



Scottish Dairy Supply Chain Map



About This Sector

DEFINITION

- The dairy supply chain involves feed mills, agricultural merchants, dairy equipment suppliers, vets, dairy farmers and milk processors
- Farmers and processors align themselves in different committed milk pools
- Outputs include fresh liquid milk, cream and other further processed dairy products, e.g., cheese, yoghurt and butter

MAIN ACTIVITIES

- Breeding/rearing dairy heifers
- Milk forecasting/planning
- Calving
- Milking
- Milk cooling and farm storage
- Milk pool logistics and collection
- Processing (e.g., pasteurisation, sterilisation, homogenisation, ultra-heat treatment and cheese making etc.)
- Packing, storage and distribution

SOME MAJOR PLAYERS

- Milk buying and processing in Scotland: Arla UK, Dale Farm (Rowan Glen), First Milk (for Nestle and McQueens), Graham's Dairies, Lactalis and Muller
- Other major UK milk buyers sourcing from Scotland: First Milk (mostly for their Aspatricia creamery) and Yew Tree Dairy

Scottish Dairy Supply Chain

Key External Drivers

Animal feed prices

Animal health and welfare consciousness

Real household disposable income

Global milk output

Balance of power in the supply chain

Exchange rates

Retail demand for dairy produce

2nd Tier Suppliers

Farmers growing cereals for animal feed

Blenders and compounders

Animal feed merchants

Other dairy inputs, vets and advisory services

Dairy Production in The UK

Breeding and rearing dairy heifers

Planning and milk forecasting

Milk production, cooling and farm storage

Transport/logistics and milk collection

Milk Processing

Milk testing and pasteurisation

Homogenisation and bottling for the liquid market

Further processing for added value products

2nd Tier Buyers

UK retailers

UK food processors

UK food service and catering sector

Exports

Key Facts and Figures



There are **~794** milking herds in Scotland in 2023 (down **10** from 2022) with average herd size of **227**



GB has **~7.5k** producers, with **1.63m** cows in the milking herd. Milk production for 2022 was **12.4bn** litres down **0.5%** on 2021



Scottish produce is considered fresher and beneficial for the local economy



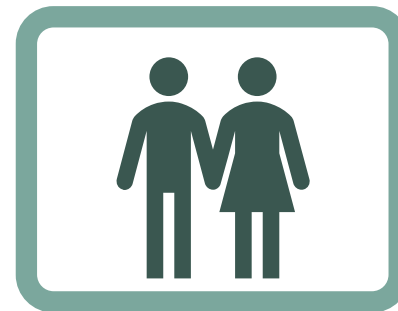
Scotland produces **~1.5bn** litres of milk per year



Cows officially milk recorded in Scotland are **72%** of the dairy cow population



43% of the volume is used for liquid milk sales and **35%** for cheese making



~4.6k people work in the sector



Imports are expected to satisfy **~40%** of UK demand for cheese and butter; **52%** yoghurts and other dairy products; **3%** milk and cream

Dairy Production Process

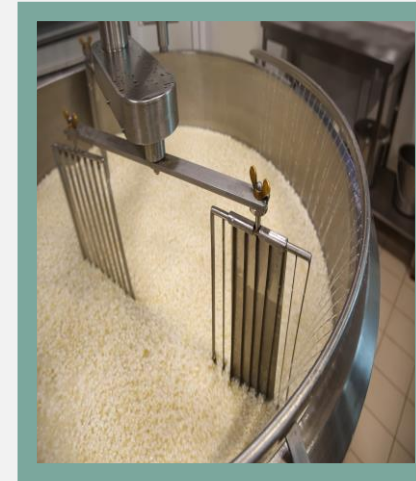
On Farm

Birth of calf initiates milk production (1/year). Milk is produced, cooled and stored on farm for regular collection. A small % can be used or processed on farm



Liquid Processing

Liquid milk is centrifuged to remove cream prior to creating whole, semi-skimmed, skimmed milk and cream. Homogenisation prevents cream rising to the top



Markets

Food processors, wholesalers, retailers, food service and catering industry

Pre-Processing

Milk is tested, pasteurised, sterilised and cooled and is then used to supply two main outputs as liquid milk, or other dairy produce. Raw milk needs to be processed within 72 hrs



Cheese Processing

Friendly bacteria cultures and rennet are added to set the milk, whey is removed, and curds are formed prior to maturation to produce mild, medium and mature cheese



