
UNIT 4 ROUTINE MANAGEMENT

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4.0 OBJECTIVES

After studying this unit, you will be able to:

- summarize management of birds during adverse weather;
- demonstrate litter management;
- summarize pest and rodent control measures;
- recognize the importance of carcass disposal; and
- assess the value of poultry manure.
- justify the need for record keeping in a poultry farm;

4.1 INTRODUCTION

There are several routine management procedures which are common to all types of chicken, whether they are broilers or layers or even other species of poultry. These are followed day-to-day as a routine operation. These management particulars are discussed in this Unit.

As a species, birds are more susceptible to heat stress and therefore, steps to reduce heat stress are more or less same for all species. With many birds in our country reared on litter, managing good condition of litter is very important.

All poultry sheds attract pests and rodents. Rodent control, in particular, is not an easy task; improper management can result in a permanent damage by allowing rodents into the sheds. In any farm, death of birds is expected which may be due to infection or stress. Disposal of carcass is extremely important in control of spread of diseases especially when the deaths are due to infection. Manure, which many of you think as a waste, is valuable as a fertilizer and for other purposes as well. Keeping all activities in the farm well recorded is very important without which no one can know whether it is worthwhile to continue poultry farming or not.

4.2 MANAGEMENT OF BIRDS DURING ADVERSE WEATHER

The temperature of 21.1°C is ideal for both broilers and layers. But, on farm, it is not possible to provide the same temperature throughout the year because most of the poultry houses depend on natural ventilation with open windows on the side-wall. Therefore, the birds are exposed to extremes of weather, particularly summer and winter.

4.2.1 Summer Management

Birds tolerate cold better than heat. You will definitely ask why it is so? Human beings have sweat glands through which we can sweat and lose heat. But, the birds do not have sweat glands at all. In addition, they have feathers, which actually helps in reducing heat loss (insulate) from the birds. Therefore, it is more difficult for them to lose heat. The birds in cages, is another added problem due to rearing of more number of birds in the given space and restricted movement.

(i) Effects of high temperature

When the outside temperature reaches 29.4°C, i.e. just 8.3°C above ideal temperature, birds increase rate of breathing and breathe with open beaks; this is referred to as “Panting”. Panting helps lose heat by evaporating water from respiratory tract. Amount of water loss through respiration rapidly increases as temperature increases. To compensate loss of water, birds drink more water. They also excrete relatively more water in their faeces which leads to humidity build-up in the house and litter problems. If litter management is not correct, litter sticks to the feet of birds causing lot of inconvenience and diseases of foot pads like bumble foot, pododermatitis etc. may occur. High temperatures reduce feed consumption. All animals including human beings eat to get our energy requirement. During summer, the energy requirement of the body reduces and hence feed consumption goes down (Table 4.1). This leads to poor growth, production and reproduction in all birds especially in broilers and layers.

Table 4.1: Effect of High Temperature on White Leghorn Layers

Parameters	Temperature (°C)			
	21.1	26.7	32.2	37.8
Feed intake (g / bird/day)	100	87	70	48
Water intake (g / g of feed)	2.0	2.9	4.8	8.5
Water intake (ml/day)	201	254	337	409
Note: Droppings produced @ 1.4 g/g of feed Source : North and Bell, 1990				

You can clearly note from the above table that sudden increase in water consumption and drop in feed consumption occurs due to high temperature. For every °C rise in temperature above 21.1°C, feed intake reduces at the rate of 3.0 %.

In case of layers, increased respiratory rate causes reduced shell thickness. This is primarily due to excessive loss of carbon-dioxide and water, both being required for shell formation. This is further complicated by reduced feed intake which causes reduced calcium intake. Therefore, depending on the severity of summer, shell thickness reduces; sometimes shell-less eggs may be produced. During extremely severe summer, even egg production itself may stop.

Then, you will be interested to know how to manage birds during summer conditions?

(ii) Cool hours during summer

You have already learnt that poultry house is usually constructed with the long axis running east-west to maximize summer shade. Facing the open side to the south also minimizes the effect of the prevailing South-West and North-East monsoon winds in India. Therefore, birds under hot weather are fed during the cool hours of the day viz. at 04.00, 17.00 and 22.00 hours. Alternatively, any schedule to feed before 07.00 or after 17.00 hours at farmer's convenience can be adopted. During summer, the birds are uncomfortable especially when the outside temperature is $\geq 35^{\circ}\text{C}$. Under such conditions, the following are practiced either singly or in combination:

(a) Hot-dry weather

Hot-dry conditions are better than hot-humid conditions because, at least, moisture can be evaporated which helps heat loss and humidity will not be a problem. Under hot-dry weather, the following steps are advised:

- Proper floor space for birds to ensure normal moisture content in litter.
- Proper ventilation to remove excess moisture.
- The floor should be raised at least 0.3 to 0.5 m above the ground level to avoid seepage of water. This should be planned before construction of the shed.
- Sprinkling the entire roof wet.
- Sprinkle surrounding ground area; this will increase relative humidity (RH)
- Use of foggers within the house; this also increases RH.
- Use of fans suspended from interior building structure and positions about 1.2 m above the litter and in the centre of the building to move air down the length of the building. Fans have to be spaced 6 to 15 m apart and tilted about 8°

from vertical to direct air down towards the birds. Fans should have a protective grid to prevent injury to birds as well as to personnel. Fans are placed on the wind-ward side of the house to increase the velocity of air as it blows through the house. If outside temperature is high, the fans are better located inside the house to blow the air length-wise.

