Commodity masterclass

Dairy

30 May 2024

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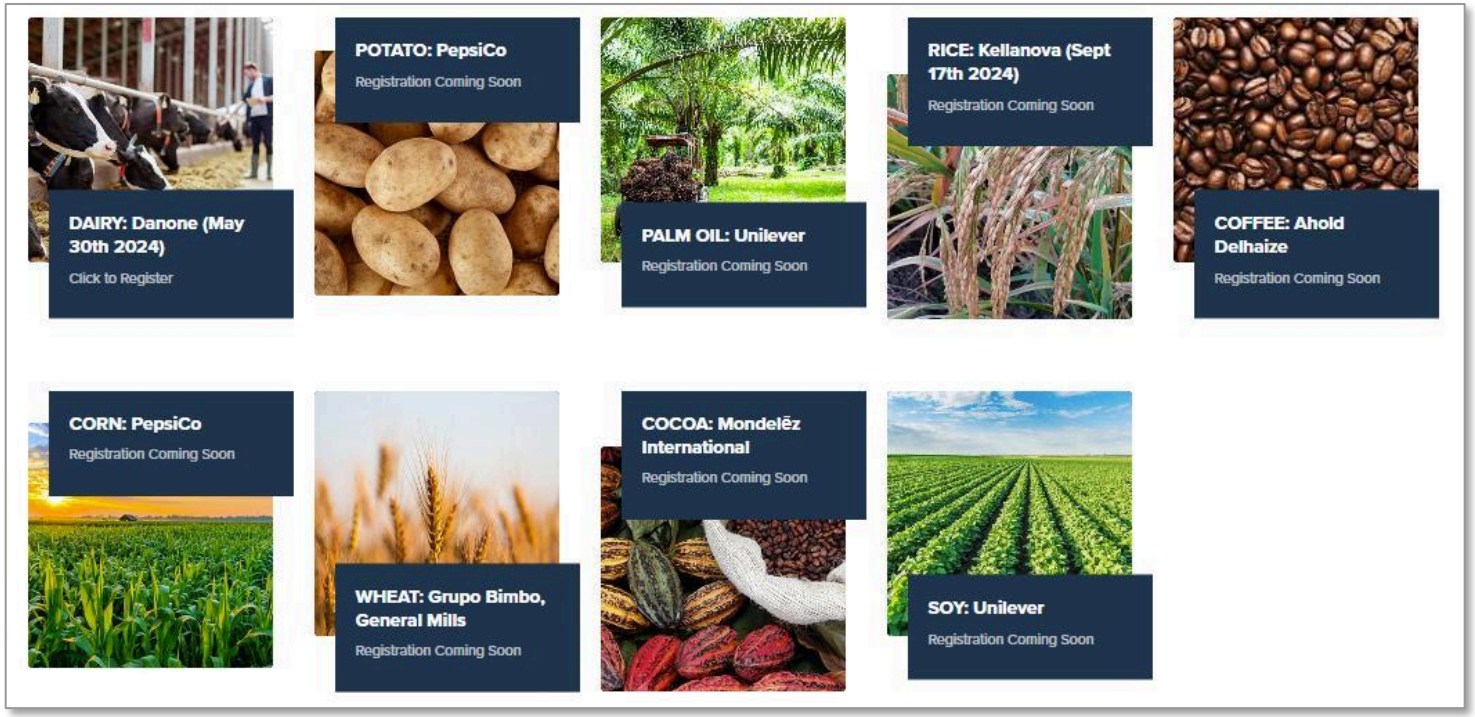
https://www.theconsumergoodsforum.com/wp-content/uploads/2023/09/The-Consumer-Goods-Forum-2023-Competition-Law-Governance-Guidelines.pdf

Commodity masterclass series

Ran by member companies' commodity captains

Materials to be made available on CGF website, incl. recordings + resources: HERE



Today's session: May 30

DANONE ONE PLANET. ONE HEALTH

Dairy

Agenda

- Provide overview on **dairy context**
- Share **regional specificities**
- Present **solutions** + case studies
- **Questions, answers & next masterclass** in series
- Discussion on **opportunities to partner & scale** for impact

Introducing Danone

54% ESSENTIAL DAIRY AND PLANT-BASED

Fresh dairy | Plant-based | Premium dairy | Coffee creamer | Plant-based

#1 WORLDWIDE
in fresh dairy products & plant-based products

30% SPECIALIZED NUTRITION

Baby formula | Specialized pediatrics | Baby food | Adult medical nutrition | Healthy aging

#2 WORLDWIDE
in early life nutrition

#1 IN EUROPE
in adult nutrition

16% WATER

Plain Still | Flavored Still | Sparkling Plain | Sparkling Flavored | Functional

#2 WORLDWIDE
in packaged waters (by volume)

Introducing Agriculture at Danone in Key Figures

OUR MAIN SOURCED INGREDIENTS

FRESH MILK
Direct & indirect via collection centers, incl. animal feed

DAIRY INGREDIENTS (DI)
Indirect via key suppliers

CROPS
PB: Soy, almonds, oats, coconuts - Direct & indirect
DAIRY & SN: Fruit & veg - Direct & indirect

SCOPE

~60 Ingredients sourced from 25 countries

~800 000 Cows

~1000 000 Ha (~300 kHa for milk)

~400 000 Farmers (>58 000 dairy)

> 120 Danoners in the field

DANONE'S FOOTPRINT

CLIMATE (CARBON & METHANE)

GHG

Scope 3 = 95% of Danone's GHG footprint.

Agriculture represents 60% of Scope 3.

Milk and DI represents >50% of our footprint.

Danone's Sustainability Journey in the past decade

2015

Start of our journey to become the first global B Corp company by 2025.

Commitment to be Net-Zero carbon by 2050 and launch of our Climate Policy.

2017

Our One Planet. One Health vision and regenerative agriculture ambition.

Approval of our 2°C science-based targets by SBTi.

2018

Join RE100 renewable energy initiative.

2019

Signature of the Business Ambition for 1.5°C pledge and partnership with SBTi on developing pathways for the Forest, Land and Agriculture sector (FLAG project).

2020

First listed company to adopt the "Société à mission" status.

2022

One of the first FMCG to have full scope 1.5°C science-based targets, including FLAG target, approved by SBTi.

2023

Our sustainable strategy, the Danone Impact Journey.

Alignment with the Global Methane Pledge and targets.

Release of our inaugural Climate Transition Plan.

