

Programme Progress to date – as at 30 June 2014

Improved production and resilience of cows through increased rate of genetic gain of New Zealand's national dairy herd

- As of May 2014 the programme had discovered 13 markers for production, differentiated product, fertility and animal health. These are included in the commercially available genotyping panel available for use by the New Zealand dairy industry.
- Facial eczema tolerant bulls have been identified and semen is commercially available for breeding tolerance into dairy herds.
- The Fertility Focus Report has been validated and is available to farmers to improve their assessment of the reproductive performance of dairy herds.

On-farm technologies and information systems provide information to farm managers

- Dairy Core Database transition to industry good enabled by a formal agreement between DairyNZ, NZAEL and LIC in August 2013; the transition will maximise the use of information about the national herd for industry good outcomes
- Fertility Focus Report (FFR) version upgrade completed October 2013 make it easier for farmers and veterinarians to assess herd reproductive performance
- Pasture Growth Forecaster launched in October 2013 makes available free regional forecasts for use by all dairy, sheep and beef farmers. Commercial model caters for individual forecasts and wider uptake.
- Techniques for determining phenotypic traits linked to ryegrass persistency were developed in 2013. Trials are delivering preliminary information to farmers, for pasture management decisions, and plant breeders, to meet breeding objectives for improved persistence in new cultivars.
- Data from a network of 80 dairy farms has been used to develop benchmarks and evaluate performance of different sensors. Field evaluation protocols for automated mastitis detection systems have been developed for use by technology developers and decision making support for farmers.
- Audited Nutrient Management System has been set up for environmental auditing and monitoring; this will allow farmers to benchmark and reduce environmental impacts

Enhanced near-farm support for improved on-farm decisions

Provision of increased rural professional capability in nutrient, effluent, animal welfare, people and farm system management:

- Seven certification and accreditation programmes operating (<http://www.dairynz.co.nz/what-we-do/investment/primary-growth-partnership/>)
- Seventeen training programmes established
- More than 1,600 trainers have been up-skilled for provision of advice and training to farmers as a result of training programmes developed or revised
- More than 17,000 farmers and rural professionals that have been up-skilled through training and webinars
- Surveys demonstrate that majority of farmers receiving plans under the certification and

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| accreditation programmes have implemented change on farm |
| Dairy sector's capacity and capability meets industry needs |
| Leadership Pipeline school networks, AgriKids and TeenAg, are established to connect children with the dairy industry, encourage learning about agriculture and career choices into the industry. |
| <p>Professional networks supporting and setting standards for farm management and farm advisors:</p> <ul style="list-style-type: none"> ➤ Rural Business Network launched in 2012 to enable rural based business people to participate in professional development. The network has 3 fully operational Hubs and over 550 members. ➤ Professional Land Managers network is providing continued professional development to farmers (over 1,000 participants in 2013/14). |
| The Centre of Excellence in Farm Business Management (www.onefarm.org.nz) established in 2012 to deliver research and education that will enhance the understanding of farm business management and advocate global best practice. |
| Over 2,700 Farmer Health Pitstops completed raising awareness of wellbeing and highlighting concern regarding high levels of stress, fatigue and burnout and cardiovascular risk in the dairy workforce. Piloting and delivery of an intervention program (MH101) to over 230 people in rural communities. |
| More efficient dairy processing – faster, less cost, reduced waste |
| <ul style="list-style-type: none"> ➤ The programme has produced two patented new to world dairy processes. One of the patents relates to the production of a new high density milk powder that creates major packing and transport efficiencies. ➤ The first phase of process analytical technology has been implemented with the development of statistically based mini-tools that can be integrated into Fonterra's control systems. The initial tools demonstrated the principle of this approach and addressed relevant control problems in the production of milk powder. ➤ Papers on the statistics of sampling and measurement error have been published and have been used as part of NZ delegation input into a recent Codex CCMAS meeting. ➤ A first generation technology for detecting economic adulteration of milk has been developed and is being trialled. Key to this is the development of decision support tools that can assess the extent to which a sample departs from the expected profile and where further testing is needed. The system will be used to ensure the safety of Fonterra's milk supply, both in NZ and elsewhere in the world. |
| New market led products and ingredients |
| <p><i>New products for the food service sector</i></p> <ul style="list-style-type: none"> ➤ Outputs from the programme have provided the basis for two current Alternate Make Mozzarella NPD projects, and have also provided scientific and technical insights that have been applied to improve the operation of the current Clandeboye Mozzarella Plant. Capital expenditure of 72 M for an expansion of the Clandeboye Mozzarella Plant was announced in 2013 ➤ Early outputs from work on the formation and stability of emulsions and creams has provided |

insights on seasonality and processing effects.

Dairy products for mobility

The programme has developed preliminary evidence to support the role of a range of Dairy Proteins in muscle maintenance in middle aged men. These findings, coupled with Fonterra's existing protein technology and other work within the programme, is creating potential options for great tasting products with elevated protein content. Whilst initially targeting the healthy ageing segment, the science and technology will eventually be rolled out to products targeting mainstream consumers.

Dairy products for Paediatrics and Cognition

Supporting the development of products and brands with cognitive development benefits for the very young the programme has produced promising results from pre-clinical animal trials on a dairy-derived lipid ingredient. This work is progressing into human clinical trials and will provide evidence of benefits to enable the development of a range of products for pregnant and lactating women, infants and toddlers.

Creation & expansion of NZ research communities

Building Capability and Reputation.

- New talent employed through the post farm gate sub-programme to date includes: 14 Postdocs, 5 Research Officers, 11 PhD's, 1 Research Associate, 4 Masters students (3 complete). 1 of the Post Docs is now employed by Fonterra at FRDC
- International expert reviews are an important part of assuring science quality in the programme. Reviews of two of the post-farm gate themes were held in 2014 with positive feedback on the quality of the thinking and research within the programme. In the food structures theme in particular, a strong team of NZ and international researchers are working together to deliver on the programme goals.