UNIT 2 FARMING SYSTEMS

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2.0 OBJECTIVES

After studying this unit, you will be able to:

- describe the different types of poultry farms available in India;
- differentiate between different poultry farming systems;
- discuss about the backyard and commercial poultry farming; and
- justify the need for breeder and mixed farming.

2.1 INTRODUCTION

Do you know what poultry means? 'Poultry' refers to domesticated birds which are reared for their flesh (meat), eggs and feathers and it includes a number of avian species such as chicken, duck, emu, geese, guinea fowl, ostrich, partridge, pea fowl, pheasant, pigeon, quail, swan and turkey. Poultry farming has become increasingly popular both in urban and rural areas. Poultry farming has become very encouraging enterprise in modern India for small farmers, landless labourers and

educated unemployed youth as well as for big entrepreneurs. It has made tremendous stride and has taken the shape of industry having many plus points such as:

i) Provide eggs and meat which are highly nutritive food as well as a source of income.

ii) It also provides employment opportunity directly or indirectly.

iii) Economic improvement of rural masses can be substantially achieved with introduction of scientific poultry farming which will have many avenues of employment of rural side particularly among educated unemployed and under-employed persons.

iv) Requires less investment to start the enterprise and also expected to get quick return.

v) Mixed farming with poultry provides opportunity for additional income during lean season of crop cultivation.

vi) Poultry manure (waste) is an excellent source of organic manure (fertilizer) which can be utilized for growing field crops.

vii) Poultry farming can be adopted by person working in offices and other business establishments on small scale.

2.2 VARIOUS TYPES OF POULTRY FARMS

Though, you can find chicken farms (for eggs or meat purpose) on a variable size, other farms employing duck, emu, geese, guinea fowl, ostrich, partridge, pea fowl, pheasant, pigeon, quail, swan and turkey are also available. Various types of poultry farms available in India are explained below:

2.2.1 Chicken

In chicken farming, a farmer may opt for starting either a broiler farm or layer farm depending upon the requirement of meat and egg in the area. Further, within layer farming, one can go for egg production, production of replacement pullets, chick production and production of hatching eggs. Besides the nutritive value, eggs have many industrial uses in preparation of adhesives, printer inks, shampoos, soap, varnishes, vaccines, etc. The egg shells are used as mineral-feed to animals and birds. The feathers are used for making various goods such as cushions, mattresses, pillows etc. Some of the day-old commercial hybrid chicks for broilers and layers are as follows:

Broilers: Anak 2000, Hubbard, Hybro Ross, Kegbro, Shaver Starbro, Vencob etc.

Layers: BV-300, BV-320, Bovans White, Deklab, HH 260, Keystone, Shaver Starcross etc.

2.2.2 Duck

The ducks occupy second place to chicken in population of eggs in the country as they are reared mainly for egg and meat purposes. Duck production is mostly concentrated in the eastern and southern states like Assam, Manipur, Tripura and West Bengal followed by Andhra Pradesh, Bihar, Jammu and Kashmir, Karnataka, Kerala, Orissa, Tamil Nadu, and Uttar Pradesh. The duck rearing is more popular due to the following advantages:

- Availability of ponds and waterways. Chickens do not flourish in marshy wetland area, which are ideal for duck rearing (Fig. 2.1).

Fig. 2.1: Ducks in pond

- These watershed areas in addition to lakes and ponds provide algae, earthworms, fungi, insects, small fishes, snails, water weeds etc., as natural food for the ducks and reduce the feed cost.
- Ducks are prolific layers. Even native breeds with a high disease resistance can lay about 160-180 eggs in a year.
- Ducks also enrich the soil by their droppings while foraging.
- Duck eggs are 15-20 grams more heavier than chicken eggs.
- Requires less care and attention in management.
- Comparatively, ducks are more resistant to diseases than chicken.
- Majority of ducks lays eggs before 9.00 A.M. which helps in easy egg collection as well as saves labour cost.
- Acts as biological vector and control many diseases by destroying snails.
- Suitable for mixed farming system such as duck-cum-fish farming.

