



DAIRY FOOD SAFETY

THE AUSTRALIAN APPROACH

THRIVE
TOGETHER
WITH AUSTRALIAN DAIRY



INTRODUCTION

The Australian dairy industry is committed to producing quality food, while providing best care for our animals, protecting the environment and supporting dairy workers and communities. This is encapsulated in the dairy industry's **Sustainability Framework**.

The dairy industry is the third largest rural industry in Australia, based on its farmgate value, and Australia is in the top five exporters of dairy globally.

Dairy farms and manufacturers are well-established across the temperate regions, and some subtropical regions of Australia. They directly employ over 37,000 people and indirectly support many more. The bulk of dairy production is situated in south-eastern Australia, where the climate and natural resources are generally favourable to extensive grazing. Australian dairy cows usually live outside, grazing pastures all year round, resulting in cost-efficient farming systems producing high-quality milk.

Milk is commonly processed to produce – cheese, drinking milk, skim milk powder, butter, whole milk and infant powders and a range of other dairy ingredients, UHT and specialty dairy products.

Australians love to consume dairy. This fact alongside the country's growing population means most dairy is consumed by the domestic market. Despite this, Australia remains a major exporter of dairy products. The major buyers of Australian dairy include China, Japan, and countries in South-East Asia, although our products are exported to around 100 countries and every continent.

WHAT IS FOOD SAFETY?

According to the United Nations Food and Agriculture Organisation's **Codex Alimentarius**, food safety refers to all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer. The Australian dairy industry expands this definition to include the systems used in the handling, preparing and storing of food to ensure safe consumption.

For the dairy industry, this means that milk and dairy foods are kept safe along the supply chain: from the farm right through to the customer.

AUSTRALIAN DAIRY'S APPROACH TO FOOD SAFETY

In Australia strict food safety systems operate across the entire dairy supply chain to ensure that Australian dairy products meet stringent food safety requirements.

Collectively these systems are designed to assure the safety, quality and integrity of Australian dairy products.

The Australian industry's whole-of-chain food safety approach is underpinned by three key principles:

RISK-BASED FOCUS

Viewing food safety through a risk management lens, the dairy industry consistently identifies and prioritises food safety risks. This focus means that the industry is always alert to evolving and emerging risks and ensuring that the highest risks get the greatest attention. Food safety controls are applied proportionate to risk posed to the supply chain. This means that participants in the segments of the supply chain that are higher risk are usually licensed; require Food Safety Programs (sometimes also called Food Safety Plans) based on Hazard Analysis and Critical Control Point (HACCP) principles to operate; and undergo regular assessments and audits. Lower risk segments of the supply chain, for example after the product has been packed and is being distributed, are subject to fewer

regulatory controls with commercial and industry controls playing a greater role. Comprehensive surveillance, traceability and verification systems operate at every level of the supply chain.

SHARED RESPONSIBILITY

Food safety initiatives are most effective when operating as a system that involves participants at every segment in the supply chain. In the Australian dairy industry this means every person, regardless of role or responsibility, who is involved at any step of dairy food production must think and act to ensure the ingredient or food they handle is safe. All segments in the supply chain, from before the farm, right through to the market, rely on each other to ensure food is safe when it is consumed.

CONTINUOUS IMPROVEMENT

The Australian dairy industry adopts a philosophy of continuous improvement. This means there are ongoing efforts to improve food safety processes and systems. The industry invests in research, development and training to utilise technological developments and improve practices. Development of new systems utilising digital technology captures data that better informs industry and regulators of emerging risks. This technology, in combination with continuous improvements in food safety culture, allows for a proactive approach to food safety.

FOOD SAFETY IN AUSTRALIA

Food safety in Australia is delivered using a co-regulatory approach, in which a range of food safety controls are implemented by government regulators, trading partners and industry in each segment of the supply chain. Relevant controls include:

- International and national standards
- National controls
- State and territory controls
- Commercial controls
- Industry controls.

INTERNATIONAL AND NATIONAL STANDARDS

International standards and codes of practice such as those established by the United Nations Food and Agriculture Organisation through *Codex Alimentarius*, and agreements from the World Organisation for Animal Health, World Trade Organisation and World Customs Organisation provide the basis for Australian food regulation. Australia's commitments under these international agreements are tailored to suit local conditions as allowable under each agreement and are implemented through national legislation.

The **Australian and New Zealand Ministerial Forum on Food Regulation** sets policies for food regulation in Australia. **Food Standards Australia New Zealand (FSANZ)** use these policies as a framework to develop science-based, national food standards.

These standards are developed in conjunction with stakeholders such as consumers, government agencies and industry groups. They are legislated and published in the *Australia New Zealand Food Standards Code (Food Standards Code)* which includes 'Standard 4.2.4 – Primary Production and Processing Standard for Dairy Products'.

NATIONAL CONTROLS

Australia has three levels of government: national, state and territory, and local. Each level of government has a role to play in regulating food safety and they work together to ensure food regulations are implemented and enforced consistently across the supply chain.

The Australian Government provides certification for exported dairy products and helps facilitate market access arrangements. It regulates the export of dairy products to meet Australian and importing country requirements through the *Export Control Act 2020*. Wherever possible this Act is harmonised with the *Food Standards Code*.

The Australian Government is also responsible for a national system that evaluates and registers agricultural chemicals and veterinary medicines and specifies the conditions of their use.



STATE AND TERRITORY CONTROLS

Australia's six state and two territory governments have each established agencies or government departments with powers to regulate food safety within their jurisdiction (state regulatory authorities). The state regulatory authorities regulate supply chains producing dairy products for the Australian domestic market by implementing the *Food Standards Code*, with support from state health departments and local government. State regulatory controls for food safety include licensing dairy businesses; inspecting and approving each business' HACCP-based Food Safety Program; verifying compliance through monitoring activities and audits; taking enforcement actions; and reporting to government.

The Australian Government has arrangements in place with some state and territory regulatory authorities to regulate supply chains producing dairy products for export. Businesses that manufacture dairy products for export must first be licensed by the relevant state regulatory authority, before being registered with the Australian Government for export.

State departments of primary industries and/or agriculture enforce regulations for the use of chemicals on farms, animal welfare and the control of animal disease and biosecurity, including traceability.

