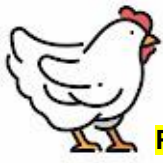


Varsha Group in association with North India Broiler Producers Association

Welcome to Discussion Commercial Broiler Management

Special attention on Gut Health & Drinking Water management



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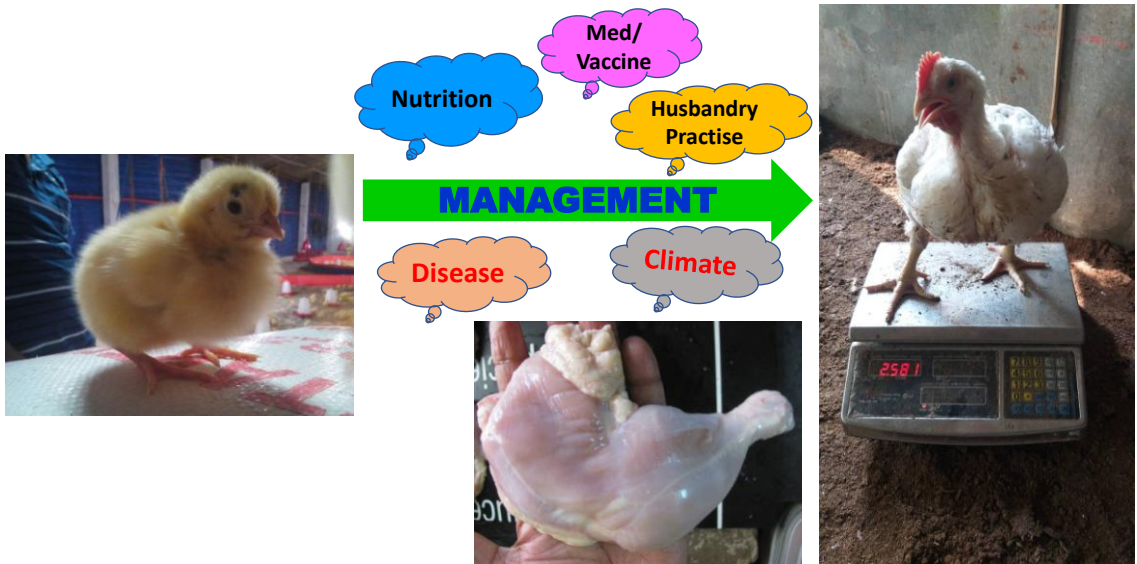


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Commercial Broiler Management



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Broiler Management



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Genetic Potential of Today's Broiler

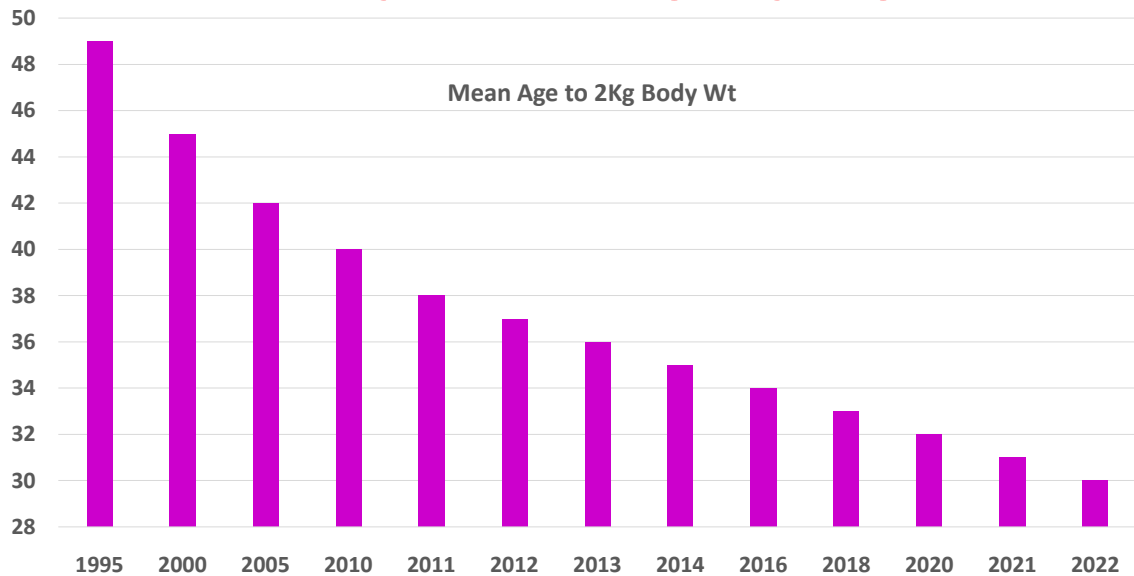


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No of Days to Reach 2Kg Body Weight