2.2.3 Emu

The emu is another latest addition to poultry species for commercial use, which has almost similar scope in farming like ostrich. The emu is the second largest bird and native of Australia, where large number of emus are reared in scientifically managed farms for their fat, feather, meat and skin. The body weight of an adult emu is about 40-50 kg and their height is around 1.75 metres. Its egg weight is 0.7 to 1 kg. Their meat is tasty and feathers are in great demand in the international market. The breedable age of emu is 40 years and it attains sexual maturity at an average age of 18 months and the incubation period of egg is 52 days. An adult emu consumes about 3 kg of feed. The meat yield is 25 kg at the slaughterable age of 12 months. The emu oil is a natural product and has been used for the treatment of muscular and arthritic pain. The beauty and body care products with emu oil are now available in the market. On account of better penetrating quality, the emu oil is absorbed rapidly.

Fig. 2.2: Emu

2.2.4 Geese

Geese are very popular (next to chicken) in Russia. Male geese are known as gander and the females are called geese. In India, the Brown-backed and White geese are found (Fig. 2.3).

Fig. 2.3: Geese

Some of the specific characteristics of geese are as follows:

- Hardy and can easily adapt to different feeding and management conditions.
- Have the ability to digest 40-50 % crude fibre; as such, the feed cost can be reduced by incorporating large quantities of high-fibre containing forages in the feed.
- Geese meat has high caloric value.
- Goosling (young geese) can attain 5 kg weight at 8 weeks of age with the feed conversion efficiency of about 3.0 kg, that is, it can gain 1 kg body weight by consuming 3 kg feed.

2.2.5 Guinea Fowl

India has a large population of guinea fowl and ranks third after chicken and duck. It is well adapted to diverse agro-climatic conditions prevailing in arid and semi-arid

regions and also well accepted by the marginal farmers as well as other vulnerable groups as small-scale poultry enterprises raised under free-range in the states of Madhya Pradesh, Punjab, Uttar Pradesh and some parts of India. Lavender, Pearl and White are the three commonly known varieties of guinea fowl in India.

The notable features of guinea fowl are:

- Hardy, disease resistant, need low input and has unique ability to survive and thrive under sub-optimal management and feeding conditions because of its foraging habit.
- Meat is tender but pinkish red or dark in colour (Fig. 2.4) and having flavour of game bird.
- Seasonal breeder and lay eggs between March and September.
- Come into production in about 30 weeks of age and lays 130-170 eggs in the first years. The average egg weight is 43-48 g.
- Highly resistant to viral disease and therefore, they are generally raised without any vaccination.

Fig. 2.4: Guinea Fowl meat

2.2.6 Ostrich

In the recent years, ostrich farming in India is also gaining momentum, though the ostriches are native of Africa. The ostrich is hardy and are the largest among the living birds at present. Locating the ostrich farms in an area suitable for Lucerne growing has an advantage since grazing of Lucerne by chicks is a method of rearing which yields excellent result. In order to have a better cash flow, the ostrich farming can be practised along with other crops, horticulture and livestock farming. It is however, not advisable to confine ostrich farming with production of other avian species such as domestic fowl, emu, turkey etc., as the risk of spread of diseases between such species is high. Day-old ostrich chicks weighs about 600-700 g and reach slaughter weight at the age of 7-8 months, weighing 150 kg with a height of 2.5 m. An ostrich can live up to 70 years and can breed for 40 years, at the rate of more than 20 chicks per year, and can produce 15 square ft. leather hide and 30 kg premium meat. The weight of one egg is 1.5 kg. The adult ostrich consumes about 5 kg feed per day.

2.2.7 Partridge and Pheasant

Rearing some of the game birds like partridges and pheasants are also popular in India. The partridges may be bred until or beyond 5-8 years whereas pheasants are usually bred for one year. The partridges fight, even while young, when put in groups. Hence, even brooding is preferably done with less than 30 chicks in one group. On an average, the partridges lay 30 eggs in spring and summer. Chinese Ring Neck pheasant is the most common game breed. The pheasants lay in clutches of 10-12 eggs and the eggs hatch in 23-24 days. Their rearing techniques are different for different purposes.

