NeoFarm GENETICS

Reproductive & Selection Protocol Layer

*This document is the official White Paper of **NeoFarm Genetics** — an infrastructure platform for capitalising the biological productivity of cattle through Web3 mechanisms. It presents the full on-chain architecture, financial model, tokenomics and investment thesis of the project.*

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EXECUTIVE SUMMAR

NeoFarm Genetics is an infrastructure platform for tokenising biological capital, transforming the reproductive cycles and genetic performance indicators of cattle into verified, liquid on-chain assets of the RWA *(Real World Assets)* class.

The project is grounded in the practical experience of the agricultural commune "Stalingrad".
The operation covers approximately 350 hectares of land across 10 farming associations.

$460B	$0.5B	$10–16T	$2 000+
Global Beef Market	**Blockchain in Agri**	**RWA Tokenisation**	**On-chain Traced Cow**
$690B by 2033 (CAGR 4 – 4.5%)	$8B by 2031 (CAGR 36–45%)	projected market size by 2030	premium over standard livestock

The core innovation is a synthesis of three elements: biologically verified genetic indicators (DEPs), the Proof-of-Breeding (PoB) protocol, and an automated genetic royalty system. Together, they create a closed-loop growth mechanism where each verified calving is recorded on-chain, increases the NFT asset's valuation, and automatically distributes royalties throughout the genetic value chain.

NeoFarm Genetics it's an infrastructure for capitalising biological productivity — establishing a fourth pillar of investment yield alongside gold, bonds and equities.

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1.PROBLEM STATEMENT

1.1 Fragmented Genetic Valuation.

The global livestock industry employs mature genetic selection tools — Expected Progeny Differences (EPDs / DEPs) — yet these indicators remain isolated within veterinary and zootechnical systems, never converting into financial value.

Current Barriers:	**Market Gap:**
• DEPs exist but are never capitalised. • No unified index of genetic worth. • Reproductive cycles are not treated as financial assets. • No transparent calving history. • Unverified fertility records. • Unpredictable dam herd longevity.	• Information asymmetry between producers and investors. • Inability to price assets based on real genetic data. • No passive-income mechanisms from genetics. • No liquid instruments for the live-asset market. • Small farmers excluded from capital markets.

1.2 Systemic Deficit of New Yield Sources.

Growth in traditional financial markets increasingly relies on capital velocity and leverage rather than the creation of underlying productive value. The market needs a new anchor — verifiable real-sector value capable of generating long-term liquidity backed by actual production.

Agricultural assets occupy a unique position in the investment spectrum: they are physically backed, biologically reproducible, and carry value independent of market volatility. ***NeoFarm Genetics*** *structures this potential into liquid on-chain instruments.*

2.SOLUTION ARCHITECTURE

NeoFarm Genetics builds a three-layer infrastructure that translates biological events into verified financial assets: the biogenetic data layer, the reproductive cycle engine, and the tokenisation / monetisation layer.

2.1 Biogenetic Data Layer.

All biogenetic indicators pass MRV verification *(Monitoring, Reporting, Verification)*, are anchored in the blockchain, and become an immutable part of each animal's digital passport.

Carcass Traits — Carcass Value Index (IVC)

Code	Indicator	Role in Protocol
DAOL	Longissimus dorsi muscle area *(Rib Eye Area, cm²)*	Key IVC parameter; direct correlation with Meat Futures Index
DACAB	Carcass fat cover *(finish precocity)*	Determines the NFT asset finalisation coefficient

$$IVC = 0.60 \times DAOL\_norm + 0.40 \times DACAB\_norm \quad \text{(normalised values in range [0–100])}$$

Growth Traits — Growth Performance Score (GPS)

Code	Indicator	Role in Protocol
DPN	Birth weight (kg)	Starting growth point; beginning of GPS tracking
DP210	Weaning weight ~210 days (kg)	Early growth efficiency; contribution of maternal MES
DP365	365-day weight (kg)	Annual productive checkpoint
DP450	450-day weight (kg)	Final GPS point; direct link to Meat Futures

$$GPS = \Sigma\, w_i \times (DP_i / DP_i\_ref) \times 100, \quad \text{weights: } [0.10, 0.25, 0.35, 0.30]$$

