

POULTRY BIO-SECURITY PROTOCOL

Objectives of bio-security :

- 1- To keep highly contagious diseases like IBD, ND out of the poultry farm.
- 2- To reduce common pathogens like E. coli and Salmonella.
- 3- To reduce or eliminate background immunosuppressive pathogens such as MD and IBD virus.
- 4- To reduce contamination by pathogens important to public health safety like Salmonella. Campylobacter.

Structural Bio-security:

1. Fencing of farm perimeter to prevent unwanted visitors restricting the entry of outside visitors & human beings.
- 2- Test the water source for mineral, bacterial, chemical contamination and pathogen load.
- 3- Disinfectant spray with suitable water and power supply for sanitization of vehicles.
- 4- Suitable location for storage of bagged feed.
- 5- Good roads within the farm to ease cleaning and to prevent spreading of microbes by vehicles and footwear.
- 6- Facilities for scientific disposal of dead birds.
- 7- Safe housing with suitable wild bird and rodent proofing.
- 8- Feed, litter and equipment should be stored in section separated from the live bird area to prevent contamination.
- 9- A-3 meter boundary of land around buildings must be kept free of all vegetation to inhibit rodent and wildlife activity.

Operational Bio-Security:

- 1- Operational manuals incorporating emergency plans should be developed for day-to-day activities carried out in feed mills, hatcheries, breeding and grow out facilities.
- 2- Proper decontamination and disinfection of equipment, houses, etc. following depletion of flocks.
- 3- In breeder farms, all workers and visitors should shower and use clean farm cloths to prevent cross contamination between facilities.
- 4- Maintaining a record of visitors, including name, company purpose of visit previous farm visited and next farm to be visited.
- 5- In case of breeders, no vehicles, or equipments should be allowed within the farm area from the time of delivery of flock until depletion.
- 6- In commercial broilers units a minimum inter flock interval of 2 weeks is recommended.
- 7- Effective pest management programme through biological, mechanical and chemical means.
- 8- Appropriate disease detection and proper vaccination schedules should be implemented.
- 9- In case of small-scale egg production units, follow all-in-all-out, If this is not possible, pullets should obtain from a source free of vertically transmitted diseases.
- 10- Recycled egg packing material, plastic egg trays. etc. Should be decontaminated at the point of entry to the farm.
- 11- Routine disease monitoring procedures like post mortem examination of dead birds and periodic serum antibody assays to determine the immune status of flocks is necessary.

PRE INCUBATION CARE OF HATCHING EGGS

Maintaining the hatching potential of the newly produced egg is of vital importance. But a lot can happen to a hatching egg between the time it is laid and the time it enters the incubator. A lot can happen during this critical period and as a result of faulty egg handling, much of the inherent hatching ability of the egg and to produce a quality chick may be lost. Therefore good egg care and handling of hatching eggs are necessary for the eggs to hatch well and produce a good quality chick.

A)- Collection of hatching Eggs:

Hatching eggs care to be taken on floor and cage-

A. Hatching egg care on floor- The material to be used in nest boxes should be good absorbent, durable, coarse dust free, porous so eggs will cool more quickly, Generally material is used rice hulls or other material like straw hay etc. is used.

1. To adopt the next-introduce the nest boxes before laying starts.
2. Put the nesting material in the nest boxes when nests are placed in the pen.
3. Provide adequate nest ventilation -to keep the nest material dry and birds comfortable.
4. Provide one nest for 4-5 birds.
5. Collect the eggs hourly i.e. 6-8 times a day.

Eggs laid late in the day, should be collected on same day. Do not keep it until next day. It will reduce hatching egg quality, shell sanitation and will prevent entrance of bacteria into eggs.

Note- Close the nest at night -Hens should not be allowed to sit in the nest overnight. Open the nest early in the morning before laying starts.

B-Hatching egg care - Collect the eggs 6-8 times. In case of summer increase number of collection, even night collection also to be done and sent the eggs to cold room.

1. Keep the egg roll mesh clean, which will keep the hatching eggs clean and bacteria free.
2. Clean the eggs with egg sanitizing solution.
3. Sent the eggs as early as possible to cold room.
4. Increase no of collection will reduce the crack%.

B). Contamination of eggs:

- 1- **Bacterial Contamination of eggs**, The number of organism found on the eggs at the time of picked from nest or floor
clean eggs - 3000 to 3400 organisms
Soiled eggs- 25,000 to 28,000 organisms.
Dirty eggs - 3,90,000 to 4,30,000 organisms.
- 2- Bacterial penetration of eggs shell depends upon shell quality.
- 3- In cages we get maximum clean eggs.