State environment protection authorities establish and administer regulations and codes of practice for the protection of the environment and water.

COMMERCIAL CONTROLS

Food safety controls in Australian dairy supply chains are also applied through commercial arrangements between customers and suppliers.

Many customers set buying specifications that may include requirements for the composition, functionality, quality and packaging of dairy products or ingredients, as well as conditions about its transport and storage. Some customers specify additional quality assurance requirements. These buyer's specifications are often underpinned by supply contracts which can include incentive payments or penalties.

More recently, commercial controls are being used to differentiate products based on sustainability issues, so may include animal welfare, environment and human rights requirements.

INDUSTRY CONTROLS

Inputs into Australian dairy supply chains are also subject to controls implemented through industry quality assurance programs. These are usually in less regulated industries that supply inputs and non-dairy ingredients into the highly regulated dairy supply chain. For example, industry quality assurance systems such as FeedSafe (for animal feed), Fertcare (for fertiliser) and AgSafe (for farm chemicals) place controls on suppliers of common farm inputs.

The Australian dairy industry also implements Australia's industry-owned livestock traceability system called the **National Livestock Identification System**.

These industry controls are underpinned by state government legislation.

Industry policies on animal welfare, environmental protection, working conditions and other aspects of dairy production are developed through the Australian Dairy Industry Council (ADIC) and are implemented through the industry's services organisation Dairy Australia. Many of these policies are captured and progress reported in the industry-developed **Australian Dairy Sustainability Framework**.

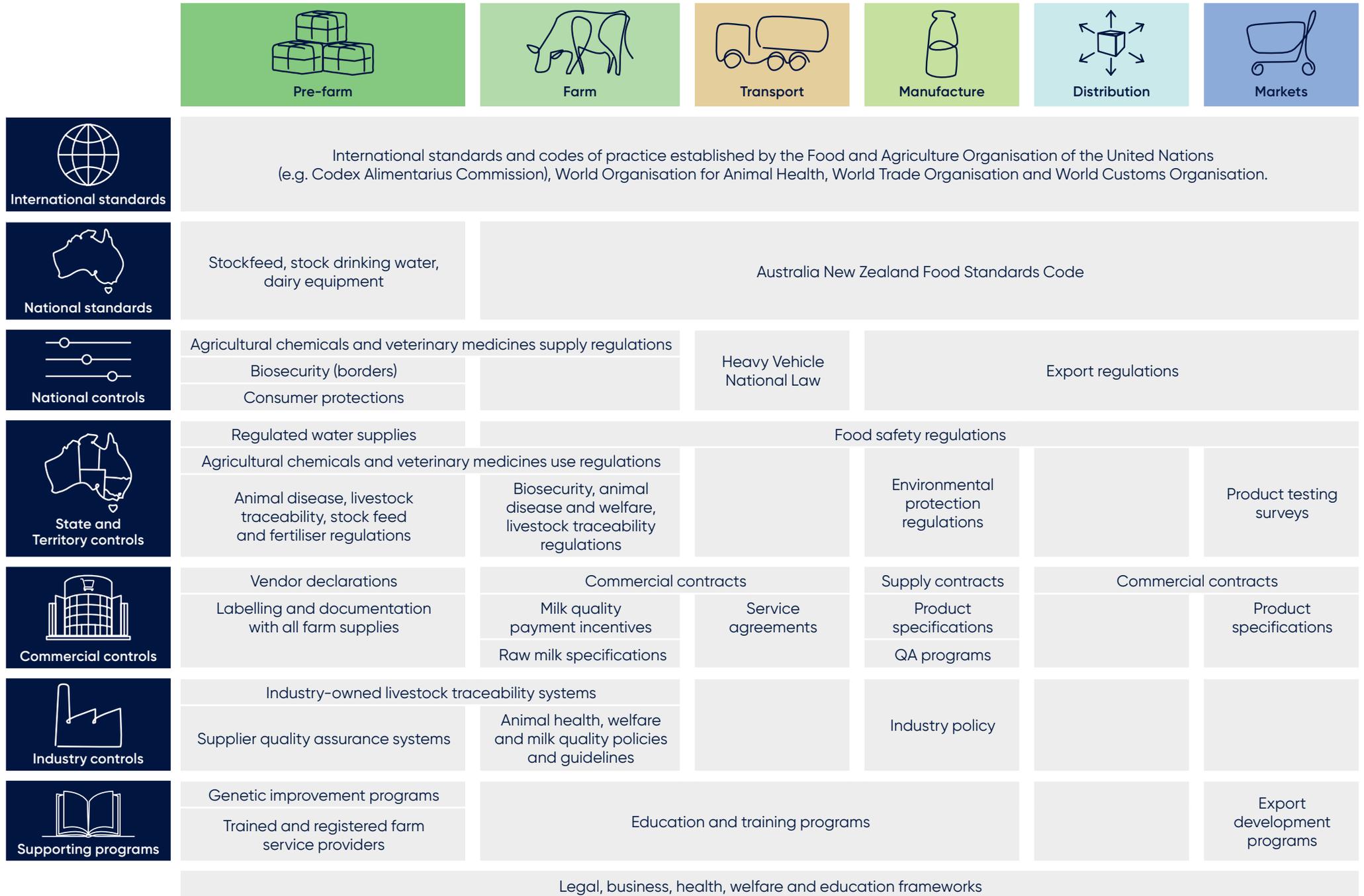
These industry programs are described in more detail in the 'Key supporting programs and organisations' chapter on page 24.

SUPPORTING PROGRAMS

Many other programs work alongside the controls described above to support Australian dairy's enviable reputation for producing clean, safe, high-quality food. These include training and extension programs delivered by industry and government agencies to improve practices along the supply chain, as well as Australia's legal, business, health, welfare and education systems that ensure companies have access to the latest technology and skilled workers.



KEY FOOD SAFETY CONTROLS ALONG THE AUSTRALIAN DAIRY SUPPLY CHAIN





PRE-FARM

Dairy farms need a range of inputs to produce milk. These inputs include agricultural chemicals and veterinary medicines, dairy equipment, additional stock feed (e.g. grain and fodder), livestock, genetic material and water.

