

## **Final Report**

### **A demand driven integrated value chain for red meat that delivers sustainable benefits for to all participants**

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## Overview

FarmIQ embarked on the value chain creation project in June 2010 after approx. 18 months of development. The project vision was to:

**Build a demand driven integrated value chain  
that delivers sustainable benefits to all participants.**

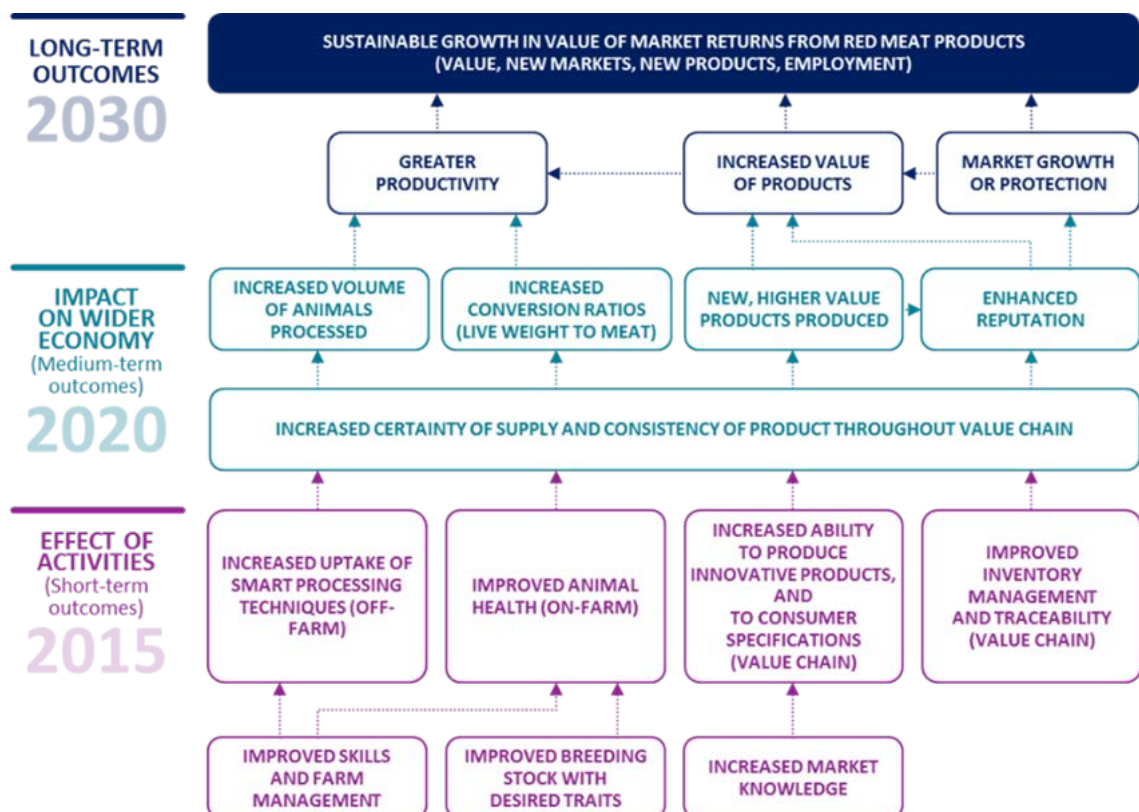
The contract with MPI (was MAF) was signed in October 2010 and the CEO employed in Dec 2010. The project started with 3 Partners in Silver Fern Farms, Landcorp and PGGWrightson. PGGWrightson exited the programme in March 2011 given financial challenges and the need to focus on core business.

The project covered 6 streams of work namely:

- IO 1 Management and KPI's
- IO 2 Market Analysis
- IO 3 IT and Database
- IO 4 Genetics
- IO 5 Processing
- IO 6 Farm Productive Capacity

Silver Fern Farms were responsible for delivery of IO 2 and IO 5, FarmIQ directly IO 1, IO 3 and IO 6 with IO 4 contracted to AgResearch. Part of IO 3 and all of IO 6 were inherited by FarmIQ directly as a result on the PGGW departure.

While not originally developed by the programme, MPI developed, in consultation with the programmes, outcome logic models. The following describes the FarmIQ programme at a high level.



This report is structured as per the IO outlined earlier (and contracted) with key outcomes mapped across the outcome logic model as an executive summary.

The programme invested a total of \$125m over the 7-year period from the following partners

- Silver Fern Farms
- Landcorp
- Trutest
- FarmIQ Customers
- MPI

This is a significant investment overall and high by historical standards, but represents 0.4% of industry earnings over that period.

## Summary outcome

In summary, we believe the programme has been successful as per the following bullet points. Towards the end of the programme the challenge has been to scale up the elements of the programme whether it be value add sales or farmer software uptake. Rather than as a result of technical issues, this has often been as a result of the time required to change human behaviour, whether they be consumers, retailers, meat companies' farmers or their suppliers/advisors. Heading down the value chain track challenges everyone to focus on the customer and work in a collaborative manner which is at odds with traditional industry behaviour.

### Key Outcomes

- Branded consumer beef, lamb and venison - **\$260m** revenue over programme period
- Beef, sheep and deer carcass traceability designed and built in plant
- Beef eating quality measurement designed and built in plant
- Beef eating quality (BeefEQ) system linked to farm (& software) - **\$3.5m per annum** in premium farmer payments
- Lamb eating quality consumer tested and processing measures used to guarantee quality
- Lamb value add return **2.75** times commodity value
- Sheep genetics tool developed to select for lamb eating quality and productivity traits.
- Farm management software in use by **10%** Sheep and beef industry
- Farm productivity lifted by **10%** on IQ Farms
- On track for NZIER revised outcome of **\$1.2b** by 2025

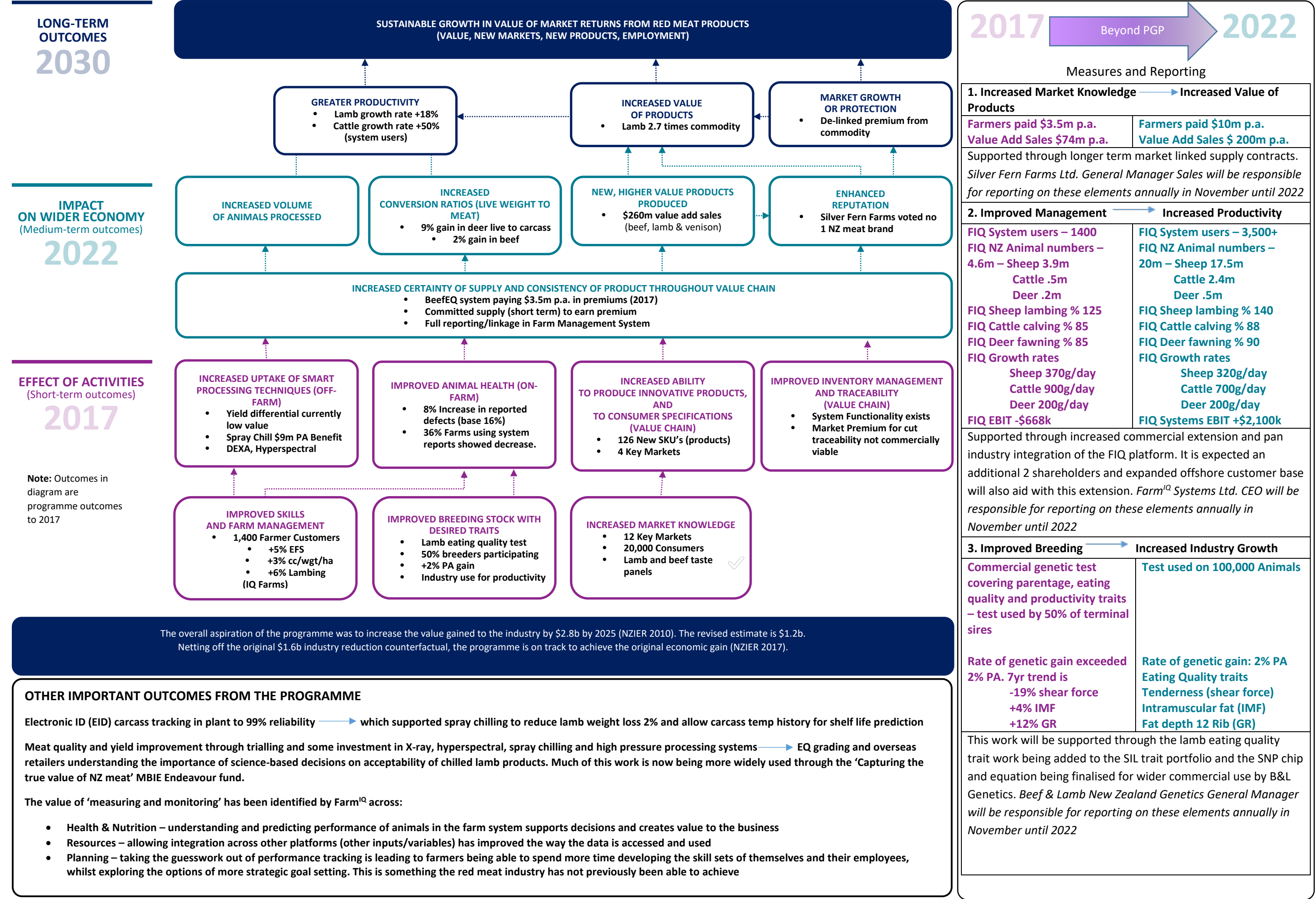
## Report Structure

The report is structured around the key outcomes from the contract in table form. The key outcomes have been modified over time through the annual programme plan process.

The Executive Summary, provides outcomes at a high level over the programme period in the outcome logic format. The outcomes are then elaborated on further in a PowerPoint summary. This is followed by a summary of IP developed and ongoing key risks. The high-level outcomes are supported by case studies which put the outcomes in a practical frame. The report concludes with a financial summary.

A summary of outcomes 2010-17 and the detailed outcomes against those agreed in the 2016/17 plan are contained in the appendices.

For public release, we have developed the Annual Insights document for the final year. This will be available in a printed and downloadable form from the FarmIQ/MPI website.



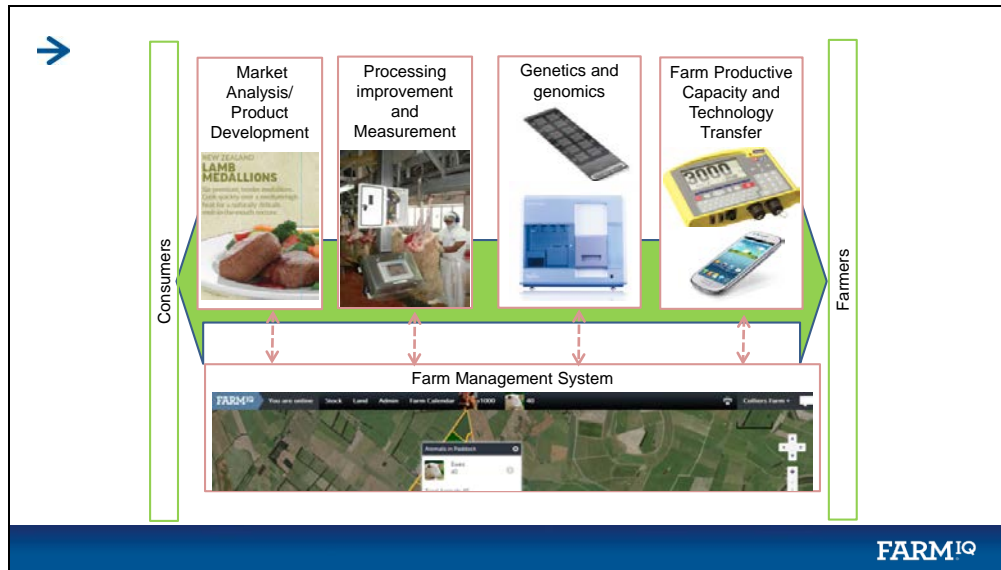
# Powerpoint Programme Summary

Slide 1



- In the context of the original business plan, meant a fully integrated value chain, paying a premium, joining market requirements back to contracted supply linked together by an information system. SFF, LFL and PGGW.
- FarmIQ has all the parts where required (lamb eating quality not required for e.g.), but not formally linked together in a contractual manner given lack of willingness from the marketplace to contact.
  - BeefEQ very close with market and supply premiums, quality measures linked to farm production and short-term supply commitments.

Slide 2



Key parts of the programme, joining up the value chain.





## The Beef Story



Opportunities – Consumer research

- 20% steak tough
- value in ABF, HGP, Grass fed
- Consumer can't cook/won't risk getting it wrong

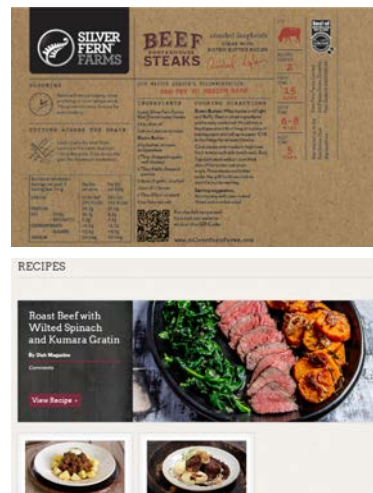
FARMIQ

Key beef market opportunities summarised



Outcome:

- ✓ New packs/product
- ✓ Cooking information
- ✓ On-pack information
- ✓ Web information
- ✓ Eating quality promise



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Key beef outcomes with a consumer focus

## ➔ Marketing Key Learnings

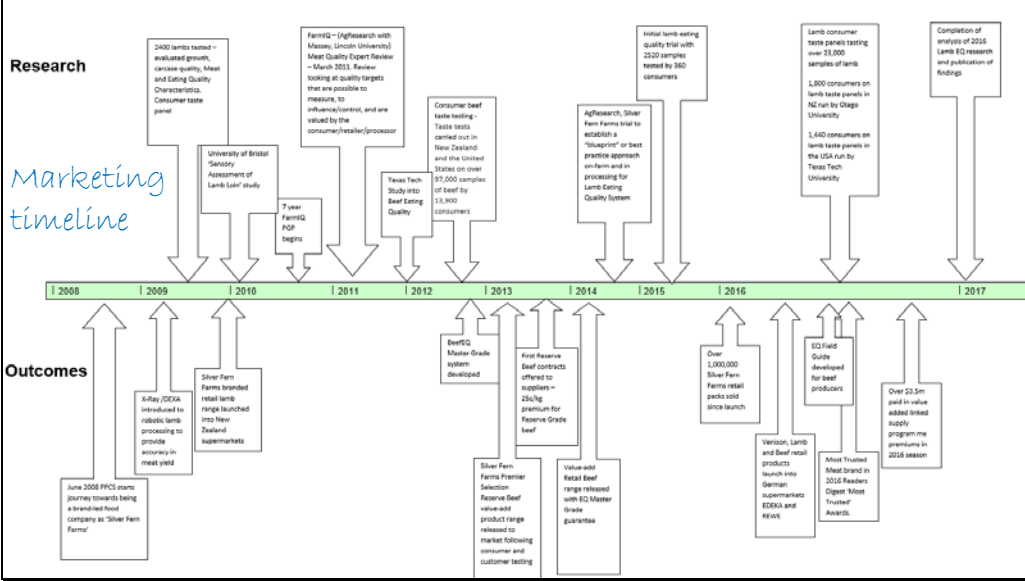
1. **Segmentation:**  
Understand & Target the Right Consumer, Customer & Market
  2. **Go To Market Plan**
    - Brand Plan
    - Product Plan
    - Win all MoTs: A,B,C,D
  3. **Capture Value** don't just Create it! (Price Strategy)
- Research, Insights, Empathy, Prototype, Iterate, Go Again..... And don't give up early!
  - Passionate People right through the value chain
  - Understand Whole of Animal Economics
  - Complex SGOP



Marketing key learnings



Marketing learnings summarised as a process.



➔

Processing Story

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## Outcome .....Track the steak ..

- EID readers
- Tracking skids
- Tracking cuts - Marel

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### Summary of beef traceability outcomes

- Installed EID readers to pick up live animal.
- Installed EID chips in skids so the animal can be tracked through the plant to the boning room picking up disease and defect data at meat inspection, weight and grade at grading and the BeefEQ measures in chiller.
- Cut tracking system set up at Te Aroha using Marel system. Consumers don't see value in pasture to plate traceability by cut at this point. Could be implemented if required.

## → Processing Improvement and Measurement



- Traceability
- Meat Yield Measurement
- Meat Quality Measurement
- Process Optimisation
- Meat Quality Improvement

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- Trialled a range of methods and systems to assess yield and eating quality
- Most added more cost than value currently
- Quality measurement on beef sorted...BeefEQ
- Quality measurement on lamb harder – large number of small carcasses.
- DEXA X-ray (meat/bone/fat yield) trialled by adding to carcass cutting X-ray guidance (proportion of carcass in fore/mid/hind ¼). At this point still in trial, not a major value driver, looks like it may scale up commercially in Australia
- Tried NIR, Hennessy and other systems, non-valuable. Hyperspectral analysis now part of an MBIE programme.

## ➔ Processing Key Learnings

- Carcass tracking OK - Electrical noise problem for RFID
- Yield interesting but yield difference not great value differential
  - DEXA yield measurement will evolve (meat/fat/bone)
- Quality measurement systems challenging esp. at lamb chain speeds
  - BeefEQ sorted
  - Processing (AC&A and Ageing) can manage any lamb issues
  - Work evolved into MBIE programme
- Cut tracking can be done, e.g. by marel system - expensive - will the consumer pay - No currently

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Processing Key Learnings.

## ➔ Outcome - Finding the tender steak



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Summary of BeefEQ quality eating system story

Slide  
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Outcome for beef  
.....measure what matters

- pH
- Colour - Meat, Fat
- Ossification
- IMF - Marbling
- Rib fat
- Weight

Solution .....record and link it

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BeefEQ, measure the key parameters to create pass/fail and record these in central system.

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Breed

Supplier

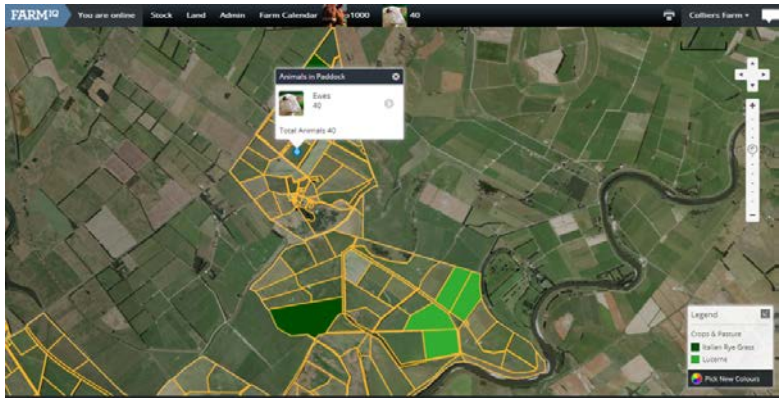


Outcome - Help the farmer work out what works

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- Transfer the pass/fail and background info to farmer through system so farmer can link on farm practice with beef eating outcome.
- Create manual to assist farmers in linking farming practice to eating outcomes.