C). Cleaning and disinfection of eggs:

Clean soiled eggs-

- 1- For hatching purpose only the clean eggs should be used and clean eggs give best results. As we know, hatching eggs are valuable so that soiled and dirty eggs should be cleaned as much as possible for percent chick yield.
- 2 Sanitizing of the egg shell is very effective for destroying the bacteria on the shell.
- 3- One of the most important aspects of hatching operation is the cleaning & disinfection of the eggs.

- 4- Both the hatching eggs as well as the equipments must be cleaned thoroughly & disinfected before use.
- 5- Dirty eggs should preferably be avoided & if necessary may be dry cleaned with the help of fine quality sand paper or wire wool. Eggs can be washed with warm water (100-100F) containing
 - (a) Dettol -4-5%
 - (b) Savlon-2-3%
 - (c) Iteol - 1%
 - (d) Virucida/Bactericidal/fungicidal solution 4ml/ltr.
- 6- Eggs must be washed gently & allowed to dry before being sent for storage.

D). Selection of Eggs for Hatching:

Size of Eggs
 Shell Quality
 Interior Quality

E) Fumigation-Formaldehyde Gas:

- 1- Fumigation is one of the easy & very effective methods of disinfect eggs & hatching equipments.
2. Eggs can be fumigated in tightly closed cabinet.
3. The eggs can be kept in fillers flats or the setting trays.
4. Fumigation should preferably be done at temperature 24C with about 75% relative humidity for a period of 20 minutes.
- 5- For 100 cubic Ft. volume 20gm of potassium permanganate & 40ml formalin is used (Ratio is 1:2) Calculation of volume= LxBxH= Cubic Ft. volume.
 NOTE: Never fumigate moisture laden eggs with formaldehyde gas.
 :Eggs must be dried before fumigation.

F) Storage of Eggs:

- 1- Temperature of cold room should be 60-65 deg. F (16-18.3C) and R.H. of room temperature should be above 75%.
2. Generally egg laid are cooled to a temperature well below the threshold of embryonic development till it goes into the incubator. Increasing R.H. of cold room controls the evaporation of interior portion of egg,
- 3- If eggs are to be stored for longer period reduce the temperature and humidity and turn the eggs. upward and downward daily.
- 4- Do not allow hatching eggs to be located in free flowing air, in front of fans.
- 5- Increasing the flow of air around eggs, increases the rate of egg evaporation, this dries out the contents more rapidly.
- 6- Minimize the egg handling, do not grade eggs unless absolutely necessary.
- 7- Warming of eggs prior to incubation, warming of eggs to be done at R.T. But not above the temperature at 75 degree F(23.9 degree C) because embryonic development initiated above this temperature.

FACTORS AFFECTING FERTILITY

In male

- 1- Breed
- 2- Age of male
- 3- Nutrition
- 4- Climatic condition
- 5- method of mating.

In female

- 1- Age
- 2- Rate of lay
- 3- Climatic condition
- 4- Nutritional factor
- 5- Diseases.

Male to female ratio- Light breed -8-10 males/100 females

Heavy breed -10-12 males/100 females

FACTORS AFFECTING HATCHABILITY;

1. Fertility
- 2- Improper Collection of Hatching eggs
- 3 Improper cleaning of Hatching eggs
- 4 Improper Selection of Hatching eggs
- 5 Improper Fumigation of Hatching eggs
- 6 Improper Storage of Hatching eggs
- 7 Improper Transportation of Hatching eggs
- 8 Improper Temperature in Incubator & Hatcher
- 9 Improper humidity in incubator & Hatcher
- 10 Improper ventilation in Incubator & Hatcher
- 11 Improper turning in Incubator
- 12 Improper nutrition in breeder flock
- 13 Diseases like Salmonellas, Mycoplasma
- 14 Genetics

Hatchery Disinfection Protocol

1. Egg cleaning
2. Egg Grader hand
3. Fumigation room
4. Cold Room
5. Setter & Setter
Hall Inside setter
Humidifier tank
6. Floor washing
7. Hatcher & Hatcher area
8. Pullout room
9. Hatcher tray cleaning
10. Chicks room
11. Packing material room
12. Surroundings of hatchery, hatchery
13. Foot dipping
14. Hand wash

BROODING MANAGEMENT PROTOCOL:

Objectives of brooding:

- 1- To provide warmth and protection.
2. To provide easily accessible feed and clean water.
3. To provide basic requirements for optimal growth and welfare such as heat, fresh air, moisture control, adequate space etc.

