
UNIT 1 OVERVIEW OF POULTRY FARMING

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1.0 OBJECTIVES

After studying this unit, you will be able to:

- summarise Indian Poultry Industry, its strengths and achievements; and
- explain various terminologies used in poultry farming.

1.1 INTRODUCTION

In this unit, you will get a clear idea about the poultry industry, which you are already or will be a part of it. The study about poultry and poultry industry is not only interesting, but it is informative too. The term **“Poultry”** indicates all domesticated species of birds like chicken, duck, emu, geese, guinea fowl, ostrich, pigeon, quail and turkey. Commercial poultry production in India is only 40 years old, although the poultry raising dates back to pre-historic times. Hybrid layer strains were introduced into India in 1955 and broiler strains in 1961.

In India, Poultry is one of the fastest growing segments of livestock/agriculture industry and contributes a major share in terms of protein supplementation from eggs and meat. Amongst the animal products, which are by and large substitutable in the diet, it is found that input-output ratio for poultry is most favourable. With 10 kg of similar feed in each case, chicken (both meat and egg type) gives more protein than pig, cow (milk and beef) and sheep. Therefore, it is evident that poultry contributes a major share in this revolutionary process.

Hybrid layers of today lay on an average of 310 eggs per year compared to 240-250 eggs 30 years back. During early eighties, broilers only achieved a mean body weight of 1.5 kg at 8 weeks of age with feed conversion ratio (FCR) of around 3.0, whereas, now it attains 1.8 to 2.0 kg mean body weight with a FCR of 1.6 to 1.8 in only 38 days (about 6 weeks).

1.2 INDIAN POULTRY INDUSTRY

Development of Poultry Industry in India has made huge stride during the last three decades evolving from backyard farming to a full-fledged commercial enterprise as a result of research and development initiated by the Government and subsequently taken up by the organized private sector.

1.2.1 Poultry Population in India

By now, you know that poultry includes chicken, duck, quail, turkey etc. Do you know how many number of poultry birds are present in India at present? This section deals with the population of poultry in India and its current status.

India has vast resource of livestock and poultry, which play a vital role in improving the socio-economic conditions of rural masses. India's poultry population is 489.01 million heads and ranks 4th in duck and 5th in chicken in the world. Chicken are the most popular among the domesticated poultry species and account for 92 per cent of the total poultry population in India. Chicken has received more attention in India's planning, research and developmental process. As a result, India's chicken industry of today is not only vibrant and self reliant but is one of the best in the world. The ducks account for 7 per cent of poultry population and are mostly found in coastal states of the country and in states with more lakes and rivers like, Andhra Pradesh, Assam, Jammu and Kashmir, Kerala, Orissa, Tamil Nadu, Tripura and West Bengal. The duck raising is still in a primitive stage and indigenous ducks outnumber exotic ducks in spite of their inferior performance. The quail eggs and meat have become popular. The growth of quail farming, however, has been hampered due to insistence on wild life licensing, high cost of production and non-availability of superior quail germplasm. The emu, guinea fowl, ostrich and turkey farming are in their infancy and there are miles to go for their commercial exploitation.

1.2.2 Status of Poultry Industry

India is the third largest producer of eggs in the world next only to China and USA and producing 45 billion eggs in 2006. The states such as Andhra Pradesh, Haryana, Maharashtra and Tamil Nadu are the major egg producing states that account for more than 60 per cent of the eggs produced in the country. Higher per capita consumption of 57 eggs and 500 g of broiler meat was recorded from southern region against the lowest consumption of 18 eggs and 130 g of broiler meat in eastern region.

India ranks fifth in the world in respect of poultry meat production during 2006 with the highest production recorded for USA followed by China, Brazil and Mexico. The poultry meat production in India increased 18 folds from 81,000 tonnes in 1961 to 2.1 million tonnes in 2006. Andhra Pradesh is the leading state in broiler production; followed by Tamil Nadu, Maharashtra, Punjab, West Bengal and Karnataka. More than 65 per cent of the broilers produced in India are raised in these states.