- Vertical cooling fans may also be used when temperature is above 37.8°C and are located preferably 3.7 m above the birds and 7.6 to 15.0 m apart.
- Roof can be covered with thatches.
- The side-walls can be covered with gunny clothes which are kept wet by spraying water regularly.
- It is also been found that wood-wool curtains, knitted and fitted in a wire-net, hung over the inlets (side-walls) with a provision of perforated plastic pipe of 0.6 cm diameter fitted on the top of the wood-wool curtain all along the shed to provide running water to wet the pads continuously can help reduce the inside temperature of the tune of 10 to 13°C.
- Reflective roof coatings (white) are also means of combating high temperature. These coatings can reflect considerable solar radiation and reduction up to 1°C can be expected.
- As temperature increases, the water consumed per g of feed consumed dramatically increases, especially above 29.4°C. Thus, the faecal excretion of water also increases during hot weather; the water so excreted evaporates due to heat and causes humidity build-up in the house. However, this can be reduced by simply increasing the airflow during hot weather as air outside will have low RH and can easily drive out excess humidity.

(b) Hot-humid Weather

Birds are most uncomfortable in this weather and the excess humidity further adds to the discomfort particularly because birds cannot sweat. Under such circumstances, the only alternative is to have shady trees all around the house so that roof is always under shade. However, trees definitely reduce ventilation by reducing prevailing winds; this is only a compromise because air-conditioning of poultry house is not an economical proposition in India.

4.2.2 Management during Winter

Since birds can tolerate cold better than heat, winter management is not as difficult as summer. Extreme cold weather is rare in India. Therefore, the winter ventilation control is accomplished by closing the side-wall opening depending on age of birds and temperature. If temperature is too low, side-wall opening is curtailed more and *vice versa*. In cold weather, real problems of humidity build-up arise because, birds consume more food and hence more water. Hence, total faecal matter and water excreted also increases. On the other hand, the heat has to be retained by reducing the airflow which eventually leads to humidity build-up. Thus, the RH increases, can lead to moisture condensation and wet-litter. Therefore, insulation to retain heat to avoid condensation during cold weather is equally important.

Table 4.2: Effect of Low Temperature on White Leghorn Layers

Parameters	Temperature (°C)			
	4.4	10.0	15.6	21.1
Feed intake (g / bird/day)	118	116	110	100
Water intake (g / g of feed)	1.3	1.4	1.6	2.0
Water intake (ml/day)	155	163	178	201
Note: Droppings produced @ 1.4 g/g of feed Source : North and Bell, 1990				

Once again, you can clearly note from the above table, that increase in feed and water consumption were not that rapid and substantial when temperature reduced. For every °C reduction in temperature from 21.1 °C, the feed intake increases by only 1.5 %. This once again proves that birds tolerate cold better than heat.

Check Your Progress 1

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

- 1) How will you manage layers in hot-humid weather?

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- 2) Explain the winter management of birds.

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- 3) Discuss the effect of heat stress on respiration rate and egg production in layers.

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4.3 LITTER MANAGEMENT

You have already learnt that litter consists of absorbent material spread on the floor for rearing birds. In this Section, you will study further about the litter and its management.

4.3.1 Materials Used as Litter

Litter material provides a media for absorbing moisture from faecal matter and also protects the feet of the birds from direct exposure to the floor and thereby minimizing the incidence of bumble foot, foot-sores etc.

Commonly used litter materials are paddy-husk, groundnut kernels, ground maize-cobs, wood-shavings, sawdust, sugarcane bagasse, wheat-straw etc. Of these, paddy-husk is the cheapest, easily available and hence, commonly used in our country.

4.3.2 Thickness of Litter

Initially, 5 to 8 cm thick litter material is spread which will be increased to 8 to 10 cm by 6 to 8 weeks in broilers and 20 weeks in laying-type birds. Bacteria decompose and convert the litter into crumbly and powdery form referred to as “compost litter”

or “build-up litter”. The fermentation also produces heat which helps drying of litter. The heat so produced is also useful in giving warmth to the birds during winter.

4.3.3 Litter Condition

In a well-managed litter, moisture will be between 25 to 30% and such manure, when pressed into a ball in hand and fist is opened, breaks into about three pieces; whereas, a wet litter forms a solid ball and the dry litter falls out like powder.