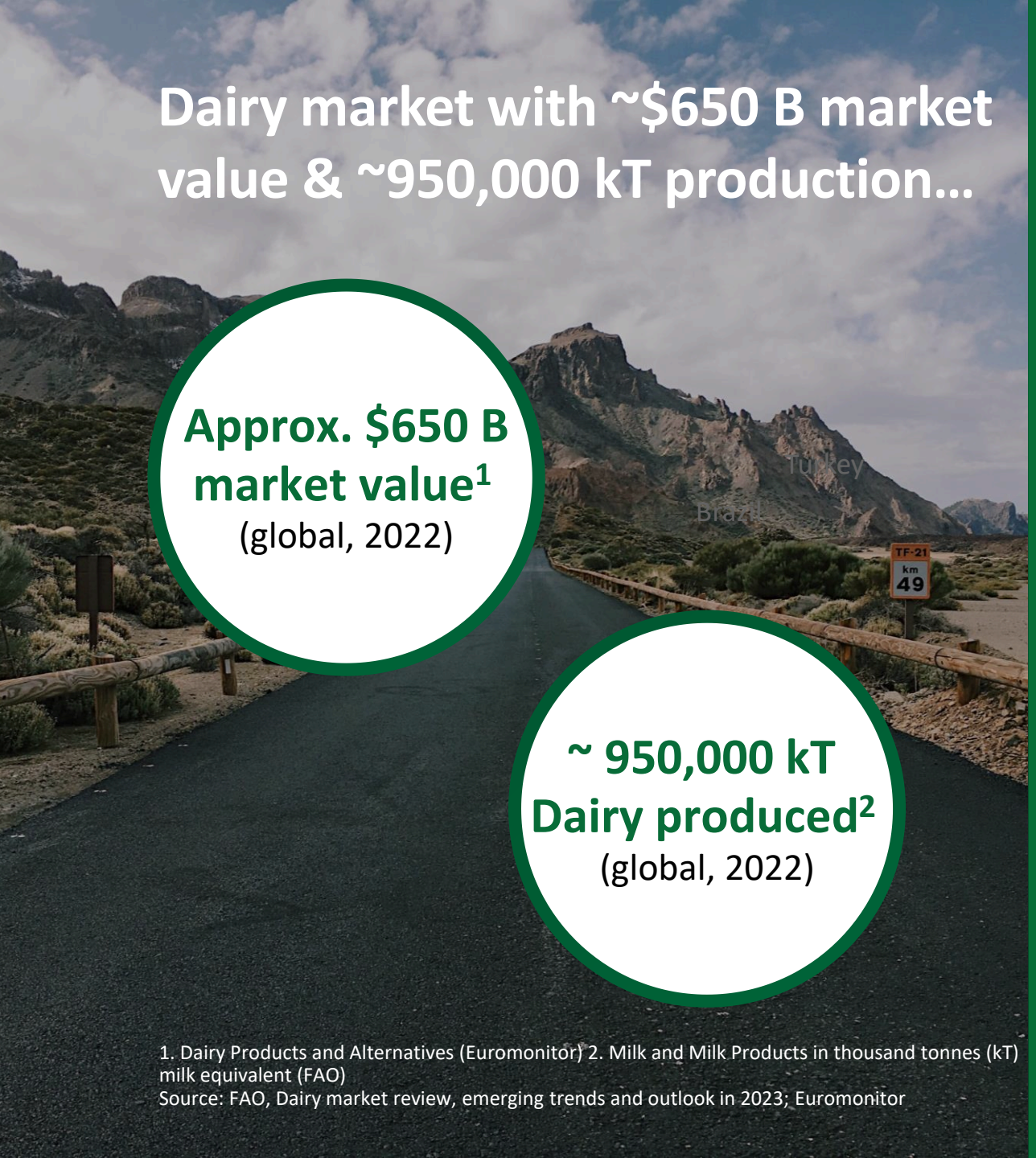
2024

Approval of our Net-Zero science-based targets by SBTi.

- Sustainability milestones
- Climate milestones

Context

Dairy market with ~$650 B market value & ~950,000 kT production…



Approx. $650 B market value[1]
(global, 2022)

~ 950,000 kT Dairy produced[2]
(global, 2022)

1. Dairy Products and Alternatives (Euromonitor) 2. Milk and Milk Products in thousand tonnes (kT) milk equivalent (FAO)
Source: FAO, Dairy market review, emerging trends and outlook in 2023; Euromonitor

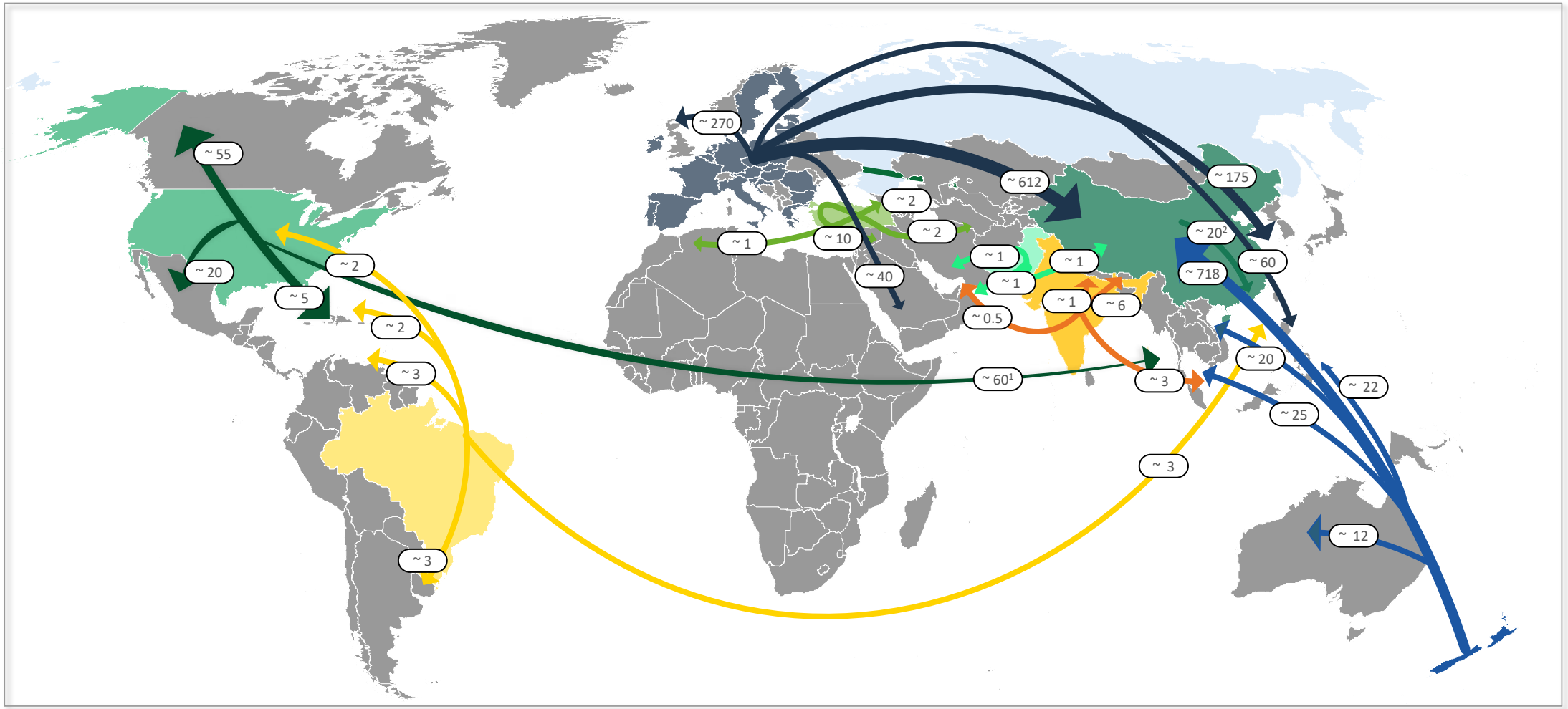
…coming from top 9 producing markets with > 20,000 kT production

