


Production

A black and white photograph of two men crouching in a field of leafy plants. The man on the left is holding a plant specimen, and the man on the right is examining it. They are both smiling and appear to be engaged in a collaborative activity. The background shows a field of similar plants under a bright sky.

Driving research and development for better solutions and proven tools to improve farming practice in the key areas of feed, animals and farm systems.

Farm systems research and adoption

Investment in farm systems aims to increase industry productivity by focusing on assisting farmers to adopt new technologies, ideas and skills in ways that benefit the individual farm business.

Project contracts 2008/09

A summary of projects contracted during the 2008/09 season in the farm systems research and adoption area.

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
Farm systems extension	SY701 (AN720)	4,227	DairyNZ Ltd
DairyNZ investment in extension aims to increase the rate and effectiveness of on-farm adoption.			
This will be achieved through measurement and refinement of extension strategy and approach; specialist groups, field days, conferences and farm systems groups; partnerships with rural professionals; building regional farmer networks/demonstrations; adoption capability development; written/electronic media and DairyNZ's natural disaster response.			
On-farm innovation	SY702A	87	DairyNZ Ltd
This initiative identifies and reports on successful on-farm innovations so that a wider group of farmers can potentially benefit from them.			
Farm systems development and regional demonstration	SY702B	272	DairyNZ Ltd
DairyNZ is involved with creating an awareness of on-farm processes to solve problems and to demonstrate a suite of tools that allow proactive management of pastures and other aspects of the farm operation.			
Southland Demonstration Farm	SY702C	100	Southland Demonstration Farm Ltd
The Southland Demonstration Farm will enable Southland dairy farmers to establish a centralised focal point and influence more sustainable and profitable decisions on their own farms.			
It will also enable industry partners and influencers the opportunity to link together, ensuring messages are provided in the context of a whole farm system rather than in isolation.			
BOP Focus on Dairying	SY702D	50	BOP Focus on Dairying Charitable Trust
This project sets up focus farms and other events to influence Bay of Plenty dairy farmers to make their farms more profitable, sustainable and satisfying.			
DairyPush	SY702E	50	DairyNZ Ltd
The DairyPush programme, which is funded by DairyNZ, Fonterra and the South Waikato Economic Development Trust, was launched in 2007 by the South Waikato District Council to increase dairy farmers' profitability with a significant financial flow-on to the South Waikato community.			
Systems decision support tools	SY702G	87	DairyNZ Ltd
The goal of this project was to, in a group, teach/support farmers to adopt feed planning tools for decision-making and to identify any opportunities/needs of rural professionals for the feed planning tools.			
Labour productivity	SY702H	269	DairyNZ Ltd
The overall objective of the labour productivity project is to improve labour productivity on New Zealand dairy farms by 20% by 2018.			
The focus in 2008-09 was on improving labour productivity in milk harvesting – which involves the time spent collecting cows from paddocks, milking, clean up and returning cows to paddock.			