➔ The Farm Management System.....



Designed by farmers – for farmers & friends



- System developed based on initial 1,300 user stories developed by farmer reference group.
- System was designed for farmers and those that they work with e.g. vet, consultant etc

➔ The Farm!Q Software Journey



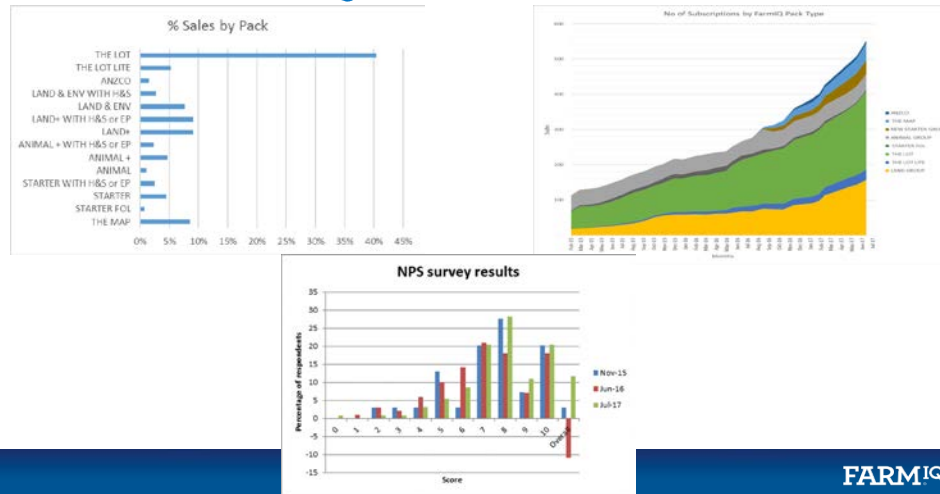
- 1,300 user stories
- 50 man years of development
- Delivered 3,000 stories
- 400,000 lines of code
- 1,400 Farmers
- 5.9m Stock Units
- 1.4m hectares
- 800k map features
- 35m animal weights
- 11m carcasses
- 680k animal events
- Average customer 8000 Su



High level time line for system development and commercialisation. Metrics around system build and current volume of data.

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## ➔ Software Story - Sales and NPS



Majority of sales are the lot. The Map is growing as farmers relate to maps, want to have a system independent of input supplier e.g. fertiliser, its cheap and easy way to try the system out.

NPS showed a strong lift from the previous year (-11 to +13). The reasons are not clear at this stage, but no doubt relate to additional functionality (more on mobile) and familiarity with the system. The survey included 900 users and had a 14% response rate.

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## ➔ Software Functionality



Summary of system functionality. The dark blue boxes show areas of operation/recording. The light blue boxes recording. The white boxes are areas of new development outside current scope, mostly dairy related



Slide  
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→ Integrates with devices, partners and partner software

**FARMAX**  
YOUR ADVANTAGE

**TRU-TEST**

**Ballance**

**SILVER FERN FARM**

**CASH manager**  
RURAL

**GALLAGHER**

**NAIT**

**ANZCO FOODS**

**GRAZCARE**  
Grow, gain & maintain

**TE PARI**

**Environment Canterbury Regional Council**  
Kaitiaki Take Kōwhiri

**Alliance Group**

**StockCare**  
Identifying potential. Optimising productivity.

**JENQUIP**  
First in the Field

**PRECISION FARMING**

**AFFCO NEW ZEALAND**  
ESTABLISHED 1950

**landbase**

**TRAC**

**FARM!Q**

Summary of partners in information/system sharing. Farmax and Cashmanager share data to remove double entry of data and support the other parties functionality. The scale manufacturers support data transfer to avoid manual data entry. Grazecare, Stockcare and Landbase use parts of the system to provide functionality for their business. FarmIQ is rebranded for these purposes. The meat companies provide kill data either via CSV for import or directly. With Ballance and Precision we are working on sharing data to allow for the replacement of the original Ballance product, AgHub.

Slide  
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→ Software Key Learnings

- Majority of farmers don't formally plan and monitor
- Systems support planning and monitoring
- Not all farmers aim to optimise their business for commercial outcomes
- Will respond to compliance if they have to – e.g. HES, LGE, QA/FAP
- 5% pointy heads – love this stuff
- Collecting data often not seen as time effective
  - Mobile phone apps help
  - IOT will really help
- Other sector participants don't want to share info
- Original B to B path preferable, now picking up on this approach
- Rural broadband connectivity challenge
- Sector participants wont challenge farmer thinking if risks relationship

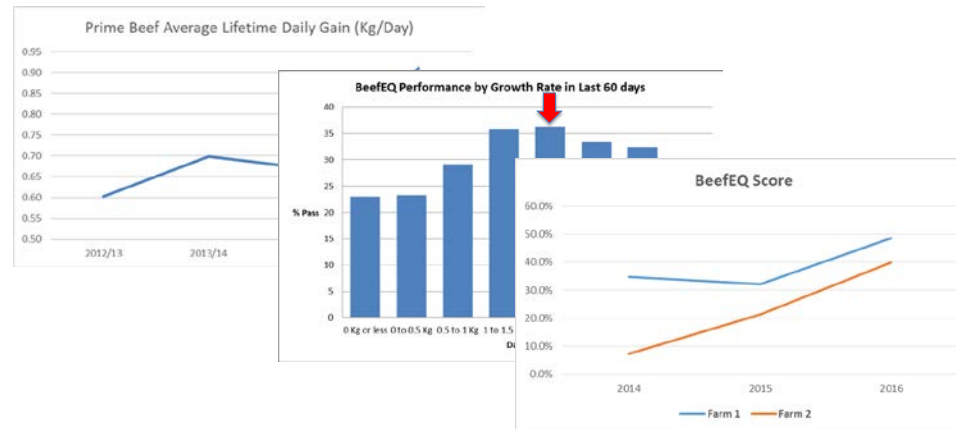
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Summary of software key points.



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→ Working out what works by providing information..



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- Can use system data to support farmers with better ideas to get better outcome.
- This example, strongest correlation of BeefEQ pass with growth is 60 days prior to slaughter – Gain of 1.5 to 2 kg/day at that time equals highest pass rate.

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→ Beef EQ Scores



- 60,000 animals annually
- + \$0.25c/kg (+5%)
- \$3.5 m Premiums annually

FARM IQ

- Farmers with better information are improving eating outcomes.

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## ➔ It's productivity data



Data from Bakers FAB Annual reviews

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IQ Farm performance has improved over the course of the programme. This outcome can be attributed to a mixture of planning, farm activity, recording and analysis, not solely system use.

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## The Lamb Story



### Opportunities - Consumer research

- Lamb good experience
- Cut sizes vs. leg roast?
- Match cuts to cooking
- Eating quality opportunity?

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### Lamb consumer focus:

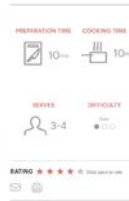
- Overall, taste panels (assuming aged if frozen), thought lamb was a good eating experience.
- The traditional lamb leg is too large for most occasions, so breaking down to key muscles e.g. rump both gives a more useful size, and a consistent cook as one muscle.
- Ensure the cooking instructions are aligned with a cut.
- If processing done right, not the opportunity to improve eating quality in a 'BeefEQ' manner.

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### → Outcomes:

- ✓ Cooking information
- ✓ On-pack information
- ✓ Web information
- ✓ Range of cuts

Sizzling Chinese-style Lamb Stir-fry  
By Silver Fern Farms



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- Making sure the consumer has some ideas on what to cook, how to cook etc

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### → LambEQ?



- Taste test
- 4,300 Lambs
  - 27 Breeds
  - Gender (rams, crypts etc)
  - Grades
  - On farm info e.g. growth rate, feed
- 23,000 samples
- 3,240 Consumers - NZ and US



- Conclusion - No major issues which cant be managed by:
  - Best cuts
  - Ageing the meat (chilled or before freezing)
  - Matching cut to cooking method
  - pH decline management - Electrical stimulation
  - Compelling Brand Story

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LambEQ work outcome.

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## ➔ Breeding better eating quality lamb possible

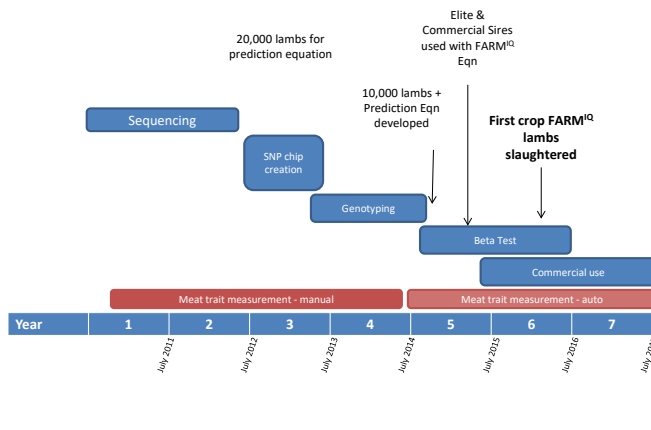


- Sheep only – already plenty of work in beef
- Working with B&L Genetics as they use technology on non eating quality (productivity) traits
- Should be able to do all traits for about \$27
- Next steps include continuing to extend breeder uptake of eating quality chip.....already 50% uptake
- B&L Genetics – Zoetis possible challenge.

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## ➔ The Plan

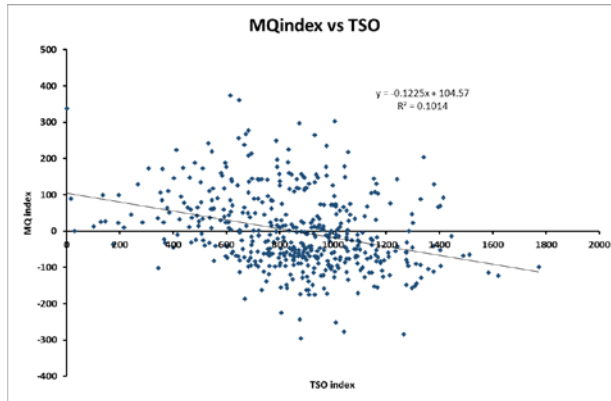


Timeline

FARM<sup>IQ</sup>

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➔ Maximising gain in terminal sires risks reducing eating quality

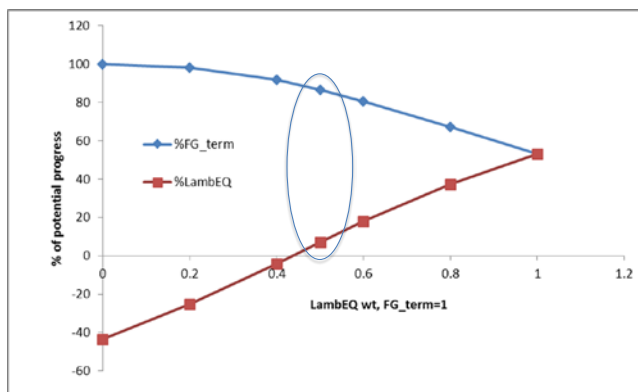


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Work confirmed that selection for maximum gain for terminal sire index (growth rate, yield) will result in reduced eating quality

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➔ Good compromise possible.....

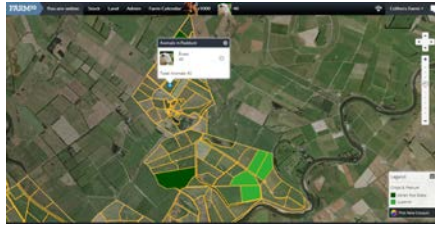


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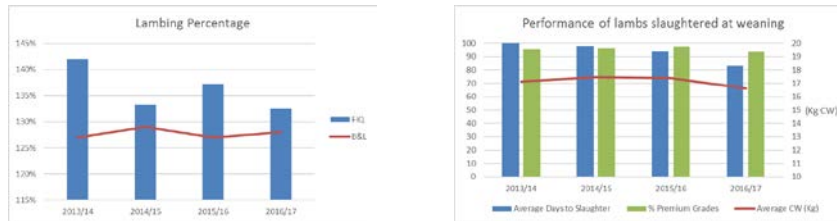
By optimising for terminal sire gain at 90%, you can still make a gain of 10% in the eating quality index. Maximum terminal sire gain would take the eating quality index back 40%.

## → Drive productivity with....

Farm  
Management  
System Data



Animal health:  
Against an upward  
trend, 36% of farms  
using F&Q disease  
reports showed a  
reduction



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Using system reporting examples, you can see outcome for reproduction and growth rate.

- On reproduction, while ahead of the B+L benchmark, the margin is reducing as customer numbers grow in the system. Early adopters were those that focused on performance measurement and performed well.
- Lamb growth rate is increasing year on year with a slight decline in the % in premium grades. Ccwtg has dropped slightly but days to slaughter has dropped proportionally more, hence the increase in growth rate. Farmers juggle these outcomes against weather and schedule trends.

## → On-Farm Key Learnings

### Behaviour change

- New knowledge - technologies require time to familiarise
- Adaptation to their system
- Confidence from peers and steering teams
- New behaviours become new normal
- Variation in willingness/ability to adapt
- Can be delay between new behaviours and results
- More confidence, between risk management, greater certainty, greater feeling of control
- Needs to be simple to understand otherwise, flogging a dead horse
- Top four inches important
- Less practical work, more management work

### Productivity improvement

- Better understanding of cause and effect
- Understanding productivity drivers
- Understanding natural resource capacity
- Improved match of resource capacity to farm system
- Output/input = Efficiency
- Control the things you can control
- Quality vs quantity
- Improved feeding (biomass, energy, protein, seasonal distribution) foundation for improved productivity

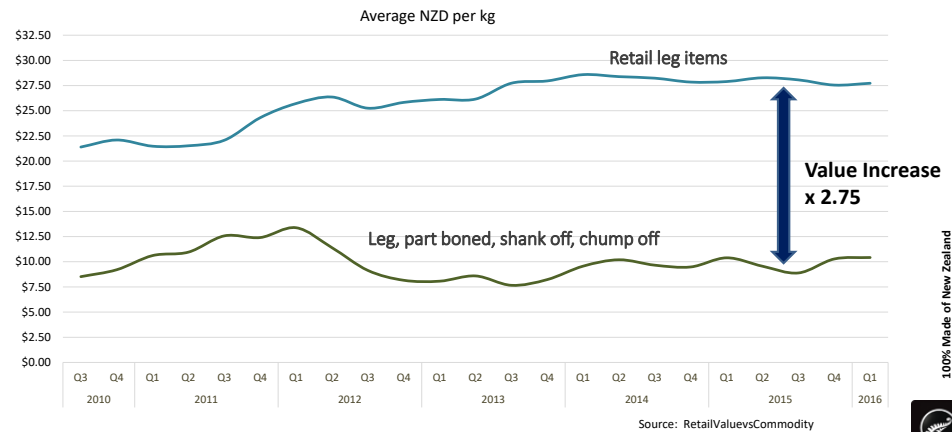
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On farm key learnings



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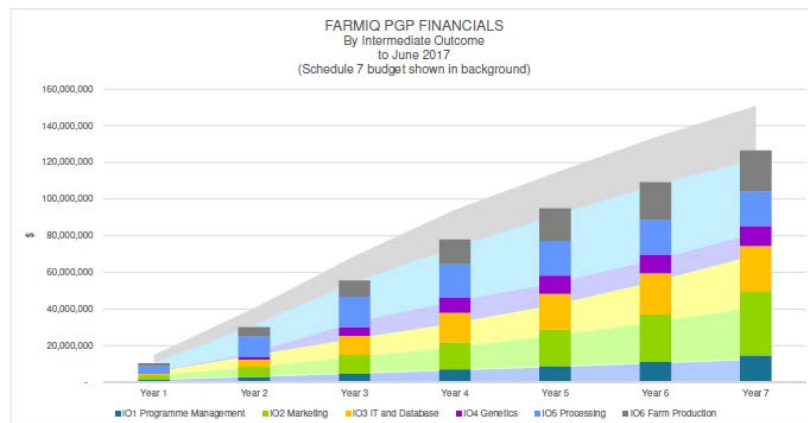
## → Create lamb value.....



With lamb, broken the commodity price linkage with retail leg items 2.75 times the commodity equivalent. Downside - Silver Fern Packs a shoplifting risk!

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## → Programme Financial Summary - I/O

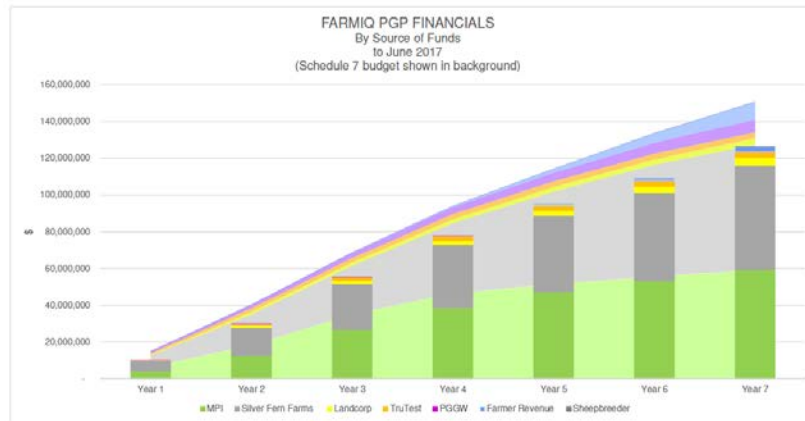


The programme overall concluded below total budget. Points to note by IO:

- Significant revision in 2014 which saw the IO5 Processing significantly reduced as the technology development had not provided outcomes that warranted commercial rollout.
- IO 2 Marketing exceeded the original budget with opportunities to increase the scale.
- IO 1 Management over budget as a proportion of the software rollout was included.

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## → Programme Financial Summary - Funder



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The programme overall concluded below total budget. Points to note by Funder:

- PGGW below having exited the programme in 2011
- Silver Fern Farms below budget with the reduction in expenditure in IO 5 Processing from 2014, which also saw the programme move to a 50/50 funding basis. MPI funding concluded at 47%.
- Farmer software revenue below budget with change in distribution channel and slower farmer uptake than planned.

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## → What next by 2022?

- Branded consumer beef, lamb and venison - ~~\$700m~~ revenue post programme
- Beef eating quality system linked to farm (£ software) - ~~\$10m p.a.~~ in premium farmer payments
- Productivity gain of 10%
- Sheep genetics 2% gain per annum for lamb eating quality.
- Farm management software in use by 40% Sheep and beef industry
- Remain on track for NZIER revised outcome of ~~\$1.1b~~ by 2025

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Summary of targets post the programme.

## → NZIER Review 2017

- Gross Output in 2025 of estimated at \$1.2b vs original proposal of \$2.8b.
- NZIER believe the original counterfactual with the meat industry shrinking to \$3.5 billion was overstated which led to the benefit claim of \$2.8b. A more conservative assessment would see then industry earn \$5.1b in 2025 which would result in a revised original net FIC benefit of \$1.2b.
- Alternate Benefit Cost Ratio (BCR) analysis shows a BCR of approx.10 with ratios of between 3 and 5 being accepted indicators of success for similar projects.