Dairy farmers source many of these supplies from local retailers, which often provide products and services on behalf of national or multi-national companies.

A range of national, state, commercial and industry controls are in place to manage the risks posed by inputs to dairy supply chains. The national and state controls are administered by government, while industry quality assurance systems and commercial contracts provide additional assurance for dairy farmers purchasing their supplies.

INTERNATIONAL AND NATIONAL STANDARDS

Many farm inputs are manufactured to meet international standards such as the International Organization for Standardization (ISO) standards for milking equipment and the International Committee for Animal Recording (ICAR) standards for animal identification and livestock data. National standards are developed by the Australian government for farm inputs such as stockfeed

and stock drinking water, based on international standards established by Codex Alimentarius. Australia also has an independent, non-governmental, national standards setting body called Standards Australia, which produces standards for a wide range of goods and processes across many industries including agriculture.

NATIONAL CONTROLS

Dairy farmers use a range of chemical inputs to keep their herds healthy and their farms productive. The Australian Government regulates the supply of agricultural chemicals and veterinary medicines in Australia. It assesses all agricultural chemicals and veterinary medicines for safety before registering and approving them for use. Regulations require that every chemical sold in Australia must have an approved label that stipulates how the chemical must be used to minimise risks.

The Australian Government establishes, and regularly reviews, maximum residue limits of agricultural and veterinary chemicals and other chemical contaminants in agricultural produce and stock feeds. These levels are set based on existing international standards set by Codex Alimentarius and a scientific risk assessment of the potential risks to plant, animal and human health, the environment, trade and the chemical's use according to good agricultural practice in Australia. The limits established are well below the level

that could pose health and safety risks to consumers. The maximum residue limits are legislated nationally and enforced by State and Territory governments.

The Australian Government administers national biosecurity laws, including controls on imported animals and animal genetic material. National laws protect Australia from many serious diseases of livestock found in other parts of the world. Proactive surveillance measures maintain Australia's internationally recognised status of being free of serious zoonoses (i.e. also known as zoonotic diseases, being infectious disease that can be transmitted from an animal to a human) such as bovine tuberculosis, brucellosis and bovine spongiform encephalopathy. The National Biosecurity Committee helps coordinate activities of the federal, state and territory governments and industries as they work together to minimise the impact of pests and diseases on Australian agriculture.

Other national laws include general consumer protections, which ensure the supplies and equipment sold to dairy farmers are advertised accurately and are fit for purpose.

STATE AND TERRITORY CONTROLS

State and territory governments, through their departments of primary industry and/or agriculture, regulate and enforce many of the national standards and state laws that relate to dairy farm inputs. At this level of the supply chain, state governments enforce controls on livestock diseases, pest plants and animals, the use of agricultural and veterinary chemicals, and stock feeds.

Only veterinarians registered by the relevant state and territory government can supply prescription veterinary medicines (such as antibiotics) for use. Veterinarians work with farmers on a 'whole of farm' approach to improve animal health and avoid the use of chemicals where possible.

State and territory government water authorities also monitor and regulate water supplies used on dairy farms, and their environmental protection authorities regulate environmental pollution.

COMMERCIAL CONTROLS

Documentation accompanies all supplies purchased by farmers, including details of the supplier and description of the goods, providing transparency and traceability. Additional documentation accompanies feed, fertiliser and chemical supplies such as product labelling and specifications and/or test sheets. Vendor declarations about the source, safety and quality of stock feeds are supplied with consignments to dairy farmers.

INDUSTRY CONTROLS

Industry-developed supplier quality assurance programs give additional assurance to farmers sourcing inputs for their farms. Examples include FeedSafe (for stockfeed), AgSafe (for agricultural and veterinary chemicals) and Fertcare (for fertiliser).

Industry has developed robust traceability systems for livestock through the **National Livestock Identification System**.

SUPPORTING PROGRAMS

Dairy suppliers rely on a range of service providers such as vets, agronomists, nutritionists, dairy technicians, artificial inseminators and laboratory technicians. The education and qualifications systems used to train these dairy farm service providers are world class.

DataGene is an independent, industry-owned organisation developing modern tools and resources to drive genetic gain and herd improvement in the Australian dairy industry. It has a strong focus on productivity including breeding healthier animals.



CASE STUDY **PRE-FARM**

Safe milk starts with the inputs farmers use. Our industry quality management system FeedSafe® provides our dairy farmer customers with assurance that the risks to the safety and quality of purchased stock feeds have been properly managed – from sourcing to delivery.

**DAVID BRAY, CHAIR OF STOCK FEED
MANUFACTURERS' COUNCIL OF AUSTRALIA**



FARM

In Australia most dairy cows graze outdoors all year round, converting natural grass and supplementary feeds into high quality milk.

Most dairy cows are milked twice a day. Cows are brought up to the holding yard and milking shed, and walk onto the milking platform, where they receive some supplementary feed while the milking machines are attached to their teats. It takes less than 10 minutes to extract the milk, with the facilities built to minimise animal stress and injury, and to be cleaned effectively. The cows then walk back to their paddock to continue grazing.

Skilled staff use modern machine milking equipment and practices to ensure that cows are milked hygienically. A small but growing number of farms have automatic milking (or 'robotic') dairies.

Staff clean and sanitise the milking equipment after each milking, using detergents and sanitisers registered by the Australian Government.

The quality of water used in the dairy is monitored to ensure it is clean and suitable for use. Wastewater and effluent are captured in ponds to minimise pollution of the environment, the farm and surrounding water supplies.

Milk is quickly cooled after being collected. It is then stored in a refrigerated bulk milk tank where the milk is kept at a carefully regulated temperature.

Trained technicians supply and maintain the milking and milk cooling equipment and farmers are supported by a range of other service providers including agronomists, nutritionists, veterinarians, dairy hygiene specialists, artificial inseminators and laboratory technicians.

The health and welfare of animals is paramount to ensure optimal milk production. Farmers closely monitor the health of their animals. They treat sick animals promptly and withhold their milk from sale to manage potential residue risks. Registered veterinarians support farmers with the diagnosis and treatment of livestock disease.

Although most dairy cattle are bred on the farm, all livestock must be individually identified with an approved electronic tag. The **National Livestock Identification Scheme** provides lifetime traceability of all cattle in Australia.