1.2.3 Strengths of Poultry Industry

You already know that India stands third and fifth in egg and poultry meat production, respectively. This is achievable because of the developments brought about in the poultry industry in India by the following ways:

- 1) Development of new high productive layer and broiler strains.

- 2) Development of low-cost vaccines.
- 3) Giving freedom to the poultry farmers for fixing prices for egg through organizations like National Egg Co-ordination Committee (NECC).
- 4) Financing of poultry schemes.

1.2.4 Achievements of Poultry Industry

The achievements of Indian Poultry Industry are as follows:

- Improved FCR, quality control, upgraded management.
- New feed milling technologies.
- Purchase of feed raw materials and supply of better quality materials.
- Better breeding stocks.
- Rationalised pricing of breeder and commercial stocks.
- Pellet feeds are gaining increasing market share.
- Availability of feed additives viz. enzyme, pro-biotics.
- Positive role of integrators and corporates in industry.
- Distribution of feed in all regions.
- Increase in percentage of processed foods.
- Marketing of branded eggs.
- Tapping of export potentials.
- Advancement in disease diagnosis and screening procedures.

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 do you mean by the term 'poultry'?

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- 2) Globally, what is the rank of India in egg and meat production?

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- 3) List out the achievements of Indian Poultry Industry.

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Activity 1

Visit few of your neighbour's house, note down the number of birds of different poultry species reared by them, egg and meat production per day and per capita egg and meat consumption.

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1.3 TECHNICAL TERMS AND DEFINITIONS

The rearing of poultry on scientific lines is not a single job. It required expertise, skill and complete knowledge on the farming systems. Several terms are frequently used while describing the activities of poultry farming. Some of them are as follows:

Ad lib (Latin): *Ad libitum* (full feeding) means as much as desired. It is commonly used to express the availability of feed on a free choice basis. It is a labour saving system under which poultry help themselves and eat as much as they wish.

Age at sexual maturity: It can be measured either as age at first egg (or) age at 5 per cent egg production. Sexual maturity is the duration (number of days) between the date of hatch and the date of first egg laid or date of 5% egg production as the case may be. The younger the bird when she begins to produce eggs, greater the egg production will be during her laying year. Early sexual maturity is advisable but too early sexual maturity is also not good because it produces more number of small sized eggs (peewee eggs) which fetches lower price and more incidence of prolapse (falling down or slipping out of place of an organ or part such as uterus). Light breeds like Leghorn mature about a month earlier than heavy breeds.

Artificial Incubation: In this method, the mechanical equipment such as incubator is used for hatching of eggs.

Artificial Insemination: is the technique by which seminal fluid (semen) of male is introduced or deposited into the female reproductive tract by a pipette (Fig. 1.1). One cock will yield about 0.4 to 0.7 ml of semen (Fig. 1.2) depending upon the body weight. About 0.05 to 0.10 ml of semen is enough to inseminate one hen.



Fig. 1.1: Artificial Insemination of a hen



Fig. 1.2: Collection of semen from a cock

Automation: A process or system which operates by mechanical or electronic means which replaces the human efforts and decisions.

Beak trimming (Debeaking): Removal of a part of upper and lower mandible (beak) by a sharp knife (Fig. 1.3) and cauterizing by a soldering rod in order to minimize feed wastage and to reduce the risk of feather pecking/cannibalism.

Bill: The beak of duck or geese (Fig. 1.4).



Fig. 1.3: Beak trimming using debarker



Fig. 1.4: Bill

Bio-security: relates to maintenance of flock (birds) free of pathogens (diseases). Bio-security is the key element in the triangle of disease control. Bio-security is a term that includes all the measures taken to prevent pathogens (bacteria, fungi, parasite, virus) insects, rodents and wild birds from entering or surviving and infecting the poultry flocks. Bio-security literally means safety of living things, is a programme designed to prevent the exposure of birds to disease causing organisms by reducing, introduction and spread of pathogens into and between the farms.

Breed: A group of birds within a species having similar characteristics and are able to produce offsprings with similar characteristics.

