HOW TO MEASURE AND REWARD BIODIVERSITY IN DAIRY

A Comprehensive Framework for the Dairy Sector

Wilco Brouwer de Koning | Nuffield Scholar 2025-2026

ABOUT WILCO BROUWER DE KONING

THE FARMER

- Third-generation dairy farmer at Boerderij Ter Coulster in Heiloo, Netherlands
- Started in 1954 by my Grandpa Wim
- Farming together with my brother, family, labor
- 2 Farm locations, in the heart of Heiloo
- 180 dairy cows on total 125 hectares
- 42 hectares of nature land for biodiversity
- Family farm with three generations
- Farm located in densely populated area with 25,000 neighbors

THE FARM LEADER

- Board member, LTO Netherlands (Dutch Farmers Organization)
- Dairy farmer representative, Science & Programme Coordination Committee, International Dairy Federation (IDF)
- Member Council Agrifirm
- Nuffield Scholar 2025-2026

BOERDERIJ TER COULSTER

A third-generation Dairy farm

BOERDERIJ TER COULSTER

27.000 direct neighbors

BOERDERIJ TER COULSTER

Three core pillars guide our farming approach

1

GRAZING

Primarily grass-fed cows grazing outdoors from April to November whenever possible

2

COMBINATION WITH NATURE

42 hectares of nature land and 23 ha of agricultural nature land.

3

CONNECTION WITH COMMUNITY

Open engagement with events, social media, selling farm products.

GRAZING

- From April to November
- Dairy cows around the farm, young stock on the field further away
- Nature land with dry cows and older young stock
- Grass, clovers and herbs

TOGETHER WITH NATURE

- Production land with herb rich grassland
- GPS registration of meadow birds on production land
- Adapting work on meadow birds
- Nature land for biodiversity and meadow birds

CONNECTION WITH COMMUNITY

- Social media
- Farm events, Open farm day and “cow dance”
- Direct selling (vending machines and shop)

NUFFIELD SCHOLARSHIP 2025-2026

RESEARCH QUESTION

“How to measure and reward biodiversity in dairy”

OBJECTIVES

- Learn from global best practices in biodiversity measurement
- Understand different reward mechanisms across countries
- Identify scalable solutions for Dutch, European and Global dairy farming
- Tell the story about sustainable Dairy Farming

NUFFIELD INTERNATIONAL FARMING SCHOLARS

GLOBAL RESEARCH JOURNEY

Countries visited during Nuffield Scholarship

1. New Zealand
Pasture-based systems & environmental frameworks

2. Australia
Extensive grazing & biodiversity integration

3. United States
Technology & intensive dairy systems

4. Brazil
Tropical biodiversity & sustainable intensification

5. Chile
South American perspectives

6. Japan
Quality focus & community integration

7. Denmark
Nordic approaches to nature-inclusive farming

8. Italy (planned)
FAO, WFO & company engagement

9. Canada/US (planned)
North American dairy & biodiversity approaches

10. Armenia, NZ, Australia (planned)
Biodiversity COP17 & international frameworks

KEY FINDINGS FROM GLOBAL RESEARCH

Everything starts with Data
A data system, trusted by farmers, automatically connect with different systems, certificated and transparent.

Biodiversity is the Competitive Advantage
For pasture-based dairy systems, biodiversity offers a unique selling point that intensive systems cannot match on climate metrics alone

Measurement Drives Action
Countries with standardized biodiversity monitoring tools see faster farmer adoption and clearer progress toward environmental goals

Multiple Reward Pathways
Successful programs combine supply chain premiums, government payments, and market access benefits

Community Connection Matters
Farmers who engage with their communities about biodiversity gain social license and long-term sustainability

FOUR PILLARS OF BIODIVERSITY

1. FUNCTIONAL AGROBIODIVERSITY
Fertile soil, clean water, healthy nutrient cycles. Closing loops on farm level.

2. DIVERSITY OF LANDSCAPE
Hedges, trees, ditches, field margins create habitat and ecosystem services.

3. DIVERSITY OF SPECIES
Protecting and strengthening specific flora and fauna. In the soil, on land, water and air.

4. REGIONAL BIODIVERSITY
Connecting areas across farm boundaries through regional management approaches.

These pillars provide an integrated framework for assessing biodiversity on dairy farms

HOW TO MAKE A POSITIVE IMPACT

MITIGATION HIERARCHY

AVOID
Prevent impacts where possible

REDUCE
Minimize unavoidable impacts

COMBINE
Combine farm practices with nature.