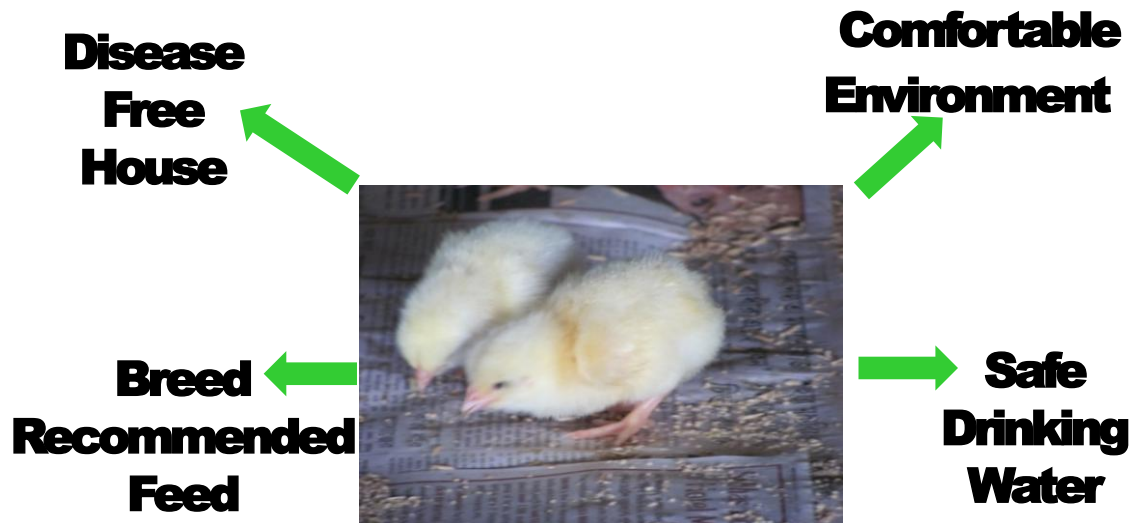


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Basic Need of Chicks

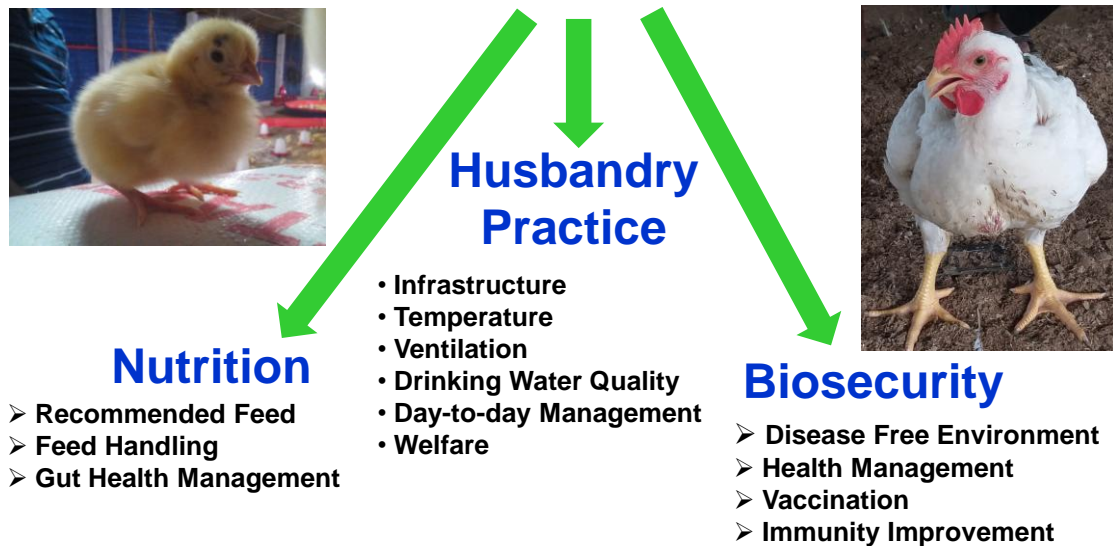


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Requirement of Today's Broiler Chick



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Disease Free House

Biosecurity



A set of protective measures
to
Prevent Entry of pathogens
in Poultry Production Area
and /or
Prevent their transfer
or
Spread within / to other
Poultry Production Site

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Biosecurity



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Economic Benefits of Biosecurity

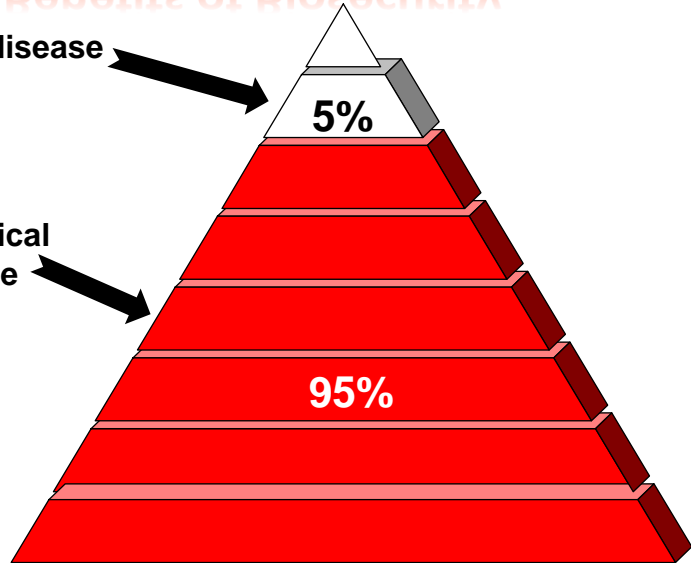
Good Biosecurity Measures can Reduce 50% Medicine Cost

Clinical disease

5%

Sub-Clinical Disease

95%



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Biosecurity Objective



Disease

Prevent the Loss



LOSS
in Poultry
Business

Visible
1) Mortality &
2) Cost of Medication

Invisible
1) Poor Weight Gain/
Low Egg Production &
2) Motivation Loss of Farmer

Heavy Mortality due to ND, Bird Flu, IBD, IBH, IB, Salmonella etc

Disease with No/Little Mortality with Low Body Wt Gain/Low Egg Production resulting high FCR like CRD, *E coli*, Enteritis, Coccidiosis

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Bio-Secured Farm




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Biosecurity – Not Like these