Broiler (Fryer): Immature young chicken of either sex with tender meat, soft, pliable, smooth textured skin and flexible breast bone cartilage of about 6 weeks of age.

Brood: A group of (baby) chicks from one hatch (Fig. 1.5).



Fig. 1.5: Day-old chicks



Fig. 1.6: Brooder

Brooder: A metallic or wooden equipment used for artificial brooding of young chicks by supplying the necessary heat (Fig. 1.6).

Brooder chick: A young chick of 0 to 8 weeks of age.

Broodiness: is a condition in which hen stops laying and show tendency to sit on eggs to hatch them.

Broody hen: A hen which tends to sit on the egg to hatch them.

Cages: A system of housing poultry made up of steel and welded wire netting in horizontal, stepped or vertical configuration usually in two or three tiers. Example: Californian (Fig. 1.7) and Battery Cages (Fig. 1.8).



Fig. 1.7: Californian Cages



Fig. 1.8: Battery Cages

Candling: is the process of visual examination of an intact egg against a light emerging through an aperture (opening) to determine the interior quality, shell soundness or stage of embryonic development (Fig. 1.9).



Fig. 1.9: Mass candling of eggs

Cannibalism: Vice (Bad habit) that may occur in chickens of all ages. It is characterized by pecking of head, feather, vent and wing due to over crowding, excess lighting, lack of exercise and improper balanced ration. This vice may be overcome by identifying and correcting the faulty management practices or by correcting feed, if it is unbalanced and debeaking.

Capon: A surgically castrated (testes removed) male usually below 8 to 10 months of age that is tender meat with soft, pliable, smooth textured skin and is good for table (meat) purpose.

Chick: A young one of poultry from day old to seven or eight weeks of age (Fig. 1.10).

Chicken: The most widely domesticated fowl.

CLFMA: means Compounded Livestock Feed Manufacturers Association of India.

Clutch: Eggs laid by a hen on consecutive days without a break.

Coccidiosis: A disease caused by coccidia (micro-organism) with symptoms of anaemia, blood-mixed dysentery and death.

Cock (Rooster): A mature male chicken (above one year of age) with coarse skin, toughened and darkened meat and hardened breast bone cartilage usually kept for breeding.

Cockerel: An immature male fowl (obtained from the layer hatchery) less than one year of age reared for meat purpose.

Comb: A fleshy protuberance (swelling) on the top of the fowl's head varying in size and shape (Fig. 1.11).



Fig. 1.10: Chicks

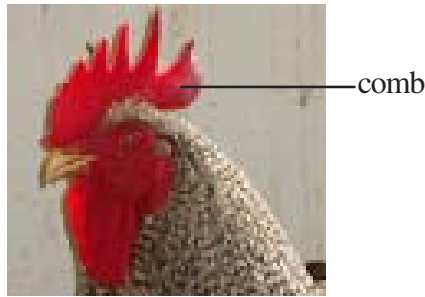


Fig. 1.11: Comb

Coryza: An inflammation of membrane lining the upper part of respiratory tract that is eye, nostrils and sinuses of head.

Croiler: is a colour feathered broiler. It is not a hybrid; but developed from crosses of Barred Plymouth Rock, Dark Cornish, New Hampshire and Sussex breeds. In general, the croilers are having lesser growth rate and poorer feed efficiency compared to broilers. Therefore, they are more suitable for backyard or free range or semi-intensive system of rearing rather than intensive system. Even though they grow at a slower rate, they attain a body weight of 1.5 kg at 8-10 weeks of age with FCR of 2.5-3.0; they fetch a higher price per kg compared to the broiler. Some of the croiler varieties available in Indian Market are Giriraja, Nandanam Chicken II and Vanaraja.

Culling: The elimination of unproductive or undesirable birds which when judged from their physical characteristics are found to lack the qualities for which they were reared, whether it may be for egg production, table purposes or for show; an important and continuous operation for profitable poultry farming.

Deep litter: Intensive type of rearing birds on floor covered with bedding material (Fig. 1.12) for the birds like wood shavings, groundnut hulls, paddy husk etc.



