International Agri-Food & Climate Circle 2023

Using data to produce accurate environmental measurements, credibly and transparently

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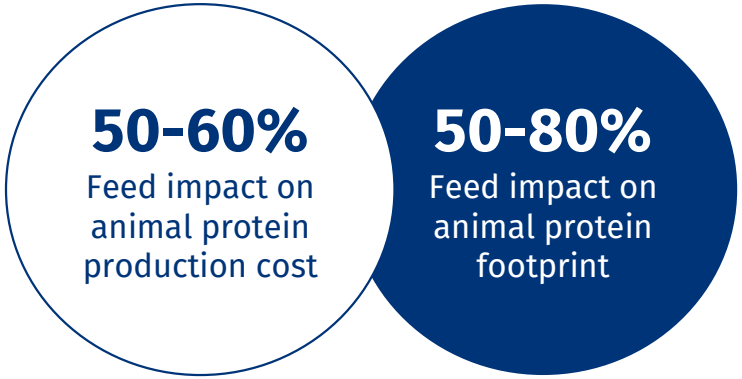
May 10 2023, Copenhagen

ANIMAL NUTRITION AND HEALTH

- ESSENTIAL PRODUCTS
- PERFORMANCE SOLUTIONS + BIOMIN®
- PRECISION SERVICES

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.

The worldwide drive for sustainable animal protein demands accurate footprint measurement & improvement



Nutrition is key to more sustainable animal protein, driven by feed production, digestion and excretion.....

.... and requires **accurate, credible measurement** to meet emissions requirements of the downstream value chain

Change driven by the value chain

Sustainability conscious consumers put pressure on food brands & retailers

Investors want to mitigate risks & put pressure on food brands

Regulators setting new boundaries in which farms can operate

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A full eco-system approach is required

to ensure animal protein production becomes more sustainable and profitable

From a siloed industry approach

There are many **product-driven approaches** that are focused purely on single steps of the **ecosystem** looking at it from a **supplier perspective**

To full eco-system approach

Need to take **a full ecosystem approach** to show and **measure the full environmental footprint** of animal protein production & how to improve with science-based solutions

Animal feed including crop / raw material impacts

Live production including animal health

Outputs such as manure management

Slaughter-house

Full ecosystem emissions & environmental footprint

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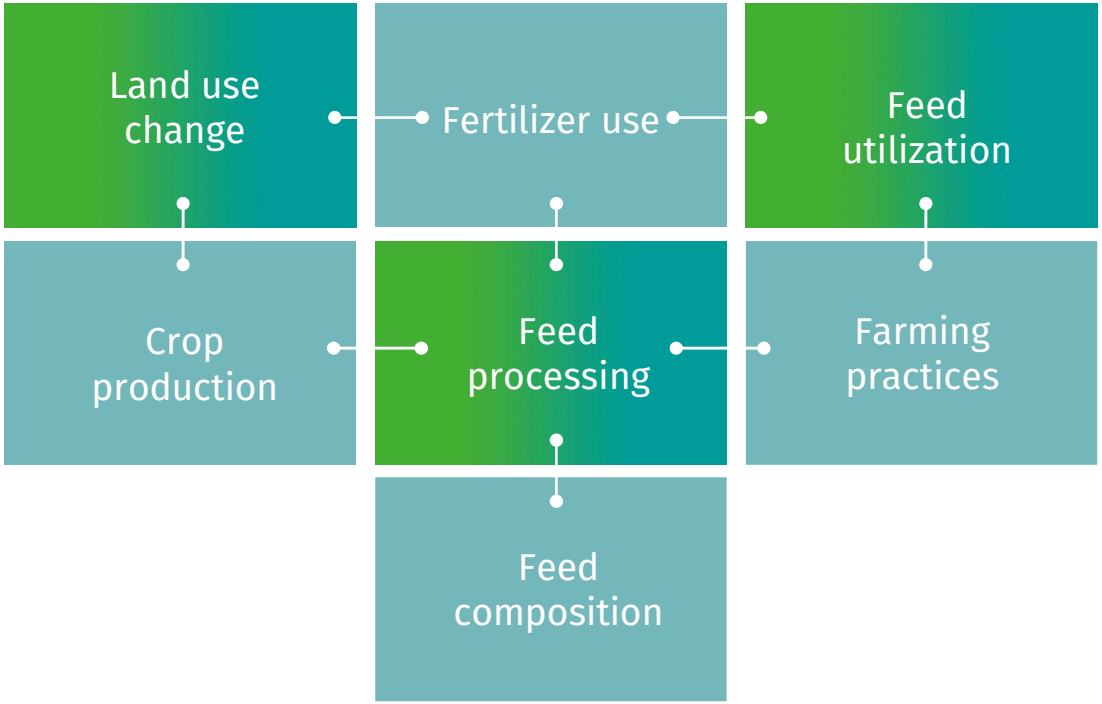
You don’t improve what you don’t measure

Relevant LCA metric systems and greater use of primary data are critical to measure and know how to reduce footprints in animal production

Requires a full systems understanding ....