Primary Production



Dairy Farming

- According to the 2023 Agri Census, there are ~264,093 female dairy cattle in Scotland, most of which are over 2 years old with offspring. No change compared to the total 5-year average
- Scotland has 12.6% of the UK's dairy cattle holdings with 596 dairy specialist holdings
- SW Dumfries and Galloway has the larger number of dairy holdings (503), followed by SW Ayrshire (320), which matches the largest numbers of female dairy cattle per holding
- Despite the herd size reducing by 100k head in the UK, the overall production is up 26m litres pa, with the average yield per cow increasing by 57 litres pa
- Scottish output was estimated at 1.51 bn litres in 2020. 18% (~270m litres) of the milk produced is sent south to England and Wales
- In the UK the average milk yield/cow/year (2022) is 8,169 litres, ~9.3% more than 10 years ago
- The average herd size stands at 227 cows/holding

Primary Production



Dairy Farming

- Ayrshire saw the biggest decrease with a net loss of six herds followed by Dumfriesshire with a net loss of six herds, but there was a net increase of six herds in Aberdeenshire and Wigtownshire
- Milk production in Scotland is worth £377m
- Dairy cattle sales (especially at auctions) are a small part of total industry revenue (~5%) but are vital for breeding the next generation of cattle
- Farmers also generate revenue by selling off dairy cattle to other farms. Dairy farmers purchase young cattle to raise their production capacity or support breeding
- The main production systems are spring block calving, All Year Round (AYR), or autumn block calving. In 2023, 51% of the calving in the UK was through a non-defined system; 31% in AYR; 5% spring; 5% autumn; 4% dual block; 4% other block
- In Scotland, most herds are AYR calving
- The most common dairy breeds are Holstein, Friesian and Jersey. Other breeds include Crossbreed, Ayrshire, Guernsey and Swiss Brown
- The largest feed input for dairy cows is grass – grazed or as grass silage

Milk Processing

- Raw milk is collected and sold to be pasteurised, killing dangerous bacteria, so it is safe for direct consumption by consumers; a small number of farmers sell raw milk directly to consumers.
- In Scotland ~40% of milk supplies the liquid milk market and ~40% is processed into cheese. The remainder goes into other added value products
- In the UK, 57.4% of milk is sent to private dairies; 34.9% to co-operative processing; 6.5% to POs; and 1.2% direct to consumers
- Five major processors account for 94% of milk collection
- McQueen's and Muller focus on liquid milk. Graham's produces liquid milk and other further processed dairy products
- Graham's and Muller mainly supply the retail market, while McQueen's specialises in doorstep deliveries. Lactalis focuses on the cheddar cheese market. Arla produces cheddar cheese and other dairy products
- In the UK, 43% of the milk produced is marketed for liquid milk consumption, 35% for cheese, 3% for butter, 6% for milk powder, 3% for yoghurt, 2% for cream and 7% for other dairy products (AHDB)
- In the UK, 47.9% of milk produced is semi skimmed; 19.3% whole; 9.7% cream, 8% flavoured; 9.1% skimmed milk; 5.5% condensed and 0.5% other
- In 2021-22 the UK produced 6,069k t of liquid milk (05% down on 2020-21), 211k t of butter (3.9% increase) and 505k t of cheese (1.5% increase)
- Food manufacturers purchase large quantities of dairy products (liquid milk and cream) for processing into confectionery, chocolate and desserts



Liquid Milk

Processing

- Dairy product manufacture in Scotland is worth £415m
- The majority of milk used for processing is turned into cheese. According to Dairy UK, there are more than 700 different named cheeses in the UK
- There are 18 British cheeses protected under the GI (Geographical Indication) Scheme
- Other dairy products are yoghurt, crème fraiche, sour cream, milk-based soft drinks, yoghurt drinks and whey
- In the UK, flavored yogurt (40.5%), milk powder (22.9%), plain yogurt (23.1%), whey (9.6%) are the most important products for the dairy processing sector
- Main Scottish manufacturers are: Lactalis (cheese), ARLA UK (cheese, butter, yogurt), Graham's (butter) and Nestle (chocolate crumbs, ingredients)
- First Milk is the second largest farmer-owned dairy business in the UK (>800 members) and is a cheddar cheese specialist
- For butter and cheese production in the UK, cheddar accounts for 34.4% of revenue, butter and dairy spreads for 23.6%, unripened cheese 20.7%, other cheese 16.5% and processed cheese 4.5%
- In Scotland cheddar is by far the most popular cheese consumed followed by other regional/locally produced cheese
- Scotland has four international cheddar brands and ten artisan cheesemakers exporting product
- Scotland has cheese varieties reflecting differences in culture, tradition and terroir. These include Dunlop, Lanark Blue, Crowdie and Orkney butter