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Biosecurity – Like these



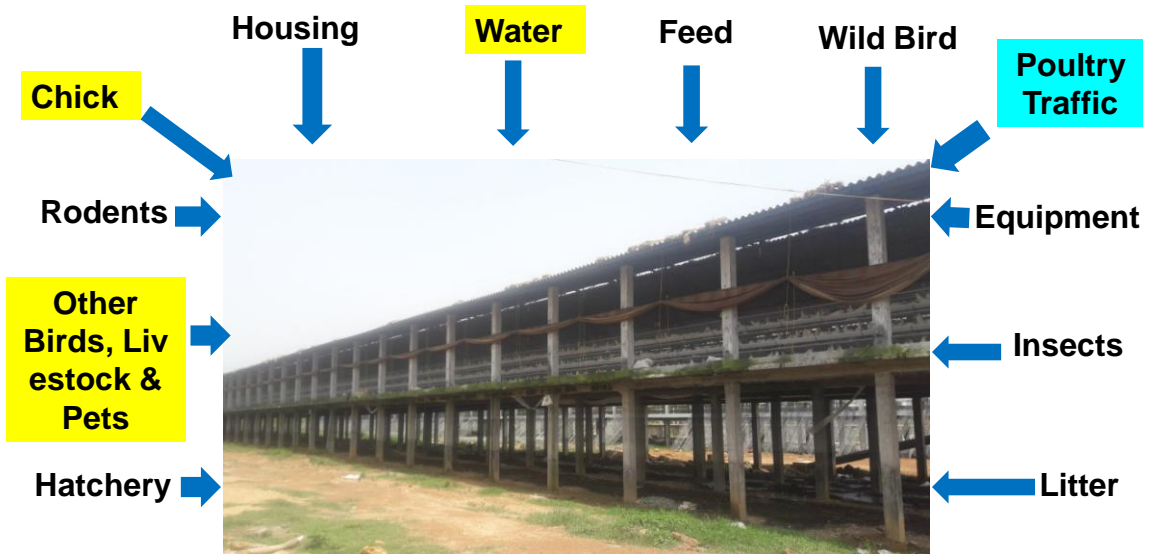
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Routes of Disease Entry to farm



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Hands of Biosecurity

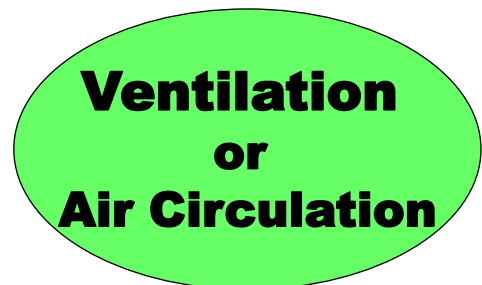
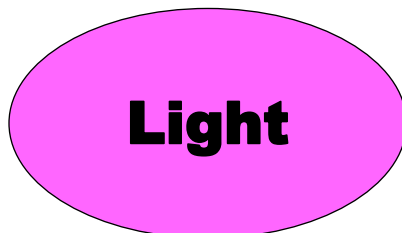
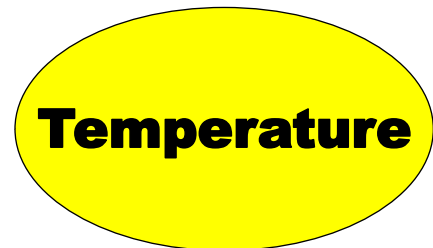


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Comfortable Environment



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Space & Bedding (Litter) Management

Floor Space Need/Chick depends on

- Targeted Live Weight & Age of Harvesting
- Season & Climate
- Type & System of Housing and Equipment, particularly Ventilation

1 st Week	0.25 – 0.4 sq ft
2 nd Week	0.50 – 0.60 sq ft
3 rd Week	0.70 – 0.80 sq ft
4 th Week onwards	Full Space

Under Open Farming System (No EC) having Excellent Ventilation with Both Side Open, 1.580 Kg Live Broiler/Sq Ft is Possible



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Space & Bedding (Litter) Management

EC Shed Stocking Density Influences

- Broiler Performance
- Uniformity
- Bird Welfare
- Profitability

Targeted Body Wt	Max Kg Broiler/ Sq Ft
Below 2.04 Kg	2.60
2.04 – 2.49 Kg	3.00
Above 2.49 Kg	3.40

Quality of Housing & EC System determine the stocking density; Casual Increase in stocking density must be complemented with Ventilation, Feeding space & Drinker availability



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Space & Bedding (Litter) Management

Poor Space Results

- Over-Crowding for Feed & water of Micro-organisms
- Huddling
- Dampness of litter
- Competition
- Poor Growth & High FCR
- Growth & Multiplication
- Death due to Starvation



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Temperature Management

It is crucial for broiler performance to ensure a proper development of the chick (incubation + first 10 days of grow-out) especially because the chick does not have the ability to properly control its body temperature ('Cold Blooded') during this period.

Winter temperatures pose an additional challenge to the development of chick and the subsequent adult broiler. This is mainly due to poor temperature control and also to compromised ventilation in the broiler houses. Good stockmen have the responsibility to maintain a good environment for the chick to maximize the birds' genetic potential.