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Summary of NZIER review.

## IP Outcomes

Project	Outcomes	FarmIQ IP	Application
IO 1 - Management	<ul style="list-style-type: none"> <li>FarmIQ Systems Management Experience</li> </ul>	NA	<ul style="list-style-type: none"> <li>Ongoing in FIQ Systems</li> </ul>
IO 2 - Marketing	<ul style="list-style-type: none"> <li>Lamb, beef and venison products <ul style="list-style-type: none"> <li>Cuts, packaging, marketing materials, web sites, support systems.</li> </ul> </li> <li>BeefEQ <ul style="list-style-type: none"> <li>BeefEQ supported beef products, producer manual, cut, measure matrix relating scores to pass/fail contained in algorithm.</li> </ul> </li> <li>LambEQ <ul style="list-style-type: none"> <li>LambEQ research outcomes published April 2017.</li> </ul> </li> <li>Underpinning market research</li> </ul>	<ul style="list-style-type: none"> <li>BeefEQ algorithm</li> <li>NA</li> <li>NA</li> </ul>	<ul style="list-style-type: none"> <li>Commercial outcomes incorporated in Silver Fern Farms value add marketing operational systems and business.</li> <li>BeefEQ embedded into value add operational systems. Open to all farmers that supply Silver Fern Farms. Non-or partial Silver Fern Farms suppliers also provide improved eating outcomes to other processors.</li> <li>LambEQ findings incorporated into overall Silver Fern Farms value add marketing programme</li> <li>Incorporated in Silver Fern Farms value add marketing programme.</li> </ul>
IO 3 - System	<ul style="list-style-type: none"> <li>FarmIQ Farm Management System</li> </ul>	<ul style="list-style-type: none"> <li>FIQ System IP</li> </ul>	<ul style="list-style-type: none"> <li>Commercialised in FIQ Systems products, open to all on commercial terms.</li> </ul>
IO – 4 Genetics	<ul style="list-style-type: none"> <li>Genetic test (8k SNP chip)</li> <li>Equations to calculate breeding values (gBV's) for eating quality traits</li> </ul>	<ul style="list-style-type: none"> <li>Equations to calculate gBV's.</li> </ul>	<ul style="list-style-type: none"> <li>Test (SNP chip) to be used by industry through B&amp;L Genetics for productivity and eating quality traits to be added to B&amp;L trait portfolio.</li> </ul>
IO 5 - Processing	<ul style="list-style-type: none"> <li>Electronic ID (EID) carcass tracking in plant</li> <li>Meat quality measurement systems</li> <li>Boning room technology/yield measurement</li> </ul>	NA	<ul style="list-style-type: none"> <li>All available commercially</li> <li>No commercial products resulting from programme.</li> <li>All available commercially e.g. Marel systems</li> </ul>
IO 6 - On farm	<ul style="list-style-type: none"> <li>General farm practice improvements</li> </ul>	NA	<ul style="list-style-type: none"> <li>Information transferred to sector over course of programme through field days, workshops, upskilling technical input and publications.</li> <li>Ongoing tech transfer through use of the FarmIQ System.</li> </ul>

The significant intellectual property that has been generated from the programme is shown in the above IP Register. There was no IP that was appropriate for patenting so trade secret approach has been used (i.e.: Standard Operating Procedures) with BeefEQ and genetics. Where the IP is required for marketing/external credibility purposes, it has been made public through scientific publications. This is primarily the case with the genetics project.

## Key Risk Table

#	Risk/Issue	Consequence	Action plan	Owner
1	Value Add sales do not reach target	Additional market value unable to be obtained to drive value chain forward.	<ul style="list-style-type: none"> <li>As per Post Programme Plan               <ul style="list-style-type: none"> <li>New product development</li> <li>New Market development</li> <li>Growth in current markets</li> </ul> </li> </ul>	Grant Howie (SFF)
2	Below budget customer number/commercial software sales	Less information in system, less farmer productivity gain and ongoing commercial model challenged	<ul style="list-style-type: none"> <li>As per 2017-22 Business Plan               <ul style="list-style-type: none"> <li>New products</li> <li>New Channels</li> </ul> </li> </ul>	Darryn Pegram (FIQS)
3	Unsuccessful Capital raise	Programme would be undercapitalized. <b>Note:</b> Current shareholders have agreed to underwrite capital raise.	<ul style="list-style-type: none"> <li>Continue to proceed with capital raise.               <ul style="list-style-type: none"> <li>Vet Ent taken shareholding (12%)</li> <li>Farmlands positive. Negotiation continues</li> </ul> </li> </ul>	Darryn Pegram (FIQS)
4	Uptake of SNP chip test	Genetic gain in lamb eating quality not realised	<ul style="list-style-type: none"> <li>As per Post Programme Plan               <ul style="list-style-type: none"> <li>Breeder involvement</li> <li>BLG for productivity traits</li> <li>Complete commercial model</li> </ul> </li> </ul>	Collier Isaacs (FIQPGP)

# Case Study Outlines

## Case Study outline IO1 Outcomes

### Value Chain Development

#### The Issue

- The value chain from plate to pasture is disconnected limiting:
  - The value that can be gained from the consumer by better meeting their needs
  - Feedback along the production chain to improve consumer value
  - Payment systems to incentivise value chain behaviour
  - Optimisation of the supply chain in marketing, processing and production.
  - Commitment around specification, volume and price from consumer to farm

#### Opportunity

- Build a demand driven integrated value chain that delivers sustainable benefits to all participants.

#### Actions

- Undertake market research in key markets:
  - 12 Markets
  - 20,000 Consumers
- Develop product range to meet consumer (FMCG and HORECA) needs. Key opportunities:
  - Manage eating quality – cuts, quality measures
  - Fit for purpose cuts
  - Improve consumer cooking skills
  - Promote provenance – grass fed, antibiotic free, growth promotant free
- Develop processing technology to:
  - Trace carcass
  - Assess eating quality in NZ and US markets with 17,000 consumers
  - Develop eating quality measurement systems
- Genetics
  - Develop selection tools for eating quality and productivity
- On farm
  - Develop software system to support farm management
  - Trial farm system changes to improve productivity and eating outcomes
- Commitment
  - Set up longer term supply contacts from 'consumer' to farm.

#### Results

- Marketing
  - Value add sales – \$260m Beef/Lamb since programme inception
  - 6 key markets
  - Product range – 126 new SKU's
- Processing
  - Carcass traceability for beef and lamb
  - Product quality measurement – BeefEQ
  - Product quality management - Lamb
- Genetics
  - SNP Chip test to allow for eating quality selection in lamb
  - SNP Chip test to allow for productivity trait selection through Beef & Lamb SIL



- On Farm
  - FarmIQ Software System to manage
    - Land, animal and people
    - Beef eating quality (BeefEQ)
  - Premium \$3.5m for BeefEQ
  - Productivity gain on IQ farm from 194kg meat/ha to 215kg (average gain 3%)
- Commitment
  - Uncertainty in the market, initially generated by GFC and commodity price volatility has severely limited the ability to link in market to farm. For example, the bull beef grower contract ceased when Mc Donalds removed the underpinning contract.

#### Behaviour Change

- Consumers understanding and valuing premium positioned products.
- Processor/marketers taking a market led value add rather than commodity approach
- Farmers optimising their business based on formal business planning and objective measurement.
- All chain participants looking to optimise value along the chain rather than maximising return to them in the short term.

## Case Study outline IO3 Outcomes

### Farm Management System design and uptake

#### The Issue

- Poor Agri-business performance due to a lack of information capture, analysis and sharing
- Lack of objectivity – 80% of sheep and beef farmers see themselves in the top 20%
- Disparate, disjointed systems (where used) e.g. weigh scales, EID
- Computer literacy
- Rural broadband
- Ease of use.
- Replace the paper diary through the use of mobile technology; record as you go.
- Compliance (NAIT, Regional Councils, Health & Safety)
- Farmer direct marketing path with the departure of PGWrightson as a partner and Silver Fern Farms not utilising the system at scale with their supplier base.

#### Opportunity

- Improve farmer profitability - Reproduction, weight gain, reduce costs
- Benchmarking
- Top 20% performers achieve 400% greater EFS than the average sheep and beef farms; provide tools that allow the average farmer to move in this direction
- Link to other applications/systems to create both an end to end value chain and ecosystem.
- Link to farm advisors (consultants, agronomists, accountants, etc.)
- EID
- Data Standards
- Broaden shareholder base to support system uptake (clients and capital) and use of common core system

#### Actions

- Pilot to identify key requirements
- Agile development methodology to allow rapid delivery of functionality to customers and the ability to pivot as opportunities were identified
- Minimum viable product; User centred design (design thinking)
- Ease data capture by implementing a policy of autoloading, load via mobile, manual data entry.
- Online/Offline design – HTML5
- Modular design; focus the system on the specific areas of interest for the user
- Support & Training programme
- Support the creation of data standards for both data transfer (weigh scales) and recording.
- Seek partners to use system with their clients and raise capital.

#### Results

- Launch initial FMS June 2013, regular functionality upgrades since then.
- First B2B modules 2016 – Landbase, GrazCare, StockCare, RMPP Calculator, etc.
- Development of Android and iPhone mobile apps
- Interconnection with weigh scales from Gallagher, Iconix, Te Pari & Tru-Test

- Automated kill sheet feeds from SFF other processors currently in train
- Interconnection to CashManager, Farmax and NaVision
- Interconnection to on-farm data collection devices e.g. JenQuip, Smart Farm Systems, C-Dax
- Partners (Vet Ent (Grazecare, Stockcare) and AgFirst (Landbase)) using system with their client base. ANZCO, Alliance and Affco sharing processing information and Vet Ent becoming a shareholder.

#### Behaviour Change

- Currently 1500+ farmers using the system and growing weekly
- Objective versus subjective planning, recording and analysis
- Measuring is simple, easy and creates value
- Technology is empowering not challenging
- Sharing data/systems by multiple parties

## Case Study outline IO4 Outcomes

### Genetic selection for meat quality

#### Issue

- The issue selection for many years for growth and meat yield via ultrasound and CT for its terminal sire flocks (now Focus Prime). Result was lean fast growing animals but meat quality was presumably declining with declining IMF% and also introgression of genes affecting meat quality specifically shear force.

#### Opportunity

- Use low cost genomics on commercial crossbred progeny to create a training population in order to predict eating/meat quality breeding values in young terminal sire ram lambs. This allows selection for growth and carcass yield while maintaining or improving eating quality.

#### Actions

- Develop high density SNP chip
- Measure growth, yield and meat quality and genotype 17,000 commercial crossbred progeny from terminal sire flocks
- Develop a prediction equation for above traits using DNA genotypes >0.5 accuracy approximating measurement on the animals itself
- Create low cost low-density SNP chip for use in terminal sire flocks
- Create “a desired gains” selection index
- Validate measures against taste panels
- Implement via beta testing in terminal sire flocks
- Create ongoing breeder supported calibration flock
- Monitor the changes

#### Benefits

- Can improve growth and meat yield (~90% of potential) while reversing detrimental changes in eating quality and slowly improving them
- Can be implemented in terminal sire flocks for approximately the cost of existing DNA parentage
- Cost of calibration flock is less than 1 cent/kg meat sold approximately 10 fold less than likely benefits when eating quality can be measured at chain speed in processing plants
- Focussed commercial attention on eating quality as a critical parameter for lamb to maintain its image and market niche including what management changes are required

#### Results

- Technology adopted by terminal sire breeders who provide more than 50% of terminal sire rams and they have over 70% of the top 200 sires in the SIL ACE rankings
- Estimated these rams supply ~3M lambs for slaughter annually
- Genetic trends now showing stabilisation and improvement of meat quality traits
- Spin off benefits very large

- HD chips now used for all key maternal sires by BLG, also by PGGRC researching methane emissions
- Genotyping by sequencing technology developed separately has been adopted for DNA testing by the entire NZ deer industry as well as the NZ ryegrass, whiteclover and aquaculture industry

#### Behaviour change

- A focus on quality of production rather than simply quantity
- Objective will always beat subjective, but not everyone likes the transparency created.

# Case Study outline IO5 Outcomes

## IO 5.1 RFID Traceability in Processing

### Issues

- The need to automatically collect reliable information on individual carcasses where the live animals have EID.
- The need to track individual cuts and link back to the carcass.
- Labour cost and error levels with manual systems (eg bar code scanning)
- Electrical noise from processing equipment
- Animal behaviour influence
- Carcase size variation
- Carcass swing and movement on high speed conveyors making RFID tag reading difficult

### Opportunities

- Assist NZ industry to develop robust reliable technology for traceability from stockyards to boning.
- Use in-plant traceability to improve production effectiveness and efficiency and develop market opportunities with individual cut quality and origin captured.
- Determine if existing hardware (eg carcass hooks) could be modified to incorporate RFID tags.
- Demonstrate end-to-end traceability with EID tagged animals

### Actions

- Trials with stockyard panel readers to optimise for size, shape, colour
- Modifications to site electrical equipment to minimise electrical interference
- Multiplexing antenna within panel readers after slaughter.
- Duplication of panel readers down slaughter chain to improve reliability
- Development of software logic to handle tagged and untagged animals
- Strength and reliability trials with existing carcass hooks fitted with RFID tags.
- Design of RFID tag readers for high speed conveyors.
- Assessment of commercial cut traceability and development of a prototype RFID tray system for tracking cuts.

### Results

- Robust solutions found for animal EID tags and RFID-embedded hooks to exceed 99% reliability
- Development of commercial solutions with a NZ manufacturer.
- Traceability systems demonstrated for beef, sheep and venison plants.
- Automated live deer EID tag scanning found to be impractical with the behaviour of the animals making reliable scanning very difficult.
- RFID traceability identified as an important part of capturing a 2% yield gain with spray chilling.
- Opportunity identified to create a full time/temperature history for every carcass to improve shelf life prediction of chilled lamb.

Note: Spray chill

In the SFF case, some UK cuts were taken from most carcasses, so it was all or nothing. For a 5M lamb kill with an average weight of say 17kg/carcass and \$6/kg average meat value, this would be  $2\% \times 17\text{kg} \times \$6/\text{kg} = \sim \$2/\text{carcass} \times 5\text{M} = \sim \$10\text{M}/\text{yr}$ .



## IO 5.2 Meat Yield Measurement (general)

### Issues

- Inaccurate results from traditional carcass grading (weight, GR).
- Mismatch between farmer payments for lambs and market revenue of products.
- Insufficient carcass grading data to permit smarter decisions on boning decisions and market destinations for meat cuts.
- Different challenges to apply yield measurement systems by species to suit beef, lamb and venison operations.

### Opportunity

- Development of a suite of grading technologies at carcass and cut level to provide appropriate price signals to farmers and accurate data for carcass boning and market destinations.

### Actions

- Analysis of muscle yield variability from boning trials.
- International review of objective measurement systems.
- Installation of X-Ray grading systems for lamb composition measurement on all SFF ovine sites
- Development of DEXA X-Ray grading for lamb meat/fat/bone proportions.
- Preliminary trials of DEXA for beef grading.
- Trials with spectral imaging scanning at Canterbury University.
- Development of rail yield grading system for venison carcass yield measurement.
- Trials with RFID boning room trays for beef cut yield measurement.
- Assessment of Marel meat belt cut weigh/trace system.
- Trials with Lincoln Agritech on microwave measurement of surface fat depth.
- Video imaging trials with lamb cross-sections for loin measurements.
- Contract with Auckland University Auckland Bioengineering Institute (ABI) to develop dynamic models of lamb carcasses with retail cut yield functionality

### Results

- Successful implementation of lamb X-Ray grading with 6 systems installed on SFF sites.
- Pre-commercial development of DEXA grading with prototypes installed on NZ and Australian sites.
- Commitment of further funding and development of beef DEXA technology by the MLA in Australia.
- Venison rail yield grading installed on all SFF venison plants.
- Trials completed with tray beef cut yield measurement system.
- ABI modelling work well advanced but not completed by the end of the contract period.

## IO 5.2 Meat Yield Measurement (Lamb DEXA X-Ray Grading)

### Issues

- Inaccurate results from traditional carcass grading (weight, GR).
- Mismatch between farmer payments for lambs and market revenue of products.
- Insufficient carcass grading data to permit smarter decisions on boning methodology and market destinations for meat cuts.
- X-Ray grading operational for robotic lamb cutting and trialed for lamb carcass grading, but unable to discriminate meat from fat in soft tissue.

### Opportunities

- Upgrade X-Ray systems to incorporate DEXA technology for carcass conformation and meat/fat/bone proportion assessment.

### Actions

- Trials with different DEXA materials to optimise for lamb carcass grading.
- Trials with batches of lambs in NZ and Australia to develop predictive algorithms.
- Collaboration with Murdoch University (Perth) to analyse data.

### Results

- Ongoing algorithm development to improve predictive accuracy.
- DEXA grading systems installed in NZ and Australian lamb plants.
- Substantial additional funding by the MLA in Australia to continue system development with Scott Technology Ltd.

## IO 5.3 Meat Quality Measurement (general)

### Issues

- No useful on-line or off-line objective measurement technologies available for meat quality measurement of carcasses and meat cuts other than for pH and beef marbling.
- Carcasses and cuts produced with significant quality variation batched together, limiting the potential for market premiums for superior products.

### Opportunity

- Develop a suite of technologies for meat quality measurement to allow improved sorting by quality parameters to meet market requirements.

### Actions

- Contract with AgResearch to undertake a review of meat quality measurement technologies.
- Watching brief maintained on international objective measurement system development, including visits to technology centres in Europe, the US and Australia.
- Development with Carne Technology of a Smart Stimulation ultimate pH prediction system for beef and lamb carcasses.
- Trials by AgResearch and Massey University on near infra-red (NIR) on hot beef carcasses for prediction of post-rigor ultimate pH.
- Trials by AgResearch and Massey University on near infra-red (NIR) on chilled lamb carcasses for prediction of quality attributes.
- Testing of meat quality for all species over 4 years to build a baseline database for later analysis.
- Trials with a commercial Hennessy probe used in the pork industry for beef and lamb quality measurement.
- Trials with Lincoln Agritech on voltametric pH measurement.
- Testing of the Carne tenderness measurement tool to replace the outdated MIRINZ Tenderometer.
- Testing of the Syft mass spectrometry system to detect taste differences between ram and ewe lambs.
- Development of holistic quality prediction models drawing on multiple measurements for quality prediction.
- Contracts with Texas Tech and Otago Universities to modify the MSA beef eating quality model for NZ conditions.
- Contracts with AgResearch and Otago University to develop a predictive eating quality model for lamb.

### Results

- Completion of trial work with limited commercial outcomes.
- Discounting of most of the technologies tested as unreliable and/or inaccurate.
- Identification of hyperspectral imaging technology as the most promising objective measurement tool in the development pipeline.
- Development of the BeefEQ beef eating quality grading system modelled on the Australian MSA grading system.

