SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCE & TECHNOLOGY, JAMMU

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POULTRY FARMING

- As a Sustainable Enterprise

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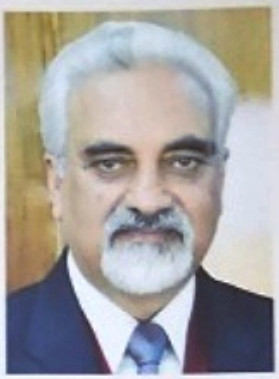
Foreword



Poultry rearing has always been an integral component of livestock production systemin India. Poultry as an enterprise has taken a quantum jump during the last five decades in the country, emerging from an entirely unorganized and unscientific farming practice to a commercial production system with state-of-the-art technological interventions. Indian commercial poultry sector has advanced remarkably due to a scientific approach adopted by the industry and an enabling environment created by the Government of India for its development.

Poultry industry has a tremendous potential in Jammu & Kashmir state. There is a huge demand of poultry meat and eggs in the state, while the state is deficit in meat and egg production by 46 and 31%, respectively. Small-scale producers are facing constraints in terms of poor access to inputs, market and services. Lack of adequate infrastructure in the state, the skills and knowledge of the entrepreneurs, and access to effective technologies further add to their misery. To make poultry farming a sustainable, profitable and lucrative livelihood option for the rural youth, the transformation of traditional poultry farming on scientific lines has become essential. The farmers/unemployed youth/SHGs and NGOs need advanced poultry farming training, skills and knowledge to enable them to address various challenges of poultry sector.

Dr. Mandeep S Azad and Dr. R.K. Arora have written a book entitled *Poultry Farming –a sustainable enterprise*, covering various aspects of small and large-scale poultry production including feeding and nutrition, housing, general management and flock health etc. The objective is to up-scale the capacity building of poultry entrepreneurs. I believe that this book shall serve as a comprehensive practical guide to the extension workers, poultry farmers and other stakeholders who intend to undertake poultry farming as a sustainable livelihood option. I congratulate the authors to undertake this venture and sincerely hope that the farming community engaged in poultry production shall benefit from it.

Pradeep K. Sharma
Vice Chancellor

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Introduction

Agriculture plays a vital role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP).India ranks first in having the largest livestock population in the world. Livestock plays an important role in the national economy as well as in the socio economic development by augmenting family incomes and generating gainful employment in the rural areas, particularly for the landless, small and marginal farmers and women. With its 1.2 billion population and 8% GDP growth rate, India is rapidly emerging as one of the biggest markets in the world. Livestock sector contributes approximately 4% to GDP and 27% to agriculture GDP. In the poultry segment, the Government's focus, besides framing suitable policies for enhancing commercial poultry production, is for strengthening the family poultry system, which addresses livelihood issues. Both egg and fish production has also registered an increasing trend over the years. Egg production was around 78.48 billion eggs in 2014-15, while poultry meat production was estimated at 3.04 MT. Poultry and dairy sectors are the major sectors contributing to economic development. The poultry sector has undergone a paradigm shift in structure and operation during the last two decades. It has transformed itself from a mere backyard activity into a major commercial activity with participation by big players as also successful implementation of contract poultry farming on a large scale.

India is emerging as the world's 2nd largest poultry market with an annual growth of more than 14%, producing 61 million tonnes or 3.6 percent of global egg production. The annual growth rate of egg production is 5-8%. Apart from this, India ranks 6th in broiler production (125 billion Rupees) with an annual output of 2.39 million tonnes of broiler meat, as per the estimates of the Ministry of Agriculture, Govt. of India. The total poultry industry is valued at about 350 billion rupees. The per capita consumption per year is approx 2.2 kg, which is much lower than the National Institute of Nutrition's recommendations of 11 kg.

Despite all of these achievements, lack of advanced technology, inadequate cold storage facilities and processing equipment, particularly at the farm level, act as a major constraint in enabling this sector to take a quantum jump in production and productivity . What is needed is a strong platform for all stakeholders to share knowledge and technology.

Government Initiatives

Given the importance of the agriculture sector, the Government of India, in its Budget 2016–17, planned several steps for the sustainable development of agriculture. Budget 2016-17 proposed a slew of measures to improve agriculture and increase farmers' welfare such as 2.85 million hectares to be brought under irrigation, Rs 287,000 crore (US$ 42.11 billion) grant in aid to be given to gram Panchayats and municipalities and 100 per cent village electrification targeted by May 01, 2018. The government has set an ambitious target of producing a record 270.1 MT of food grains in 2016-17, 7 per cent higher than the 252.23 MT of production estimated for 2015-16.

- The National Dairy Development Board (NDDB) announced 42 dairy projects with a financial outlay of Rs 221 crore (US$ 32.42 million) to boost milk output and increase per animal production of milk.
- Government of India has set up an inter-ministerial committee, which will look into ways to examine the potential of Indian agriculture, identify segments with potential for growth, and work towards doubling farm incomes by 2022.
- The Government of India has allocated Rs 200 crore (US$ 29.9 million) for electronically linking 585 major wholesale agriculture and livestock markets across the country, thereby creating a National Agriculture Market (NAM) in July 2015 for three years.

Road Ahead

Layer Industry

India is the third largest producer of table eggs in numbers after China and US. It has recently overtaken Mexico, which was the third largest egg producer.

Commercial layers in India are predominately white (> 95 per cent). Few brown layers introduced could not maintain the market share due to higher feed intake and no price advantage for brown eggs.

Layer birds bred and adapted to Indian climate, feed and the market situation holds the largest share. International brands like Bovans, Lohmann and Hyline are also present in the market. The grandparents (GP) of the multinational brands are imported and multiplied.

Layer chick placements remained constant for three years between 2004 and 2006 due to bird flu but have been going up steadily since. The placement of layer chicks was about 140 million in 2002 which rose to 220 million by 2012.

All commercial layer birds are in cages. Three-tier California cages in raised floor houses are common. Due to environment issues and the pressure of expansion, closed housed with multi-tier cages, mechanised egg collection, automatic feeding and manure-drying are being examined for their economic viability. The individual house capacity is usually 100,000 birds.

Around 70 per cent of the layer farming is in the southern states. The lower land prices and grain prices as well as less variation in seasonal climates are the reasons for the distribution. Separate brood/grow facilities situated in the closed vicinity is the order of the day. The growing areas are used on 'all in, all out' basis. Layer flocks are mostly in multi-age group farms.

The number of vaccinations for the layers have been going up with growing awareness of new diseases and new variants of the same disease. Many vaccines are imported but there are vaccine manufacturing companies in India. Bivalent Marek's vaccines are prevalent, yet “Rispens” is not permitted for use. India does not vaccinate against highly pathogenic avian influenza (AI) but rather practices a 'stamping-out' policy in case out outbreaks. There is government monitoring system for AI guided by OIE regulations.

Least-cost formulations are used to feed layer birds and there is a constant search for cheaper, unconventional feed materials. Feed prices fluctuate during the year, with the grain becoming cheaper during the harvest and more expensive again just before the beginning of the crop season. Many layer farmers concentrate on bulk purchase of grains in season to save costs. More than one grain is being used. Most layer feeds are low-energy rations, having around 2,400 kcal of energy.

The eggs are being sold in numbers. Grading, packing and branding is not widespread. Few attempts to sell them as graded and value-added eggs have not been very successful due to limited cost-effectiveness in pricing and volume of sales.

Layer farming is concentrated around few areas and lot of eggs move from place to place within the country. Various state governments are moving to enhance the local availability of eggs by giving incentives to farming. Exports of table eggs went up during 2002-2004 but is not increasing due to trade restrictions from the buying countries. India has half a dozen egg powder plants exporting egg powder. Many state governments are implementing midday meal schemes and serve eggs in the menu for the school children. Eggs are also served as a part of the hospital food. Eggs and bread is the popular “fast-food”, which enhances the consumption of eggs enormously.

With good farming practices, production is up to 320 eggs per hen housed in a 365-day laying cycle. The average production of hen is calculated at 300 eggs per hen housed.

Per-capita consumption of eggs has gone up from 36 in 2002 to 48 in 2012.

To increase the availability of eggs in the rural areas, backyard poultry backed with “mother units” is being encouraged by the governments as an alternative system of poultry production to augment egg production while addressing the health issues in poultry.

Broiler Production

India is the fourth largest broiler producer after China, US and Brazil.