Maternal Traits — Maternal Efficiency Score (MES)

Code	Indicator	Role in Protocol
MP120	Maternal ability at 120 days *(kg milk-equivalent)*	Key parameter for tokenised maternal genetic lines

$$MES = MP120\_norm \times h^2 \quad \text{(typical } h^2 \text{ for MP120 = 0.20–0.30)}$$

Reproductive Traits — Reproductive Yield Index (RYI)

Code	Indicator	Role in Protocol
D3P	Probability of early calving (%)	Reduces operational risk; increases RYI
IPP	Age at first calving (days)	Early productivity; inverse correlation with RYI
DSTAY	Reproductive longevity / Stayability (%)	Long-term asset; critical multiplier for RYI and NGCI

$$RYI = 0.30 \times D3P\_norm + 0.35 \times (1 - IPP\_norm) + 0.35 \times DSTAY\_norm$$

Extended Reproductive Metrics

Code	Indicator	Role in Protocol
IEP	Inter-calving interval (days)	Reproduction efficiency; affects RYI
CR	Conception rate (%)	Reproductive reliability of the line
SBR	Stillbirth / dystocia rate (%)	Corrective coefficient for D3P in RYI calculation

2.2 Reproductive Cycle Engine.

Each animal is an autonomous financial asset with a dynamic on-chain lifecycle. The reproductive cycle transforms biological events into verified blockchain transactions, creating a continuously updated history of genetic value.

On-Chain Animal Statuses:

- Heifer *(Novilla)* — prior to first pregnancy.
- Pregnant *(Gestante)* — confirmed pregnancy.
- Lactating *(Lactante)* — post-calving period.
- Open *(Vacia)* — inter-calving interval.
- Culled — end of productive cycle.

Key Cycle Metrics:

- Calving count *(Partos)*.
- Inter-calving interval *(IEP, days)*.
- Conception rate *(CR, %)*.
- Offspring NFT history *(on-chain links)*.

Proof-of-Breeding (PoB)

PoB is a cryptographically signed blockchain event confirming a successful calving.

Sequence of events:

1. Verifier records the calving event *(IoT + zootechnician)*.
2. Offspring data is written on-chain.
3. Smart contract mints offspring NFT, updates parent NFTs.
4. Genetic line is recalculated with new DEPs.
5. Royalties are automatically distributed to semen / line owner.
6. Maternal line RYI is recalculated.

2.3 NeoFarm Genetic Capital Index (NGCI).

NGCI is a composite index [0–100] aggregating all dimensions of an animal: productivity, reproduction, health and ecological efficiency into a single score. NGCI determines NFT price, royalty rate and access level within the NeoFarm ecosystem.

Component	Weight	Sub-indices	Formula
Growth (GPS)	**25%**	DP210, DP365, DP450, DPN	0.25 × GPS
Carcass (IVC)	**20%**	DAOL, DACAB	0.20 × IVC
Reproduction (RYI)	**25%**	D3P, IPP, DSTAY	0.25 × RYI
Maternal (MES)	**15%**	MP120	0.15 × MES
Health & Longevity (HLS)	**15%**	DSTAY, PoH, ESG	0.15 × HLS

NGCI = `0.25×GPS + 0.20×IVC + 0.25×RYI + 0.15×MES + 0.15×HLS`

HLS = `0.50×DSTAY_norm + 0.30×PoH_score + 0.20×ESG_score`

Tier	NGCI	Privileges	Royalty Multiplier
Genesis Elite	**≥ 85**	Priority DAO access; Meat Futures listing; Genesis auctions	**×2.5**
Premium	**70–84**	Full access to Breeding DAO; all platform instruments	**×1.8**
Standard	**50–69**	Standard DAO access; basic Futures positions	**×1.0**
Emerging	**< 50**	Observer status; NGCI accumulation period	**×0.6**

3.TOKENISATION MODE

NeoFarm Genetics employs a two-tier NFT architecture covering both the individual animal asset and the aggregated genetic line.

3.1 Animal NFT.

Each animal receives a unique digital passport — an NFT updated at every reproductive and veterinary event.