2.2.8 Peafowl

Indian blue is the common breed with Java Green and Congo being the other breeds of peafowl. A male can mate with 5 females and laying begins after 2 years of age. Usually, 10-12 eggs are laid in one year.

2.2.9 Pigeon

Pigeons are reared for fancy, flyers, meat and sports purposes. Homer, Swiss Mondaine and White King are important breeds of pigeon available in India. They mate in pairs and remain faithful throughout their life. The house for pigeons is called 'loft'. The female pigeon will usually lay 2 or 3 eggs in a clutch and the clutch interval will be 4 to 5 weeks. The males incubate eggs during mid-day and females during the rest of the time; the eggs hatch by 17^{th} day and young one is referred to as squab. Both the parents take care of the feeding of young ones by regurgitating (bring back) the crop contents called 'crop milk' or 'pigeon milk'. Pigeons, like geese, are very fast growing.

2.2.10 Quail

The term 'quail' refers to a group of small-sized birds, which generally run rather fly to escape from danger. Japanese quail is a sub-species and mostly reared in India. They are first raised as pets or singing birds, but now they are widely used for meat and egg. The reasons for popularity of quail farming are as follows:

- Hardy and it can adapt to various environments.
- Do not require specially designed house.
- Fast growing birds, mature in about six weeks and are usually in full production by about seven weeks of age. The live weight of mature bird is 120-150 g for male and 150-180 g for female.
- Prolific layers produce three to four generations per year and lay 260 eggs in their first year of lay.
- The adult hen will consume 20 to 25 g of feed per day and lay egg of 10 to 12 g in weight.
- Comparatively, less floor, feeder and water space in required in comparison to chickens and ducks.
- More resistant to diseases than chickens.
- Require less capital investment.

2.2.11 Swan

The swans are mainly ornamental. Common breed is Mute Swan which has no voice. They mate in pairs and, like pigeons, remain faithful throughout their life. Females breed as long as 30 years and males live up to 60 years. They lay only 6-8 large, greenish-white eggs per year which hatch in 35-40 days (six weeks).

2.2.12 Turkey

Among the various poultry species, turkey is mostly reared for meat purpose. In India, turkey production is still in its infancy (initial stage). Small flocks are available at some of the Agricultural Universities and Private farms for research and development purpose only. Since the turkey poults and hens are bigger in size, their cut-ups can be marketed in various attractive packaging suited to the individual consumer. They are more resistant to disease than chicken and therefore, rarely suffer from diseases. The turkey farming has the following benefits:

- Grows very fast.
- Can be reared under range system in the backyards.
- Turkey egg weighs 1.3 times more than the chicken egg.
- More resistant to diseases than the chickens.
- Better forager than chickens.
- Turkey meat contains very less fat as compared to meat of other avian species.

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) What are the different types of poultry farm?

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2) Which type of poultry farming is most commonly practiced in India?

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3) What are the benefits of turkey farming?

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4) Name any three advantages of duck rearing?

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Activity 1

Survey your locality and collect information on different types of poultry farms available and their scope. Which type of poultry farm do you think will be suitable for your locality and why?

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2.3 DIFFERENT TYPES OF POULTRY FARMING SYSTEMS

Do you know what poultry farming system means? Poultry farming system is the method of rearing birds based on the purpose for which they are reared for. There are different types of poultry farming systems practiced in our country from backyard to commercial unit, small to big farm and for production of fertile eggs to table eggs.

2.3.1 Backyard Poultry Farming

Backyard Poultry Farming by and large is a low input or no input activity and is characterized by indigenous night shelter, scavenging system with little supplementary feeding, natural hatching of chicks, poor productivity of birds (low egg production and reduced weight gain), local marketing and no health care practice. Since time immemorial, the backyard poultry farming has played an important role to meet the domestic as well as socio-cultural needs of the rural people. Recently, the traditional poultry farming in villages, which was the primary source of animal protein and supplementary income for more than 50 per cent of the population of this country, has suffered due to commercialization. In true sense, the backyard poultry rearing consists of 5 to 10 birds per household. The major constraints identified for this farming system were high incidence of diseases, lack of suitable germplasm and attack by predators.