INTERNATIONAL AND NATIONAL STANDARDS

Referencing international standards established through *Codex Alimentarius*, the *Food Standards Code* establishes national food safety standards for the primary production of milk for human consumption. The national standards are based on HACCP principles and set out the requirements for dairy farm businesses to control potential microbiological, physical and chemical hazards to milk. The *Food Standards Code* also sets national standards for chemical residues in milk. These standards are implemented and enforced by state and territory regulatory authorities (see 'State controls' below). The *Food Standards Code* requires dairy farms to implement a documented Food Safety Program, the core elements of which include:

- Control of potential contaminants – physical, chemical and microbiological
- Fit-for-purpose dairy milking premises
- Hygienic milking processes
- Water supply and quality
- Cleaning and sanitising
- Animal identification and traceability
- Animal health
- Exclusion of milk
- Traceability and record keeping
- Staff skills and training
- Staff health
- Milk cooling and storage
- Record keeping.

Standards for food safety auditors are also established nationally under the National Food Safety Audit Policy.

NATIONAL CONTROLS

The Australian Government administers laws controlling the registration and supply of agricultural chemicals and veterinary medicines for use on farms.

STATE AND TERRITORY CONTROLS

All Australian dairy farms must be licensed with the relevant state regulatory authority to produce milk for human consumption. The state regulatory authorities are responsible for regulating dairy farms to ensure they implement the Food Standards Code. It is a condition of the licence that each farm has a documented Food Safety Program, which aims to manage potential microbiological, chemical and physical hazards in the production, harvesting and storage of milk.

Processes to meet the Food Standards Code are documented in each farm's Food Safety Program. Most dairy companies help their farm suppliers to develop and document their food safety plan by providing standard templates that set out the regulatory requirements, as well as company specific Quality Assurance requirements. Farmers can tailor these to meet their individual farm's operational requirements. Templates for creating the required food safety records for the program are also provided.



CASE STUDY **FARM**

Producing milk for someone to drink is a great responsibility. Every day I strive to ensure that the milk leaving my farm is as safe and nutritious as it can possibly be – and there are lots of checks and balances in place to ensure that it meets factory specifications.

STUART BURR, TASMANIAN DAIRY FARMER



Qualified auditors, approved by the state regulatory authority, regularly audit farms to ensure their Food Safety Program is being implemented effectively. Feedback from audits helps farm managers identify and mitigate food safety risks.

State and territory governments also regulate the use of agricultural chemicals and veterinary medicines on farms. Clear labelling, withholding periods and prohibitions on high-risk uses control the risks of agricultural chemicals entering the food supply chain. Higher risk veterinary chemicals such as antibiotics are only available by prescription through registered veterinarians. Farmers must use veterinary medicines in accordance with label or veterinary directions, observe recommended withholding periods for milk and meat and keep records of all treatments.

State and territory governments also enforce controls on serious livestock diseases to manage food safety and biosecurity risks.

They provide the legal framework and enforcement that underpin industry traceability systems such as the National Livestock Identification System (NLIS) and National Vendor Declarations.

State and territory governments are also responsible for regulating environmental protections as well as animal welfare on farms, which can have direct and indirect impacts on animal health and dairy food safety.

COMMERCIAL CONTROLS

Australian dairy farmers supply milk to dairy companies under commercial contracts, which specify food safety and raw milk quality requirements.

All milk is tested at the time of pick up and samples are taken for later analysis. Dairy companies provide the testing results to farmers and pay them depending on the composition and quality of their milk.

Key descriptors of milk quality include a senses test (sight and smell), milk composition, manufacturing or processing properties, presence of any 'abnormalities' (e.g. high numbers of somatic cells or colostrum) and contamination by foreign substances (e.g. bacteria, chemicals and foreign matter).

If a farmer becomes aware of any risks to the quality or safety of milk, they must notify the dairy company. The company will then arrange an investigation and/or testing before the milk can be cleared for collection or used by the company if already collected. The dairy company's field officers work with farmers to implement suitable corrective actions to avoid any reoccurrence.

INDUSTRY CONTROLS

In addition to the regulatory framework, the Australian dairy industry has adopted policies, guidelines and programs to drive improvements in animal health, welfare and milk quality, all of which can impact on the food safety of milk.

Examples include phasing chemicals out of the dairy supply chains to meet international customer specifications, and adopting the *Australian Animal Welfare Standards and Guidelines for Cattle* and the *Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock*. These requirements are picked up in farm quality assurance programs implemented by each dairy company.

SUPPORTING PROGRAMS

Dairy Australia, state and territory governments and the education sector have developed training and extension programs to support farmers in managing their farms. Examples include programs focussing on cow health and welfare (mastitis, lameness, reproduction, calf management and heat stress); environment (effluent, fertiliser and water use efficiency); feedbase; and staff and business management.

Dairy companies also provide a wide range of supports to their dairy farm suppliers including training in food safety, business management, feeding and technical advice in implementing their approved Food Safety Program and quality assurance requirements.

MASTITIS CONTROL PROGRAM

Countdown, launched in 1998, is Dairy Australia's mastitis control program. Farmers have made great progress in udder health contributing to on-farm efficiencies via reduced treatment costs and milk quality penalties, and improved production.

By applying best practices on milking and animal health the percentage of dairy farmers with an average annual bulk milk cell count (BMCC) below 250,000 cells/ml increased from 61% (2010) to 83% (2018). The annual Australian Milk Quality Awards recognises the lowest 5% of farms across Australia.

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MILK & D40
WHEY
UNLOADING



TRANSPORT

An end-to-end process ensures the safe transport of milk from collection from the farm to arrival at the factory.

In peak season, collection from farm usually occurs daily. When production declines, milk collection may reduce to a lesser frequency in line with milk company policy and approved by the state regulatory authority.

Milk transport operators follow documented standard operating procedures, which are aligned to national industry protocols and commercial requirements. After arriving at the farm, the operator checks the milk's suitability for collection and records its temperature before loading.