RESTORE
Compensate for net gain

GOAL: Achieve a marginal net gain in biodiversity on a global level

REWARD MECHANISMS

Creating new revenue models in the supply chain

SUPPLY CHAIN PARTNERS

- Premium milk prices
- Performance bonuses
- Long-term contracts
- Technical support
- Lower interest

GOVERNMENT & POLICY

- Agri-environment payments
- Tax incentives
- Subsidies for nature management
- Regulatory compliance credits

SOCIETY

- License to produce
- Connection
- Direct payment

BENEFITS OF REWARDING BIODIVERSITY

FOR FARMERS

- Clear action perspective for improvement
- Financial rewards for biodiversity efforts
- Reduced environmental compliance risks
- Enhanced farm resilience and soil health

FOR SUPPLY CHAIN

- Quantifiable sustainability metrics
- Risk mitigation in sourcing
- Brand value and market differentiation
- Alignment with ESG commitments

FOR SOCIETY

- Restoration of agricultural biodiversity
- Protection of meadow birds and species
- Improved water and air quality
- Preservation of cultural landscapes

ARLA FARMAHEAD™

A Data-Driven Approach to Sustainable Dairy

Case Study: Arla Foods Cooperative

FARMAHEAD™ TECHNOLOGY

Three integrated tools for measuring and rewarding sustainability

ARLA: 7,600 farmers across 7 European countries • €500M annually for sustainability

1

FarmAhead™ Check

One of the world's largest validated datasets covering 99% of Arla's milk pool. Over 200 data points per farm verified by third-party advisors.

2

FarmAhead™ Incentive

Point-based reward system paying farmers up to 4 eurocents per kg milk for sustainability activities. Historical change to milk pricing model.

3

FarmAhead™ Customer Partnerships

Customers invest in on-farm sustainability and access data for their ESG reporting and scope 3 emission reduction goals.

CLIMATE TARGETS & THE 'BIG 5'

SCIENCE-BASED TARGETS

- 30.3% reduction in CO_2e per kg milk by 2030 (from 2020 baseline)
- 63% reduction in production & logistics by 2030
- Carbon Net Zero by 2050

ACHIEVEMENTS

- 1 million tonnes CO_2e reduced in 2 years
- 8,500+ farms with verified climate data
- Customers: Aldi, Asda, Morrisons, Starbucks

THE 'BIG 5' FOCUS AREAS

1. Feed efficiency - optimizing cow nutrition
2. Manure management - biogas conversion
3. Renewable energy - solar, wind on farms
4. Herd genetics - breeding for efficiency
5. Fertilizer optimization - precision application

FARMAHEAD™ INCENTIVE MODEL

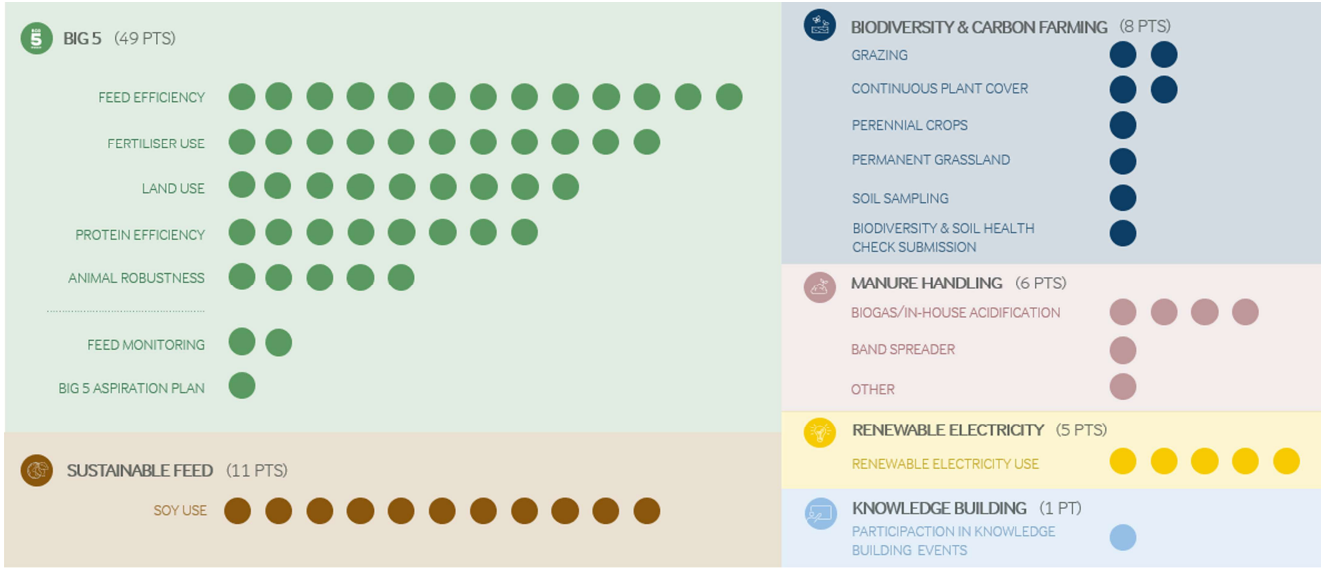
Point-based system rewarding sustainability actions

