NEW ZEALAND
TRADE & ENTERPRISE
Te Taurapa Tūhono

THAILAND DAIRY PRODUCTION LANDSCAPE

Market Landscape

ANTHONY CHEUNG | JANUARY 2024

About this report

Background

This report has been prepared by NZTE's East Asia Market Research Team with the aim of presenting a comprehensive view of Thailand's dairy production landscape, including challenges and potential opportunities of the industry.

Methodology

The findings presented in this research are sourced from an extensive body of scientific and medical research.

Data provided are primarily from Office of Agricultural Economics, Department of Livestock Development, Food and Agriculture Organization.

Definitions

Dairy cows include milking cows and cows that are not currently lactating.

Milking cows are defined as cows that are milked on a regular basis.

Limitations

All findings in this report are intended for informative purposes only and should not be considered as professional advice.

The research is subject to limitations and ongoing advancements in the respective fields of study. Readers are encouraged to verify the information from professionals and to exercise their judgment in assessing its applicability to individual circumstances.

Contents

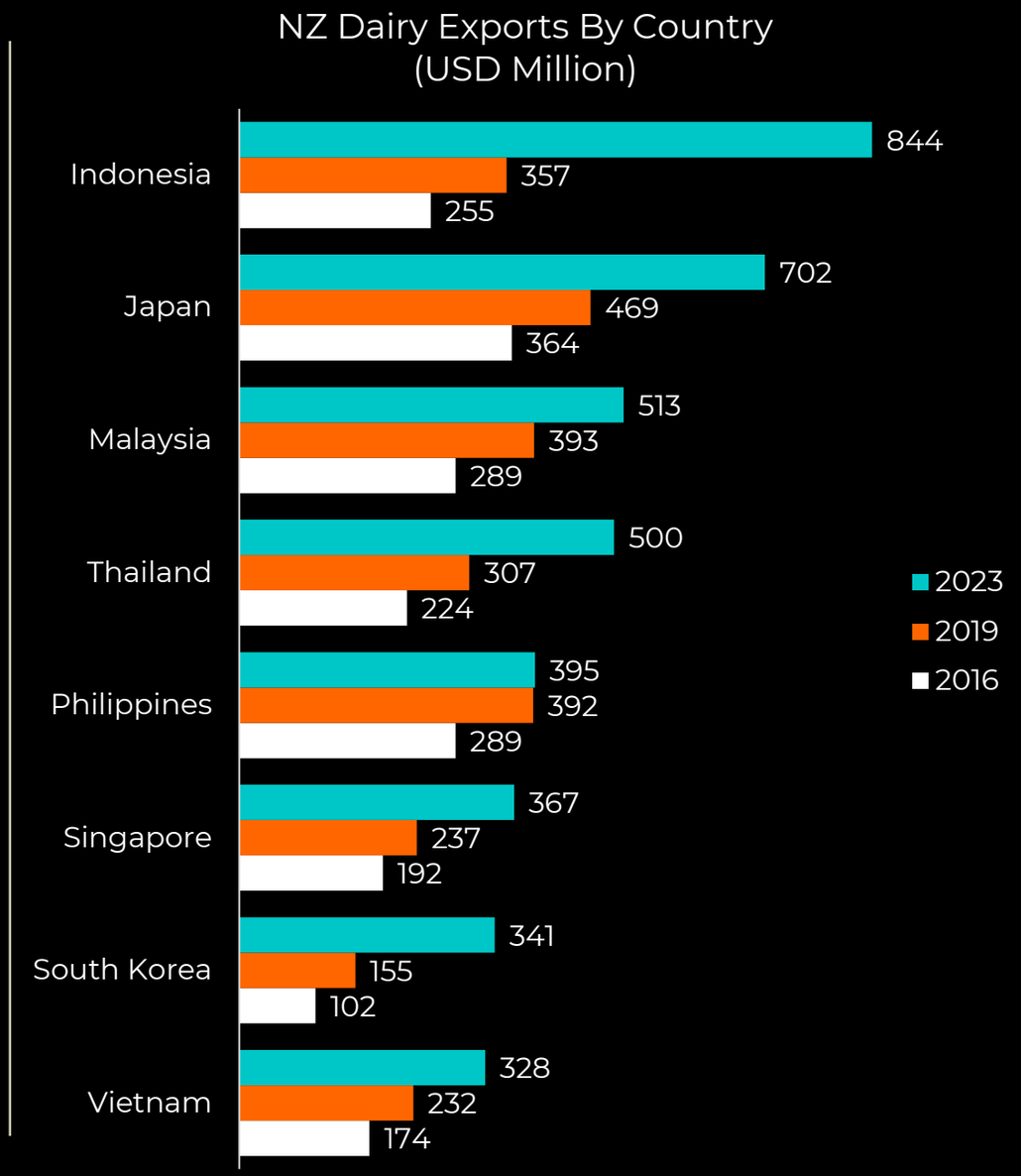
SECTION 1

SECTOR OVERVIEW

Thailand Snapshot

New Zealand's Dairy Products Hold Significant Influence In Thailand