Genetic Data:	**History & Context:**
• All DEP indicators *(DAOL, DACAB, DPN, DP210, DP365, DP450)*. • Genomic score *(SNP panel, when available)*. • Pedigree: sire, dam, grandparents. • Inbreeding coefficient (F). • Composite indices: IVC, GPS, MES, RYI, NGCI.	• Proof-of-Health (PoH): в vaccinations, vet checks. • Proof-of-Breeding (PoB): all calvings + offspring NFT links. • Live-weight dynamics and growth curve. • Housing conditions, microbiota, welfare score. • ESG rating: carbon footprint, pasture management.

3.2 Genetic Line NFT.

An aggregated asset formed automatically from verified offspring data. This is a "portfolio" of genetic expectations whose value grows with each generation.

Genetic Line NFT Components:

- Average offspring DEPs *(auto-recalculated at each PoB)*.
- Line RYI *(aggregated reproductive yield index)*.
- DSTAY — line longevity *(long-term value multiplier)*.
- Heritability estimate h^2 *(predictive coefficient)*.
- Number of registered offspring *(DEP reliability measure)*.
- On-chain pedigree history across N generations.

3.3 Launch-Phase NFT Instruments.

NFT Instrument	Value (ELYS)	Limit	Description
Live Herd NFT (15 bulls)	**8 000 000**	10	Pool of 15 bulls; yield from live-weight gain and sale
Live Herd NFT (20 heifers)	**13 000 000**	10	Self-reproducing RWA — living deposit accumulating value through generations
Neo-Farm NFT (50 head)	**50 000 000**	3	Governance rights + DAO management of a 50-head herd
Meat Futures NFT (10,000 kg)	**22 000 000**	10	Right to 10,000 kg live weight; staged cash flows over 36 months

1 ELYS = 0.0009 USDT.

25% of tokens available immediately; 75% unlock over 20 months at 15% every 4 months.

Initial DEX listing: Uniswap and PancakeSwap.

4.GENETIC ROYALTY SYSTEM

The royalty system is **NeoFarm Genetics'** key financial innovation. It automatically distributes value between all chain participants: semen owner, line owner, verifier and DAO treasury.

4.1 Royalty Triggers.

#	Trigger	Mechanism	Calculation
1	**Semen licensing**	genetic license — per-use	BaseRate × RYI
2	**Offspring registration**	on-chain PoB event	Per-offspring fee × GPS
3	**DAO genetic line auction**	participation in tokenised auction	% of lot price
4	**RYI threshold reached**	KPI milestone — auto-trigger	Bonus % of NGCI

4.2 Royalty Rate Formula.

Royalty% = BaseRate × f(RYI, D3P, DSTAY, GPS)

$$f = 0.35 \times RYI\_norm + 0.25 \times D3P\_norm + 0.25 \times DSTAY\_norm + 0.15 \times GPS\_norm$$

Multipliers by NGCI tier:

- Genesis Elite (NGCI ≥ 85): BaseRate × 2.5
- Premium (NGCI 70–85): BaseRate × 1.8
- Standard (NGCI 50–70): BaseRate × 1.0
- Emerging (NGCI < 50): BaseRate × 0.6

4.3 On-Chain Revenue Distribution.

Participant	Share	Basis
Herd Management NFT	**35%**	Strategic management of livestock, reproduction and production cycle
Pasture Control NFT	**30%**	Provision of land, ecosystem, grazing conditions and biological sustainability
Farm Operator	**10%**	Daily operational management and execution of the production model
Neo-Pastor	**10%**	Independent audit of housing conditions, biological and digital standards
NeoFarm Genetics	**15%**	Infrastructure: veterinary supervision, ESG control, on-chain traceability, DeFi gateway

4.4 Redemption Mechanism: From ELYS to Certified NFT.

NFTs are issued exclusively after accumulating verifiable on-chain proof. This eliminates speculative emission and guarantees that every token is backed by a real asset.

Step1	The investor acquires ELYS, reserving rights to a future NFT asset. Tokens remain liquid and tradeable until redemption.
Step 2	The smart contract accumulates verified data: PoB pedigree, weight and age, housing conditions, reproduction calendar — via the Neo-Pastor and MRV system.
Step 3	Once all contract conditions are met, an NFT with full on-chain metadata is issued, linked to the specific animal or pool.
Step 4	ELYS used in redemption are permanently burned — reducing token supply and supporting economic stability.
Step 5	The NFT may be sold on secondary markets, redeemed for physical produce, used as collateral, or converted into Meat Futures / royalty streams.