India	EU	US
~230,000 kT	**160,000 kT**	**100,000 kT**
Pakistan	China	Brazil
65,000 kT	**40,000 kT**	**35,000 kT**
Russia	Türkiye	New Zealand
33,000 kT	**21,000 kT**	**21,000 kT**

Note: Estimated production, thousand tonnes (kT), milk equivalent (FAO, 2022)

EU & NZ are top dairy exporters across top 9 producing markets

Non-exhaustive



1. Reflects US exports to "other Asian countries" 2. Reflects exports from China to Hongkong SAR (top export country) Note: base year 2022, Milk and cream = code 0401, considering top 3-5 export countries in $M USD, Europe to reflect EU exports, not specific country-level, data for Russia not reported on UN Comtrade Source: UN Comtrade

(XXX) **$M USD export value** (top 3-5 export countries shown per market, '22) **Different colors to represent different market flows** **Russia – data not available** **Commodity flows** (size relates to $USD export value)

The people & animals behind dairy production

10% of the world population directly depends on dairy farming for their livelihood

133 Million Dairy Farms, (source GDP).

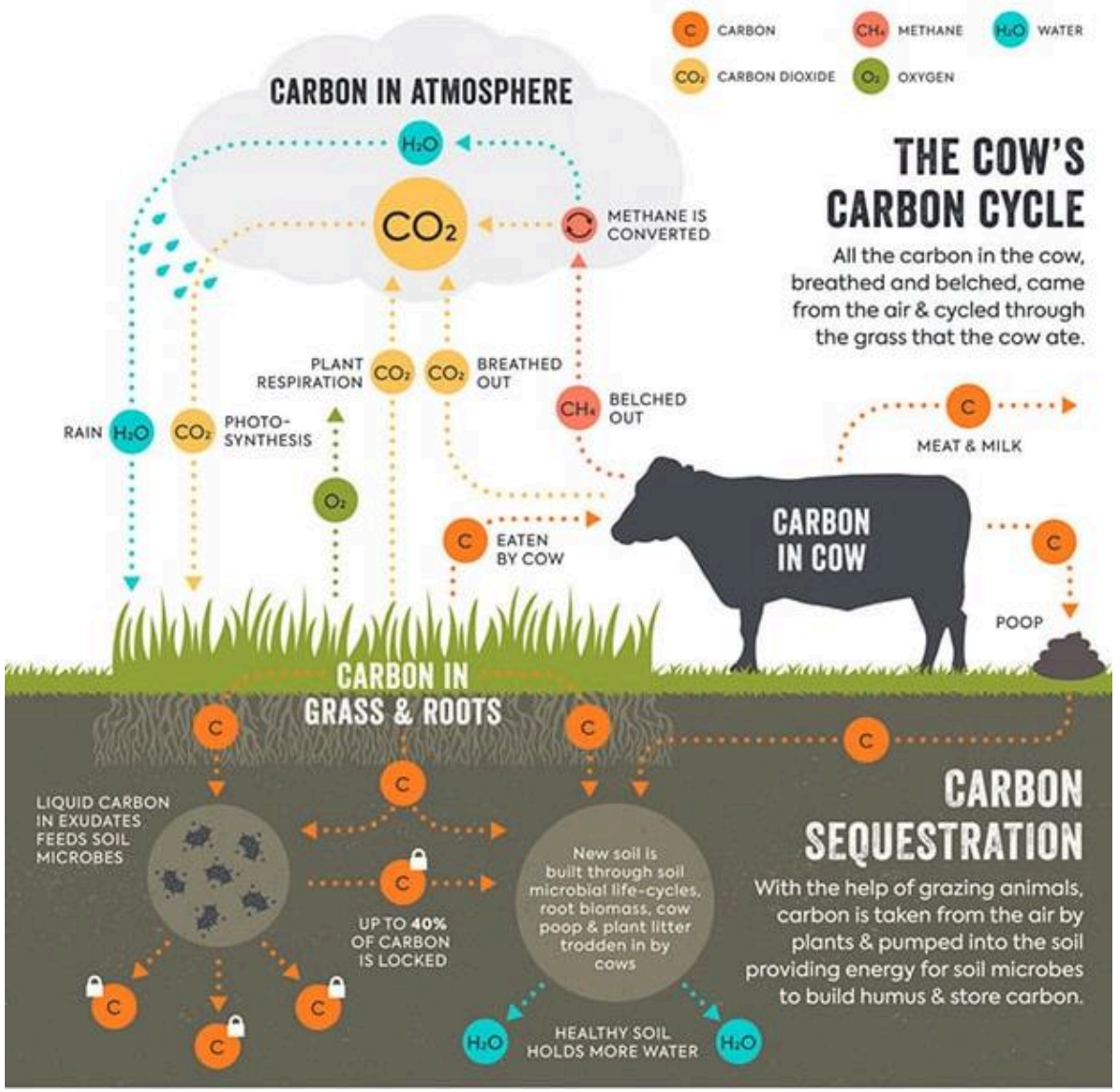
270 Million dairy cows (source GDP).