## IO 5.3 Meat Quality Measurement (BeefEQ)

### Issues

- High eating quality variation between animals for the same muscle.
- Premium beef steak cuts not capturing sufficient market premiums.
- Farmers not sufficiently rewarded for producing superior cattle.
- Inadequate understanding of best practice farm and processing procedures.
- Australian MSA beef grading system targeting individual muscles much better than NZ cattle grading systems.

### Opportunities

- Develop a NZ version of MSA grading, tailored to NZ cattle and production systems.
- Use the new system to underpin the development of a superior range of beef cuts for top end retail and food service customers.
- Integrate the supply and production system to reward farmers for producing cattle that satisfy the eating quality grading system.

### Actions

- Detailed analysis of the MSA grading system with support from Australian developers.
- Large scale consumer taste panel trials in NZ and the US, supported by Otago and Texas Tech Universities.
- Development of the BeefEQ algorithms to predict the eating quality of individual meat muscles from each carcass by cooking method and aging time.
- Market testing and development of a Reserve Beef product range for retail and food service.
- Contract arrangements established with farmers supplying cattle to the BeefEQ programme.

### Results

- Robust eating quality algorithm developed.
- Three Silver Fern Farms beef plants set up for BeefEQ grading
- Reserve beef product range developed and introduced to the NZ and international market.
- Farmers paid premiums for qualifying cattle.

## IO 5.3 Meat Quality Improvement (general)

### Issues

- Long shelf life chilled lamb production threatened by extension of required shelf lives and instances of early spoilage of lamb cuts in the UK.
- Accept/reject criteria for chilled lamb by UK supermarkets that were not based on good science.
- Conservative attitudes by UK retail to innovation in lamb processing (eg spray chilling, warm boning).
- Variability in eating quality between carcasses resulting in downgraded market value from averaging of product.

### Opportunities

- Evaluate emerging technologies to place NZ in an advanced position internationally producing safe high-quality meat products that capture market premiums.

### Actions

- Contract with AgR, Massey University and Lincoln University to review meat quality science.
- Testing of meat quality for all species to build a baseline database.
- Contracts with AFBI (Northern Ireland) to review forage effects on beef, lamb and venison eating quality.
- Contract with AgResearch to update the best practice guide for chilled lamb production.
- Contract with Otago University to investigate confinement odour from vacuum packed chilled lamb.
- Organoleptic and shelf life trials in the UK with lamb cuts from warm boned and spray chilled carcasses.
- Evaluation of carcass pasteurisation systems using hot water.
- Trials with high pressure processing to improve tenderness of hot boned beef.
- Trials with the Carne Technologies SmartStim electrical stimulation systems to control the fall of pH before rigor.
- Analysis of Beef eating quality database to identify the effects of hanging method, pH and other variables on eating quality.
- Trials with Carne Technologies to investigate the relationships between meat pH, glycogen and purge.
- Trials with meat stretching technology for hot boned beef.
- Preliminary trials with immersion freezing of meat cuts and offal.
- Testing of hot boned beef eating quality.
- Design of blueprint best practice procedures on farm and in processing to optimise lamb eating quality.
- Trials with Foodcap International on storage bin technology for naked cut storage and export.

### Results

- Updated version of the best practice guide for chilled lamb released to the NZ industry.
- Optimisation of spray chill systems for lamb production.
- Acceptance of spray chilled lamb by major UK retailers (~2% yield gain).
- Optimisation of high pressure processing for hot boned beef plants.
- Supporting data provided to UK retailers to help steer them to more science-based decisions on acceptability of chilled lamb products.

## IO 5.5 Meat Quality Improvement Case Study (High Pressure Processing)

### Issues

- Variable eating quality of beef muscles
- Suspect eating quality of some hot boned beef muscles.
- Large price differential between top steak muscles and other second tier muscles.
- Production costs associated with aging beef cuts before distribution chilled or after freezing.
- Poor reputation and discounting of frozen beef.
- Seasonal production limiting availability of premium cuts from June to September.
- Current beef product functional properties not ideal for some further processed products.
- Known effect of high pressure processing (HPP) to improve beef tenderness, particularly pre-rigor.

### Opportunities

- Develop technologies to produce consistently high eating quality from multiple muscles
- Produce high quality frozen beef to smooth production level fluctuations and improve frozen product pricing.
- Produce beef ingredient products with functional properties matched to further processing customer demand.

### Actions

- Trials with a HPP machine at the Foodbowl in Auckland.
- Installation of a commercial HPP machine at SFF Te Aroha for 4 months of trials with various hot boned beef cuts from prime, cow and bull carcasses.
- Laboratory testing of pH, tenderness, colour, cooking loss and functional properties.
- Consumer taste panel testing at Lincoln University.
- Preliminary trials with immersion freezing systems.

### Results

- Production of tender cuts from steak muscles of hot-boned bulls, cows and prime cattle.
- Optimisation of HPP compression times and pressures for different muscles for tenderness improvement and ultimate pH.
- Publication of taste panel results in Meat Science (premier international meat science journal).

## Case Study outline IO6 Outcomes

### 6.1 Farm Management Systems and Nutrition

#### **Glenaan Station – realising the sustainable productive capacity of the farms natural capital**

##### **The Issue**

- High country environment – long winters, steep land, tussock vegetation, summer dry, hot, nor-westerly winds
- Unproductive river terrace land – shallow stony soils, native grasses, poor quality
- No right to extract water for irrigation

##### **Opportunity**

- > 200 ha of flat land contributing little to farm production
- Use forages that grow deep roots to access subterranean water further down the soil profile
- Build fences and stock water systems to better manage feed grown
- Use forages that grow high quality feed
- Increase farm productivity by

##### **Actions**

- Discussion of the issue with FarmIQ Steering Team
- Lucerne identified as having the right attributes to succeed
- Agronomist created a development plan on how to remove native vegetation and establish lucerne and manage Lucerne
- Farm consultant analysed what system changes were required to accommodate the extra ME and protein available.
- Establishment of climate stations to monitor rainfall and soil moisture
- Measurement of pasture production
- Measurement of animal production
- Analysis of results through FarmIQ
- Other improvements in pasture/forages (Fescue, Lucerne & clover mixes) also implement on intermediate country between the river flats and alpine environment.
- Focus on animal performance measurement – weights, conditions scores & wool data

##### **Results**

- Show the Lucerne establishment cycle
- Paddock history comparison report in FarmIQ
- Grazing report from FarmIQ shows increase in yield harvested with time from Lucerne
- Increases in productivity (since pre-2012 average)
  - o 24% Increase in merino scanning
  - o 7% increase in fleece weight
  - o 15% increase in tailing outcome
  - o 6% increase in weaning weight
  - o 20% increase in carcass weight
  - o 30% increase in total CWt sold

- 18% increase in winter carrying

### **Behaviour change**

- Measuring animals and the environment
- Better prediction of performance
- Better understanding of drivers of performance
- Motivation to keep improving
- Increased sustainability of farming - perennial vegetation stabilises vulnerable erodable soils and adds organic matter



## 6.2 Animal Health

### 1. Whangara Farms – Liver Fluke

#### The Issue

- Large farm, how to identify issues and apply accurate response
- Internal fluke parasites eaten by cattle, cause liver damage and carcass defects
- This leads to lost production and lost value
- Adult flukes can live for several years and shed thousands of eggs a day

#### Opportunity

- By comparing with regional averages, the carcass defect report in FarmIQ System identified the farm has an issue with liver fluke
- The impact of different management practices (different anthelmintic options) can be compared in the FarmIQ System to identify the best solution and prevent the issue in the future

#### Actions

- Whangara treated about half of 1250 R1 bulls with a more expensive drench with effectiveness against liver fluke and half with their normal drench
- Treatment was recorded against EID tag
- Growth rates were monitored and carcass data collated in the FarmIQ System

#### Results & outcomes

- Able to quantify the losses to liver fluke
- Data justified the extra expense in treating for liver fluke was outweighed by the extra production

#### Behaviour change

- Evidence-based farm management decisions

### 2. Mangarata, Glenside, Ohineumeri & Mairedale – Large scale field trial of a pneumonia vaccine in sheep

#### The Issue

- Ovine pneumonia is a major limitation to the liveweight gain and meat production in post-weaned lambs in New Zealand
- It is prevalent in lower North Island sheep flocks
- It can cause rejection of carcasses at processing plants
- It costs the farmer productivity and is a significant animal welfare issue

#### Opportunity

- Controlled lab and small-scale trials by AgResearch had shown enough promise to conduct a large on-farm trial of a vaccine that aims to give immunity against the agents that cause pneumonia in sheep
- Driven by AgResearch scientists, they required farmers that could manage with trial design requirements and record production data against individual ewes and lambs

- Also looking to integrate on-farm data with processing data recorded against individuals
- FarmIQ System was able to prove the platform to collect the data and the farmers to conduct the trial

## **Actions**

- Large logistical effort
- 4 farms
- Additional agent pneumonia added to typical 5-in-1 vaccine to make a 6-in-1
- 1600 twin-bearing ewes treated at scanning. Half with 5-in-1, half with 6-in-1.
- 5-in-1 and 6-in-1 treatments lambled separately
- 2800 lambs treated, half of each ewe-treatment group vaccinated with 5-in-1 and half with 6-in-1
- Lamb weights measured at docking, weaning, before kill and at drenching
- Carcass data collected as per normal
- Tissue samples collected from a percentage of lambs for analysis

## **Results & outcomes**

- The highest antibody responses to *M. haemolytica* were measured in lambs vaccinated with the 6 in 1 (groups E51L61 and E61L61) vaccine.
- Vaccination of ewes with the 6 in 1 (groups E61L51 and E61L61) vaccine showed some protection against colonization with *M. haemolytica* from lungs at slaughter
- Ovine pneumonia was only present in the majority of the lambs on one farm. On this farm, vaccination of both ewes and lambs with the 6 in 1 (group E61L61) vaccine reduced lung pathology compared to vaccinating only the lambs with the 6 in 1 (group E51L61) vaccine.
- Lamb daily weight gain and carcass weights did not show any significant differences between vaccine groups but this is likely due to the low prevalence of pneumonia on the farms.
- Retention of lambs as replacement stock meant this proportion of vaccinated animals could not be included in the final carcass weight analysis because they were not slaughtered.
- Lamb survival was not able to be adequately assessed because we could not determine actual lamb deaths.
- Additional trials: AgResearch are committed to on-going trials into a pneumonia vaccine:
- AgResearch has recently done a challenge trial to using a vaccine that includes a component against *Mycoplasma ovipneumoniae*.
- AgResearch aim to do some more optimising of the vaccine further and this is planned for late in 2017 using a small AgResearch flock.
- AgResearch recognises that field trials are very important to assess vaccine efficacy and want to do more in 2018. It is likely to also involve vaccination of ewes.

## **Behaviour change**

- Potential industry change and \$ gains could be large
- By 2023, AgResearch is aiming for at least 75% of sheep farms with historical or active pneumonia incidence using the novel ovine pneumonia vaccine, with a gross benefit value to the NZ sheep sector of \$59 million annually.

## 6.3 Equipment /Infrastructure

### **Rosebank – Using EID technology to improve management and drive production**

#### **The Issue**

- Condition (fat reserves) is a more important driver of productivity in adult livestock than weight. Small farm animals can weigh less but be in better condition than large framed animals.
- Separating animals into groups and allocating feed based on condition can greatly increase the productivity of the whole flock/mob
- Rosebank observed wide variation in ewe BCS post weaning
- Animals need to be measured to assign into correct management mob to get as many animals at optimal condition at mating as possible
- Condition scoring is labour intensive to measure on all animals therefore it is not done often enough
- Condition scoring is subjective

#### **Opportunity**

- Once adult frame is achieved there should be a good relationship between weight and condition in the critical post-weaning to pre-mating period for sheep
- Individual weights are relatively easy to measure EID tags, weigh scales indicators and auto-drafters
- Can previously captured pairs of weight and condition score data against individuals be used to develop a relationship between condition and weight?
- Is that relationship good enough to use their current weight to assign animals into the right condition?
- Use EID technology to make this fast and efficient
- Explore the potential for FarmIQ to generate the assigned weights for individual ewes. For this to become a feature of the FarmIQ System that other farmers will want to purchase

#### **Actions**

- Individual weights and BCS scores measured on all 2T and MA ewes
- Analysis by Iris Data Science to build algorithm
- Determine how much 1 BCS equals in liveweight and advancements for annual growth from one age class to the next
- Determine for individuals their assigned weight at BCS 3.5 (target BCS at mating)
- Weigh animals, weigh scale indicator compares to assigned weight to current weight, drafts into below, on-target and above-target condition management mobs

#### **Results**

- Initial results showed that assigned weight correctly allocated 75% of ewes to the right mob
- Adjustments were made to improve formula and increase accuracy
- This work is ongoing with Iris Data Science
- It was determined that a generalised relationship is not going to be accurate enough. Separate relationships will need to be determined for individual flocks. This can

potentially be done automatically by embedding statistical software in the FarmIQ system

- Analysis was performed to determine the potential increase in revenue by achieving the optimal BCS of ewes at mating across the entire flock. For Rosebank, this could mean an extra 295 lambs or \$28,000 based on average lamb value or an extra \$14 per ewe after accounting for the additional feed cost.

-

### **Behaviour change**

- Better understanding of drivers of performance
- More focused monitoring of ewes leads to improved management based on understanding individual needs rather than managing to the average
- Making more use of the investment in technology

## 6.4 Technology transfer – Plate to pasture demonstration farms

### IQ Farm Final Year survey observations

#### Expectations

- Better decisions based on data rather than emotion
- New technology, better analysis, smarter not harder
- Paddock to Plate
- Monitoring, recording, reporting
- More profitable, stronger bottom line
- Farmer driven research

#### Barriers to change

- Yet to see consistent premiums from the value chain to modify behaviour
- Environmental conditions derail plans
- Having time to measure, record and analyse data
- Coping with complexity and technology
- Only one industry processing partner
- Perception that small family operations will not find value

#### Learnings & achievements

- Achieving ambitious production goals laid out in the beginning
- Greater awareness of the potential for integration between parts of the value chain
- Commercially successful integrated value chain for prime beef
- Adoption of technology and expertise on farm to drive better decision making
- Stretched to cope with things outside comfort zone
- Greater confidence in farming and standing up to voice opinion
- Sense of being at the forefront and contributing to the rapidly changing technological wave occurring in farming
- Changing farming for the better – tipping the balance from feelings to facts
- Understanding physical and human resource limitations
- Development of professional networks in farming
- Improved public speaking
- Better computer skills
- Interesting, lots of fun, challenging, huge learning curve

#### Behaviour change

- Setting goals and working toward them
- Valuing time where tactical and strategic decisions are made
- Actively planning to capture opportunities, minimise threats
- Employing expertise, engaging in more management thinking
- Using technology to measure and analyse
- FarmIQ System has become the central information hub. No longer use paper diary

#### Threats to success (of FarmIQ)

- Industry patch protection and reluctance to engage/integrate
- Too many alternatives, competitors coming into the market, dividing a small pie into smaller and smaller slices
- Becoming complacent

**Future opportunities (for FarmIQ)**

- FarmIQ industry leader/standard for farm management software
- Numerous integrations with more industry partners – processing, compliance/regulation, financial & physical planning, rural supplies, animal health