They also take samples of the vat milk for testing by the dairy manufacturer. Typical tests include fat, protein, somatic cell count, microbiological quality and antibiotic residues. The results of the tests are provided to the farmer and used as a basis for payment. If an abnormal result is detected, such as positive antibiotic residue or high somatic cell count, the farmer is promptly notified of the result and appropriate action is taken.

Prior to unloading the milk at the factory, the operator checks the milk is suitable to unload and meets the dairy manufacturer's requirements. Typical tests include antibiotic residues and temperature. If a positive residue result is detected, the load is held for confirmatory testing while trace-back testing is performed on individual milk samples from each farm supplier so corrective action can be taken.

Milk that does not meet the required standard is isolated and disposed of, in line with the factory's Food Safety Program.

Tankers are cleaned using clean-in-place systems with approved chemicals and potable water (i.e. water that is safe for people to drink). Visual inspections of the internal tanker surfaces and swabbing of food contact surfaces may be used to check the effectiveness of cleaning programs.

Information on the origin of and destination of milk supplies is recorded to ensure traceability between farm and manufacturer.

INTERNATIONAL AND NATIONAL STANDARDS

The *Food Standards Code* includes standards for milk transport operators. These operators must implement a documented Food Safety Program that effectively manages potential microbiological, physical and chemical hazards to the milk supply. Core elements of their Food Safety Program include:

- Control of food safety hazards during collection and transport from equipment, vehicles, containers and personnel
- Product traceability
- Time and temperature controls
- Cleaning and sanitation
- Personnel skills and knowledge.

NATIONAL CONTROLS

Recognising that many heavy vehicles (e.g. tanker trucks) drive across Australia's state and territory borders, there is one set of laws called the Heavy Vehicle National Law that sets minimum standards for heavy vehicles using public roads. These laws underpin the reliability of the milk tanker fleet and are enforced by each state and territory government.

STATE AND TERRITORY CONTROLS

Safe Food Queensland does not license milk transporters. Instead requires milk processors to manage the transport process according to the *Food Standards Code*. Transporter compliance is verified during milk processor audits.

COMMERCIAL CONTROLS

Commercial contracts for the transport of milk include food safety requirements and set out the required standard of service. Milk transport operators must be competent in doing the checks on milk prior to loading, including milk sampling; delivering on-time; maintaining temperature controls during transport; unloading at the factory; maintaining hygiene of tankers and more.

SUPPORTING PROGRAMS

Dairy Australia has developed national training resources for milk transport operators, which includes how to perform pre-loading food safety checks, especially raw milk sampling.



MANUFACTURE

Once delivered to the dairy manufacturer, raw milk is processed in modern and automated factories using stringent food safety, quality assurance, workplace safety and environmental practices.

The manufacturing process varies according to the products being manufactured.

Generally, after the milk is tested and found to be suitable for processing, it is unloaded from the tanker into large silos. It is then pasteurised and separated into components ready to be manufactured into a wide variety of dairy products. These include commodity products such as cheeses, milk powders and butter fats, as well as specialty cheeses and fresh, UHT and frozen dairy products for the domestic and export markets.

Australia's dairy manufacturers are constantly innovating and developing new products including nutraceuticals and specialty products. New manufacturing techniques have also been developed to extend the shelf-life of dairy products, keeping them fresher for longer, so opening up new markets for fresh products.

They also introduce technologies to improve food safety during manufacture including greater automation and the latest in-line sensors to monitor product lines.

INTERNATIONAL AND NATIONAL STANDARDS

Food safety standards for dairy manufacturers are established nationally under the *Food Standards Code*. This uses internationally recognised HACCP principles to manage microbiological, physical and chemical hazards in the processing of milk.

Under the *Food Standards Code*, dairy manufacturers must implement a documented Food Safety Program, the core elements of which include:

- Pathogen reduction technologies including pasteurisation
- Temperature controls
- Processing
- Cleaning and sanitising
- Storage
- Traceability forwards and backwards through the supply chain from farm to customer
- Post-pasteurisation hazard management
- Raw material and ingredient management
- Accurate labelling including of allergens
- Verification of food safety
- Product recall process
- Record keeping to support traceability.

Compliance with national standards is regulated by the Australian Government for export supply chains (see National controls) and by the state and territory regulatory authorities for domestic supply chains (see State and territory controls).

NATIONAL CONTROLS

The Australian Government regulates exporting manufacturers.

These manufacturers must first be licensed by the relevant state regulatory authority for domestic production. Then they can apply to be registered with the Australian Government to produce dairy products for export. Export registered dairy manufacturers must implement an **Approved Arrangement** that includes Australian export requirements and those of the importing country.

The Australian Government has a robust verification program for the food safety of dairy products that are exported.

Key elements include:

- Trained and qualified auditors
- Frequent audit of every export manufacturer
- Product testing programs (to meet Australian and importing countries requirements)
- The Australian Milk Residue Analysis Survey (described in the 'Key supporting programs and organisations' chapter on page 24)
- Participating in periodic overseas compliance audits.

STATE AND TERRITORY CONTROLS

State regulatory authorities license and regulate dairy manufacturers supplying dairy products for the Australian market.

They must approve a business's Food Safety Program before granting a licence to manufacture.

Based on HACCP principles in the *Food Standards Code*, each business's Food Safety Program must include a HACCP plan and supporting pre-requisite programs which include standard operating procedures and work instructions for every process essential for food safety in the manufacturing facility.

Verification is built into every step of manufacture. Manufacturers typically keep records of the following:

- The source and characteristics of raw milk and ingredients
- Measurement of temperature, time and chemical composition
- Calibration of measuring and testing equipment
- Monitoring of the factory environment for contaminants
- Product testing programs
- Food safety issues and corrective actions
- Internal auditing of procedures.



CASE STUDY **MANUFACTURE**

Each and every team member, whether they work on the factory floor or not, now knows how they can contribute to excellent food safety practices, and there's an understanding that it's everyone's responsibility.

ALLAN HOOD, BULLA DAIRY CEO,
speaking about participating in the
Dairy RegTech project described on page 21



External auditors approved by state and territory regulatory agencies regularly conduct audits of the manufacturer's Food Safety Program. Follow-up audits are conducted if non-compliance is found.

Dairy manufacturers also work with state and territory government environmental protection authorities to reduce the impact of dairy processing on the environment.

