil or sand/stone mixture and cement.

4.5 How to construct a guinea fowl house (as in figure 2)

4.5.1 Steps
- Construct side walls with sandy loam soil to a height of 1.22 meters (4ft).
- Extend the 4 corners of the wall to form pillars of 0.91 meters (3ft) high to support the roof.
- Make a wooden frame just above the 4 walls and on top of the 4 corner pillars (ie. Beam). Tree branches could be used.
- Weave sorghum stalks vertically across the wooden frame 6-8 cm apart and also horizontally in between the stalks, allowing spacing of about 6-8 cm (This allows for good ventilation and light in the house).
- Put some wood (tree branches) on top of the beam as support for the roof.
- Make an appropriate thatch roofing to cover the wooden frame.

This house can be used from brooding to finishing. A portion of the house can be partitioned and open spaces covered with jute sack or polythene sheet to keep the place warm for brooding. The partition is removed when birds are 4-6 weeks to have access to the whole house for good ventilation and spacing.
### 4.5.2 Space requirement

**Table 1. Floor Space Requirement**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Age in weeks</th>
<th>Ft.sq/bird</th>
<th>M.sq/bird</th>
<th>Birds/m.sq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter</td>
<td>0-6</td>
<td>0.6</td>
<td>0.06</td>
<td>18</td>
</tr>
<tr>
<td>Grower</td>
<td>7-20</td>
<td>1.5</td>
<td>0.14</td>
<td>7</td>
</tr>
</tbody>
</table>

Grower stage is 4 weeks and above.

Birds can be reared in one house throughout the brooding and growing period. Floor space is as recommended in the Table 1.

### 5.0 Equipment required

Equipment such as feed troughs, water trough, brooder guard, coal pots, gas heaters, incandescent bulbs and nests are needed for guinea fowl rearing.

Figure 3: Some basic poultry equipment

- Feeders and water troughs can be of such materials as tins/cans or earthenware pots or metal/plastic containers.
- Feeders and water troughs must be secured so that they are not overturned.
- Lanterns or electric bulbs may be used to provide light and heat during the night.

### 5.1. Space requirement for watering and feeding

5.1.1 Water - Chicks require 1.3-1.5cm/keet (0.5-0.6 inches) of trough space. As keets grow, that is from 4 weeks the space must be increased to 2cm/bird (0.8 inches) of trough space at grower stage.

5.1.2 Feeding - Keets require 5cm/keet (2 inches) of trough space. As keets grow, the space must be increased to 7.5cm, (3 inches) of trough space per bird at grower stage.

### 6.0 Raising of Birds

#### 6.1 Preparation for keets

Keets are brooded for a period of 4-6 weeks under hygienic conditions to avoid infections and mortality.

#### 6.1.1 Steps to follow

- Clean and disinfect the brooder house 1-2 weeks before keets arrive.
- Wash and disinfect water/feed troughs and brooder guard.
Guinea fowls have a feed conversion ratio of 4:1 to 4.5:1 and are usually marketed at about 14-20 weeks of age under the semi intensive system of rearing, when they weigh 1.2 - 1.5 kg. Age at sale could be reduced depending on the feeding regime adopted by the farmer.

---

7.0 Biosecurity measures

- Clean and remove weeds and debris outside the house
- The floor of the house must be covered with appropriate bedding material 3 days before keets arrive
- Cover the open spaces/windows with polythene sheet or cement paper during brooding
- Place brooder guard around the source of heat few hours before keets arrive
- The house must be preheated at a temperature of 36°-38°C about 3-4 hours before keets arrive (gas/electric brooders/coal pots and charcoal are recommended). This should be reduced gradually to 32°C by week 4 (ie. reduce by 2°C weekly).
- Two 150 watts incandescent bulbs are recommended for a floor space of 4.95 sqm. (53.28 sqft.) suspended at 5 cm high from the floor level.
- Fill waterers with clean water and place in the house 3-4 hours before keets arrive
- Provide feed on flat pans about 1 or 2 hours after the keels have taken some water.