In backyard poultry farming, most of the farmers keep the birds in kuccha house prepared using locally available materials like broken bricks, mud, tiles, wire net, wood etc., whereas, only few people generally keep the birds in pucca house. The average length, breadth and height of the poultry house constructed normally are 4 feet, 3.5 feet and 2.5 feet, respectively. Such houses are easy to clean and help in frequent removal of droppings thus reducing susceptibility to diseases and parasites.

Under this system, the farmers release the birds early in the morning and leave the birds for scavenging in the surroundings of the house, fields, gardens, village, alleys etc. During scavenging, the birds generally consume kitchen waste, ants, earthworms, grasshoppers, green grasses, leafy vegetables, seeds etc. In addition to scavenging,

sometimes, the poultry owners offer a handful of broken bajra, maize, rice, wheat etc.

Normally, the poultry owners follow the process of natural hatching of chicks, where the desi broody hens are used as natural incubator. Women are generally engaged in caring of broody hens by providing them nesting place, food and water till hatching. The nesting place are generally located in isolated dark corner of the house to avoid any disturbance and are usually provided with sufficient litter and bedding material. Generally, 8-10 eggs are set under each broody hen and after 21 days, chicks are hatched out. After hatching, the chicks are generally removed on the second or third day from the broody hens and allowed to scavenge with their mother. The average age at first laying is around 7-8 months. The weight of eggs range from 35 to 40 g with an average egg production of 50-60 eggs per hen per year. The average body weight and age at the time of disposal of bird is 1.5 to 2 kg and 70-80 weeks, respectively.

In the North-eastern India, the demand for rural backyard poultry is quite high especially in tribal areas. The small rural producers produce coloured birds and brown shelled eggs under backyard poultry and their products meet the requirements of the rural consumers. Thus, there is a need to take up specific rural poultry production programme.

With the initiative of Indian Council of Agricultural Research (ICAR), New Delhi, the All India Coordinated Research Project on Poultry (AICRPP) started programme for upgradation of low input technology birds in different parts of the country and finally release certain high yielding varieties like Giriraja, Gramlakshmi, Grampriya, Krishilayer, Vanaraja etc.

2.3.2 Commercial Poultry Farming

In the past, the poultry rearing was a supplementary occupation i.e. chickens were kept for obtaining some additional money and in some cases for cock fighting. In some communities, the fowl is still used, as in the past, as a means of knowing when daytime is nearing.

Gradually, the poultry keeping developed into a commercial enterprise involving thousands of bird. Large poultry units replaced small ones, while more efficient strains of birds, balanced feeds, intensive housing and better poultry equipment came into use.

In commercial intensive poultry farming, there are many managemental techniques followed to increase the net profit. Besides, there should be good stock of birds, adequate water supply, regular quality feed supply, availability of a nutritionist within the farm together with laboratory facilities can be of great help. The diagnostic facility with Veterinary services is also prime importance in commercial farm to take care of sudden occurrence of any problems. In addition to this, regular disposal of all the wastes, both solid (manure) and effluent should be followed. Once all these conditions are fulfilled, a definite set-up of the farm can be chosen. The poultry units as a whole individually owned or part of an integrated company should be large enough to get the advantage of discounts in prices of inputs, and extra charges to be paid for the off-farm products. The important commercial poultry operations in our country is the production of egg and meat.

(i) Commercial Egg Farming

Commercial egg production is a highly competitive business that involves a substantial investment of capital. The commercial egg production can be achieved either from

chicken or duck. The popular commercial chicken strain like BH-78, BV-300, BV-320, HH-260, ILI-80, ILM-90, ILR-90 and Starcross-288, and popular commercial duck breed like Khaki Campbell and Indian Runner can be used for egg production. These birds lay over 280-300 eggs or more per year, if properly fed and maintained. Successful commercial chicken farms today are likely to have 10,000 to 50,000 layers and individual farms often have 1,00,000 or more.