There has been a phenomenal increase in broiler production between 2002 to 2012 in spite of the crisis that arose out of bird flu scare in 2004-2006.

Parent breeder placements are estimated to be 30 million in 2012 against 1.5 million in 2002. They are concentrated in a few pockets and there is a heavy movement of hatching eggs to less productive areas. There are more than 500 breeding farms in the country housing the broiler parent stocks. The numbers went up sharply from 2007 to 2010 due to raising demand in chicks. The numbers have since stagnated due to reduced chick sales. The numbers are being compensated by enhanced capacities by few breeding units who grow their own chicks as a part of their downward integration. The stagnation could be a short gap after sharp rise due to changing trends in placements.

Most of the broiler breeders are in cages with artificial insemination. Best of the breeding flocks produce up to 200 hatching eggs and 160 chicks. Excellent health standards are maintained and there are 'all in, all out' breeder flock units. Two-tier California cages in open-sided raised-floor houses are common. Due to the raising concern about the environment, trials on closed houses with multi-tier cages are being put up as an alternative cost-effective housing system. Power availability/cost, success in manure handling and artificial insemination

result in multi-tier cages will decide on the future systems.

Most - 93 per cent - of broilers are marketed live in India and so there is limited opportunity to transport birds to distant locations. Hence, local integrators are coming up with huge volumes of parent stock and broiler rearing. The biggest of them have more than one million parent stock producing more than one 100,000 chicks a day.

All multi-national brands of broiler chicks are available in India produced from imported grandparents. Aviagen has established a great grandparent (GGP) farm in India. There are local pure line breeding programmes running in India, producing birds scientifically in open-sided houses with lower energy feeds. Indian-bred birds dominate the replacements.

All the commercial broiler chicks are raised on deep litter on 'all in, all out' basis. In 2002, 80 per cent of the chicks produced were sold as day-old chicks and the farmers were rearing them. In 2012, the number of chicks sold has come down to 50 per cent and the rest are reared by the companies who hatch them as a part of integrated production. The trend shows that the shift in rearing may continue.

Due to large-scale rearing of broilers, reduced production cycle and marketing live birds, the live broiler market has remained speculative. Single flock-growers lose money when the prices are down and cannot realise the benefit of high prices prevailing for few weeks. Larger scale rearing companies are going in for contract farming to utilise the same facility to increase their volumes. The small growers are becoming a part of the big company which is proving to be healthy growth of the industry.

Broiler feed, which used to be all mash, is being processed in to crumbles and pellets. Efficient feeds rather than least-cost formulations are favoured. Feed conversion ratio and overall cost of production are considered more important than the cost of feed alone. Broiler rearing companies are establishing large feed processing plants. Most of the pre-starter and starter feed is steamed and crumbled. FCRs are coming down - from 2.0 in 2002 to 1.75 in 2012, with the best of the flock recording 1.5 at 2.0kg bodyweight.

Broiler farms are open-sided; controlled houses are not even five per cent of the total volume. The main reason being the live bird market into which the birds reared under climate-controlled houses do not fit in besides the high capital costs and power requirements involved.Live broiler markets fluctuate seasonally. Summer prices are high due to reduced production and availability under open-housing system. Festive seasons record low prices due to reduced consumption as some sects abstain from eating meat during this time. Only seven per cent of the broilers are further processed into chicken products. This volume is not going up due to lack of cold chain availability and traditional consumption habits. People still like to buy a live bird slaughter and cook in their own way.

Future Prospects

The outlook for poultry production in India looks bright. The growth of layer business is estimated at six per cent and broilers at 12 per cent annually. Government policies to augment domestic grain production and ensure the availability to the poultry sector without exporting the grains directly will encourage the industry to grow.

India may not be an exporting country for eggs and chicken but the industry can assure feeding the more than one billion human population with quality eggs and chicken at cheaper prices than anywhere else in the world.

WHY POULTRY FARMING ?

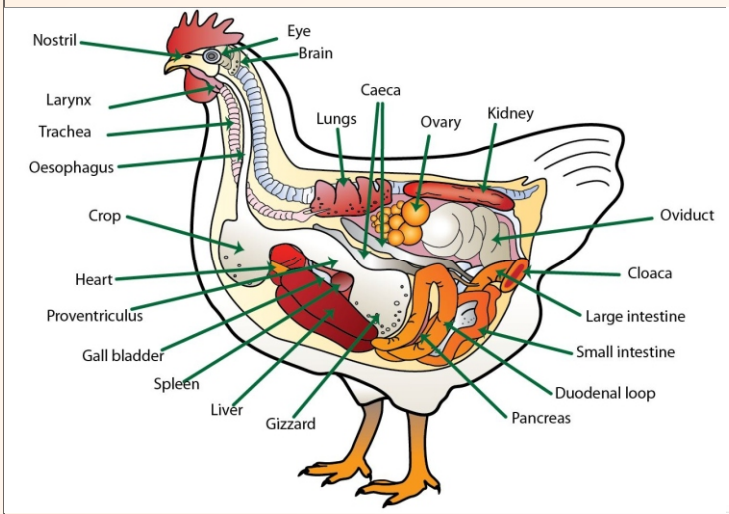
Poultry Farming

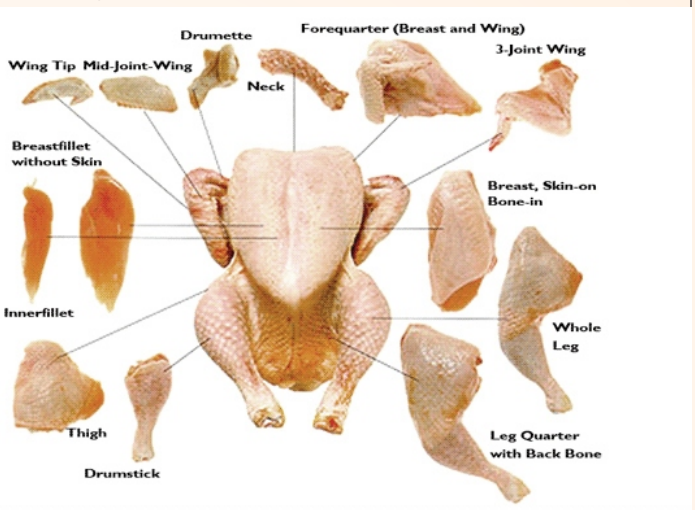
Before discussing commercial poultry farming in India, let me first explain what does poultry farming means. Generally, poultry farming means, raising various types of domestic birds for the purpose of producing foods like eggs and meat. Nowadays, most of the people are using the poultry as the synonym of chickens. Because chickens are the widely raised poultry birds. Along with chicken's ducks, geese, turkeys, guinea fowl, quails, peacock etc. are also popular domestic poultry birds. In India, various types of poultry birds are being raised from a long time ago. The largest number of poultry population in India is found in Andhra Pradesh followed by Tamil Nadu, Maharashtra, West Bengal, Karnataka, Bihar, Orissa, Kerala, Assam, Uttar Pradesh and Punjab. Some important urban areas like Mumbai, Pune, Nagpur, Kolkata, Delhi, Chandigarh, Bangalore, Chennai, Hyderabad, Shimla, Bhubaneswar, Ajmer etc. are raising poultry through a developed poultry farming systems. West Bengal and some other regions like Assam, Tamil Nadu, Kerala, Andhra Pradesh, Bihar, Orissa etc. are the most suitable place for duck farming. However, in this book we are describing the benefits of commercial poultry farming in India and the steps for starting this business.T

Benefits of Poultry Farming in India:

- .Commercial poultry farming in India has created and still creating profitable business opportunity for the entrepreneurs.
- Poultry farming business can provide a great employment source for the job seeking people.
- This is such a business in India that can never dry up.

- All types of poultry product has a **great demand in the market** inside India. And there are no religious taboo about consuming the poultry meat and eggs.
- Highly **productive local and foreign breeds** are available for commercial production.
- Required **initial investment is not too high**. You can start with small scale production and elaborate it gradually.
- **Bank loans and subsidies** are available throughout the country.
- Numerous farms are available and you can easily learn **about** poultry farming from those established farmers.





Starting Commercial Poultry Farming in India

Starting commercial poultry farming business in India is not too tough, hard work and little skill is needed. You have to go through some step by step process. To be successful in poultry farming in India, you have to go through the steps listed below.

