

## COMMERCIAL BROILER MANAGEMENT GUIDE

### ECONOMIC TRAITS IN COMMERCIAL BROILERS

- |                                 |                           |
|---------------------------------|---------------------------|
| 1. Growth rate                  | 6. Liveability            |
| 2. Body weight                  | 7. Dressing percentage    |
| 3. Body size                    | 8. Breast meat percentage |
| 4. Feed consumption             | 9. Disease resistance     |
| 5. Feed consumption ratio (FCR) |                           |

### PERFORMANCE CAPABILITIES OF COMMERCIAL BROILERS:

Sl. No.	Trait	Standard
1.	Liveability % – 0 to 6 weeks of age	96-98
2.	Body weight at 35-42 days (Kg)	2.0 to 2.2
3.	FCR	1.65-1.85
4.	Number of crops/year/shed	7-8
5.	Standard mortality (%)	4.00
	Brooding phase	2.75
	Growing phase	1.25
6.	Feed consumption (Kg) upto 6 weeks.	3.0-3.5
	Brooding phase(0-3 weeks)	1.062
	Growing phase (4-6 weeks)	2.378

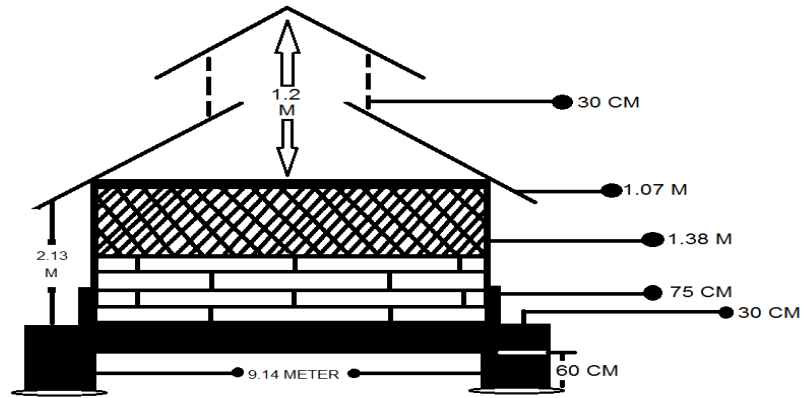
### COMMERCIAL STRAINS OF BROILER DEVELOPED BY PRIVATE SECTOR

Commercial Strains
Cobb 100, Cobb 200, Cobb 400-Y, Cobb 500
Hubbard Hi-Y, Hubbard Classic, Hubbard Roaster.
Ross-308, Ross-208, Ross508, Ross Male, Ross, Indian River.
Anak-2000, Anak 40 Red, Anak White –B
Avian 24K female, Avian 34K female, Avian 43K female
Kasila Broiler, Lohman, Indbro, Starbro, Charbro, Samrat Hubchix etc

### COMMERCIAL STRAINS OF BROILER DEVELOPED BY GOVT INSTITUTION IN INDIA:

B-77 2. IBL-80 3. IBB-83 4. IBI-91

### BROILER HOUSE CONSTRUCTION:



**BROILER HOUSE WITH RIDGE VENTILATION**

**Optimal environmental conditions for rearing broilers:**

Temperature	22 <sup>0</sup> - 30 <sup>0</sup> C ( 70 <sup>0</sup> - 85 <sup>0</sup> F)
Relative Humidity	30 - 60%
Ammonia level	less than 25 ppm
Litter moisture	15-25%

**SELECTION OF SITE**

- Location- isolated, away from residential and industrial area, away from other poultry farms, away from local breeds/ desi birds.
- Market – for farm inputs and out puts. Consider –Distance, Demand , Annual growth
- Land – should be elevated and Square in size
- Water- Availability, Source, Quantity of water – ½ lit per bird, 60 lit per person
- Should have proper electricity facility and proper road facility

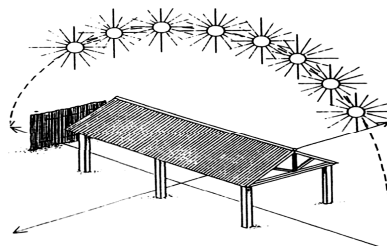
**BROILER SHED**

**► ORIENTATION**

The broiler shed should be constructed in east-west direction.