Each day, a cow can eat up to 40-50kg of food and drink 200 L of water

Dairy contributes to 5% of global emissions

5%
of global emissions
(2020)

Where do emissions come from?

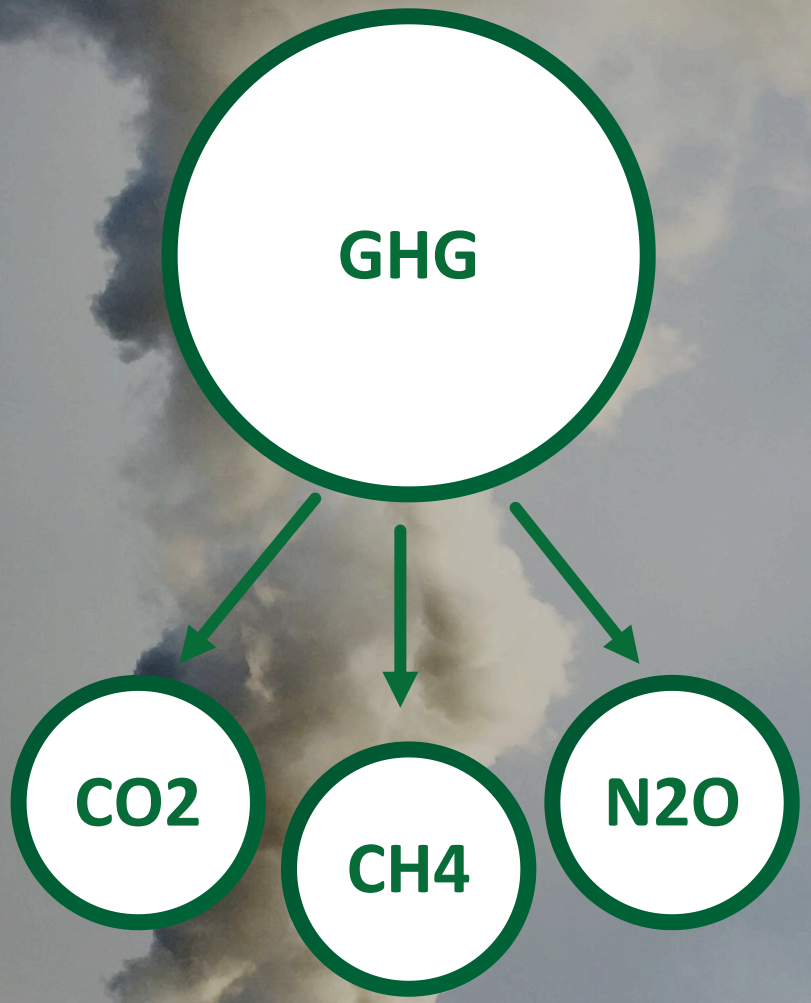


EMISSIONS

REMOVALS

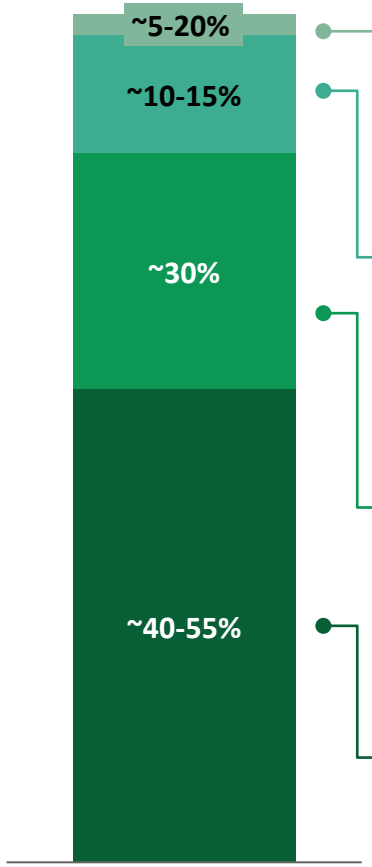
Source: Livestock emissions downplayed | The Western Producer

3 main greenhouse gases generated by Dairy



4 main drivers of dairy emissions

Emissions breakdown



Infrastructure & utilities

Manure management

Methane from manure releases into the air as it decomposes in the absence of a suitable covered pit or digester

Feed

Fertilizer and fuel contributes to emissions from feed grown on the dairy farm or purchased from feed suppliers

Enteric fermentation

Cows digest feed via enteric fermentation, which results in the production and release of methane

Source: "Farming Our Way Out of The Climate Crisis", Project Drawdown, 2020; "The carbon footprint of breastmilk substitutes in comparison with breastfeeding", Karlsson et al, 2019; OpenLCA (Agribalyse, ADEME); "Tackling Climate Change Through Livestock – A Global Assessment of Emissions and Mitigation Opportunities", Gerber et al., 2013.

Regional specificities

There are a large diversity of dairy farming models

Feed and housing system

1. Pastoral based

2. Land-based (More than 50% of total diet produced on farm)

3. Limited land (Less than 50% total diet produced on farm)

Farm size

Small (0-25)

Medium (25-100)

Large (100-400)

Mega (400+)

Farm outputs

Specialised dairy

Dairy / Meat-Eggs / Cash crops

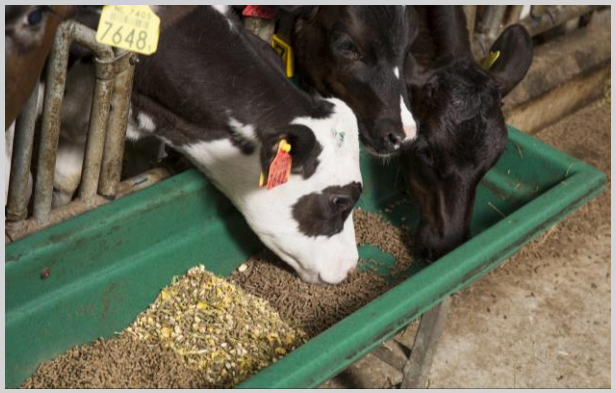
There are 3 main farm archetypes for dairy production

Non-exhaustive

Pastoral

Mixed

Confined



	Pastoral	Mixed	Confined
Housing	**Pasture-based,** livestock shifted among pastures across seasons	**Pasture-based** in summer, **confinement** in winter	**Confinement** across seasons
Feedstock	**Fresh grass / hay**, no incremental concentrate / feed for livestock	**Crop land,** supplemented with concentrates to increase yield	**Mixed feed ration** (i.e. concentrates; forage; silage; etc.).
Share in global production	**~9%** of global milk production	**~81 of global milk production** (but strong regional variances)	**~10%** of global milk production
Example geographies	New Zealand Nomadic: Africa Sub-Saharan	European Union, Brazil	US, China, Mexico, European Union