## Financial Summary - By Programme Stream

HIGH LEVEL FARMIQ PGP TO DATE June 2017												
	Year 1 ACTUAL 2010/2011	Year 2 ACTUAL 2011/2012	Year 3 ACTUAL 2012/2013	Year 4 ACTUAL 2013/2014	Year 5 ACTUAL 2014/2015	Year 6 ACTUAL 2015/2016	Year 7 ACTUAL 2016/2017	TOTAL OVER 7 YEAR PERIOD Schedule 7	TOTAL OVER 7 YEAR PERIOD Prog Plan 2017	TOTAL TO DATE Actual to June 2017	Variance Prog Plan 2017 to Actual to date June 2017	Variance Sch 7 to Actual to date June 2017
<b>Intermediate outcome 1</b>												
Contribution in Kind Farm IQ	\$638,238	\$167,247	\$250,899	\$345,815	\$98,575	\$27,500	\$58,300	\$4,964,987	\$1,695,011	\$1,586,574	\$108,437	\$3,378,413
Cash Farm IQ		\$134,926	\$482,039	\$480,272	\$618,672	\$839,210	\$1,531,783		\$3,874,678	\$4,086,902	(\$212,224)	(\$4,086,902)
Cash Govt	\$1,020,032	\$944,559	\$1,223,970	\$1,409,540	\$1,091,705	\$1,415,743	\$1,949,096	\$7,659,960	\$8,627,410	\$9,054,646	(\$427,236)	(\$1,394,686)
<b>Total</b>	<b>\$1,658,270</b>	<b>\$1,246,732</b>	<b>\$1,956,908</b>	<b>\$2,235,628</b>	<b>\$1,808,952</b>	<b>\$2,282,453</b>	<b>\$3,539,179</b>	<b>\$12,624,947</b>	<b>\$14,197,099</b>	<b>\$14,728,122</b>	<b>(\$531,023)</b>	<b>(\$2,103,176)</b>
MPI %		75.8%	62.5%	63.0%	60%	62.0%	55%	60.7%	60.8%	61.5%		
<b>Intermediate outcome 2</b>												
Contribution in Kind Farm IQ	\$627,545	\$1,060,172	\$1,518,078	\$2,204,739	\$2,043,130	\$2,728,887	\$3,740,366	\$5,803,985	\$13,657,169	\$13,922,917	(\$265,748)	(\$8,118,932)
Cash Farm IQ	\$878,779	\$1,247,889	\$1,100,272	\$1,718,286	\$2,691,341	\$2,967,204	\$4,703,555	\$17,361,411	\$14,192,103	\$15,307,326	(\$1,115,223)	\$2,054,085
Cash Govt	\$809,951	\$904,891	\$2,002,390	\$842,488	\$287,158	\$250,155	\$358,600	\$5,417,000	\$5,454,878	\$5,455,633	(\$755)	(\$38,633)
<b>Total</b>	<b>\$2,316,275</b>	<b>\$3,212,952</b>	<b>\$4,620,740</b>	<b>\$4,765,513</b>	<b>\$5,021,629</b>	<b>\$5,946,246</b>	<b>\$8,802,521</b>	<b>\$28,582,396</b>	<b>\$33,304,150</b>	<b>\$34,685,876</b>	<b>(\$1,381,726)</b>	<b>(\$6,103,481)</b>
MPI %		28.2%	43.3%	17.7%	6%	4.2%	4.1%	19.0%	16.4%	15.7%		
<b>Intermediate outcome 3</b>												
Contribution in Kind Farm IQ	\$36,760	\$25,765	\$19,758	\$1,324	\$17,882	\$61,966	\$1	\$2,560,972	\$267,762	\$163,456	\$104,306	\$2,397,516
Cash Farm IQ	\$474,099	\$951,818	\$1,987,916	\$2,073,508	\$192,220	\$47,149	\$67,494	\$15,682,714	\$5,794,205	\$5,794,204	\$1	\$9,888,510
Cash Govt	\$374,459	\$2,189,299	\$4,343,844	\$3,443,637	\$3,488,544	\$2,640,307	\$2,640,631	\$10,097,324	\$19,133,475	\$19,120,721	\$12,754	(\$9,023,397)
<b>Total</b>	<b>\$885,318</b>	<b>\$3,166,882</b>	<b>\$6,351,518</b>	<b>\$5,518,469</b>	<b>\$3,698,646</b>	<b>\$2,749,422</b>	<b>\$2,708,126</b>	<b>\$28,341,009</b>	<b>\$25,195,442</b>	<b>\$25,078,381</b>	<b>\$117,061</b>	<b>\$3,262,629</b>
MPI %		69.1%	68.4%	62.4%	94%	96.0%	98%	35.6%	75.9%	76.2%		
<b>Intermediate outcome 4</b>												
Contribution in Kind Farm IQ	\$3,242	\$3,437								\$6,679	(\$6,679)	(\$6,679)
Cash Farm IQ	\$8,049	\$144,936	\$425,012	\$441,375	(\$30,234)	\$95,840	\$192,080	\$1,562,650	\$1,184,978	\$1,277,058	(\$92,080)	\$285,592
Cash Govt	\$252,117	\$904,182	\$3,099,807	\$2,978,720	\$1,716,764	\$309,971	\$240,977	\$10,270,350	\$9,565,257	\$9,502,538	\$62,719	\$767,812
<b>Total</b>	<b>\$263,408</b>	<b>\$1,052,555</b>	<b>\$3,524,819</b>	<b>\$3,420,095</b>	<b>\$1,686,530</b>	<b>\$405,811</b>	<b>\$433,057</b>	<b>\$11,833,000</b>	<b>\$10,750,235</b>	<b>\$10,786,275</b>	<b>(\$36,040)</b>	<b>\$1,046,725</b>
MPI %		85.9%	87.9%	87.1%	102%	76.4%	56%	86.8%	89.0%	88.1%		
<b>Intermediate outcome 5</b>												
Contribution in Kind Farm IQ	\$525,274	\$824,055	\$917,241	\$720,417	\$195,524			\$2,099,200	\$3,182,511	\$3,182,511		(\$1,083,311)
Cash Farm IQ	\$2,586,925	\$5,466,962	\$3,029,523	\$625,570	\$218,832			\$31,077,700	\$11,927,812	\$11,927,812		\$19,149,888
Cash Govt	\$661,408	\$1,278,251	\$1,080,256	\$639,748	\$131,000			\$7,447,800	\$3,790,663	\$3,790,663		\$3,657,137
<b>Total</b>	<b>\$3,773,607</b>	<b>\$7,569,268</b>	<b>\$5,027,020</b>	<b>\$1,985,736</b>	<b>\$545,356</b>			<b>\$40,624,700</b>	<b>\$18,900,987</b>	<b>\$18,900,987</b>		<b>\$21,723,713</b>
MPI %		16.9%	21.5%	32.2%	24%			18.3%	20.1%	20.1%		
<b>Intermediate outcome 6</b>												
Contribution in Kind Farm IQ	\$419,338	\$869,509	\$781,502	\$1,201,461	\$1,334,965	\$880,997	\$642,473	\$7,568,383	\$6,266,228	\$6,130,245	\$135,983	\$1,438,138
Cash Farm IQ	\$57,655	\$340,175	\$910,993	\$670,425	\$992,373	\$490,068	\$364,441	\$2,705,000	\$3,428,191	\$3,826,130	(\$397,939)	(\$1,121,130)
Cash Govt	\$1,111,390	\$2,232,816	\$2,298,652	\$2,476,073	\$2,044,373	\$1,442,260	\$731,066	\$18,449,567	\$12,770,316	\$12,336,630	\$433,687	\$6,112,937
<b>Total</b>	<b>\$1,588,383</b>	<b>\$3,442,500</b>	<b>\$3,991,147</b>	<b>\$4,347,959</b>	<b>\$4,371,711</b>	<b>\$2,813,325</b>	<b>\$1,737,980</b>	<b>\$28,722,949</b>	<b>\$22,464,735</b>	<b>\$22,293,005</b>	<b>\$171,731</b>	<b>\$6,429,945</b>
MPI %		64.9%	57.6%	56.9%	47%	51.3%	42%	64.2%	56.8%	55.3%		
<b>Total PGP</b>												
Contribution in Kind Farm IQ	\$2,250,397	\$2,950,185	\$3,487,478	\$4,473,756	\$3,690,076	\$3,699,350	\$4,441,140	\$22,997,526	\$25,068,681	\$24,992,382	\$76,299	(\$1,994,856)
Cash Farm IQ	\$4,005,507	\$8,286,706	\$7,935,755	\$6,009,437	\$4,683,204	\$4,439,471	\$6,859,353	\$68,389,475	\$40,401,968	\$42,219,433	(\$1,817,465)	\$26,170,042
Cash Govt	\$4,229,357	\$8,453,999	\$14,048,919	\$11,790,207	\$8,759,544	\$6,058,436	\$5,920,370	\$59,342,000	\$59,342,000	\$59,260,831	\$81,168	\$81,169
<b>Total</b>	<b>\$10,485,261</b>	<b>\$19,690,890</b>	<b>\$25,472,152</b>	<b>\$22,273,400</b>	<b>\$17,132,824</b>	<b>\$14,197,257</b>	<b>\$17,220,862</b>	<b>\$150,729,001</b>	<b>\$124,812,648</b>	<b>\$126,472,646</b>	<b>(\$1,659,998)</b>	<b>\$24,256,355</b>
<b>MPI % of Total costs</b>	<b>40.3%</b>	<b>42.9%</b>	<b>55.2%</b>	<b>52.9%</b>	<b>51.1%</b>	<b>42.7%</b>	<b>34.4%</b>	<b>39.4%</b>	<b>47.5%</b>	<b>46.9%</b>		

- PGGW left the programme in Year 1 and their contributions were taken on by SFF and Landcorp (82%:18%)
- IO1 Value Chain Managers not supplied by partners. CIK was replaced with partner cash including Farmer revenue of \$2.6m.
- IO2 Silver Fern Farms spend on Marketing was \$6m higher than Schedule 7 budget.
- IO3 Database software build was planned to use \$9.7m Farmer Revenue. First sales began October 2014, with uptake slower than budget. No Farmer Revenue used in build costs.
- IO4 Genetics - \$278k partner cash removed, MPI cash \$768k lower.
- IO5 Processing - decision made in 2014 to discontinue R&D in this project. Removal of \$22m costs from this project.
- IO6 MPI cash expenditure on ear tags \$3.7m below plan. These funds agreed to be moved to IO1 and IO3 to assist farmer uptake in other ways.
- MPI funding of \$81k to be carried forward for programme wrap up costs

## Financial Summary - By Programme Partner

Total Summary by Funder  
FARMIQ PGP TO DATE  
June 2017

	Year 1 ACTUAL 2010/2011	Year 2 ACTUAL 2011/2012	Year 3 ACTUAL 2012/2013	Year 4 ACTUAL 2013/2014	Year 5 ACTUAL 2014/2015	Year 6 ACTUAL 2015/2016	Year 7 ACTUAL 2016/2017
<b>Contribution in Kind Farm IQ</b>	<b>\$2,250,397</b>	<b>\$2,950,185</b>	<b>\$3,487,478</b>	<b>\$4,473,756</b>	<b>\$3,690,076</b>	<b>\$3,699,350</b>	<b>\$4,441,140</b>
SFF	\$1,742,139	\$2,219,205	\$2,759,361	\$3,821,716	\$3,250,381	\$3,203,778	\$4,115,452
PGW	\$288,328						
TT	\$167,770	\$609,385	\$417,606	\$369,918	\$156,147	\$66,065	\$3,908
LFL	\$52,160	\$121,595	\$310,511	\$282,122	\$283,548	\$429,507	\$321,780
<b>Cash Farm IQ</b>	<b>\$4,005,507</b>	<b>\$8,286,706</b>	<b>\$7,935,755</b>	<b>\$6,009,437</b>	<b>\$4,683,204</b>	<b>\$4,439,471</b>	<b>\$6,859,353</b>
SFF	\$3,942,120	\$7,318,056	\$6,966,801	\$5,607,346	\$3,731,320	\$3,330,496	\$4,821,962
PGW	\$11,102						
TT	\$52,285	\$79,823	\$665,755	\$210,429	\$132,667	\$126,776	\$13,163
Sheepbreeder					\$45,805	\$95,840	\$192,080
Farmer					\$549,940	\$659,558	\$1,346,666
LFL		\$888,827	\$303,199	\$191,662	\$223,472	\$226,801	\$485,482
<b>Cash Govt</b>	<b>\$4,229,357</b>	<b>\$8,453,999</b>	<b>\$14,048,919</b>	<b>\$11,790,207</b>	<b>\$8,759,544</b>	<b>\$6,058,436</b>	<b>\$5,920,370</b>
<b>Total</b>	<b>\$10,485,261</b>	<b>\$19,690,890</b>	<b>\$25,472,152</b>	<b>\$22,273,400</b>	<b>\$17,132,824</b>	<b>\$14,197,257</b>	<b>\$17,220,862</b>

MPI percentage                      40.3%                      42.9%                      55.2%                      52.9%                      51.1%                      42.7%                      34.4%

A		B		A-B
TOTAL OVER 7 YEAR PERIOD Schedule 7		TOTAL TO DATE Actual to June 2017		Variance Schedule 7 Adjusted for PGGW to Programme Plan 2017
<b>\$22,997,526</b>	<b>15.3%</b>	<b>\$24,992,382</b>	<b>19.8%</b>	<b>(\$1,994,856)</b>
\$11,571,739	7.7%	\$21,112,032	16.7%	(\$9,540,293)
\$6,640,497	4.4%	\$288,328	0.2%	\$6,352,169
\$2,281,998	1.5%	\$1,790,799	1.4%	\$491,199
\$2,503,292	1.7%	\$1,801,223	1.4%	\$702,069
<b>\$68,389,475</b>	<b>45.4%</b>	<b>\$42,219,433</b>	<b>33.4%</b>	<b>\$26,170,042</b>
\$56,620,261	37.6%	\$35,718,101	28.2%	\$20,902,160
\$310,000	0.2%	\$11,102	0.0%	\$298,898
\$945,000	0.6%	\$1,280,898	1.0%	(\$335,898)
		\$333,725	0.3%	(\$333,725)
\$9,655,308	6.4%	\$2,556,164	2.0%	\$7,099,144
\$858,906	0.6%	\$2,319,443	1.8%	(\$1,460,537)
<b>\$59,342,000</b>	<b>39.4%</b>	<b>\$59,260,831</b>	<b>46.9%</b>	<b>\$81,169</b>
<b>\$150,729,001</b>	<b>100.0%</b>	<b>\$126,472,646</b>	<b>100.0%</b>	<b>\$24,256,355</b>

39.4%                      46.9%

- PGGW left the programme in Year 1 and their contributions were taken on by SFF and Landcorp (82%:18%)
- Farmer Revenue budgeted at \$9.7m in plan set in 2010. Farmer uptake of FarmIQ products slower than budgeted.
- Programme decision to discontinue IO5 Silver Fern Farms Processing project reduced overall SFF contribution by \$19m. Higher than planned contribution in IO2 gave a net reduction of \$11.4m in SFF funds.
- Sheepbreeder revenue of \$334k earned by AgResearch selling genetic tests.
- Landcorp covered portion of loss in PGGW funds, overall 23% increase in funds (\$758k).
- MPI percentage changed from 39% to 47% with removal of IO5 project.



## Appendices

- 2010-17 Programme Summary Table
- 2016-17 Summary Annual Outcome Table
- 2016-17 Annual Outcome Table

## 2010-17 Programme Summary Table

Project	Key Outcomes	Outcome Measures	Post Programme activity	Measures to 2022*
IO 1 - Management	FarmIQ Systems Management Experience	See IO 3 - Software	Ongoing in FIQ Systems	See IO 3 - Software
IO 2 - Marketing	<ul style="list-style-type: none"> <li>Lamb, beef and venison value add products <ul style="list-style-type: none"> <li>Underpinning market research in <b>12 key markets with 20,000 consumers</b></li> <li>Cuts, packaging, marketing materials, web sites, support systems. <b>126 new SKU's</b> (products) <ul style="list-style-type: none"> <li>e.g. Reserve Range</li> </ul> </li> <li>Commercial outcomes incorporated in Silver Fern Farms value add marketing operational systems and business. Team of X developed.</li> <li>Contractual linkages along chain not developed extensively due to market conditions (in-market price volatility)</li> </ul> </li> <li>BeefEQ <ul style="list-style-type: none"> <li>BeefEQ measurement system, supporting Reserve beef products implemented. Producer manuals, FIQ information system integration to provide farmer feedback.</li> </ul> </li> <li>LambEQ <ul style="list-style-type: none"> <li>LambEQ system developed to manage lamb quality through cut development and processing technique (pH, electrical stimulation, cut ageing). Research outcomes published April 2017.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>\$260m</b> Value Add turnover over programme period</li> <li><b>\$3.5m</b> in premium payments</li> </ul>	<ul style="list-style-type: none"> <li>Undertake market research as required.</li> <li>Scale up range in USA, China, Germany.</li> <li>Grow the value add business utilising the team and skill set developed in the programme.</li> <li>Continue to monitor actions that would formally link supply chain together that fit with market conditions and customer needs.</li> <li>BeefEQ embedded into value add operational systems. Supply of stock lifted to align with value add turnover targets.</li> </ul>	<ul style="list-style-type: none"> <li>Value Add Turnover: <i>\$200m per annum (2022)</i> <ul style="list-style-type: none"> <li>Channel <ul style="list-style-type: none"> <li>FMCG – \$100m</li> <li>HORECA - \$100m</li> </ul> </li> </ul> </li> <li>Value Chain connections <ul style="list-style-type: none"> <li>Market linked supply contracts</li> </ul> </li> <li>Premium paid: \$9.5m by 2022 <ul style="list-style-type: none"> <li>BeefEQ</li> </ul> </li> </ul> <p>(Reporting by Silver Fern Farms)</p>

IO 3 - System	<ul style="list-style-type: none"> <li>FarmIQ Farm Management System. <ul style="list-style-type: none"> <li>System developed to cover land, animal and human planning, recording, reporting and analysis.</li> <li>Cloud based system with integration to mobile device</li> <li>Integration to data sources: <ul style="list-style-type: none"> <li>Processing info</li> <li>Weigh scale</li> <li>Weather</li> <li>Pasture cover</li> </ul> </li> <li>Integration with partners: <ul style="list-style-type: none"> <li>ANZCO, Alliance, Affco</li> <li>Ballance</li> <li>Vet Ent, AgFirst</li> </ul> </li> <li>New shareholders <ul style="list-style-type: none"> <li>Vet Ent</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Customer numbers <ul style="list-style-type: none"> <li>System users – <b>1,400</b></li> </ul> </li> <li>NZ Animal numbers – <b>5.9m SU (11% SU)</b> <ul style="list-style-type: none"> <li>Sheep – 2.9m</li> <li>Cattle – 2.7m</li> <li>Deer – 0.4m</li> </ul> </li> <li>Productivity change <ul style="list-style-type: none"> <li>Reproduction <ul style="list-style-type: none"> <li>Sheep 140%</li> <li>Cattle 85%</li> <li>Deer 85%</li> </ul> </li> <li>Growth rate <ul style="list-style-type: none"> <li>Sheep 370 g/day</li> <li>Cattle 900 g/day</li> <li>Deer 200 g/day</li> </ul> </li> </ul> </li> <li>Farm system area <ul style="list-style-type: none"> <li><b>1.4m Ha (eff)</b></li> </ul> </li> <li>Commercially viability <ul style="list-style-type: none"> <li>FIQ Systems EBIT –</li> <li>-\$668k</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Commercial Extension of FarmIQ System <ul style="list-style-type: none"> <li>Extend system to cover dairy and possibly horticulture</li> <li>Extend system to other platforms e.g. tablet</li> <li>Integration to data sources: <ul style="list-style-type: none"> <li>Majority of processors meat and dairy</li> <li>Shed information</li> <li>Automate input broadly</li> </ul> </li> <li>Integration with partners: <ul style="list-style-type: none"> <li>80% of meat &amp; dairy Co's</li> <li>Fert Companies</li> <li>Vets and consultants</li> </ul> </li> <li>New shareholders <ul style="list-style-type: none"> <li>2 additional shareholders</li> </ul> </li> <li>Build customer base offshore <ul style="list-style-type: none"> <li>Sri Lanka</li> <li>Australia</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Customer numbers <ul style="list-style-type: none"> <li>System users – 3,500+</li> </ul> </li> <li>NZ Animal numbers – <b>20m SU</b> <ul style="list-style-type: none"> <li>Sheep – 17.5m</li> <li>Cattle – 2.4m</li> <li>Deer – 0.5m</li> </ul> </li> <li>Productivity change <ul style="list-style-type: none"> <li>Reproduction <ul style="list-style-type: none"> <li>Sheep 150%</li> <li>Cattle 88%</li> <li>Deer 90%</li> </ul> </li> <li>Growth rate <ul style="list-style-type: none"> <li>Sheep 320g/day</li> <li>Cattle 700g/day</li> <li>Deer 200g/day</li> </ul> </li> </ul> </li> <li>Commercially viability <ul style="list-style-type: none"> <li>FIQ Systems EBIT +\$2.1m</li> </ul> </li> </ul> <p>(Reporting by FIQ Systems)</p>
IO – 4 Genetics	<ul style="list-style-type: none"> <li>Genetic test (High density 650k SNP chip) developed.</li> <li>17,000 lambs progeny tested to validate test for eating quality</li> <li>Equations to calculate breeding values (gBV's) for eating quality traits.</li> <li>Commercial genetic test (8k SNP chip) <ul style="list-style-type: none"> <li>Commercial test covers parentage, eating quality and productivity traits.</li> </ul> </li> <li>Test to be used by industry through Beef and Lamb Genetics</li> <li>New platform (GBS) created for deer industry</li> </ul>	<ul style="list-style-type: none"> <li>Test use: <ul style="list-style-type: none"> <li>Number of animals tested – <b>50% terminal sires</b></li> </ul> </li> <li>Rate of genetic gain: <ul style="list-style-type: none"> <li>Exceeds <b>2% PA</b></li> </ul> </li> <li>7-year trend (2016 progeny) <ul style="list-style-type: none"> <li>-19% for shear force</li> <li>+4% for IMF</li> <li>+12% GR.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Finalise test use (SNP chip and equation) by B&amp;L Genetics. B&amp;L Genetics considering both technical and commercial matters as part of path to wider industry use.</li> <li>Eating quality traits to be added to SIL trait portfolio.</li> </ul>	<ul style="list-style-type: none"> <li>Test use: <ul style="list-style-type: none"> <li>Number of animals tested – 100,000</li> </ul> </li> <li>Rate of genetic gain: <b>2% PA</b> <ul style="list-style-type: none"> <li>Eating quality traits <ul style="list-style-type: none"> <li>Tenderness (shear force)</li> <li>Intramuscular fat (IMF)</li> <li>Fat depth 12 Rib (GR)</li> </ul> </li> </ul> </li> </ul> <p>(Reporting by AgR/B&amp;L Genetics)</p>
IO 5 - Processing	<ul style="list-style-type: none"> <li>Electronic ID (EID) carcass tracking in plant to 99% reliability <ul style="list-style-type: none"> <li>Supported spray chilling to reduce weight loss 2%</li> <li>Carcass temp history for shelf life prediction</li> </ul> </li> <li>Meat yield measurement <ul style="list-style-type: none"> <li>Lamb X-ray in 6 plants with DEXA trials. Now installed in some lamb</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Initially programme had strong focus on yield. Cut price differentials changed so that value reduced. Focus moved to eating quality systems with development of BeefEQ and lamb EQ.</li> </ul>	<ul style="list-style-type: none"> <li>Directly commercially relevant work (traceability, X-ray) has been implemented and is now considered BAU and available to the wider industry.</li> <li>The DEXA and hyperspectral work have been picked up by other parties as relevant.</li> </ul>	<ul style="list-style-type: none"> <li>Systems developed supported the Value Add Turnover in IO 2 Marketing above.</li> </ul>