- New Zealand food and beverage products are sought after in Thailand, where New Zealand consistently ranks top in consumer preferences.
- Thailand is New Zealand's 10th largest export market, and 8th largest import market. New Zealand dairy exports to Thailand grew at 5-Year CAGR of 14% between 2018 to 2023.
- In 2040, Thai consumers are expected to raise their yearly milk intake from 31kg in 2022 to 54kg
- Thailand is currently ASEAN's largest milk exporter and aims to develop into a regional export hub for UHT and ready-to-drink dairy products.
- Thailand is also the world's second-largest exporter of flavoured UHT milk-based drinks, relying predominantly on imported dairy products, with a significant portion sourced from New Zealand.
- From 1st January 2025, the last two tariffs under the 2005 (TNZCEP), including skim milk powder and liquid cream will be removed. Further growth is poised for New Zealand dairy exporters.



Source: NZStats, MFAT Market Intelligence Report Thailand
Note: NZ dairy exports are as of year ended September 2023. USD/NZD 1.58
Dairy exports to Indonesia's surged in 2023 due to an outbreak of Foot and Mouth Disease (FMD)

SECTION 1

Overview Dairy Sector

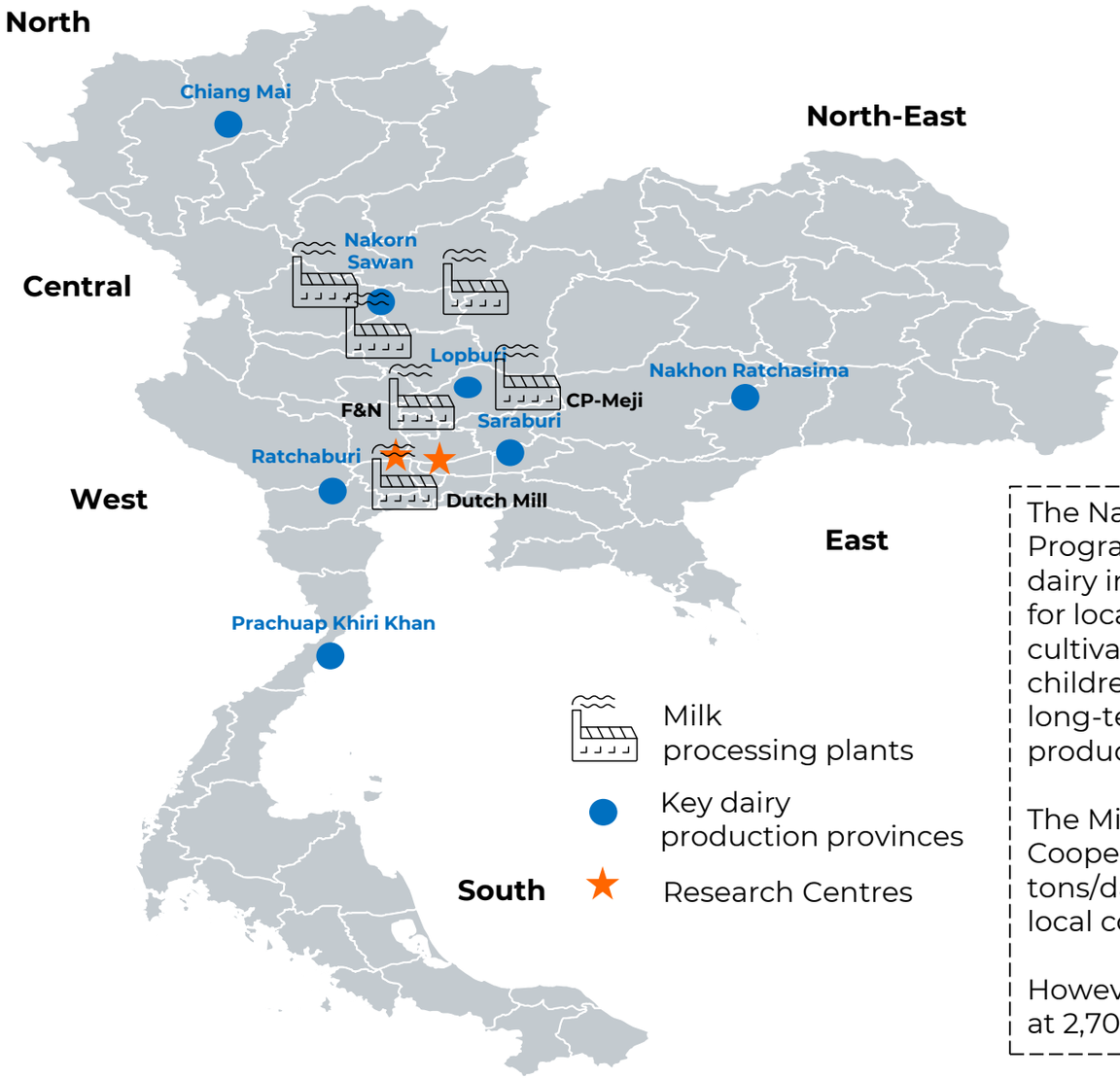
Thailand's dairy industry mainly consists of small farms and relies on importing skim milk powder for further processing into finished products.