5.OPERATIONAL MODEL

NeoFarm Genetics operates two complementary production circuits: genetic capital reproduction *(Neo-Farm #1)* and live-weight fattening *(Neo-Farm #2)*.

5.1 Neo-Farm #1 — Genetic Capital Reproduction.

Strategy: building a herd with a high proportion of heifers, confirmed genetics and predictable reproductive value.

Starting Base:

- 100 Nelore dams (12–18 months) — core maternal pool.
- Each unit tokenised: NFT profile, pedigree, growth parameters and health.
- Artificial insemination (100 doses): premium genetics reduces inbreeding risk.

Selection Principle:

- Each heifer generation undergoes index evaluation: gain, health, feed conversion, stress tolerance, fertility.
- Top 70% enter the core breeding herd.
- Remainder directed to fattening or sale (cash flow)

Herd Growth Projection

Starting point: 100 heifers, sexed semen (90% heifers), generation survival ~85%, 70% best retained in pool.

Year	Breeding herd	New calves (90%)	Selection into pool (70%)	Sale / fattening	End-of-year herd
0	100	—	—	—	**100**
1	100	90	63	27	**163**
2	163	147	103	44	**266**
3	266	239	167	72	**433**
4	433	390	273	117	**706**
5	706	635	445	190	**1 151**

By Year 5: 1,151 dams producing 1,100+ calves annually — reproduction becomes a sustainable income stream.

5.2 Neo-Farm #2 — Live-Weight Fattening.

Cost Structure		Profit Economics		
Cost Item:	**Amount:**	**Weight**	**Revenue**	**Margin**
Bull purchase (150–250 kg)	**$400–$500**	**350 kg**	$850–$1,200	**~10–35%**
Feed + grazing (6 months)	**$150–$250**	**450+ kg**	$1,100–$1,350	**~30–50%**
Veterinary & digitalisation	**$100–$150**			
Total per head:	**$650–$900**	*Live weight price $2.5–$3.5/kg. Target gain: +100 kg per 4-month fattening cycle.*		

5.3 Market Valuation (2025).

Animal Type	Indicative Price (USD)
Standard beef cow (≈500 kg)	**$1,100–$1,300**
Breeding cow with improved genetics	**$1,800–$2,500**
Premium cow with on-chain traceability	**$3,000+**

6.REVENUE MODEL

NeoFarm Genetics yield is linked not to production volume, but to reproduction quality, genetic line sustainability and long-term productivity. This creates self-reinforcing genetic capital.

Revenue Stream	Return	Description
Live-weight fattening	~15–25% margin	Accelerated +100 kg gain; tokenised weight growth
Offspring sales	$1,200–$2,000/head	Premium calves from verified genetic lines
Genetic licences / NFTs	Royalty per-event	Digital reproduction rights; genetic delegation
DAO genetic auctions	Platform fee + listing	Market allocation of access to breeding animals
Meat Futures NFT	Pre-sale financing	Contracts on future live weight; liquid marketplace
Traceability-as-a-Service	B2B / Institutional	Traceability, certification, agri-data export
Infrastructure commission	~10% of turnover	PoH, PoB, NFT tracing and BioMarket within ecosystem

6.1 Financial Projection Framework.

The financial model is built on the herd's key operational parameters and the integration of on-chain monetization mechanisms.

Key Projection Parameters:

- Average herd RYI.
- Heritability coefficient h^2.
- Average annual offspring count.
- Share of tokenised genetics in the pool Premium beef market CAGR ≥ 5%.
- On-chain traceability price premium: 2.3–3.0×
- Heterosis effect: +8–12% gain vs standard.

