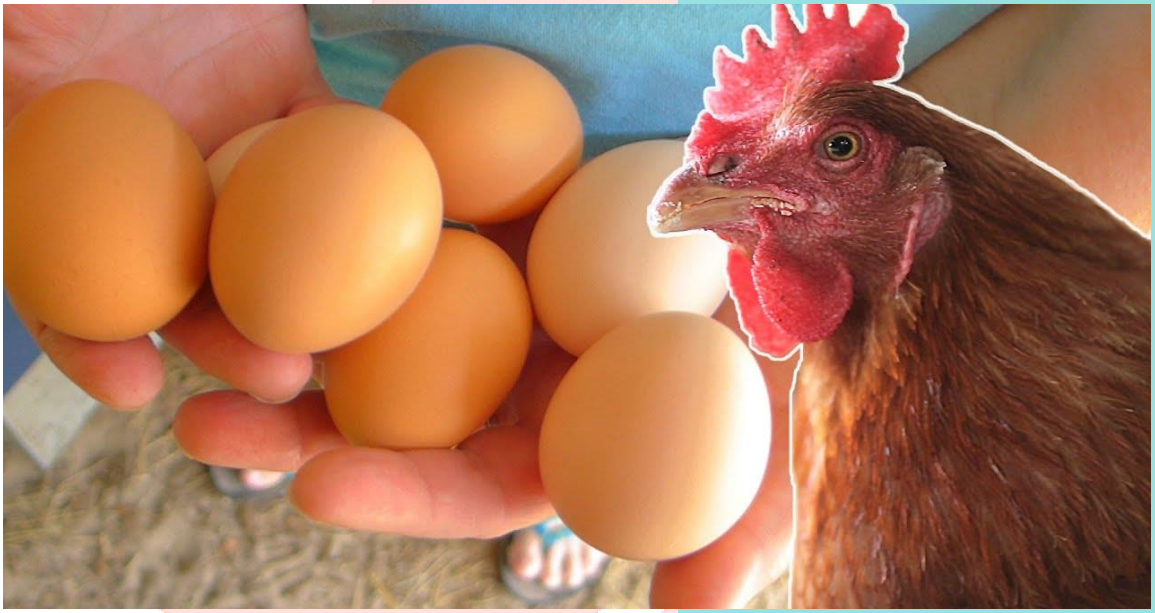
Recommended Prctice for Backyard Farming



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Introduction

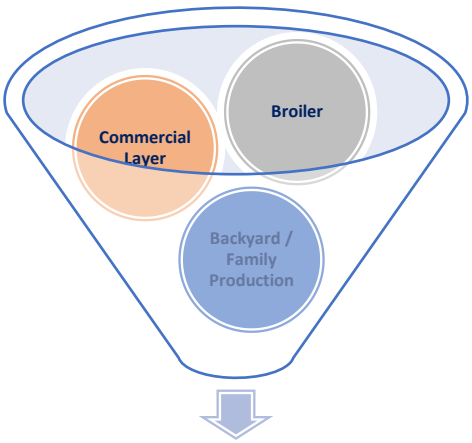
Poultry farming in India has transformed into a techno-commercial industry the status of backyard farming since three decades. India stands as third largest producer and fifth chicken meat producer in the world with about 60 billion eggs & more than 500 million metric tons of chicken meat. This production is achieved generally by commercial poultry operations; however, a significant contribution comes from rural poultry also.

The present status of agriculture, and food crop production makes it inevitable design a policy which is complimentary and suitable for landless labourers and masses. Animal Husbandry Sector plays a major role in alleviating protein deficiency & promoting sustainability of rural economy. Rural Poultry is a good occupation for the rural masses' economic sustainability and nutritional security. Many countries have adopted Poultry as a micro enterprise model for rural economic sustainability that also empower women.