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
Prototype farms for dairy farming's future	SY703	320	DairyNZ Ltd
<p>DairyNZ's prototype farms aim to determine the boundaries to sustainable and productive dairy farming by achieving targets anticipated as requirements for the dairy industry in 10 years' time.</p> <p>The prototype farms funded under this project include:</p> <ul style="list-style-type: none"> • The Super Productivity Farm, which aims to produce 1750 kgMS/ha from home grown feed • The Tight Nitrogen Farm, which aims to maintain current production of 1200 kgMS/ha while reducing nitrate leaching by 50%. 			
Automatic milking	SY704A	370	DairyNZ Ltd
<p>This research will develop and deliver farming systems and methods to automate milking in pasture-based dairy systems.</p> <p>The main objectives in 2008/09 were to compare the performance of two farm systems incorporating automatic milking technology and monitoring the performance of the first commercial farms to adopt automatic milking systems.</p> <p>It will also develop decision-support tools for farmers considering farming with automatic milking systems.</p>			
Operational milking management – achieving shorter milking times	SY704B	302	DairyNZ Ltd
<p>This project aims to reduce the labour required for milking in conventional herringbone and rotary dairies by setting a maximum milking time.</p>			
Animal measurement/principles of information use on farms	SY704D	450	DairyNZ Ltd
<p>This research will build knowledge and expertise to underpin the development and adoption of advanced tools to optimise farm production, mitigate labour constraints, improve animal welfare and broaden lifestyle choices.</p> <p>This will be achieved in the areas of automation technology to reduce manual labour, along with information technology, to increase output via better decision-making.</p>			
Forage value for increased dairy productivity	SY705	250	DairyNZ Ltd
<p>Forage supply influences farm profit through a range of plant traits including yield, persistency and quality. The project aims to develop and test a Forage Value (FV) index that calculates the relative economic worth of different forages. Ultimately such an index might assist both plant breeders and farmers to get better value from plants.</p>			
On-farm risk in the dairy industry	SY706	113	AgResearch Ltd
<p>This project seeks to increase the understanding of on-farm business and financial risk in the dairy industry.</p> <p>This greater understanding of risk will identify effective processes, practices and required information to assist all those involved in dairy farm management, from farmers and consultants to extension workers and researchers.</p>			
Extension evaluation	SY707A	178	DairyNZ Ltd
<p>Field extension aims to contribute to the rapid and effective adoption of practices that enhance farm productivity. This project will evaluate industry investment in extension for effectiveness and provide insights into potential improvements in delivery in relation to farmer adoption of new industry tools.</p>			
Applied adoption research	SY707B	87	DairyNZ Ltd
<p>Adoption research is able to inform improved field extension in the dairy industry. This project aimed to scope and commission practical adoption research which would lead to improved planning and delivery of extension.</p>			
Farm systems modelling	SY708	347	DairyNZ Ltd
<p>The aim of this project is to develop and apply computer models to explore farm system and environmental questions that are expensive and difficult to answer with traditional research methods.</p> <p>The DairyNZ Whole Farm Model (WFM) was used to support projects including evaluation of:</p> <ul style="list-style-type: none"> • Supplemental feeding strategies at BOP Focus Farm • Impacts of GHG mitigation strategies on profitability. 			

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
Improving financial capability of dairy farmers	SY710(FB802)	87	DairyNZ Ltd
This project was part of the larger farm business programme of work. The main aim was to improve the strategic and financial capability of New Zealand dairy farmers through a mix of farmer-focused workshops and seminars and general industry communications.			
Science interns	SY711	137	DairyNZ Ltd
The aim of this project is to create a new generation of dairy industry professionals, by developing skills in research, development and extension, to drive the sustainability and productivity of New Zealand dairy farming.			
Dairy industry datacentre	SY712	130	DairyNZ Ltd
This project aims to develop and populate a database of dairy industry economic data, economic models and results of past analyses as a resource for industry monitoring and to enable future analyses of New Zealand dairy farming competitiveness, sustainability, productivity and threats to these.			
Organic/conventional dairy systems trial	SY713	171	Massey University
This project is underway at Massey University, undertaking comparisons between certified organic and conventional systems. The research team has shown the feasibility of conversion to organic systems and identified and managed many of the issues facing the organic farmer. The work is completed on two comparative farmlets, one managed conventionally and the other organically (certified).			
Winter feeding systems for Southland's burgeoning dairy industry: a framework for deciding the best options	SY801	44	DairyNZ Ltd
This project will deliver a framework to enable farmers to make informed decisions on which wintering system best suits their farm resources and goals and identify priorities for future research to fill information gaps.			
Pasture management systems for Northland: quantifying the effect of three different pasture management systems on milk production and farm profitability	SY803 (FD)	139	Northland Dairy Development Trust
This research looks into the productivity and profitability of three different pasture management systems in Northland – a kikuyu-based farmlet using mechanical control of pasture; a kikuyu-based farmlet using no mechanical control of pasture and an all-ryegrass farmlet.			
Grow Organic Dairy	SY804	89	The Organic Dairy and Pastoral Group
This farmer-led research project aims to identify the key management practices of successful organic dairy farmers to:			
<ul style="list-style-type: none"> • Grow the organic dairy network • Lift the production of individual farms • Identify organic dairy production methods that are attractive propositions to other dairy farmers. 			
Telford Dairy Demo Farm	SY805	86	Telford Farm Training Institute
This provides relevant information to the Otago dairy community on important areas of:			
<ul style="list-style-type: none"> • Pasture management • Effluent management • Herd production and health • Dairy grazing management and crop management on sensitive soils. 			