Fig. 1.12: Deep litter system of rearing

Delouse: To eradicate lice from bird.

Desi fowl: Fowl indigenous to India; Not a pure breed. Exhibits great variation in size, shape, colour and conformation. Best mother and ideal sitter (Broody in nature).

Deworming: Act of removing or killing intestinal parasites through drug.

Disinfection: is the method of reducing the amount of infection in flocks after an outbreak. This is accomplished by mechanical, physical or chemical means.

Downtime: Period between removal of one batch and introduction of new batch of birds in the shed (or) is the period of time between two batches when the house is depopulated, disinfected, kept closed and empty.

Drake: Adult male duck.

Dressed bird: A slaughtered bird with feathers, feet and head removed. In other words, a ready-to-cook chicken.

Dressing percentage: Dressed weight divided by live weight of the bird multiplied by one hundred.

$$\text{Dressing Percentage} = \frac{\text{Dressed weight in kg}}{\text{Live weight in kg}} \times 100$$

Dubbing: Process of removal of comb and wattles of large combed males to prevent frost-bite and to enhance fertility. It is done on day one of bird's life with the help of scissors.

Duckling: Young one of the duck.

Eaves: The point at which the roof project out from the side of the building.

Egg tooth: Small horny protrusion on the tip of chick's beak used to pip the egg shell during hatching. It drops off soon after chick hatches out of egg.

Feed Conversion Ratio (FCR): A ratio expressed in terms of kg feed consumed by the bird divided by kg body weight gain in case of broiler and kg egg weight or dozen eggs laid in case of layers.

$$\text{Feed Conversion Efficiency (in layers)} = \frac{\text{One kg feed consumed by the bird}}{\text{One kg egg weight or dozen eggs laid}}$$

$$\text{Feed Conversion Efficiency (in broilers)} = \frac{\text{One kg feed consumed by the bird}}{\text{One kg body weight gain}}$$

Feed Efficiency Ratio (FER): A ratio expressed in terms of kg body weight gain divided by kg feed consumed in case of broiler and kg egg weight or dozen eggs laid divided by kg feed consumed in case of layers.

$$\text{Feed Efficiency Ratio (in layers)} = \frac{\text{One kg egg weight or dozen eggs laid}}{\text{One kg feed consumed by the bird}}$$

$$\text{Feed Efficiency Ratio (in broilers)} = \frac{\text{One kg body weight gain}}{\text{One kg feed consumed}}$$

Fecundity: Producing many offspring (young ones).

Fertility: refers to capacity to reproduce. It is the factor which determines the successful offspring that may be obtained from a given number of eggs.

Fertility per cent: Expressed as % of fertile eggs divided by total number of eggs set and multiplied by one hundred.

Filler flats: A card board or plastic made tray used for collection, storage and transport of eggs. Thirty eggs can be kept in one filler flat.

Flock: A group of birds or animals of one kind, especially birds or sheep.

Franchise: An agreement between a breeding organization, breeder and hatchery.

Fumigation: A method of disinfection using disinfecting gases especially Formaldehyde gas produced by mixing formalin and potassium permanganate. Normally used in hatcheries and in poultry farms where there is a severe disease problem.

Gosling: Young one of the Goose.

Gander: Adult male goose.

Green Duck: is a duckling, which is grown rapidly and marketed from 9 to 16 weeks of age for meat.

Grower: Pullets between 9 to 20 weeks of age or at the point of lay.

Hatchability: may be defined as % of fertile eggs hatched (or) % of chicks hatched from all eggs placed in the incubator.

$$\text{Hatchability \%} = \frac{\text{\% of fertile eggs or chicks hatched}}{\text{Number of eggs placed in the incubator}}$$

Hatcher: A machine or that portion of incubator that is used for the last 2 or 3 days of incubation and hatching of eggs. No turning of the egg is required.

Hatchery: A building equipped with incubators used for hatching of day old chicks from fertile eggs through artificial incubation.

Hen: The female of all classes of poultry, except goose, whose age can vary considerably depending on the class of poultry. A chicken hen is of egg laying age, usually over 20 weeks old, and raised for egg production purposes.