Choosing Suitable Location

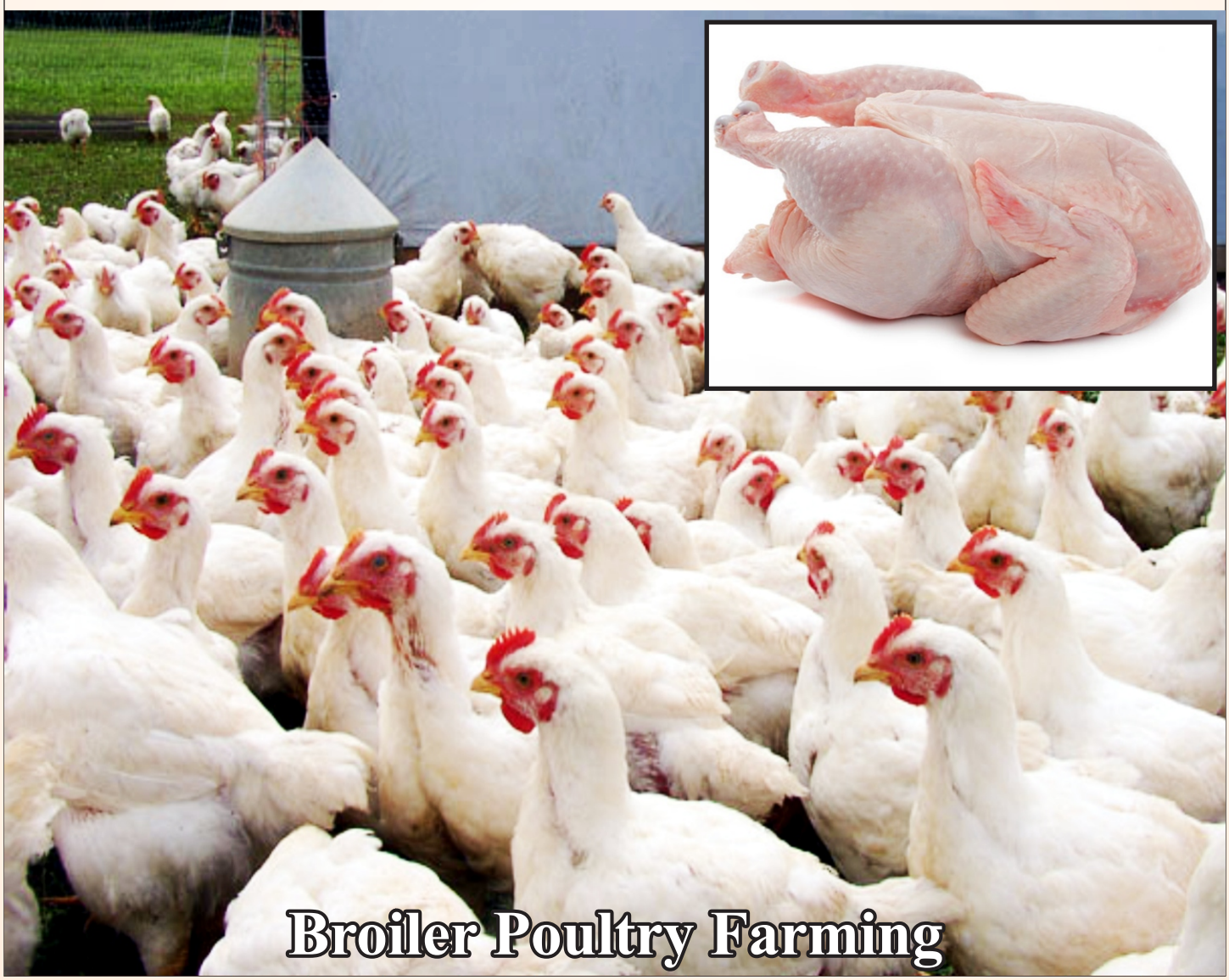
The main and most important thing for poultry farming in India is selecting a suitable land. And it is the most expensive part of this business. For setting up commercial poultry production, it would be better if you have the land of your own. The area of the land depends on the number of birds you want to raise. Consider the following aspects while choosing land for commercial poultry farming business in India.

- Try to setup the farm in rural areas that is slightly far from the city. Because, land and labor are relatively cheaper in rural areas.
- Select a chaos and noise free calm and quiet place.
- The area of the land depends on the number of birds and farming system. Free range farming system requires more land than intensive system.
- The chosen area must have to have fresh and pollution free environment.
- Never setup the farm in rented land. Because, in rented land the land owner can force you to leave his land at anytime. So, it would be better if you are the owner of the land.
- While selecting land, ensure a great source of sufficient amount of fresh and clean water.
- The selected area must have to be free from all types of harmful animals and predators.
- Suitable transportation system is a must.
- Presence of a suitable market near the farm will be effective. You will be able to buy necessary commodities and sell your products easily in the market.

Farming Selection

Selecting high quality productive breeds is very important for successful poultry farming in India. There are numerous local and foreign high quality poultry breeds available in India. Choose proper breeds according to your desired production. If you want to start producing eggs commercially, select highly productive layer poultry breeds. For commercial meat production business, go with highly meat productive broiler poultry breeds. Contact with your Krishi Vigyan Kendra ,animal sciences expert to learn more about highly productive breeds. Common and mostly raised poultry breeds in India are of three types.

- Broilers: The poultry breeds that is suitable for commercial meat production is known as broiler poultry. They are like meat producing machines. They consume foods and convert them to meat quickly. They grow fast and become suitable for slaughter purpose within very short time.
- Cockerels: Cockerels are other types of meat producing poultry breeds. They are also used for commercial meat production like broilers. But their growing rate is slower than broilers. They become hardy and can adopt themselves with the environment easily than the broilers. Cockerel meat is also very popular and has a great demand in India.
- Layers: Various types of layer poultry are very popular for commercial eggs production throughout the world. Some of them are very suitable for farming in India. Layers can be used for both commercial meat and egg production. There are some layer poultry breeds available which can lay up to 250-300 eggs per year.



Broiler Poultry Farming in India

Broiler (Gallus domesticus) production is the emerging industry in India. Due to short turn overrates of poultry flock and strong market demand, this business could be the potentially profitable business. Proper management ensures the efficiency production and good quality of meat. This can be accomplished by maintaining feed efficiency, proper handling of wastes, proper sanitation etc.

The poultry birds which are raised for commercial meat production are called broiler poultry. By using modern farming methods broiler chickens become suitable for consumption within their 5 to 6 weeks of age. In India, various types of poultry birds are being raised from a long time ago. The largest number of poultry population in India is found in Andhra Pradesh followed by Tamil Nadu, Maharashtra, West Bengal, Karnataka, Bihar, Orissa, Kerala, Assam, Uttar Pradesh and Punjab. Some important urban areas like Mumbai, Pune, Nagpur, Kolkata, Delhi, Chandigarh, Bangalore, Chennai, Hyderabad, Shimla, Bhubaneswar, Ajmer etc. are raising poultry through a developed poultry farming systems.

Benefits of Poultry Farming in India

There are many benefits of commercial poultry farming in India. The main benefits are listed below.

- Commercial poultry farming in India has created and still creating profitable business opportunity for the Entrepreneurs.
- Poultry farming business can provide a great employment source for the job seeking people.
- This is such a business in India that can never dry up.
- All types of poultry product has a great demand in the market inside India. And there are no religious taboo about consuming the poultry meat and eggs.
- Highly productive local and foreign breeds are available for commercial production.
- Required initial investment is not too high. You can start with small scale production and elaborate it gradually.
- Bank loans are available throughout the country.
- Numerous farms are available and you can easily learn about poultry farming from those established farmers.

Preparation before Chick arrival

One week before arrival of chicks

- Plan the next batch at least 15 days after liquation depending on the size of the farm.
- Clear gap of minimum 7 days should be available after cleaning and before arrival chicks. Plan to house the total farm with one batch. Calculate the number of chicks required for the whole farm.
- Remove all litter scrape the floor off the caked litter. Clear cobwebs at the roof, broom all the dust.
- Wash the roof with a pressure hose, if the roof is washable. Clean the floor with water.
- Sprinkle caustic soda flakes on floor and apply with broom. Wash with water after a gap of one hour.
- Spread bleaching powder on the wet surface and apply with broom.
- White Wash the side walls and floor. Leave the shed vacant for one week.
- For mud floor- Scrap off some mud along with litter-Replace at least 3 inches of fresh mud. Stamps well apply dry lime powder + bleaching powder on the wet surface and allow it to dry.
- Take out the equipment and clean with water.
- If the side curtains are HDP or plastic, dip them in water and leave to dry.
- Clean the surroundings of the poultry house off the grass and Vegetation.
- Drain out the water tank and pipe lines. Put Acetic acid of Chlorine liquid 3 times the normal quantity and leave for a day.