Rural Poultry involves Chicken Farming, Duck Rearing, Turkey, Quail and Fowl Farming with minimum available infrastructure and open range farming. It is suggested that these formats are made better sustainable with usage of locally available materials such as food grain waste, floor mill waste, vegetable waste etc., to keep cost of production at a minimum. There are two benefits one can derive by way backyard Poultry Farming namely Income generation by selling eggs or Poultry for and the major benefit would be supplementing the household nutritional requirement way of self-consumption to the needy.

This evolution in layer farming techniques has led to varied layers of farming across the country. The poultry industry has turned lucrative and highly competitive. The economic factors of the industry demand higher production at lower costs without compromising the consumer quality standards. The scale and intensity of production is substantially higher in the commercial and industrial sectors than in backyard farming. Advantages are derived by the poultry industry from economies of large-scale production which provides for specialisation and division of labour at different stages in the production process, leading to automation of operations and labour-cost savings.

In contrast, backyard poultry farming in rural areas still follow the traditional way of farming methods. This makes the production ineffective as it exposes the birds to predators and renders them prone to diseases. Further, lack of constant optimal environment leads to low hatchability among the birds. Thus, the housing conditions in poultry farming have a significant impact over the production. In order to achieve the maximum production, low cost caging techniques even at the cost of consumer quality standards are rampantly in use. The present trend in the market indicates



Different Segment of Poultry

that small houses are being discarded for larger and more mechanised houses for egg production. The birds are maintained in hen houses without any contact with other flocks and other wildlife. Consequently, it reduces the immunity of the birds making bio-security a critical factor in egg production.

Basic concept of rural poultry revolves around production of colored variety chicken similar to desi or local variety with a higher performance outputs namely body weight gain and more egg production under low input technology conditions. Poultry Production has three segments:

Commercial Layers
(Egg)

Broilers
(Chicken)

Backyard / Family Production
(Both eggs and chicken)

Nutritional Benefits

In spite of the increasing prevalence of obesity and non-communicable diseases, undernutrition remains a critical issue for many of the world's poorer countries. In India, more than a third of children are stunted. In fact, nearly 151 million children under five in the world were still stunted in 2017. For many of these children, the poor growth which will blight their entire lives began in their mothers' wombs. Poor quality food is one major contributor to poor growth both in the womb and during the vulnerable first years of life. But which foods should we be promoting to make a difference to these figures? And how should we go about making the most nutritious foods accessible to world's poorest populations?

The humble egg seems increasingly likely to offer a practical and impactful opportunity to tackle these problems. Eggs are almost pure protein, of very high quality. They also provide virtually the entire Adequate Intake, for young children, of vitamin B12 and choline. The essential fatty acid content of eggs may be especially important in pregnancy. Nearly the whole world—with the notable exception of the vegetarian belt of India—likes to eat eggs, and they can be produced at prices which make them

accessible even to the moderately poor.

Sharing the nutritional values of the meat and egg;

Nutrient	Benefit
Protein	Essential for building and repairing muscles, organs, skin, hair and other body tissues; needed to produce hormones, enzymes and antibodies; the protein in eggs is easily absorbed by the body
Iron	Carries oxygen to the cells; helps prevent anemia – the iron in eggs is easily absorbed by the body
Vitamin A	Helps maintain healthy skin and eye tissue; assists in night vision
Vitamin D	Strengthens bones and teeth; may help protect against certain cancers and auto-immune diseases
Vitamin E	An antioxidant that plays a role in maintaining good health and preventing disease
Vitamin B12	Helps protect against heart disease
Folate	Helps produce and maintain new cells; helps prevent a type of anemia; helps protect against serious birth defects if taken prior to pregnancy and during the first three months of pregnancy
Selenium	Works with Vitamin E to act as an antioxidant to help prevent the breakdown of body tissues
Lutein & Zeaxanthin	Maintains good vision; may reduce the risk of age-related eye disease, such as cataracts and macular degeneration
Choline	Plays a strong role in brain development and function

Cholesterol:

An egg a day is ok!
If you've been avoiding eggs because of concerns linking them to dietary cholesterol and coronary heart disease, it's time to reconsider. The latest research shows that dietary cholesterol, like what's in eggs, has very little effect on your blood cholesterol levels. Healthy adults can enjoy an egg every day without increasing their risk of heart disease.