Although dairy farmers are dispersed nationwide, greater density of production is located in the northern, central and western regions.

As a highly prioritised industry, the Thai government plans to uplift the entire value chain, from dairy farms, milk collection centres and milk processing plants.

Further support from the government is expected for dairy farmers as the country aims to be self-sufficient in its domestic supply and transform into a production hub for high value milk products.

Key Provinces for Dairy Production



The National School Milk Programme aims to develop the dairy industry by creating a market for locally produced milk, while also cultivating a taste for milk among children which could translate into long-term demand for dairy products.

The Ministry of Agriculture and Cooperatives estimates that 3,100 tons/day of raw milk is required for local consumption and processing.

However, local production stands at 2,700 tons/.day.

Source: Dairy Global, Office of Agricultural Economics, Department of Livestock Development, The Ministry of Agriculture and Cooperatives
Note: Locations indicated on the map are for illustrative purposes and are not drawn to scale

Dairy Value Chain

As of 2022, there are over 24,000 dairy farms, 162 milk collection centres and 130 milk processing plants.

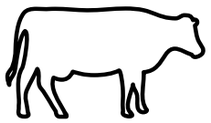
Most small-scale dairy farmers (<14 milking cows) deliver raw milk to nearby collection centres, which is then sent to processing plants.

Most of the the country's milk processing are handled by MNCs such as CP Meiji, Nestle, Friesland Campina Thailand, The Thai Dairy Industry, and Dutch Mill, located in the central region.

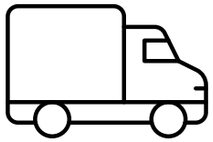
They are also the largest importers of dairy products, the majority of which comes from New Zealand.

These are further processed to finished dairy products destined for domestic and overseas market.

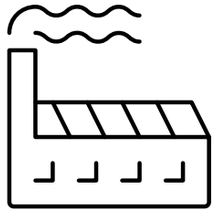
Dairy Value Chain and Markets



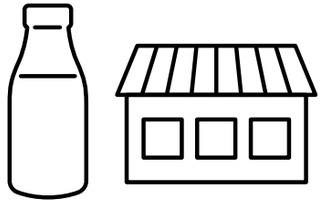
24,000 Dairy Farms
Strengthen farmers and organizations capability



162 Milk Collection Centres
Elevate Thailand's dairy industry to global standards



130 Milk Processing Plants
Thailand aims to be a regional export hub for UHT and ready-to-drink dairy products.



Distribution
1,375 kilo tons of milk production per year[1]

85%

Domestic Market
- Pasteurized / UHT milk
- Other dairy products

15%

Export Market
- Milk cream
- Ice cream
- Skim and whole milk powder
- Condensed milk
- Condensed creamer
- Drinking yogurt
- Yogurt
- Butter

Imported Products
- Milk cream
- Skim milk powder
- Whole milk powder
- Whey powder
- Sweet butter milk powder
- Butter oil

