



Art'o'val

*True Art of Valuation*

# Valuation of Livestock: Where Biology meets the Balance Sheet

July 2026



# Living Assets: A Multi-Trillion-Dollar Opportunity

*Why livestock valuation has become a board-room conversation*

The global livestock economy spans dairy, meat, breeding stock, and aquaculture - collectively one of the largest productive-asset bases in agriculture, with billions of animals representing trillions of dollars of book value worldwide. Yet unlike inventory or fixed assets, livestock value changes continuously through biological transformation: growth, reproduction, productivity and degeneration.

## IAS 41

*Agriculture standard*

Mandates fair value less costs to sell at every reporting date - biology and price changes flow through P&L.

## IFRS 13

*Fair value hierarchy*

Levels 1-3 inputs apply: quoted prices, observable adjustments, and unobservable model-driven estimates.

## IFRS S2

*Climate disclosure*

Methane intensity, water risk and biodiversity now reshape value drivers and audit expectations.

Valuing livestock requires understanding the interplay of biological transformation, market liquidity, and entity-specific cash-flow models. This presentation explores the framework end-to-end - covering classification, the three approaches, drivers, sector application, disclosure, and emerging climate considerations - alongside worked examples that show how the standard is applied in practice.

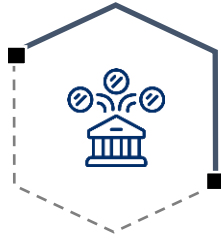
# Why It Matters: Five Lenses on Livestock Value

*The same herd carries different values depending on the question being asked*



## Financial Reporting

IAS 41 fair value at every reporting date; gains/losses to P&L.



## Lending & Financing

Banks discount fair value (often 50–70% LTV) to size working-capital and herd loans.



## M&A and Private Equity

Enterprise value of dairy / protein platforms includes herd FV plus operating intangibles.



## Insurance Cover

Indemnity values for mortality, disease and catastrophe - typically actuarial replacement cost.



## Tax & Subsidy






Specific depreciation regimes for productive livestock; subsidy schemes use scheduled values.

## Practical implication

*Different stakeholders use different points on the fair-value hierarchy — auditors prize Level 1 observability; lenders apply liquidity haircuts; insurers price replacement cost; tax authorities apply scheduled values. **The methodology must follow the use case.***

# The Livestock Map: Navigating Asset Categories

Where IAS 41 applies - the five operating categories that dominate global value




Dairy	Beef	Poultry	Swine	Aquaculture
				
Bearer assets producing recurring milk yield	Consumable assets sold at slaughter weight	Mixed - short-cycle broilers + layer hens	Consumable production with breeding herds	Fastest-growing - Level 3 valuation heavy
Holstein, Jersey, Buffalo Lactation curves drive value Example: Fonterra, Lactalis, Amul	Angus, Hereford, Brahman Live-weight pricing dominant Example: JBS, Tyson, Marfrig	Broilers (consumable) Layers (bearer) Example: Pilgrim's Pride, BRF	Finishing pigs · Sows · Boars FCR is critical metric Example: Smithfield, Danish Crown	Salmon · Shrimp · Tilapia Biological complexity high Example: Mowi, Bakkafrøst

## Key Point

**Every category is in scope of IAS 41 - but the dominant valuation approach differs sharply. Dairy and breeding stock lean income-led (predictable cash flows). Beef, poultry-broiler and swine lean market-led (active live-weight markets). Aquaculture is increasingly Level 3 - limited liquidity, biological complexity, long grow-out cycles.**

# From Recognition to Disclosure: How IAS 41 Works

The standard prescribes three integrated obligations — recognition, measurement, and disclosure