4.3.4 Keeping Litter in Good Condition

The following are precautions for maintaining good litter condition:

- Proper floor space given for birds.
- Proper ventilation of the house to remove moisture.
- House should have a plinth of at least 0.3 to 0.5 m to avoid seepage of water.
- Concrete flooring is preferred; otherwise, thickness of litter has to be increased.
- Overhangs to the roof must be able to protect the house from rainwater.
- Leaky or overflowing drinkers should never be used; drinkers must be kept on a horizontal plane; watering channels should never overflow.
- Wet or mouldy litter should be replaced at once with good dry litter.
- Litter should be raked several times daily to help drying as well as to prevent caking. It is a very good practice to wade through the litter (see Fig. 4.1) during all routine feeding and watering so that, on one hand, litter is automatically raked and, on the other hand, prevents weight of the farmer moving on the litter cause caking of litter. Even deliberate raking by wading throughout from one end to another is recommended at least twice daily. Frequency can be increased depending on the litter condition.



Fig. 4.1: Raking of litter

- For wet-litter, hydrated lime at the rate of 1 kg or super phosphate of lime at the rate of 0.75 kg per sq. m can be used. A mixture of wood ash and super-phosphate in a ratio of 4:1 can also be used.

- Nutritional causes, if any, for wet-litter should be checked for, and suitable corrective measures to be taken up. For example, excess salt or potassium in the ration, high temperature leading to excess water intake etc.

4.3.5 Causes of Wet Litter

You are already aware of the management causes of wet litter i.e. high temperature and ammonia, poor ventilation and overcrowding. Improper placement of drinkers and leaky drinkers can invariably create problems of wet-litter.

In addition to the above, many other causes can result in wet litter; but it is primarily due to diarrhoea of birds which results in increased moisture excretion through faeces. Many nutritional factors lead to diarrhoea like high sodium, chlorine and potassium in diet, high soybean meal in ration, use of tapioca and barley in the diet, and high-fat diets (which result in sticky faeces). Diseases causing enteritis also result in diarrhoea.

What happens if the litter is wet?

This is the normal question expected. The consequences of wet litter are many; the main ones are as follows:

- In case of chicks, excess moisture (above 30%) leads (on most occasions) to coccidiosis (see Unit 5 Block 2). This causes severe economic loss in the form of mortality and medication cost.
- In addition, diseases such as pododermatitis, hock burn and breast blisters are all a consequence of poor litter (see Unit 5 Block 2).
- Excess moisture in litter leads to increased fermentation process and thereby accumulation of gases like ammonia. Ammonia not only causes discomfort to both birds and the farmer but also causes eye irritation. Severe decrease in weight gain and increased mortality are also expected.

4.3.6 Reuse of Old Litter

Birds can be allowed on litter as long as 16 to 18 months. But, chicks are reared only for 6 months in BGH. Therefore, under emergency only (like shortage of litter material which is very rare), litter can be re-used but with utmost caution because of the possibility of coccidiosis. Generally, used litter in a BGH is sold when the birds are shifted to CLH.

You will definitely get a doubt, how to re-use old litter? The old litter should be from a healthy flock. It is heaped and at the centre of the heap, temperature should be about 51 to 52°C which ensures safety from worm eggs and coccidial oocysts. The heap should be held at this temperature for about 3 to 4 days. If litter is dry, water may be added. If litter is wet, hydrated lime can be added at the rate of 1 kg per sq m of floor area. Following heaping for 3 to 4 days, litter can be re-used.

Check Your Progress 2

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

- How do you assess litter condition?

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2) What are the causes of wet litter?

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3) Explain re-use of old litter.

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Activity 1

Visit a nearby poultry farm. Gather information regarding the litter materials used, thickness of litter, litter management practised followed and whether litter is re-used or not. Give your opinion and suggestion on the overall litter management of the farm you visited.

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4.4 PEST CONTROL

The term “Pest” means bug, insect, nuisance etc. Now, you will agree that there can be several pests in a poultry farm like rodents, flies, lice, mites etc. Rodents are by far the most common of all the pests. Rodents include rats and mice. Rodents eat feed, eggs etc.; more than the loss due to eating, they contaminate feed and damage buildings (curtains, insulation, equipment etc). In addition, they chew electrical wiring which, sometimes, may cause fire due to short-circuit. They also carry many diseases and ecto-parasites. You also know that rodents urinate and the smell of urine attracts other rodents as well.

Another most important factor is reproductive capacity of rats and mice which is very high. Rats and mice breed all through the year and give birth 4 to 8 times; each time 5 to 6 young ones. That means a pair can produce 20 to 48 young ones in one year! The young ones also mature in 3 to 5 months and join the reproducing group. Hence, it is estimated that a pair of rats can multiply to as many as 1500 in one year! But, other natural causes do reduce their numbers; but at least 100 to 200 are likely to survive. Each rat consumes 30 to 60 g feed and a mouse about 3 g per day that means, per year, 10 to 20 kg of feed is consumed by a rat and 1 kg by a mouse. Added to this, they waste twice this amount by spilling and urinating.

4.4.1 Rodent Control

Rodents require feed, water and place to hide; a poultry farm will have all these. Hence, control of rodents can be achieved by proper sanitation, rodent proofing and rodent killing.

(i) Sanitation

- Old equipment should be removed.
- If feed spills while moving or filling feed, it should be immediately cleared.

