
EXPERIMENT 7 WATER MEDICATION AND SANITATION IN POULTRY

Structure

7.1 Introduction

Objectives

7.2 Experiment

7.2.1 Principle

7.2.2 Requirements

7.2.3 Procedure

7.2.4 Calculations

7.2.5 Results

7.3 Precautions

7.1 INTRODUCTION

Water medication is required for three reasons: (1) Therapeutic – for treatment of a disease during outbreak, (2) Prophylactic- for prevention of occurrence of diseases, and (3) Supportive- for supporting the life of a bird. Various medicines are given to birds for prevention and/or treatment of diseases or to improve their performance. One of the common methods for medication to the birds is through water. For water medication, it is necessary to work out exact quantity of medicine required according to recommended dose to have optimum effect because, if less medicine is administered, it will not be effective. On the contrary, if more medicine is administered, it may be harmful and a wasteful expenditure. Water is very essential nutrient for life. Provision of good quality and germ-free water is most important for maintaining proper health status of the flock. Water sanitation is essential to destroy harmful microbes in the contaminated drinking water and prevent diseases that may be transmitted through water and help in maintaining proper health status and overall productivity of the birds.

Objectives

After performing this experiment, you will be able to:

- assess exact quantity of medicine required for the flock and arrange medication of the flock; and
- select a sanitizer for water and organize water sanitization program.

7.2 EXPERIMENT

7.2.1 Principle

Medicine to be offered for the birds through water should reach all the birds in correct quantity (dose) within a reasonable period of time before medicine loses its activity in water. Drinking water must be clean and hygienic. Water having >1,000 bacteria/ml and/or >50 *E. coli* organisms/ml is not suitable for birds. Hence, proper water sanitation is absolutely essential to prevent water-related disease.

7.2.2 Requirements

- Common poultry medicines
- Common water Sanitizers

7.2.3 Procedure

The procedures for water medication and sanitation are described below:

(A) Water Medication

- 1) Depending upon the medicine required, select a preparation of your choice. This is because several pharmaceutical companies manufacture the same medicine in different names. Generally, veterinarian/poultry specialist will help select commercial preparations which, in their opinion, are most effective. Commonly used medicines and dosage are listed in the previous experiment.
- 2) Calculate the quantity of medicine required as discussed under 7.2.4 (i).
- 3) Add the medicines to the water tank as per the requirement.

(B) Water Sanitation

Many microorganisms are transmitted through drinking water. Hence, proper sanitation of the water is necessary to reduce the microbial load in the drinking water. The methods of sanitizing water are described below:

(i) Chlorination

Chlorination is the most common method of water sanitation. This is done by treating the water with bleaching powder or liquid chlorine to the water tank as follows:

a) Using bleaching powder

Bleaching powder is a commonly available sanitizer. It is actually a chalk-based chlorine source containing 33% chlorine when fresh. It loses chlorine quite rapidly and hence, bleaching powder is not generally purchased and stored; but used fresh. It is cheap, easy to handle and non-toxic even with over-dosage within a reasonable limit. It is used at the rate of 2 g for every 1,000 litres of water.

- 1) Calculate the volume of the water tank using its geometric measurements as discussed under 7.2.4 (ii).
- 2) Weigh calculated quantity of bleaching powder on a weighing balance.
- 3) Add the weighed bleaching powder into 3 to 5 litres of water; mix thoroughly.
- 4) Transfer the above mixture quickly to the water tank.
- 5) Allow for a reaction time of 3 hours before the water is fit for use.

b) Using liquid chlorine

Many commercial preparations of liquid chlorine are available. Liquid chlorine is used at a rate of 10 ml for 100 litres of water.

- 1) Calculate the volume of the water tank using its geometric measurements as discussed under 7.2.4 (ii).

- 2) Accordingly, measure the required volume of liquid chlorine and add to the water tank.
- 3) Allow for a reaction time of 3 hours before the water is fit for use.

Note

- Since the birds drink less after around 9 pm, bleaching powder/liquid chlorine sanitation can be performed in the night.
- Chlorine containing sanitizer should never be exposed to direct sunlight.

(ii) Other water sanitizers

Chlorine is by far the cheapest of all the sanitizers and effective; therefore, it is by far the most employed water sanitizer. In any case, other water sanitizers, like iodine (in the form of povidone iodine), quaternary ammonium compounds can also be used. They are in the liquid form and are mixed in the water tank as described under liquid chlorine. Dosage suggested for various sanitizers is tabulated below:

Table 7.1: Water Sanitizers - Their Composition and Doses

Type	Composition	Dose
Acid dodecyl dimethyl ammonium chloride	Propionic sodium acetate, Tartaric sodium acetate	1 ml/50 litres
Bleaching Powder	33% available chlorine	2 g/1,000 litres
Chlorine	5% Sodium hypochloride	1 ml/10 litres
Iodine	1.6% iodine	1 ml/10 litres
Quaternary ammonium compounds	2% Dimethyl alkyl-Benzalkonium chloride	1 ml/10 litres

Note

If water contains suspended particles like mud etc., alum must be added and allowed to sediment for 24 hours.

7.2.4 Calculations

(i) For Water Medication

For example: Ciprofloxacin is given at a rate of 15 mg/kg body weight per day.

- Let us assume a flock having 8,000 birds with average body weight of 500 g.
- Total weight would be $8,000 \times 500 \text{ g} = 40,00,000 \text{ g}$. i.e. 4,000 kg.
- At 15 mg/kg of body weight, total quantity of medicine would be $4,000 \times 15 = 60,000 \text{ mg}$. i.e. 60 g per day.

Note: Amount of water required for medication depends upon the feed consumption of the bird per day. Bird consumes 2 ml of water for every 1g of feed consumed. In summer, water consumption would be 3 to 4 ml per 1g of feed.

(ii) For Water Sanitation

Water quantity in a tank can be calculated by measuring volume in terms of cubic feet by using the following formulae:

- Round tank - Volume (cft) = $\pi r^2 h$, where, $\pi = 22 \div 7$, r = radius and h= height (in feet)
- Cubic tank - Volume (cft) = $L \times W \times H$ where, L= length, W= width, H= height (in feet)

Note: 1 cft = 28.3 litres of water. Therefore, capacity of tank = Volume in cft \times 28.3 litres.

7.2.5 Results

Give your opinion on extent of water sanitized at the farm you visited.

.....
.....
.....

7.3 PRECAUTIONS

- Calculate accurately the quantity of medicine required on the basis of dose prescribed, average body weight and number of birds.
- Chlorine based water sanitizer should not be allowed to exposure to direct sunlight.
- Regular monitoring of drinking water for bacterial count and testing of effectiveness of chlorination is a must.