Looking ahead

There is no doubt that 2009/10 will be a challenging year for farmers. With an industry focus on efficient farm management, the work of regional extension teams supported by demonstration activity will be a key part of supporting farmers as they drive greater profitability.

2009/10 Investment

Farm systems research: \$4.6 million

Proportion of levy: 9%

Adoption network: \$6.5 million

Proportion of levy: 12%

Activity	Key objectives	2009/10 Plan
<p>This programme contains a focus on technical aspects of labour productivity – bringing together component technologies to improve system performance, and achieving demonstration and adoption in the regions.</p> <p>A strategic issue, which will increase in importance, is expanding the role of the farm systems programme, leading a systems approach to resource use efficiency (with the environmental driver) and influencing government policy.</p>	<ul style="list-style-type: none"> • Increased labour productivity • Lifting on-farm profit from productivity (PPF) and resource use efficiency • Regionally relevant demonstrations • New farm systems tested in R&D • Government policy tested at farm system level • Industry capability 	<p>Generate new options from research and development by universities, research teams, on-farm innovation and agri-business, which are integrated into farming systems with reference to overall system performance and regional variation.</p> <p>Achieve farmer adaptation, leading to higher performing farm systems through:</p> <ul style="list-style-type: none"> - Effective adoption approaches, involving all parts of the industry networks - Building capability in all parts of the industry. <p>Test government policy initiatives in a farm systems context; communicate these results back to government and influence policy design.</p>

Feed production

New Zealand's unique competitive advantage is based on its low cost, pasture-based farming systems. DairyNZ is focused on achieving profitable and sustainable farming systems through improving the quality and amount of feed dairy farmers grow, matching feed supply with demand, and improving efficiency with which feed is converted into milksolids.

Project contracts 2008/09

A summary of projects contracted during the 2008/09 season in the feed production area.

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
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Impact of a new ryegrass endophyte (AR37) on dairy production	FD601	435	DairyNZ Ltd
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This project is determining the effects of AR37 endophyte on pasture production and persistence, milksolids production and cow health.

Improving water use efficiency on irrigated dairy farms	FD602	182	AgResearch Ltd
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This project aims to make pastoral production in Canterbury more sustainable and ensure that the ongoing significant commercial benefits to individual farmers and communities will continue.

New Zealand Pastoral Industries Ryegrass Development Programme	FD603	854	Pastoral Genomics
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The aim of the investment in Pastoral Genomics is to use modern biotechnology approaches to develop new ryegrass and clover plants that are more productive and persistent.

Tall fescue-based dairy systems	FD604	160	DairyNZ Ltd
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This project determines the annual dry matter production and nutritional quality profiles of various forage grass and legume species in irrigated and non-irrigated Waikato dairy pastures.

Increasing feed intake of pasture-fed dairy cows	FD605	349	AgResearch Ltd
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The objective of this research is to increase productivity of forage-based dairy systems by developing perennial ryegrass varieties and endophytes that will promote superior digestion rate and voluntary intake of grazed pasture by dairy cows.

Experimental release of a clover root weevil biocontrol agent	FD606	222	AgResearch Ltd
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The Irish wasp *Microctonus aethiopoulos* was released in 2006 as a biocontrol agent for the clover root weevil, a serious pest of white clover in New Zealand. This project aims to improve vigor and viability of white clover through the successful biocontrol of clover root weevil throughout New Zealand.

Enhanced dairy nutrition via herbage protein stability	FD607	267	AgResearch Ltd
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The rapid degradation and loss of grazed forage nitrogen (N) in the rumen causes economically-significant energetic and environmental costs. This project aims to develop and deliver forage-mediated solutions leading to improved N utilisation in the dairy rumen.

The role of high sugar grasses in pasture-based dairy systems	FD608	311	AgResearch Ltd
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Ryegrass is the main grass used for dairy pastures. This project has been testing the effect of increasing the concentration of water-soluble carbohydrate in ryegrass (high sugar grasses); on the total quantity of metabolisable energy grown and the efficiency of grass conversion to animal product; and nitrogen partitioning to milk and urine.