Hover: An equipment with incandescent bulbs for heating element to keep chicks warm (Fig. 1.6).

Incubate: To maintain favourable condition for developing and hatching fertile eggs.

Incubation: is the act of bringing an egg to hatching i.e. providing suitable warmth, humidity and turning movement to facilitate growth and development of embryo inside the egg.

Incubation period: is the period between setting and hatching out of eggs which vary from species to species.

Incubator: A machine developed to provide the proper environment for the development of the fertile egg and embryo into a chick or poult.

Keet: Young one of the Guinea fowl.

Layer: A mature female fowl which has been kept for egg-laying purpose (21-72 weeks of age) especially those are in current production (or) an adult commercial chicken of 21 – 72 weeks of age and produces most of the eggs for consumption.

Leeward: A side sheltered from the wind.

Litter: An absorbent bedding material used to cover the floor in poultry houses.

Live weight: A term associated with the meat bird to indicate its weight before slaughter.

Liveability: Ability of individual bird to live and remain vigorous and productive.

$$\text{Liveability} = \frac{\text{Number of birds alive at market age}}{\text{Number of chicks purchased}} \times 100$$

Natural Incubation: In this method, broody hens are made to sit over the hatching eggs to hatch out chicks.

Nest Box: Boxes provided for layer or breeder hens inside their house to lay eggs (Fig. 1.13).



Fig. 1.13: Nest box

Overhang: Outward projection of the roof at eaves.

Oviparous: Producing offspring from egg that hatch outside the body.

Pause: Any cessation (stoppage) of egg laying for a period of 7 days or more is called pause.

Pen: An enclosed area where birds are housed.

Photo-period: A period of illumination by both natural and artificial means.

Pipping: The act of pecking the shell and shell membranes by the chick in order to break and hatch out of the shell.

Poult: After hatching, a young turkey of either sex that is between one day and a couple weeks old.

Poultry: Although the term poultry is very often used as synonymous to chicken, it includes a number of avian species such as chicken, duck, geese, guinea fowl, quail, turkey, etc., that are domesticated for economic (egg or meat) purpose.

Poultry management: The science and art of organization and operation of poultry farms to obtain the maximum returns or constant income.

Poultry Science: is the study of principles and practices involved in the production and marketing of poultry and poultry products.

Pullet: A young domestic hen, usually one that is less than one year old. A female chicken that has not yet started to lay eggs.

Ration: A measured amount of feed allowed to a bird during a particular period of time.

Roaster: A broiler grown up to the age of 9-11 weeks with a body weight of 2.5 to 3.0 kg.

Shank: Legs

Snood: A fleshy protuberance (swelling) hanging from the base of the beak in turkeys or a fleshy wrinkled fold of skin that hangs down over a turkey's beak (Fig. 1.14).

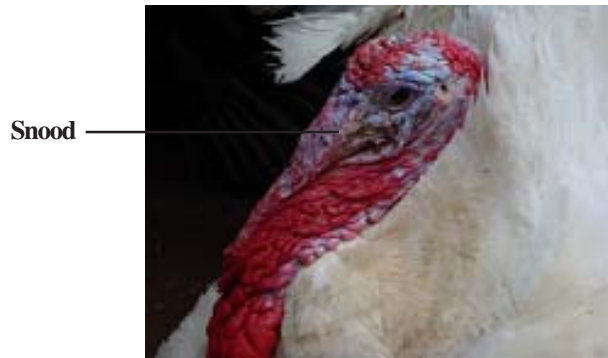


Fig. 1.14: Snood

Spent Hen: A breeder or commercial type egg hen that no longer performs at desired production levels.

Sterile: Not capable of reproducing or incapable of producing offspring (young ones); not producing offspring.

Tom: Male turkey

Trap nest: A laying nest where the layer gets trapped when she enters to lay eggs. It is used to identify the layer for the pedigree studies.

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.