(ii) Commercial Broiler Farming

Similar to that of egg farming, the commercial broiler production also can be achieved either through chicken or duck. B-77, CA-42, IBB-83, Vencobb are some of common commercial broiler strains of chicken. Similarly, Aylesbury and Pekin are the best breeds for commercial duck broiler production. Chick or duckling of this type grows very fast. The table type bird must be tender meated with soft, pliable, smooth textured and flexible breast bone.

(iii) Factors influencing egg and meat production

For efficient poultry business operation and control, the factors influencing egg and meat production are as follows:

A) Egg production

This is one of the important poultry operations at present in our country and continues to be so in near future. Layers may be maintained either on deep litter or in cages. Cages are becoming more popular Layer farming involves raising point-of-lay pullets (replacement stock) and maintenance of layers. These can be separate operations or more popularly the combined one. The important factors that influence egg production are stock, size of unit, stock density, stock replacement policy, diet and egg sales.

- **Stock**: The genetic potential of birds in terms of egg production, efficiency of conversion of feed to egg, livability and other economic traits are fully expressed when conditions of management, nutrition and disease control are optimum. This underlies the importance of source of genetic material that is 'stock'.
- **Size of the unit:** The unit size may range from a small unit of not more than 100-200 layers to a large flock of more than 10,000-50,000 layers. In larger units, the capital expenditure is usually large than in smaller units because of the expensive house needed to control extremes of climate more effectively.
- **Stock density**: Stocking density involves two things: Area per bird and colony size. Both these act independently and additively in influencing the performance of layer and profitability. Increased colony size and decreased area per bird decreases egg production and increases mortality. The birds on floor are more susceptible to variation in stocking density than caged layers.
- **Stock replacement policy**: For layers, the stock replacement policy depends on housing policy and age of replacement of layers. If the stock is procured at point of lay, the housing policy is fixed that is once the point of lay pullets are placed in the house, they are removed after desired laying period for disposal either by selling or slaughter (killing). After the flock is disposed, the house is cleaned and next batch of point of lay pullets are placed.
- **Diet:** Feed is the dominant cost item in egg production operations. Every effort should be made to minimize the feed cost without lowering the performance of the bird. Feed is required for maintenance of body mass of the bird and for production of egg in layers.

- **Egg Sales:** The average price of the eggs received is one of the important factors determining the returns in egg production business.

B) Meat (Broiler) production

In broiler production, a short term large investment is needed. The entire investment is required in the form of capital expenditure as returns occur only at the end of operation. It is best to follow All-in-All out system in broiler production for more efficient operation and to reduce disease occurrence. The important factors besides cost of input and output are the stock, number of units per year, feed conversion, optimum age at market weight and utilization of floor space.

- **Stock:** Broiler chicks must be capable of rapid growth with excellent livability. The nutrition, environment control and management play a significant role in influencing profit and worth only with stock capable of rapid growth.
- **Number of broiler units**: The number of broiler units raised per year depends on the growing period and down time. Down time is the period the house is occupied with no birds, for cleaning and preparing the house for next batch. This is usually 7 to 15 days.
- **Feed and feed conversion**: Feed is the largest single item of expenditure. The rate at which the feed is utilized for conversion to meat is important in broiler production. Feed is required both for maintenance and growth. The feed conversion efficiency decreases with increase in age of broilers.
- **Age at market weight**: This is the optimum killing age of broilers and is related to cost of feed and price of broiler.
- **Maximum utilization of space**: For efficient operation and to keep the disease level low, All-in-All out system is preferable in broiler production. In this case, all the birds are housed in the same house at the same time and disposed off at the same time.

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.

1) What do you mean by backyard poultry farming?

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2) What are the different types of commercial poultry farming?

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3) What are the factors affecting egg and meat production?

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2.3.3 Breeder Farming

In India, the development of productive broiler and layer strains with efficient parent stock is brought about by several breeder farms located in different parts of the country such as Bangalore, Coimbatore, Hyderabad and Pune. The main objective of this type of farming are to maintain breeder stock for production of large number of fertile eggs and good quality chicks.