(ii) Rodent - proofing

Mice require only 6 mm hole to enter into a house. Keeping the door open may help rats and mice enter the house. Therefore, additional precautions like sealing all openings around water pipes, drains and vents with concrete or heavy mesh will greatly help rodent control.

(iii) Rodent Killing

You should always remember that rat poisons (called “Rodenticides”) are poisonous not only to rats but also for humans and birds. Hence, you must be very careful in using rodenticides. Several preparations are available in market in the form of pellets, bars, powder or concentrates. They are classified as single-dose and multiple-dose rodenticides. Single dose rodenticide can kill rodents after they eat it once or maximum twice. Multiple dose rodenticides need to be eaten daily for 7 to 21 days to actually kill the rodents. You can choose any one. The chosen rodenticide is kept at several places simultaneously like near the holes, along the walls, in places where rodent movement is noticed etc. At once it is known that rodents have died, they have to be immediately disposed off far away from the house.

4.4.2 Control of Other Pests

If the litter moisture is maintained $\geq 30\%$, none of the other pests, especially flies, will cause nuisance or economic loss. However, it may not be possible to maintain litter moisture below 30%, especially in cage layer houses and hot-humid conditions.

Check Your Progress 3

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

1) Explain rodent proofing.

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2) Discuss rodent killing.

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3) How will you control other pests?

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Activity 2

Visit a nearby poultry farm. Go around the farm and note down the different pest control measure taken up in the farm. Give your opinion on the pest control measures practised in the farm you visited.

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4.5 CARCASS DISPOSAL

In any farm deaths do occur for various reasons; not all deaths need to be infectious. But what you should remember is any of the deaths could be infectious. If the dead birds are not disposed properly, the least that can happen is that it will be acted upon by bacteria and foul smell will be produced. Therefore, it is compulsory that dead birds (carcasses) are disposed off properly. There are primarily two ways: of disposing the carcasses - one to bury (cremation) and the other to burn (incineration). Either of them is acceptable provided correct procedure is followed. It is a general practice to locate carcass disposal facility near or adjacent to manure pit.

4.5.1 Burial

An underground pit (Fig. 4.2) measuring 2 m × 2 m × 2 m (about 6 ft x 6 ft x 6 ft) with open floor, brick walls with lid made of concrete slab [with an opening of 30 cm × 30 cm (1 ft × 1 ft)] and a vent tube 15 cm (½ ft) diameter having a chimney of at least 3 m (10 ft) with a cap (cowl) at its tip as far away as possible [at least 15 m (50 ft)] from the poultry house is necessary for carcass burial. You may wonder why the bottom of the pit is left without any flooring. Can you imagine and tell? Yes; during degradation of the carcass, some fluids ooze out. To absorb these, the bottom is left totally uncovered.

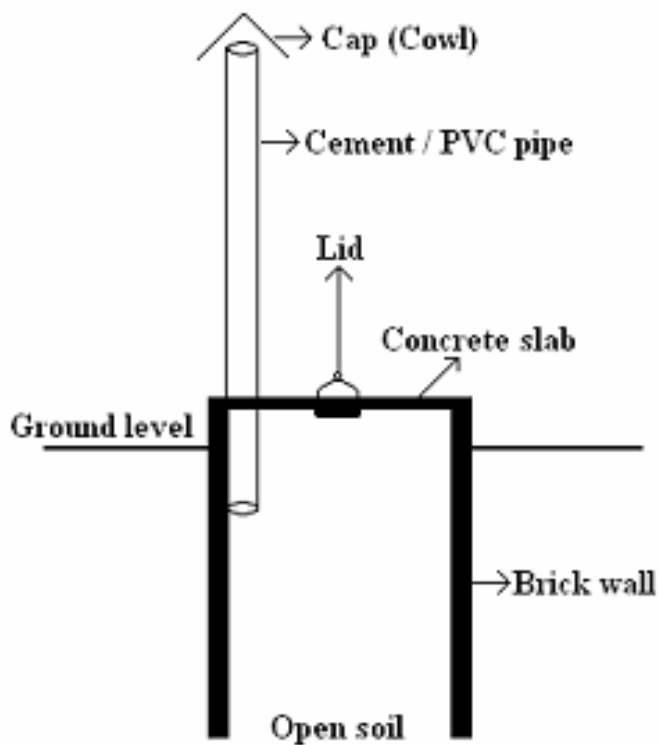


Fig 4.2: Burial pit

4.5.2 Burning

Carcass burning (cremation) is done above the ground level. This requires fuel. The structure is similar to that of burial pit but above the ground. Burning is more hygienic than burial. Dimension of the incinerator (Fig. 4.3) depends on the average number of birds expected to be incinerated per day. However, pipe to take away fumes will be about 3 m long.