Brassica SFF project co-funding	FD609	120	Plant and Food Research
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This project has worked to transfer existing and new management technologies for forage brassicas to a large number of pastoral farmers in diverse climates and farming situations so that a significant improvement is achieved in the performance of New Zealand's forage brassica crops.

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
Pasture covers using satellite technology	FD610	395	Fonterra
The Pastures from Space programme is based on the premise that more accurate and frequent information on pasture cover would support farmers making more timely and profitable farm management decisions. This project is testing the use of satellite remote sensing to measure pasture cover at farm and paddock scale.			
Validating and promoting tools for pasture measurement	FD611	102	AgResearch Ltd
The objective of this project is to increase dairy farmers' use of tools for pasture measurement. In 2008/09 this has focused on regional, on-farm validation of the C-Dax Rapid Pasture Meter equations for estimating pasture mass.			
Standardised feed quality analysis in New Zealand	FD612	178	Lincoln University
Farmers use feed analysis as the basis of purchase and management decisions. This project aims to develop a robust standard methodology for feed chemistry, ensuring consistency of NIR (near infrared) results from different labs.			
Increasing pasture eaten	FD615	540	DairyNZ Ltd
This project aims to increase New Zealand dairy farming profitability and competitiveness by increasing the amount of homegrown forage (pasture and crops) eaten per hectare (measured as metabolisable energy) on New Zealand dairy farms while not increasing the environmental footprint.			
Acquisition of new plant germplasm for New Zealand dairy industry	FD617	75	AgResearch Ltd
This project aims to provide new plant germplasm to underpin future production systems. This requires coordinated industry action to ensure access to new pasture and forage crop germplasm.			
Integrating high yielding, sustainable crops into dairying	FD701	80	Waimate West Demonstration Farm Trust
This aims to improve dairy farming productivity by at least 12% through demonstrating the successful and sustainable integration of forage cropping (targeting 45 TDM/ha per annum) into the pastoral dairy farming system.			
Sustainable feed systems for dairy support land in North Otago	FD801	20	AgResearch Ltd
This project aims to identify feed systems (pastures/crops) that improve young stock liveweight gain during summer/autumn and feed dry cows during winter without causing long-term damage to soil quality.			
Best-practice pasture renewal for forage production and sustainability	FD802	111	AgResearch Ltd
This project trialled best-practice pasture renewal and management techniques with close monitoring of the establishment, persistence and production of the key forage species. This project has worked closely with farmer groups in the BOP and Waikato.			
Adapting to a drier environment by improving irrigation practices	FD803 EN634	13	The Agribusiness Development Group NZ Ltd
The aim of this project is to increase the uptake of already available irrigation practices and tools by dairy farmers, particularly in areas where water restrictions do or are likely to occur.			
Pastoral21	FRST/P21	1,133	
DairyNZ is a co-founder of this joint industry-government research programme. The programme aims to increase the yield and quality of feed harvested on New Zealand pastoral farms.			

Looking ahead

The dairy industry faces two imperatives around feed. In the short term, farmers need to extract more profit out of the pastures and supplements they already have. This requires better decision-making and will require farmers to take unprofitable inputs out of their systems. In the longer term, new plant material is required that will meet industry goals of greater productivity and resource use efficiency.

2009/10 Investment: \$5.9 million

Proportion of Levy: 11%

Activity	Key objectives	2009/10 Plan
<p>Increasing feed supply through breeding and identifying better plants, and better use of existing plants, including dealing with pasture persistency and improving utilisation of existing pastures and supplements.</p> <p>Improved systems for plant evaluation throughout the breeding cycle has been identified as a key element.</p>	<ul style="list-style-type: none"> • New systems for better use of existing plants • On-farm adoption of existing plants and technologies • New, better plants • Improved plant evaluation systems 	<p>Investment in:</p> <ul style="list-style-type: none"> - Increasing adoption of existing beneficial technologies - Developing new technologies to increase potential milksolids production from forage, potential feed conversion efficiency, cow functionality and resource use efficiency - Developing measurement and management tools for on-farm decision-making. <p>Develop an industry-endorsed, quantitative plant evaluation system that integrates a forage value method (akin to production worth) with physical performance testing at a range of scales.</p> <p>Ensure the long-term potential of farm production to:</p> <ul style="list-style-type: none"> - Deliver a regulatory regime that supports the agreed use of new plant and animal material based on both conventional and biotechnology-based breeding. - Maintain and develop relevant capability throughout the industry. <p>Achieve highest quality on-farm storage and management of milk with respect to bacteriology, inhibitory substances and traceability.</p>

Animals

The cow is the engine room of the New Zealand dairy industry, which relies on healthy, efficient animals to convert grass into profit. DairyNZ is working to ensure the New Zealand dairy herd is based on healthy cows that have good reproductive performance and efficient feed conversion rates.