Breeder flocks are managed basically by using the same technique that is applicable to layers. Their management from one day old to point of lay are also basically identical. The minor differences in practical details rest on the assumption that the breeders require more physical stamina and fitness to perform satisfactorily as breeder. It is sought to impart these qualities through feeding and physical exercises. Breeder stocks are given more floor, feeding and water space. However, culling of the breeders is more frequent than layers. To prevent precocious (early age) mating, males and females are managed separately till maturity.

Adult breeders are usually kept on the floor. Their maintenance in cages will necessitate artificial insemination. The mating ratio in case of breeder flock varies depending on the type of mating and type of breed. The males are introduced to the female flock at about 6 weeks after point of lay of the pullets. By then, the pullet breeders must have reached the egg size suitable for setting. Good quality eggs should be ensured through clean and adequate nesting facilities and frequent egg collection.

The efficient production of fertile hatching eggs, both for producing pullets for commercial egg layers as well as for the broiler chicks, depends on continuous and skilled management of the breeder birds. Although both types of breeders are kept for the same purpose (production of fertile hatching eggs), one must realize that the two types of birds are completely different.

Commercial egg layers can be further divided into white-egg layers (White Leghorns) and brown-egg layers (Rhode Island Red). Likewise, meat-type broiler breeders parents can be divided into normal or standard meat type breeders and mini or dwarf-type breeders. For commercial production, the mini type female is mated with standard male, thus producing standard broilers. Several different types of broilers are used in the industry, depending on the local market situation.

Rearing programme of the breeder flock:

- **Housing:** The breeder stock can be reared successfully on deep litter or in breeder cages. The minimum floor space required is 1860 cm^2 in deep litter, 450 cm^2 for females and 700 cm^2 for male breeders in cages. About 15 cm feeder space and 2.5 cm drinking space with one nest for every four layers is required. It is always advisable to rear the cockerels separately from the pullets
- **Flock uniformity:** It is important to maintain the flock with uniform body weight; that should coincide with the recommended weight of the particular strain. This will be more helpful in exploiting the genetic potential of the breeder especially

for hatching egg production. Better the uniformity of growing birds, better the future egg production. From 4 weeks of age, breeder chicks should be grouped according to the body weight. The weak chicks should be taken extra care for attaining uniformity. At any stage, the breeder flock must be having at least 80 per cent uniformity. In general, breeders will be slightly heavier if raised during winter and slightly lighter if reared during summer.

- **Feeding programme:** Feed has direct effect on the productive and reproductive performances of the breeder flock and is considered as the most important single factor influencing the fertility and hatchability of hatching eggs. The development of embryo is entirely dependent upon the contents and structure of the egg for its supply of nutrients. Therefore, breeder flock must be fed rations (feed) that will supply adequate quantity of nutrients needed for the embryonic growth. Separate feeding of breeder hens and cock should be followed for obtaining proper fertility and hatchability.

- **Breeding programme:** The males are to be reared separately up to 21 weeks and then introduced into the breeder flock. To achieve maximum fertility in hatching eggs, maintain at least 12 per cent males in case of natural mating and 8 per cent in case of artificial insemination. At the beginning of breeding season (22 weeks) introduce 8 males per 100 females. Replace the weak, lame and sick males quickly. In case of artificial insemination, at any given time, at least 5 per cent males which can yield at least 0.5 ml semen per ejaculation (collection) with not less than 60 per cent motility (movement) should be utilized for breeding. Inseminate females once in 5 days with 0.03 to 0.05 ml of neat semen within 30 minutes of collection.

- **Health care programme:** This is more or less similar to the programme followed for commercial layers. These programmes vary from place to place and time to time depending on the prevalence of diseases in the area. The only difference in the vaccination programme will be that killed vaccines are given for the diseases like Infectious Bronchitis, Infectious Bursal Disease, Mycoplamosis, Ranikhet Disease etc. Generally, these vaccines are repeated at 45 weeks of age in order to increase the maternal acquired immunity to the chicks. Fowl cholera vaccine will be given at 10 weeks of age in endemic (prevalent) area. Moreover, cock should be tested for mycoplasma and salmonella at around 16 weeks of age and the positive reactors should be eliminated. Deworming will be done every month or once in 6 weeks in deep litter system and once in two months in case of cage system and slat reared breeders.

