TASSELLS Farm Limited
Re-Defining Agri-Living

INTERPRETING CATTLE BEHAVIORS

A GUIDE TO ENHANCED DAIRY HERD MANAGEMENT.
THE DISCIPLINE OF OBSERVATION FOR ECONOMIC BENEFIT.

Authored by Tassells Farm Limited (TFL) Research Division

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Mastering The Core Lessons.

Key Learnings Inside:

Learn to Override Farm blindness and assess Specific elements to identify risks.

(Lesson A) **The Discipline of Observation**: Purposeful, systematic observation of cattle behavior and condition reveals early signs of health, welfare, and management issues. Turning these signals into insights enhances herd well-being, productivity, and farm profitability.

(Lesson B) **Grazing Managment**: Pasture supports natural grazing rhythms, social behavior, and hoof health, but requires careful management of nutrition, comfort, and environmental risks to sustain cattle welfare and productivity.

(Lesson C) **Housing System Managment**: Comfortable, well-ventilated housing with proper flooring, hygiene, and stall design is essential for hoof health, cow welfare, and maximizing milk production.

(Lesson D) **Nutrition & Digestion**: Maximizing intake while maintaining rumen health requires balanced rations, effective fiber, and constant monitoring of signals like rumen fill, dung, and body condition. Proper rumination sustains microbial balance, prevents acidosis, and drives efficient milk production.

(Lesson E) **The Milking Process**: A calm, hygienic, and stress-free milking routine is vital for cow welfare and milk quality. Stress blocks oxytocin release, reducing yield and increasing mastitis risk.

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Research & Management Division

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A Guide to

Interpreting Cattle Behaviors

For Enhanced Dairy Herd Management

Perspective on Production, Science, and Sustainable Opportunities

Engineering Africa's Food Future

A Blueprint for the Kenya Integrated Dairy & Agro-Industrial Dairy Complex

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Dairy agri-research.

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To Tassells Farm Limited.

TFL Lesson A: The Discipline of Observation

The objective is to perceive the constant stream of information cattle provide. This information is then used to enhance and sustain the herd's health, welfare, and output, which yields economic benefits.

Observation is distinct from merely looking; it is an active, purposeful process. Dedicate specific time daily to assess the animals. There are two primary approaches:

- **Focused Assessment:** Actively searching for and evaluating specific elements to identify potential risks or deviations from the ideal.
- **Open-minded Assessment:** Setting aside preconceptions to view the environment as if for the first time.

Adopt a systematic method: begin by evaluating the entire herd, then focus on subgroups, and finally on individual animals. This process should be repeated. Context is crucial; sometimes stepping back provides a better perspective than moving closer.

Key herd-level observations include: the distribution of animals within the available space, usage patterns of walking areas and resting stalls, herd movement dynamics (congestion, conflicts), and overall uniformity in appearance.

Individual animal assessment should cover: alertness, coat condition, growth, cleanliness, body condition, digestive fill, skin injuries, swellings, pain responses, behavior, posture, movement, and production data. Note any changes.

Interpreting Bovine Indicators

To accurately interpret indicators, they must be considered within their context—the relationship between the circumstance, the animal, and the signal itself. Authentic indicators are repetitive. A single event may be incidental, but a recurring behavior signifies an underlying issue.

Cattle behavior is generally driven by three motives: satisfying a natural need (e.g., eating, resting), reacting to an environmental stimulus (e.g., avoiding discomfort), or responding to a physical urge (e.g., illness, pain, calving).

Comparing animals within your herd and with those on other farms helps determine what is normal. Employ all senses during inspections—sight, smell, and touch—while supporting observations with recorded data like milk records and health charts.

Establishing consistent routines and using checklists ensures a structured approach. Evaluate dry cows, calving heifers, and lactating cows three times daily, and young stock at least twice. Adequate lighting throughout the housing facility is essential for effective observation.

Maintain detailed notes to track observations over time, which aids in recognising patterns and facilitates communication among farm staff.

Risk Categories

Certain animals and situations are more vulnerable. These "risk groups" (e.g., high-yielding cows, newly calved heifers) are often the first to display problems, acting as herd sentinels. Similarly, "risk locations" are specific areas where animals are prone to injury (e.g., uneven paths, poorly designed facilities). "Risk periods" are times of heightened susceptibility, such as calving, dietary changes, or extreme weather, often linked to stress which compromises the immune system.