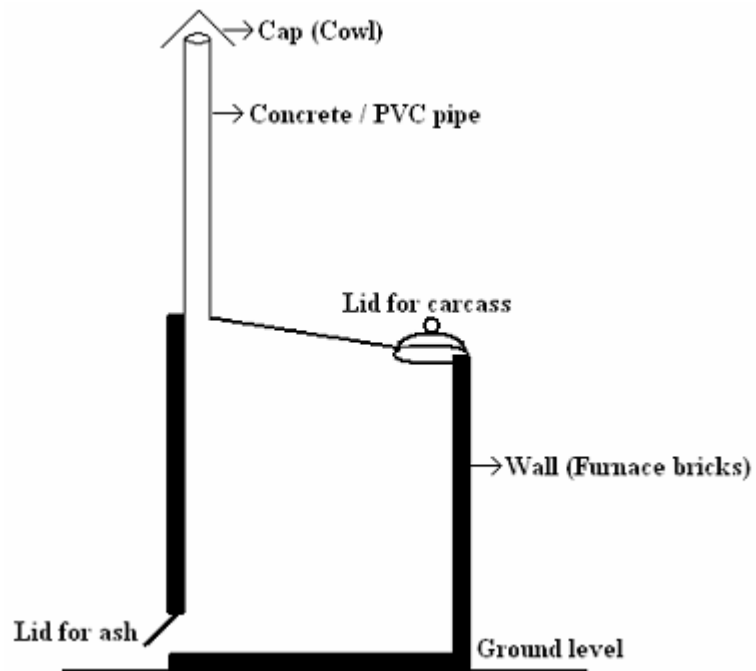


Fig. 4.3: Incinerator

Check Your Progress 4

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

- 1) Give the dimension of burial pit.

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- 2) Why the bottom of the burial pit is left without any flooring?

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- 3) Define carcass burning.

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4.6 POULTRY MANURE

You know that the poultry litter is good manure. Let us now find out how much manure is expected from broilers and layers:

4.6.1 Quantity Produced

Quantity of faecal matter produced remains more or less the same but water content changes, especially at higher temperatures. However, assume that, as a rule of thumb, the birds produce 1.4 g of faecal matter per g of feed consumed. The faecal matter will have a water content of 82%, out of which, only 30% will be left over in a well-managed litter. Therefore, remaining 52% of water is lost by evaporation. Now you will agree that out of 1.4 g of faecal matter produced; only about 0.7 g (about 50%) only will be left over as litter (manure). Quantity of manure expected by broilers and layers are as follows:

Table 4.3: Quantity of Manure Produced

Parameters	Broilers		Layers	
	On litter	In cages	On litter	In cages
Feed consumed, kg/bird	4.00	4.00	40.00	40.00
Faeces produced, kg/bird	5.60	5.60	56.00	56.00
Manure, kg/bird	2.80	2.80	28.00	28.00
Litter material, kg/bird	0.50	Nil	0.50	Nil
Total manure, kg/bird	3.30	2.80	28.50	28.00
Number of birds to produce 1 tonne manure	300	350	35	36

Now, let us consider broilers: each broiler weighs about 2 kg at market of which 1.4 kg will be edible meat. Meat has 18% protein. Hence, each broiler produces 252 g of protein in its meat. It produces 3.3 kg of manure which has at least 9% protein. That means, its manure has 297 g of protein! Naturally, you are totally surprised. Let us consider the case of layers as well. Each layer produces on average 300 eggs, each egg weighing a standard weight of 56.7 g. That means, a total weight of about 17 kg. Eggs have 12% protein. Therefore, total protein in the form of eggs is 2040 g. Each layer also produces 28 kg manure with 9% protein which comes to 2520 g of protein. Again surprising isn't it so? In short, birds are excreting more protein than they are producing in the form of meat and eggs. Therefore, can you say that manure is a waste? Definitely, manure is not a waste but a resource of nutrients at a wrong place.

4.6.2 Composition

You know that manures are assessed for Nitrogen (N), Phosphorus (P) and Potash (K) contents popularly called NPK. Comparison of NPK content of farm yard manure (cattle manure) and poultry manure is as follows:

Table 4.4: Composition of Poultry and Farm Yard Manure (kg/m³)

Type of Manure	Nitrogen (N)	Phosphorus (P)	Potash (K)
Poultry Manure	9.0	5.5	5.5
Farm Yard Manure	2.5	1.0	4.5

4.6.3 Uses

In developed countries, poultry manure is processed by several methods and put to different uses. However, in our country, poultry manure is generally used as follows:

- 1) As fertilizer – composted poultry manure for flowers (especially roses), root crops (potato etc.) and greens (leafy vegetables) at the rate of 113 g/m².
- 2) Raw poultry manure (fresh faecal matter) at 1.75, 3.00 and 3.75 tonnes/ha and deep litter manure at 1.50, 2.50 and 3.00 tonnes/ha for cereals, grass and roots and greens, respectively.
- 3) When open land is adjacent to poultry house, slurry irrigation through pipeline by mixing poultry manure with thrice the quantity water can be undertaken.
- 4) Dried poultry manure can be fed to cattle, sheep and pigs.

Check Your Progress 5

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

- 1) Give the water content in per cent in faecal matter.

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- 2) Describe the composition of poultry manure.

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- 3) How many broilers in cages would excrete one tonne of manure?