**Other Dairy
Products**

Markets

- 18% (~270m litres) of the 1.51bn litres of milk produced in Scotland is sent to England and Wales
- Scotland accounts for 12.5% of dairy cattle raising establishments
- Customers spend £1.1bn pa on dairy products in Scotland
- Scottish dairy sales for milk and fresh milk in 2023 increased by ~8% in value but decreased in volume
- Many of UK popular cheeses e.g., halloumi and feta have protected origin status and are imported from the EU
- Regional dairy products have a strong presence in Scottish shops, competing in all the major categories in retail with both branded and own-label offerings
- Retailers have the largest UK market share for milk and cream (68.2%), followed by foodservice operators (15.8%), food processors (12.1%) and household deliveries (3.9%)
- Milk is used as an ingredient in a lot of different foods, meaning the number of food processors seeking milk and cream from processors is huge. This makes this market segment highly fragmented
- The dairy industry's bestselling product is milk for processing, accounting for 53.4% of revenue



**Scotland, UK
and Exports**

Markets

- The UK average farm-gate milk price for January 2024 is 37.68 pence per litre (ppl). This represents a 0.6% (0.24 ppl) decrease on December 2023 and a 24% decrease on the same month last year
- For cheese and butter, retailers also have the largest market share (68.9%), followed by foodservice (14.3%), food processors (12.8%) and wholesale (4%)
- Cheddar dominates the global cheese market. Its low cost and familiarity drive consumer preference, limiting the success of other types of cheese
- For yoghurt and other dairy products, retail is the biggest market (62.4%), followed by food manufacturing (19.7%), food service (11.5%) and wholesale (6.4%)
- Total Scottish sale of cheese (excl. discounters) in 2022-23 represented £261.6m, up 9.5% on previous year
- Scottish dairy exports in 2019/20 were valued at £57 million. Cheese dominates its global dairy trade



**Scotland, UK
and Exports**

Markets

- In 2023 the best performing sub-category of cheese was grated increasing both volume and value sales
- Imports are high but decreasing, especially foreign cheeses. Exports are high but also decreasing due to the impact of Brexit, although the UK is trying to diversify markets
- AHDB reported an 11% increase in dairy product imports in 2021-22 as supply chain disruption caused by COVID eased in Ireland and other major importers to the UK
- In 2022, the export volumes of milk and cream products saw a significant surge from 2021 levels, showing the largest increase compared to other dairy exports
- 20k t of butter, 392k t of milk and cream and 43k t of milk powder and condensed milk were exported



**Scotland, UK
and Exports**

- Dairy farms are becoming larger, with more advanced technology, automation (e.g., robotic milking) and innovation in genetics, breeding and husbandry
- Many dairy farms are family-owned operations, with many making up for their small size by joining cooperatives and producer organisations
- Many private dairies buy their raw milk directly from farms and rely on producer organisations. As producer organisations become more commonplace, private dairies are expected to lose buying power
- Compared to 2022, GB dairy producer numbers have reduced by 8% as of April 2023
- UK production of liquid milk reduced by 0.5% in 2023, but butter increased 4% and cheese 2%
- The cheesemaking industry is more fragmented than butter



Sector Trends

- There is increasing interest in breeding to improve butterfat and protein content for milk buyers that are processing milk into dairy products
- In the UK market, interest and sales in Scottish dairy are more restricted with liquid milk, cheese, yoghurts and ice cream the main players
- Milk prices are expected to remain volatile
- Consumers are interested in animal welfare and product provenance
- UK organic milk production as a percentage of total milk fell from 4% in 2021 to 3% in 2022
- The growing popularity of alternative types of milk, like almond and soy milk, is also expected to eat into revenue
- Retail spend on dairy products increased by 9.4% in 2023
- 43% of Scottish consumers are willing to pay a premium for Scottish produce dairy



- For the cheese and butter sectors prices surged a further 43.7% in 2022-23 as inflationary pressures increased costs for dairy farmers
- Cheese and butter volume sales have dropped as consumers have reacted to the price rises, but the popularity of butter and cheese means that revenue has risen nonetheless
- The AHDB reports that in 2022-23, the retail volume of cream sales dropped by 8%, as all cream categories experienced a decline. This coincides with an average price increase of 11.6%, which, along with heightened health consciousness, has discouraged consumer purchases
- Scotland has a higher preference for dairy spreads compared to the rest of the UK
- Cottage cheese has become more popular over recent years because of its low-calorie content and high level of protein, making it an appealing choice for health-conscious consumers
- Yogurt processors have benefited from growing health consciousness, as demand for natural yoghurt-style products has also risen