Learn to recognize "intentional movements"—when an animal begins an action but does not complete it. Understanding what prevented the behavior provides valuable insight into housing or social constraints.

Pay close attention to "Unexplained Notable Observations" (UNOs). These seemingly minor, unexplained events can signal underlying issues. The process involves describing the observation, investigating the cause, and determining its impact on the animal.

A basic understanding of bovine anatomy is crucial for clear communication and accurate assessment.

Health and Welfare Evaluation

A healthy animal is alert, active, and aware of its surroundings. It possesses a shiny, smooth coat, a good appetite, and moves without signs of pain. Key indicators of good health include steady breathing, a well-filled abdomen, a straight back, strong rumination activity, and clean, undamaged skin, udder, and hooves.

Conversely, signs of sickness or distress include lethargy, drooping ears, sunken eyes, abnormal dung, reduced milk yield, an empty rumen, and an arched back indicating pain. Body temperature, respiratory rate, and heart rate are vital signs that provide immediate health insights.

TFL Science Insight for Lesson A

The Neuroscience of Observation: Seeing with Purpose

The human brain is designed for efficiency, often filtering out familiar, repetitive stimuli—a phenomenon known as "habituation." This is the science behind "farm blindness." Purposeful observation is the conscious act of overriding this automatic filtering. When you actively schedule observation time and use a checklist, you engage the prefrontal cortex, the brain's executive Centre, to direct your attention. This shifts perception from a passive to an active process, allowing you to detect subtle deviations—like a slight head tilt, a change in ear position, or a minor alteration in social standing—

that your brain would otherwise classify as "normal." Systematic observation creates new neural pathways, making you more sensitive to the nuanced language of cattle behavior over time.

Conclusion

Dairy cattle are constant communicators. Their behavior, appearance, and production offer a continuous stream of data on their health, welfare, and nutritional status. By honing your observation skills, systematically assessing the information, and understanding the context, you can make informed management decisions that proactively address issues, enhance animal comfort, and ultimately improve the profitability and sustainability of your dairy operation. The fundamental questions remain: What do I see? How did this occur? What does it signify?

TFL Lesson B: Grazing Management

Pasture offers a natural setting to observe innate cattle behavior, including social interactions and normal movement. However, it also presents unique risks like internal parasites and exposure to poisonous plants.

On pasture, cattle are ultimate grazers, consuming forage in a distinct pattern. Important checks include monitoring hair coat, behavior, digestive fill, body condition, and herd uniformity. Grazing behavior itself provides information on forage availability and potential risks.

Cattle are herd animals with synchronized behavior. They establish a social hierarchy, which can be linear in low-competition environments or complex when resources are limited. Understanding their "personal space" or flight zone is key to calm handling.

Observing cattle lying down and rising on pasture provides the benchmark for designing comfortable resting stalls. Fertility detection is also more natural on pasture, with specific behaviors indicating oestrus.

Pasture generally promotes good hoof health due to soft, gripping ground. However, paths to and from pasture can cause wear and injury. A movement scoring system (from 1: healthy walk to 5: severely lame) is used to assess individuals and the herd.

Cattle comfort on pasture requires attention to shelter from elements, fly control, and constant access to clean water.

TFL Science Insight for Lesson B

The Grazing Rhythm and Rumen Physiology

The synchronized grazing behavior of a herd is not just social; it's a reflection of optimal rumen function. Cattle are "crepuscular," meaning they are most active at dawn and dusk. This behavior is tied to their internal circadian rhythms and the rumen's digestive cycle. After a major feeding bout, the rumen requires several hours of rest for microbial fermentation to break down fibrous material. This fermentation produces heat, so grazing during cooler parts of the day helps regulate body temperature. Observing the herd's natural grazing peaks and troughs provides a health check. A herd that grazes intermittently throughout the day and night indicates good rumen health and comfortable conditions. A herd that is restless or fails to exhibit these natural rhythms may be experiencing heat stress, inadequate forage, or painful foot conditions, all of which disrupt the delicate rumen environment.

TFL Lesson C: Housing Systems Management

Housed cattle are highly dependent on their managed environment. A housing facility is an interconnected system where layout, dimensions, materials, and management practices all interact. Standards must be continually evaluated against the needs of the cattle.