Project contracts 2008/09

A summary of projects contracted during the 2008/09 season in the animals area.

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
AE with genomic selection	AN701	226	NZ Animal Evaluation Ltd
<p>This project updates the National Animal Evaluation model by developing procedures for integrating genomic information – provided by breeding companies – into the standard trait evaluation routines that use pedigree and phenotype data.</p>			
National breeding objective - information delivery	AN702	764	NZ Animal Evaluation Ltd
<p>This provides regular provision of the most up-to-date genetic information on dairy sires for improvement of farmers' herds. This is achieved by the continued management by New Zealand Animal Evaluation Limited (NZAE, a subsidiary company of DairyNZ Inc) of the national breeding objective, which has the goal to 'identify animals whose progeny will be the most efficient converters of feed into farmer profit'.</p> <p>This management entails updating economic information related to the breeding objective and updating of genetic trait evaluations as new information becomes available for the national genetic evaluation system.</p>			
Feed conversion efficiency	AN705	977	DairyNZ Ltd
<p>The ultimate aim of this project is increased productivity in the dairy industry through on-farm improvements in the conversion of feed to milksolids, via improved genetics for metabolic feed conversion efficiency. This is a trait that cannot be directly selected for in normal animal evaluation or sire proving systems.</p>			
Lactation management (includes SY709)	AN706	113	DairyNZ Ltd
<p>This research will provide farmers with a simple genetic/physiological test to determine which cows will be the best producers on OAD milking based on milksolids.</p>			
InCalf NZ	AN707	356	DairyNZ Ltd
<p>The objective of the InCalf NZ project is to increase the six-week in-calf rates on New Zealand dairy farms through a targeted adoption programme. InCalf is a learning package for herd reproductive management. It includes resources, tools and training for both dairy farmers and their advisers. It was developed in Australia and is revised for New Zealand conditions, and made available thanks to an agreement between DairyNZ and Dairy Australia.</p>			
National Mastitis Advisory Committee - basic operations	AN711	160	DairyNZ Ltd
<p>The National Mastitis Advisory Committee (NMAC) is a group of interested and experienced people who have an interest in mastitis. NMAC undertakes activities that reduce the incidence and severity of bovine mastitis, for the benefit of the New Zealand dairy industry.</p>			
Reducing mastitis in heifers	AN712	133	Animal Health Centre Ltd
<p>Heifer mastitis has been an increasing problem for dairy farmers in recent years and is costly to farmers, with increased treatment and labour costs, and increased losses due to discarded milk, additional culling and lost production.</p> <p>This work aims to provide farmer-friendly packages which will allow individual herd owners to assess various control options, explore the likely cost/benefits of these options and to select the appropriate strategy for their farm.</p>			
Novel tools to prevent <i>streptococcus uberis</i> mastitis in dairy cows	AN713	302	DairyNZ Ltd
<p>This project aims to improve on-farm productivity and profitability by providing farmers with new and improved tools to prevent mastitis. By 2013, this project aims to develop and validate procedures to identify cows with superior resistance, to assess this resistance under natural and experimental challenge situations and to identify biochemical, physiological and genetic markers of these super-resistant cattle phenotypes.</p>			