Source: Dairy Global, Office of Agricultural Economics, Department of Livestock Development, USDA
Note: Milk production as of 2021 [1]

Dairy Production

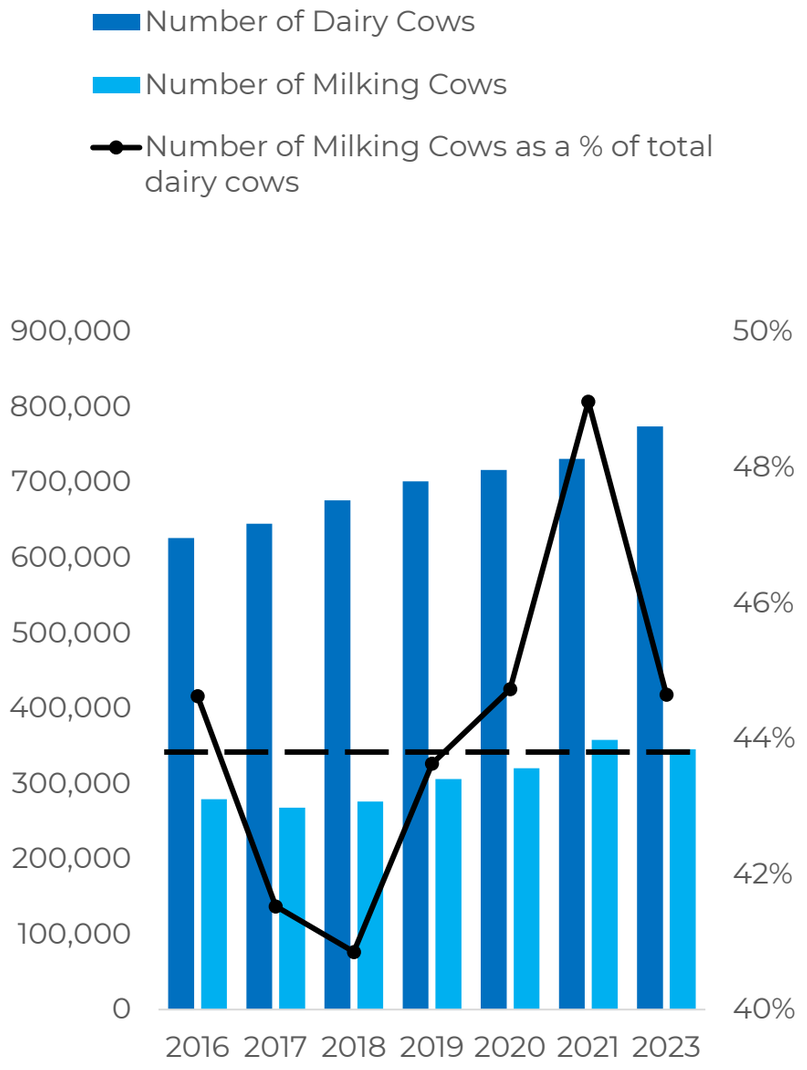
Although the number of dairy cows rose to a high of 731,527 in 2021, milking cows only represent 44% (301,439) of total dairy cows on average.

Despite an uptick in the number of milking cows between 2019 and 2021, annual production per milking cow is on a downwards trend due to increased production costs from feed and fuel prices.

Production costs are driven by fundamental issues such as:

- Feed costs
- Poor nutritional intake
- Lack of good dairy farming practices (GDFP)
- Environmental issues (heat)
- Outbreak of diseases

Dairy Production



Source: Dairy Global, Office of Agricultural Economics, Department of Livestock Development, USDA

SECTION 2

SECTOR CHALLENGES

Feed Costs

Thailand's animal feed industry is led by dominant local companies such as Charoen Pokphand (CP Group), Betagro and Thai Foods Group.

With a vertically integrated supply chain, these companies have significant pricing power.

Incremental costs from fluctuations in feed prices, influenced by global commodity markets and weather conditions are often pass on to dairy farmers.

Consequently, dairy farmers are forced out of business or opt for subtitutes of feed.

Animal feed comprises ~70% of total operational expenses, posing a challenge for dairy farmers to remain in business

Source: Journal of Applied Animal Research

SECTION 2

Poor Nutritional Intake

Poor nutritional intake due to the lack of quantity and quality of feed has a significant impact on the milking and breeding cycle of dairy cows.

Furthermore, it reduces production volume, quality and safety of its milk.