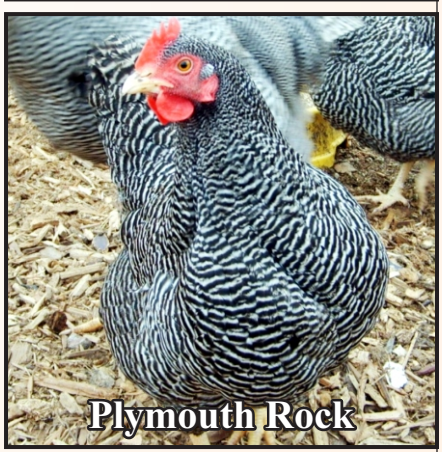
Cleaning of Shed

One day before arrival of chicks

- Put back the curtains. Disinfect equipment like brooders, drinkers and feeders by dipping them in disinfect solution or spraying the surface with disinfectant.
- Spread husk on the ground .Check water and electrical connections.
- Make a round shaped guard and hang the brooder in the center. If electric bulb brooding is used, make a round of 5ft diameter for 250 to 300 chicks. If gas brooders are used, up to 2500 chicks can be brooded in one group.
- Spray 2% Formalin (200ml in 10ltrs of water.) all over the interiors of the shed, over the equipment and the surroundings. If the house is small, consider fumigation. Measure width / breadth /average height in feet to arrive at the total cubic feet. Use 40 ml Formalin for 100cft. Place it in a bigger container (the quantity should be half full)
- Take Potassium Permanganate 50% of the quantity of Formalin. See that all persons are out. Pour Potassium Permanganate crystals in to the Formalin liquid and come out quickly as the fumes raise.(The fumes burn the eyes)25/40/10 ft = 1000 cft for this 4000ml Formalin and 2000gms Potassium Permanganate is required. Keep all curtains closed.
- Open the curtains on the sides one hour before the arrival of chicks to allow some fresh air. Spread news paper on the litter carefully after making the litter leveled.
- Add medicines in water tank as required. We can use one antibiotic @ one gm per liter of water and B-complex liquid @ 30 ml/100 chicks and Vitamin A,D3,E,C @ 5ml/100 chicks.
- Keep small drinkers inside the guards. One for 80 chicks. Keep them at least 2 inches above ground level on a stand to prevent chicks getting. Sprinkle maize powder or pre-starter feed on the paper slightly.
- When the chicks arrive:
- If the weather is too cool, request the hatchery to deliver the chicks in the day time. The chicks will have time to settle down. Find out the time of hatch. If the chicks are delivered on the same night and if the weather is bad, the chicks can live without feed or water for 48 hours. Keeping them in the boxes is better than leaving them in chilled weather. Delay leads to dehydration. The chicks should reach the house in minimum possible time.
- Open the boxes and ensure that all chicks are alive and active. The chicks should try to jump out of the boxes, when the lids are taken out. Check the number against the delivery note. Take out the dead and dull chicks.
- Take medicated water in a plate. Dip the beak of each chick in the medicated water before releasing. Count while releasing. Few chicks should be shown to nipples. Others copy them.
- Put the heating system on before the chicks are released. When gas brooders are used, use an extra bulb for light above the brooder so that all the chicks can see the surroundings clearly. If the temperature is high, the chicks move away from the heat source, If the temperature is low, they crowed in the center. Adjust the height of the brooder or the source of heat accordingly.


Brahma


Sussex


Plymouth Rock


Cornish

Meat Productive Poultry Breeds (Broilers)

This type of poultry breeds are used for only meat production purpose. Their meat become very soft and tasty. They weights about 2 to 2.5 kg within their 7 to 8 weeks of age, consuming about 4 kg food. They become suitable for marketing within 8 weeks. The world's most popular broiler poultry breeds are starbro, plymouth rock, cornish, sussex, brahma, hy-line, rose broiler, asil, cochin etc.

- Comparatively weights much than other poultry breeds.
- Don't incubate their eggs.
- Food to meat converting efficiency is very high (FCR-Feed conversion ratio).
- Grow very fast.
- Contain much fat in their body.
- Egg producing power is very low.
- They become very big sized.


Rhode Island Red

Egg and Meat Productive Poultry Breeds

Popular poultry breeds for both meat and egg production are new hampshire, australorp, rhode island red, plymouth etc. Characteristics of these types of poultry breeds are described below. These types of poultry breeds are of medium sized.

- Weight high.
- They may have trend for hatching eggs.
- Lay less eggs than egg productive breeds.
- They contain proper ratio of fat in their body.
- Grows very well.
- Gain maturity very fast.


Australorp


New Hampshire

Common Raising Systems

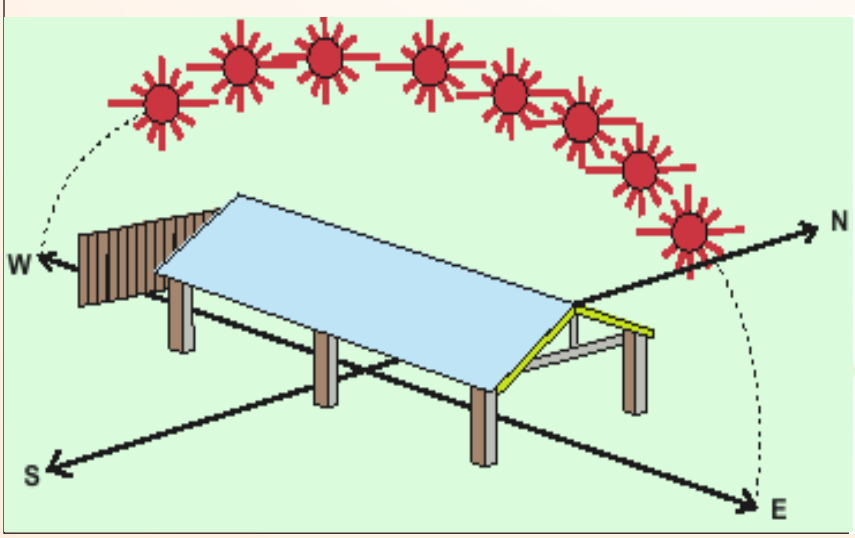
The common raising systems which are mostly used for commercial broiler poultry farming.

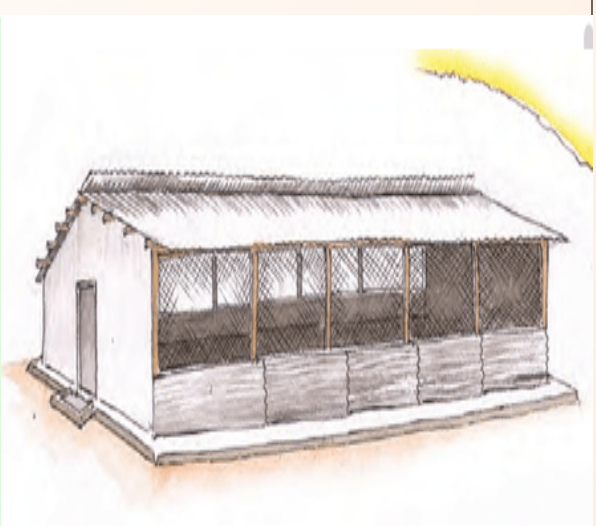
Indoor Raising Methods: In this method broilers are kept inside a house. Rice hulls, wood shavings, peanut shells etc. are used as litter in the floor of the house. In this system the broilers are kept in a large and open house (known as broiler house/growout houses) and they become suitable for consumption within their 5 to 6 weeks of age.This types of poultry houses are well equipped with mechanical systems for delivering the feed and water to the poultry birds. Well ventilation system, coolers and heaters are must. It is very important to keep the house always dry and clean. Generally a house of 400 feet long and 40 feet wide can accommodate about 20,000 birds. One-half square feet space is required per bird.

In this method broilers are kept inside a house. Rice hulls, wood shavings, peanut shells etc. are used as litter in the floor of the house. In this system the broilers are kept in a large and open house (known as broiler house/growout houses) and they become suitable for consumption within their 5 to 6 weeks of age.This types of poultry houses are well equipped with mechanical systems for delivering the feed and water to the poultry birds. Well ventilation system, coolers and heaters are must. It is very important to keep the house always dry and clean. Generally a house of 400 feet long and 40 feet wide can accommodate about 20,000 birds. One-half square feet space is required per bird.