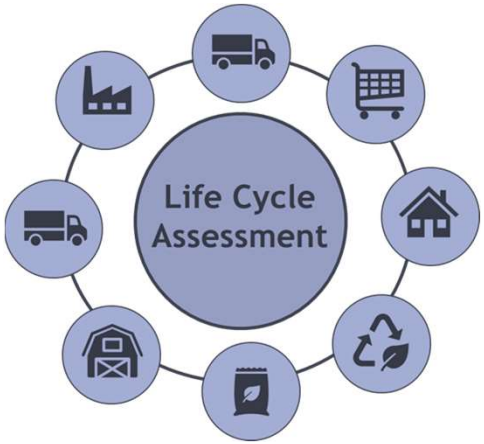


And .....

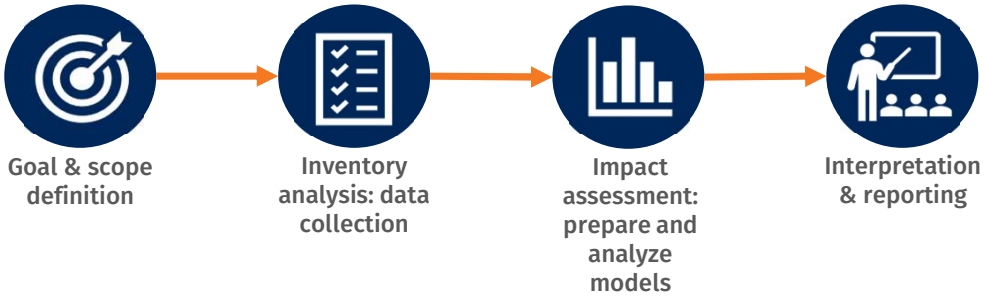
- Internationally recognized methods, databases and calculation tools to determine full environmental footprint
- at farm level
- to enable tangible and measurable reductions in footprint by different interventions (nutritional, animal, manure & housing management, etc.)

PEF guidelines

LCA provides scientifically robust metrics that highlight sustainability benefits and potential improvements



Life Cycle Assessment determines the environmental impacts of a product over its entire life cycle, or selected phases, by identifying the associated material, energy and waste flows



With our own production data and extensive specialist databases, using latest methodologies, our LCAs provide crucial sustainability information about our products and applications

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At DSM we demonstrate ambitious climate leadership

Sustainability is in our DNA; engrained in our purpose, strategy, business and operations. We've been taking climate action for more than a decade

Absolute emissions reduction from operations (scope 1 & 2) by 2030

59%

Complimenting our value chain emissions (scope 3) reduction target

28%

Intensity reduction by 2030

Reviewed and approved by the Science Based Targets Initiative; vs. baseline 2016

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At DSM we understand the key drivers for environmental footprint of our product portfolio and act to address them

Reducing emissions from our operations

Ex.: In 2019 DSM Sisseln commissioned a new biomass heat and power plant. Supplying steam to the site and exporting renewable electricity to the grid, **significantly reduced carbon footprint of our vitamins**

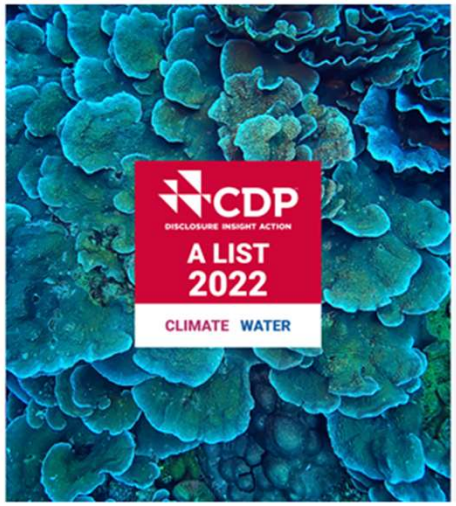
Energy impact reductions

Carbon footprint of steam reduced by 60%, electricity by 90%

Conventional energy sources have much higher impacts

Fossil-based sources have considerable higher environmental impacts than the DSM biomass energy plant. Where coal is used, these impacts can be up to 30x higher

… and it has been key to work with our supply chain to reduce our scope 3 emissions



As a **double A List** company, we are leaders in corporate transparency and action on climate change and water security.