---

8.0 What to do after brooding

- Avoid wet litter conditions as this promotes the growth of infectious disease.
- Wash troughs with clean water and detergent daily. Provide footbath with disinfectant at the door step.
- The poultry house and feed storage area should be kept free of rodents and wild birds. There should be good aeration and light in all poultry houses.
- Fill waterers with clean water and place in the house 3-4 hours before keets arrive
- Provide feed on flat pans about 1 or 2 hours after the keels have taken some water.

---

9.0 Feeding of Guinea fowl

Guinea fowls have a feed conversion ratio of 4:1 to 4.5:1 and are usually marketed at about 14-20 weeks of age under the semi intensive system of rearing, when they weigh 1.2 - 1.5 kg. Age at sale could be reduced depending on the feeding regime adopted by the farmer.
### Table 2: A feed mixture for keets aged between 0 and 8 weeks

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Max. allow. Limit</th>
<th>Quantity (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>70</td>
<td>17</td>
</tr>
<tr>
<td>Maize chaff</td>
<td></td>
<td>10.3</td>
</tr>
<tr>
<td>Maize mill flour</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Rice bran</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Wheat bran</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Pitomash</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Fish meal</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Soya bean cake (SBC)</td>
<td>30</td>
<td>18.4</td>
</tr>
<tr>
<td>Cotton seed cake (CSC)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Salt</td>
<td></td>
<td>0.3</td>
</tr>
<tr>
<td>Coccidiostat</td>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td>Premix</td>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td>di CaP</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Oyster Shells</td>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>Total weight of feed and nutrients (kg)</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.2 Example 2

<table>
<thead>
<tr>
<th>Feed Ingredient</th>
<th>Quantity in terms of kilos</th>
<th>Quantity in terms of koko bowls (an approximation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn mill waste flour</td>
<td>5.4 kg</td>
<td>22 bowls</td>
</tr>
<tr>
<td>Soya bean cake</td>
<td>42 kg</td>
<td>18 bowls</td>
</tr>
<tr>
<td>Salt</td>
<td>2/3 kg</td>
<td>2/3 of the 500 g sachet or 23 level tablespoons</td>
</tr>
<tr>
<td>Premix</td>
<td>1/4 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>2 kg</td>
<td>4 cups</td>
</tr>
<tr>
<td>Oyster shells</td>
<td>1 kg</td>
<td>Full cup</td>
</tr>
<tr>
<td>Total</td>
<td>99 1/2 kg</td>
<td>Estimated cost of 100 kilos of this feed = $25.00</td>
</tr>
</tbody>
</table>

### Table 3.3 Example 3

<table>
<thead>
<tr>
<th>Feed Ingredient</th>
<th>Quantity in terms of kilos</th>
<th>Quantity in terms of koko bowls (an approximation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground maize</td>
<td>60 kg</td>
<td>24 bowls</td>
</tr>
<tr>
<td>Soya bean cake</td>
<td>15 kg</td>
<td>6 bowls</td>
</tr>
<tr>
<td>Broiler starter concentrate</td>
<td>13 kg</td>
<td>6 bowls</td>
</tr>
<tr>
<td>Cotton seed cake</td>
<td>10 kg</td>
<td>4 bowls</td>
</tr>
<tr>
<td>Salt</td>
<td>1/16 kg</td>
<td>6 tablespoons</td>
</tr>
<tr>
<td>Premix</td>
<td>1/4 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>4/5 kg</td>
<td>2 cups</td>
</tr>
<tr>
<td>Oyster shells</td>
<td>2/5 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Total</td>
<td>99 1/2 kg</td>
<td>Estimated cost of 100 kilos of this feed = $40.00</td>
</tr>
</tbody>
</table>