 <p><b>Initial Recognition</b></p>	<p><b>Paragraphs 12–13</b></p> <p>On acquisition or birth, measure at fair value less costs to sell. Difference between FV-LCTS and price paid (or rearing cost) hits P&amp;L immediately.</p>	<p><b>Paragraph 30</b></p> <p>Rebuttable presumption that fair value is reliably measurable - only displaced where market-determined prices are unavailable AND alternative FV estimates are clearly unreliable.</p>	<p><b>Fallback</b></p> <p>If presumption rebutted: cost less depreciation less impairment - until FV becomes measurable, then revert.</p>
 <p><b>Subsequent Measurement</b></p>	<p><b>Fair Value Less Costs to Sell</b></p> <p>Re-measure at every reporting date; the carrying value is a live balance-sheet view, not a historical cost.</p>	<p><b>P&amp;L Impact</b></p> <p>All FV changes (biology + price) flow through profit or loss as they occur - no FVTOCI option.</p>	<p><b>Unit of Account</b></p> <p>Aggregate by age, breed, weight or productive stage - herd-level grouping, not animal-by-animal.</p>
 <p><b>Disclosure Obligations</b></p>	<p><b>Paragraphs 40–46</b></p> <p>Description of each group of biological assets, methods, and significant assumptions including discount rates and yield curves.</p>	<p><b>Paragraph 50</b></p> <p>Roll-forward reconciliation: opening → purchases → births → sales → harvest → FV change → FX → closing.</p>	<p><b>Paragraph 51</b></p> <p>Encouraged separation of FV change attributable to physical change (growth) vs price change - the hallmark IAS 41 disclosure.</p>

# The Three Approaches: Maximize Observable Inputs

IFRS 13 hierarchy in action — step down only when observable evidence fails

## Observable / Preferred

## Fallback Only

PRIMARY

### Market Approach

Active markets → observable pricing

Price per kg live-weight or per head with adjustments for age, breed, genetics, health, location.

IFRS 13 Level 1–2 inputs.

Example: 4-yr Holstein at regional auction, \$2,000 reference + breed/health adjustments – costs to sell.

SECONDARY

### Income Approach

DCF for cash-generating stock

$$FV = \sum [Yield_t \times Price_t - Costs_t] \div (1+r)^t$$

Applies to dairy, breeding stock, integrated farms with planning horizons.

Key inputs: lactation curves, price forecasts, variable costs, farm WACC (typically 9–14%).

BLENDED

### Hybrid Application

Sector-led method selection

Many entities apply different approaches by sub-population:

- Adult dairy cows → Income
- Young heifers → Market
- Exotic genetics → Cost

Document the rationale at the unit-of-account level.

FALLBACK

### Cost Approach

When no reliable signal exists

Book Value = Purchase / Rearing Cost – Accumulated Depreciation.

Appropriate only for very early-stage stock or niche species without market data.

Must revert to FV the moment market evidence emerges.

# Two Paths to Fair Value: Bearer vs Consumable Worked

Same standard, different mechanics - illustrative numbers for a dairy cow and a beef steer

## BEARER · Dairy Cow · Income Approach



### Case Study 1: 4-Year Holstein in Productive Phase

Year	1	2	3	4+ Term
Milk yield (litres)	10,000	9,500	8,800	7,800
Milk price (\$/L)	0.50	0.51	0.52	0.53
Milk revenue (\$)	5,000	4,845	4,576	4,134
Discount factor 9%	0.917	0.842	0.772	0.708
<b>Present value (\$)</b>	<b>4,587</b>	<b>4,079</b>	<b>3,533</b>	<b>2,927</b>

**Sum of PVs = \$15,126 – Costs to sell (3%) = \$14,672**

### Key Takeaways

- Predictable lactation curve enables defensible DCF
- Terminal cull value captures end-of-life realization
- Discount rate = farm WACC; sensitivity disclosure required