Incubation					Broiler House							
0	5	10	15	21/0	5	10	15	20	25	30	35	40
"Cold Blooded"					"Warm Blooded"							
Development					Growth							

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Temperature Management

Age (Days)	Whole-House Brooding Temp °C (°F)	Spot Brooding Temp °C (°F)	
		Brooder Edge (A)	2 m (6.6 ft) from Brooder Edge (B)
Day-old	30 (86)	32 (90)	29 (84)
3	28 (82)	30 (86)	27 (81)
6	27 (81)	28 (82)	25 (77)
9	26 (79)	27 (81)	25 (77)
12	25 (77)	26 (79)	25 (77)
15	24 (75)	25 (77)	24 (75)
18	23 (73)	24 (75)	24 (75)
21	22 (72)	23 (73)	23 (73)
24	21 (70)	22 (72)	22 (72)
27	20 (68)	20 (68)	20 (68)



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Temperature Management

COLD STRESS	COLD	OPTIMUM (Ambient)	WARM	HEAT STRESS
Below 10°C	10 – 18°C	18 – 24 °C	25 – 30°C	Above 30°C
Exhaustion	Adjustment	Thermo-Neutral or Comfort Zone	Adjustment	Exhaustion

To achieve maximum performance, poultry house Temperature must be kept consistently within the bird's thermo-neutral or **comfort zone**. Otherwise, the bird will expend additional energy to regulate its Body Temperature resulting poor Body Weight Gain & Poor FCR

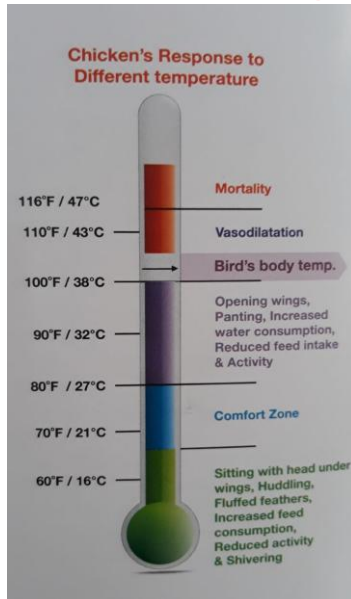
The bird's comfort zone changes with age & is influenced by • Body Weight • Ventilation • Feed Intake • Relative humidity & • Ambient temperature

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Temperature Management



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To achieve maximum performance, poultry house Temperature must be kept consistently within the bird's thermo-neutral or **comfort zone**

Otherwise, the bird will expend additional energy to regulate its Body Temperature resulting poor Body Weight Gain & Poor FCR

Ventilation Management

Ventilation is the Min Amount of Air Volume required to maintain full Genetic Potential by ensuring sufficient Oxygen supply while removing the waste products of growth & combustion from the environment



OBJECTIVE

- To Provide Oxygen required for growth
- To Remove Water from faeces & vapour from broilers respiration to maintain the RH (At 10 days age, 15 broilers produce almost 1 litre water/Day, of which 25 to 40 % from faeces) throughout the growing period and to maintain Good Litter condition
- To Remove Excess heat created by birds and litter
- To Remove unhealthy gas: CO₂, NH₃, etc

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Ventilation Management

Air quality is critical during the brooding period.
Proper ventilation is required to maintain correct Temp and RH.

- > **Improper Ventilation** leads to reduced air circulation, accumulation of Ammonia which results low Feed Intake, reduced Growth rate, Loss of Cilia in Trachea, which in turn leads to Sneezing & other abnormal Respiratory Sounds
- > **Inadequate ventilation** leads to high incidence of Ascites & Chronic Respiratory Disease.



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Ventilation Management



Effects of Ammonia Exposure (Calculated at Birds level)

Target	< 10 ppm
Human detection	> 5 ppm
Damage of Respiratory tract Cilia	20 ppm (3 min)
Poor Body weight & High FCR	25 - 51 ppm
Eye damage/Starvation/Dehydration	46 - 102 ppm (12 hrs)

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Feeding Management



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Feeding Management

Manufacturing

- Formulation
- Raw Material
- Factory Efficiency
 - Grinding,
 - Mixing,
 - Pelletting &
 - Conditioning
- Manpower Efficiency
- Physical Presentation
 - Particle Size
 - Hardness
 - Dust% &
 - Moisture%

Storage & Distribution

- Godown Quality
- Storage System
- Storage Time

Application & Usage

- Health Management – General & Gut Health
- Feeding Frequency
- Feeding Technique
- Drinking Water Quality
- Equipment Quality
- Farm Sanitation

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Feeding Management



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Feed Storage at Godown & Farm

- Feed bags to be stacked with a gap of 1 Feet from the wall
- Feed bags to be stacked with a gap of 1 Feet from the ground using wooden pallets
- First in First out (FIFO) system to be followed for feed distribution



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Feeding (Tips) Management

Use Aluminum bucket to give feed from bag

- Minimum 3 times feeding daily
- Fill feed 1/3 of a feeder at a time
- Cleaning Cone every time after feeding
- Cylinder cleaning every week



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Feeder Drinker Alignment



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Feed Mis-Handling



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Drinking Water Quality Management - Why?



Broiler Chick Drinks 10 Litres Water in 5.5 Weeks

Gut Epithelial Surface is much higher than external body Surface

High Volume of Water passing through Gut Epithelial Everyday

"All Diseases begins in the gut"
- Hippocrates



Layer Chick Drinks 170 - 180 Litres Water in 100 Weeks

Safe Drinking Water is Essential for Normal Health & Production

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Drinking Water Management

- 70% of Chicken Body Weight is Water
- For Optimal Growth, Chicken should have Free and Easy Access to Water

WATER CONTENT (%) OF CHICKEN MEAT		
PRODUCT NAME	RAW	COOKED
Whole Chicken	66%	60%
White Meat Chicken with Skin	69%	61%
Dark Meat Chicken with Skin	66%	59%



- Water is an Important Nutrient, consumed in greater quantity (Maize x 5) than any of the other nutrient

- Birds may Die rapidly from lack of water than due to lack of any of the other nutrients
- The Body Requirement of water varies with Age, Health, climate and Feed type

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Drinking Water Management

- Water is the major component of blood and plays main role in transporting Nutrients & Oxygen to the cells and carrying waste away