Our supplier engagement program **CO2REDUCE** collaborates with suppliers of key contributing raw materials to develop and implement emissions reduction action plans.

Exploring new opportunities for scope 3 emissions reductions **reduces the footprint of our products** and the **scope 3 emissions of our customers**

DSM

We unlock the value of sustainability by combining measurement with science-based solutions

Calculate the footprint of the products

Environmental Product Declarations & **Premix Carbon Calculator**

We start by transparently sharing our products' reduced footprints on 16 different metrics

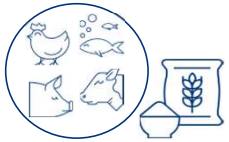
Calculate the footprint of the animal protein

Sustell™

Intelligent Sustainability Service

We calculate the full environmental footprint of animal protein using primary feed and farm data, combined with expert knowledge and tailor-made, practical solutions to unlock the value of sustainability

Provide science-based, proven solutions for improvement



Innovative and complete portfolio

We provide innovative feed additives & nutritional solutions to address many of the key environmental footprint drivers

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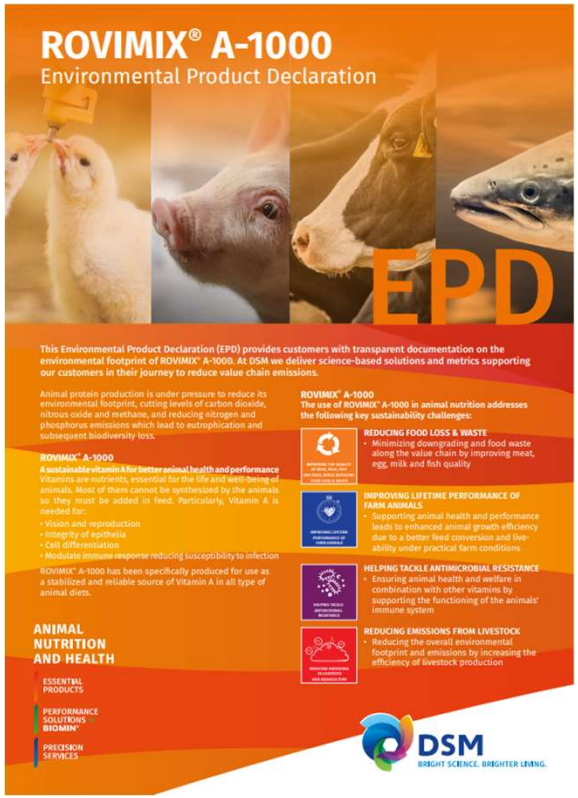
Environmental Product Declarations

A credible approach to communicate product sustainability metrics



- **Product specific environmental footprint data** with illustrative comparisons where available
- Key environmental data across **19 impact categories**
- Transparent descriptions of **standards, data sources and methods used**
- **3rd party verification** of the calculation and reporting processes

Critical review

This EPD is prepared in accordance with ISO 14021:2016, using DSM's internal calculation and reporting processes assured by DNV.

DNV

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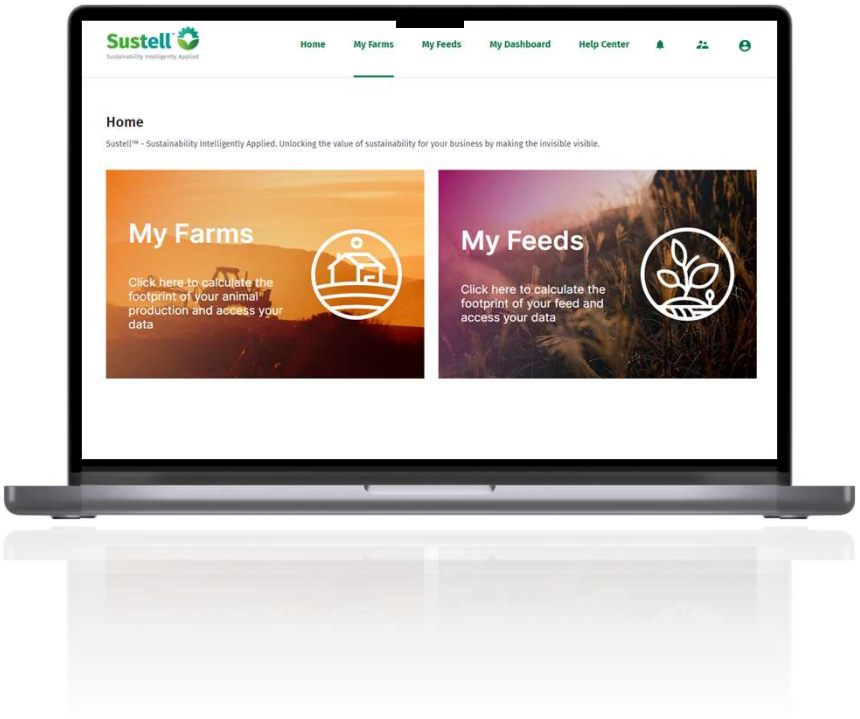
Sustell™ – An Intelligent Sustainability Service