- **Bio-security programme:** Bio-security is an integrated programme involving the expenditure for resources with an anticipation of return through enhanced productivity. Bio-security should be viewed as a comprehensive system to prevent disease outbreaks. Effective bio-security should be economically justified and should be consistent with the design of housing, layout facilities and the competence and capability of managers and workers.

In addition to the regular recommended health care, feeding, watering, medication and vaccination programmes, adaptation of the following measures will help in improving the overall efficiency of the breeder farm:

i) Breeder flock complex should be located in areas where there is no backyard poultry or high density of commercial poultry.

ii) In integrated operations, the breeder flock complex should be separated from commercial flocks.

iii) Breeder farms should be located sufficiently close to public roads to facilitate access, but individual units should be subjected to limited entry to unauthorized persons or vehicles.

iv) All houses in the breeder farm operations must be locked except when authorized workers are present.

v) All the persons involving in the breeder farm operations have to necessarily undergo complete decontamination including shower and has to wear appropriate outer clothing supplied for the unit.

vi) Each breeder farm should be independent in respect of equipment and installations.

vii) Egg packing materials can serve as a significant route of introducing ecto-parasites and infections into the breeding farms. Hence, plastic washable egg filler flats should be used and should be thoroughly disinfected before reuse.

viii) Avoid contaminated feed at any stage of the breeder flock.

ix) Special provisions should be made to remove sick, injured or dead birds from flocks.

Therefore, better management of breeder flock for the hatching egg production is the ultimate result for the growth of the poultry industry.

2.3.4 Mixed Farming

Agriculture is still considered to be the major sector providing employment in India. However, the small and marginal farmer families and agricultural labourers have to face un-employment and under-employment due to seasonal work in crop production and also due to the natural calamities occurring at one or the other seasons of the year. Therefore, the mixed farming system seems to provide better means of providing regular employment to these sections of rural mass. The employment potential of mixed farming system is higher than individual farming. A sustainable mixed farming model which is economically viable integrating different component like pig, poultry, duck and fish are very much important for upliftment of rural economy. Further, better utilization of land, water, input and output resources have been observed in the mixed farming model as compared to individual farming. Some of the mixed farming systems are discussed below:

(i) Poultry-cum-fish farming

It is an economically viable system with fish production levels of 4500-5000 kg fish per hectare. An advantage of this system is that the residual animal feed in addition to the excreta could also be used as feed for fishes to increase the biological productivity of water. Secondly, the droppings of the birds can be used directly as fish feed for omnivorous fishes such as common carp by constructing the huts over the fish ponds. One adult chicken produces about 25 to 30 kg manure in one year; 500-600 birds are sufficient for fertilizing one hectare water spread area. Deep litter poultry manure is applied at 40-50 kg/ hectare daily depending on the status of the water quality in the pond.

(ii) Duck-cum-fish farming

It is the most common mixed farming system. Ducks are considered as live manuring machines of the fish ponds. Ducks help in aerating the pond waters. Ducks also make a safe environment for fish by consuming young frogs, tad poles, dragon fly etc. Average size of about 300 ducks would be sufficient for fertilizing one hectare water spread area.

(iii) Poultry-cum-pig-cum-fish farming

This is the most profitable mixed farming system. In this system, 270 number of chicken are kept with 30 pigs. The excreta of 30 pigs will be sufficient for a pond area of one hectare for fish farming.

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) How do you manage breeder stock?

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2) What are the advantages of mixed farming over individual farming?

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3) Among all mixed farming systems, ... is the most profitable one.

Activity 2

Survey your locality and collect information on different types of farming systems practices by the farmers and their scope. Which type of farming system do you think will be suitable for your locality and why?

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2.4 LET US SUM UP

The 'poultry' refers to domesticated birds which are reared for their flesh, eggs and feathers. Chicken and ducks are kept for commercial production of both egg and meat. The various types of poultry farms are chicken, duck, turkey, geese, quail, emu, guinea fowl, swan, pea fowl, pigeons, pheasants, Ostrich, partridges etc.