Age of brooding - 0 to 8 weeks (Commercial Layers)

FACTORS AFFECTING BROODING MANAGEMENT:

1. Cleaning and Disinfection or preparation of shed before arrival of chicks
2. Quality of chicks.
3. Litter Management.
4. Temperature.
5. Ventilation
6. Relative humidity
7. Floor Space
8. Feed
9. Water
10. Medication
11. Vaccination

1. Cleaning and Disinfection of Shed

1. To avoid various bacterial, viral fungal & Protozoan diseases
2. To enhance the performance of birds.

Steps to be followed:

1. Remove all portable equipments, clean & wash them with jet of water. Afterwards dip them in any suitable disinfectant as per manufacturer's instructions & then sun dry for a day.
 2. Remove all organic material preferably after spraying 5 to 19% formalin & disposed it off away from farm premises.
 3. Control of Rodents & Wild birds entry.
 4. Cleaning of overhead tank with pipeline - 5 to 19% sodium hypo chloride. Keep it over night & then flush the system with plain water.
 5. Heat treatment _ Burning of floor, cages, side wire mesh with flame go to reduce Coccidiosis, wing rot etc.
 6. Chemical Treatment-Soak floor with strong solution caustic soda flake for 12 to 24 hrs. with pH above 12 in order to kill VVIBD virus Dose of NaOH-11 to 12 gm/lit of water, or 2kgs/1000 Sq.ft.
 7. Control of Ticks, Mite and Lice infestation by spraying any insecticide e.g.-Cythion 8-16 ml/lit of water.
 8. White wash - Lime stone + 2 to 5% formalin + 1c Copper Sulphate + 1% kerosene
 9. Fumigation - 20gm of Kmn O4+40ml formalin for 100 cu.ft
 10. Spray veridical disinfectants
 11. Keep the house vacant for 7 to 15 days.
2. Quality of Chicks
 3. Litter Management
 4. Temperature
 5. Ventilation
 6. Relative humidity
 7. Floor Space

Depends on

- *Type of housing
- *Climatic Condition
- *Age of birds
- *Body Weight of birds

Deep litter system (0 to 8 weeks)

First week	0.15 to 0.18 sq.ft/bird
Second week	0.3 sq.ft/bird
Third & Fourth week	0.5 sq.ft/bird
Fifth to eight week	1 sq.ft/bird

Cage system

0 to 8 weeks	32 sq. inches/chick
Cage size	60 inch(L)x20 inch (W)x12 inch(H) (40 birds)

Effect of less floor space-

1. Overcrowding
2. Piling
3. Feather pecking and cannibalism
4. Injuries
5. Sudden death syndrome
6. Decreased comfort
7. Lower feed consumption
- 8 Lower body weight
- 9 Poor FCR
10. Bad litter quality
11. Poor carcass quality

8. Feed

Points to be considered for good quality feed-

1. Good quality raw material
2. Proper feed formulation according to the age of the birds.
3. Proper mixing of various feed components.
4. Proper processing of feed.
5. Proper storage of feed.
6. Proper particle size of feed.
7. Balancing of energy and crude protein
8. Form of feed-mash, crumble, concentrate or pellet
9. Free from micro-organisms and toxins.

Types of feed

Maize - For first two days coarse ground maize should be given to the chicks because

1. It acts as a laxative to remove metabolic waste.
2. It is source of energy it stimulates energy metabolism
3. It helps to absorb the yolk rapidly, thereby avoiding yolk sac infection

Chick crumble/chick mash- After two days up to 8th week (580 gms avg. body weight)

Chick mash - C.p. 20.5%

Energy - 2750 M.E Kcal/Kg.

Body wst. gains are better with crumble feed compared to mash feed

Total Feed consumption/bird 2.5kg in brooding (0-8 weeks)

Mortality upto 15% in brooding 0-8 week

Types of feeder

- *First 5 days - flat feeders or chick plates - 1 chick plate - 100 chicks
- *After 5 days slowly replace chick plates with semi automatic feeder
- *For first 2 wks - 1 feeder/100 chicks
- *2nd wk - 8th wk. 1 feeder/50-60 chicks

Medications

1. Antibiotics First 5 to 7 days
2. Coccdiostat- 28th to 32nd day
3. B complex 1st day to 21st day
4. Antis tress 1st day to 21st day
5. Electrolyte & Glucose 1st 3 days

Vaccination:

Day	Name of vaccine	Dose	Routes of vaccine
1st	Mareks(HVT)	0-2ml	By S/c
5th day	F strain/lasota	0.03ml	By I/O I/nasal route
13th day	I.B.D.Intermediate Standard	0.03ml	By I/O route
24th day	I.B.D.Intermediate Plus	0.03ml	Through D/W
30th day	F strain/lasota	0.03ml	By I/O I/nasal route
51st day	R2B	0.5ml	By S/C

Dubbing Removing the comb in breeder male

1. Dubbing is best done when the chicks are 1 day of age.
2. With a pair of manicuring scissors, cut the comb off close to the head of the day old chick, running the shears from the front to the back of the comb. The concave side of the scissors should be up.

