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POULTRY

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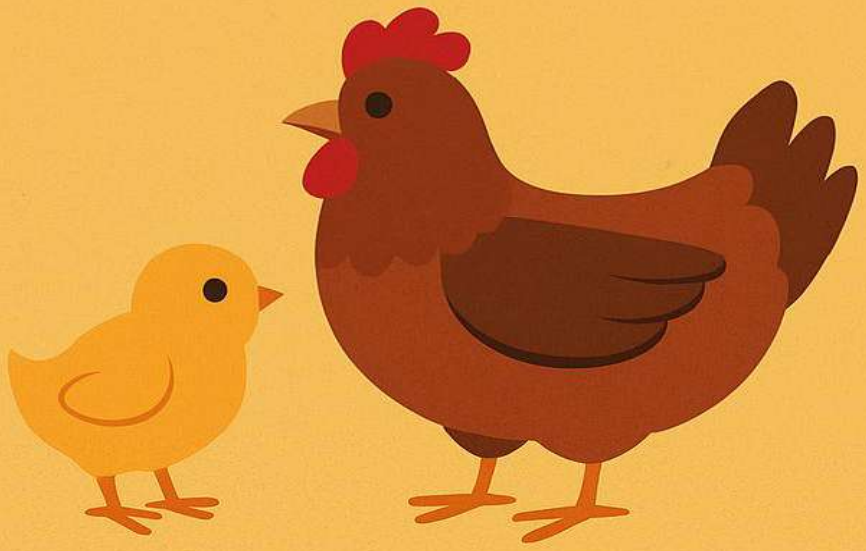

INDIAN IQ

Introduction to Poultry Farming in India

- **Significance**: Poultry farming is a vital component of Indian agriculture, contributing to food security, rural employment, and economic growth. It provides affordable protein through eggs and meat, supporting nutritional needs.
- **Economic Impact**: Accounts for ~7.28% of agricultural GVA, with an estimated value of Rs. 2,12,915 crores. It supports millions of livelihoods, especially in rural and semi-urban areas.
- **Global Position**: India ranks 3rd in egg production (103 billion eggs annually) and 5th in poultry meat production (4.6 million metric tonnes annually).
- **Livestock Census (2019)**: Poultry population ~851 million, with a 33.1% growth from 2012. Tamil Nadu leads in poultry population, followed by Andhra Pradesh.

Poultry Breeds

Indigenous Breeds

- **Aseel**:
  - Origin: Andhra Pradesh, Tamil Nadu, and Rajasthan.
  - Characteristics: Strong, aggressive, used for cockfighting. Good for meat production due to robust build.
  - Egg Production: 40–50 eggs/year.
  - Weight: Males (4–5 kg), Females (3–4 kg).
- **Kadaknath**:
  - Origin: Madhya Pradesh (Jhabua region).
  - Characteristics: Black meat, high protein, low fat, valued for medicinal properties.
  - Egg Production: 80–100 eggs/year.
  - Weight: Males (1.8–2 kg), Females (1.2–1.5 kg).
- **Chittagong**:
  - Origin: Eastern India (Odisha, West Bengal).
  - Characteristics: Dual-purpose, hardy, suitable for backyard systems.
  - Egg Production: 60–80 eggs/year.
- **Busra**:
  - Origin: Gujarat.
  - Characteristics: Small size, disease-resistant, ideal for free-range systems.

- Egg Production: 50–60 eggs/year.

- **Other Breeds**: Frizzle, Naked Neck, and Vanaraja (hybrid for backyard farming).

Exotic Breeds

- **White Leghorn**:
  - Characteristics: Small body, white feathers, excellent layer.
  - Egg Production: 250–300 eggs/year.
  - Used in: Commercial layer farms.
- **Rhode Island Red**:
  - Characteristics: Brown feathers, dual-purpose, hardy.
  - Egg Production: 200–250 eggs/year.
  - Weight: Males (3.5–4 kg), Females (2.5–3 kg).
- **Plymouth Rock**:
  - Characteristics: Barred feathers, good for meat production.
  - Weight: Males (3.5–4.5 kg), Females (2.5–3.5 kg).
- **Cornish**:
  - Characteristics: Fast-growing, muscular, ideal for broiler production.
  - Weight: Males (4–5 kg), Females (3–4 kg).