Key factors include:

- **Light and Climate:** Cattle benefit from long light periods (e.g., 16 hours) for production and activity. They perform best in comfortable temperatures, with heat stress occurring above 20°C (68°F), leading to reduced intake.
- **Ventilation:** A continuous flow of fresh air is critical to remove moisture and gases, preventing respiratory issues and heat stress.
- **Floors:** Surfaces must provide secure footing. Slippery floors cause apprehension and injury, while uneven floors can cause bruising.

Hoof Health is Paramount

Hoof problems cause significant pain and production losses. A hoof scoring system helps classify lesions (e.g., foot rot, digital dermatitis, laminitis, sole ulcers). Laminitis is often linked to metabolic or dietary issues, while infectious lesions like digital dermatitis are associated with poor hygiene.

Successful hoof health management rests on four pillars: excellent hygiene (clean, dry floors), optimal hoof quality (good nutrition, regular trimming), minimized physical pressure (adequate rest, good flooring), and early, effective treatment.

Resting Comfort

Cattle require around 14 hours of rest daily. Comfortable resting stalls are a compromise between space and hygiene. Key design elements include a soft, dry bedding base, sufficient length for the animal to lunge its head forward when rising, and correctly positioned neck rails and brisket locators that guide without hindering movement.

Injuries to hocks and knees are direct signals of inadequate stall comfort, often resulting from hard surfaces, abrasive bedding, or insufficient space.

A cleanliness scoring system for the animal's udder, flanks, and legs provides a clear indicator of overall hygiene levels in the housing environment, which directly impacts udder health.

TFL Science Insight for Lesson C

The Biomechanics of Rest and Hoof Health

A cow's need for 14 hours of rest is not laziness; it's a physiological requirement. During rest, blood flow to the udder increases significantly, boosting milk production. Furthermore, the act of lying down allows for proper blood circulation in the hoof's corium (the sensitive tissue that produces the hoof horn). When a cow is standing for prolonged periods, pressure on the corium reduces blood flow, leading to weaker, poorer-quality horn growth and increasing susceptibility to lesions like sole ulcers. The "lunge" movement when rising is a biomechanical necessity. A cow cannot lift its front quarters vertically; it must propel itself forward. An inadequate stall that inhibits this lunge forces the cow to impact stationary objects, causing injury, or discourages her from lying down at all. Therefore, a comfortable stall is not a luxury; it is direct investment in milk yield and hoof integrity.

TFL Lesson D: Nutrition and Digestion

The goal is to maximize dry matter intake while maintaining a healthy rumen environment. The feeding process involves ration calculation, delivery, availability, actual intake, digestion, and final output (dung). Signals at each stage provide feedback.

Assess nutrition by looking at past signals (body condition change, production data) and current signals (rumen fill, dung consistency, cud chewing).

Key Assessment Tools:

- **Rumen Fill Score (1-5):** Indicates intake over the past hours. A sunken left flank (score 1) signifies very low intake, while a bulging flank (score 5) is ideal for dry cows.
- **Dung Scoring:** Evaluates digestion (Score A: from homogeneous to coarse, undigested particles) and consistency (Score B: from watery to hard balls). Ideal dung is a well-formed pile with good digestion.

- **Body Condition Score (BCS 1-5):** Reflects long-term energy balance over weeks and months. A sharp decline post-calving signals problems. The ideal BCS changes through the lactation cycle.

A healthy rumen requires a balanced intake of forage and concentrate, with sufficient effective fiber to stimulate cud chewing. Cattle should ruminate for 8-10 hours daily. Sorting feed leads to an imbalanced nutrient intake.

All cattle must have safe, comfortable access to feed and unlimited access to fresh, clean water. Risk groups, such as first-lactation heifers and fresh cows, are particularly vulnerable to nutritional shortcomings and require close monitoring.