### Table 3.4 Example 4

<table>
<thead>
<tr>
<th>Feed Ingredient</th>
<th>Quantity in terms of kilos</th>
<th>Quantity in terms of koko bowls (an approximation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground maize</td>
<td>26 kg</td>
<td>10 bowls</td>
</tr>
<tr>
<td>Corn mill waste flour</td>
<td>26 kg</td>
<td>10 bowls</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>10 kg</td>
<td>10 bowls</td>
</tr>
<tr>
<td>Soya bean cake</td>
<td>20 kg</td>
<td>9 bowls</td>
</tr>
<tr>
<td>Broiler starter concentrate</td>
<td>16 kg</td>
<td>7 bowls</td>
</tr>
<tr>
<td>Salt</td>
<td>1/16 kg</td>
<td>6 tablespoons</td>
</tr>
<tr>
<td>Premix</td>
<td>1/4 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>3/5 kg</td>
<td>1 1/2 cups</td>
</tr>
<tr>
<td>Oyster shells</td>
<td>1/3 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Total</td>
<td>99 1/2 kg</td>
<td>Estimated cost of 100 kilos of this feed = $235.00</td>
</tr>
</tbody>
</table>
For guinea fowl health management to be effective, it must aim at preventing the onset of disease or parasite infestation, and to recognise at an early stage the presence of disease or parasites, and to treat all flocks that are diseased or infested with parasites as soon as possible before they develop into serious condition or spread to other flocks.

**10.0. Health management**

For guinea fowl health management to be effective, it must aim at preventing the onset of disease or parasite infestation, and to recognise at an early stage the presence of disease or parasites, and to treat all flocks that are diseased or infested with parasites as soon as possible before they develop into serious condition or spread to other flocks.

**10.1. Signs of ill health in guinea fowls**

Some of the common signs of ill health in guinea fowls are:

- Loss of appetite
- Sore feet
- Dull eyes
- Pale comb
- Ruffled feathers
- Sneezing
- Weight loss
- Coughing
- Sudden death

**10.2. Causes of disease conditions in guinea fowls:**

A disease is any condition that interferes with the normal functioning of the cells, tissues, organs and systems. Diseases of guinea fowl have many causes. These causes include:

- Deficiencies of essential nutrients e.g. vitamins, minerals; or other nutrients.
- Consumption of toxic substances i.e. poisons.
- Physical damage e.g. environmental extremes and injury.
- Parasite infestations i.e. external and internal such as lice and worms.
- Infectious disease caused by micro-organisms e.g. bacteria and viruses.

---

### Table 3.5 Example 5

<table>
<thead>
<tr>
<th>Feed ingredient</th>
<th>Quantity in terms of kilos</th>
<th>Quantity in terms of koko bowls (an approximation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground maize</td>
<td>53 kg</td>
<td>21 bowls</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>10 kg</td>
<td>16 bowls</td>
</tr>
<tr>
<td>Soybean cake</td>
<td>20 kg</td>
<td>9 bowls</td>
</tr>
<tr>
<td>Broiler starter concentrate</td>
<td>16 kg</td>
<td>7 bowls</td>
</tr>
<tr>
<td>Salt</td>
<td>1/10 kg</td>
<td>6 tablespoons</td>
</tr>
<tr>
<td>Premix</td>
<td>1/4 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Dicalcium phosphate</td>
<td>3/5 kg</td>
<td>11/2 cups</td>
</tr>
<tr>
<td>Oyster shells</td>
<td>1.3 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>99 1/2 kg</strong></td>
<td><strong>Estimates cost of 100 kilos of this feed = $40.00</strong></td>
</tr>
</tbody>
</table>

### Table 3.6 Example 6

<table>
<thead>
<tr>
<th>Feed ingredient</th>
<th>Quantity in terms of kilos</th>
<th>Quantity in terms of koko bowls (an approximation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground maize</td>
<td>28 kg</td>
<td>11 bowls</td>
</tr>
<tr>
<td>Corn mill waste flour</td>
<td>28 kg</td>
<td>11 bowls</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>10 kg</td>
<td>10 bowls</td>
</tr>
<tr>
<td>Soybean cake</td>
<td>12 kg</td>
<td>6 bowls</td>
</tr>
<tr>
<td>Broiler starter concentrate</td>
<td>22 kg</td>
<td>10 bowls</td>
</tr>
<tr>
<td>Premix</td>
<td>1/4 kg</td>
<td>Half cup</td>
</tr>
<tr>
<td>Oyster shells</td>
<td>1/10 kg</td>
<td>5 tablespoons</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>About 100 kg</strong></td>
<td><strong>Estimated cost of 100 kilos of this feed = $35.00</strong></td>
</tr>
</tbody>
</table>
10.3 Medication/Vaccination
This is a guide for Vaccination and deworming regime for guinea fowls (please consult the local Veterinary officer for guidance)