GROWING MANAGEMENT

Period - 9 to 20 week

Space Required

-Deep litter system 1.25 to 1.50 sq.ft/bird

Feed-

Grower mesh contains energy -2500 k cal/kg & protein -17%

Total feed consumption per bird -7.500gms. (9to 20 week)

Debeaking:

Age- Touching 10th day of age

Debaking 10 to 12 week of age.

Precautions to be taken during the debeaking:

1. Debaking must be done by trained person for less stress on the birds & to prevent faulty cutting of beak.
2. Dont' debak when the birds are under stress, weight until birds recover & return to normal,
3. Give antistress medicines before & after debeaking to relieve stress
 1. Dextrose 1gm/lit of water
 2. Antistress
 3. Bcomplex
4. Do not give Sulfa Drugs before debaking because certain sulfa drugs particularly Sulfonamides are known to prolong bleeding if there has been such trouble in past give Vit K in drinking water.
5. It is extremely important that the chicks or birds eyes comb & tongue not to be injured or burned
6. It is necessary to change the blade when it becomes blung or usually after every 5000 birds,
7. Newly debeaked birds will have difficulty in scoping the water therefore increased the level of water in waterers and add extra waterers to overcomes stress
8. It is likely that chicks may find difficulty to reach the feeder & pickup the feed, therefore increase the level of feed in feeder to prevent striking the bottom of feeder with its cauterization tender beak which would certainly be painful result into decreased feed consumption
9. Do not carry debeaking & vaccination together.

GRADING;

1. To obtain better uniformity of flock
2. To save feed & Medicine
3. To get synchronization in egg production
4. To get more number of eggs during laying cycle.
5. To cull weak birds
6. To detect ectoparasite and any clinical abnormalities
7. Onset of egg production is delayed
8. Occurrence of prolapsed is reduce or nil
9. Fertility and hatchability is increased in parents
10. The 1st egg is larger
11. Layer mortality is reduced
12. Economics
13. By actual grading by weight at right time we get one extra egg/bird/year.

VACCINATION

Day	Name of vaccine	Dose	Route of vaccine
70th day	Fowl pox vaccine	0.5ml	By wing web
112th day	R2B	0.5ml	By S/C
126th day	IBD killed	0.2ml	By s/c I/M

Mortality up to 5% in growing period 9 to 20 week

LAYING MANAGEMENT:

Period: 19th to 72nd week

Space required:

Deep litter system - 2sq. ft/bird

Cage system 60 sq.inch/bird

Cage size 17"x12x16" (3birds)

Feed - Layer feed offered to the laying birds should be formulated according to the age of the birds & egg production. Accordingly, layer feed can be divided into three groups i.e. Phase I, Phase II & Phase III.

Phase I feed should be given up to the age of 40 weeks & later Phase II ration may be given. Phase III feed should be given after the after of 60 weeks.

	Phase I (20-40 wks)	Phase II (41-60 wks)	Phase III (61-up yo liquidation)
Metabolizable			
Energy K cal/kg.	2550	2450	2450
Crude Protein%	17.5	16	15.5
Calcium%	3.6	4	4 to 4.2
Total feed consumption/bird 41.25 kg.(19 to 72 weeks)			

A) LIGHTING PROGRAMME

The poultry house should be provided with required warmth for chicks and enough natural light to locate feeders and waterers. During the brooding period, artificial lights should necessarily be provided for the initial 48 hours. Subsequently depending upon climatic conditions and brooding management, the need of artificial light may be decided in consultation with a local technical person.

*** Light Distribution**

It is important to place bulbs in such a way to as to achieve equal distribution of light of the specific intensity throughout the poultry house.

*** Time switches**

Good quality time switches can be installed for poultry houses. This enables the availability of an exact quantity of artificial light to the birds. One has to monitor clocks, make adjustments for increasing or decreasing day lengths, power failures etc.

*** Light during growing period**

In India the day length varies from region to region and also between summer and winter. The total duration of lighting to be provided to the birds should take into consideration the availability natural light.