Hybrid Breeds

- **Layers**: Babcock, BV-300, Hy-Line Brown (high egg yield, 280–320 eggs/year).
- **Broilers**: Cobb, Ross, Hubbard (fast growth, market weight in 35–42 days).
- **Dual-Purpose**: Kuroiler, Vanaraja, Gramapriya (developed for rural poultry farming).

Poultry Production Systems

- **Backyard Poultry**:
  - Low-input, free-range system using indigenous or improved breeds.
  - Benefits: Low cost, nutritional security, women empowerment.
  - Challenges: Predation, disease susceptibility, low productivity.
- **Semi-Intensive System**:
  - Combines free-range and confined housing.

- Suitable for dual-purpose breeds like Rhode Island Red.
- Features: Small coops, supplemental feeding, moderate biosecurity.

- **Intensive System**:
  - Commercial farms with controlled environments.
  - Types:
    - **Cage System**: Layers housed in battery cages (1.5–2 sq.ft./bird). Maximizes egg collection and hygiene.
    - **Deep Litter System**: Broilers raised on bedding (rice husk, sawdust). Requires 1 sq.ft./bird.
    - **Slat Floor System**: Elevated floors for better waste management.
  - Features: Automation, climate control, high productivity.
- **Environmentally Controlled Housing (ECH)**:
  - Maintains temperature (18–25°C for layers, 24–26°C for broilers) and humidity (50–60%).
  - Uses fans, heaters, and cooling pads for optimal conditions.

Poultry Management Practices

Housing

- **Design**:
  - Orientation: East-west to minimize direct sunlight.
  - Ventilation: Cross-ventilation to reduce ammonia buildup.
  - Flooring: Concrete or earthen with litter (4–6 inches deep).
  - Lighting: 16 hours/day for layers to stimulate egg production.
- **Space Requirements**:
  - Layers: 1.5–2 sq.ft./bird (cage), 2–3 sq.ft./bird (deep litter).
  - Broilers: 0.8–1 sq.ft./bird (deep litter).
  - Chicks: 0.5 sq.ft./chick (brooding).
- **Brooding**:
  - Temperature: 32–35°C (1st week), reduced by 3°C/week.
  - Equipment: Brooders (electric, gas, or infrared lamps).

Feeding

- **Nutrient Requirements**:
  - **Layers**:
    - Protein: 16–18% (for egg production).
    - Calcium: 3–4% (for eggshell formation).
    - Energy: 2600–2800 kcal/kg.
  - **Broilers**:
    - Protein: 20–22% (starter), 18–20% (finisher).
    - Energy: 3000–3200 kcal/kg.
  - **Chicks**: High protein (22–24%) starter feed for first 2 weeks.
- **Feed Types**:
  - **Starter**: 0–2 weeks (high protein, small particle size).
  - **Grower**: 3–6 weeks (moderate protein).
  - **Finisher**: 6–8 weeks (for broilers, high energy).
  - **Layer Mash**: Post-18 weeks for egg production.
- **Additives**:
  - Antibiotics: Prevent bacterial infections (e.g., oxytetracycline).
  - Probiotics: Enhance gut health.
  - Vitamins: A, D3, E for immunity and bone health.
- **Feeding Schedule**:
  - Chicks: Ad libitum feeding.
  - Layers: 110–120 g feed/bird/day.
  - Broilers: 150–200 g feed/bird/day.

Water Management

- **Quality**: Potable, free from pathogens and chemicals.
- **Quantity**:
  - Layers: 250–300 ml/bird/day.
  - Broilers: 200–250 ml/bird/day.

    - Chicks: 100–150 ml/chick/day.
- **Equipment**: Nipple drinkers, bell drinkers, or manual waterers.

Litter Management

- **Materials**: Rice husk, sawdust, wood shavings.
- **Depth**: 4–6 inches for deep litter systems.
- **Maintenance**: Regular turning to prevent caking and ammonia buildup.