Sector Trends



- Retailers are importing yoghurt products from countries like Greece, Turkey and Eastern European countries to meet demand, often promoting them as premium products
- Whey is a crucial ingredient in many popular protein supplements. Swelling sales of protein supplements and functional foods, driven by growing gym memberships and activity levels, are driving up whey sales
- Innovation is mostly carried out by bigger players producing nutrient-enriched and flavored milk products
- Increasing consumer health consciousness has led to a rise in low-fat dairy products, low sugar, or dairy alternatives
- A push towards sustainability will continue to be an essential trend for dairy food producers over the next few years as consumers become more environmentally conscious
- Supermarkets are expanding their own label ranges. 2022 saw a 33% increase in own label dairy product purchasing



SWOT Analysis

STRENGTHS

- Good climate, location, geography and milking practices
- Established and well-connected supply chain with good connectivity
- High number of farmers milk recording
- Sophisticated network of technical and managerial support available for producers
- Milk's status as a "staple product" ~96% of adults in the UK buy milk
- Resilience and growing global demand for dairy products
- Success of branded Scottish cheddar offers concrete proof of interest in Scottish brands
- Medicine Hub (developed by AHDB)

WEAKNESSES

- The organic market is challenging at the moment due to the cost-of-living crisis
- Scotland's market opportunities are mostly limited to cheddar and liquid milk
- Exclusive nature of milk contracts deters innovation in the milk field
- Overly reliant on UK retail and foodservice, which has commoditised sales
- Strong competition with other UK, Irish and European regional products and brands
- Increasing purchase costs, including packaging material (carton, bottles and other containers)
- Highly volatile milk prices

SWOT Analysis

OPPORTUNITIES

- High appetite for Scottish cheese and butter products nationally and internationally
- Inward investment in milk processing capacity and innovation
- Digital revolution (use of digital tags, sensors on cows and blockchain technologies) could improve supply chain efficiencies
- Longer shelf life of milk powder means its exports are less euro-centric. Developing economies in the Middle East and Africa are likely to become more significant future buyers of milk powder
- Companies that can show their environmental credentials by adopting sustainable packaging options, using local suppliers and implementing environmentally friendly production practices will be rewarded
- New export opportunities for Scottish dairy brands and products
- Making Scottish dairy products available to target the foodservice market
- Food tourism for the dairy sector alongside other iconic products (PGI and PDO products)
- 82% of Scottish people would like to buy more Scottish products/cheese

THREATS

- Reputational damage caused by individual farmers' bad practices
- Lack of young people attracted to work on dairy farms
- Increasing costs of feed, fertiliser and other inputs (energy, fuel, transport and storage)
- Health consciousness, animal welfare concerns and changing consumer taste has challenged industry operators
- Milk consumption is expected to decline in 2022-23 with highly flavoured/sugared yogurt and butter products are also in decline
- End of EU support, new subsidies scheme
- Barriers for new entrants: high level of competition, regulation and start-up costs
- Decrease in the domestic price of milk
- Increase in popularity of vegetable milk alternatives

Sustainability

ENVIRONMENT

- The sector will have to work on developing integrated approaches to tackling climate change, including better land use, efficient use of water and biodiversity
- Need to reduce rates of antibiotic use
- Advances in treatment of wastewater from creameries
- Cleaning technology in manufacturing machines, with built-in techniques to decrease the need for water, produce less waste and take less time to clean
- Appropriate climate conditions for grass to grow

SOCIAL/PEOPLE

- Pool of workers available is limited due to new immigration laws and automation is not always possible for small producers or those farms using grazing systems
- Provenance is becoming an important issue for consumers who are interested in the geographic origin



ECONOMIC

- The sector will need to ensure the annual supply profile is closely aligned to market demand, avoiding oversupply
- The industry is heavily dependent on the farm gate price of milk. Dairy cattle operators can only increase profit either by raising prices or decreasing production cost via technological innovation
- Better farmer understanding of milk contracts regarding milk composition, volumes, price, etc. to maximise returns
- Proactive health and welfare management of the herd will ensure optimum return, drive efficiency for the farmer and deliver consumer support
- Exports are likely to take a long time to recover from the fall caused by Brexit
- Greater need for farmers to pass on volatility in their input costs to be in a better position to protect their profit margins
- Greater use of fixed-price and long-term sales contracts to insulate from price volatility
- 2020-21 has been characterised by low milk prices and a fall in support in payments
- Difficulty in passing increased costs along the supply chain
- Ability to innovate and expand ranges to include cheeses traditionally associated with other countries

