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Australia's dairy industry is a significant player in the global dairy trade. Asia plays a particularly important role as the key export market for Australian dairy products, primarily cheese and skim milk powder. In 2006/07, approximately 45 per cent of the milk production was supplied to export markets mainly in Asia. This accounted for approximately 12 per cent of the global dairy trade. An increase in global demand for dairy and drought in several regions with high dairy production have created historic highs in commodity prices for dairy products.

The Australian domestic market is dominated by retail sales and branded products. In 2006/07, approximately 55 per cent of Australia's milk flowed into domestic markets either in the form of liquid milk or dairy products, such as cheeses, yoghurts, butter and creams. Cheese consumption clearly showed a trend toward more varietal cheeses instead of Cheddar.

Around 70 per cent of Australia's dairy markets are mature markets (Australia and Japan) with higher GDPs, good penetration of health care and ageing populations. Consumers are generally aware of the importance of health and nutrition and prepared to spend on functional foods.

Australia's dairy production

Dairy production in Australia has undergone radical change in the last decade and dairy producers continue to adapt after almost a decade of drought conditions. Climate change and the resulting water shortages force the relocation of many farmers into higher rainfall areas or a switch from a pasture-based production system to lot feeding. The demand for more energy efficient production processes forces a continuous review of manufacturing practices for dairy products. The Australian state of Victoria in the continent's southwest corner remains the heartland of dairy production and provides 65 per cent of the milk produced. Despite the changes to the industry, Australian dairy products are in high demand globally due to their high quality, product consistency, food safety and green and clean image.

A collaborative industry model for innovation

Australian dairy manufacturing companies strive to satisfy the demands of such diverse markets and consumer populations and continuously create new opportunities in those markets, doing so amidst a radically changing production environment. There is a constant need for new product ideas and process technologies as well as a constant need for innovation.

Dairy Innovation Australia Ltd was founded in January 2007 by Australian dairy manufacturing companies and dairy industry organisations with the mission to be Australia's premier centre for dairy manufacturing science, technology and innovation.

Dairy Innovation Australia

Dairy Innovation provides commercially driven research to enhance the international competitiveness of the Australian dairy manufacturing industry. The non-profit company is located in Melbourne, the capital of the State of Victoria. Today, the State Government of Victoria commends and supports the Australian dairy industry as its most innovative agricultural industry.

Member companies include Bega/Tatura Milk Industries, Burra Foods, Dairy Farmers, Murray Goulburn Co-operative, National Foods, Parmalat Australia and Warrnambool Cheese and Butter on top of two industry organisations, Dairy Australia and Gardiner Foundation.

Funding

Australian dairy manufacturing companies and industry organisations have committed Aus\$15 million (9.4 million euros) for the initial three-year funding period from 2007 to 2009. This funding is leveraged by contributions from Dairy Innovation's extensive network of collaborating research organisations, such as the University of Melbourne, Australian National University, Food Science Australia and international collaborators like Moorepark in Ireland and INRA in France. Company members of Dairy Innovation Australia contribute a levy based on their annual milk production. Australia's peak body for the dairy industry, Dairy Australia, is Dairy Innovation's major funder and both Dairy Australia and the Victoria-based Gardiner Foundation contribute through membership and specific project funding.

Programme direction

How can competitors in the market collaborate? Dairy Innovation has designed a model that has risen to this challenge by focusing its research on areas that are of common strategic interest to company members and the industry as a whole. This builds research platforms accessible for both collaborative and bilateral research projects. On an operational level, members of Dairy Innovation have a seat and vote on all programme committees and are involved in the selection and direction of pre-competitive research projects. Research programmes are undertaken with the view to build capabilities that resource collaborative research as well as commercial R&D, enabling companies to have access to the same resources for their internal development projects and facilitating the adoption of innovative technologies for the development of new products and processes.

Industry engagement

One of Dairy Innovation's key roles is to manage the translation and implementation of knowledge and technologies from a research environment into commercial applications. To achieve this, Dairy Innovation engages with its industry members in a number of effective ways involving research and industry personnel at all levels. The Newsletter DAIRY PLANET informs the wider industry and research community. Direct engagement with company R&D and technical managers occurs in stakeholder meetings, technical road shows, industry workshops and industry internships. Many projects are carried out in the commercial production environment, for example, evaluations of new technologies, pilot and commercial scale validation trials and a wide range of fee-for-service projects. The engagement expands to the decision makers in our member companies at the board level through strategic planning and forecasting.

Ingredients and applications

A significant proportion of Australian dairy milk is converted through capital intensive, high throughput processing plants into a range of bulk dairy powders and concentrated liquid products, e.g. skim and whole milk powder, milk protein concentrates, whey and whey protein powders, caseinates and bulk cream. These products are used as ingredients in a wide range of applications in formulated foods like infant formula, confectionery, bakery and/or further processed foods, including dairy products, e.g. yoghurts, cream cheese and processed cheese. Despite the currently high commodity prices for dairy products, financial returns from bulk dairy ingredients are an ongoing challenge and functionality in the downstream food processing system or formulation is a critical success factor. Cheaper non-dairy sources are a potential challenge for both the functional and nutritional advantages of dairy. Dairy Innovation's research aims to improve the physical and nutritional functionality of dairy ingredients through projects investigating all stages of the manufacturing process.

Dairy process engineering

Dairy processing, regardless of final product, involves processing liquid milk streams and manufacturing infrastructure consisting of common unit operations and process management strategies. Continuous improvements in operational efficiencies are essential and these are increasingly required to improve production flexibility, process yields, product quality and consistency and environmental sustainability (waste, water and energy consumption reduction).

Driven largely by the need to address pressing environmental and sustainability issues, Dairy Innovation works directly with equipment manufacturers and government and industry agencies to bring new concepts to dairy manufacturers. The application of modeling tools plays an important role in the implementation of process improvements, for example, by benchmarking and simulating energy use and efficiency or production yields, thus saving manufacturers expensive large-scale production trials.

Australia's new initiative in dairy health and nutrition

Health concerns and nutritional value have become major factors that influence us in the choice of food we purchase and eat. We are increasingly aware that the choice of food has a profound influence on our metabolic state, immune system and general wellbeing. On one hand, nutrition and the choice of food can predispose us to some diseases like diabetes and increase certain disease risk factors, for example, cardiovascular disease. On the other hand, many diseases and metabolic conditions can be managed with carefully selected diets and balanced nutrition. Health and nutrition has thus become a major driver for the development of new products for the food industry in the past few decades.

Dairy is necessarily involved in the growing debate about healthy eating and Australian dairy manufacturers and industry funding bodies have decided to develop a cohesive response to these health challenges. In a joint effort, the Geoffrey Gardiner Foundation and Dairy Innovation Australia launched The Dairy Health and Nutrition Consortium in February 2008. This new initiative applies the successful model of direct industry leadership and co-investment in strategic industry specific research regarding health and nutrition.

The Dairy Health and Nutrition Consortium will deliver a research program of Aus\$12.5 million dollars over the next five years with the objective to substantiate health benefits of dairy and dairy products. Particular emphasis will be placed on the health conditions that are summarised under the term "metabolic syndrome", a condition that can lead to the development of obesity, diabetes and cardiovascular disease.

Dairy Innovation focuses its research on areas that are of common strategic interest to company members and the industry as a whole.

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