7.TECHNOLOGY STACK & SECURITY

7.1 Protocol Architecture Layers.

Code	Indicator	Role in Protocol
IoT / Edge	Field data collection	Weight sensors, RFID ear tags, GPS trackers, microclimate sensors
MRV / Oracle	Verification & relay	Neo-Pastor + IoT data *(cryptographically signed blockchain transactions)*
On-chain	Immutable storage	IPFS for NFT metadata; hashes + indices *(EVM-compatible chain)*
Smart Contract	Protocol logic	NFT minting, PoB events, royalty splitter, DAO governance
DeFi Layer	Financial instruments	Meat Futures AMM, NFT collateralisation, NGCI staking, ELYS pools
Analytics	Interface & dashboard	On-chain analytics, DEP tracker, real-time NGCI dashboard, BioMarket

7.2 Security & Trust Mechanisms.

Multi-Signature Verification:

- Critical events require 2-of-3 multi-sig.
- Verifiers: zootechnician + IoT sensor + DAO validator.
- Neo-Pastor — independent biological and digital auditor.

Timelocks:

- Index formula changes — 48-hour delay.
- Smart-contract upgrades — 7-day timelock + DAO vote.

Transparency & Audit:

- Full open-source smart contracts.
- Public history of all PoB events and royalty payments.
- Quarterly independent protocol audit.
- On-chain MRV verification of production data.

Anti-Speculative Emission:

- NFTs issued only after confirmed on-chain proof.
- ELYS burning on redemption reduces inflationary pressure.

8.COMPETITIVE ANALYSIS

NeoFarm Genetics creates a new asset class — on-chain living RWAs — without a direct market equivalent. Existing solutions address only isolated aspects of the agri-Web3 economy.

Competitor	Limitation	NeoFarm Advantage
Carnes Validadas	Basic meat traceability — no financial modelling of asset value	Full living-capital economy: genetics, health, reproduction and future production as tradeable tokenised assets
E-Livestock Global	Tracks animal movement; no ESG capitalisation or DeFi instruments	Unified financial circuit: traceability + ESG + genetics + access to green capital and carbon markets
Beef Ledger	Focus on logistics and export of the end product	Value is created from day one through PoH, PoB and NFT genetics — long before meat is sold

Key Differentiator: Competitors work with the end product (meat) or individual metrics. **NeoFarm Genetics** creates value from an animal's first day of life and compounds it across generations, turning genetics into a scalable RWA with reproducible yield.

9.TARGET MARKETS & AUDIENCE

RWA Investors:

- RWA-oriented private and strategic investors.
- AgriTech / FoodTech investors.
- Institutional investors in alternative assets.
- Long-term yield seekers with no leverage preference.

Web3 / FinTech Platforms:

- Digital banks and investment fintech platforms.
- Neo-brokers and alternative asset platforms.
- Web3 / crypto-native projects with institutional focus.

Production Base:

- Small and medium farmers and agri-producers.
- Breeding centres and stud farms.
- Scientific-production agri-consortia.

Strategic Partners:

- RWA biological asset distribution infrastructure partners.
- ESG funds and carbon market participants.
- Veterinary and zootechnical organisations.

10.STRUCTURAL ADVANTAGES OF BOLIVIA

Bolivia's legal framework naturally aligns with the Web3 paradigm, creating unique conditions for deploying RWA farming DAOs.

Legal Model	Ecosystem Potential	Low CAPEX / OPEX
Collective land ownership allows DAO-style governance without fragmenting property into legal units. Roles, access and assets are distributed via smart contracts.	The biologically rich Amazonian region opens access to carbon markets and regenerative agriculture programmes.	Land and operating costs are significantly lower than in Brazil or Argentina — freeing capital for reinvestment in genetics, pasture biosystems and digital infrastructure.

11.ROADMAP

Phase	Timeline	Key Milestones
Private Round	**Now**	Preparation of RWA production infrastructure for organic protocol liquidity.
Phase I	**Q1–Q2**	Biological foundation for capitalization. Initial establishment of genetic lines.
Phase II	**Q3–Q4**	On-chain capitalization. Living capital integrated into DeFi infrastructure. Digital and biological infrastructure ready for NFT issuance.
Phase III	**Year 2+**	Scaling: • DAO farm network. • Integration of smallholder farmers.