Due to limited green forage and rising feed prices, farmers are forced to use crop by-products[1] and Agro-industrial wastes[2], despite its low nutritive value.

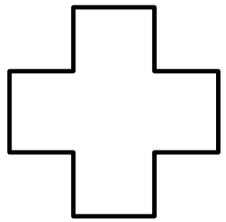
While these by-products could be physically and chemically processed to improve its nutritional value, farmers lack access to capital and specialized equipment.

Nutritional value and prices of forage sources for dairy cows in Thailand

Type of forage		Dry Matter (%)	Crude Protein (%)	TDN (%)	Ether Extract (%)	USD/Ton (2021)
Typical Forage	Rice Straw	90.2	5.2	57.7	0.1	84.0
	Corn Husk	22.3	6.2	59.1	1.1	136.0
	Corn Silage	25.6	8.4	59.1	1.0	165.5
None-Forage Fibre Source	Palm Oil Sludge	23.5	15.4	9.9	43.4	64.5
	Cassava-ethanol by product	22.7	12.0	70.7	1.9	106.7
	Cassava Pulp	14.5	2.4	72.1	0.1	167.5
High-Quality Forage	Alfalfa Hay	90.1	18.0	62.0	N.A	605.6
	Alfalfa Silage	50.1	18.0	62.0	N.A	804.4

Source: National Library of Medicine (NIH)
Notes: Total digestibility nutrient (TDN), [1]Rice Straw
[2]Pineapple waste, sugarcane molasses, the peel, husk or sillage of sweet corn and baby corn

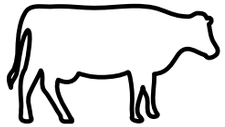
Poor farming practices are primary causes for declining milk production



Animal Health

Outbreak of diseases

- Bovine viral diarrhoea virus (BVDV), typically transmitted through giving birth or environmental conditions, impairs the cattle's growth, milk production and resulting in infertility.
- The ever-increasing milk production demands of dairy cows also led to higher occurrence of mastitis, resulting in reduced quantity and quality of milk produced.



Breeding Management

Challenges remain in handling cattle's reproductive phase

- Dystocia, frequently observed in dairy farming, is more likely to occur in cattle bred at a young age or with insufficient body weight, leading to higher illness and mortality rates among calves and decreased fertility in the mother.
- Natural mating process is inefficient due to various factors, including herd management practices.
- Dairy farmers lack sufficient knowledge of genetic selection and mating strategies.

Milking Management

Unhygienic conditions

- Milk is often harvested under unhygienic conditions, where the milking area is inadequately cleaned.

Milking procedures utilized by small-scale dairy farmers are labour intensive and risk contamination

- Hand milking is labour intensive and often result in inconsistency of milk quality
- Bucket milking is preferred due to its cost-effectiveness, despite the drawback of manually recording milk quantity data into book / application.

Environmental Management

Humidity and heat stress levels

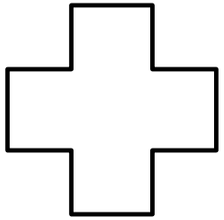
- Milk production yield and fat declines by 0.2, 0.012 litres, respectively, with every unit increase of The temperature humidity index (THI[1]) above the threshold at 72.
- Lactating cows produce 27 – 48% more metabolic heat than non-lactating cows.

Source: Google Scholar, The National Research Council (NRC)
Notes: [1] The temperature humidity index (THI) is a measurement to assess the combined effects of heat stress. Generally, a THI <68 is considered comfortable, while a THI >72 indicates potential heat stress, and values > 88 are associated with severe heat stress

SECTION 3

SECTOR OPPORTUNITIES

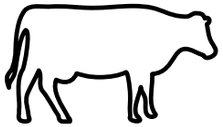
Good dairy farming practices are fundamental to improve milk production



Animal Health

Biosecurity measures

- Mastitis could be prevented with good hygiene practices such as cleaning the udder before milking, and application of iodine after.
- Transmission of Bovine viral diarrhoea virus (BVDV) could be limited prior to giving birth by providing adequate vitamin A and D.
- Regular disinfection for the cowshed and isolation for sick cattle also limits the risk of transmission.



Breeding Management

Good Breeding Practices

- Farmers should ensure the cattle reaches over 300kg in weight and between the age of 16 – 18 months before its reproductive phase.
- Artificial insemination (AI) is a cost and time efficient breeding measure when cattle reach the peak of their estrous cycle.
- Cows at dry period should be given 60 – 90 days to allow the mammary glands to heal before the cow is ready for the next (AI)

Milk Management

Automatic milking systems (AMS)

- Taking into consideration Thailand's closed-range farming setup and upfront cost, AMS is only feasible with larger farms with economies of scale.