Pastoral also referred to as grassland
Source: Institut national de la recherche agronomique

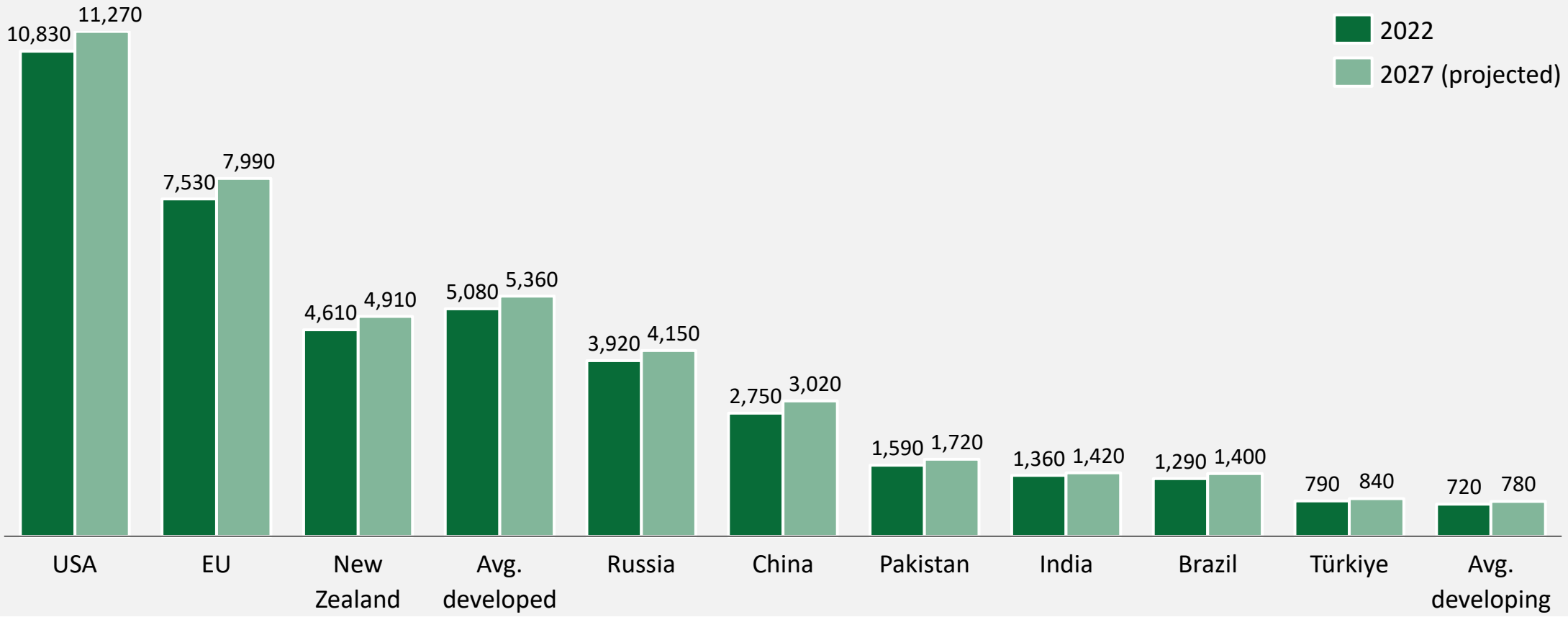
Significant regional specificities exist for dairy decarbonization

	Consolidated			Fragmented				Diverse	Data not available
Supplier dynamics[1]	US	NZ	China	EU	India	Pakistan	Brazil	Türkiye	Russia
Productivity (L/animal/year)[2]	~10,830	~4,610	~2,750	~7,530	~1,360	~1,590	~1,290	~790	~3,920
Carbon baseline (kg CO2e / kg FPCM)[3]	1-1.5	1-1.5	2-3	1-1.5	2-3	2-3	2-3	2-3	1-1.5

1. Producer landscape in the market; 2. Productivity = Average milk yields by region in t/animal/year (2022) 3. FPCM = Fat & Protein Corrected Milk, ranges derived from WFLDB values
Source: OECD-FAO Agricultural Outlook database, WFLDB, web research

Zoom: Productivity levels vary significantly by market

Current and projected average milk yields by market (L/animal/yr)



Productivity = Average milk yields by region in L/animal/year (2022 / 2027e)
Source: OECD-FAO Agricultural Outlook Database (2018-2027, last retrieved April 2024)

Detailed view on regional specificities available for download – see CGF Dairy Masterclass webpage

Significant regional specificities to be aware of for dairy decarbonization

	Supply dynamics[1]	Main archetype[2]	Productivity[3]	Production[4]	Trade[4]	Carbon baseline[8]	Regulatory environment
India	**Fragmented market** (significant # small-farmers)	**Pastoral & mixed**	1,360 L/animal/year	~230,000 kT	**Imports:** ~74 kT **Exports:** ~100 kT	2-3 kg CO2e / kg FPCM	• **Farm productivity & animal welfare schemes:** DIDF[5] & AHIDF[6] programs for equipment funding; RGM breeding program; LH&DC /NADCP disease control programs
Pakistan	**Fragmented market** (95% rural/semi-rural small-scale farmers)	**Pastoral & mixed**	1,590 L/animal/year	~65,000 kT	**Imports:** ~290 kT **Exports:** ~100 kT	2-3 kg CO2e / kg FPCM	• **ERS**[7]: Potential future Emission Trading Scheme inc. impact on agricultural sector • **Farm productivity & animal welfare schemes:** National Climate Change Policy inc. promotion of sust. food production systems
Türkiye	**Diverse market** (small-scale farmers, trend to consolidation)	**Pastoral & mixed**	790 L/animal/year	~21,000 kT	**Imports:** ~100 kT **Exports:** ~1000 kT	2-3 kg CO2e / kg FPCM	• **ERS**[7]: Potential future Emission Trading Pilot; EU pre-accession assistance project for transposition of EU ETS legislation to secondary legislation
Brazil	**Fragmented market** (~70% small-scale farmers, ~20% co-ops)	**Mixed**	1,290 L/animal/year	~35,000 kT	**Imports:** ~1,151 kT **Exports:** ~120 kT	2-3 kg CO2e / kg FPCM	• **Farm productivity & animal welfare schemes:** Embrapa program (Balde Cheio) providing technology & management tools to farmers
Russia	Data not available	Data not available	3,920 L/animal/year	~33,000 kT	**Imports:** ~3,500 kT **Exports:** ~400 kT	1-1.5 kg CO2e / kg FPCM	Data not available