Ambient Temperature °C/°F	Feed vs Water Intake in Broiler
4°C / 39°F	1 : 1.7
20°C / 68°F	1 : 2.0
26°C / 79°F	1 : 2.5
30°C / 86°F	1 : 3.0
37°C / 99°F	1 : 4.5



- Water is directly related with all physiological activities like Digestion, Respiration, Excretion, Production, Movement & Thermoregulation

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Water Quality Parameters

- Presentation: Clear & Odourless
- Contamination: Free from Chemical & Bacterial Contamination
- TDS/Hardness: 65 - 105
- pH: 6.0 – 6.6



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Poor Quality Drinking Water & Practical Problems at Farm

- Poor Drinking Water quality with high pH & high TDS leads to Enteritis, diarrhoea & Pasty Vent condition in chicks
- Continuation of the problem cause mal-absorption of protein leads to undigested protein in hind gut resulting Necrotic Enteritis. Maggot development is a common outcome of persistent NE in broiler




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Poor Quality Water & Practical Problems in Gujarat



13
Day
Age



5 Day Age



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Poor Quality Water & Practical Problems in Gujarat



22 Day Age



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Disease Control through Farm Water Quality Management

Safe Drinking Water to Chicks

Control of Water borne Disease

- Fowl Cholera (*P. multocida*)
- Fowl Typhoid (*S. gallinarum*)
- *E. coli* Infections
- CRD
- Coccidiosis
- ND or RD
- IBD
- IB

Reduced Oxidative Stress and optimum Immune System function > Less Chance of Disease. If Disease comes, will be with reduced severity

Optimum Intestinal Integrity

(Mucous – Microbiome - Tight Junction – GALT)

Reduced Mycotoxin Effect

Reduced Microbial Invasion through Gut Mucosa (No Leaky Gut development); Less Chance of Disease

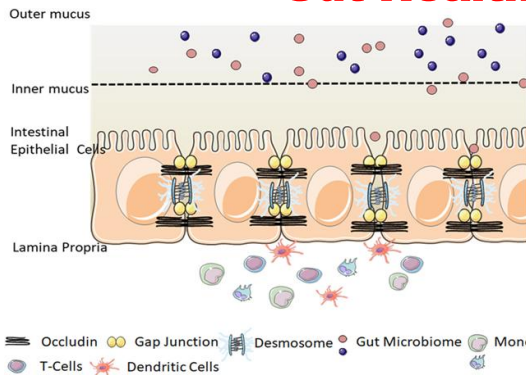
- Necrotic Enteritis
- Coccidiosis
- Infectious Coryza
- Compylobactor
- Avian Influenza
- ND or RD
- IBD or Gumboro
- IBH
- Avian Adenovirus
- Reovirus Infection
- Rotavirus Infection
- CIA (subclinical)

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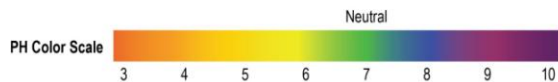
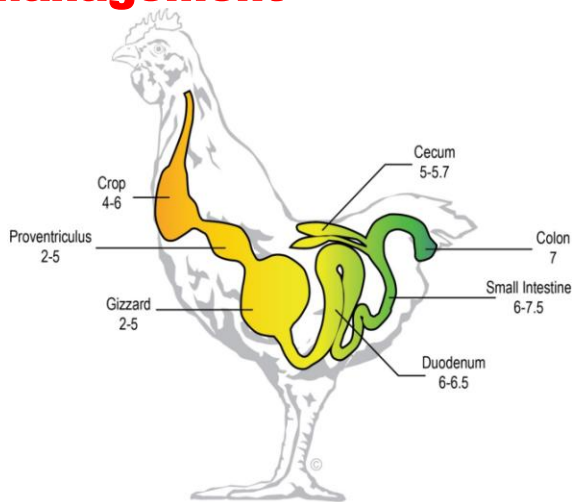
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Gut Health Management



Gut Health means Interconnection of these all 5 factors

- Good Structural Integrity of the Intestine
- Normalcy of Intestinal Mucus Layer
- Healthy balance & Diversity of Microbiota
- Intact Tight Junction
- Healthy Status of Gut Immune System



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Factors Affecting Gut Health

- **Incubation:** Hatchery Temperature maintenance affects Gut development
- **Brooding:** Chick level Temp, Early & Easy access to Feed & Water
- **Water Quality:** pH, Hardness & Contaminations
- **Stress/Welfare:** Stocking density, Temp, Ventilation, Space
- **Feed:** Feed Form, Access to Feed, Feed Changes, Mycotoxins
- **Nutrition:** Feed component, Particle size, Micro-nutrients, Anti-Nutritional factors & Enzymes
- **Litter:** Material, Moisture% & Litter Ammonia
- **Health Intervention:** Therapeutic Antibiotic, AGP, Vaccination, Prebiotic & Probiotic, etc
- **Infections:** Bacterial, Viral & Parasitic
- **Gut Microbiota:** No of Species, Populations, Balance between Commensal & Pathogenic, Competitive exclusions, etc.
- **Biosecurity:** Hygiene, Sanitation



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Incubation & Brooding on Gut Health



Hatchery Temp Control directly affect the length of Villi & depth of crypts, specially in Single Stage machine which finally impact broiler performance

Early & Easy access of Feed & Water helps Developments of Intestine; which directly related to Brooding Efficiency, Temperature Ventilation, Space & Lighting

