



A Scientific Guide to Intensive Housing Systems.

HOUSING HIGH-YIELDING HYBRID DAIRY COWS



Authored by Tassells Farm Limited (TFL) Research Division

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Investing in Comfort, Harvesting Productivity.

The core principle of intensive housing is to create an environment that minimizes stress and maximizes comfort for the dairy cow. A stressed or uncomfortable animal will not eat properly, is more susceptible to disease, and cannot achieve her genetic potential for milk production.

This guide provides a scientifically backed approach to designing and managing intensive systems that are paramount to maximizing milk yield, ensuring animal welfare, and improving operational efficiency. It delves into the critical science behind:

- **Thermoregulation** to prevent heat stress
- **Rumination and Rest** to optimize milk production
- **Lameness Prevention** through superior flooring and stall design
- **Hygiene and Udder Health** to reduce mastitis

Reflecting the innovations and lessons from Tassells Farm Limited, this approach will help ensure sustainable profitability for years to come.

Tassells Farm Limited (TFL)

Research & Management Division

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Dairy housing basic Manual.

Housing High-Yielding Hybrid Dairy Cows

A precise Scientific Guide

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This basic article provides dairy farmers, livestock practitioners, and researchers with a scientifically backed guide to housing high-yielding hybrid dairy cows. It reflects the innovations and lessons from Tassells Farm Limited, an award-winning agribusiness redefining dairy farming.

To Tassells Farm Limited,

A basic Guide to Intensive Housing Systems

Executive Summary

For modern dairy operations like Tassells Farm Limited, the dairy animal housing should meet the following criteria.

- Maximizing milk yield,
- Ensuring animal welfare,
- Improving operational efficiency are paramount.

Intensive housing systems, when designed and managed correctly, provide a **controlled environment** to achieve these goals. This article delves into the key science, features, and practical design of an intensive system.

1. The Science Behind Intensive Housing

The core principle of intensive housing is to create an environment that *minimizes stress and maximizes comfort* for the dairy cow. A stressed or uncomfortable cow will not eat properly, is more susceptible to disease, and will not achieve her genetic potential for milk production. The science focuses on four critical areas:

- **1.1 Thermoregulation:** Dairy cows are most comfortable in a Temperature Humidity Index (THI) between 40 and 72. Above this, *heat stress occurs*, leading to *reduced feed intake, lower milk yield, and reproductive issues*. Intensive housing uses insulation, natural ventilation (ridge and eaves openings), and often mechanical ventilation (fans) to manage temperature and humidity, removing stale air and pathogens.
- **1.2 Rumination and Rest:** A cow must lie down for *12-14 hours per day* to optimize rumination and blood flow to the udder, which is directly linked to milk production. The provision of *deep, soft, and dry bedding* (whether sand, compost, or mattresses) is non-negotiable. It encourages lying time, *reducing hock injuries, and improves overall hoof health*.

- **1.3 Lameness Prevention:** *Hard, abrasive, or wet floors* are primary causes of lameness. The system design prioritizes cow comfort flooring. This includes soft rubber mats in high-traffic areas, grooved concrete for traction, and, most importantly, ample comfortable resting space.
- **1.4 Hygiene and Udder Health:** Mastitis is a major economic drain. Intensive systems control this by:
 - Separation of functions: Cows eat, drink, rest, and are milked in dedicated areas, preventing manure contamination of feed and bedding.
 - Efficient manure management: Automated scrapers or manual removal keeps alleyways dry and clean, *reducing the bacterial load on the udder between milkings.*

2. Essential Features of an Intensive Dairy Unit

A well-designed intensive barn integrates several key features:

- **Free-Stall Layout:** Cows are free to choose when to eat, drink, rest, or go to the milking parlour. This reduces competition and stress.
- **High-Quality Ventilation:** A combination of open sides (with curtains for bad weather), a raised, open ridge, and eaves openings creates a "chimney effect" for passive airflow. For larger units or hot climates, fans are installed over the resting and feeding areas.
- **Comfortable Stalls:** Each stall must be correctly sized for the herd (e.g., 1.2m x 2.4m for a Holstein). They feature a neck rail to position the cow correctly, a brisket board to prevent her from lying too far forward, and a generous bed of sand, dried manure, or compost.
- **Feed-Face and Waterers:** There should be enough feeding space for all cows to eat simultaneously (approx. 60-75cm per cow). Constant access to clean, fresh water is critical; provide at least two large water troughs for a 20-cow unit.

- **Alleyways and Flooring:** Scraped alleys (3-3.5m wide for cows to pass easily) with grooved concrete and rubber mats at the feed-face improve cow traffic and safety.
- **Calving and Sick Pen:** A dedicated, spacious pen for calving and isolating sick animals is essential for biosecurity and animal welfare.

3. Sample 20-Cow Intensive Unit by TFL

All design must prioritize simplicity, cow flow, and cost-effectiveness for a small-scale, high-welfare operation.

Assumptions:

- Breed: Holstein-Friesian
- Milking: In a separate parlor (e.g., a simple swing-over herringbone).
- Manure Management: Manual scraping once or twice daily.

Layout and Dimensions:

The building is a clear-span structure, **12m wide x 27m long (approx. 324 sqm)**.

Key Components:

1. **Free-Stall Resting Area (Two rows):** 20 Stalls (10 on each side, facing outwards). Stall Size: 1.2m (width) x 2.4m (length). Bedding: Deep sand or composted manure. Central Loafing Alley: A wide (3.5m) alley between the two rows of stalls for cows to move and socialize.
2. **Feed Alley and Bunk:** Located along both side walls. Feed Space: 60cm per cow = 12m of total feeding space (6m on each side). Flooring: Grooved concrete with a rubber mat at the feed-face for comfort and traction.
3. **Water Access:** Two large water troughs placed at the ends of the central alley within easy reach.
4. **Milking and Exit:** Cows exit the barn at one end and are directed to the milking parlour. Upon returning, they walk through the central alley back to the stalls or feed bunk.

5. **Calving/Sick Pen:** A partitioned section at one end of the barn (approx. 4m x 4m) with its own water source.

5. Management is Key

The best building will fail without excellent management, this means:

- **Strict hygiene:** Regular stall grooming, alley scraping, and feed bunk cleaning.
- **Stockmanship:** Daily observation of cow behavior for signs of lameness, mastitis, or other health issues.
- **Nutrition:** Providing a consistent and balanced TMR (Total Mixed Ration) at the feed face.
- **Ventilation Management:** Adjusting side curtains daily based on weather conditions to ensure optimal air quality without creating drafts.

6. Conclusion

Investing in a scientifically-designed intensive housing system is an investment in the productivity, health, and welfare of your herd. For cow unit housing, the focus should be on simplicity, superior ventilation, and unmatched cow comfort. This approach will ensure a farmer achieves sustainable profitability for years to come.

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