COMMERCIAL CONTROLS

Dairy manufacturers work with their suppliers, including non-milk suppliers, to ensure the raw milk and ingredients they receive meet specifications.

Dairy manufacturers must also comply with customer requirements detailed in sales agreements. These can include requirements for the processes used in the manufacture of the products as well as specifications for the products themselves. Additional quality assurance programs and production processes may be adopted to meet customer and market specifications. Australian and international customers may also audit all or part of a company's food safety and quality assurance program.

INDUSTRY CONTROLS

Dairy manufacturers work collaboratively through the Australian Dairy Products Federation to address shared issues. Dairy company members implement policies for the sector that are adopted by industry.

SUPPORTING PROGRAMS

Dairy Australia, state and territory regulatory authorities and the education sector offer training and qualifications in food safety and dairy manufacturing.

Dairy manufacturers collectively address sustainability issues through the Dairy Manufacturers Sustainability Council.



DISTRIBUTION

Before being sent to customers, dairy products are stored in warehouses operated by the dairy manufacturer or by external contractors.

Good product handling throughout the supply chain is vital to food safety and quality. This includes keeping products within specified storage conditions such as temperature and humidity.

Sophisticated traceability systems are used to track product being distributed. All distributors have systems in place to respond to a product recall notification should it be necessary to remove product from supply.

Prior to loading of product, warehouse staff check the integrity of the product and cleanliness of the interior of transport vehicles and shipping containers.

Australian dairy distributors embrace new technologies including improved logistics and traceability systems and greater automation in handling of product. The rise of the Internet of Things (IOT) is enabling remote monitoring of warehouses and containers during transport giving greater assurance. Blockchain technologies are showing promise for dataflow in supply chain distribution systems.

INTERNATIONAL AND NATIONAL STANDARDS

As a member the World Trade Organisation, Australia adheres to the agreed sanitary and phytosanitary measures including those related to the distribution of dairy products.

For distribution in domestic supply chains, national food safety standards through the *Food Standards Code* apply. For distribution in export supply chains, Australian export requirements capture importing countries' requirements.

NATIONAL CONTROLS

Warehouses that store product for export must be registered by the Australian Government and implement an Approved Arrangement showing how the establishment meets Australian export requirements and importing country requirements. Approved auditors conduct audits to verify compliance.

Containers destined for export are sealed and appropriate documentation is completed prior to shipping. Companies use the **NEXDOC** electronic system for certification of dairy exports.

Dairy ingredients being stored for further processing in Australia are subject to standards established through the *Food Standards Code*.

Distributors are required to have a traceability and a documented food recall system in place for both export and domestic supply chains.

STATE AND TERRITORY CONTROLS

In most Australian states and territories, their regulatory authorities license and regulate dairy distributors. These regulations require dairy distributors to implement the food safety requirements set out in the *Food Standards Code*. These requirements manage potential hazards to dairy product during transport and storage, and provide traceability through the supply chain.

COMMERCIAL CONTROLS

Commercial contracts set out storage requirements, including for cold chain. Australian and international customers often conduct audits on all or part of a warehouse's quality assurance program as a part of verifying food safety and quality management systems along the dairy supply chain.



CASE STUDY **MARKETS**

As a trader, it is critical that the dairy products we send around the world meet both Australian domestic and export regulatory requirements. They must also meet the quality specifications required by our customers. Over many years Australian dairy products have gained a reputation for being safe and of consistently high quality – making them sought after in every continent.

**GARRY EMBLETON,
OPERATIONS DIRECTOR, AUSFINE FOODS**



MARKETS

Australian dairy manufacturers work closely with domestic and international customers to ensure that safe and high-quality dairy products are supplied all year round. This requires an integrated approach by the Australian dairy industry and regulators across the entire supply chain from farm to customer.

New technologies including improved document transfer and traceability systems, as well as greater automation in handling of product provides additional assurance and supports the relationship between suppliers and customers.

INTERNATIONAL AND NATIONAL STANDARDS

The trade of Australian dairy products in export markets is undertaken in accordance with international law and agreements through the World Trade Organisation and World Customs Organisation.

International standards for milk and milk products established by *Codex Alimentarius* also inform Australia's national food safety standards and export legislation.

NATIONAL CONTROLS

The Australian Government administers Australia's export legislation. Export regulations cover Australian and the importing country's food safety requirements, product standards, biosecurity, quarantine standards, traceability, labelling and more.

For domestic markets, dairy products need to comply with national consumer laws and the *Food Standards Code*, including product labelling requirements.

STATE AND TERRITORY CONTROLS

State and territory health departments delegate the regulation of domestic food retailers to local governments.

State regulatory authorities and health departments also monitor the safety of food products through product testing surveys and through public health surveillance.

COMMERCIAL CONTROLS

Retail and ingredient customers within Australia and overseas set requirements for the products they purchase through buying specifications. Typical buying specifications include product specifications, transport and storage conditions and the buyer's expectations of the quality assurance approach taken during manufacturing.

Some customers also set specific requirements on the way milk is produced on farm and want to know more about farm production systems including animal welfare, environmental stewardship and workers' rights.

Many customers audit their suppliers on a regular basis, for food safety and other requirements detailed in their buying specifications.

SUPPORTING PROGRAMS

Dairy Australia works with its partners in international markets to explain Australian food safety controls and show how they are maintained throughout the supply chain to consistently produce safe, quality products.

DEVELOPMENT OF AUSTRALIA'S DAIRY FOOD SAFETY SYSTEMS

The drive to continuously improve food safety has long been a feature of the Australian dairy industry. Modern dairy export legislation was first introduced in 1942, and laws requiring drinking milk to be pasteurised followed in the mid-1950s. The first Australian *Food Standards Code* was endorsed by the federal, state and territory governments in 1986, marking a national approach to food safety.

Developments since the 1990s have refined Australia's co-regulatory food safety approach. These allow supply chain participants to determine how their individual business can best respond to food safety risks and regulatory requirements, making them more responsive than many systems implemented around the world.

The development of Australian dairy's food safety systems has shown adaptability and continuous improvement, with industry and regulatory authorities responding to changing market expectations, new technologies and emerging risks.

Australian food safety systems will continue to adapt and change to protect dairy customers and consumers right around the world.