Backyard poultry farming by and large is a low input or no input venture and is characterized by indigenous night shelter, scavenging system, with little supplementary feeding, natural hatching of chicks, poor productivity of birds (low egg production and weight gain), local marketing and no health care practice. In the past, poultry rearing was a supplementary occupation. Gradually, poultry rearing developed into a commercial enterprise involving thousands of bird. Breeders are managed basically by using the same technique that is applicable to layers. Their management from one day old to point of lay are also basically identical. The minor differences in practical details rest on the assumption that the breeders require more physical stamina and fitness to perform satisfactorily as breeder. The mixed farming system seems to provide better means for providing regular employment to rural mass.

2.5 GLOSSARY

Breeders : Birds which produce hatching eggs.

Broiler : Meat type bird.

Clutch : The complete set of eggs produced or incubated at one time.

Cockerel : A young domestic cock (adult male bird).

Commercial : Profit making.

Entrepreneur : One who starts a business or other venture that promises economic gain but that also entails risks.

Fertility : The state of being fertile; capable of producing offspring.

Foraging : The act of looking or searching for feed.

Hardy : Able to survive under unfavourable weather conditions or able to with stand difficult conditions.

Indigenous : Local.

Layer : A hen kept for laying eggs.

Manure : Poultry excreta.

Omnivorous : Feeds both on plants and animals.

Poultry : Domesticated birds like chicken, duck, quail, turkey etc.

Predators : An animal that lives by capturing and eating other animals.

Pullet : A young hen, less than one year old.

Scavenging : Eating outside in an open area.

Stock : Birds or animals kept for use or profit.

Venture : An investment that is very risky but could yield great profits.

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2.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) The various types of poultry farms are chicken, duck, emu, geese, guinea fowl, ostrich, partridge, pea fowl, pheasants, pigeons, quail, swan and turkey.

2) Among all types of poultry farms, the most common farming practised in India are chicken and duck.

3) The turkey farming has the following benefits:

- Grows very fast.
- Can be reared under range system in the backyards.
- Turkey egg weighs 1.3 times more than the chicken egg.
- More resistant to diseases than the chicken.
- Better forager than chickens.
- Turkey meat contains very less fat as compared to meat of other avian species.

4) The advantages of duck rearing are as follows:

- These watershed areas in addition to lakes and ponds provide algae, earthworms, fungi, insects, small fishes, snails, water weeds etc., as natural food for the ducks and reduce the feed cost.
- Ducks are prolific layers. Even native breeds with a high disease resistance can lay about 160-180 eggs in a year.
- Ducks also enrich the soil by their droppings while foraging.
- Duck eggs are 15-20 grams more heavier than chicken eggs.
- Requires less care and attention in management.

Check Your Progress 2

1) Backyard Poultry Farming by and large is a low input or no input venture and is characterized by indigenous night shelter, scavenging system, with little supplementary feeding, natural hatching of chicks, poor productivity of birds (low egg production and weight gain), local marketing and no health care practice.

2) The different types of commercial poultry farming are layer farming for egg production and broiler farming for meat production.

3) The important factors that influence egg production are stock, size of unit, stock density, stock replacement policy, diet and egg sales. The important factors besides cost of input and output are the stock, number of broiler units per year, feed and feed conversion, optimum age at market weight and utilization of floor space.

Check Your Progress 3

1) Breeders are managed basically by using the same technique that are applicable to layers. Their management from one day old to point of lay are also basically identical. The minor differences in practical details rest on the assumption that the breeders require more physical stamina and fitness to perform satisfactorily as breeder. It is sought to impart these qualities through feeding and physical exercises.

2) Mixed farming system provides better means of regular employment to these sections of rural mass. The employment potential of mixed farming system is higher than individual farming. A sustainable mixed farming model which is economically viable integrating different component like pig, poultry, duck and fish are very much important for upliftment of rural economy. Further, better utilization of land, water, input and output resources have been observed in the mixed farming model as compared to individual farming.

3) Poultry-cum-pig-cum-Fish farming.