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4.7 RECORD KEEPING

It is generally known that every business should have proper records so that whether the business is profitable or not can be assessed as and when required. For instance, in a broiler farm, you may have to decide when to sell the birds and at what rate. For this, you should have correct records of all expenditure you have made so that you can fix a reasonable price which is acceptable in market and profitable to you. Therefore, all records have to be properly maintained.

You already know that loans are available from commercial banks for starting a poultry farm. In such cases where the farm has been started on loan, the bank officials can audit the accounts also. The records must be such that they are accountable, auditable, easy to maintain, easy to understand and convenient to assess the cash flow. It is not possible to give a complete list of all registers required for each of the farms. However, for purposes of a poultry farm, registers ordinarily used are given below:

4.7.1 Records for Bank Transactions

The following records are required for bank transactions:

(i) Journal; (ii) Ledger – feed; (iii) Ledger – chicks; (iv) Ledger – medicines; (v) Ledger – equipment; (vi) Ledger – electricity, water and miscellaneous; (vii) Ledger – sales (Broilers/Culled birds/Spent hens); (viii) Ledger – sales (Eggs); (ix) Ledger – sales (manure); (x) Ledger – sales (Gunny bags); (xi) Cash-book; (xii) Miscellaneous register (to maintain records of land, buildings etc.)

Proforma (details of columns in each page of the register) for various registers are:

(i) Journal

Date	Particulars	Ledger folio	Debit (amount)	Credit (amount)
		Debit Credit		

(ii) Ledger

Separate ledger or separate sheets within a ledger have to be maintained for each of the items like livestock, feed, medicine, sales etc.

Debit				Credit			
Date	Particulars	Journal folio	Amount	Date	Particulars	Journal folio	Amount

(iii) Cash-book

Date	Receipt		Credit	
Opening balance				
	Particulars	Amount	Particulars	Amount

4.7.2 Records for Farm Operations

These registers are not auditable and the information in these are also available in Journal, respective Ledgers and Cash-book. However, these are maintained because they are easy to understand by any farmer. If these are maintained, it will be very easy and accurate to make entries in Journal, appropriate Ledger and Cash-book. The registers that are commonly maintained are:

(i) Livestock Register; (ii) Feed Procurement and Issue Register; (iii) Feed Ingredient Procurement and Compounding Register; (iv) Medicines and Vaccines Register; (v) Building Maintenance Register; (vi) Equipment Purchase and Maintenance Register; (vii) Miscellaneous Expenditure Register; (viii) Sales Register (Birds); (ix) Egg Production Register; (x) Egg Sales Register; (xi) Manure Sales Register; (xii) Gunny Bags Sales Register; and (xiii) Mortality Register.

(i) Livestock Register

Month and year:				Breed/Strain:		Date of hatch:	
Date	Receipt	Issue	Sold	Died/Killed/Culled	Total Debit	Closing Balance	Initials

(ii) Feed Procurement and Issue Register

If you are buying ready-made feed, this register is required.

Month and year:				Breed/Strain:		Date of hatch:	
Manufacturer's name and address:				Feed:		Batch No.	
Date	Receipt	Quantity	Amount	Issue	Balance	Remarks/Initials	

(iii) Feed Ingredient Procurement and Compounding Register

(Separate registers/pages to be allotted to each ingredient)

If you are mixing your own ration, this register will be required.

Month and year:				Ingredient:			
Supplier's name and address:				Batch No.			
Date	Receipt	Quantity	Amount	Issue/Discard	Balance	Remarks/Initials	

(iv) Medicines and Vaccines Register

(Separate registers/pages to be allotted to each medicine/biological)

Month and year:					Ingredient				
Supplier's name and address:									
Date	Receipt	Quantity	Amount	Issue/ Discard	Batch No.	Date of Manufacture	Expiry Date	Closing Balance	Initials

(v) Building Maintenance Register

Date	Building constructed	Cost of construction	Name of construction firm	Remarks
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(vi) Equipment Purchase and Maintenance Register

(Separate sheets for each of the equipments)

Date	Receipt	Quantity	Amount	Supplier Details	Issued/ condemned/ sold	Closing Balance	Remarks
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(vii) Miscellaneous Expenditure Register

Date	Item	Quantity	Supplier Details	Amount	Issued	Closing Balance	Remarks
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(viii) Sales Register (Broilers/Spent-hens/Culled birds)

Month and Year:				Breed/Strain:			Date of Hatch
Date	Opening Balance	Receipt	Sold	Selling Price	Purchaser's Details		Initials

(ix) Egg Production Register

Obviously, this register is required only in layer farms.

Month and year:			Breed/Strain:				Date of Hatch:	
Total hens housed:				Age at sexual maturity:				
Date	Opening Balance	Live Hens	Eggs Produced	Broken	Saleable Eggs	Closing Balance	Cumulative	Initials

(x) Egg Sales Register

This register is required only in layer farms.