Free-Range Methods: In free-range broiler farming methods the broilers are kept like the free-range layers. The broiler breeds which grow slowly (takes more than 8 weeks for reaching slaughter weight) are suitable for raising in this systems. The main facilitiy of free-range farming systems is that, it allows the birds scratching, foraging, pecking and outdoor exercise. While choosing breeds for commercial production, consider the availability of all types of necessary facilities. Visit your nearest local market and try to understand which product has a huge demand and price.

POULTRY HOUSING





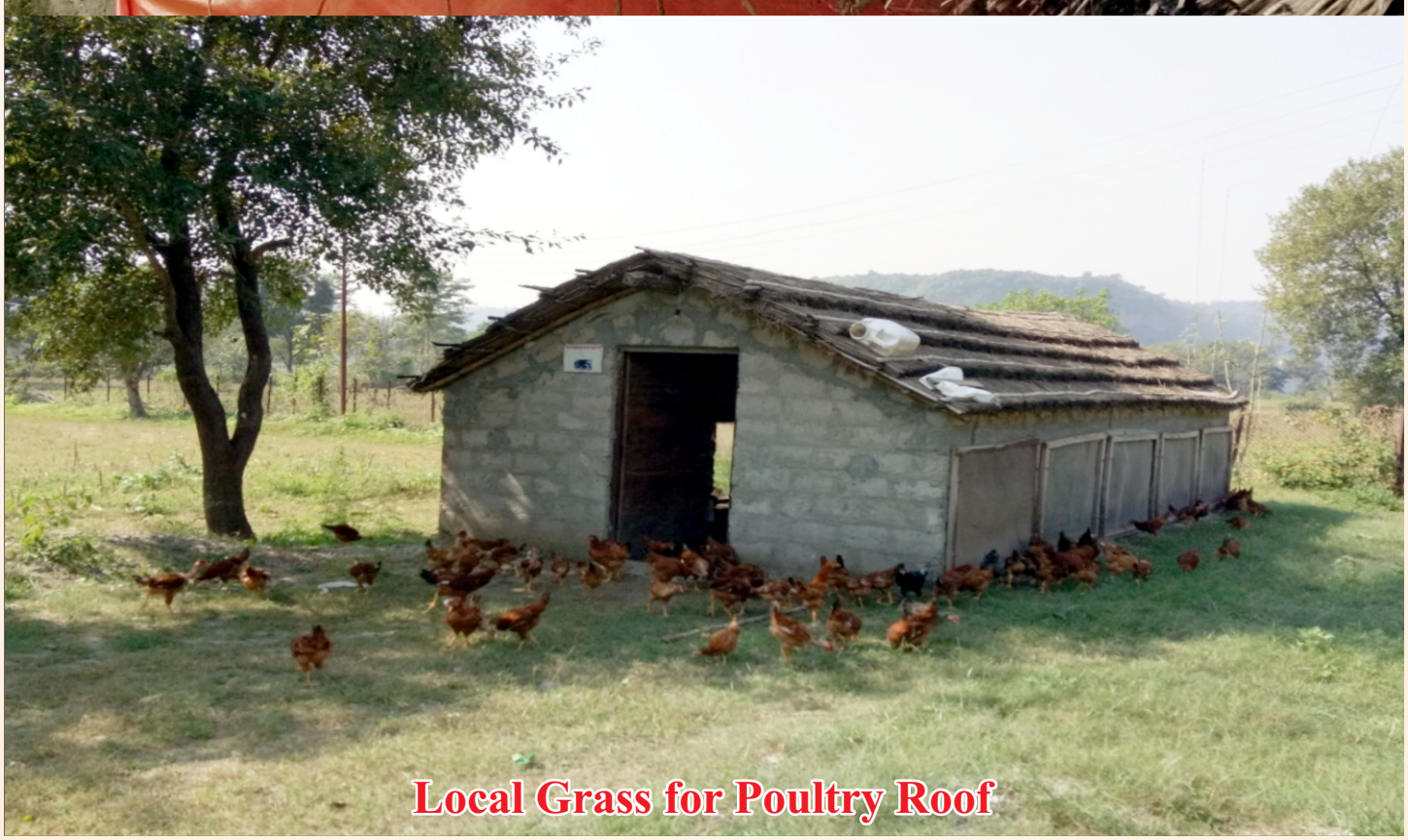
Poultry Housing

Suitable poultry housing is very important for successful poultry farming business. Poultry birds can be raised in both free range and indoor production systems. In case indoor production system, it is very crucial to manage the environment. Poultry need accurate management and environment for better production and welfare. Whether the poultry raised in indoor or outdoor system, make sure the well management, ventilation, lighting, temperature and litter condition. For a small scale poultry production, portable houses are best and this is an organic method. But for sustainable commercial poultry production, planned and proper designed poultry housing is very essential to keep the poultry birds healthy and productive. And this will increase the farming production and income.

Making a suitable poultry housing is another important factor for commercial production. But it is not too expensive like buying land. There are numerous ways for making a good house for the poultry birds. Always be sure that, the house or cage is sufficient and spacious enough to accommodate the birds with necessary space and facilities. In free range farming system, ensure sufficient amount of space for running and moving. The design of the house depends on the breeds and production type. However, while making a poultry house, consider the followings.

- Direction of poultry shed should always east-west direction and window direction should north- south.Make a proper ventilation system in the house. Because, good ventilation system ensures good health and proper growth of the birds. So, the house must have to be well ventilated.
- Ensure flow of sufficient amount of fresh air and light inside the house.
- Try to make south faced house. This will help to entrance sufficient amount of clean and fresh air.
- If you go for large scale commercial production and make numerous house, then the distance from one house to another house will be at least 40 feet.
- Always keep the house clean and fresh. And clean it perfectly before bringing the chicks into the farm.
- Prevent all types of harmful animals and predators.
- Make good facilities so that rain water and cold wind can't enter inside the house.
- Try to build the house in a calm and quiet place.
- Make a suitable drainage system inside the house. It will help you to clean the house easily.
- Keep all equipment in proper distance inside the house. And always clean the house and equipment in a regular basis.

Age weeks	Floor space Sq.ft./Chick	Feeding space inches/chick	Watering space inches/chick
1	0.2	1.5	0.5
2	0.2	2.0	0.7
3	0.3	2.0	0.7
4	0.4	2.5	0.8
5	0.6	2.5	0.8
6	0.8	3.0	1.0
7	0.9	3.0	1.0



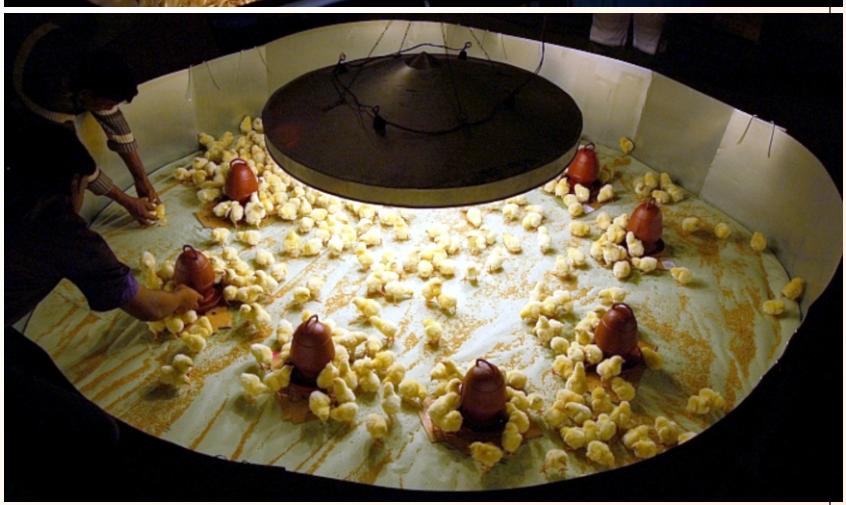
Local Grass for Poultry Roof

Environment

A good poultry housing system must have to be weather proof. Weather proof poultry housing system will keep the poultry birds safe from the adverse weather conditions such as cold, rain, wind, hot sun etc. The poultry housing system should have the facilities of providing warmth, particularly during brooding period and winter season. The house must have to be well ventilated. Must have the facilities of protecting the poultry birds from harmful predators. Different types of innovative poultry housing design are used in poultry farming business. It may be just a simple house, mobile or portable house or fixed houses with permanent foundation.