TFL Science Insight for Lesson D

Rumen Fermentation: The Engine Room of Production

The rumen is a complex fermentation vat populated by billions of microbes (bacteria, protozoa, and fungi). The goal of nutrition is to feed these microbes, not just the cow. Cud chewing (rumination) is critical because it mechanically breaks down long forage fibers, increasing their surface area for microbial attachment. This process also produces bicarbonate-rich saliva (up to 150 liters daily!), which is the cow's primary natural buffer against rumen acidosis. When a cow chews its cud, it is actively managing the pH of its rumen. Poorly digested dung with whole grains or long fibers is a direct sign of insufficient rumination, often due to a lack of effective fiber. This leads to a drop in rumen pH (acidosis), which kills fiber-digesting microbes, reduces feed efficiency, and can trigger laminitis. Therefore, observing rumination is a direct window into the health of the rumen's microbial ecosystem.

TFL Lesson E: The Milking Process

The milking parlor provides a daily opportunity for close individual assessment. A calm, predictable routine is essential for both cattle and operator. Observe behavior entering

and leaving the parlor; reluctance or nervousness indicates underlying issues like pain or slippery floors.

During milking, cattle should be tranquil. Restlessness can be caused by machine problems, rough handling, pain (e.g., mastitis, teat injuries), or environmental irritants like flies. Proper udder preparation and unit attachment are critical.

Hygiene is paramount to prevent mastitis. Clean udders and teats are vital. The parlor is also the ideal place to assess hock and knee injuries and the top of the hooves.

Milk should be checked before milking; clots or discoloration indicate mastitis. Teat end condition is a key indicator of milking machine function. Calloused or cracked teat ends signal excessive vacuum, over-milking, or ill-fitting liners.

Stress-free movement of cattle to and from milking is crucial. This involves using wide, well-maintained tracks, allowing cattle to move at their own pace, and employing calm, consistent handling techniques.

TFL Science Insight for Lesson E

The Oxytocin Cycle and Milk Let-Down

A calm milking routine is not just about animal welfare; it's a hormonal necessity. Milk ejection is controlled by the hormone oxytocin, which is released from the pituitary gland in the brain in response to tactile stimulation of the teats and udder (during preparation) and conditioned stimuli like the sound of the milking parlour. This release takes about 60-90 seconds. If an animal is stressed or fearful during this critical window—due to rough handling, slippery floors, or pain—the adrenal gland releases adrenaline. Adrenaline blocks the action of oxytocin, constricting blood vessels and preventing the myoepithelial cells around the alveoli from contracting. This results in incomplete milk let-down, leaving a significant portion of milk in the udder. This not only reduces yield but also increases the risk of mastitis. Therefore, a predictable, low-stress environment is essential for triggering the correct neuroendocrine response for complete milking.

TFL Lesson F: Managing Young Stock and Dry Cows

These groups are critical for future productivity but often receive less attention. Heifers and dry cows experience numerous "risk periods" (e.g., birth, weaning, moving, calving) where management must be exceptional.

Young Stock: Focus on achieving targeted growth rates to ensure heifers are mature enough at first calving. Monitor health closely, particularly around weaning and group changes. Provide a clean, comfortable environment with appropriate nutrition. Young cattle are quick to learn from both positive and negative experiences.

Dry Cows: The dry period is a rest phase but also a time of preparation for the next lactation. It is typically divided into a "far-off" period and a "close-up" (or transition) period starting about three weeks before calving.

The transition period is the highest-risk time in a cow's life. The goal is to manage the cow to have a body condition score of 3.5 at calving, maximize dry matter intake before and after calving, and minimize all forms of stress. A specialized close-up diet helps adapt the rumen for lactation.

Signs of approaching calving include udder development, relaxation of the pelvic ligaments, and a slight drop in body temperature. Calving should occur in a clean, separate area to allow for monitoring and assistance if needed.

TFL Science Insight for Lesson F

Metabolic Programming and the Transition Cow

The concept of "metabolic programming" is crucial for understanding dry cow management. The management of the dam, particularly during the transition period, can "program" the metabolism of her unborn calf, influencing its future health and productivity. More directly, the close-up period is about preparing the cow's metabolism for a massive shift. The rapidly growing calf and hormonal changes cause a natural reduction in dry matter intake just before calving. Meanwhile, the energy demand for

colostrum and milk production is skyrocketing. This creates a state of negative energy balance. The specialized close-up diet, often higher in energy density and with controlled calcium levels, helps the cow's liver and fat metabolism adapt to this change. It encourages the liver to become efficient at processing fats, preventing excessive fat mobilization that leads to ketosis and fatty liver. Managing this metabolic adaptation is the single most important factor in preventing postpartum diseases.

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