Internet of Things (IoT) devices

- Embedded systems equipped with modular weight mechanisms on traditional milking equipment supports real-time recording of milk quantity.
- This enhances labour productivity without impacting conventional milking process, while also allowing farmers to ensure proper cleaning of milking equipment between each milking session.

Environmental Management

Solutions to heat stress levels

- Cooling management using a combination of sprinkler and fan systems were found to be cost-effective without causing respiratory issues.
- The identification of the slick gene through genomic advances opens possibilities for crossbreeding Holstein cattle and enhancing their offspring's' heat tolerance.

Source: The Cattle Site, Google Scholar, The National Research Council (NRC), Journal of Dairy Science
Notes: Biosecurity series of management designed to minimize, prevent and control of diseases

Innovation in Smart Dairy Farming

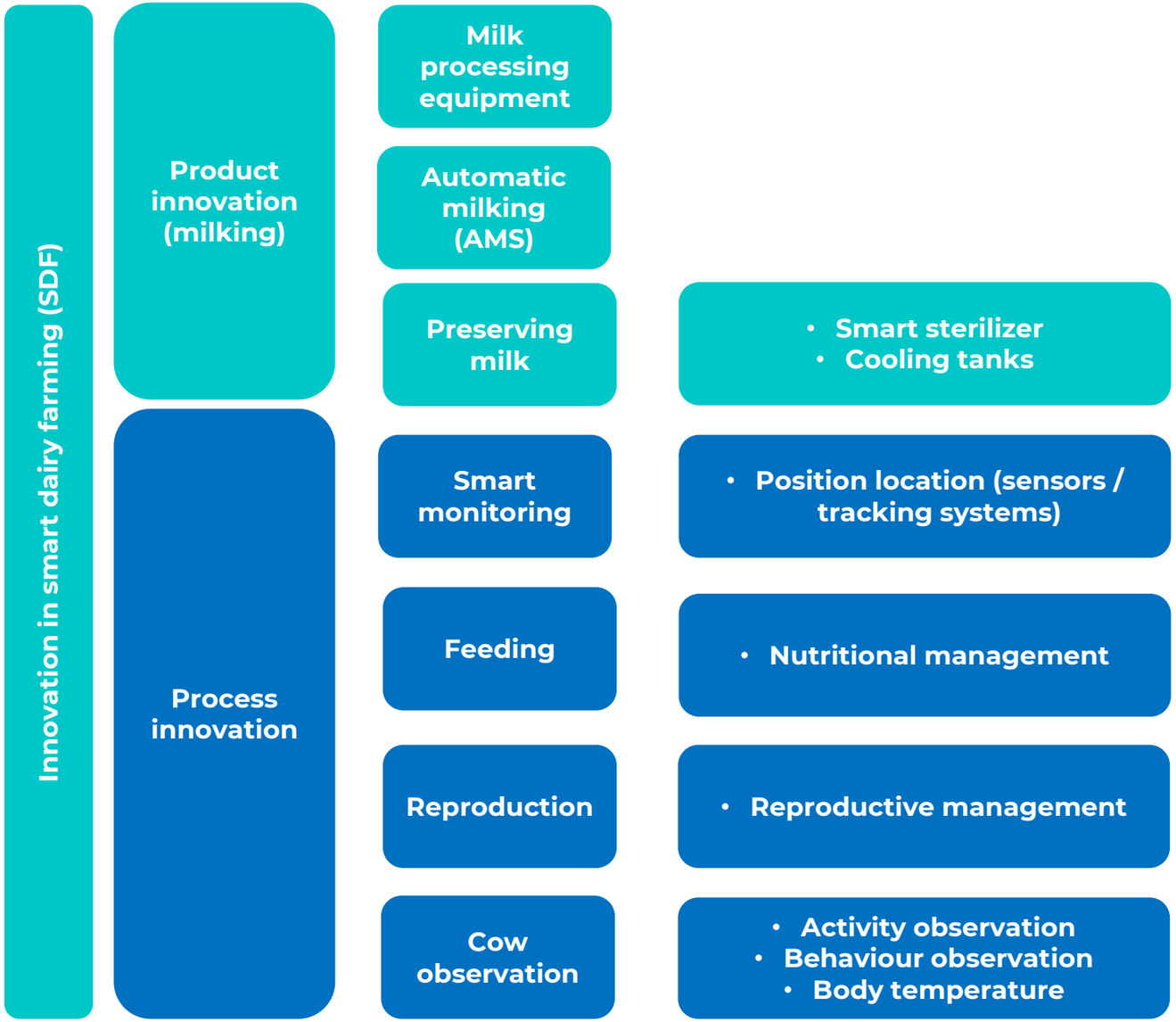
Labour shortages caused by unfavourable economic conditions, is a key challenge for Thailand's dairy sector.