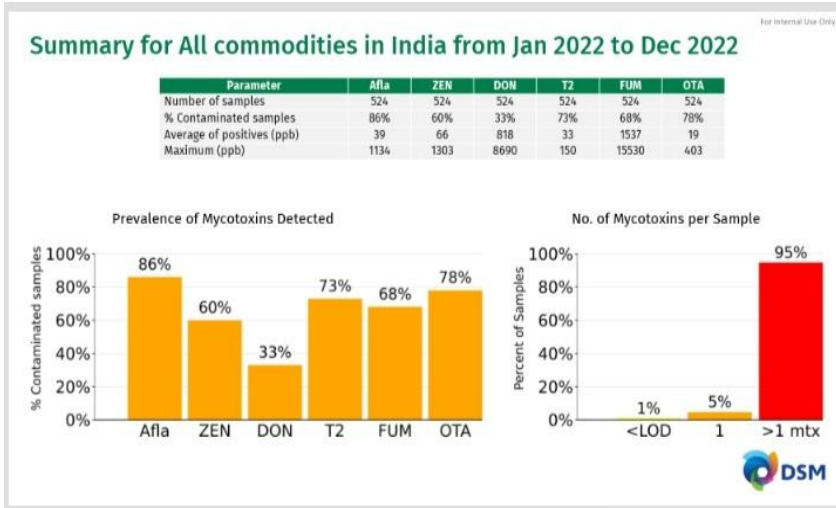


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Mycotoxins & Gut Health



Mycotoxin Effect:

- **Inhibition of Intestinal Cell (Villi Length & Crypt depth) Proliferation – Aflatoxin B1 & T2 Toxin**
- **Impact Nutrient Absorption – Ochratoxin A, Fumonisin B1 & DON**
- **Affect Tight Junction Integrity - Ochratoxin A, Fumonisin B1 & DON**
- **Inhibit Immunoglobulin Production – T2 Toxin & DON**
- **Inhibit Production of Cytokines – Fumonisin B1 & DON**

Loose Dropping & Feed passage is almost common in Broiler Farms Now a Days

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Infections & Gut Health



Gut Health is under pressure from both Clinical & Subclinical Infections at all age of chicken's life

- **Bacterial**
- **Parasitic**
- **Viral**

Mortality may not be high but Performance is always Poor



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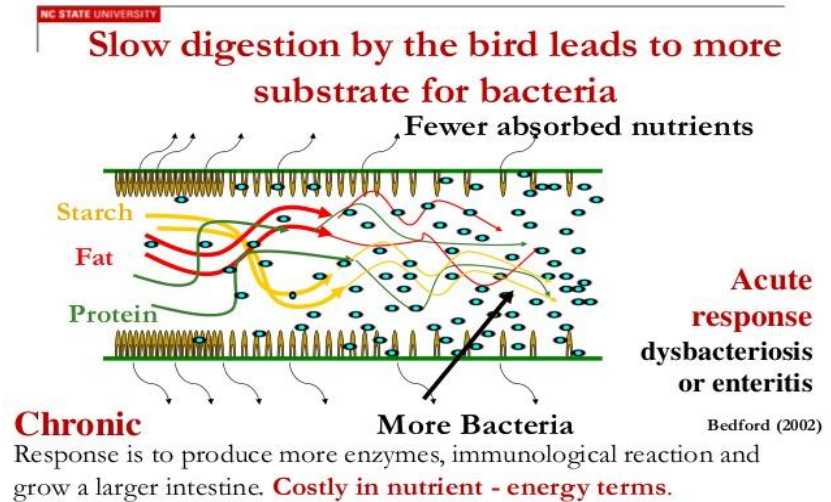
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Effect of Gut Health Compromise

Deviation in Microbiota results Malabsorption

- Poor absorption of Fat, Protein & Carbohydrate
- **More Fat, Protein & Sugar available at hind gut; Caeca**
- **More nutrients available for microbes like Clostridium**



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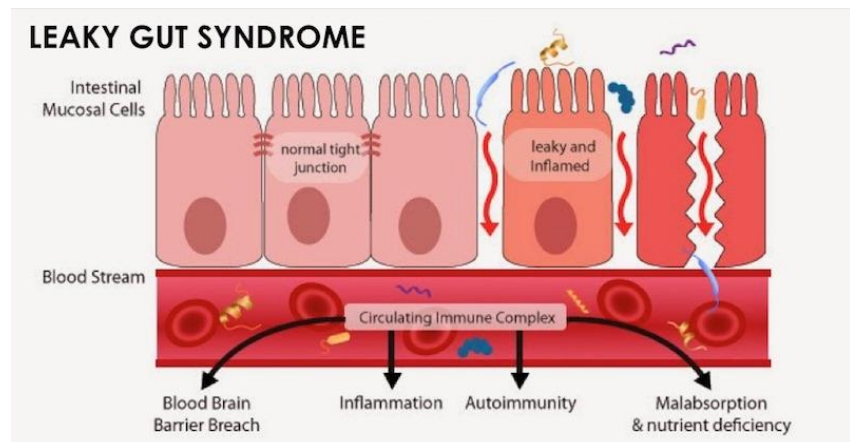
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Effect of Gut Health Compromise

Unwanted Microbial Overgrowth

- Excess Production of Toxic gas like CO₂, NH₃ & H₂S
- Production of Toxic Chemical (Amines); irritates gut & reduced body growth
- Inactivation of Bile acid impacting Fat absorption
- Immune reaction leading to Leaky Gut

This leads to further disruption & damage of Intestinal mucosa leading to many more infections