1. Producer landscape in the market 2. Main archetype: Predominate use of X market archetypes, 3. Productivity = Average milk yields by region in L/animal/year (2022), 4. Estimated annual dairy production & trade in thousand tonnes milk equivalent (2022) 5. Animal Husbandry Infrastructure Development Fund 6. Dairy processing & Infrastructure Development Fund 7. Emission reduction schemes 8. FPCM = Fat and Protein Corrected Milk; ranges derived from WFLDB values

Source: Government & public institutions websites ; Reuters ; Euractiv; OECD-FAO Agricultural Outlook Database, FAO Dairy Market Review 2023, SDGs UN, Statista, FAO; WFLDB; BCG analysis

Significant regional specificities to be aware of for dairy decarbonization

	Supply dynamics[1]	Main archetype[2]	Productivity[3]	Production[4]	Trade[4]	Carbon baseline[9]	Regulatory environment
US	**Consolidated market** (dominated by Cooperatives)	**Confined & mixed**	~10,830 L/animal/year	~100,000 kT	**Imports:** ~2,400 kT **Exports:** ~14,000 kT	1-1.5 kg CO2e / kg FPCM	• **Carbon taxes:** Potential future regulations or permit fees from EPA on GHG from livestock • **ERS**[5] Inflation Reduction Act $20 B funding for climate programs; 2023 Farm Bill[6]
EU	**Fragmented market** (regional & national players)	**Mixed**	~7,530 L/animal/year	~160, 000 kT	**Imports:** ~3,400 kT **Exports:** ~23,000 kT	1-1.5 kg CO2e / kg FPCM	• **Carbon taxes:** EU Restoration Law, EU Nitrates Directive, Potential revision of IED[7], EU Emissions Trading Scheme, EU Farm to Fork • **ERS**[5]**:** Higher budget share dedicated to sust. project '23-'27 Common Agricultural Policy
NZ	**Consolidated market** (1 major Cooperative & few smaller players)	**Pastoral**	~4,610 L/animal/year	~21, 000 kT	**Imports:** ~180 kT **Exports:** ~19,000 kT	1-1.5 kg CO2e / kg FPCM	• **Carbon taxes:** Plan to tax livestock gas from 2025, NZ Emissions Trading Scheme[8] • Potential incentives for feed additives & tree planting
China	**Consolidated market** (Cooperatives set up promoted by gov.)	**Confined & mixed**	~2,750 L/animal/year	~40,000 kT	**Imports:** ~74 kT **Exports:** ~100 kT	2-3 kg CO2e / kg FPCM	• **ERS**[5]: Green Agricultural and Rural Revitalization Program for Results (Hubei & Hunan) • **Farm productivity & animal welfare schemes:** Plan for sust. utilization of farmland & control pollution; 5-year plan for green farming

1. Producer landscape in the market 2. Main archetype: Predominate use of X market archetypes, 3. Productivity = Average milk yields by region in t/animal/year (2022), 4. Estimated annual dairy production & trade in thousand tonnes milk equivalent (2022) 5. Emission reduction schemes 6. Advocacy for integration of Regen Ag support schemes 7. Industrial Emissions Directive 8. Emissions Trading Scheme not yet covering agricultural activities 9. FPCM = Fat and Protein Corrected Milk; ranges derived from WFLDB values

Sources: Government & public institutions websites ; Reuters ; Euractiv; OECD-FAO Agricultural Outlook Database, FAO Dairy Market Review 2023; FAO; USDA; WFLDB; BCG analysis,

Solutions

Key challenges to address for dairy decarbonization

Key decarbonization challenges across commodities

Large & fragmented supplier landscape

High degree of variability in system across regions

Limited awareness on **solutions available** (e.g., at farm level)

High upfront carbon reduction **costs**

Lack of financing for adoption of low-carbon and regen. practices

Short-term reduction in yield & farmer revenues

Speed and rate of adoption of best practices on farm

Lack of low-carbon technologies available at scale

Lack of accurate carbon data at farm level

Lack of measurability & common certifications

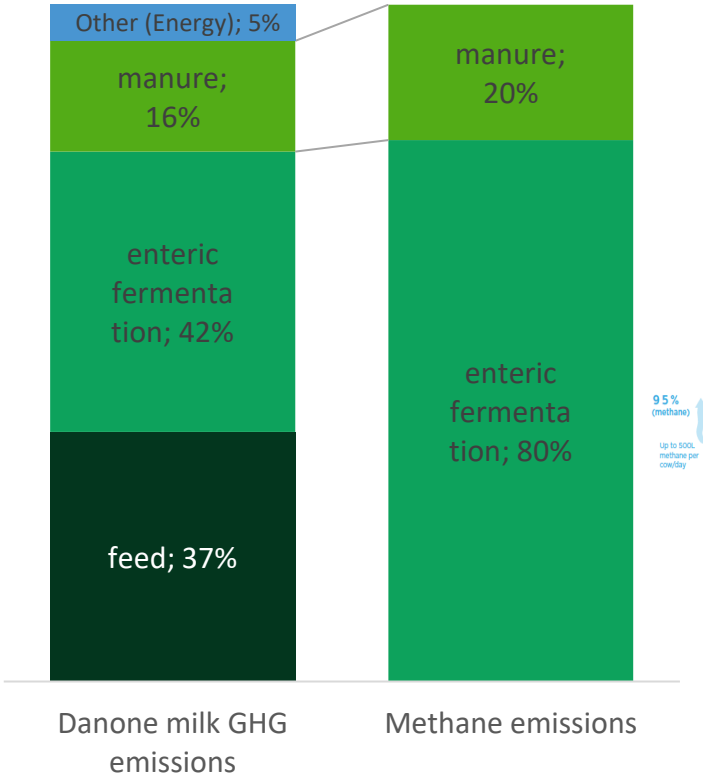
Lack of **unified and stable regulatory** & policy landscape

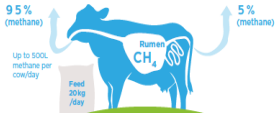
Strong dependency on Nature (land, climate)

Challenges with highest impact for dairy | Other applicable challenges

Optimising emissions at the source, supporting farmers resilience & focusing on efficiency & sustainable practices

WHERE DO EMISSIONS COME FROM ?