Research centres and Thailand's government have since introduced appropriate technologies based on farm size.

Smaller farms utilize technologies that revolves around processes. Barcode scanning is utilized for collecting dairy cow's data, while a feeding system that adjusts feed based on animal welfare considerations is implemented.

Larger farms are typically focused on product innovation such as using rotary milking.

Process driven innovations are key to transforming the dairy industry into smart farms



Source: Journal of Food Quality

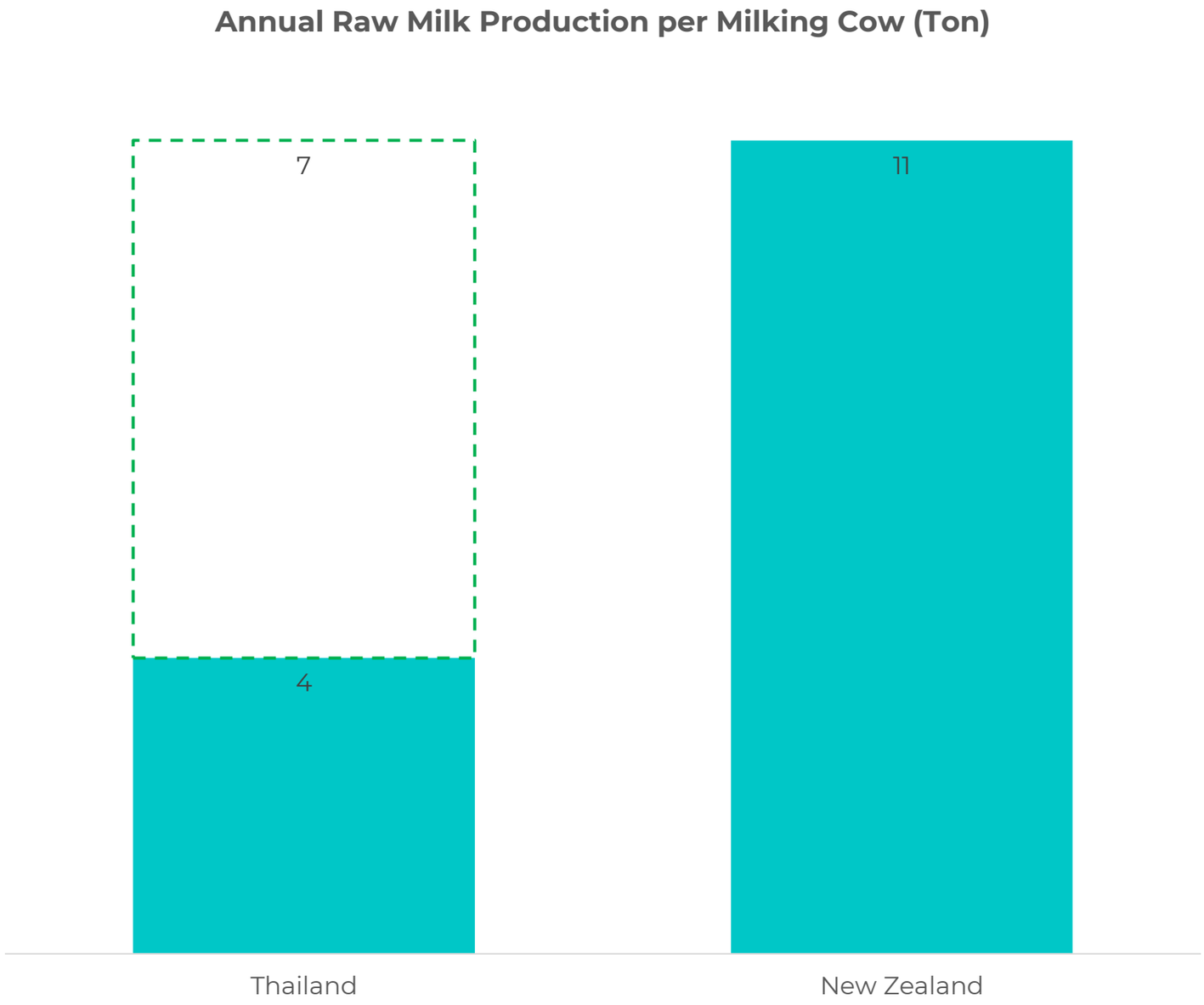
SECTION 3

Opportunity Assessment

In 2023, Thailand's annual raw milk production per milking cow rebounded to 4 tons, matching the 2020 levels.

Industry experts believe that the uptick in Thailand’s milk yield is largely attributed to improved farming practices, including enhanced animal health, environmental management and milk handling.

New Zealand exceeds Thailand's raw milk production by almost threefold, offering dairy businesses opportunities to address the gap in milk yield through innovative products and services.

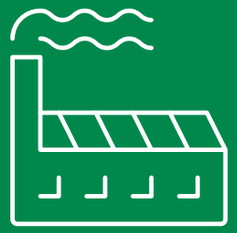


Source: Industry expert interviews
Notes: In 2023, daily production per milking cow estimated in Kg: 11 (Thailand), 31 (New Zealand).

SECTION 4

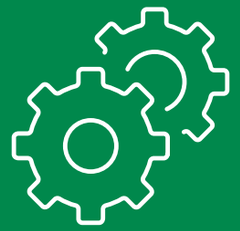
KEY TAKEAWAYS FOR NEW ZEALAND

Opportunities for New Zealand



Manufacturing Capabilities

- For small farms, modular equipment for improving product innovation or process efficiency given their land constraints.
- For larger scale farms and cooperatives, implementing automatic milking systems could boost production levels.



R&D Capabilities

- Introduce simple tools (software/hardware) for record-keeping and tracking of farm activities. E.g., costs, milk yield.
- Provide further R&D capabilities on DNA sequencing for dairy cows best suited to local conditions and yet produce high milk yields.

Operations

- Offer best vaccination practices and vaccines.
- Offer best farm practices and breeding which are applicable for closed range farming.

Services

- Strengthen training centres and staffs' capabilities in conducting R&D on production and processing technology.
- Dairy cooperative managers need to be trained on how to develop proper plans to reduce risks, with a focus on milk processing for local markets and using low-cost technology.