Measurement combined with practical, science-based, proven solutions to unlock the value of sustainability across species (fish, dairy cows, swine, laying hens, chickens) and farming systems



Sustell™

Sustainability Intelligently Applied

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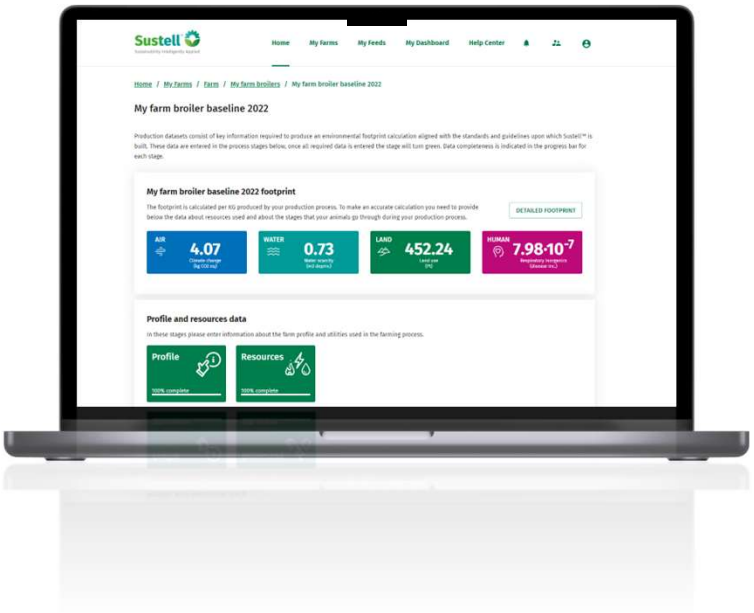
Sustell™ – The Intelligence Platform

A highly advanced, yet user-friendly system for calculation and visualization of full environmental footprint results (19 variables)



- Manages the complexity of thousands of data points with an intuitive, user-friendly interface that provides credibility and transparency of foot-printing
- Respects data sensitivities around data sharing and permissions to enable scalable, end-to-end foot-printing for the value chain

Sustell™

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Sustell™ is an ISO assured system that delivers accurate full environmental footprint impacts

Verified input data

3rd party assured farm and feed data, according to recognized standards or approaches

Sustell™

LCA calculation and scenario analyses certified to ISO 14040/44

ISO assured results

Results calculated according to ISO 14040/44, with farm-level data assured to relevant standards

ISO assured results provide credible input for:

- Sustainability reporting
- Environmental labelling schemes (Eco-labels)
- GHG Accounting
- Sustainability Linked Loans
- Verified ESG reporting
- Best practices gains

Sustell™

All data privacy applicable laws and regulations conformed with

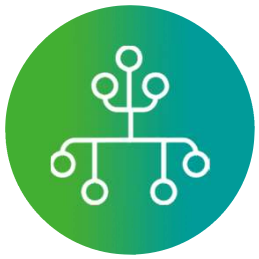
DSM

Data and data interpretation is key for credibility & value creation in sustainable food systems

Assured data

From feed ERP systems/feed formulation & Farm Management systems

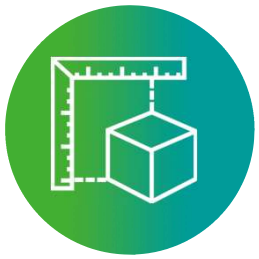
Credible databases such as Agri-Footprint & GFLI