Temperature

Brooding Temperature



- Initial house temperature should be 25-27°C (75-80°F).House temperature should be reduced in line with brooder temperature to achieve a final house temperature of 20-22°C (68-72°F) by 24-27 days. The initial temperature under the brooders should be 29-31°C (87.8-91.4°F). Thereafter, temperature under the brooders should be reduced by an average of 0.2-0.3°C (0.4-0.6°F) per day
- Where a whole house brooding system is used, the initial brooding temperature at chick level should be 29-31°C (84-88°F). House temperature should be reduced gradually, in response to bird behaviour and condition, to achieve a final temperature of 20-22°C (68-72°F) by 21-24 days.
- An adult chicken has normal 105° to 107° Fahrenheit body temperature. The chickens can maintain their body temperature and grow very well in a thermo neutral zone of 65° to 75° Fahrenheit. If the temperature is under or higher than this zone, then you must have to control the temperature in any way.
- Chickens reduce their food consumption rate in hot weather. They have no sweat glands. As a result, the growth of poultry will be less in hot weather condition. They begin panting at or above 85° Fahrenheit temperature. They drink water frequently to keep them free from dehydration. It is very difficult to combine between high temperature and high humidity, because in those conditions panting does not make the body of chicken cool.
- It is must to keep sufficient cool drinking water inside the poultry housing, during summer season. During winter season, use heaters or some other heating device for heating the poultry housing system. Most of the farmers do not use heaters to heat the house and depend on the body warmth of poultry birds for heating.
- The poultry birds consume more feed in winter season, because they need more energy to keep their body warm and keep them free from cold. Most farmers provide poultry more food instead of heating the house. Because feeding more feed costs less than heating the house.
- However, you can use electric heaters or gas brooders for the purpose of heating the poultry housing area. Keep a thermometer inside every poultry house for measuring the daily temperature, and always follow the weather forecasts.

Age in weeks	Temperature under hover, at 5 cm above floor (°C)
0-1	35
0-2	32
2-3	29
3-4	26
5-5	23

Brooding of Chicks

There are two types of brooding viz. Natural brooding and Artificial brooding that can be adopted for backyard poultry farming.


Natural brooding

Natural brooding

If natural brooding is practiced the local broody hen is used as the indigenous hens are very good sitters. Improved variety of fertile eggs is put into incubation. The hen is provided with nesting materials. Food and water supply is given throughout the incubation period. A broody hen can easily take care for brooding and hatching of 12 to 15 chicks. After hatching the chicks are let loose along with mother for scavenging. There should be provision for separate place inside the shed for young chicks and mother at night.

Artificial brooding

In artificial brooding provision of artificial heat is necessary. Artificial heat can be provided with electricity, gas, kerosene, wood, sawdust etc. 'Bukharies' also can be used as a source of artificial heat. Wood, charcoal or sawdust is used in 'Bhukaries' and it is an ideal source of artificial heating when there is acute shortage of electricity, gas and kerosene. The optimum temperature is 95 F in first week and it can be reduced 5F per week up to 6 week till 70F(add degree sgn). Two watt per chick heat is required up to 6 week in brooder house. The necessity of light in brooder house is to increase feed consumption for maximum growth in a short period and also to prevent stampeding or piling if scared. Initially (up to 6 weeks) there should be provision for at least continuous light up to 48 hours in brooder house and in growing stage (8 to 18 weeks) light hour is 10 to 12. But in laying period light should be for 15 to 16 hours. The provision for extra light may be in the morning or evening or may be morning and evening both. To prevent direct contact with heat a chick guard made up of card board or metallic guard can be used in brooder house. The height of chick guard is 15 to 18" is placed in circular shape at a distance of 3' away from the hover.

Ventilation

- Good ventilation inside poultry housing system play a very vital role to control the indoor environment. It removes moisture, heat, gas etc. and brings fresh air inside the poultry house. You can design ventilation system in both natural and artificial (mechanical) methods.
- Most farmers use natural ventilation for poultry production. In natural ventilation system, you can open wide windows and side curtains to ensure the entrance of fresh air to make the house cold during summer season (hot weather). A pair of vent in the roof of poultry house will help to remove the hot air.
- A roof of at least six feet height from the floor is suitable for this purpose. Controlling natural ventilation is more difficult than artificial method.
- In winter season, make proper ventilation system to preserve heat and remove moister and gas (like ammonia) from the house. Most farmers close the windows and side curtains during winter season, because warm air holds more moisture than cold air. However, you should allow small amount of air inside the house with high moisture once or twice a day.
- In artificial ventilation system you can fully control the movement of air inside the poultry housing system. But this system is not suitable for free range poultry housing.

Lighting

Lighting in the Poultry House

- Light is also a very important element for poultry farming. And poultry birds become very sensitive to light. Light helps the poultry birds to be productive, finding food and simulating them for reproduction. Besides light, the poultry birds also need dark period for keeping good health and producing melatonin hormone (which is very important for immune function).
- Almost all types of poultry birds require 8 hours of darkness period and 16 hours presence of light. Almost all poultry producer use only the natural light for lighting the poultry house. Darkness is helpful for some fast growing broiler species, and helps them for reducing leg disorders and builds their body frame. However, poultry chicks require 24 hours light daily after hatching for finding food and water pot. Some commercial broiler poultry producer use long lighting period to encourage the bird consuming more food. This results in very fast growing of broilers. Broiler poultry birds do not eat feed and drink water in the dark. If the poultry birds are kept in darkness for some moment, then they will be more active in the light than continuous lighting period (and they will eat more feed). This is a good practice, and it keeps the poultry birds healthy. In accordance with natural lighting, you have to use artificial light.
- In small scale poultry rearing, you can use 14 to 16 hours of lighting period for layer poultry (where artificial lighting is needed for 4 to 6 hours daily depending on the season). But the lighting period should not be more than the longest day of the year. Maintain the lighting period for layer poultry farming very carefully, otherwise they will lay egg very soon or stop laying eggs.
- Use incandescent or fluorescent bulb for the purpose of artificial lighting. Fluorescent bulbs are very expensive than incandescent bulb. But fluorescent bulbs are very energy efficient and long lasting. However, use bulb according to your choice and demand.

- In the case of incandescent bulb use a 60 watt bulb for each 200 square feet area, and use a wide reflector always to maximize the light.
- Clean the bulbs regularly. You can use an automatic controller for maintaining a regular lighting period. Because if you forget to switch on the light manually, then it can hamper the egg and meat production of your poultry birds. Always use waterproof sockets inside the poultry housing system.
- Maintaining a lighting period inside the poultry house in morning is very effective than lighting in the evening. Adjust the lighting period according to the weather condition and season. Where there is no electricity or load shedding is very high, use batteries, solar panel for lighting the poultry house.

Litter / Floor Bedding Management

For successful poultry farming and getting desired production, litter management is very important. Usually the litter is used for covering the floor of poultry housing system which may be made of concrete, wooden or earthen. Following things should be kept n mind for proper management of litter:

- Litter absorbs the moister of closet and dilutes the manure. It also works as the bed for the poultry birds. Rice hulls and soft wood shavings are the common materials used by the farmers around the world. Besides this, you can use some other materials for litter making purpose such as recycled newspaper, sand, dried wood fiber, chopped pine straw, peanut hulls etc.
- Small scale poultry farmer also use some other materials such as hay and straw as poultry litter. Whatever you use, always try to use those materials which are healthy for poultry and compost well.
- A good litter contain about 20% to 30% moisture and depth about 2 to 4 inch. Ventilate the pulse very well, and it will help to remove moisture from the litter. High moisture in litter is very harmful for poultry health.
- Wet litter causes some problem like sores, and blisters on poultry birds and produce ammonia gas which hampers the respiratory system of poultry.
- Use aluminum sulfate or hydrated lime to reduce ammonia gas from the litter. You can use the litter again and again after drying the materials properly. But don't use the used litter if any disease affect in the poultry farm.
- After selling the poultry, remove the used litter from poultry house by machine or hand. This litter can be used as a good manure in the agricultural land for crop cultivation. In some area poultry manure and litter is very valuable and an extra source of earning cash.
- Dry poultry manure contains 3.84% nitrogen, 2.01% phosphorus and 1.42% potassium. In a word, poultry manure is very suitable for make soil fertile and it can be used in organic farming system.
- These are the common consideration for creating a suitable poultry housing system for your birds. Follow everything very carefully while making house for your birds. God bless you.