East

North



West

South

- ▶ **SIZE** : Each broiler requires one square foot of floor space under deep litter system of rearing.
- ▶ **LENGTH** : Any convenient length, but maximum should be 150 feet for open house.
- ▶ **WIDTH** : Open sided poultry houses should have a width not more than 22 to 25 feet.
  
- ▶ **HEIGHT** : Eaves height from foundation =7 to 8 feet and Height at centre =12 to 14 feet.
- ▶ **FOUNDATION** : The depth of the foundation should be 3 to 5 feet.
- ▶ **FLOOR** : The floor should be concrete, Sloppy with rate proof device and free from dampness.
- ▶ **SIDE WALLS** : The side wall should be 1 to 1.5 feet height The rest to be kept open and fitted with wire mesh or expanded metal. The wire nets should be 2.5 x 2.5 cm (1 inch) size of 16 gauge strength.
- ▶ **ROOF** : The roof of the shed may be thatched or asbestos sheet. Full monitor and Gable type roof are mostly preferred in tropical countries like India.
- ▶ **OVERHANG** : Not less than 3.5 feet in order to prevent the entry of rain water into the shed.
- ▶ **END WALLS** : End walls on both sides may be closed from roofline to floor level. In small sized houses wire mesh may be fitted on the end walls as done on the sides.
- ▶ **DOORS** : There should be two doors of 1.98 x 0.90 meter (6.5 x 3 ft) size on the end walls. At the entry a foot bath of the size 45x 90 x 9 cm (1.5x3x0.4 ft) should be constructed.



Foot bath

- ▶ **DOOR STEP** : The door step should be made of concrete and should be detached by 15 cm (6 inch) from the plinth.
- ▶ **LIGHTING** : Light should be provided at 7 to 8 feet above the ground level and must be hanged from ceiling. For incandescent bulb the interval between two bulbs is 10 feet and in case of fluorescent light (Tube lights) the interval is 15 feet.

### **Broiler house equipments**

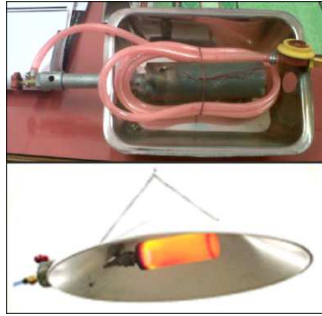
- ▶ **Hover brooder-**

It is canopy type, made of tin and wood. Incandescent bulbs of 40,60 or 100 watts are used to provide heat to the chicks. A brooder with 1.22 meter (50 inch) diameter can be used to brood about 250 chicks.

- ▶ **Gas Brooder** – Natural gas, LPG is connected to heating element which is hanged 3 to 5 feet above the chick. For gas brooding side curtains should be kept open for sufficient availability of oxygen in shed.



Hover brooder  
brooder



Gas brooder



Electric

- ▶ **Electric Brooder**- This brooder can be used for 400 to 500 chicks.
- ▶ **Bukhari Heater**- It is a cylindrical chamber with a central funnel. The chamber is packed with saw dust/paddy/rice husk as fuel
- ▶ **Infra red bulb** – The infra red have germicidal effect and also helps in synthesis of vitamin D . 250 watts IR bulb can provide brooding for about 150 to 250 chick.



Chick guard

- **Brooder guard / Chick guard** : Chick guards should be 30-45 cm (1-11/2 ft) in height and should have arrangements to add or remove guards as and when required for extension or reduction of the area. 5 feet diameter brooder guard area can hold 200-250 chicks.

- **Feeders and drinkers**



Plastic feeding tray

Hanging feeders



Pan and jar type of drinker



Automatic bell drinker

## **HUSBANDRY PRACTICES TO BE FOLLOWED IN SUCCESSFUL BROILER PRODUCTION**

- In deep litter system of management, litter materials may be rice husk, saw dust, ground nut hulls, wood shavings etc. Depth of litter should be 3-6 inches. Broilers should be reared in All-in-all out system (single batch at a time).