LCA methods & ISO assurance

Adherence to the latest, internationally recognized LCA guidelines & methods

ISO assured LCA foot-printing platform



Data based interventions

Based on proven evidence / science-based technologies

Data transparency

Traceable, credible, assured data from the data eco-system to unlock the value

Sustell™

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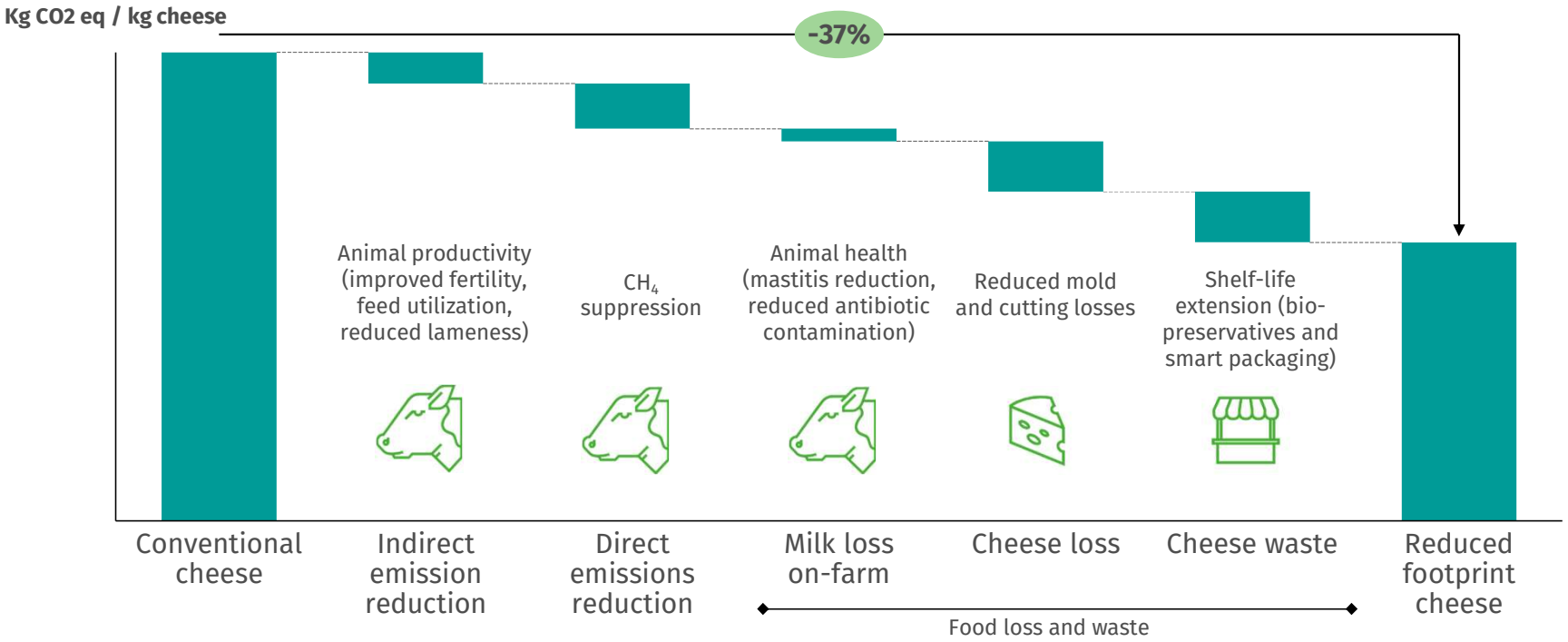
Measurement combined with practical, science-based, proven solutions unlocks the value of sustainability

Example decarbonization of the dairy value chain



The dairy value chain is committing to decarbonizing their value chain & setting ambitious Net Zero targets (IDF, GDP)

Based on DSM data and 3rd party LCA commissioned by DSM in 2021 for selected solutions, according to FAO LEAP Guidelines and ISO standards
Base case uses a current Dutch dairy system and Gouda cheese production

Sustell™ intelligently unlocks the value of sustainability

- **High precision:** primary farm & feed data (linked to credible LCA databases, Agri-Footprint and GFLI) & customer specific compliant LCI data
- **Credibility:** LCA process assured to ISO 14040/44, aligned w/leading methodologies (FAO LEAP & EU PEF, and IPCC guidelines)
- **Full environmental feed & farm footprint:** (aligned with impact assessment methodology EF 2.0) detailed insights & levers for improvement
- **Business insights dashboard**: for multi-farm footprint analysis & business decisions
- **Scalable:** fast, efficient multi-farm & feed analysis and multi-species 'what if scenarios'; API connections
- **Meeting the needs:** all stakeholders across animal protein value chain
- **Ease of use:** intuitive multi-user-interface saving time and cost, requires minimum training, user friendly design

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