Table 4: Vaccination and Deworming regime

<table>
<thead>
<tr>
<th>AGE (DAYS)</th>
<th>MEDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st and 2nd</td>
<td>Glucose in water</td>
</tr>
<tr>
<td>6th</td>
<td>Antibiotic and vitamin premix</td>
</tr>
<tr>
<td>10th</td>
<td>Coccidiostat</td>
</tr>
<tr>
<td>16th</td>
<td>Newcastle</td>
</tr>
<tr>
<td>23rd</td>
<td>Gumboro</td>
</tr>
<tr>
<td>25th</td>
<td>Antibiotic and vitamin premix</td>
</tr>
<tr>
<td>30th</td>
<td>Coccidiostat</td>
</tr>
<tr>
<td>35th</td>
<td>Dewormer</td>
</tr>
<tr>
<td>38th</td>
<td>Fowl pox</td>
</tr>
<tr>
<td>44th</td>
<td>Coccidiostat</td>
</tr>
<tr>
<td>49th</td>
<td>Newcastle</td>
</tr>
<tr>
<td>52th</td>
<td>Antibiotic plus vitamin premix</td>
</tr>
<tr>
<td>56th</td>
<td>Dewormer</td>
</tr>
<tr>
<td>60th</td>
<td>Coccidiostat</td>
</tr>
<tr>
<td>84th</td>
<td>Fowl pox</td>
</tr>
<tr>
<td>98th</td>
<td>Dewormer</td>
</tr>
<tr>
<td>112th</td>
<td>Newcastle</td>
</tr>
</tbody>
</table>

11.0 Breeding
Guinea hens start laying at 22 - 28 weeks of age (with increasing daylight or artificial light) and continue laying for about 9 - 10 months (36 - 40 weeks). The egg-laying period starts from April to September. The eggs average 45 grams and have very hard shells. Local Guinea fowls can lay between 70 to 100 eggs in a year.

The following husbandry practices should be considered:
- Maintain breeding ratio of 1 male : 3 female
- Provide comfortable nest for laying
- Eggs for hatching should be gathered twice daily and stored in a cool dry place

11.1 Egg handling
Egg handling prior to incubation is important to maintain the viability of eggs.

Steps to follow:
- Collect Eggs at least twice daily
- Discard the very dirty ones.
- Dry clean with clean cloth is recommended though the use of fine steel is the best method for hatching eggs.
- Fumigate Eggs shortly after being collected and cleaned.
- Store eggs at 12°C to 15°C for not more than seven days before setting.
- Eggs can be stored in egg crates, calabashes and card boxes lined with cloth.
11.2 Incubation
The normal incubation period for Guinea eggs is 26 to 28 days. Eggs can be hatched either naturally or artificially. Guinea fowls are not usually good sitters and therefore an ordinary hen is used for preference to hatch a small number of eggs. Incubators are used to hatch eggs artificially.

At temperatures above 18°C the embryos can start developing, causing uneven hatching or many early embryonic mortalities may occur.

12.0 Record Keeping
It is important to keep accurate and relevant records in guinea fowl management. Below are samples of records that should be kept by farmers.

Table 5: Hatchery record

<table>
<thead>
<tr>
<th>SN</th>
<th>Date</th>
<th>No. of Eggs Set</th>
<th>No. of Eggs Hatched</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Table 6: Daily Stock Record

<table>
<thead>
<tr>
<th>Date</th>
<th>Beginning stock</th>
<th>Mortality/No. Dead</th>
<th>No. Culled</th>
<th>No. birds sold</th>
<th>No. given out as gift/consumed</th>
<th>closing stock</th>
<th>remarks</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
Table 7: Health Records

<table>
<thead>
<tr>
<th>Date</th>
<th>Type of Treatment/Vaccination</th>
<th>Drug used</th>
<th>No. of Birds</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
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</table>
BI B L I O G R A P H Y