### **PREPARATION OF BROODER HOUSE TO RECEIVE THE CHICKS**

- ▶ Remove all portable equipments, clean and wash then dip them in any suitable disinfectant as per manufacturer's instruction and then sun dry for a day.
- ▶ Remove all organic material preferably after spraying 5 to 10 % formalin and disposed it off away from farm premises.
- ▶ Heat treatment – burning of floor, side wire mesh with blow lamp to reduce coccidiosis.
- ▶ Chemical Treatment- Soak floor with strong solution of caustic soda flake for 12 to 24 hrs to kill VVIBD virus. Dose of NaOH-11 -12 gm per lit of water, or 2 kg per 1000 sq feet.
- ▶ White wash- Lime stone + 2 to 5 % formalin + 1 % copper sulphate + 1 % kerosene
- ▶ Fumigation- 20 gm of KMnO<sub>4</sub> + 40 ml formalin for 100 cu feet.
- ▶ Keep the shed vacant for 7 to 10 days.

### **Preparation of brooder house 24 hours prior to arrival of chicks:**

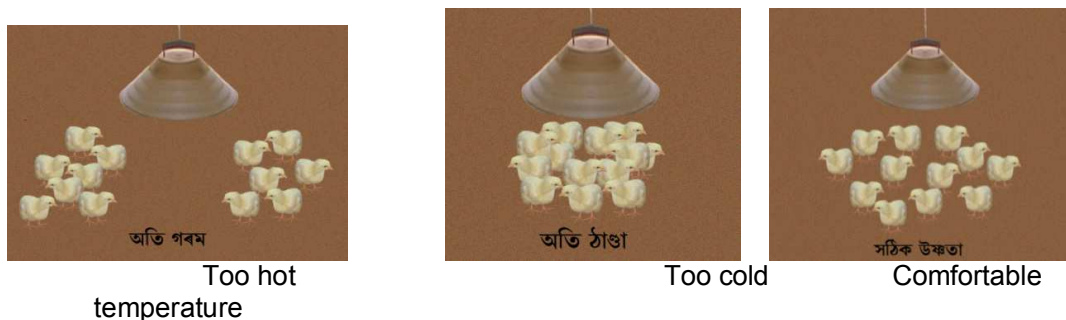
- ▶ Rounds of the corners
- ▶ Spread the litter

- ▶ Spread news papers
- ▶ Place the brooder
- ▶ Place the Brooder/ Chick guards
- ▶ Place the drinker and chick plates/ feeders.
- ▶ Closed the side wall curtains.
- ▶ Start brooder 3-4 hours before arrival of chicks
- ▶ Fill drinkers 2 hours before arrival of chicks
- The feeders and waterers under the brooder have to be arranged alternatively in a “cart-wheel spokes” like fashion.

### Work to be done at Arrival of the chicks:

- ▶ Proper unloading
- ▶ Immediately opening of boxes
- ▶ Counting of chicks
- ▶ Checking of mortality and weak chicks
- ▶ Dipping of beak in water
- ▶ Feed and electrolyte mixed water must be available immediately to the chicks
- ▶ Electrolyte (5g per 100 chicks) and anti stress (3-5 ml per 100 chicks) drugs
- ▶ Weighing of sample chicks (ideal weight 38-45 gm)
- ▶ Giving feed every 3-4 hours.

### BROODING OF CHICKS



Behaviour of chicks under the brooder indicate the correct brooding temperature

### Temperature requirements of Chicks

Age	Brooding temperature	Age	Brooding temperature
1 <sup>st</sup> Week	35.0° C ( 95° F )	4 <sup>th</sup> Week	26.7° C ( 80° F )

2 <sup>nd</sup> Week	32.2° C ( 90° F )	5 <sup>th</sup> Week	23.9° C ( 75° F )
3 <sup>rd</sup> Week	29.4° C ( 85° F )	6 <sup>th</sup> Week	21.2° C ( 70° F )

### Brooding space

- The ideal number of chicks under each brooder will be 250-300 chicks. A minimum brooder space of 150 cm<sup>2</sup> should be provided per chick brooder in deep litter up to 2 weeks of age.