Omega-3

Omega-3s are a type of polyunsaturated fat, or healthy fat, known to protect your heart. They are essential for good health, but our bodies do not naturally produce them, which is why we have to eat them from foods such as salmon, certain types of oils and nuts, and Omega-3 eggs.
Omega-3 eggs are produced by feeding hens a diet containing flaxseed, a known source of Omega-3. Flaxseed naturally contains alpha-linolenic acid (ALA), a plant-based type of Omega-3 fatty acid.

Commercial Layer Industry

The small layer units are becoming unviable. Large units with million birds and 100,000 birds in one house are coming up. Some 70% of the layer birds were in the states of Andhra Pradesh, Tamil Nadu, Maharashtra & Karnataka in south and only Punjab in the north. The eggs were transported to other states. More production units are coming up in Uttar Pradesh, West Bengal and Bihar now. North-Eastern states are planning production units to get fresh eggs at more reasonable costs saving time and money on transport.

Larger units go for bulk purchases, seasonal purchases at harvest and even go for import of feed ingredients. The production costs can be managed.

- Mechanization in feed production, feeding the birds & egg handling is possible with larger units.
- Long distance supplies, exports & further processing can be planned with mass production.
- Larger units can adopt better technology like least cost feed formulations & biosecurity protocols to prevent diseases.
- The eggs in supermarkets will be graded, cleaned, well packed & labelled for the nutritive value & "use before date."
- Promotion of egg consumption in mid-day meal schemes, hospitals will boost the demand.
- Shell eggs & egg products, like pasteurised and processed liquid eggs have good markets in many countries like the Middle-East and Japan. We have to enhance the quality standards to meet the requirement of those countries.

These large houses with mechanisation require huge investments. The cost of finance is a large part of production cost of an egg. Social issues around the large farm units like manure handling, labour availability and environment pollution are putting a limit on expansions.

Growth of the industry can be appreciated by following figures

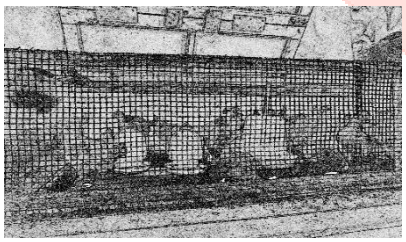
Parameter	Year 1990	Year 2016
Layer bird (In crore)	10	28
Layer feed price (In Rs)	12	24
Egg price (In Rs)	1.50	5.00
Egg per head year	20	68

The price of feed is increasing. The egg prices also increase but at a low pace. The gap is being met with the efficiency in production.

Technical Protocol

In backyard poultry we use improved dual-purpose breed (Meat & Egg) which Is. Mostly these breeds are developed by crossing existing breeds or improved breeds. Few breeds common in India are: Vanaraja, Giriraj, RR (Rainbow Rooster), Grampriya. These breeds are developed by government institutions or private companies. These breeds have many positives over the native breed:

The important management practices are as follow:



Housing

Brooding/Care of chicks

Sanitation & Hygiene

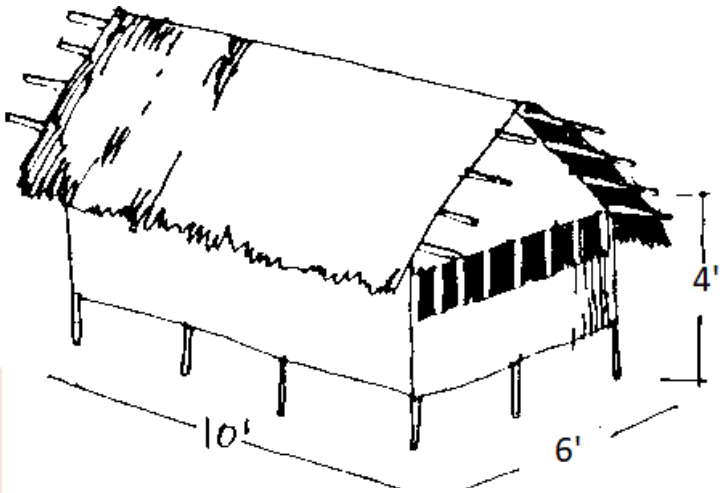
Vaccination

Feeding

Record keeping

Housing

- 1.5-2 sq. ft. area per bird should be allotted
- Litter Material should be 2-3 inch deep
- Wood powder or rice husk could be used as litter
- Cross ventilation is must
- Roof height should be min. 4 Feet
- A separate secluded egg laying (Hen House) area should be provided in the shed. 2*2 feet area (within the shed) could be earmarked for Hen House by surrounding it with bamboo sticks & filling it with >=5 inch litter

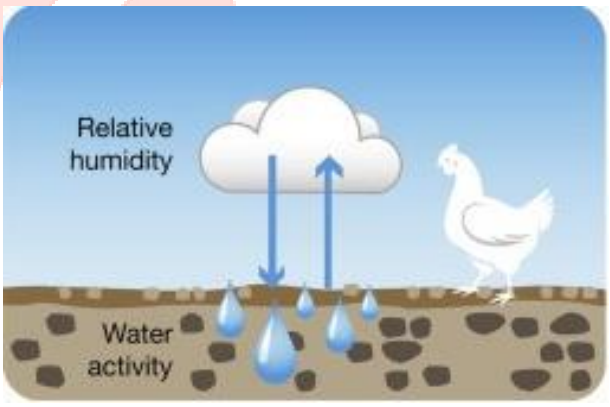


The shed is for 20 layers, it requires 60 sq. ft

- Birds should be let loose early in the morning & should be gathered in the shed by evening
- During rains, provisions should be made to prevent entry of water & wetting of litter. Wet litter should be changed immediately
- The retaining wall around the shed must not be greater than 1.25 feet high to allow cross ventilation
- The shed must be well ventilated & well lit with provision of electricity for illumination in the night
- For better laying, make provision for lighting (18-20 hours a day)

Sanitation & Hygiene

Litter management place a vital role in controlling the disease in the flock. birds are housed on deep litter, placing of waterers and their maintenance should due attention to keep the litter dry. The litter should be stirred at regular intervals depending on the environmental temperature, humidity, ventilation fecal moisture quality of water system. Fortnightly (Summer & Winter Season)/ Weekly (Rainy Season) Unslaked Lime should be added to the litter @100gm per kg of litter. The steps to follow for keeping clean are as follows;



- Hen House should be cleaned regularly & litter should be replaced fortnightly
- Spray (B-904 @8ml/lt water) should be done fortnightly in the shed & Over the birds also
- The roaming area should be fenced & common hunters like Cat & Dogs should not be allowed
- The Pigeons should be prevented in & around the roaming area/Shed
- The dead birds should be properly disposed (either buried with Salt/Lime or shall be burned or should be properly boiled before feeding to pig)
- The feeder & drinkers should be cleaned weekly. The drinker should be washed thoroughly (to remove the bio-film). Any sort of greasing inside the drinker should not be allowed to settle

Vaccination

Vaccination is the inoculation of specific biological substance antigen to stimulate resistance or immunity to the birds against diseases. Blow listed the name of the vaccination and the age for vaccination;