Wood Husk Poultry Bedding

Poultry Vaccination Tips

For vaccinating poultry the producers must have to follow some rules. Some poultry vaccination tips are listed bellow which will be helpful for the poultry producers.

- Before starting poultry vaccination wash the hand with soap who vaccinate the bird.
- Make the syringe and related equipment germ free with hot water (100 c).
- Never use germicide in this purpose.
- Mix the vaccine with distilled water, not with general water.
- Mix the vaccine with water in a dry and cold place.
- Keep some ice around the pot in which you mix the vaccine.
- After mixing with water apply it to the poultry as soon as possible.
- If some vaccine remain in the pot then put it under soil.
- Vaccinate the healthy bird. Don't vaccinate disease affected poultry anyhow.
- Don't use the date expired vaccine.
- Day temperature can damage the potency of vaccine. So vaccinate the poultry in morning or evening.
- Use one time syringe to vaccinate the poultry.
- If vaccinating with water needed, then stop serving water 3-4 hours before vaccinating.
- To ensure the potency of vaccine provide the poultry vitamins for three days.

DAYS	VACCINE	ROUTE
6-7	Ranikhet disease(F1 OR B1)	Eye drop or nasal drop
10-12	Gumboro (intermediate)	Drinking warter
18-21	Lasota vaccine(intermediate)	Drinking water
24-30	Gumboro disease (intermediate)	Drinking water

Broiler Poultry Feed

	Different Aged Broiler	
Feed Ingredients	Starter (1-4 w)	Finisher (4-8 w)
Broken Wheat	47	52
Rice Bran	20	18
Sesame Cake	13	12
Kipper Fish Powder	18	15
Bone Powder	1.25	1
Oyster Shell Powder	–	1.25
Salt	0.5	0.5
Primix (Vit & Min)	0.25	0.25
Total	100	100

Broiler Poultry Feed

- Broiler poultry birds are raised for commercial meat production. They convert foods to meat within a very short period of time. They have a good feed to meat converting ratio. So quality feeding is very important for maintaining a profitable broiler poultry farming business. Broilers require more energy and protein in their food.
- The main difference between layer poultry feed and broiler poultry feed is that broiler poultry needs more nutrient ingredients than layer poultry. So broiler poultry feed must have to be enriched with highly nutrient ingredients. You can provide nutritious feed to your broilers by formulating at your home or through purchasing from your nearest market. There are many companies available, who are supplying quality commercial poultry feed for broilers. This type of commercial poultry feeds are suitable for poultry health, and especially designed for broiler poultry.
- Feed your broiler birds some extra energy enriched food during winter season. Because they require more energy for keeping their body warm during this season. And they get the required energy from foods.
- Adequate amount of protein is also very important. Broilers are very fast growing birds, and they require more protein enriched food than layer poultry. And adding adequate amount of protein to broiler poultry feed is the most important and expensive part of broiler poultry feed. You can add both animal and vegetable protein in their food.
- Fish meal, meat meal, meat, milk, liver, dried animal blood etc.are great source of animal protein. Various types of corn, vegetables, grains etc. provide required protein for the poultry birds. Also ensure the availability of sufficient amount of vitamins and minerals in their food. Add adequate amount of required minerals and Vitamins in their food.
- For making balanced food for your poultry birds, you have to mix the feed ingredients in proper ratio. A good chart of nutritious broiler poultry feed is shown below. Adequate amount of clean and fresh drinking water is very important for poultry.
- Usually broiler poultry birds drink more water than layer poultry. So along with quality poultry feed, always ensure availability of adequate amount of fresh and clean drinking water according to their demand.
- Feed should be placed on a clean egg trays, sack, or news paper for first 7 days so that it can be found easily. Gradually introduce them to feeders.Ratio should be 4 Trays per 100 chicks.These should cover 50% of the brooding area. For regular feeders should be 3 feeders per 100 birds.

CHICK STARTER	**Give 0.5 kg per bird of crumbles/pellets for 2 weeks**
GROWER	**Give 1.5 kg per bird of grower pellets for 2 weeks.**
FINISHER **ellets are depleted at 5 weeks**	**Give 1.5kg per bird of finisher pellets for last 2 week. However, most birds fed on p**

Management of Broiler Production in Summer

In the course of production, management of broiler in summer is the most difficult period for the poultry farmers as heat stress is frequently observed. As the temperature raise above 35°c, it disrupts in the physiological phenomenon of the body . Heat stress releases the corticosterone which finally reduces the efficiency of flock. For maintaining of body temperature, control of heat is done by following ways:

- By spreading of wings i.e. heat loss by radiation without any medium.
- By conduction through touching on pipeline, walls or by digging in to the litter.
- By convection, loss of heat in the surrounding air which is the best and the effective one.

However, the above mechanism of heat loss diminishes if the temperature is above 40°c. There is rapid respiration 10 times the resting period through mouth breathing which results in low feed intake and increase water intake. There is excess co2 exhaled

as a result blood become more alkaline which reduces the capability of oxygen carrying resulting the reduced bone strength and low body weight. Hence, proper care and management is must to maintain the proper growth and development of broiler along with opening the gate way for optimization of profitability.

Effect of Heat in Poultry Farming in Summer.

- Most important effect of heat stress is decrease in body resistance and more susceptibility to E.coli and CRD etc. In summer outbreaks of gout may be seen in broilers and layers.
- In heat stressed birds blood flow increases to upper respiratory tract, skin and abdominal muscles for relieving heat, however, blood flow to intestinal tract is decreased. As a result there is reduction in appetite leading to lower feed intake.
- Concurrently water intake is increased resulting in fluid contents in intestinal tract. This further cause's diarrhea that results in loss of electrolytes needed to maintain acid base balance.

Clinical Sign and Symptom.

The following clinical signs will be observed in heat stressed birds:

- Panting/rapid respiration
- More intake of water
- Reduced appetite.
- Reduction of egg production
- Poor egg shell quality
- Less body weight gain in broilers
- Reduced feed efficiency
- Increase in body temperature
- Death

Post Mortem Lesions.

Dehydrated carcass

Mucoid exudates in mouth and nostrils

Pale/cyanotic combs

Pale breast muscles

Congestion of liver, spleen, kidney and lungs.

Fluid contents in intestines.

Chicken Heat Stress Management

Poultry producers can take a number of measures to help their chickens survive the effects of heat stress. Here are some tips for controlling poultry heat stress:

- Have very cool, clean drinking water available at all times in accessible locations.
- Supplement drinking water with electrolytes.
- Birds in heat stress are not inclined to eat during the heat of the day, so feed chickens during the coolest part of the day. Digestion naturally produces heat.
- Keep chickens in a well-ventilated area with adequate air flow. Remove the shutters from continuously operating fans to increase air flow. An ongoing cooling breeze makes a big difference in how chickens manage the heat.
- Avoid overcrowding the chickens. It reduces body heat, as well as the corresponding amount of heat the ventilation system must move out of the poultry house. Provide shady areas if the birds are outdoors.
- Regularly remove any accumulated litter from the chicken house, as decomposition produces heat. Removal also keeps pests to a minimum.
- Reduce radiant heat in the poultry house with adequate ceiling insulation.
- Outside of the chicken house, tall grass and weeds restrict air flow, while bare ground can reflect heat into the house. Low cut grass is best as it helps to absorb the sun and heat.

Poultry Management in Rainy Season

In monsoon rain can start continuously for few days. The poultry farmers should take necessary steps. In this season naturally south-west monsoon flow causes heavy rainfall. Gradual reduction and increase of temperature and humidity cause's parts of the country a lot of rain, rain fall for a long time threatened the farm management. In this situation, farmers will be benefited with the following measures-

- Increase additional 5 meters space around the poultry shed.
- The additional space should be clean and well kept. It should be free of grass and brushwood.
- Repair any holes in the roof.
- Polythene will need to supply if additional roof is not provided. It should be noticed that in case of more rain supply gunny in front and back cover.
- The floor should be repair well and kept dry as long as possible before leaving chick.
- Feeders should be kept dry as far as possible.
- All measures can be taken to ensure all litter is dry. Breaking the hard litter spread new litter. Dry goods such as lime powder, ammonium sulphate etc. can use to maintain the dry condition. Otherwise wet litter infects poultry such as coccidiocies, entireties, worm infection that causes great harm.