Basic rules in litter management:

- The litter should be always kept dry and clean.
- Wet and caked litter should be replaced with fresh litter to avoid disease occurrence.
- Litter should be stirred daily to avoid cake formation.
- Leakage and spillage of water on the litter from the drinker and roof should be stopped.
- A mixture of wood ash and fertilizer grade super phosphate in the ratio of 4:1 should be sprinkled over the litter at the rate of 5 kg per 10 m<sup>2</sup> area to avoid damp litter and to prevent release of ammonia gas from litter.
- Slaked lime powder must not be used on the litter, because this will increase the pH of the litter, which in turn release more ammonia from the litter and also favour growth of *E. coli*, the most common pathogen of poultry.
- Sufficient ventilation to house should be provided and overcrowding should be avoided to keep the litter dry.
- The litter should be neither too dry nor wet. The condition of the litter can be tested by taking a handful of sample of litter in the hand, press it hard in the palm and gently open the hand. If the litter condition is optimal, the compressed litter material shows crevices. If the litter is too wet, it will form a cohesive ball. If the litter is too dry, it will form no impression, crumble easily and fall away in a pile.

### LIGHTING MANAGEMENT

- Provide 24 hours lighting during brooding period, followed by 23 hours and

one-hour darkness per day until marketing.

- For brooding period intensity of one-foot candle or 11 Lux units at birds eye level. *i.e* provide one 40 watt incandescent (round) bulb at 2.4 metres height with reflector for every 20 sq.m area.
- After the brooding period, about 5.5 Lux or 0.5 foot candle at bird's eye level.

### FEEDING AND WATERING

Type of feed	Crude protein (%)	ME Kcl /Kg	PERIOD OF USE
Pre starter feed	24	3000	Day-old to 12 <sup>th</sup> day of age.
Starter feed	22-23	2800 - 2900	13 to 24 days of age
Finisher feed	19-20	3000 -3100	25 days of age onwards till marketing

**Gradual changing of feed from one type to other is recommended as follows-**

11 days	- 70 Prestarter : 30 Broiler Starter
12 days	- 50 Prestarter : 50 Broiler Starter
13 days	- 30 Prestarter : 70 Broiler Starter
14 days	- 100 Broiler Starter
23 days	- 70 Broiler Starter : 30 Broiler Finisher
24 days	- 50 Broiler Starter : 50 Broiler Finisher
25 days	- 30 Broiler Starter : 70 Broiler Finisher
26 days	- 100 Broiler Finisher

#### Feeding management:

- Feed should be given within one hour after the chicks are placed in brooder by sprinkling it over the entire area covered by newspaper and encircled by the chick guard.
- After a few hours, feed should be given on Chick feeder plate or shallow trays or tyre feeder during first week.
- As the birds grow, their feeding space requirement also increases and thus smaller feeders should be replaced with larger ones from 3<sup>rd</sup> week onwards.
- Shaking of feed should be done every hour regularly to attract the birds towards fresh feed.
- Feed should be easily available to the birds.
- Distance between two feeder should be not more than 5 feet.
- The height of feeder should be adjusted at the level of back of the bird.



- 1 chick plate/ tyre feeder for 50 – 60 chicks (1st Week)
  - 1 chick feeder for 50 – 60 chicks (1 to 3 weeks)
  - 1 feeder for 30 – 40 birds (4 to 6 weeks)
- During hot weather (June, July and August) feed should be provided during early morning and evening only to prevent death due to heat stroke.
- Feed should be procured for about 15 days period of use only

**Watering of broilers:**

- Drinking water for broiler should be soft, clear, fresh, clean, colourless and free from any kind of odour. Contaminated water is mostly responsible for a number of problems in causing diseases like Colibacillosis, Coccidiosis, Salmonellosis, Enteritis, Ascitis, Septicaemia, Hepatitis etc.