	<ul style="list-style-type: none"> <li>meat plants but not on commercial scale.</li> <li>o Beef trialled, venison installed.</li> <li>• Meat quality measurement systems</li> <li>o Trial work with limited commercial outcomes as unreliable and/or inaccurate.</li> <li>o Identification of hyperspectral imaging technology as the most promising tool but not economic to continue alone.</li> <li>o Development of the BeefEQ beef eating quality grading system modelled on the Australian MSA grading system.</li> <li>• Meat quality improvement</li> <li>o Updated version of the best practice guide for chilled lamb released to the NZ industry.</li> <li>o Optimisation of spray chill systems for lamb production. (~2% yield gain).</li> <li>o Optimisation of high pressure processing for hot boned beef plants.</li> <li>o Supporting data provided to UK retailers to help steer them to more science-based decisions on acceptability of chilled lamb products.</li> </ul>	<ul style="list-style-type: none"> <li>• Live to cc/yield improved <b>9%</b> (52% base) in deer and <b>2%</b> (51% base) in beef.</li> <li>• Quality improved with pass rate lifting from <b>24% to 36% from 2014</b></li> <li>• <b>\$9m</b> per annum benefit</li> </ul>	<ul style="list-style-type: none"> <li>o DEXA now being commercialised in Australia (MLA and Scott Tech)</li> <li>o Hyperspectral imaging now an industry MBIE project</li> <li>• BeefEQ is now BAU and incorporated in the marketing stream above.</li> </ul>	
IO 6 - On farm	<ul style="list-style-type: none"> <li>• Farm management and Nutrition key learnings: <ul style="list-style-type: none"> <li>o Measurement of animals and the environment create value</li> <li>o Prediction of performance supports business</li> <li>o Understanding of drivers of performance supports improvement</li> <li>o Motivation to keep improving</li> </ul> </li> <li>• Animal Health <ul style="list-style-type: none"> <li>o Evidence based farm management decisions</li> </ul> </li> <li>• Equipment and Infrastructure <ul style="list-style-type: none"> <li>o Supports better understanding of drivers of performance</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Average annual IQ Farm change over 6 years, <ul style="list-style-type: none"> <li>o <b>+3%cc/wgt/ha</b></li> <li>o <b>+5% Eco Farm Surplus</b></li> <li>o <b>+6% Lambing%</b></li> </ul> </li> <li>• Overall system data (4 years) <ul style="list-style-type: none"> <li>o Lamb growth rate to weaning has lifted <b>18%</b> (314g/day to 371 g/day)</li> <li>o Cattle growth rate lifted <b>50%</b> (600g/day to 900g/day)</li> <li>o Lambing % 133% (B&amp;L +5%)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing farm improvement relies on clear business objectives translated to operational plans, measures, monitoring and effective action across both the farmer and their advisory network.</li> <li>• The farm management system was built to support these outcomes.</li> <li>• Beyond the Information transferred to sector over course of programme through field days, workshops, upskilling technical input and publications on farm productivity is supported by:</li> </ul>	<ul style="list-style-type: none"> <li>• Farm productivity change as per IO 3 system information above.</li> </ul> <p>(Reporting by FIQ Systems)</p>

	<ul style="list-style-type: none"> <li>○ More focused monitoring of livestock leads to improved management based on understanding individual needs rather than managing to the average</li> <li>○ Making more use of the investment in technology</li> <li>● Technology Transfer <ul style="list-style-type: none"> <li>○ Setting goals and working toward them</li> <li>○ Valuing time where tactical and strategic decisions are made</li> <li>○ Actively planning to capture opportunities, minimise threats</li> <li>○ Employing expertise, engaging in more management thinking</li> <li>○ Using technology to measure and analyse</li> <li>○ FarmIQ System has become the central information hub.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>○ These changes will have been significantly affected by climate and price relativity.</li> <li>○ Animal health – Increase in defect incidence of 8% (base 16%)</li> <li>○ 36% Farms using system reports showed a decrease.</li> <li>● Note: variability in the type and completeness of data entry makes system wide comparisons challenging.</li> </ul>	<ul style="list-style-type: none"> <li>○ System use.</li> <li>○ Ongoing tech transfer through use of the FarmIQ System.</li> <li>○ Continued user number scale up of software supports the uptake of FIQ on-farm learnings as per IO 3 above.</li> <li>● FarmIQ Systems responsibility.</li> </ul>	
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\* The Measures to 2022 are based on the Silver Fern Farm market projections, FarmIQ Systems Business Plan, assumptions from the Cranleigh 2016 analysis and original programme targets for rate of genetic gain.

## Summary Annual Outcome 2016-17

Outcome	Status	Activity	Comments
<b>IO 1 - Value Chain add</b> <ul style="list-style-type: none"> <li>Original \$360m value add by 2017 (NZIER)</li> <li>Revised \$88m value add by 2017 (Cranleigh)</li> </ul>		<ul style="list-style-type: none"> <li>Re-run both Cranleigh and NZIER Models to estimate value add outcomes by programme end and 2025.</li> </ul>	<ul style="list-style-type: none"> <li>The key assumptions for Cranleigh modelling remain very similar which do not warrant re-running the model.</li> <li>NZIER have provided analysis. Key points: <ul style="list-style-type: none"> <li>Gross Output in 2025 of estimated at \$1.2b vs original proposal of \$2.8b.</li> <li>NZIER believe the original counterfactual with the meat industry shrinking to \$3.5 billion was overstated which led to the benefit claim of \$2.8b. A more conservative assessment would see then industry earn \$5.1b in 2025 which would result in a revised net FIQ original benefit of \$1.2b.</li> <li>Alternate Benefit Cost Ratio (BCR) analysis shows a BCR of approx.10 with ratios of between 3 and 5 being accepted indicators of success for similar projects.</li> </ul> </li> </ul>
<b>IO 2 - Market Development</b> <ul style="list-style-type: none"> <li>Annualised turnover <b>\$103m</b> (June year) <ul style="list-style-type: none"> <li>Lamb - \$ 16m</li> <li>Beef - \$ 77m</li> <li>Venison - \$ 9m</li> </ul> </li> <li>6.2 % of overall SFF turnover in value add from FIQ supported work</li> </ul>		<ul style="list-style-type: none"> <li>Long term and annual planning processes now embedded for the Silver Fern Farms Value Added business.</li> <li>During 2016/17, new market streams are likely to require new people in China, Germany and USA.</li> <li>Focus on FMCG/HORECA</li> <li>Key Markets <ul style="list-style-type: none"> <li>Germany</li> <li>USA</li> <li>China</li> </ul> </li> <li>Extend innovation culture into commodity business</li> <li>Total annualised turnover forecast \$103m NZD for 2016/17</li> </ul>	<ul style="list-style-type: none"> <li>Annual value add turnover <b>\$74m.</b> (Dec 2016 year)</li> <li><b>China Restaurant Trade</b> <ul style="list-style-type: none"> <li>China is now our largest Reserve market</li> <li>Sales exceed \$12m and continue to grow. Expect to be \$20m next year</li> </ul> </li> <li><b>China FMCG</b> <ul style="list-style-type: none"> <li>Launch plan developed for test market into 120 supermarkets in November</li> <li>Product mix of steak cuts and traditional Chinese beef items</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>2-year marketing plan to be completed prior to December 2016 (complete)</li> </ul>	<ul style="list-style-type: none"> <li><b>German FMCG</b> <ul style="list-style-type: none"> <li>On-going development in this market continues as we look to expand from the current 2,000 supermarkets. Long term brand building activities underway.</li> </ul> </li> <li><b>USA FMCG</b> <ul style="list-style-type: none"> <li>Results from large consumer research study have provided powerful new insights. Further shopper research underway using 'video-mining' techniques</li> <li>Product prototypes to include Grass Fed Reserve Beef and Pasture Raised Venison with strong NZ story product claims.</li> </ul> </li> </ul>
<p><b>IO 2 - (Part IO 5) Yield (or similar) based payments</b></p> <ul style="list-style-type: none"> <li><b>Beef<sup>EQ</sup></b> <ul style="list-style-type: none"> <li>Volume (63% of Prime Steer)</li> <li>Pass rate (29%)</li> <li>Value (\$2.5m)</li> </ul> </li> <li>Lamb<sup>EQ</sup> pilot</li> <li>Venison supply contract</li> </ul>		<ul style="list-style-type: none"> <li>Extend Beef<sup>EQ</sup> geographical coverage, increase throughput and improve pass rate. <ul style="list-style-type: none"> <li>Investigate additional cold boning plant</li> <li>Review incentive structures and identify sensitivity options</li> <li>Support on farm practice (manual and FMS)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>BeefEQ</b> - Pass rates have lifted from 28% to 35% for the season. There is the opportunity to earn an additional \$6.5m. (assuming 100% could be achieved).</li> <li>On average now capturing 750 Reserve grade and 500 PRE Beef grade animals each week. So more than 60,000 premium EQ graded animals annually.</li> <li>Key markets are China (Reserve HORECA); USA (Reserve HORECA &amp; PRE Beef FMCG); Germany (FMCG).</li> <li>Annualised farmer premiums of \$3.5m paid for in-spec animals</li> <li>EQ Reports to all farmers supplying our EQ processing plants (Pacific, Belfast and Finegand)</li> </ul>

		<ul style="list-style-type: none"> <li>• Lamb<sup>EQ</sup> project completion – Final recommendation delayed from Dec 2016 to Feb 2017.</li> </ul>	<ul style="list-style-type: none"> <li>• BeefEQ manuals have been well received by farmers. Further manuals are being distributed to key suppliers.</li> <li>• <b>LambEQ</b> – Final report completed from testing 23,000 consumer samples in NZ and USA. Conclusive results from this study, combined with all previous studies show that Lamb Eating Quality outcomes driven by 3 factors: <ul style="list-style-type: none"> <li>• Selecting the correct cut for specified cooking method. For grilling this means single muscle cuts (not multiple muscles such as cross cut leg steaks)</li> <li>• Lamb cuts require adequate ageing post processing. Typically, this means 7-21 days ageing</li> <li>• Perception of eating quality can be enhanced by telling a compelling back-story associated with the product.</li> </ul> </li> <li>• All other attributes examined and tested over the past 7-8 years have proven to have minimal or no impact on eating quality.</li> <li>• The commercial implications of these conclusions are that we will now continue to roll out our branded FMCG programs into global markets utilizing single muscle cuts that are aged before consumption.</li> <li>• Report and press release distributed in April.</li> <li>• A further Venison supply contract to July has been rolled out which has been well supported by farmer suppliers.</li> </ul>
		<ul style="list-style-type: none"> <li>• Venison supply contract through to Feb 2017 based on German retail programme.</li> </ul>	



<b>IO 4 - Three breeding programmes targeting consumer requirements with genetic gain &gt; 2%</b> <ul style="list-style-type: none"> <li>Move sheep genetics to commercial base from beta test</li> <li>Calculate annual genetic gain for IMF and tenderness (shear force)</li> <li>Extend Beef<sup>EQ</sup> back to genetic base</li> </ul>		<ul style="list-style-type: none"> <li>Continue linkage with Focus Genetics, Kelso and Suftex Breeders (70% of top 200/75% to 20% or 50% of all recorded). Breeders contribute 75% of cost of the test. Post programme, full cost recovery on commercial terms.</li> <li>Re run GBv calculations for 2016 progeny - 6-year trend (2015 progeny), -17% for shear force and +3% for IMF (+11% GR).</li> <li>Continue to support a range of beef studs (Kakahu, Focus and Rissington) who are using Beef<sup>EQ</sup> scores to focus genetic selection for eating outcomes and include in manual/FMS</li> </ul>	<ul style="list-style-type: none"> <li>Core breeders remain on board with programme. SNP chip available for use.</li> <li>7-year trend (2016 progeny), -19% for shear force and +4% for IMF (+12% GR). Annual rate of gain continues to exceed 2% target.</li> <li>Have continued farmer workshops using individuals kill data to improve Reserve beef hit rates through best practise and proven systems</li> </ul>
<b>IO 1 - Animal number</b> <ul style="list-style-type: none"> <li>Sheep 3.8m (13% flock)</li> </ul>		<ul style="list-style-type: none"> <li>Numbers change based on schedule 7 and delivered by system uptake</li> </ul>	<ul style="list-style-type: none"> <li>3,273k Sheep (3,952 peak season)</li> </ul>
<b>IO 1 - Animal number</b> <ul style="list-style-type: none"> <li>Cattle 460k (13% herd)</li> </ul>		<ul style="list-style-type: none"> <li>Numbers change aligned with system uptake</li> </ul>	<ul style="list-style-type: none"> <li>475.5k Cattle (487 peak season)</li> </ul>
<b>IO 1 - Animal number</b> <ul style="list-style-type: none"> <li>Deer 197k (21% herd)</li> </ul>		<ul style="list-style-type: none"> <li>Numbers change aligned with system uptake</li> </ul>	<ul style="list-style-type: none"> <li>143k Deer (159 peak season)</li> </ul>
<b>IO 1 - Farm number in FMS</b> <ul style="list-style-type: none"> <li>1061 Farm customers (FIQ Business Plan)</li> <li>1000 farms contributing info (Programme Plan)</li> </ul>		<ul style="list-style-type: none"> <li>See functional database and sales partners/channels below</li> </ul>	<ul style="list-style-type: none"> <li>858 Customers</li> <li>150 Landcorp <ul style="list-style-type: none"> <li><b>1008 Total Farm Customers</b></li> </ul> </li> <li>279 SFF E-Diary <ul style="list-style-type: none"> <li><b>1,303 Contributing info</b></li> </ul> </li> </ul>
<b>IO 6 - On farm productivity lift</b> <ul style="list-style-type: none"> <li>Reproductive performance</li> <li>Growth rate</li> <li>C/c wgt/ha</li> </ul>		<ul style="list-style-type: none"> <li>Extend analysis beyond IQ farms where system data permits.</li> <li>Analyse BeefEQ data along value chain and include in production manual where relevant</li> <li>Provide learnings through system functionality where relevant (calculators etc) and support IQ farm activity below.</li> </ul>	<ul style="list-style-type: none"> <li>Average annual IQ Farm change over 6 years, <ul style="list-style-type: none"> <li>+3%cc/wgt/ha</li> <li>+5% Eco Farm Surplus</li> <li>+6% Lambing%</li> </ul> </li> <li>Complete</li> <li>Ongoing</li> </ul>

<p><b>IO 6</b> - 12 IQ Farms in operation</p> <ul style="list-style-type: none"> <li>• Feedback on value chain and system</li> <li>• On farm productivity lift</li> <li>• Tech transfer</li> </ul>		<p>11 IQ Farms</p> <ul style="list-style-type: none"> <li>• Continue role of IQ farms to support information collection and dissemination supporting farm practice change and system uptake. Activities include field days, workshops and case studies and final report write up.</li> </ul>	<ul style="list-style-type: none"> <li>• IQ Farms continue to operate as per plan. Agreed final year projects which range from assigned weighing (calculate condition score from weight), measuring what matters, eliminating repeat single bearing ewes, early lamb weaning, measuring and managing pasture growth variability and impact of lamb growth profile. All projects use system data and aim to systemise the process. Projects presented at Final IQ Farm meeting in May and then through case studies and video summary.</li> </ul>
<p><b>IO 3</b> - Data standards and protocols</p>		<ul style="list-style-type: none"> <li>• Approved under the Farm Data Code of Practice</li> <li>• Continue to work with the RMPP Data Linker project</li> <li>• Started work on the RMPP KPI project</li> </ul>	<ul style="list-style-type: none"> <li>• RMPP DataLinker have commissioned their first supplier of data in ANZCO. Implementation of the DataLinker functionality delayed due to Datalinker delays.</li> </ul>
<p><b>IO 3</b> - Functional database with releases as appropriate (FMS)</p>		<ul style="list-style-type: none"> <li>• <b>August Release – Planned</b> <ul style="list-style-type: none"> <li>○ OL2 to OL4 (Mapping) upgrade</li> <li>○ Dairy pack <ul style="list-style-type: none"> <li>▪ Milk data feeds</li> <li>▪ Targets &amp; consumption</li> <li>▪ Supplementary feed and pasture reports</li> <li>▪ Milk &amp; animal reports</li> <li>▪ Farm dashboard</li> <li>▪ Company &amp; Organisation dashboard</li> <li>▪ Marking mobs</li> </ul> </li> <li>○ Inventory redesign</li> <li>○ Bug fixes</li> </ul> </li> <li>• <b>Mobile Release – Planned</b> <ul style="list-style-type: none"> <li>○ Update Cordova</li> <li>○ Push notifications</li> <li>○ Change tallies</li> <li>○ Supplementary Feed</li> <li>○ Inventory Purchase</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Functionality released in June ¼ <ul style="list-style-type: none"> <li>○ RMPP benchmarking</li> <li>○ DataLinker integration for ANZCO</li> <li>○ H&amp;S Updates</li> <li>○ GrazCare Reporting</li> <li>○ Timesheet updates</li> <li>○ Sri Lanka pilot system</li> <li>○ Dairy – land applications</li> <li>○ Landcorp updates</li> <li>○ Bug fixes</li> </ul> </li> <li>• Mobile <ul style="list-style-type: none"> <li>○ Mapping</li> <li>○ H&amp;S Updates</li> <li>○ Timesheet updates</li> <li>○ Chemical Applications</li> <li>○ General Animal</li> <li>○ Task updates</li> </ul> </li> </ul>