TIMELINE

1986	1990s	1991	1993	Mid-1990s	1995	1996
Agreement that State-based food safety standards and governance frameworks be replaced by a single national approach to food safety	Industries start developing HACCP-based quality assurance systems e.g. AgSafe, FeedSafe	<i>Food Standards Australia New Zealand Act 1991</i> unifies food standards across Australia	Australian Pesticides and Veterinarian Medicines Authority established (previously individual state and territory governments registered these chemicals)	Milk companies introduce payments based on milk quality (BMCC)	A Treaty established between Australia and New Zealand allows New Zealand to participate in a joint food safety system	Australia New Zealand Food Authority (ANZFA) created
1998	1999	2000	2002	2008	2014	2021
Australian Milk Residue Analysis (AMRA) survey commences	Murray Goulburn Cooperative introduces the first large-scale HACCP-based farm quality assurance program	<i>Australia New Zealand Food Standards Code</i> adopted	Food Standards Australia New Zealand (FSANZ) created	Primary Production and Processing Standard for dairy products (Food Standards Code – PPPS 4.2.4) adopted	FSANZ grants approval to produce raw milk cheese under strict conditions	Dairy export legislation updated in the national <i>Export Control Act 2020</i> and <i>Export Control Rules 2021</i>

INSIGHTS INTO THE FUTURE OF FOOD SAFETY

Many recent developments in Australian dairy's food safety systems reflect the use of real-time data to verify food safety systems. This is reducing the industry's focus on periodic audits as the primary means to verify compliance with Food Safety Programs and provides real time assurance that the systems are operating effectively. In addition, in-line sensors and the Internet of Things (IOT) are generating a great amount of useful data that is being used to continuously improve supply chain processes, including food safety.

There is also an increasing interest in food safety culture as a driver of improved food safety outcomes. Food safety performance is largely dictated by people's behaviours, so reinforcing a culture that can influence or change these behaviours is a powerful tool to improve food safety at every step

of the supply chain. To date, the Australian food safety system – both within and outside of dairy – has largely focussed on the 'how' and 'what' (i.e. skills) when explaining food safety to staff, but more focus is now going into explaining 'why' we do things to change attitudes and behaviours of supply chain participants.

The Australian dairy industry is excited for the next developments in food safety, which include:

- A greater use of automated in-line sensors collecting a wide range of data (e.g. screening diagnostics, internal and external conditions, logistics)
- Light-touch regulatory involvement that better utilises remote, automatically generated data rather than disruptive on-site audits.

The Australian dairy industry is also well-positioned to continue meeting the increasing demand for assurance from customers about dairy production systems, especially about farm practices and is actively working on systems to improve data flows across the supply chain.

Dairy RegTech WORKING TOGETHER

A new approach to food safety, developed by Victoria's state regulatory authority, is providing consumers with greater assurance of the safety of their food.

Dairy RegTech focusses on improving food safety culture, recognising that it leads to better food safety outcomes. It does this by measuring behaviours related to food safety within a business and identifies areas to strengthen the food safety culture.

Dairy RegTech uses digital technology to streamline regular reporting and communication between the business and the state regulatory authority. This data helps the business and state regulatory authority work together to determine how best to improve food safety performance.

Existing compliance programs in Australia have relied on on-site audits, looking at documentation, monitoring records and procedures. These current audits, while very important, only measure a point in time. Whereas Dairy RegTech aims to measure food safety performance of businesses across the year.



KEY ORGANISATIONS AT A GLANCE

Type	Competent authority	Function	Website
Australian Government			
	Food Standards Australia New Zealand	Sets standards for the production and sale of foods within Australia and New Zealand. Works with other Australian and New Zealand government agencies to continuously monitor the food supply to ensure it is safe.	foodstandards.gov.au
	Department of Agriculture, Water and the Environment	Administers Australia's export legislation and regulates export supply chains. Negotiates with importing countries about market access requirements.	agriculture.gov.au
	Australian Pesticide and Veterinary Medicines Authority	Administers the national scheme for the assessment, registration and supply of agricultural chemicals and veterinary medicines.	apvma.gov.au
State departments, agencies, partners			
State and territory regulatory authorities (food safety)	Dairy Food Safety Victoria	Regulates food safety in Victoria's dairy industry. Coordinates Australian Milk Residue Analysis Survey, on behalf of the Australian Government.	dairysafe.vic.gov.au
	NSW Food Authority	Regulates and monitors food safety in New South Wales.	foodauthority.nsw.gov.au
	Safe Food Production Queensland	Regulates the primary production and processing of dairy and other food in Queensland.	safefood.qld.gov.au
	Tasmanian Dairy Industry Authority	Regulates food safety in Tasmania's dairy industry.	tdia.tas.gov.au
	Dairysafe South Australia	Regulates food safety in South Australia's dairy industry.	dairy-safe.com.au
	WA Department of Health Food Unit	Regulates food production businesses in Western Australia including dairy manufacturers.	ww2.health.wa.gov.au
State departments of primary industries or agriculture	Department of Economic Development, Jobs, Transport and Resources Victoria	Enforce a broad range of regulations controlling livestock disease, livestock identification, weeds, pests and vermin, animal welfare, and the use of agricultural chemicals and veterinary medicines.	agriculture.vic.gov.au
	Department of Primary Industries, Parks, Water and Environment Tasmania	Train, advise and assist dairy farmers.	dpiuwe.tas.gov.au
	Department of Primary Industry and Resources SA		pir.sa.gov.au
	NSW Department of Primary Industries		dpi.nsw.gov.au
	Queensland Department of Agriculture and Fisheries		daf.qld.gov.au
	Department of Primary Industries and Regional Development		agric.wa.gov.au
State and territory environmental protection authorities	NSW Environment Protection Authority	Develop policy, planning and regulation for the protection of the environment and development of sustainable industries. Monitor and enforce regulations.	epa.nsw.gov.au
	Environmental Protection Authority Victoria		epa.vic.gov.au
	Department of Environment and Sciences (Queensland)		ehp.qld.gov.au
	Environment Protection Authority Tasmania		epa.tas.gov.au
	Environment Protection Authority South Australia		epa.sa.gov.au
	Environment Protection Authority Western Australia		epa.wa.gov.au
State and territory veterinary practitioners' registration boards	A separate Board is established in each State and Territory	Registration of veterinarians to practice and supply prescription medicines.	Accessed via ava.com.au/library-resources/other-resources/veterinary-boards-state-health-departments-requirements/

KEY SUPPORTING PROGRAMS AND ORGANISATIONS

INDUSTRY QUALITY ASSURANCE PROGRAMS

AGSAFE

Industry-led organisation that sets industry standards and provides training and other services to agricultural and veterinary chemical supplier members.