**How to sanitize drinking water for poultry?**

- ❖ First- water should be preserved in a reservoir of cap. of 200, 500 or 1000 litre.
- ❖ Secondly- add 0.5 ml each of acidifier and water sanitizer to 10 litre of water. Sanitizer acts well in presence of acidifier. The performance of broiler (body weight, FCR etc) increases provided with this water.
- ❖ Never put lime or bleaching powder in ring well. Use alum or fitkiri in well to settle down the sediments.

Sanitizer	Suggested residual level in the drinking water (ppm)	Comments
Chlorine	2-4 ppm free chlorine	Chlorine is most effective in 5-7 pH range Total chlorine test does not separate the bound chlorine from the free or available chlorine
Chlorine dioxide	0.8ppm	Effective over a wide pH range 4-9 but does work best in pH range of 4-7
Hydrogen peroxide	25-50 ppm	Hydrogen peroxide works well when injected after ozone treatment

### Recommended quality of drinking water for broiler

Sl. No.	Parameters	Desirable level
1.	pH	6.8 – 7.2
2.	Colour	Colourless
3.	Total dissolved solids (ppm)	< 1000
4.	Magnesium (ppm)	100- 250
5.	Sodium (ppm)	200- 1000
6.	Iron (ppm)	0-1
7.	Nitrate (ppm)	< 40
8.	Nitrite (ppm)	0-1
9.	<i>E. Coli</i> & other bacteria	Nil

### Water consumption of broilers:

- In cool weather, broilers drink about 2 litres of water for every kilogram of feed they consume. In hot weather the ratio can be increased to as much as 4 litres of water for one kilogram of feed. As a thumb rule one can determine the approximate water requirement by multiplying the age of the bird in weeks by 2, the resulting figure would be litres of water per 100 chicks. e.g.  $2 \times 5 = 10$  litres / 100 broilers at 5<sup>th</sup> week.

### Important tips of watering:

- At no stage water trough should be allowed to become dry.
- The maximum distance between 2 waterers should be 8 ft.
- Waterers should be placed daily at different sites.
- All the waterers must be washed nicely with a detergent powder daily in the morning before filling.
- Water reservoirs should be disinfected at regular interval.
- Waterer height should be adjusted at the level of back of bird.

### HEALTH CARE:

#### (a) Proper farm sanitation and personal hygiene:

- A food bath containing reliable disinfectant solution (Dettol, phenyl, potassium permanganate) must be maintained at the entrance of the farm.

- Visitors should be strictly discouraged. Unavoidable visitors may be allowed to see the birds from outside the shed.
- There should be different attendants for the birds of different age group or different shed. If one attendant is made responsible for more than one house, the younger birds should be attended first.
- Stray dogs, cattle, goats, wild birds, vehicles etc. should not be allowed in the farm premises.
- Old litters should not be stored within the farm area.

**(b) Vaccination programme for broilers:**

Day-old	Marek's disease HVT- strain	Subcutaneous (S/C) at hatchery	Dose
5-7 days	Ranikhet disease, Lasota/ F/ VH strain	Intraocular or drinking water	1 -2 drops
12-14 days	Infectious Bursal disease(IBD) 'MB' intermediate strain	Eye drop Or Drinking water	

**Precautions to be followed during vaccination**

- Minimize stress during vaccination by handling the chicks gently and by administering anti-stress drugs through drinking water during and after vaccination for 5 to 7 days.
- Store the vaccine at 2° to 8°C in the refrigeration chamber of the freeze.
- Destroy the left over vaccine along with its container by boiling and disposing off safely.
- Use the reconstituted vaccine within 2 hours after reconstitution.

**Medication schedule for broilers:**

- The major types of medicines are commonly used in broilers:
  - Tonics and growth promoters.
  - Drugs to counteract infections.
- The tonics include vitamin, minerals, amino acids, liver extract, herbal liver stimulants etc..