<p><b>IO 1 – Business Development</b> Sales partners and alternate sales/distribution channels.</p> <ul style="list-style-type: none"> <li>• Maintain farmer direct</li> <li>• Extend B to B</li> <li>• 1061 customers as per above.</li> </ul>		<ul style="list-style-type: none"> <li>• BM field team of 5</li> <li>• Vet Ent, Farmlands, PGW, AgFirst, BakerAg, ANZCO etc</li> <li>• Supporting sales through sales and marketing activities</li> </ul>	<ul style="list-style-type: none"> <li>• Farmer sales on budget and continue to gain traction supported by farmer word of mouth.</li> <li>• B to B development continues to ramp up. Work with Farmlands, ANZCO and Ballance picking up significantly. Vet Ent continue to extend customer numbers in graze and stockcare. Agfirst are gradually increasing numbers in Landbase.</li> <li>• System development work for Sri Lanka complete to meet the pilot needs after a successful pre-pilot.</li> </ul>
<p><b>IO 1 - Business Model/Planning</b></p> <ul style="list-style-type: none"> <li>• FIQ Systems on commercial base</li> <li>• SFF adoption of value chain where commercially viable</li> <li>• Other supporting parties linked into ecosystem – vet, consult etc</li> <li>• Capital raise to support system operation post programme.</li> </ul>		<ul style="list-style-type: none"> <li>• Work with SFF management to identify impediments and opportunities.</li> <li>• Extend system use to supporting parties through B to B channel</li> </ul>	<ul style="list-style-type: none"> <li>• SFF E-Diary customers now being transitioned to other packs on commercial terms. SFF supporting transition by offering financial support to 30 June for those logged on and using the e-diary.</li> <li>• ANZCO successfully trialled system linked in with on farm assurance activities. Based on trial outcome, working towards on boarding 250 farms in October and 300 per year for the next 3 years.</li> <li>• Developed HOA with Ballance and now working to provide integrated system to Ballance customers.</li> <li>• Alliance and Affco providing processing information.</li> <li>• In addition to shareholding, working with Farmlands on product opportunities</li> </ul>

		<ul style="list-style-type: none"> <li>• Capital raise <ul style="list-style-type: none"> <li>○ Vet Ent agreed to invest.</li> <li>○ Capital raise to commence August 2016, targeting \$3.1m by December 2016.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Deal completed. Vet Ent now have 12% share in FIQ</li> <li>• On completion of due diligence and business case, Farmlands made offer for FarmIQ shareholding. Offer now subject to further negotiation.</li> <li>• Current shareholders agreed to underwrite in the event the capital raise is unsuccessful. First 1/4ly tranche provided July 3.</li> </ul>
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## Annual Outcome Table 2016-17

### Intermediate Outcome 1

Short title	Programme Management and Key Indicators
<b>IO Statement</b>	<p>This will be achieved through the Board of FarmIQ Systems which will have representatives on the Programme Steering Group which also includes MPI and MBIE representatives.</p> <p>The Management of the Programme will contribute to the transformation to a demand driven integrated value chain for red meat by ensuring that the projects and sub projects all work toward achieving the key performance indicators. These indicators will be a measure of the successful implementation of the Programme as a whole contributing toward achieving the goal of a demand driven integrated value chain for red meat that will deliver sustainable benefits to the sector.</p> <p>The aspirational goal is to grow the red meat sector's contribution to New Zealand's GDP, from 2010 figures, by \$1.1 billion over the seven years of the project by:</p> <ul style="list-style-type: none"> <li>• Designing, piloting and implementing an integrated red meat value chain model</li> <li>• Developing capability to identify and understand premium markets and developing products to meet their individual specifications</li> <li>• Developing genetic and genomic capabilities to enable the identification and isolation of desired animal traits to improve New Zealand's ability to produce products to customer/consumer specification</li> <li>• Developing new technologies and capabilities to enable product information to be collected during processing</li> <li>• Maximising value through smart processing and quality improvement</li> <li>• Enabling distribution of information back to the farmers</li> <li>• Improving on-farm production and performance through best practice production systems, data capture and aligning this with the integrated value chain</li> <li>• The integrated value chain is sustainable beyond 2017 with the industry on track to grow New Zealand's GDP by a further \$7.7 billion by 2025</li> </ul> <p>Our aspirational target is that the value gained to the industry is to be 47 cents for every dollar earned by 2025. By 2017, we want to be on track to achieve the key value drivers for this growth which are:</p> <ul style="list-style-type: none"> <li>• Production growth (45%) – this represents the additional amount of meat produced as a result of improved animal breeding and trait selection</li> <li>• Value growth (31%) – this represents the increased value secured in markets and distributed back to value chain participants – Programme farmers will receive additional incentive payments (purely commercial)</li> <li>• Carcass conversion (13%) – this represents the optimisation of products produced per animal</li> <li>• Capability growth (11%) – this represents the improvement in on-farm management through improved farmer skills and farm inputs</li> </ul> <p>Key determining factors:</p> <ul style="list-style-type: none"> <li>• Exchange rate fluctuations</li> <li>• Market access changes</li> <li>• Significant land use changes</li> <li>• Adverse weather events impacting on animal production</li> <li>• Significant animal health events</li> </ul> <p>The other five intermediate outcomes in this contract are project specific.</p>

Short title	<b>Programme Management and Key Indicators</b>
<b>Start date</b>	1 October 2010
<b>End date</b>	30 June 2017
<b>IO leader</b>	Collier Isaacs

## Intermediate Outcome Plan 2016/17

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
1.1	Programme Management	Annual review and update of Business Plan, programme/project schedules.	<ol style="list-style-type: none"> <li>1. MPI contribution to general equilibrium model (NZIER and Deloitte) – Economic analysis complete (prior to contract signing)</li> <li>2. Business Plan reviewed, updated and submitted to MPI for approval by the date determined by the PSG</li> <li>3. Variations approved and incorporated into Schedule 7 of the contract within one month of PSG approval</li> <li>4. Updated cashflow forecast approved by the PSG (materially within original annual approval) and amended in Schedule 7 if required by 30 June each year</li> <li>5. NZIER CGE modelling report completed and provided to MPI by 30 April 2015</li> <li>6. NZIER CGE modelling report completed and provided to MPI by 30 April 2017</li> </ol>	<p>Complete</p> <p>Annual</p> <p>Annual</p> <p>Annual</p> <p>Utilising Cranleigh sheep and beef model</p> <p>Re-run NZIER model as per objectives.</p>	<p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Complete</p> <p>Utilised Cranleigh Modelling</p> <p>NZIER have provided analysis. Key points:</p> <ul style="list-style-type: none"> <li>o Gross Output in 2025 of estimated at \$1.2b vs original proposal of \$2.8b.</li> <li>o NZIER believe the original counterfactual with the meat industry shrinking to \$3.5 billion was overstated which led to the benefit claim of \$2.8b. A more conservative assessment would see then industry earn \$5.1b in 2025</li> </ul>			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
					<p>which would result in a net FIQ benefit of \$1.2b.</p> <ul style="list-style-type: none"> <li>o Alternate Benefit Cost Ratio (BCR) analysis shows a BCR of approx.10 with ratios of between 3 and 5 being accepted indicators of success for similar projects.</li> </ul>			
1.2	Design and Research	Year one to three (the design and research phase) is primarily focussed on designing the approach and setting up the infrastructure necessary to deliver the approach.	<ol style="list-style-type: none"> <li>1. Specificity around data standards and protocols</li> <li>2. Animal numbers reach programmed uptake (as per Section 1.6 of the Business Plan or subsequently amended plan</li> <li>3. Farmer reference group established (using a representative sample) for consultation with project leads. Purpose is to provide feedback on design and development features of the Programme from the farmers' perspective (30 June 2011)</li> <li>4. 200 farms contributing their on-farm information to the database</li> <li>5. A functioning database meeting operational needs including recording key attributes of animal performance and carcase performance</li> </ol>	<p>Continue involvement with data standards and Datalinker programmes.</p> <p>See 1.4.1 2016-17 Objectives</p> <p>Operational and functioning</p> <p>See 1.4.2</p> <p>See IO 3</p>	<p>Accredited to data standards and working to implement datalinker</p> <p>See 1.4.1 2016-17 Objectives</p> <p>IQ Farm and customer feedback on an ongoing basis.</p> <p>See 1.4.2</p> <p>See IO 3</p>			



Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			6. Commencing the collection of market data and securing long term contracts using the integrated value chain to develop capabilities (30 June 2013) 7. Design and development of the systems and processes required to support the value chain (30 June 2013) 8. Securing two long term contracts that the integrated value chain is servicing through farmer suppliers under contract to supply product under the virtually integrated model (30 June 2013)	See 1.4.3 2015-17 Objectives  See 1.4.3 2015-17 Objectives  See 1.4.3 2015-17 Objectives	See 1.4.3 2015-17 Objectives  See 1.4.3 2015-17 Objectives  See 1.4.3 2015-17 Objectives			
1.3	Pilot	Years four and five of the Programme are primarily focused on piloting and testing the systems and processes on farm, scaling the model to obtain economies of scale and proving the genetic gain through animal performance	Note: Pilot elements of the programme not completed or have ongoing relevance have been transferred to section 1.4					
1.4	Refinement	Years six and seven are planned for the refinement (through re-piloting) of systems and	1. Animal numbers reach programmed uptake (as per Section 1.6 of the Business Case) these are a subset of the commercial target.	2016/17 Targets. Sheep – 3,793,000 (13%) Cattle – 463,000 (13%) Deer – 197,000	3,952,000 sheep 487,000 cattle 159,000 deer			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
		processes we are developing.		(21%) Animal numbers linked to system uptake.				
			2. 1000 farms contributing on-farm information to the database by 2017	1061 customers as per FMS business plan through farmer direct and B to B channels.	1,303 Contributing info			
			3. Five long term customer orientated contracts that the integrated value chain is servicing through farmer suppliers under contract to supply product under the virtually integrated model	Market conditions remain unconducive to this outcome though intent is to develop if possible.  The key future focus will be on; - Germany - USA - China  Each market will require different plans and resources and on-going consumer research and market prototyping will be used to define our plans.	Market conditions remained unconducive to this outcome though the intent to develop remains if possible. Venison contracts have been used to manage supply given industry supply constraints.			
			4. Significantly growing the Programme out to other industry participants having proved that the integrated value chain delivers sustainable benefits to all participants with 25% of industry utilising core infrastructure developed by the Programme	Looking to grow programme out to wider sector through broadening shareholding and system use. See FMS commercialisation below.	FMS now covers 10% of SU's.			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			<p>5. Further recruitment of new markets and product development to match the demand of farmer uptake into the system</p> <p>6. Breeding programmes are in place and are fully integrated to support value chains. Note: genetic gain requirement of 2% PA from 1.3.1.</p>	<p>See IO 2.</p> <p>Our key future focus will be on;</p> <ul style="list-style-type: none"> <li>- Germany</li> <li>- USA</li> <li>- China</li> </ul> <p>Each market will require different plans and resources and on-going consumer research and market prototyping will be used to define our plans.</p> <p>Extension of breeder numbers in sheep programme through top terminal sire breeders who are using BV's for eating quality. LambEQ will provide the impetus for the increase. (75% of top 200 or 50% of all recorded using SNP test on partial cost recovery basis). Move cost recovery to full commercial model.</p> <p>LambEQ still under development though selection pressure being applied as above.</p>	<p>Continued linkage with Focus Genetics, Kelso and Suftex Breeders (70% of top 200/75% top 20% or 50% of all recorded). Breeders contributed 75% of cost of the test. Post programme, full cost recovery on commercial terms</p> <p>7-year trend (2016 progeny), -19% for shear force and +4% for IMF (+12% GR). Annual rate of gain continues to exceed 2% target.</p> <p>See below.</p>			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			7. Payment systems supporting customer attributes e.g. eating outcome (1.3.6)	<p>Extend number of breeding programmes aligning with BeefEQ, through SFF quality beef initiative.</p> <p>No venison related breeding programme as quality not an issue. GBS work has been extended to deer industry.</p> <p>Note 2015/16 Outcome for Beef EQ. Further scale up in 2016/17 year.</p> <p>LambEQ scheduled to be piloted in the 2016/17 year.</p>	<ul style="list-style-type: none"> <li>• <b>BeefEQ</b> - Pass rates have lifted from 28% to 35% for the season. There is the opportunity to earn an additional \$6.5m. (assuming 100% could be achieved).</li> <li>• On average now capturing 750 Reserve grade and 500 PRE Beef grade animals each week. So more than 60,000 premium EQ graded animals annually.</li> <li>• Annualised farmer premiums of \$3.5m paid for in-spec animals</li> <li>• EQ Reports to all farmers supplying our EQ processing plants (Pacific, Belfast and Finegand)</li> <li>• BeefEQ manuals have been well received by farmers. Further manuals are being distributed to key suppliers.</li> <li>• <b>LambEQ</b> – Final report completed from testing 23,000 consumer samples in NZ and</li> </ul>			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			8. As individual animal performance data is gathered the phenotypic programme is scaled up and	For participating farmers, BeefEQ linking eating data to on farm performance and	<p>USA. Conclusive results from this study, combined with all previous studies shows that Lamb Eating Quality outcomes driven by 3 factors:</p> <ul style="list-style-type: none"> <li>• Selecting the correct cut for specified cooking method. For grilling this means single muscle cuts (not multiple muscles such as cross cut leg steaks)</li> <li>• Lamb cuts require adequate ageing post processing. Typically, this means 7-21 days ageing</li> <li>• Perception of eating quality can be enhanced by telling a compelling back-story associated with the product.</li> </ul> <ul style="list-style-type: none"> <li>• All other attributes examined and tested over the past 7-8 years have proven to have minimal or no impact on eating quality.</li> <li>• The commercial implications of these conclusions are that we will now continue to roll out our branded FMCG programs into global markets utilizing single muscle cuts that are aged before consumption.</li> <li>• Report and press release distributed in April</li> </ul> <p>Continued support for range of beef studs (Kakahu, Focus and Rissington) who are using BeefEQ scores to focus genetic selection for eating</p>			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			<p>focussed on customer requirement (1.3.9)</p> <p>9. On farm productive capacity is improved as the benefits of improved genetics, farming systems and technology is taken up by the farmers as part of their commitment and participation in the integrated value chain (1.3.10)</p>	<p>genetics. Selected beef breeders have undertaken progeny tests linked to SFF quality initiative.</p> <p>IQ Farm performance continues to improve, the results of this work continue to be widely disseminated through field days, newsletters and website.</p> <p>Measurement of improved performance limited by system uptake. Focusing on lifting customer number either directly or through B to B channel.</p>	<p>outcomes and include in manual/FMS</p> <ul style="list-style-type: none"> <li>Average annual change over 6 years, <ul style="list-style-type: none"> <li>+3%cc/wgt/ha</li> <li>+5% Eco Farm Surplus</li> <li>+6% Lambing%</li> </ul> </li> </ul> <p>IQ Farms operated as per plan. Agreed final year projects which range from assigned weighing (calculate condition score from weight), measuring what matters, eliminating repeat single bearing ewes, early lamb weaning, measuring and managing pasture growth variability and impact of lamb growth profile. All projects use system data and aim to systemise the process. Projects presented at Final IQ Farm meeting in May and then through case studies and video summary.</p>			
			<p>1. FMS Commercialisation</p> <ul style="list-style-type: none"> <li>FIQ Systems on commercial base</li> <li>SFF adoption of value chain where commercially viable</li> </ul>	<ul style="list-style-type: none"> <li>Extend B to B model and broaden shareholder base</li> <li>Identify with SFF management</li> </ul>	<p>Customer numbers and capital sufficient to support FIQ post 30 June 2017.</p>			

Objective sequence	Objective title	Objective text	Objective Achievement Measure	Activity 2016/17	Outcome	Budget (2016/17)	Actual (2016/17)	Variance
			<ul style="list-style-type: none"> <li>Other supporting parties linked into ecosystem – vet, consultants, meat companies, rural retailers.</li> <li>Capital raise to support system operation post programme.</li> </ul> <p>Note: Summary Business Plan attached at Appendix 1.</p>	<p>commercial roadblocks to the wider adoption of the system in the value chain and how these may be mitigated.</p> <ul style="list-style-type: none"> <li>Extend system use to supporting parties through B to B channel</li> <li>Vet Ent have signed Term Sheet for investment, capital raise to commence August 2016, targeting \$5.5m by December 2016. Target shareholders as per B to B channel partners.</li> </ul>	<p>Linkages with vets (Vet Ent), Consultants (Ag First, Perrin), meat companies (ANZCO, Alliance) Rural retail (Farmlands and PGGW)</p> <p>Deal completed with Vet Ent with 12% shareholding for \$500,000. Farmlands offer on table under negotiation.</p>			
<b>Total</b>						<b>\$2,948</b>		

## Intermediate Outcome 2

Title	Marketing
Aim	<p>The objective of this project is to develop capability to identify and understand markets that are willing and able to pay a premium for quality products and developing products to meet their individual specifications.</p> <p>This will contribute to the vision by: <i>creating a market analysis capability which enables the value chain to be based on consumer specifications and enables the production of product to those specifications.</i></p> <p>This project will inform the other five IOs to ensure that product is delivered to customer specifications, on time. These specifications will vary depending on the market (which is not limited by country), allowing matching of value chain participants, animals, genetics, forage and farm systems to the most suitable value chain.</p> <p>The outcome will be the development of capability to determine market specifications to enable product to be delivered to those specifications.</p>
This will be achieved by 2017 by:	<p>IOO 2.1      Market Stream</p> <p>This sub project will design and implement the Programme's new market led strategy. This will set out the planned growth of high value lamb, beef and venison markets, the development of commodity supply partnerships, and the resourcing needed to undertake this transformation. This sub-project is fully funded by the Industry partners.</p>
	<p>IOO 2.2      Market Research</p> <p>Insights into the needs, attitudes and behaviours of consumers of New Zealand lamb, beef and venison around the world will lead to the commercialisation of new products and the identification of new market segments.</p>
	<p>IOO 2.3      New Product and New Market Development</p> <p>To establish and pilot a new product development process for red meat</p>
	<p>IOO 2.4      Consumer Sensory Evaluation</p> <p>To provide timely and cost-effective consumer sensory evaluation feedback information to the red meat industry which will enable consumer focused product development, meat quality improvements and superior quality assurance.</p> <p>Information gathered from sensory evaluation panels and consumer panels will be used to inform new product development and on farm production practices.</p>
Key indicators of success	<p>1. Five long term customer orientated contracts that the integrated value chain is servicing through farmer suppliers under contract to supply product under the virtually integrated model</p>



	<p>2. Farm IQ and Silver Fern Farms work together to embody a modern food company with market capabilities and functions measured through a benchmarking audit in 2016</p> <p>3. Supplying new market channels by 2017</p> <p>4. The value received from the market has improved (over the long run company average – Revenue / total kill based on annual reports)</p> <p>5. 7 year strategic market plan is in place.</p>
Start date	30 July 2010
End date	30 June 2017
IO leader	Grant Howie