LEVERS FOR REDUCTION

EFFICIENCY

- HERD MANAGEMENT
- ANIMAL WELFARE
- FEED

REGENERATIVE PRACTICES

- MANURE
- SOIL
- WATER

IMPACT

- Secure access to milk ↑
- Yield ↑
- Competitiveness ↑ (Cost per litre ↓)
- CO2/ Methane per litre ↓

There are 6 key levers to address commodity decarbonization

Levers	Typical carbon reduction potential	Typical time to impact	Expected ROI for farmers (if ag commodity)
Herd management [e.g., herd productivity]	10-45%	2-6 years	High
Manure management [e.g., handling, storage]	5-25%	1-2 years	Medium
Animal feed [e.g., autonomy; DCF certified]	10-40%	1-3 years	High
Soil health for feed and crops [e.g., RegAg]	15-30%	Long term	Medium
Methane innovations [e.g., feed additives]	20–40%	1-2 years	Low
Other [e.g., energy & portfolio management]	2 – 10%	1-2 years	Low

Data table available – download via commodity captain webpage for full details

Applicability and impact of levers varies across farming systems

Levers	Small/low productive	Mid-sized extensive	Mid-large sized mixed farm	Large intensive	Full grazing	Example of relevant geography
Animal genetics	High	High	Medium	Low	High	EU; US; AMEA; LATAM
Animal productivity	High	High	Medium	Low	High	AMEA; LATAM
Animal feed (incl. DCF)	Medium	Medium	High	High	Medium	EU; LATAM; US
Manure management	Low	Low	High	High	Low	EU; US; LATAM transformation
Methane inno. (incl. feed additives)	Low	Low	High	High	Low	US; EU; LATAM
Soil health	Low	Low	High	High	High	US; EU; LATAM

Applicability: High, Medium, Low

Data table available – download via commodity captain webpage for full details

Multiple management practices for herd management

Feed management
e.g., nutrient optimisation

Reproduction management
e.g., early calves grouping

Cow heat stress & cow comfort
e.g. connected sensors

Multiple management practices for manure

Manure with no proper storage system

Closed storage for slurry and solid manure

Transformation i.e., Biodigester and manure spreading

From conventional practices to regenerative farming

Reconciling efficiency and resilience, from feed production to breeding / housing / milking to waste management

3 case studies to illustrate our dairy transformation journey

NORAM Reg Ag Program

Program aimed at improving soil health, carbon sequestration and crop yields and long-term farm resilience

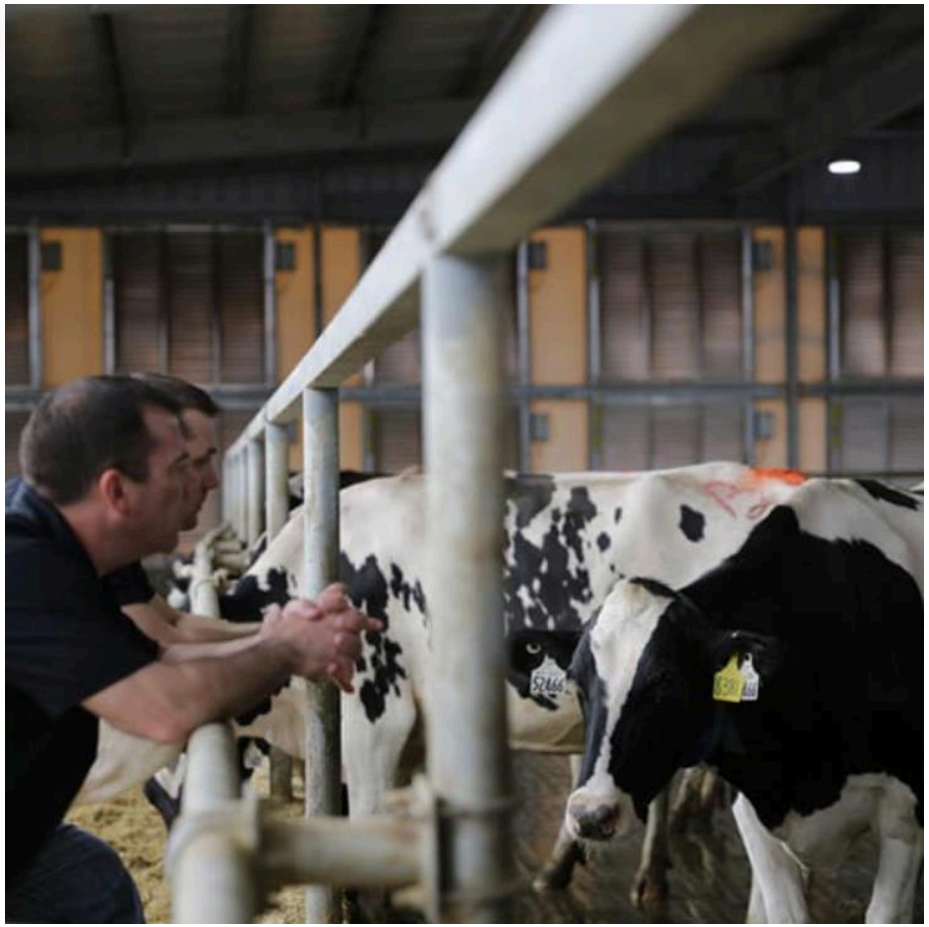
H'Lib Bladi, Morocco

Transitioning to sustainable milk production by empowering smallholder Moroccan dairy farmers

Low Methane Milk Belgium

Reducing Methane emissions through the introduction of a new ingredient to cattle feed

Case Study 1: NORAM Reg Ag Program



Objective: Launched in 2017, to improve soil health, carbon sequestration, crop yields and long-term farm resilience.

Scope:

- Dairy, Almonds & Soyabeans
- 50 farmer and grower partners
- 114,183 acres

Key Actions:

- Implementing no-till farming practices to minimize soil disturbance and help enrich soil biodiversity.
- Planting more than 20 cover crops species, from barley and oats to alfalfa and red clover, to improve soil health, slow erosion and attract pollinators.
- Establishing buffer zones to prevent contamination between certified organic production and non-organic land.
- Fostering on-farm biodiversity by conserving just over 1,700 acres of grassed waterways, buffer lands, forest and wetlands.