	Project Number	DairyNZ Funding \$'000's (excl. GST)	Parties
Mastitis control programmes & farm productivity	AN714	53	DairyNZ Ltd
<p>This project aims to provide farmers with information on costs and benefits of key mastitis control technologies. This in turn should increase the motivation to apply new and existing control measures on-farm, thereby improving productivity and profitability. This will be achieved by evaluating differences in mastitis incidence, bacterial aetiology, herd production responses and mastitis-related costs incurred at a mob or herd level when cows are exposed to different mastitis control programmes.</p>			
Healthy Hoof programme	AN715	150	DairyNZ Ltd
<p>Launched in early 2008, the purpose of Healthy Hoof is to help farmers reduce lame cows through improved management of cows and people. Healthy Hoof has been developed in consultation with vets as well as local and international lameness experts.</p>			
Reducing lameness in the South Island	AN716	157	Lincoln University
<p>This project has produced key new research findings that represent an important step forward in understanding lameness and why certain regions have unacceptably high rates of lameness. It develops effective strategies to reduce South Island lameness through partnership with the South Island industry and farmers by establishing baseline data on all aspects of South Island lameness – including the role of herd size, management and nutrition.</p>			
BVD (Bovine viral diarrhoea) - Prevalence of infected herds and economic consequences of infection in dairy cows in Taranaki	AN717	86	Eltham District Veterinary Services
<p>This study aims to quantify the risk factors and economic consequences of BVD in dairy herds.</p>			
Farm systems extension	AN720 SY701	231	DairyNZ Ltd
<p>This drives farmer adoption toward sustainable profitability targets through an integrated programme of field extension.</p>			
Strategic lactation management tools	AN802	121	DairyNZ Ltd
<p>This study will provide modified lactation and nutrition management strategies and associated phenotypic markers to identify suitable cows to contribute towards improved total factor productivity and increased profitable cow lifetime milk production for New Zealand dairy farmers.</p>			
Condition score and nitrate excretion responses to commonly-used supplements	AN803	244	DairyNZ Ltd
<p>This project will determine the effect of commonly used supplements on body condition score change and nitrogen excretion in pasture-based dairy cows.</p>			
Improving dairy cattle fertility	AN806	143	Animal Health Centre Ltd
<p>This project assesses the effect of the InCalf programme in biophysical and social terms on 100 dairy farms across New Zealand. It also defines the barriers of InCalf uptake by herd owners, staff and rural professionals; benchmarks current fertility of the New Zealand dairy industry and builds capability in delivering InCalf.</p>			
Reducing facial eczema damage in dairy cattle	AN807	53	AgResearch Ltd
<p>This looks at developing a DNA marker test for facial eczema (FE) resistance/susceptibility for use by the NZ dairy industry. This project identifies causes of under-protection against FE, in FE-prone herds applying zinc treatment via the water trough [co-funding for MAF SFF-Climate Change contract no 08/034].</p>			
Improving cow fertility	AN808	461	DairyNZ Ltd
<p>This project aims to improve reproduction on New Zealand dairy farms by expanding our understanding of the factors affecting the incidence of postpartum uterine pathology and the speed of uterine recovery, with a particular focus on the effect of energy status and uterine bacteriology.</p>			

Looking ahead

The New Zealand dairy industry has an enviable track record in delivering genetic gain and healthy, fertile animals. There is on-going tension between improving genetic merit for production and having cows perform well in the system with regard to reproduction and health. Both genetic and management solutions are required, and the investment in the animals programme is focused on these two pathways.

2009/10 Investment: \$5 million

Proportion of levy: 9%

Activity	Key objectives	2009/10 Plan
<p>The on-going tension between improving genetic merit for production and having cows perform well in the system with regard to reproduction and health is clear.</p> <p>Both genetic and management aspects of this tension are important.</p>	<ul style="list-style-type: none"> • Systems for animal evaluation • Improved reproduction • Reduced mastitis • Reduced lameness • Increased feed conversion efficiency through genetics and management • Reduced production disease incidence 	<p>Maintain and enhance the animal evaluation system including the genomic and national databases, the capture of herd testing and other phenotypic data and the introduction of improved and new traits.</p> <p>Increased cow functionality through improvements in:</p> <ul style="list-style-type: none"> - Animal health including reproduction, lameness, mastitis and facial eczema, BVD, EBL. <p>Traits and management that support farm systems productivity (e.g. milking speed, calving ease).</p> <p>Achieve positive changes to milk composition and value from on-farm modification (e.g. genetics, nutrition). Ensure that any effects of new farm management systems and products on the supply chain (through changes in milk processing, composition or food edibility) are understood and considered.</p>