## CONSUMABLE · Beef Steer · Market Approach



### Case Study 2: Mid-Cycle Angus at Regional Auction

Build-up line	Amount	Note
Reference auction price (live, healthy)	\$2,400	Level 2 input
+ Genetic / breed premium	+\$180	+5–8% standard
– Lactation / cycle adjustment	–\$70	Mid-stage cycle
– Health adjustment (minor history)	–\$100	Vet records
<b>= Gross fair value</b>	<b>\$2,410</b>	
– Costs to sell (transport + commission)	–\$85	≈3.5%
<b>= Carrying value (FV-LCTS)</b>	<b>\$2,325</b>	

### Key Takeaways

- Anchor before adjustments — benchmark must be observable
- Each + / – line maps to documented evidence
- Costs to sell are mandatory — auditors challenge omissions

# What Moves Value: The Driver Universe

Four categories of input shape every fair-value model — and two of them are inside the firm

## Biological

*Lifecycle drivers — the value engine itself*

- Age & lifecycle stage · young vs productive vs declining
- Genetics & breed · GEBVs, sire registry, fertility rates
- Yield capacity · litres/day, eggs/yr, body-condition score
- Reproductive history · parity, conception rate, calving interval



## Operational

*Farm-level execution — controllable*

- Feed conversion ratio (FCR) · kg feed per kg gain or per litre milk
- Mortality & culling rates · natural attrition, voluntary cull policy
- Farm-level productivity · labour efficiency, automation level
- Veterinary cost · vaccination, biosecurity programs



## External

*The world outside the farm gate*

- Climate & weather · heat-stress, drought, flooding affect yield/fertility
- Disease & biosecurity · Avian Influenza, Foot-and-mouth disease, Bovine spongiform encephalopathy outbreaks; antibiotic policy
- Regulation & ESG · emissions caps, animal welfare, water rights
- Trade & geopolitics · export bans, tariff regimes, sanitary agreements



## Market

*Price discovery — the multiplier on biology*

- Milk / meat spot & futures · CME live-cattle, lean-hog, Class III milk
- Demand–supply imbalance · protein cycles, dairy seasonality
- Export parity & FX · major beef / dairy exporters' currency moves
- Feed-grain pass-through · corn / soy cycles flow into output prices



# Inside the Hierarchy: Levels 1–3 Applied to Livestock







Auditors map every input to a level — analysts must too

	Livestock examples	When applicable
<p><b>Level 1</b></p> <p>Quoted prices in active markets</p> <p><b>Directly observable</b></p>	<ul style="list-style-type: none"><li>• Quoted live-cattle / lean-hog futures (CME)</li><li>• Regulated auction prices for standardized commodity stock</li><li>• Published spot for milk solids (Class III)</li></ul>	<p><i>This is uncommon for individual herds and mainly applies to standard, commodity livestock that have active futures markets</i></p>
<p><b>Level 2</b></p> <p>Observable inputs other than Level 1</p> <p><b>Indirectly observable</b></p>	<ul style="list-style-type: none"><li>• Recent auction transactions for similar livestock</li><li>• Regional auction-barn prices adjusted for breed / age / condition</li><li>• Benchmark price-per-kg curves</li><li>• Comparable-herd transactions</li></ul>	<p><i>Most common in practice — quoted prices for similar (not identical) livestock with documented adjustments</i></p>
<p><b>Level 3</b></p> <p>Unobservable inputs</p> <p><b>Model-driven</b></p>	<ul style="list-style-type: none"><li>• DCF with internal yield assumptions</li><li>• Cost-build-up for exotic breeds</li><li>• Entity-specific lactation curves</li><li>• Subjective discount rates and growth rates</li></ul>	<p><i>Required for niche genetics, novel aquaculture species, very young stock — triggers expanded disclosure under IFRS 13 §93</i></p>

**AUDIT LENS** · Document the level for every input — Level 3 inputs require sensitivity disclosure and qualitative description of valuation technique under IFRS 13 paragraph 93.