Sr. No.	Age	Vaccine	Route	Dose
1	1 day (Layer)	Marek's disease (MD)	S/C	0.2 ml
2	4 day	B1	Eye drop	1 drop
3	12 day	IBD	Eye drop	1 drop
4	21 day	Fowl Pox	Wing Puncture	0.2 ml
5	64 day	R2B	S/C or I/M	0.5 ml
6	84 day	Fowl Pox	Wing Puncture	0.2 ml
7	8 Month	R2B	S/C or I/M	0.5 ml
8	9 Month	Fowl Pox	Wing Puncture	0.2 ml
9	14 Month	R2B	S/C or I/M	0.5 ml
10	15 Month	Fowl Pox	Wing Puncture	0.2 ml
11	20 Month	R2B	S/C or I/M	0.5 ml
12	21 Month	Fowl Pox	Wing Puncture	0.2 ml

Feeding

The rural type chicks need balanced feed during the initial 6 weeks of age nursery rearing/brooding. In the nurseries, the chicks are reared on standard chick ration. For the Grower birds in the second phase, besides the feed material available the free range, natural food/greens like waste grains germinated seeds, mulberry azolla, drumstick leaves and subabul leaves (high protein sources). The need for feed depends on the free range available, intensity of vegetation, availability of grains, insects, grass seeds. Types of shed available;

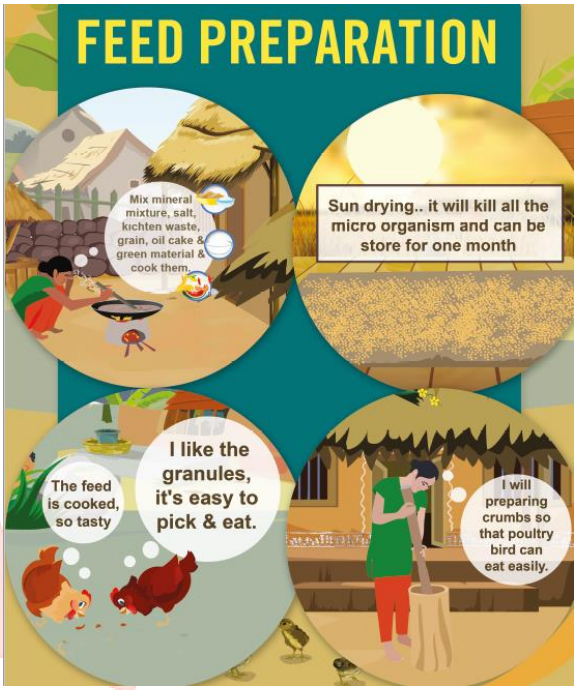
Mash feed: Obtained by grinding and mixing of the raw materials. It is most commonly used feed, easy to prepare and economical

Pellet feed: Prepared by exposing the mash feed to heat treatment under pressure. The heat destroys the micro-organisms and anti-nutritional factors in raw materials enabling the feed for better digestibility. This system of feed minimises the feed wastage.

Crumbles: the pellets are broken into granules. The feed preparation is little expensive compared to mash and pellets.

Other major points to remember while feeding is;

- ♣ Scavenging should be practiced in daytime.
- ♣ Add 3-4 gms of Stone grits in the feed once laying start. Stone grits will supply required Calcium for egg laying & aid in digestion of feed
- ♣ Always provide supplementary feed after 4 weeks of age. This could be a handful of broken Rice/ any other grain mixed with some Oil Seed Cake
- ♣ For meat purpose, Finisher poultry feed could be provided @25 gm/Bird/Day
- ♣ Add some mineral mixture & common salt to the feed (@5gm per kg. of feed).
- ♣ The feed mixture could be prepared using various combination of the ingredients as per need (like for First few 20 days add more protein source, during laying season increase the salt & mineral mixture concentration & reduce the fat content of the feed)