Define the following:

1) Broiler

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2) Broody hen

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3) Layer

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4) Comb

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5) Drake

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1.4 LET US SUM UP

The term “**Poultry**” indicates all domesticated species of birds like chicken, duck, emu, geese, guinea fowl, ostrich, pigeon, quail and turkey. India is the third largest producer of eggs in the world next only to China and USA and producing 45 billion eggs in 2006. The states such as Andhra Pradesh, Haryana, Maharashtra and Tamil Nadu are the major egg producing states that account for more than 60 per cent of the eggs produced in the country. India ranks fifth in the world in respect of poultry meat production during 2006 with the highest production recorded for USA followed by China, Brazil and Mexico. Andhra Pradesh is the leading state in broiler production; followed by Tamil Nadu, Maharashtra, Punjab, West Bengal and Karnataka. More than 65 per cent of the broilers produced in India are raised in these states. The ducks account for 7 per cent of poultry population and are mostly found in coastal states of the country and in states with more lakes and rivers like Andhra Pradesh, Assam, Jammu and Kashmir, Kerala, Orissa, Tamil Nadu, Tripura and West Bengal. Developments in poultry industry is brought about by the development of new high productive layer and broiler strains; development of low-cost vaccines; giving freedom to the poultry farmers for fixing prices for egg through organizations like National Egg Co-ordination Committee (NECC) and financing of poultry schemes.

1.5 GLOSSARY

Anaemia	: A deficiency in the oxygen-carrying component of the blood (haemoglobin) or the number or volume of red blood cells.
Commercial Broiler	: A hybrid broiler used exclusively to produce fast growing birds with a good feed efficiency.
Commercial Layer	: It is a hybrid egg type bird capable of producing about 320 eggs per year with a very good feed efficiency.
Domesticated	: A population of birds whose life cycle, behaviour or physiology has been systematically altered as a result of being under human control for many generations.
Hybrid	: The product of two or more pure lines which tends to exhibit hybrid vigour (is superior to either of its parents).
Organic	: To be certified as an organic egg or meat, the birds should be fed with organic feed which is produced without pesticide, drugs, antibiotics or genetically modified crops. The birds must be reared in deep litter system with sufficient access to free range.
Per-capita	: A Latin term that translates into “by head,” basically meaning “average per person or by or for each individual person.
Perpendicular	: Walking straight like a penguin.
Prolapse	: Coming out of intestines and/or reproductive system through anus (vent).
Variety	: It is the term used to sub-classify breeds. There may be many varieties within a breed differentiated by plumage colour and comb pattern. (eg.) Black Leghorn, Brown Leghorn and White Leghorn.

1.6 SUGGESTED FURTHER READING

Jadhav, N.V. and Siddiqui, M.F. 2007. *Handbook of Poultry Production and Management*, 2nd Edn, New Delhi.

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1.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) The term “Poultry” indicates all domesticated species of birds like chicken, duck, emu, geese, guinea fowl, ostrich, pigeon, quail and turkey.
- 2) Third in egg production and fifth in meat production.
- 3) The achievements of Indian Poultry Industry are as follows:
 - Improved FCR, quality control, upgraded management.
 - New feed milling technologies.
 - Purchase of feed raw materials and supply of better quality materials.
 - Better breeding stocks.
 - Rationalised pricing of breeder and commercial stocks.
 - Pellet feeds are gaining increasing market share.
 - Availability of feed additives viz. enzyme, pro-biotics.
 - Positive role of integrators and corporates in industry.
 - Distribution of feed in all regions.
 - Increase in percentage of processed foods.
 - Marketing of branded eggs.

- Tapping of export potentials.
- Advancement in disease diagnosis and screening procedures.

Check Your Progress 2

- 1) Immature young chicken of either sex with tender meat, soft, pliable, smooth textured skin and flexible breast bone cartilage of about 6 weeks of age.
- 2) A hen which tends to sit on the egg to hatch them.
- 3) Layer is a mature female fowl which has been kept for egg-laying purpose (21-72 weeks of age) especially those are in current production (or) an adult commercial chicken of 21-72 weeks of age and produces most of the eggs for consumption
- 4) A fleshy protuberance (swelling) on the top of the fowl's head varying in size and shape.
- 5) An Adult Male duck.