# How Approach Selection Differs by Sector (1/2)






The same standard routes through different methods depending on cycle length and market liquidity

Sector	Asset Type	Cycle Length	Dominant Approach	Hierarchy Level	Typical Example
 Dairy	Bearer	5–7 yrs productive	Income (DCF)	Level 2–3	Holstein cow with predictable lactation curve and known cull value
 Beef	Consumable	18–30 months	Market (live-weight)	Level 1–2	Angus steer at regional auction with breed/age adjustments
 Poultry — Broiler	Consumable	6–8 weeks	Market	Level 1–2	Standard broiler with weight × spot price at slaughter
 Poultry — Layer	Bearer	60–80 weeks	Income	Level 2–3	Layer hen valued on residual egg-production curve + cull
 Swine	Consumable + Bearer	6–8 mo finishing	Market for pigs; Income for sows	Level 1–2	Finishing pig + breeding sow herd valued separately
 Aquaculture	Mixed	12–24 months	Income / Cost	Level 3	Atlantic salmon with feed conversion ratio-driven biomass valuation models

**Cycle length is the underlying signal.** Short cycles (broilers, finishing pigs) generate continuous market evidence — Level 1–2 is achievable. Long cycles with biological complexity push valuations into Level 3 model territory.

# How Approach Selection Differs by Sector (2/2)

Risk profile and key drivers vary by sector — the same FV-LCTS basis yields very different volatility

Sector	Key Value Drivers	Primary Risks	Sensitivity Focus	Typical Margin Profile
 Dairy	Lactation yield, milk price, breeding offspring, genetics	Feed inflation, milk-price cycles, mastitis / disease	Milk price $\pm 10\%$ , yield $\pm 5\%$ , feed conversion ratio $\pm 200$ bps	EBITDA margin 12–18%; high working-capital intensity
 Beef	Live-weight, breed grading, dressing %, feed conversion	Drought / pasture loss, BSE / FMD outbreak, tariff shocks	Live-weight price $\pm 10\%$ , mortality +200 bps, feed $\pm 15\%$	EBITDA margin 6–12%; volatile through protein cycle
 Poultry	Cycle length, FCR, hatch rate, integrated feed cost	Avian influenza, feed-grain spike, antibiotic policy	Bird-price $\pm 10\%$ , feed conversion ratio $\pm 5\%$ , mortality +150 bps	EBITDA margin 8–14%; integrated firms more resilient
 Swine	Sow productivity, FCR, lean-hog price, herd disease status	ASF (African swine fever), feed cost, sow-replacement cycle	Hog price $\pm 15\%$ , feed conversion ratio $\pm 5\%$ , sow productivity $\pm 10\%$	EBITDA margin 8–15%; cyclical with hog cycle
 Aquaculture	Biomass, FCR, water temperature, harvest timing	Sea-lice / disease, oxygen events, environmental regulation	Salmon price $\pm 15\%$ , mortality +200 bps, feed conversion ratio $\pm 5\%$	EBITDA margin 18–28% in good cycles; very volatile

Source: Author analysis · Margin ranges illustrative — based on industry-published company filings; recalibrate for entity-specific work

# Key Sensitivity Metrics in Livestock Valuation (1/2)

The five formulas analysts must defend in every model

## 01 Fair Value (IAS 41)

$$FV = \text{Quoted Price} - \text{Costs to Sell}$$

Costs to sell include transport, commission, levies - not income tax or financing. Apply at every reporting date.

## 02 Income Approach (DCF)

$$FV = \sum [ \text{Yield}_t \times \text{Price}_t - \text{Costs}_t ] \div (1+r)^t$$

Standard for cash-generating bearer assets. Discount rate = farm WACC; horizon = remaining productive life + terminal cull value.

## 03 Cost Approach

$$BV = \text{Acquisition} + \text{Rearing} - \text{Accumulated Depreciation}$$

Permitted only under IAS 41 §30 fallback. Mirrors PP&E logic but must revert to FV the moment evidence emerges.