Market Developments

Regulations

- Import tariffs for NZ dairy products (whole milk powder, whey, cheese, and anhydrous milk) were removed in 2021.
- Import tariffs and quotas for milk, cream, flavoured milk, and skim milk powder will be progressively eliminated by 2025.
  Please contact Ministry of Primary Industries (MPI) and NZTE for full details.

Market Access

- For export of live dairy cattle and bovine semen to Thailand, please contact Ministry of Primary Industries (MPI) for full details and requirements.

Note: The information provided herein reflects current regulations as of the date of this document and is subject to changes in regulatory frameworks

SECTION 5

APPENDIX

Stakeholders in Dairy Eco-system
Roles and Responsibilities

Department of Livestock Development (DLD)

- Roughage management
- Genetics and breeding
- Reproduction management
- Milk quality control
- Disease control and veterinary services
- Training programs for dairy farmers
- Establishing feed centres
- Development of vaccine for lumpy skin disease

Universities

- Chulalongkorn University operates the research centre for technology transfer
- Kasetsart University operates genomic evaluation in dairy cows

Trade Organisations

- Dairy Farming Promotion Organization of Thailand (DPO) operates genomic evaluation in dairy cows
- Thai Holstein-Friesian Association supports farmers with good roughage management practices, provides information on Holstein-Friesian varieties to dairy farmers .
- Thai Dairy Board, established by the Thai Government for issuing policies and coordinating all government dairy committees and private associations

Private Entities

- Collaborating with government agencies in R&D
- Pilot test in dairy farming innovations
- Skimmed Milk Powder Processing Association, which was established by private sector companies to promote cooperation among skimmed milk dairy processors;
- Thai Dairy Industry Association, which was established by private dairy companies that use milk powder in their dairy products.
- Pasteurized Milk Producer Association, which was established by local milk producers who use locally produced milk for processing pasteurized milk

NEW ZEALAND
TRADE & ENTERPRISE
Te Taurapa Tūhono