Light has a direct effect on sexual maturity. The period of light made available to the flock affects the time the first egg is laid. Decreasing day length during growing period increases their growing period or helps in delaying sexual maturity.

* Light day (total light in hours) should not be allowed to increase during growing period.

In India we have open sided houses BV 300 needs no special lighting programme during growing period. Therefore, do not give any artificial light after the 8th week of age.

* Increasing Natural Day Length during Growing Period

Monitor feed consumption and see that increase in the length of day light at sexual maturity coincides with an increase in feed consumption. During the initial period of lay, egg production rises rapidly and there is a rise in body weight too. Each of these changes need additional feed intake. In areas where longer day length coincides with summer, one must take additional care for making feed allotments in cooler parts of the day to induce feed consumption.

* Light during the laying period

Sexual maturity is controlled by the lighting programme during the rearing period. The length of day i.e. number of hours of light per day and the intensity of light are both the factors that need to be considered. Lighting programmes are designed to have a flock lay 5% production at the 19th week of age and attain over 90% production by 25th week of age. The average body weight of a BV 300 pullet at the age of 20 weeks should be 1360gm.

Many farmers use compact fluorescent light (CFL) during laying period. CFL of 12 watts are economical as they use less electricity, provide an even distribution of light and whose results are comparable.

Natural light should be made use of till the flock achieves the desired body weights and 80% production. Later increase the artificial light by 1/2 hours every week till it reaches 15 hrs, inclusive of natural light.

* Lighting schedule

Age of starting - 21st week

Body wt. 1250-1360gm. Production -80%

Age(wks)	Natural day light(hrs)	Artificial light(hrs)	Total light(hrs)
21	12	1/2	12
22	12	1	13
23	12	1	13
24	12	2	14
25	12	2	14
26	12	3	15

From 26th -40th wk - give 15 hrs. light

From 41st-72 wk - give 16 hr light.

F- CULLING:

Culling is a vital operation of removal of undesirable unproductive birds from the flock, irrespective of whether the flock is beginning to lay or is completing the laying cycle. Poorer the flock greater the need to culling.

- * When culling has been done at right time an improvement in livability occurs due to the removal of chronic morbid birds, because culls are the ones that tend to die first,
- * The extra cost of feeding unproductive birds is saved. An adult hen eats about 3.2 kg.feed/month even though not laying.
- * Eggs production will be maintained high
- * More space is provided for the remaining birds
- * Cull birds often transmit disease to healthy birds. Hence by culling sick birds we can reduce incidence and spread of poultry disease in flock.
- * It also helps to save cost of medication and vaccination.

Types of culling:

1. Mass Culling
2. Selective culling.

How to identify culls-

The culling of bird is practiced on the basis of following characteristics during laying phase.

- *External body characteristics
- * Pigmentation
- * Moulting
- *Available records.

RECORD KEEPING

To assist in daily and weekly management decisions and to monitor and control eggs/chicks/feed flow through overall policy decisions following records should be maintained in the farm at different levels.

1. Flock Register(Flock wise and Breed wise)
2. Vaccine & Vaccination Register
3. Hatching Egg Register
4. Egg collection and disposal Register
5. Feed ingredients stock Register
6. Feed Preparation Register
7. Table Bird/Eggs sale Register
8. Backyard Supply Register
9. Postmortem Register
10. Egg setting & Pullout Register.
11. Visitors Register.

STANDARD OPERATING PROCEDURE

POULTRY FARMS

संचालनालय पशु चिकित्सा सेवायें,
मध्य प्रदेश, भोपाल

क्रमांक ----- / कुक्कुट / विविध / 2010-11 भोपाल / दिनांक
प्रति,

प्रबंध संचालक
मध्य प्रदेश राज्य पशुधन एवं कुक्कुट विकास निगम,
कोटरा सुल्तानाबाद, भोपाल ।

विषय:- कुक्कुट प्रक्षेत्र / पशु प्रजनन प्रक्षेत्र एवं चारा नीति के एस0ओ0पी0 बाबत ।

—00—

उपरोक्त विषयांतर्गत कुक्कुट प्रक्षेत्रों / पशुप्रजनन प्रक्षेत्रों के संचालन एवं चारा नीति से संबंधित **Standard Operating Procedure** (एस0ओ0पी0) की प्रति सूचनार्थ सादर संप्रेषित ।

संलग्न:- उपरोक्तानुसार

संयुक्त संचालक(कुक्कुट)
पशु चिकित्सा सेवायें
मध्य प्रदेश, भोपाल ।