Month and Year:			Breed/Strain:				Date of Hatch:	
Date	Opening Balance	Receipt	Sold	Broken or Discarded	Total Debit	Closing Balance	Selling Price	Initials

(xi) Manure Sales Register

Month and Year:				Breed/Strain:			Date of Hatch
Date	Opening Balance	Receipt	Sold	Selling Price	Purchaser's Details		Initials

(xii) Gunny Bags Sales Register

Month and Year:				Breed/Strain:			Date of Hatch
Date	Opening Balance	Receipt	Sold	Selling Price	Purchaser's Details		Initials

Date	Date of		Age (weeks)	Number Died	<i>Post-mortem</i> Findings	Signature of Specialist
	Hatch	Death				

Check Your Progress 6

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

- 1) Name essential types of register required in poultry farm.

.....

- 2) Name essential records of poultry farm for bank transaction.

.....

- 3) Mention the columns in Egg sale Register.

.....

Activity 3

Visit a nearby poultry farm. Note down the records maintained in the farm. Classify them based on the purpose for which they are maintained.

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4.8 LET US SUM UP

In every poultry farm, certain routine management procedures are undertaken. For example, management during adverse weather, especially hot weather, rodent control, record maintenance, carcass and manure handling. Birds tolerate cold better than heat. Therefore, special care is necessary in area where severe summer is expected especially associated with high humidity. Most birds, especially broilers, are grown on litter. Hence, it is essential that the litter condition is maintained well to minimize infections. Rodents are a problem wherever there is feed, water and hiding place. Their control saves considerable money for the farmer. Disposal of dead birds is no less important in maintaining overall health in the farm. Manure which most feel as a waste, is actually a resource at a wrong place. It can be utilized in several ways, although used mainly as manure. In a well-managed farm, accurate record keeping gives a clear picture about the profitability of the business. It helps calculation of various performance criteria defined separately for broilers and layers.

4.9 GLOSSARY

Carcass	: Dead body.
Cft	: cubic feet.
Condensation	: The process by which a gas or vapour changes to a liquid.
Cowl	: Cap or cover on a vertical tube.
Decompose	: To separate into components or basic elements.
Fermentation	: The anaerobic conversion of sugar to carbon dioxide and alcohol by yeast. Any of a group of chemical reactions induced by living or non-living ferments that split complex organic compounds into relatively simple substances.
Incineration	: Burning.
Insulate	: To prevent the passage of heat, electricity, or sound into or out of, especially by surrounding with a non-conducting material.
Manure	: Any natural or artificial substance for fertilizing the soil.
Panting	: Open mouth breathing with increased rate.
Pest	: Insect, bug, nuisance.
Proforma	: Details of columns in each page of a register.
Raking	: To gather or move with or to scrape.
Rodenticide	: Chemical which kills rodents.
Rodents	: Rats, mice, beavers, squirrels etc.
Wading	: To walk in or through something.

4.10 SUGGESTED FURTHER READING

Ensminger, M.B. 1993. *Poultry Science*, 3rd Edition. International Book Distributing Company, Lucknow, India.

North, M.O. and Bell, D.D. 1990. *Commercial Chicken Production Manual*. AVI Publication, Van Nostrand Reinhold, New York, USA.

Sreenivasaiah, P.V. 2006. *Scientific Poultry Production*, 3rd Edition. International Book Distributing Company, Lucknow, India.

4.11 REFERENCES

Sreenivasaiah, P.V. and Venugopal, S. 2008. *Small-Scale Broiler Production*. International Book Distributing Company, Lucknow, India.

Sreenivasaiah, P.V. and Venugopal, S. 2008. *Small-Scale Layer Production*. International Book Distributing Company, Lucknow, India.

4.12 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) Birds are most uncomfortable in hot-humid weather and the excess humidity further adds to the discomfort particularly because birds can't sweat. Under such circumstances, the only alternative is to have shady trees all around the house so that roof is always under shade. However, trees definitely reduce ventilation by reducing prevailing winds; this is only a compromise because air-conditioning of poultry house is not an economical proposition.
- 2) Winter ventilation control is accomplished by closing the side-wall opening depending on age of birds and temperature. If temperature is too low, side-wall opening is curtailed more and *vice versa*. In cold weather, real problems of humidity build-up arise because, birds consume more food and hence more water. Thus, total faecal matter and water excreted also increases. On the other hand, the heat has to be retained by reducing the airflow which eventually leads to humidity build-up. Thus, the RH increases, which can lead to moisture condensation and wet-litter. Therefore, insulation to retain heat to avoid condensation during cold weather is equally important.
- 3) In case of layers, an increased respiratory rate causes reduced shell thickness. This is primarily due to excessive loss of carbon dioxide and water, both being required for shell formation. This is further complicated by reduced feed intake which causes reduced calcium intake. Therefore, depending on the severity of summer, shell thickness reduces; sometimes shell-less eggs may be produced. Under still extreme summer, even egg production itself may stop.