Sr. No.	Ingredients	Nutrient Source
1	Broken Grains	Carbohydrate, Roughage
2	Rice Bran	Carbohydrate
3	Azolla	Protein, Vitamins
4	Deoiled Cake	Protein, Fat, Vitamins
5	Dry Fish	Protein, Vitamins
6	Meat Waste (Poultry/Pig/Cattle/Buffalo/ Sheep/Goat) **(Boiled, Dried, Fine chopped & Fresh only)**	Protein, Fat, Minerals, Vitamins
7	Legume Seeds (with or without cover)	Protein, Vitamin, Minerals
8	Green Leafy Vegetables	Vitamins, Minerals, Roughage,
9	Common Salt	Electrolyte
10	Mineral Mixture	Minerals

Making crumbles using Kitchen Waste

Kitchen waste constitute a very good & Balanced source of nutrition. It contains all the nutrients (Carbohydrate, Fat, Protein, Salt) in right proportion. As the kitchen waste is generated daily, there is no extra monetary pressure on the family for feeding birds.

Constraints

The kitchen waste contains particle size larger than a bird can pick from their beak & as the waste is collected through out the day, it picks up a significant amount of micro-organisms. If the kitchen waste is fed as such, it shall result in health compromise & may be unpalatable to the birds.

Method

The kitchen waste (including meat chunks or offal) should be cooked, with adding some Mineral mixture into a Puree. The Puree should be dried in the sun & broken into small crumbles using pestle & mortar. This obtained feed could be stored for more than a month & could be fed to the birds as supplementary feed.

Brooding/Care of chicks

Brooding of chicks is very important operation in the early age of the Chicks are provided with required temperature by artificial means. The details of brooding methods are presented below.

- If brooding is done by the Hen, the hen should be provided a separate space to tend to the chicks. Separate housing for each mother Hen is recommended
- If the Eggs are hatched in a Hatchery, proper brooding arrangements has to be made.
- The chicks should be provided with some heat source for the first 15 days (95^0 F in first week followed by 90, 85, 80 in every week & make constant at 80^0F)
- An Incandescent bulb (2W per chick at height of 1.5 feet) could serve the purpose
- Chicks movement should be restricted during the colder parts of the day (like Morning & evening) by using a chick guard. If the chicks are hatched in a hatchery, they should not be allowed to venture out for first 15 days of their life.
- The chicks should be offered jaggery water mixed with some black salt (0.5%) for the first few days, this shall allow smooth expulsion of Muconium.
- Additionally, vit. B-Complex, Vit. A, D3 & E could also be given in the drinking water for first 10 days
- With every vaccine (2 days Pre & Post vaccine), immunomodulator is highly recommended (Vit. E & Selenium)
- First few days are very important in the life of chick, as the development of gut occurs during this time. With right quality & form (Crumbs) of feed, the development could be influenced. For the first few days, the chicks are to be provided with high quality of feed with particle size 1-3mm. The feed used must be nutritionally balanced with required amount of Minerals, Proteins, Fats & carbohydrates.
- For the first few days, right proportion of Protein & Minerals is required. This could be ensured by mixing commercially available Pre-starter feed with broken grains (coarse grinding of grains shall serve the purpose).

Weight Gain & Egg Laying Details*

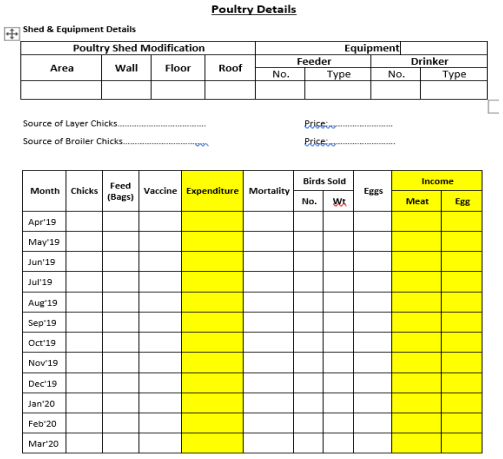
Parameter	Value
Day Old Chick Weight	40 gm
Body Wt. at	
6 Week	700-850 gm
20 Week	2-2.2 kg
40 Week	3-3.2 kg
Mortality (upto 6 week)	2%
Age at first Egg Laying	20-22 Week (140-160 Days)
Wt. of Egg at 40 weeks	42-44 gm
Wt. of Egg at Start of Egg Laying (25-28 Week)	52-58 gm
Eggs Laid (Since start of egg laying to 40 Week)	55-65
Eggs Laid (Since start of egg laying to 1.5 Years)	140-150