Results 2017 – 2022 (Note project scope adjusted from 2023):

- The program has arrived at over 98% enrollment for our direct fresh milk dairy supply and 90% total enrollment of almonds
- Reduced nearly 119,000 metric tons of carbon dioxide equivalent, sequestered more than 31,000 tons of carbon through regenerative soil health practices, and prevented more than 337,000 tons of soil from erosion, resulting in nearly $3.3 million in cost avoidance for farmer partners

Case Study 2: H’Lib Bladi, Morocco

Objective: In 2016, a coalition of partners launched the H’Lib Bladi project in Morocco aiming at promoting a sustainable milk production model amongst 10,000 smallholder dairy farmers through 3 pillars: social; environmental; economic.

Scope:

- Dairy
- 10,000 farms
- 149,808 acres

Key Actions:

- Social: farmer training; improving Milk Collection Centers, offering services to support farmers in their development.
- Economic: improve profitability and ensure a stable source of income for the farmers.
- Environmental: introducing RegAg practices to minimize the ecological impact of farming activities. & reducing GHG, goal to reduce by 30% by 2030.

Results:

- Phase 1 between 2016 and 2019: upgraded 30 MCC, 1600 farmers involved in project
- Phase 2 from 2023 to 2026: upgrade 170 MCCs and extend to 10,000 farmers.

Case Study 3: Low Methane Milk Belgium

Objective: To reduce enteric Methane emissions from cows through adding feed additive Bovaer (DSM) into the feed ration.

Scope:

- Dairy farms
- 2023: 25% of milk collection volume
- 2024: 50% of milk collection volume

What can be achieved per year:

- 34% reduction of Methane associated per cow.
- 12% reduction CO2 eq. per farm

Main challenges/learnings:

- Changing farmer mindset
- 50% government subsidy for Bovaer in Belgium, but farmer has to pay this up front, ahead of receiving government subsidy in April

How we can engage our suppliers & farmers

Direct Sourcing

- Proximity with farmers with dedicated local teams (& Collection centers)
- Benchmarking & Showcasing best practices, from farmers to farmers
- Trainings (collective/individual)
- Building long-term contracts, sharing risks
- Supporting with access to finance

Indirect Sourcing

- SDP (Sustainable Dairy Partnership) as pre-competitive sustainability engagement framework
- Decarbonisation targets part of contracts with Dairy processors
- Invest in on the ground projects

Call to Action

Align Best Practices

1. GHG accounting methodologies and Regen Ag framework
2. Shared purpose, vision and way of working with farmers & suppliers

Bring about collective effort

Work together on implementation & unlocking barriers by pooling our resources i.e. collective expertise; financing mechanisms…

Get WoW organised!

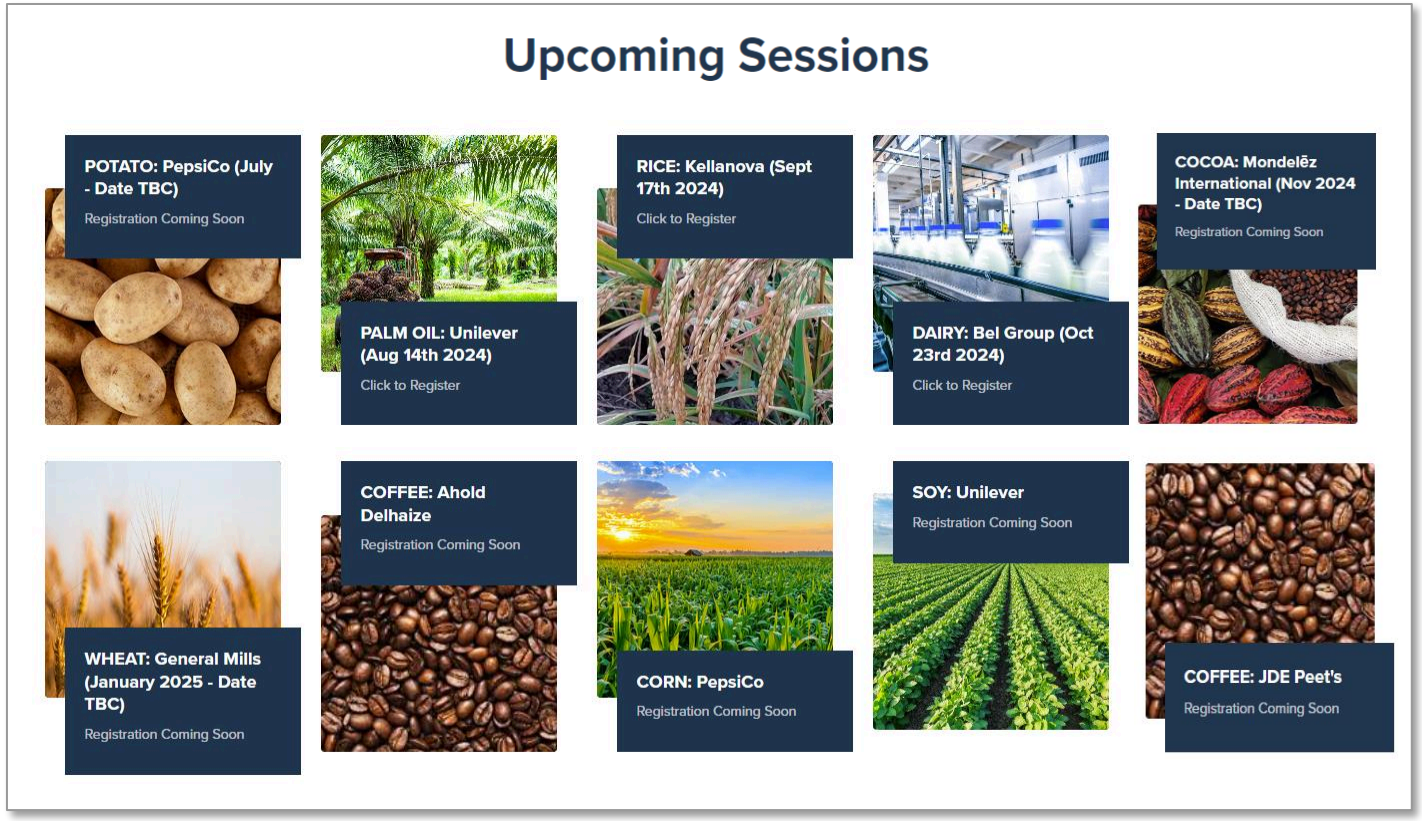
Time to reflect on our own organisational structures.

Are our own organisations fit for scaling solutions? (obj, governance, finance)


Time for your questions

Next masterclasses in series

Stay tuned for our next masterclasses



All information and resources available on CGF website: HERE

Thank you