## 04 Discount Rate

$$r = R_f + \beta \times ERP + \text{Country premium} + \text{Liquidity premium}$$

Farm WACC typically 9–14% in developed markets; 14–20% in developing markets reflecting biological + cycle risk.

## 05 Costs to Sell %

$$CTS\% = \text{Selling cost} \div \text{Gross fair value}$$

Auction commission + transport + grading. Industry norms 2–5% - auditors will challenge values outside this band.

# Key Operational Metrics in Livestock Valuation (2/2)

The five operating ratios that move fair-value inputs

## 01 Feed Conversion Ratio (FCR)

$$\text{FCR} = \text{Feed consumed (kg)} \div \text{Output produced (kg)}$$

Lower is better. Broilers  $\approx$  1.6, swine  $\approx$  2.7, beef  $\approx$  6.0, salmon  $\approx$  1.2. Each 0.1 improvement materially shifts unit-economics.

## 02 Mortality Rate

$$\text{Mortality \%} = \text{Deaths in period} \div \text{Average inventory}$$

Industry norms: layers 5–8% / yr, broilers 3–5% / cycle, salmon 10–15% over grow-out. Spikes signal disease / biosecurity events.

## 03 Yield per Animal

$$\text{Yield} = \text{Total output} \div \text{Animal-days} \div \text{Effective animals}$$

Dairy: 6,000–10,000 L / cow / yr (varies by breed). Layers: 280–320 eggs / yr. Drives the income-approach numerator directly.

## 04 Body Condition Score (BCS)

$$\text{BCS} = 1 (\text{emaciated}) \rightarrow 5 (\text{obese}) \cdot \text{vet-assessed}$$

Lactating cows target 2.5–3.5 BCS. Below 2 reduces fertility; above 3.5 raises calving complications — both impair fair value.

## 05 Replacement Rate

$$\text{Replacement \%} = \text{Animals culled / sold} \div \text{Average herd size}$$

Dairy: 25–35% / yr. Layers: 100% per cycle. High replacement = young herd; low = aging — the analyst's clue to lifecycle profile.

# Stress-Testing the Worked Example

Sensitivity output for the dairy-cow DCF on slide 7 — disclosed under IAS 41 §51

Scenario	Milk Price	Yield	Disc. Rate	Mortality	FV (\$ K)	Δ vs Base	Hierarchy Note
Base case	Base	Base	9.0%	Base	14.67	—	Level 2/3 — DCF with observable inputs
Price upside +10%	+10%	Base	9.0%	Base	16.14	+10.0%	Level 3 — projection sensitive
Price downside -10%	-10%	Base	9.0%	Base	13.20	-10.0%	Level 3 — projection sensitive
Yield -5%	Base	-5%	9.0%	Base	13.94	-5.0%	Level 3 — entity-specific input
Discount rate +200bps	Base	Base	11.0%	Base	14.08	-4.0%	Level 3 — discount rate Level 3
Discount rate -200bps	Base	Base	7.0%	Base	15.29	+4.2%	Level 3 — discount rate Level 3
Mortality outbreak	Base	Base	9.0%	+200bps	14.01	-4.5%	Level 3 — disease scenario
Combined stress	-10%	-5%	11.0%	+200bps	11.50	-21.6%	Level 3 — disclose downside

## DISCLOSURE PRINCIPLE

*IAS 41 §51 encourages separation of physical (yield, mortality) from price effects. Combined stress should be disclosed when realistic — particularly for Level 3 inputs.*

# IAS 41 §50: Carrying-Amount Reconciliation

The roll-forward that lets users separate biology from price — illustrative \$ thousand figures