Check Your Progress 2

- 1) In a well-managed litter, moisture will be between 25 to 30%; such manure when pressed into a ball in hand and fist is opened, breaks into about three pieces whereas a wet litter forms a solid ball and the dry litter falls out like powder.
- 2) Management causes like high temperature and ammonia, poor ventilation and overcrowding. Improper placement of drinkers and leaky drinkers can invariably pose problems of wet-litter. In addition to the above, many other causes can result in wet litter; but it is primarily due to diarrhoea which results in increased moisture elimination through faeces. Many nutritional factors lead to diarrhoea like high sodium, chlorine and potassium in diet, high soybean meal in ration, use of tapioca and barley in the diet, and high-fat diets (which result in sticky faeces). Diseases causing enteritis also result in diarrhoea.
- 3) Birds can be allowed on litter as long as 16 to 18 months; but chicks are reared only for 6 months in brooder grower house (BGH). Therefore, under emergency only (like shortage of litter material which is very rare), the litter can be re-used but with utmost caution because of the possibility of coccidiosis. Generally, used litter in a BGH is sold when the birds are shifted to cage layer house (CLH). You will definitely get a doubt – how to re-use old litter? The old litter should be from a healthy flock. It is heaped and at the centre of the heap, temperature should be about 51 to 52°C which ensures safety from worm eggs and coccidial oocysts. The heap should be held at this temperature for about 3 to 4 days. If litter is dry, water may be added. If litter is wet, hydrated lime can be added at a rate of 1 kg per sq m of floor area. Following heaping for 3 to 4 days, litter can be re-used.

Check Your Progress 3

- 1) Rodent-proofing is very important measure in rodent control programme. Mouse require only 6 mm hole to enter into a house; keeping the door open may help rats and mice enter the house. Therefore, additional precautions like sealing all openings around water pipes, drains, and vents with concrete or heavy mesh will greatly help rodent control.
- 2) Rodent Killing is also a very important measure in rodent control programme. You should always remember that rat poisons (called “Rodenticides”) are poisonous not only to rats but also for humans and birds. Hence, you must be very careful in using rodenticides. Several preparations are available in market in the form of pellets, bars, powder or concentrates. They are classified as single-dose and multiple-dose rodenticides. Single dose rodenticide can kill rodents after they eat it once or maximum twice. Multiple dose rodenticides need to be eaten daily for 7 to 21 days to actually kill the rodents. You can choose any one. The chosen rodenticide is kept at several places simultaneously like near the holes, along the walls, in places where rodent movement is noticed etc. At once it is known that rodent(s) has (have) died, it (they) have to be immediately disposed of far away from the house.
- 3) Control of Other Pests is also very important aspect of management of birds. If the litter moisture is maintained $\leq 30\%$, none of the other pests, especially flies, will pose any nuisance or economic loss. However, it may not be possible to maintain litter moisture at or below 30% especially in cage layer houses and hot-humid conditions.

Check Your Progress 4

- 1) An underground pit measuring 2 m × 2 m × 2 m (about 6 ft × 6 ft × 6 ft) with open floor, brick walls with lid made of concrete slab [with an opening of 30 cm × 30 cm (1 ft × 1 ft)] and a vent tube 15 cm (½ ft) diameter having a chimney of at least 3 m (10 ft) with a cap (cowl) at its tip as far away as possible [at least 15 m (50 ft)] from the poultry house is necessary for carcass burial.
- 2) To absorb fluids oozing out of carcass, the bottom of the burial pit is left totally uncovered.
- 3) Carcass burning (cremation) is done above the ground level. This requires fuel. The structure is similar to that of burial pit but above the ground. Burning is more hygienic than burial. Dimension of the incinerator depends on the average number of birds expected to be incinerated per day. However, pipe to take away fumes will be about 3 m long

Check Your Progress 5

- 1) The faecal matter will have a water content of 82%. Of the water in the fresh faeces, only 30% will be left over in a well-managed litter.
- 2) The poultry manure contains 9% nitrogen, 5.5% phosphorus and 5.5% potash.
- 3) About 350 broilers reared in cages would produce one tonne of manure.

Check Your Progress 6

- 1) There are thirteen types of register maintained in the farm and these include: (i) Livestock Register; (ii) Feed Procurement and Issue Register; (iii) Feed

Ingredient Procurement and Compounding Register; (iv) Medicines and Vaccines Register; (v) Building-maintenance Register; (vi) Equipment Purchase and Maintenance Register; (vii) Miscellaneous Expenditure Register; (viii) Sales Register (Birds); (ix) Egg Production Register; (x) Egg Sales Register; (xi) Manure Sales Register; (xii) Gunny Bags Sales Register; and (xiii) Mortality Register.

2) The following are required for bank transactions:

(i) Journal (ii) Ledger – feed (iii) Ledger – chicks (iv) Ledger – medicines (v) Ledger – equipment (vi) Ledger – electricity, water and miscellaneous (vii) Ledger – sales (Broilers/Culled birds/Spent hens as the case may be) (viii) Ledger – sales (Eggs) (ix) Ledger – sales (manure) (x) Ledger – sales (Gunny bags) (xi) Cash-book (xii) Miscellaneous register.

3) In Egg Sales Register about nine columns are entered and these are (i) date (ii) Opening Balance (iii) Receipt (iv) Sold (v) Broken or Discarded (vi) Total Debit (vii) Closing balance (viii) Selling Price (ix) Initials

Date	Opening Balance	Receipt	Sold	Broken or Discarded	Total Debit	Closing Balance	Selling Price	Initials
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