FEEDSAFE

The FeedSafe program is an audited quality assurance program developed by the Australian stock feed industry to mitigate risks in the manufacture and use of animal feeds.

FERTCARE

The Australian fertiliser industry's Fertcare program trains and accredits fertiliser suppliers, advisors and others involved in the supply of fertiliser and soil ameliorant products. It ensures that high quality advice is passed on to farmers, allowing them to optimise productivity while minimising environment and food safety risks.

VERIFICATION PROGRAMS

AUSTRALIAN MILK RESIDUE ANALYSIS SURVEY (AMRA)

Managed by DFSV on behalf of the Australian Government, the Australian Milk Residue Analysis Survey monitors Australia's raw milk supply for the potential presence of chemical residues, including antimicrobials, animal parasite control chemicals, feed contaminants and environmental contaminants. The survey

has been conducted annually for over 20 years and tells an overwhelmingly positive story with close to 100% compliance over the history of the survey.

NATIONAL ASSOCIATION OF TESTING AUTHORITIES (NATA)

Australia's leading national accreditation body, recognised by government to assess organisations against a number of international standards for laboratories, inspection bodies, proficiency testing scheme providers and reference material producers.

OZFOODNET

A collaborative initiative with Australia's state and territory health authorities to provide national capacity to identify and respond to outbreaks of foodborne diseases and to provide information on foodborne disease.

ANIMAL TRACEABILITY AND INTEGRITY PROGRAMS

LIVESTOCK PRODUCTION ASSURANCE

The on-farm quality assurance program that underpins market access for Australian red meat, including beef from dairy cattle.

NATIONAL LIVESTOCK IDENTIFICATION SYSTEM (NLIS)

Australia's system for the identification and traceability of cattle (including dairy), sheep and goats. The National Livestock Identification System combines

three elements to enable the lifetime traceability of animals. Firstly all livestock are identified by a visual or electronic ear tag/device. Secondly all physical locations are identified by means of a Property Identification Code (PIC). Thirdly all livestock location data and movements are recorded in a central database. This industry-owned system is underpinned by legislation in each state and territory, which makes the use of the system mandatory.

NATIONAL VENDOR DECLARATIONS (NVDs)

Traceability of livestock and feed supplies in dairy supply chains is supported by industry-owned and nationally agreed documentation that is filled out by the vendor and supplied to the purchaser with each consignment. A range of declaration forms are used, including National vendor declarations (NVDs) for livestock, commodity vendor declarations for stock feeds, and animal health declarations. Many food safety and quality assurance programs require the use of such declarations. In the case of livestock, the use of NVDs is underpinned by legislation.

ANIMAL HEALTH ORGANISATIONS

ANIMAL HEALTH AUSTRALIA

Independent national animal health body in Australia that brings together government and industry to deliver national animal health and biosecurity outcomes.

AUSTRALIAN VETERINARY ASSOCIATION

Professional association representing veterinarians across Australia.

DATAGENE

Independent and industry-owned organisation that is responsible for developing modern tools and resources to drive genetic gain and herd improvement in the Australian dairy industry, through research, development and extension activities.

DAIRYBIO

An initiative to create improved pastures and improved herds for the Australian dairy industry through the latest approaches in bioscience.

NATIONAL BIOSECURITY COMMITTEE

The National Biosecurity Committee develops national approaches for the control of animal diseases and management of animal health and welfare for consideration by government.

OFFICE OF THE GENE TECHNOLOGY REGULATOR

The Australian Government's Gene Technology Regulator administers legislation to protect the health and safety of people, and to protect the environment from any risks posed by gene technology.

ROYAL SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS (RSPCA)

An independent, community-based charity providing animal care and protection services across the country. RSPCA inspectors are authorised to enforce animal welfare legislation in most States and Territories.

INDUSTRY GROUPS

AUSTRALIAN DAIRY INDUSTRY COUNCIL

The peak national representative body of the Australian dairy industry. Representing the interests of Australian dairy's whole value chain through its two constituent bodies, Australian Dairy Farmers and the Australian Dairy Products Federation.

AUSTRALIAN DAIRY FARMERS

The national policy and advocacy body providing collective representation for dairy farmers in Australia.

AUSTRALIAN DAIRY PRODUCTS FEDERATION

The national policy body representing commercial, post farm-gate members of the Australian dairy industry, including processors, traders and marketers of Australian dairy products.

DAIRY AUSTRALIA

The national services body for the Australian dairy industry, funded by a combination of levies paid by dairy farmers and matching payments from

the Australian Government for eligible research and development (R&D) activities. Dairy Australia's purpose is to support the profitability and sustainability of dairy farming and it provides practical tools, services and advice to assist farming operations and the dairy supply chain.

SUSTAINABILITY

AUSTRALIAN DAIRY SUSTAINABILITY FRAMEWORK

A whole-of-industry sustainability framework that is aligned with the United Nations Sustainable Development Goals. This helps the industry identify and address the biggest risks to its long-term sustainability. All segments of the Australian dairy industry work together to implement the Australian Dairy Sustainability Framework. The industry regularly reports its progress, which cover how the industry is taking better care of people, communities, the environment and animals.

AUSTRALIAN PACKAGING COVENANT ORGANISATION

Not for profit organisation leading the development of a circular economy for packaging in Australia.

DAIRY MANUFACTURERS SUSTAINABILITY COUNCIL

Nationally recognised community of practice comprised primarily of environmental and sustainability group managers from Australian dairy manufacturing companies.





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Acknowledgement

Dairy Australia acknowledges the contribution made by the Commonwealth government through its provision of matching payments under Dairy Australia's Statutory Funding Agreement.

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