HOW IT WORKS

- Farmers collect points for sustainability activities
- Maximum 80 points currently available
- Each point = 0.03 eurocent per kg milk
- +1 eurocent for annual Climate Check participation
- Quarterly updates with verified documentation

REWARD CRITERIA

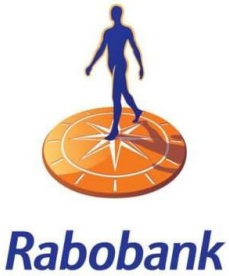
- Activities with biggest impact = most points
- Based on feasibility and cost-efficiency
- Covers past achievements + future actions
- Transparent, verified third-party data
- Integrated into monthly milk payment



THE BIODIVERSITYMONITOR

A Data-Driven Approach to Sustainable Dairy

Case Study: The Biodiversity Monitor



THE BIODIVERISTY MONITOR (NL)

A collaborative initiative driving change

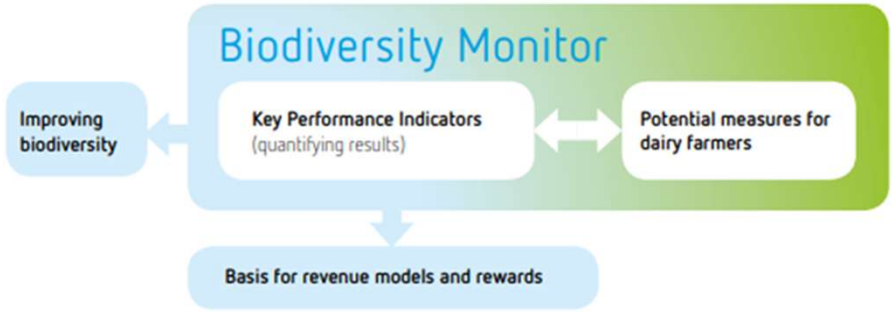
INITIATORS: FrieslandCampina • Rabobank • WWF Netherlands

KEY OBJECTIVES

- Develop standardized measurement tool
- Enable sustainable revenue for farmers
- Create supply chain incentives
- Restore biodiversity in agriculture

NEXT STEPS

- Pilot testing with dairy farmers
- Refine technical methodology
- Engage other supply chain partners
- Establish independent governance



THE BIODIVERSITY MONITOR SOLUTION

A standardized tool to quantify and reward biodiversity-enhancing performance

MEASURE

- Key Performance Indicators
- Standardized methodology
- Farm-level data collection

MONITOR

- Track progress over time
- Compare farm performance
- Identify improvement areas

REWARD

- Supply chain incentives
- Financial rewards
- Market recognition
- Used by the government to steer on goals.

PRACTICAL MEASURES FOR FARMERS

ON-FARM ACTIONS

- Increase permanent grassland
- Overseed clover in grassland
- Postpone first mowing date
- Create herb-rich grassland borders
- Plant hedges and field margins
- Install ponds and wildlife corridors
- Reduce chemical fertilizer use
- Implement meadow grazing