**What growth promoter for broiler?**

- ❖ Add recommended level of PROBIOTIC and PREBIOTIC in drinking water or feed.
- ❖ PROBIOTICS are live culture of Direct Fed Microbes (*Lactobacillus* type)

- ❖ PREBIOTICS (MOS, DOS) enhances the activity of probiotic.
- Preparations like antibiotics, furazolidone compounds, sulpha drugs; Trimethoprim, Coccidiostats, antifungal etc. are used either as preventive or curative measures against bacterial, protozoan and fungal infection. As far as possible use of antibiotics is always discouraged in commercial broiler production. If necessary to counteract infections, only approved drugs should be used. The banned drugs should not be used, as they may affect the human health.
- The medicines to poultry are administered either through feed or drinking water. A general schedule of medication is outlined hereunder:

Age of broilers	Name of medicine with dose	Period of use
Day 1 to 2	Electrosol powder 1 g/2 litres of drinking water	2 days
Day 1 to 12	Multivitamin tonic in drinking water 5 to 10 ml per 100 broilers daily or organic growth promoters in drinking water as per recommended dose for first 15 days.	12 days
Day 3 to 9	Approved antibiotics or antimicrobials if necessary may be used in consultation with the local Veterinary doctor as per recommended dose.	7 days
Day 12 to 16	Liver tonic and antistress 5 to 10 ml per 100 birds daily	5 days
Day 17 to till marketing	Plain drinking water only	-

### RECORD KEEPING :

Accurate record keeping is essential to monitor the performance and profitability of broilers. The following records should be maintained:

Batch No :  
 Total number of chicks received :  
 Total mortality with causes :  
 Total feed consumed per batch :  
 Average feed consumed per broiler :  
 Total live weight sale :  
 Average body weight per broiler :  
 Total expenditure :  
 Total income :  
 Total gross / net profit :  
 Average profit per broiler :  
 Feed conversion ratio :  
 Medication and vaccination records :

### Biosecurity measures :

- Fencing on farm perimeter to prevent unwanted visitors restricting the entry of outside visitor and human beings.
- Foot bath and disinfectant spray with suitable water and power supply at entry point.
- Test the water source for mineral, bacterial, chemical contamination and pathogen load.
- Promptly remove and properly dispose off dead birds.
- Proper disposal of old litter.
- Practice all in all out system.
- Feed storage building should be bird proof, insect proof and rodent proof.
- Keep free flying birds and wild birds away from the flocks.
- Feed, litter and equipment should be stored in a separate section from the live bird area to prevent contamination.
- Proper inter flock interval
- Proper decontamination and disinfection of equipment, houses etc following depletion of flocks.
- Appropriate disease detection and proper vaccination schedules should be implemented.

## **POULTRY DISEASES:**

### **Bacterial diseases:**

#### **COLIBACILLOSIS :**

- This is a common bacterial disease caused by *Escherichia coli*.
- Soil and water are the main source of contamination. It can manifest in different forms.
- Coli often infect respiratory tract of bird infected with various combinations-IB, ND, and CRD. This is commonly known as “air sac disease”.
- Synovitis-Joint infection.
- Enteritis and diarrhoea.
- Yolk sac infection –the condition is known as omphalitis or mushy chick disease. Unabsorbed yolk found during post-mortem examination, a hatchery born problem.

#### Prevention and control:

- Purchase of day old chicks from reliable hatchery.
- Control of infection of the yolk sac depends on sanitary condition at the hatchery and provision of appropriate warmth during brooding.
- The practise of efficient water sanitisation methods and use of clean drinkers
- Provision of adequate ventilation and proper litter management.

#### **SALMONELLOSIS:**

- This is also known as Pullorum disease or Bacillary white diarrhoea caused by *Salmonella pullorum*
- Symptoms are-Huddling of chicks near heat source, chalky white diarrhoea

with pasty vent.

### **Chronic Respiratory Disease ( CRD) :**

- It is a respiratory disease caused by *Mycoplasma gallisepticum* .
- Symptoms are-Respiratory distress, gurgling sound during respiration, sneezing, poor weight gain, nasal discharge.

Prevention and control:

- Avoid overcrowding.
- Improved ventilation.
- Ensure hatchery sanitation.