Poultry Breeding

- **Selection Criteria**:
    - Layers: Egg number, size, and shell quality.
    - Broilers: Growth rate, feed conversion ratio (FCR), meat yield.
    - Dual-Purpose: Balanced egg and meat production.
- **Breeding Methods**:
    - **Natural Mating**: 1 rooster per 10–12 hens.
    - **Artificial Insemination**: Used in commercial farms for genetic improvement.
- **Hatchery Management**:
    - **Incubation**:
        - Duration: 21 days.
        - Temperature: 37.5–37.8°C.
        - Humidity: 55–60% (setter), 65–70% (hatcher).
        - Turning: 4–6 times daily to prevent embryo sticking.
    - **Candling**: Done on days 7 and 14 to check embryo viability.
    - **Hatching**: Chicks hatch on day 21, transferred to brooding units.
- **Sexing**:
    - Vent sexing or feather sexing for day-old chicks.
    - Auto-sexing breeds (e.g., Rhode Island Red) for easier identification.

Poultry Diseases and Health Management

Viral Diseases

- **Newcastle Disease (Ranikhet)**:

- Cause: Paramyxovirus.
- Symptoms: Respiratory distress, green diarrhea, nervous signs, high mortality (80–100%).
- Control: Vaccination (Lasota: Day 5–7, R2B: Week 8–10).

- **Infectious Bronchitis (IB)**:
  - Cause: Coronavirus.
  - Symptoms: Coughing, sneezing, reduced egg production, wrinkled eggshells.
  - Control: Vaccination at 4–6 weeks.
- **Avian Influenza (Bird Flu)**:
  - Cause: Influenza A virus (H5N1, H7N9).
  - Symptoms: Severe respiratory issues, swollen head, high mortality.
  - Control: Biosecurity, culling infected flocks.
- **Marek's Disease**:
  - Cause: Herpesvirus.
  - Symptoms: Paralysis, tumors, weight loss.
  - Control: Vaccination on Day 1.
- **Fowl Pox**:
  - Cause: Poxvirus.
  - Symptoms: Skin lesions, diphtheritic membranes in mouth.
  - Control: Vaccination at 6–8 weeks.

Bacterial Diseases

- **Fowl Cholera**:
  - Cause: Pasteurella multocida.
  - Symptoms: Fever, diarrhea, sudden death.
  - Control: Antibiotics (sulfonamides), vaccination.
- **Salmonellosis**:
  - Cause: Salmonella spp.
  - Symptoms: Diarrhea, reduced hatchability, mortality in chicks.
  - Control: Biosecurity, antibiotics (enrofloxacin).

- **Colibacillosis**:
    - Cause: Escherichia coli.
    - Symptoms: Respiratory issues, septicemia.
    - Control: Antibiotics, clean water.

Parasitic Diseases

- **Coccidiosis**:
    - Cause: Eimeria spp.
    - Symptoms: Bloody diarrhea, weight loss, high mortality in chicks.
    - Control: Anticoccidial drugs (amprolium), vaccination.
- **Roundworms**:
    - Cause: Ascaridia galli.
    - Symptoms: Poor growth, intestinal blockage.
    - Control: Deworming (piperazine).

Fungal Diseases

- **Aspergillosis**:
    - Cause: Aspergillus fumigatus.
    - Symptoms: Respiratory distress, gasping.
    - Control: Clean litter, avoid moldy feed.

Vaccination Schedule

- **Day 1**: Marek's Disease (HVT vaccine, subcutaneous).
- **Day 5–7**: Newcastle Disease (Lasota, eye drop/intranasal).
- **Day 14**: Infectious Bursal Disease (IBD, drinking water).
- **Week 4–6**: Infectious Bronchitis (IB, drinking water).
- **Week 6–8**: Fowl Pox (wing-web method).
- **Week 8–10**: Newcastle Disease booster (R2B, intramuscular).

Biosecurity Measures

- Restrict farm access to authorized personnel.
- Disinfect equipment, vehicles, and footwear.

- Quarantine new birds for 2–3 weeks.
- Use all-in, all-out system to prevent disease carryover.
- Dispose of dead birds properly (incineration or deep burial).