*As provided by ICAR-Directorate of Poultry Research, Hyderabad

Recording Keeping

- ♣ Proper record maintenance is most important to compute the economics of the enterprise
- ♣ 2 types of records are maintained:
  - Production Records: Dealing with the production side i.e. Wt. of the chick, Growth monitoring, Mortality, Disease profile, Vaccination record,
  - Financial Records: Deals with the money matters like: Price of Chicks, Supplier of chicks, Date of Sale, Price, wt. at sale, price of feed stuff, expenses on feed, chicks & other inputs

In case of any disease outbreak/ loss, the records help to pin point the cause & rectify the same



Poultry Details

Shed & Equipment Details

Poultry Shed Modification				Equipment			
				Feeder		Drinker	
Area	Wall	Floor	Roof	No.	Type	No.	Type

Source of Layer Chicks..... Price.....

Source of Broiler Chicks..... Price.....

Month	Chicks	Feed (Bags)	Vaccine	Expenditure	Mortality	Birds Sold		Eggs	Income	
						No.	Wt		Meat	Egg
Apr'19										
May'19										
Jun'19										
Jul'19										
Aug'19										
Sep'19										
Oct'19										
Nov'19										
Dec'19										
Jan'20										
Feb'20										
Mar'20										

Cost Benefit Analysis

CBA (Cost Benefit Analysis) of Backyard Poultry			
Parameter	**Unit**	**Value**	**Remarks**
Unit Size	**Birds**	**50**	Male:Female = 1:4. The ration could be brough down to 1:8, so the males could be sold earlier to the market, as they are fast grower
Duration of Rearing	Months	18	After 18 months, the birds are sold, as the potential to lay eggs comes down very significantly at this age
Mortality (%)	%	10	
Age of Egg Laying	Months	5	The She-Hen continue to lay eggs till 24 weeks of age but after 18 months of age, the potential comes down very significantly
Average Eggs Laid in life time	Eggs/Bird	120	In duration of 13 months i.e. start age of 5 months to culling age of 18 months
Body Wt.	Kg.	1.7	Male body wt. will always be higher by 5-15% than of female body. Wt.
No. of Dead Birds		5	
No. of Birds available for sale		45	
Price of Chick	Rs./Chick	50	
Price of Vaccine & medicine	Rs./Bird	10	
Price of Sanitation & hygiene	Rs./Bird	10	
Price of Shed	Lumpsum	2500	

Price of feeding	Rs./Bird	100	Packed Feed 2.5kg per bird, Mineral Mixture & Salt (Used to fortify the home cooked food)
Misc Exp.	Rs./Bird	10	
Expenses			
Expenses on Shed	Rs	2500	
Expenses on Chicks	Rs	2500	
Expenses on Vaccine & Medicine	Rs	500	
Expenses on Sanitation & Hygiene	Rs	500	
Expenses on Feeding	Rs	5000	
Misc. Expenses	Rs	500	
Total Expenses	**Rs.**	**11500**	
Revenue			
No. of Eggs Laid	No	4560	It includes 5% mortality of the birds
Price of Egg	Rs./Egg	10	
Price of Meat	Rs./Kg.	250	
Sale proceed of Eggs	Rs	45600	
Total Body Wt. Sold	Kg.	80.75	
Sale proceed of Meat	Rs.	20188	
Total Revenue	**Rs.**	**65788**	
Profit In a Cycle	**Rs.**	**54288**	
Profit per annum	**Rs./Year**	**36192**	