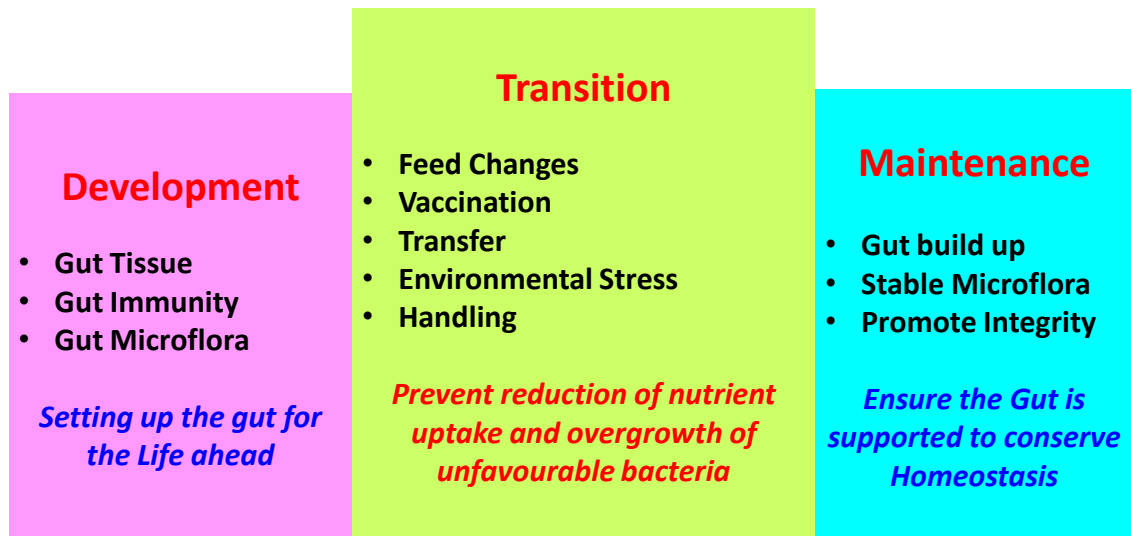


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How to Promote Gut Health?



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Litter Management

Litter is a harmless, soft, fibrous material used as bedding, which helps facilitate evaporation of moisture & gases from Fecal materials

- Absorb moisture from the droppings quickly
- Absorb less moisture from atmosphere & dry rapidly
- Least tendency to form cakes
- Light in weight, and free from molds
- Non-toxic, bio-degradable, cheap & locally available
- Uniform particle size
- Soft and compressible
- Low Thermal Conductivity



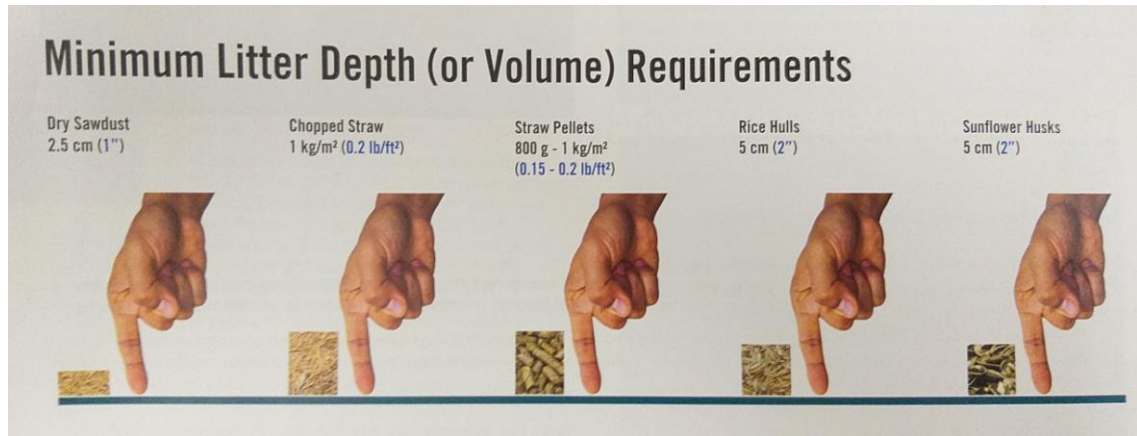
- Rice Husk is the best Litter material besides Saw dust, wood flakes, etc
- Litter Thickness: 2 Inches or 450gm/Chick

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Litter Management



- Rice Husk is the best Litter material
- Litter Thickness: 2 Inches or 400g/Chick

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Litter Management

Causes of Caked Litter

- Humid or Cold Surface
- **Insufficient**, Non-absorbent or Too Compacted
- High Stocking Density or Over-Crowding
- **Insufficient Ventilation or Poor Air Circulation**
- **Infections**
- **Poor Water quality**
- Poor Drinker Adjustment resulting Leakage
- Cold Climate
- **Feed & Nutrition**



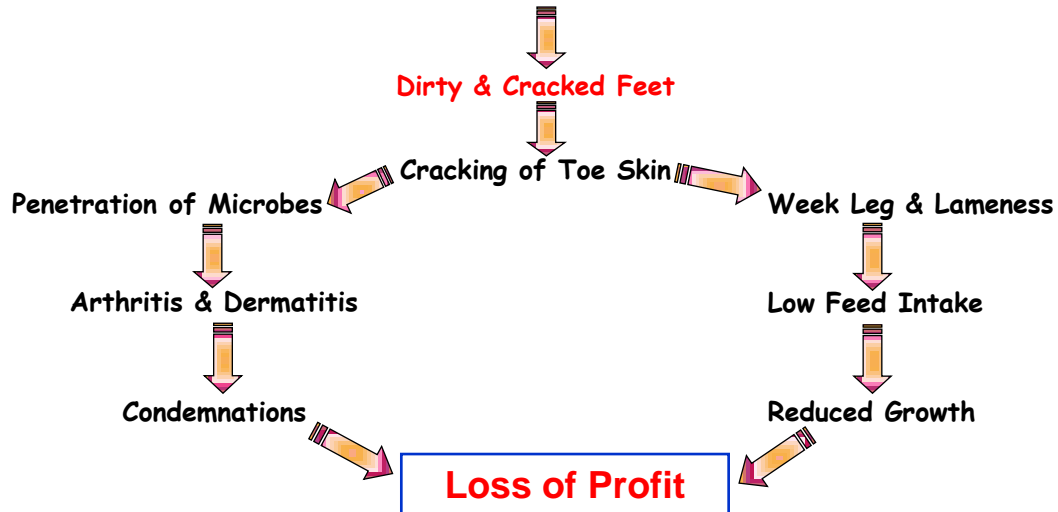
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Litter Management