Egg and Meat Production

Egg Production

- **Age of Lay**: 18–20 weeks for commercial layers.
- **Peak Production**: 26–30 weeks (80–90% hen-day production).
- **Annual Yield**: 280–320 eggs/bird for hybrids.
- **Factors Affecting**:
    - Nutrition: High calcium and protein.
    - Lighting: 16 hours/day (natural + artificial).
    - Stress: Avoid overcrowding, temperature extremes.
- **Egg Quality**:
    - Grading: AA (>60g), A (53–60g), B (<53g).
    - Shell Quality: Affected by calcium, vitamin D3, and age.
    - Storage: 10–15°C, 70–75% humidity.

Meat Production

- **Broiler Growth**:
    - Market Weight: 1.5–2 kg in 35–42 days.
    - Feed Conversion Ratio (FCR): 1.6–1.8 (kg feed/kg weight gain).
    - Dressing Percentage: 70–75%.
- **Processing**:
    - Slaughter: Humane, at 0–4°C to preserve meat quality.
    - Packaging: Vacuum-sealed or frozen at -18°C.
- **Factors Affecting**:
    - Genetics: Cobb, Ross for fast growth.
    - Feed: High-energy finisher diets.
    - Management: Proper ventilation, low stress.

Government Schemes and Initiatives

- **National Livestock Mission (NLM)**:
    - Supports backyard poultry, hatchery development, and feed units.
    - Provides subsidies for small-scale farmers.
- **Poultry Venture Capital Fund (PVCF)**:
    - Financial assistance for poultry farm setup, including housing and equipment.
    - Interest subsidies through NABARD.
- **Rashtriya Krishi Vikas Yojana (RKVY)**:
    - Funds poultry development projects, training, and extension services.
- **Krishi Megh**:
    - Cloud-based data platform for agricultural research, including poultry statistics.
- **Kisan Sarathi**:
    - Real-time information system for farmers, covering poultry health and market trends.
- **ACABC (Agri-Clinics and Agri-Business Centres)**:
    - Training by MANAGE for poultry entrepreneurship.

Key Statistics (2019–20)

- **Poultry Population**: 851 million (33.1% growth from 2012).
- **Egg Production**: 103 billion eggs annually.
- **Poultry Meat**: 4.6 million metric tonnes annually.
- **Per Capita Availability**:
    - Eggs: 74 eggs/person/year.
    - Poultry Meat: 3.5 kg/person/year.
- **Top States**:
    - Poultry Population: Tamil Nadu, Andhra Pradesh, Telangana.
    - Egg Production: Andhra Pradesh, Tamil Nadu, Haryana.
    - Meat Production: Maharashtra, Haryana, West Bengal.

Miscellaneous Topics

- **Poultry Waste Management**:

    - Manure: Rich in nitrogen (1.5–2%), used as organic fertilizer.
    - Disposal: Composting or biogas production to prevent environmental pollution.
- **Marketing**:
    - Channels: Direct (farm-gate), wholesale, retail.
    - Challenges: Price fluctuations, middlemen dominance.
- **Poultry Equipment**:
    - Feeders: Linear or circular, 10–15 cm/bird.
    - Drinkers: 1 nipple/10 birds, 1 bell/50 birds.
    - Incubators: 100–10,000 egg capacity for hatcheries.
- **Record Keeping**:
    - Track feed consumption, egg production, mortality, and vaccination.
    - Helps in cost analysis and flock management.

One-Liners for Quick Revision

- Poultry population in India: ~851 million (20th Livestock Census, 2019).
- Top egg-laying breed: White Leghorn (280–300 eggs/year).
- Ideal FCR for broilers: 1.6–1.8.
- Incubation period: 21 days at 37.5°C, 55–60% humidity.
- Newcastle Disease vaccine: Lasota (Day 5–7), R2B (Week 8–10).
- Calcium requirement for layers: 3–4% in feed.
- Broiler market weight: 1.5–2 kg in 35–42 days.
- Tamil Nadu: Highest poultry population state.
- ACABC training: Provided by MANAGE for agribusiness.
- Nitrogen: Key nutrient in poultry feed and manure.