## Carrying-Amount Roll-Forward · Year ended 31 Dec 2025

Item	\$ K	Type	FV Hierarchy
Opening carrying amount	1,420	Base	Mixed L2 / L3
+ Purchases of livestock	+140	Cash	Level 2 — auction
+ Births / increase in herd	+35	Physical	Level 3 — model
– Sales of livestock	–125	Cash	Level 2 — auction
– Harvest (slaughter / cull)	–85	Cash	Level 1–2 — spot
+ FV change — physical (growth, yield)	+105	Non-cash	Level 3 — biology
+ FV change — price (mark-to-market)	+30	Non-cash	Level 1–2 — observable
+ FX translation	0	Non-cash	Level 2
<b>Closing carrying amount</b>	<b>1,520</b>	<b>Total</b>	<b>Mixed L2 / L3</b>

## \$51 Physical vs Price Split

### PHYSICAL CHANGE

**+ \$105 K**

*Growth, weight gain, lactation maturation — biology-driven value accretion*

### PRICE CHANGE

**+ \$30 K**

*Mark-to-market re-pricing of unchanged biological state — commodity-cycle driven*

**Total FV change \$ 135 K**

## INVESTOR INSIGHT

*Splitting the FV change tells investors how much earnings come from biological growth vs commodity-cycle re-pricing — the single most useful livestock disclosure.*

# IFRS (IAS 41) vs US GAAP (ASC 905)

Same biology, materially different reported earnings — implications for cross-border comparability



Dimension	IFRS — IAS 41	US GAAP — ASC 905	Comparability Implication
<b>Default measurement</b>	Fair value less costs to sell	Generally lower of cost or market (NRV)	IFRS reports closer to economic value; US GAAP closer to historical cost
<b>FV remeasurement</b>	Mandatory at every reporting date	Not required — historical cost dominates	IFRS reflects biology + price changes continuously
<b>Bearer animals</b>	In scope — FV-LCTS	PP&E-style cost less depreciation common	Dairy / breeding stock book value differs materially
<b>P&amp;L volatility</b>	High — biology + price flow through P&L	Low — gains realized only on sale	IFRS earnings more volatile but more informative
<b>Disclosure intensity</b>	Heavy (§40–57); physical vs price split encouraged	Lighter; less biology-specific guidance	IFRS users get richer driver-level visibility
<b>Government grants</b>	IAS 41 §34–38 — unconditional vs conditional treatment	ASC 958 / 605 — recognition criteria differ	Subsidy timing differs across reporting cycles

## CROSS-BORDER TAKE-AWAY

*IFRS reporters typically show higher asset values and more volatile earnings than US GAAP peers — biological reality, not bookkeeping accident.*

# Where the Framework Is Heading: ESG, Climate & Digital

New value drivers and disclosure pressures reshaping inputs to the same IAS 41 framework

## Climate Disclosure



### IFRS S2 / TCFD

*Material agri exposures now expected to disclose climate risk and transition strategy.*

- Scope 1 enteric methane (cattle) is the headline issue
- Physical risks: heat-stress yield loss, drought, water scarcity
- Carbon-credit revenue from feed-additives (e.g. seaweed, 3-NOP) and methane capture
- Transition-risk: emissions caps may impair long-life bearer assets

## Genomic Selection



### Precision Breeding

*DNA-marker valuation increasingly defensible — moving Level-3 estimates toward Level-2.*

- GEBVs for milk yield, fertility, feed efficiency
- Premium / discount adjustments objectively documented
- Reduces unobservability in genetic-quality adjustments
- Sire registries publishing accuracy-rated genomic data

## Digital Livestock



### IoT · AI · Sensors

*Continuous data capture is changing what 'observable input' means in practice.*

- RFID, accelerometer, rumination sensors at the animal level
- AI-driven herd management and disease prediction
- Mortality / disease forecasting tightens stress-test ranges
- Audit trail strengthens FV documentation

## TRAJECTORY

*Climate, genomic and digital data are progressively converting Level-3 unobservable inputs into Level-2 observable evidence — fair-value precision is improving every reporting cycle.*

# Thank You...!



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