Consequences of Poor Litter



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Stress Management

Avoid Avoidable Stress

- Overcrowding
- Poor Ventilation
- Wet Litter
- High Ammonia
- Dehydration
- Poor Management
- Mycotoxin
- Starvation
- Disease

Minimize Un-avoidable Stress

- Extreme Climate;
Heat, Chilling, Humidity
- Rapid Growth
- Handling
- Vaccination
- Transportation
- Routine Medication
- Debeaking

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Mitigation of Stress in Chicken

- Maintain a clean, calm & disease-free house environment
- Noise-free environment; Chicken don't like unusual circumstances
- **Avoid extreme heat, Cold, High Humid environment inside poultry house**
- Avoid overcrowding; Welfare is most un-attended issue creating stress in poultry
- **Avoid Litter Ammonia, dust & wet litter in poultry houses**
- Follow the SOP & behave gently while Handling, Transfer, Transportation, Mixing, Vaccination & Debeaking



Remove Stressors as soon as possible

Avoid compromised ventilation during winter & Monsoon in Open Farming

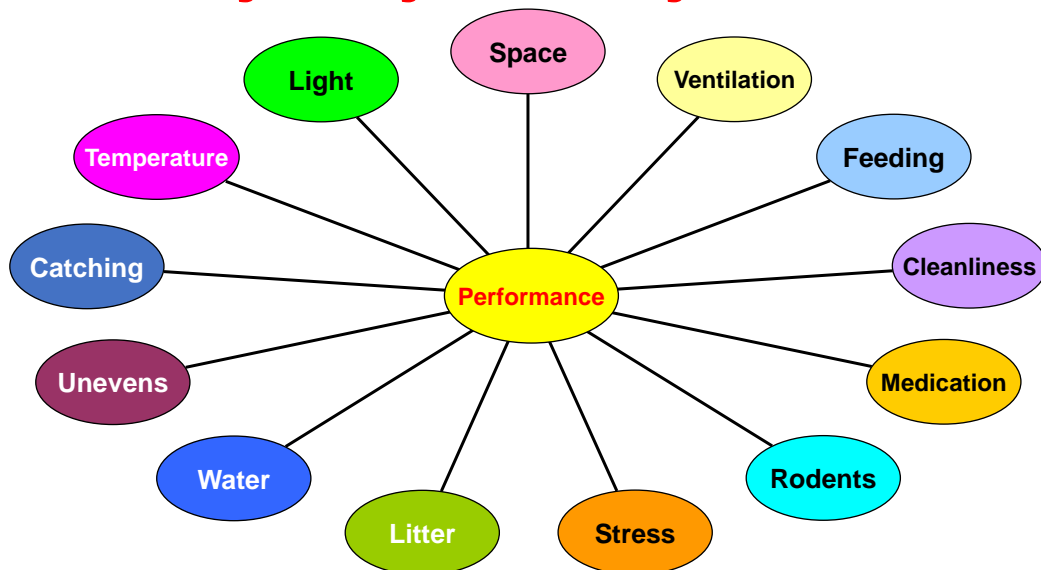
And during high humid weather situation in EC shed

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Day-to-Day Husbandry Practice

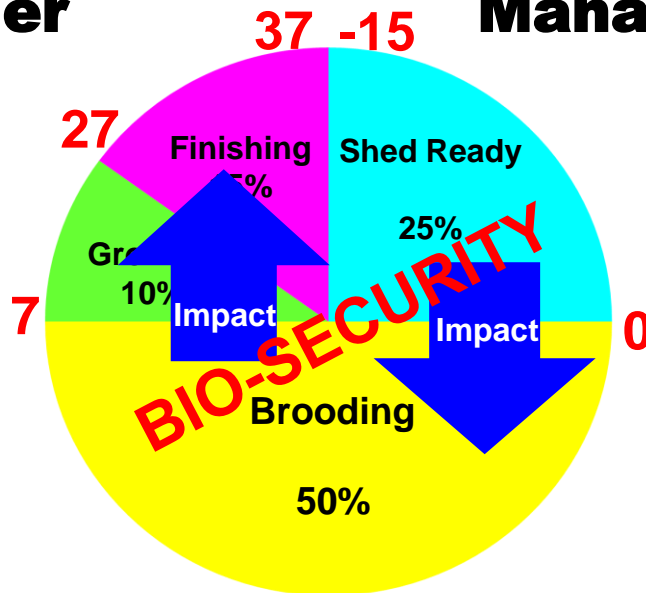


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Broiler Management



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After Lifting

- Company: **71 Integration** (Alal Feed, Bangladesh)
- Farmer: **Ariful Poultry, Bogura**
- Hatch Date: 18- 10-2020
- Chicks: 998
- **Mortality%: 3.61**
- **Av Body Weight (Kg): 2.729**
- **FCR: 1.520**
- **Mean Age: 37.01**
- **Av Day Gain: 73.74**
- **C FCR: 1.337**
- **EEF: 468**

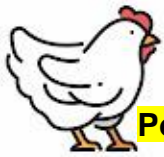


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