

Broiler Housing Design and Management

Broiler Housing Design & Management – Quick Reference Notes

1. Objectives of a Broiler House

Goal	Why It Matters
Optimal growth rate	Faster weight gain → higher profitability
Low mortality & morbidity	Reduces loss and drug costs
Uniform flock	Improves processing efficiency and market price
Energy & cost efficiency	Keeps operating expenses under control
Biosecurity	Limits disease entry and spread

2. Site Selection & Layout

Factor	Recommended Practice
Topography	Slightly sloped (0.5–1%); promotes drainage and prevents water pooling.
Soil type	Well-drained loam or sand; avoid heavy clay that retains moisture.
Wind direction	Align long axis perpendicular to prevailing winds; install windbreaks on the windward side.
Access	Separate clean/dirty traffic routes; wide gate for equipment and feed trucks.
Distance to water & electricity	Within 100m to reduce line losses and pump head.
Biosecurity buffer	Minimum 30m from other livestock operations; fenced perimeter.

3. Building Envelope

3.1. Size & Shape

- **Standard modules:** 12m × 30m (360m²) – easy to expand in rows.

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- **Height:** 3.0m to 3.5m (clear floor to ceiling) – provides adequate ventilation space and bird comfort.

3.2. Walls & Insulation

Component	Material	Typical R-value (cold climates)
Exterior wall	Galvanized steel panels (0.5mm) + insulated sandwich panel	R4 to R6
Interior wall (optional)	Polyethylene (PE) liner	Acts as vapor barrier
Floor	Concrete slab (15cm) with waterproof coating + slatted drainage	Prevents seepage & improves cleaning

3.3. Roof

- **Pitch:** 15–20° (allows rain runoff).
- **Cover:** Corrugated steel or polycarbonate panels with UV stabilizer.
- **Insulation:** Same sandwich panel system as walls for cold regions; reflective coating for hot zones.

3.4. Doors & Windows

- **Doors:** Self-closing, insulated, with vestibule for decontamination.
- **Ventilation openings:** Adjustable louvered vents (top & side) spaced 1m apart; quick-release hinges for emergency airflow.

4. Ventilation Systems

System Type	When to Use	Key Features
Natural cross-ventilation	Temperate climates, low-density flocks	Roof and side vents; wind-driven airflow.

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System Type	When to Use	Key Features
Tunnel (negative pressure) ventilation	Hot, humid climates; high density flocks	High capacity axial fans ($0.5\text{--}1\text{ m}^3/\text{s}$ per 100 kg live weight); inlet louvers open fully.
Hybrid (mix of natural + fans)	Regions with large diurnal temperature swings	Fans operate only when temperature exceeds set point.
Evaporative cooling pads	Very hot ($>30^\circ\text{C}$) & dry climates	Pads on inlet side; water flow $0.1\text{ L}/\text{min}$ m^2 ; combined with tunnel fans.