MANAGEMENT PRACTICES

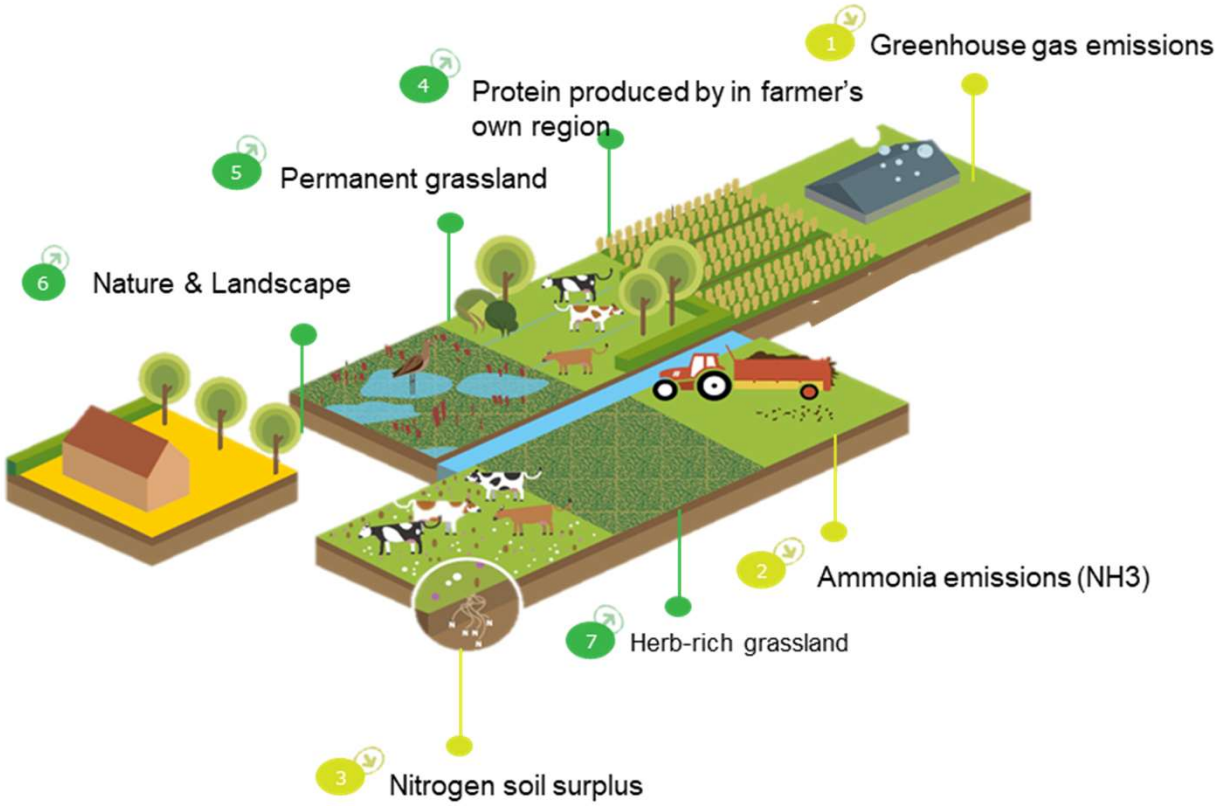
- Improve nutrient cycle efficiency
- Optimize protein production on own land
- Reduce purchased feed imports
- Participate in agri-environment schemes
- Join regional nature networks
- Monitor soil health and biodiversity
- Adopt precision farming techniques
- Engage in collective landscape planning

KEY PERFORMANCE INDICATORS (KPIs)

Seven integrated KPIs measure biodiversity performance:

The Biodiversity monitor

1. Integral management by the farmer on (company-specific) goals
2. KPI systems can make performance transparent, clear and impact measurable
3. Preventing trade offs.
4. Net positive impact
5. Basis for revenue models and rewards



SUSTAINABILTY ON OUR FARM

FrieslandCampina
nourishing by nature

Themes	Indicators	Threshold value (start of bonus)	Bonuses	Top value (maximum bonus)		
ANIMAL HEALTH AND WELFARE	Longevity (years + months)	€ 0,00	5 jaar en 4 maanden en 0 dagen – 6 jr 11 mnd 7 dgn – 7 jaar en 2 maanden en 0 dagen	€ 0,10	€ 0,09
	Calf rearing (KalfOK)	€ 0,00	70 KalfOK-score – 91 – 95 KalfOK-score	€ 0,10	€ 0,08
CLIMATE	Greenhouse gas emission (gram CO_2-eq/kg milk)	€ 0,00	1.075 gram CO2eq/kg meetmelk – 841 – 750 gram CO2eq/kg meetmelk	€ 1,50	€ 1,08
BIODIVERSITY	Nitrogen soil balance (kg N/ha)	€ 0,00	160 kg/ha – 105 – 20 kg/ha	€ 0,10	€ 0,04
	Ammonia emission (kg NH_3/ha)	€ 0,00	70 kg/ha – 54 – 35 kg/ha	€ 0,10	€ 0,05
	Protein from own land (% of total protein used)	€ 0,00	45 % – 65 – 80 %	€ 0,10	€ 0,06
	Permanent grassland (% permanent grassland)	€ 0,00	40 % – 76 – 100 %	€ 0,10	€ 0,06
	Nature & Landscape (% total surface)	€ 0,00	0 % – 27 – 40 %	€ 0,10	€ 0,07
GRAZING	Grazing	Partial grazing **€0,40**		Full grazing **€1,30**	€ 1,30 +

foqus planet
Sustainable development

€ 2,82
€ 0,60 –
€ 2,22

Foqus planet inhouding

Uw totale toeslag per 100 kg melk:

Rabobank

- 0,2% interest

LET'S CONNECT

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