- It is specially targeted that the rain water does not grow around the poultry shed. Manage adequate water drainage. Otherwise it will be ill-shed.
- You should store enough food for the rainy seasons so that you do not need buying new food on that time
- In rainy season ponds, rivers, taps even tube wells water can be infected by rain water through the soil and the natural ways. If you want to get better water you have to filter and precipitancy for 24 hours long. Another way to purify water with chlorine, in this system 2 gm bleaching powder mixed with 1000 liters of drinking water. The combination of water should apply after 3 hours.
- When the poultry is kept in the deep litter system it should always be dry. General litter consists of 25 % moisture. To understand the position of litter,put one hand on litter with light pressure, if the liter is not a ball-like shaped and leave it with at once then it will better status litter.
- Add Poultry Management in Winter Season

Broiler Management in Winter Season

- Managing broiler chickens during winter months can be challenging for producers. Finding a happy medium between heating air inside the house while ventilating for desirable air quality can be difficult. However, appropriate ventilation is necessary to maintain healthy environmental conditions for broilers while keeping economic production in mind. If broilers become too cool, they will consume costly feed to generate additional heat.
- Keep poultry shed warm by use of bukhari or heaters.
- Keep the litter dry and clean
- Keep the windows covered to prevent cold waves
- Provide clean drinking water
- When bird eat more feed, along with energy, other nutrients are also consumed more which are actually not needed and they become a waste. To avoid this wastage during winter energy rich sources like oil/fat should be added to the diet or level of other nutrients may be reduced keeping the energy at same level
- In winter number of feeders should be increased as compared to summer.
- Feed should be available to the bird whole of the day. It has been experimentally proved that for proper growth of broiler during summer, diet containing 23% protein and 3100 Kcal ME/kg diet is needed. While in winter 3400 Kcal/kg ME and 23% protein is needed.

Benefits of Poultry Farming

Poultry farming business has numerous benefits. As a result many farmers prefer to invest in this business. People generally establish poultry farm for the purpose of producing eggs, meat and generating high revenue from these products. Billions of chickens are being raised throughout the world as a good source of food from their eggs and meat. However, here I am shortly describing the main benefits of poultry farming.

- The main benefit of poultry farming is, it doesn't require high capital for starting. You need just basic capital to start raising poultry. And most of the poultry birds are not costly enough to start raising.
- Poultry farming doesn't require a big space unless you are going to start commercially. You can easily raise some birds on your own backyard with one or numerous coops or cages. So, if you are interested in poultry farming, then you can easily do it on your own backyard with several birds.
- Commercial poultry farming business also ensure high return of investment within a very short period. Some poultry birds like broiler chickens take shorter duration of time to mature and generating profit.
- Poultry farm structures do not require high maintenance. You can minimize diseases and illness in poultry by following proper hygiene and care. Diseases are less in some poultry birds like quails, turkeys etc.
- In most cases, you don't need any license. Because almost all types of poultry birds are domestic. Although, if you need license from the relevant authority it is also easy for poultry.
- Poultry provides fresh and nutritious food and has a huge global demand. Global consumers of poultry products prefer them due to their nutrients and freshness. Poultry products are not much expensive and most of the people can afford those.
- Marketing poultry products is very easy. There is an established market for poultry products in almost all places of the world. So, you don't have to think about marketing your products. You can easily sell the products in your nearest local market.
- Poultry farming creates income and employment opportunities for the people. Unemployed educated youth can easily create a great income and employment opportunity for them by raising poultry commercially. Women and students can also do this business along with their daily activities.
- Almost all bank approve loans for this types of business venture. So, if you want to start this business commercially, then you can apply for loans to your local banks.
- There are many more benefits of poultry farming along with the above mentioned benefits. Start raising and you will gradually learn everything.

Layer Poultry Farming

Layer poultry farming means raising egg laying poultry birds for the purpose of commercial egg production. Layer chickens are such a special species of hens, which need to be raised from when they are one day old. They start laying eggs commercially from 18-19 weeks of age. They remain laying eggs continuously till their 72-78 weeks of age. They can produce about one kg of eggs by consuming about 2.25 kg of food during their egg laying period. For the purpose of producing hybrid eggs layer, consider the various characteristics of cock and hen before breeding. There are various types of highly egg productive layer breeds available.

Layer Breeds

Egg Productive Poultry Breeds (Layers)

- The chickens raised for egg production are known as layer chickens. Almost all types of commercial layer poultry breeds start laying eggs within their five to six month of age. They continuously lay about 275 to 300 eggs per year. Some strain lay about 330 eggs per year. Some highly egg productive breeds are Leghorn, Minorca, Sussex, Plymouth Rock, Ancona.

Comparatively weights less than other poultry breeds.

- ❖ Gain sexual maturity earlier.
- ❖ Less egg incubating trend.
- ❖ Start laying eggs within their five to six month of age.
- ❖ Converting efficiency of food to egg is very high.
- ❖ Contain less fat in their body.
- ❖ Egg producing power is very high.
- ❖ Lay big sized eggs.

Layer Hen Selection

You have to keep in mind some essential information before selecting the layer hens for your poultry farming business. You have to select those breeds which are suitable for your layer poultry farming business and can produce well in your area. Read below for selecting proper breeds for your business.

- ❖ For commercial eggs production, you have to choose highly productive laying hens correctly.
- ❖ All type of hens does not produce equal number of eggs.
- ❖ The chosen breeds must have to have good production capability.
- ❖ If your chosen breed contains the desired characteristic and have a reputation for egg production, then that breed is suitable for your business.
- ❖ Always purchase healthy chicks from a famous and popular hatchery. You can consult animal sciences expert before purchasing the chicks.

Keeping Chicks

During the first weeks after birth, many chicks do not want to drink water due to transporting them from one place to another. So you have to make adequate water drinking systems in their brooder house, and you have to train them for drinking water. Mix 5% glucose with water, so that they can easily get energy. Provide them any types of high quality multivitamin by mixing with water. Multivitamin and electrolyte are very effective when you transport chick from a long distance. It reduces tiredness and lack of water, and help to make the chick normal.

Vaccination and it's Importance

Vaccination program is a must for layer chicks for keeping them free from all types of diseases. The main advantage of poultry vaccination are listed below.

- Timely vaccination makes disease resistance power in the body of chick.
- Help to keep the hen free from infective poultry diseases.
- Disease prevalence will be less.
- Mortality rate will reduce.
- And low mortality rate = more production = more profit.

There are many types of poultry vaccines are available for layer hens. Marex, Ranikheth, Gamboro, Bruchaities, Bosonto, Salmonela etc. are used for layer chickens.

Before Vaccination

- You have to maintain some rules before vaccination.
- Hold the chickens very carefully.
- Vaccinate the chickens without any strain.
- There is no need to vaccinate the ill hen.
- Wash the vaccination equipment with hot boiled water or germicide medicine/antiseptic.
- Do the vaccination program in cold weather condition.
- Preventive vaccine is always applicable to healthy bird. Never vaccinate an infected bird

LAYER VACCINATION SCHEDULE:

DAYS	VACCINE	ROUTE
1-3	Gumboro(intermediate) vaccine	Eye drop
7	Lasota vaccine	Eye drop
14	Gumboro(intermediate) vaccine(repeat)	Eye drop
18	Mareks disease vaccine	0.2 ml by intramuscular or subcutaneous injection
21-23	Infectious bronchitis vaccine+Lasota as combined vaccine	Drinking water
28-30	Gumboro(intermediate) vaccine(repeat)	Drinking water
42	Fowl pox vaccine	Wing web prick(stab)
Week 8	Lasota vaccine(repeat) Infectious coryza(bacterin)	Drinking water Intramuscular injection
Week11-12	Infectious bronchitis+Lasota as combined vaccine(Repeat)	Drinking water
week13	Ranikhet disease vaccine(R2B)	Intramuscular injection
week14	Fowl pox vaccine(repeat) if necessary	Wing web prick
week18	Ranikhet disease vaccine (killed)	Subcutaneous injection

Keeping Growing Chicks

You have to maintain the suggestion listed below for keeping growing layer chickens.

- You have to provide the growing chicks special care until they reach 4-5 weeks of age.
- After brooding serve them good quality feed. It will make good results in the future. They will produce egg highly. High quality feed will make the chickens healthy and increase their body weight.
- So it is very important to provide them quality pellet feed during growing period.