

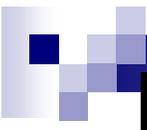


HOUSING POULTRY

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Housing serves two major functions for a poultry man-

- 1) Permits the organization and concentration of the flock into a manageable unit.
- 2) Provides a Physical Environment that is conducive to optimal egg or meat production (stress environment, protection from extremes of temperature, protection from predators etc.)



Housing is simple in mild climate but difficult in extreme climate i.e. too hot or too cold. To know the completed nature of problem and means by which it can be resolved there are three view points:-

- 1) As a problem in Biology
- 2) As a problem in Engineering
- 3) As a problem in Economics

Each is related to the matter of “weather” control in the house.

This means that we need to know the ideal conditions of temperature, humidity and air change for maximum production in the house.



Engineering design that will make it possible to control these conditions for a flock of given size. And the range of tolerance above and below the optimum that may be permitted for each factor without interfering with production still keeping costs within limits.

Keeping aside matters like- light, floor space, litter material, & equipments, housing requirements can be stated only in terms of

- i. Temperature
- ii. Relative Humidity
- iii. No. of Air changes to maintain the necessary minimum amount of Oxygen and the maximum permissible amount of Carbon Dioxide



Temperature:-

OF

0-15- Activity lessens, egg production drops, combs freezes.

15-32- Uncomfortable, cannot maintain normal body temperature & egg production.

33-55- Most difficult range with damp litter

55-75- Ideal temperature for layering hens

75-85- reduced egg size, thin shell, decreased egg production, panting starts, increasing water vaporization.

>- increasing heat stress prostration (116 °F)

Birds have no Absolute Body Temperature

Body temperature of

- Adult= 105 °F to 107 °F (40.60-41.7 °C)
- newly hatched = 103.5 °F (39 °C)
- Three weeks chick= 105-107 °F
- Smaller Breeds - Higher Body Temperature
- Males - Higher than Female.
- In Deep Litter - Higher Body temperature.
- In cages - Lower than Damp litter
- Molting Birds - Higher
- Broody Hens - Lower



Body Temperature Increases by

- i. Eating Feed.
- ii. Greater Light intensity.
- iii. When ambient temperature rises.

How heat is lost in birds?

- 1) Radiation:- Surface temperature is higher
- 2) Conduction:- Body comes in contact with solid material.
- 3) Convection:- when cool air comes in contact
 - when ambient temp. increases.Respiratory mucosa comes in contact with air
 - evaporative cooling occurs

Fecal excretion- production of egg very less

Lethal Body Temperature:-

Ambient temperature 116°F- Bird unable to dissipate excess body heat.

Panting- Insensible heat loss

When outside air having less moisture comes in contact with Respiratory mucosa- it occurs at 116°F(47°C). It occurs at HT & HH%

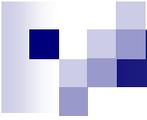
An Ideal house should provide—

- Warmth to birds during cold weather.
- Cool the birds during hot weather.
- Reduce the humidity in the house.
- Reduce the ammonia in the house.
- Provide adequate air movement in the house.



Insulation-

- It is must in both open sided and E.C. houses
- An increase of 3°C (5.5°F) temp from ambient temp. in hot weather reduces 1% growth rate, feed conversion 102.1% (less egg production)
- R-value or thermal resistance
- R-value of Urethane foam 2.5cm – 6.60
- Vapor barrier



How much insulation:-

Climate	R-value for ceiling	R-value for walls
Hot	4	2
Medium	8	2.5
Cold	12	8-10



Moisture in Poultry Manure:-

At 70°F (21 °C):-

- Birds drink 2lt. water per 1Kg. feed consumed.
75% of 2lt. will come out in feces.
- Water in feces increases as ambient temp. increases.
- In cold- air flow reduces-air carries more water in it and litter get wet.



Moisture Build up in the houses:-

Moisture content in the house increases when-

- 1) Water consumption increases
- 2) Temperature of the house decreases
- 3) Humidity in the house increases
- 4) Salt increases in feed.
- 5) Energy value of the feed reduces.
- 6) Water consumption increases by feeding crumbs or pellets.
- 7) Drinking water is contaminated with microorganisms
- 8) Birds kept in cages drink more water



TOXIC GASES :

Gases	Lethal %age	Practical %age	Limit ppm
Carbon Dioxide	Above 30	Below 1	Below 10,000
Methane	Above 5	Below 5	Below 50,000
Hydrogen Sulphide	Above 0.05	Below 0.004	Below 40
Ammonia	Above 0.05	Below 0.0025	Below 25
Oxygen	Below 6	-	-



Ammonia concentration in House:-

15 ppm is uncomfortable for Man

50 ppm is maximum allowable for 8 hrs. for men.

Tolerance Level for chicken:-

Continuous concentration lessens the activity of cilia of respiratory tract.

30ppm- slightly injurious- Drop in production

50ppm- produces serious trouble for growth & production

Above 50-100 ppm- for shorter period tolerable but for longer period water consumption increases breast blisters occur.

25 ppm= is optimum

Measurement of Ammonia in house through a KIT



How to reduce Ammonia in House:-

- i. Increasing air flow
- ii. Replacing litter
- iii. Reducing the ph of litter below 7 by mixing Phosphoric Acid or Sulphuric Acid. @ 2litre per m²
- iv. Ammonia releases rapidly from the litter when ph goes above 8.

System of housing:-

1+1+2= 1 Brooder house

1 Grower house

2 Layer House

1+1+3= 1 Brooder House

1 Grower House

3 Layer House



Kind Of Houses:-

Deep litter

Cage system

- California or open house.
- Battery with open house.
- Battery with Environment control.