Sustainability



Sustainable Credentials/Activities Along the Dairy Supply Chain

	Research and Training	Dairy Farms	Primary Processing	Secondary Processing/Added Value	Retail/Industry/Gov
<p>Economic</p> <p>Environmental</p> <p>Social</p>	"Strength in Places" project (SRUC)- platform for business and research in innovation	Sustainable Agriculture Capital Grant Scheme- Scot Gov for spreading and slurry covers	Cleaning technology in manufacturing machines to decrease water use	Graham Family Dairy plan for a low carbon heat project for its cheese production facility	Lactalis is part of the UK Plastic Pack Initiative by WRAP and has other sustainable packaging and packaging reduction initiatives in place
	Dairy Parasite Project-surveillance programme (Glasgow University)	LEAF Assurance focusing on enabling more circular farming through regenerative practices	First Milk co-op pledge to achieve net zero by 2040 with a target to reduce carbon footprint at farm level by 50% by 2030 and achieve net zero in transport and processing by 2035	Lactalis is part of the "Stronger Together" initiative to stop forced labour and exploitation across the supply chain	Dairy farmers are members of Red Tractor
	"Reduction of Antibiotic Use in Dairy Farms" – started as SRUC/KTIF project, Lactalis also has one in place	"Digitally Dairy" project- use of sensors and data from dairy herds and how it can be utilised to produce more, and better, dairy products		Lactalis "Sourcing Standard" for local procurement of milk	ARLA's "Bee Pollinator" project, ARLA Garden. ARLA UK 360 Programme
	Digital Dairy Chain Project	Grant for initiatives to help faming business better understand GHG emissions- Scot Gov/FAS		First Milk regenerative brand platform and regenerative farming programme	Muller Direct initiative for health and welfare and support of British Athletics Championship
	Creation of the Dairy Sector Climate Change Group	National Test Programme: preparing for sustainable farming grant for activities that will improve awareness of climate performance		Mullers commitment to ethical sourcing of raw material	'Find me a Milkman' or 'Milkman of the Year' initiatives
	Standardisation of carbon footprint data collection, streamlined energy and carbon reporting (SECR)			Lactalis is a FareShare member- donating unused food to charities to tackle waste	

Scottish Dairy Chain

QA, Policy, Regulation
Red Tractor, RSPCA, FSS,
Milk contracts, DTAS,
AHDB, Dairy Products
Hygiene Reg, Animal
Welfare Act, Welfare of
Farmed Animals Reg
2007, The Code of
Recommendations for
the Welfare of Livestock,
The Food Act 2015,
Condensed and Dried
Milk Reg 2015, Dairy
Transport Assurance
Schemes, PGI

Research Institutes
SRUC, RVSC, Hannah

Trade Bodies
DEFRA, Dairy UK,
AHDB, Dairy Hub, FDF

Primary Production

Breeding,
calving
rearing and
milking

Primary Processing

Chilling,
pasteurising,
homogenising
and processing
into other dairy
products but
liquid milk

Secondary Processing

Addition of
cultives, whey
removal or
maturing for
cheese

Markets

Retail, food
service and
food
processors

Local, UK and
exports

Increasing milk
recording on farm

Good network of
technical support for
farmers

Increasing interest in
Scottish dairy brand

Supply Chain Opportunities

Little flexibility
for milk
contracts
Increasing
production
costs

Little further
processing
options,
including no
milk powder
production
facility

Increasing
consumer
health and
misinformation
about dairy
products

Supply Chain Issues



References

June Agricultural Census, 2023

Dairy Herd Statistics

Milk and Cream Production in the UK, 2023

Butter and Cheese Production in the UK, 2023

Yogurt and Other Dairy Product Processing in the UK, 2023

Dairy Cattle Raising in the UK, 2023

Cheese Deep Dive Report: GB Retail, 2023

Dairy Sector report: GB Retail, 2024

[Dairy Market Information | AHDB](#)

[Latest UK Milk Prices and Composition of Milk - GOV.UK \(www.gov.uk\)](#)

[UK Milk Yield | AHDB](#)

Scottish Government

Scottish Dairy Cattle Association

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