11.1 Use of Funds.

Phase	Amount	Allocation
Phase I	**$130,000**	$75,000 — prepare 100 ha pastures; $55,000 — acquire 100 dams
Phase II	**$130,000**	$75,000 — additional 100 ha *(total 200 ha)*; $55,000 — 100 more dams *(total 200 head)*
Phase III	**$100,000+**	100 ha pastures *(total 300 ha)* + public launch of SocialFi / RWA platform

12.ESG & REGENERATIVE LAYER

NeoFarm Genetics creates not only a financial but also a regenerative asset. Every improvement in animal health, longevity and reproductive efficiency translates into measurable ecological value.

Environmental Indicators:	**ESG Monetisation:**
• Increased productive lifespan of cows. • Reduced culling rates. • Improved reproductive efficiency. • Lower carbon footprint per kg of output. • Regenerative pasture management practices.	• Carbon credits: \$10–50/tCO_2 *(standard and programme)*. • MRV verification of ecosystem services. • On-chain supply chain transparency. • Access to green capital markets. • ESG rating as NGCI component *(15% of HLS)*.

13.RISK MANAGEMENT

Category	Risk	Mitigation
Biological	Disease, mortality, reduced reproduction	PoH monitoring; line diversification; veterinary supervision by Neo-Pastor
Market	Beef price volatility; token value decline	Meat Futures hedging; DAO model; secondary NFT market; asset-backed structure
Operational	Reporting failures, human error	Standardised MRV system; multi-sig verification; on-chain auditability
Regulatory	Changes in Bolivian law or Web3 regulation	Collective land-ownership legal model; DAO structure; modular protocol design
Technical	Smart-contract vulnerabilities; oracle failures	Open source; independent audit; 48h / 7-day Timelocks; 2-of-3 multi-sig

14.INVESTMENT THESIS

NeoFarm Genetics offers a unique combination of characteristics unavailable in any other asset class: physical backing + biological reproduction + on-chain verification + scalable yield.

1. Reproductive efficiency is the primary source of agricultural capital. Every confirmed calving generates measurable on-chain value.
2. Genetics is a scalable RWA. Unlike traditional assets, genetic value compounds across generations without additional capital expenditure.
3. On-chain verification eliminates information asymmetry. Investors access the same data as professional zootechnicians.
4. The royalty model creates long-term passive income tied to real biological productivity — not market volatility.

In a classic portfolio: gold preserves value, bonds provide income, equities drive growth. **NeoFarm Genetics** introduces a fourth pillar — a system where biology becomes measurable, inheritable and reproducible capital.

15.GLOSSARY

Term	Full Name	Definition
DEP	Expected Progeny Difference	Statistical indicator of an animal's genetic transmission of a trait to offspring
NGCI	NeoFarm Genetic Capital Index	Composite index [0–100] covering all aspects of an animal
IVC	Índice de Valor Cárnico	Carcass Value Index *(weighted DAOL and DACAB)*
GPS	Growth Performance Score	Weighted live-weight trajectory from birth to DP450
MES	Maternal Efficiency Score	Normalised MP120 × heritability coefficient
RYI	Reproductive Yield Index	Weighted index: D3P + IPP + DSTAY
HLS	Health & Longevity Score	Weighted DSTAY + PoH + ESG
PoB	Proof-of-Breeding	On-chain confirmation of a calving event
PoH	Proof-of-Health	On-chain veterinary health history of an animal
MRV	Monitoring, Reporting, Verification	System for monitoring, reporting and verifying biological indicators
DAO	Decentralized Autonomous Organization	Protocol governance via token-weighted voting
RWA	Real World Assets	Physical assets tokenised on the blockchain
AMM	Automated Market Maker	Algorithmic pricing mechanism for Meat Futures contracts

CONCLUSION

NeoFarm Genetics is an open system for farmers, investors and researchers, where every participant can enter the agri-Web3 economy, own a share of living capital and take part in the transformation of the meat industry.

On-Chain Access to Real Bio-Assets	Opportunities for Farmers	Platform for Science & Cooperation
From genetics to meat — everything is tokenised, backed by NFT passports and written to the blockchain. Trust is ensured by mathematics, not by human intermediaries.	Financing and infrastructure for sustainable growth. Digital tools and DAO mechanics. Joint management of resources and living capital.	Genetic lines and breeding programmes. Health, ecosystem and productivity data. Biotechnology research and selection models.

NeoFarm Genetics connects capital, biological production and on-chain trust into a single economy of living RWAs.