Open-sided Poultry House:-

Most of the poultry houses in the world are conventional i.e. they rely on free flow of air for ventilation.



Requirements of conventional Houses:-

Width of the house:- 30ft.is ideal

Above this will create problem in ventilation in hot climate. This width is recommended for growing birds, Broilers, and layers

Height:- 8ft. Is normal for most climates except where temp. remains extremely high this will be 10ft.

Length:- As desired

Shape of roof:- As desired

Insulation:- As desired

Foundation:- Solid and adequate, termite free

Floor:- It is better to build concrete floor but where the soil is sandy concrete slab is not used.

Doors:- At the end of the house

Front and Back sides:- As desired.



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Systems Of rearing
in Poultry
is mainly 3 types

(1)
Backyard Rearing
(Extensive System)

(2)
Semi-intensive
(Free Range)

(3)
Intensive



1) Backyard Rearing (Extensive System)

- Very little attention is paid for housing.
- Size of flock- very small.
- Birds share space for the owner at night.
- In daytime more here and there scavenging.
- No exact calculation of taking feed etc. or economics.



2) Semi-Intensive or free range

- Birds kept in enclosure with a small house for night shelter.

Free range night shelter- 2 birds per sq.ft.

Outdoor- 11 sq.ft per bird.

4000 per acre

Traditional Free Range

1Sq.ft. for 11.5birds.

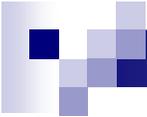
21.50 sq.ft./bird outdoor

2000/Acre



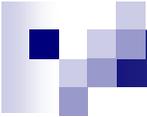
Advantages of Semi-intensive

1. Slow Growing birds preferred
2. Natural Behavior- foraging, dust bathing
3. Have ample space, sunlight, fresh air healthy environment that reduces stress
4. Birds can maximize welfare.
5. It is becoming more popular in organic farming
6. It can be integrated with livestock, crop and vegetable production in “perma culture” systems that integrate principals of natural system with agriculture
7. 50% of the feed comes from nearby farms (agriculture) for maintaining natural cycles.
8. Poultry can share pasture with cattle, sheep & goat soil will improve by poultry manure.



3) Intensive System

- i. System is preferred in most of the rural areas for less space, low input, better management.
- ii. Birds are stocked in cages for table egg production or on floors (deep litter)
- iii. Large houses allow intensive production and a high level of automation of feeders, waterers, etc.
- iv. Layers are housed in individual or battery cages.
- v. Cage space may vary from 80 to 100 sq.inch per hen.
- vi. Deep litter system-
Eggs are called- 'Cage free' or Born Eggs
Space= 1.5 sq.ft./bird
1.2sq.ft./bird in slat and floor mix



Advantages of Slat system:

- I. Some manure remains in house and some drops down
- II. Some birds rest on slats during night
- III. Aviaries are multifaceted buildings for cage free bird and provide multi levels of flooring and vertical space (perches and platform) to allow birds to jump to different levels.

Selection of site for Poultry farms:-

1. Access to road service.
2. Future Expansion need.
3. Drainage.
4. Exposure of the house.
5. Direction of wind.
6. Distances between houses.

Orientation:-

In hotter parts of country:-

The long axis should be East to West to prevent direct sunshine falling in the house.

In areas where winter is severe:-

The long axis facing South or South East to get maximum sunlight inside the shed.

In areas where both conditions prevails:-

Long axis- North East to South West

Wind Direction:- And Drainage –

Should be from the houses of young stock to adult stock

Distances- Between young and Adult stock should be about 150 to 300 feet.

Construction of Poultry Houses:-

In consideration of Birds welfare and efficiency of production

Open sided:- very popular except in colder areas

Length:-

- i. May be of any length
- ii. Automatic equipments will decide the length

Width:- less than 30feet

Foundation:- 06" to 12" above the floor level

Floor:- It must be moisture proof, free from cracks, easily cleaned, rat proof, durable and with suitable outlet.

Side walls:-

Height- 0to 10"

Wire mash:- $\frac{1}{2}$ to $\frac{2}{3}$ rd area (depends upon kind of birds to be kept)

Where temperature is high and continuous- more than $\frac{2}{3}$ rd area is left open.

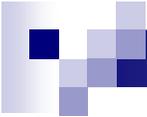
Chick House :- $\frac{1}{2}$ the area left open

Grower :- $\frac{2}{3}$ rd area left open

Layer :- $\frac{2}{3}$ rd area left open

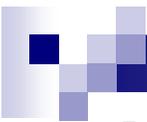
In cage House :- full area left open

In cold weather :- curtains can be lowered from overhangs.



Roofs :-

- i. Must be draft and moisture proof
- ii. Insulation of roof helps in Summer and winter
- iii. Should be painted with Aluminum paint or infrared reflecting paints.
- iv. Thatch roof not durable good for low rainfall areas.
- v. It is not vermin proof and exposed to fire hazards.
- vi. Asbestos : more desirable
- vii. Adding insulation and painting or covering with thatch can improve.
- viii. Metal roof: are good radiators of heat unless insulators are not recommended.
- ix. Over hangs- 3' well help.



Laying Cages :-

Height :- 16” (40.6 cm) at the rear end

Size of floor (width and depth) may vary from 10×16 to 24×18 inches.

Number of birds- may vary from 2 – 8 birds

Size of Deck- Double, triple, four or five deck.

Laying Nests :-

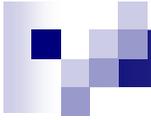
Required for floor birds

Kept before on week first egg laid.

Adequate in size, ample in numbers, easily cleaned, well ventilated and dark.

One nest (30×30 cm) for 4 hens

Community nest (204 meter × 0.6 mt.)



Thank you