### **Infectious Coryza: ( Swollen Head Syndrome)**

- Acute respiratory disease caused by *Haemophilus gallinarum* / *Haemophilus paragallinarum*.
- Symptoms are : Swollen face and swollen eyes filled with a cheesy substance, Respiratory distress, poor feed intake, mucoid nasal discharge.

Prevention and control:

- Avoid overcrowding.
- Avoid wet litter.
- Reduce the ammonia level by proper ventilation.

### **VIRAL DISEASES :**

#### **Newcastle disease: (Ranikhet Disease)**

- It is the most dreadful disease in poultry. A high mortality rate is evident in all age groups.

Symptoms are :

- Decreased feed consumption and body weight gain.
- Sudden rise in mortality.
- Greenish diarrhoea.
- Sneezing, gasping, nasal discharge, coughing, respiratory distress.
- Muscular tremors, paralysis of legs and wings, twisting of the neck (torticollis).

Post Mortem Lesions :

- Pin point haemorrhages at the tip of proventricular glands and in caecal tonsils.

- Button like ulcers in the intestine .

Prevention and control:

- Multiple vaccinations against RD disease.
- Follow strict bio security measures.

### **Infectious Bursal Disease (IBD)**

- It is an acute highly contagious viral disease of young chicken caused by Birna virus. The consequence s of this disease is 10-60 percent mortality rate and the breakdown of immunity, leading to the outbreak of other diseases.

Symptoms are :

- The symptoms include a spiking mortality i.e. it begins at 3 days, spikes at 5-7 days and then starts declining.
- Depression, disinclination to to move and feed, low water intake, dehydration, self-vent-picking, prostration and trembling before death.
- Showing a posture of head downwards, with closed eyes.
- Sulphur coloured diarrhoea.

Post Mortem Lesions :

- Haemorrhages on thigh and breast muscles and in proventriculus at its junction with gizzard.
- On 2<sup>nd</sup> -3<sup>rd</sup> day of infection, bursa is swollen and its outer surface is covered with a straw coloured viscous material.
- After 5<sup>th</sup> days of infection, bursa starts its reduction in size.

Prevention and control:

- Vaccinate young birds at recommended age.
- Include immuno stimulant like Vitamin E in the feed.
- Follow all-in-all-out programme.
- Follow strict bio security measures.

### **Infectious Bronchitis (IB)**

- It is highly contagious respiratory disease of chicken causing heavy mortality in young chicken. It also affects kidneys producing visceral gout in commercial broilers. The disease is caused by corna virus.

Symptoms are : Respiratory distress, rales and gurgling sound during respiration, sneezing, Birds may become dull and huddle towards the heating source.

Prevention and control: Vaccination of young birds at recommended age.

### **Marek's Disease:**

- The disease is caused by Herpes virus.

Symptoms are : Poor growth, Paralysis of legs, wings, legs and wings are stretched in opposite direction source.

Prevention and control: Vaccination of day- old chicks at hatchery

## **PROTOZOAN DISEASE:**

### **Coccidiosis :**

- It is one of the most important and dreadful disease caused by *Eimeria* species .
- Symptoms are: Bloody diarrhoea and high mortality, high mortality in younger birds, Chocolate or brick red coloured diarrhoea, stunted growth.
- Prevention and control:
  - Litter management. Avoid wet litter.
  - Avoid spillage of water.
  - Administration of anticoccidial drugs/ Coccidiostats in the feed/ water.
  - Proper ventilation.

## **DEFICIENCY DISEASES**

### **Thiamine (Vitamin B<sub>1</sub>) Deficiency**

- Thiamine plays an important role in the carbohydrate metabolism and normal functioning of the nerves. Symptoms of thiamine deficiency developed quickly in young birds. In most of the birds the head is pulled towards its back as a result of paralysis of extensor muscles, similarly paralysis of extensor muscles of legs causes the bird to sit on hocks. Pulling of the head towards back i.e. Star Grazing appearance.

### **Riboflavin (Vitamin B<sub>2</sub>) Deficiency :**

- This vitamin is essential for normal metabolism in body. Its deficiency affects nerves, body growth etc. Important symptoms include inward curling of the toes and sitting on the hocks i.e. curled toe paralysis.