**Intermediate Outcome Plan 2016/17 Year:**

IOO	IOO Description	Planned Activity 2016/17	Outcome	Budget (2016/17) (\$000)	Actual (2016/17) (\$000)	Variance (\$000)
2.1	Market Stream	<p>Long term and annual planning processes now embedded for the Silver Fern Farms Value Added business. People resources continually being reviewed and changes/additions made where required. With the German FMCG program likely to build, additional resources will be put in place to support this growth.</p> <p>During 2016/17, new market streams are likely to require new people in China and USA. Total annualised turnover forecast \$103m NZD for 2016/17.</p> <p>Summary market plan for 2 year period provided 30 Sept 2016.</p>	<p>German FMCG program continuing to develop and change as we learn more about the critical success factors to drive a premium aged-frozen Beef, Lamb and Venison program. Rate of sales have been below forecasted levels however we have identified numerous opportunities for further expansion. Long term brand development remains our key focus.</p> <p>In-depth consumer research and testing of prototypes in China and USA have provided new insights into these markets. Launch plans to test new products in these markets planned for early 2018. Additional people resource put in place in both these markets.</p> <p>China premium aged-frozen HORECA program has grown fast to over \$12m pa. The EQ graded Reserve beef has proven to be very popular in high-end restaurants and hotels.</p>	3,395	3,648	253

IOO	IOO Description	Planned Activity 2016/17	Outcome	Budget (2016/17) (\$000)	Actual (2016/17) (\$000)	Variance (\$000)
2.2	Market & Consumer Research	<p>We have now built a strong foundation of knowledge and experience across a number of markets regards premium paying red meat consumers. Our key future focus will be on;</p> <ul style="list-style-type: none"> <li>- Germany</li> <li>- USA</li> <li>- China</li> </ul> <p>Each market will require different plans and resources and on-going consumer research and market prototyping will be used to define our plans. How these will be reported will be developed in parallel with the market development.</p>	On-going research into these key markets will continue. New research techniques will also be utilised include 'video-mining' of supermarket shoppers in the USA. This involves multi-sensory tracking of more than 4m shoppers as they under-take their weekly shopping experience.	2,492	3,415	920
2.3	New Product & New Market Development	The Silver Fern Farms 'Discovery & Development' team is now well established and firmly part of the new culture within the business. They continue to develop products that would be considered beyond BAU in the meat industry. More broadly, the innovation culture will now be expanded into the commodity parts of the business aimed at uncovering new ideas outside of FMCG and HORECA	The 'Discovery & Development' team now engaged across the business, also including new Biological products (Pharmaceuticals)	878	780	-98
2.4	Consumer Sensory Evaluation	<ul style="list-style-type: none"> <li>- Lamb<sup>EQ</sup> outcomes will be commercialised and insights built into on-going Lamb new product development processes. Consumer taste testing is now an embedded aspect of NPD. As an example, samples taken from over 10,000 lambs over 2 years for Lamb<sup>EQ</sup></li> </ul> <p>Lamb<sup>EQ</sup> timeline:</p> <ul style="list-style-type: none"> <li>- Taste testing now into its second year <ul style="list-style-type: none"> <li>o NZ testing has started due to finish September</li> <li>o USA testing starts October finished in November</li> </ul> </li> <li>- Final results and recommendation due end of 2016</li> <li>- Commercial pilot to start on-farm 1<sup>st</sup> of October 2016</li> <li>- Market and brand development commenced July 2016 and continue from this point</li> <li>- Fully commercial with market premiums being paid 1<sup>st</sup> October 2017</li> </ul>	<p>We released a full and final report on all our findings and insights on Lamb Eating Quality. We believe this has been the most extensive study ever done on the attributes and impacts surrounding Lamb eating quality. Conclusions clearly showed that aging Lamb meat has the biggest impact on eating quality. All other factors were either insignificant or had no impact.</p> <p>Commercially this means that all lambs generally meet consumer expectations regards eating quality, so eating quality cannot be a strong differentiator. Equally, we can now be very confident that our product quality is consistently very good allowing us to build a differentiation platform on other aspects without having to invest resources on inconsistent eating quality</p>	333	560	227

IOO	IOO Description	Planned Activity 2016/17	Outcome	Budget (2016/17) (\$000)	Actual (2016/17) (\$000)	Variance (\$000)
		- Reserve lamb field manual to be written and released 2017.				
<b>Total</b>				<b>7,098</b>	<b>8,403</b>	<b>1,305</b>

### Intermediate Outcome 3

Title	IT & Database
<b>Aim</b>	<p><b>Aim: The objectives of this project are:</b></p> <ul style="list-style-type: none"> <li>To be the catalyst for the establishment and operation for a data collection and analysis mechanism able to support animal specific performance analysis.</li> <li>To enable information to be distributed back to farm through a range of knowledge transfer mechanisms e.g. farmer productivity clubs, social networking and the use of the latest in evolving technology best suited to this sector. This is a key enabler of farmer (and therefore animal) uptake.</li> </ul>
<b>This will be achieved by 2017 by:</b>	<p><b>IOO 3.1 - Value Chain Analytics Development</b></p> <ol style="list-style-type: none"> <li>Phase One – Pilot (animal data capture) software developed and operational by <del>July 2012</del> February 2013 - <b>Complete</b></li> <li>Phase One – Release to industry (animal data capture) software developed and operational by <del>March</del> November 2013 – <b>Complete</b></li> <li>A rolling four year development life cycle will be implemented as per agreed project plan – <b>Replaced with Agile market driven development strategy</b></li> <li>All agreed functionality will be available by June 2017 - <b>On track</b></li> <li>30% of industry beef, sheep, and deer animals records on the software by 2017 – <b>Dependant on customer uptake</b></li> <li>Interconnectivity of relevant and willing industry players by December 2013 – <b>On-going.</b></li> </ol>
	<p><b>IOO 3.2 - Value Chain Systems Implementation</b></p> <ol style="list-style-type: none"> <li>The full potential of the software developed in the High Level Systems Requirements is achieved. June 2017 – <b>Existing customers are now seeing benefits, but obtaining full potential is dependent on customer uptake</b></li> <li>System interface and reporting available via web portal. <del>July 2012</del> February 2013 (Pilot) / <del>March</del> November 2013 - <b>Complete</b></li> <li>Phase one functionality trialled/proven by pilot farms and signed off by CEO. - <b>Complete</b></li> <li>Data transfer between Industry Information Collaboration Partners tested on pilot farms. March 2013. - <b>Complete</b></li> <li>Each software release trialled on pilot farm and signed off by CEO before general release. Yearly review. – <b>On-going monthly release cycle in operation</b></li> </ol>
	<p><b>IOO 3.3 - Technology Transfer – Web Based Feedback</b></p> <ol style="list-style-type: none"> <li>Web based mechanism created for farmers to access real time information enhancing their decision making processes on farm – <b>Complete</b></li> <li>100% of farm data captured available for analysis/benchmarking purposes commencing <del>July 2012</del> February 2013 – <b>All logical data being used</b></li> </ol>
	<p><b>IOO 3.4 - Technology Transfer - Communication systems enhancements.</b></p> <ol style="list-style-type: none"> <li>Innovations in communications systems trialled and if appropriate used to develop and deploy new methods of technology transfer to farmers to improve on farm production – <b>On-line training and knowledge transfer tools under investigation</b></li> </ol>

<b>Key indicators</b>	1. 30% of industry beef, sheep, and deer animals records on the software by 2017 – <b>Dependent on customer uptake</b> 2. Web portal designed and operational by 30 June 2012 February 2013 – <b>Complete</b> 3. The use of the software developed in this sub-project is on track to reach a target of 60% of the red meat industry (beef, sheep and deer) recording information in the software by 2025 – <b>Too early to comment</b>
<b>Start date</b>	01 October 2010
<b>End date</b>	30 June 2017
<b>IO leader</b>	John Dyckhoff

**Intermediate Outcome Objective 2016/17 Year:**

<b>IOO</b>	<b>IOO Description</b>	<b>Planned Activity 2016/17</b>	<b>Outcome</b>	<b>Budget (2016/17)  (\$000)</b>	<b>Actual (2016/17)  (\$000)</b>	<b>Variance  (\$000)</b>
3.1	Value Chain Analytics Development	1. Based on customer demand, increase number of Information Collaboration Partners. Priorities are: <ul style="list-style-type: none"> <li>Tracmap</li> <li>Other meat processors (Alliance, ANZCO)</li> <li>Fertiliser Companies</li> </ul> 2. Continue participation in industry data standards initiatives. 3. Extend use of data standards in the Farm <sup>IQ</sup> System development.	1. Working with TracMap on phase 1 integration, developing 2 modules for use by ANZCO suppliers with commitment from ANZCO. Heads of Agreement signed with Ballance and Precision Farming to produce integrated system. Alliance have agreed to provide processing data. 2. Ongoing, FarmIQ is accredited under the Farm Data Standards Code of Practice and is a member of the steering committee. 3. Ongoing	IOO 3.1, 3.2, 3.3 & 3.4 budgets combined in IOO 3.2		

3.2	Value Chain Systems Implementation	<ol style="list-style-type: none"> <li>1. Increased market research through customer feedback to identify and prioritise future development requirements.</li> <li>2. Refine smaller hybrid/agile (in-house/outsourced) development team to allow for flexibility in build scale supporting B to B.</li> <li>3. Develop and deploy smaller frequent software releases on core system while supporting larger B to B initiatives.</li> </ol>	<ol style="list-style-type: none"> <li>1. Ongoing – customer feedback incorporated in backlog and build priorities adjusted based on BM feedback. (see table with developments)</li> <li>2. Development team moved to totally insourced model on 1/6/17</li> <li>3. In practice now deploying releases less frequently (every two months) as this works well with the size of the development and testing teams while meeting customer requirements.</li> </ol>	2,696		
3.3	Technology Transfer – Web Based Feedback	Objectives now incorporated into IOO 3.1 and 3.2		IOO 3.1, 3.2, 3.3 & 3.4 budgets combined in IOO 3.2		
3.4	Technology Transfer - Communication systems enhancements	<ol style="list-style-type: none"> <li>1. Further extend functionality of the FarmIQ mobile app.</li> <li>2. Optimise farm management system for tablet devices.</li> <li>3. Continue to work with 3<sup>rd</sup> party organisations to accelerate development/deployment of and integration with, on farm technologies.</li> <li>4. Deploy on-line training and knowledge sharing tools.</li> </ol> <p>Note: Continue to investigate the wider use of the system with RMPP and Deer PGP's</p>	<ol style="list-style-type: none"> <li>1. Ongoing, functionality extended exponentially and now includes mapping.</li> <li>2. Ongoing – focus placed on mobile phone app as above as they are the most common data entry tool.</li> <li>3. Ongoing – Continuing relationship with Farmax, Cashmanager and Figured.</li> <li>4. New Online help and knowledge base deployed in May 2017 based on ClickHelp.</li> </ol>	IOO 3.1, 3.2, 3.3 & 3.4 budgets combined in IOO 3.2		
<b>Total</b>				<b>2,696</b>		

System Developments	Mobile developments
<ul style="list-style-type: none"> <li>• Weather data – multiple weather stations, soil temperature and moisture</li> <li>• Irrigation</li> <li>• Paddock history report</li> <li>• Supplementary feed enhancement</li> <li>• Landcorp Pasture wedge enhancements</li> <li>• StockCare Phase 1</li> <li>• Planning templates by organisation/company</li> <li>• JenQuip integration</li> <li>• Greenfields finance integration</li> <li>• GrazCare additional reporting</li> <li>• StockCare Phase 2</li> <li>• ICP – Update to Farmax</li> <li>• AssureQuality/ANZCO Farm Assurance Programme</li> <li>• H&amp;S Updates</li> <li>• Pre-&amp; post grazing on a move</li> <li>• Load non-EID weights</li> <li>• Farmax delete process</li> <li>• GrazCare reports &amp; enhancements</li> <li>• Sri Lanka pilot system build</li> <li>• StockCare enhancements</li> <li>• JenQuip file admin screens</li> <li>• RMPP benchmarking</li> <li>• DataLinker integration for ANZCO</li> <li>• H&amp;S Updates</li> <li>• GrazCare Reporting</li> <li>• Timesheet updates</li> <li>• Sri Lanka pilot system</li> <li>• Dairy – land applications</li> <li>• Landcorp updates</li> <li>• Bug fixes</li> </ul>	<ul style="list-style-type: none"> <li>• Timesheet</li> <li>• General Land activities</li> <li>• Pre-and post-pasture covers</li> <li>• Near miss</li> <li>• Enhanced tasks</li> <li>• TSi 2 connectivity</li> <li>• XRS2 Wand</li> <li>• GM calculator updates</li> <li>• Full diary functionality</li> <li>• Load non-EID weights</li> <li>• Pre-&amp; post pasture covers on a move</li> <li>• Menu restructure</li> <li>• Update and add privacy policy</li> <li>• Mapping</li> <li>• H&amp;S Updates</li> <li>• Timesheet updates</li> <li>• Chemical Applications</li> <li>• General Animal</li> <li>• Task updates</li> </ul>

## Intermediate Outcome IO 4

Title	Genetics
Aim	The objective of this project is to develop new genetic and genomic capabilities to enable the identification, isolation and selection of desired animal traits to improve the ability to produce products to customer/consumer specification and to assist with the acceleration of on-farm productivity. The data captured in the market analysis and database projects along with collaboration with Ovita (now B+LNZG) as required will underpin this project's success. <b><u>NB dates have been altered below from MPI contract to reflect the delay in HD SNP chip purchase, manufacture and delivery.</u></b>
This will be achieved by 2017 by:	IOO 4.1 Data collection definition lamb-COMPLETED Define list of phenotypes Dec 2010 Rank phenotypes June 2011 Review phenotypes annually SNP discovery Aug 2011 Leverage existing infrastructure (CPT and Ovita) Sept 2013
	IOO 4.1.1.1 Data collection lamb Go/no go SNP panel (500K or equivalent) available May 2013 -complete 20K lambs generated selected and phenotyped by <del>July 2014</del> July 2015 complete DNA samples available March <del>2014</del> 2015 complete DNA auditing: proof of concept <del>August 2013</del> June 2014 complete 20K lambs genotyped <del>August 2014</del> Oct 2015 complete MBV prediction equation available Nov 2014 available - continued testing in the training flock (SIGC) to maintain accuracy and validation of the meat quality trait measurements. Beta test genotyping on 2000 stud ram March 2015 -complete
	IOO 4.1.1.2 Validation Validation on key terminal sire breeds Jun 2015-on going via SIGC Genotyping LambEQ Aug-Nov 2015 on going-complete Commercial testing breeding stock <del>Sept</del> Nov 2015 on going-industry implementation via an enhanced parentage/genomic solutions chip

	<p>IOO 4.1.2 Data collection Cattle</p> <p>Phenotype list Dec 2013</p> <p>Define and rank phenotypes March 2014</p> <p>Leverage with existing groups generating data Dec 2014</p> <p>Go/No Go decision: Validate commercial products for selected NZ phenotypes? Dec 2014</p> <p>Review new phenotypes and consumer relevance annually</p> <p>NB: Substantial funding for the cattle work was discontinued 2014, however, MBIE have continued developing genotyping technology and uptake of this technology is underway with the FIQ Lawson monitor farm.</p>
	<p>IOO 4.1.3 Data Collection Deer</p> <p>Phenotype list Dec 2013</p> <p>Define and rank phenotypes March 2014</p> <p>Leverage with existing groups e.g. Deer Research Go/No Go decision Dec 2014</p> <p>Review phenotypes and consumer relevance annually</p> <p>NB: Substantial funding for the deer work was discontinued 2014, however, DeerResearch and MBIE have continued developing genotyping technology. Industry implementation of genotyping by sequencing initially developed in this project into the deer industry as a replacement of microsatellite markers. This will enable genomic selection the key technology implemented by FarmIQ in sheep for meat quality traits.</p>
Key indicators of success	<p>A robust phenotype and DNA collection regime has been designed and underway by June 2011. Achieved</p> <p>Genomic and related selection tools for sheep available November 2013 (high density 500K SNP chip or equivalent). Achieved</p> <p>Trait selection for LambEQ starting August 2014. Achieved</p> <p>Deployment of the genomic selection panel across 30% of SFF lamb supply base by 2016. Terminal sire progeny make up ~30% of lamb kill and currently ~50% of ram flocks by recorded ewes and 70% of leading breeders based on national sire ranking lists are using the technology. Achieved</p>
Start date	1 October 2010
End date	30 June 2017
IO leader	Shannon Clarke and John McEwan



Intermediate Outcome Plan 16/17 Year:

IOO	IOO Description	Planned Activity 16/17	Outcome	Budget 2016/17	Actual 2016/17	Variance
4.1.1	Data definition	1. Completed		0		
4.1.2	Data collection lamb	<ol style="list-style-type: none"> <li>Maintenance of meat yield and quality prediction equations: Detailed meat yield and quality phenotypes collected from Duncraigen Progeny test. These animals will be genotyped with the LD SNP chip and imputed to HD. Integrate with BLG Nextgen progeny tests and leave on a self-funding basis by June 2017.</li> <li>HD genotyping of FIQ 2016 industry sires.</li> <li>MBV predictions available for delivery of mBVs to allow Focus Genetics, Kelso and Suftex breeders to make selection decisions including meat quality traits. These prediction equations will be updated and validated during beta test utilising Focus Genetics ram lambs.</li> <li>Transition from the beta test engagement of breeders to a commercial model.</li> <li>Continued data collection from Lawson FarmIQ monitor farm (Focus Genetics terminal rams).</li> <li>Scientific dissemination and audit-publication of the results from the IO4 Genetics and genomics program in internationally reviewed scientific journals (following IP clearance from FarmIQ). Secure long-term storage of phenotype and genotype data sets and DNA samples.</li> </ol>	<ol style="list-style-type: none"> <li>Phenotypic and genomic data collection from the Duncraigen progeny test completed and prediction equations updated for meat traits.</li> <li>HD genotyping completed for the 2016 and 2017 industry sires.</li> <li>Prediction equations updated and mBVs delivered to the FIQ beta test breeders prior to their selection decisions.</li> <li>Meat yield and quality mBVs available for terminal sire breeders via an enhanced parentage/genomic solutions chip. Enables breeding values to be delivered prior to weaning, dependent on when DNA sampling has occurred.</li> <li>Focus Genetics did not supply rams to the Lawson FarmIQ monitor farm this year, however, the beef program has utilized the GBS technology for sire assignment.</li> <li>Two articles published in international scientific journals detailing the genetic diversity of the NZ sheep population and the use of genomic selection for meat carcass traits and a third paper accepted in an international journal on genetic parameters of meat quality traits; both direct outcomes of the HD SNP chip development. Data is currently stored in AgResearch data repositories but is being transferred to Beef + Lamb Genetic database with all high-density genotype data already transferred and all phenotype data transferred.</li> </ol>	256		

IOO	IOO Description	Planned Activity 16/17	Outcome	Budget 2016/17	Actual 2016/17	Variance
4.1.3	Validation lamb	Commercial testing- an implementation strategy for use of SNP established. This is linked to the LambEQ development programme with terminal sired samples sourced from the genomics programme.	1. Industry implementation requires continued testing in the training flock (SIGC) to maintain accuracy and validation of the meat quality trait measurements. The "South Island Genomics Collaboration (SIGC)" flock has been set up and includes rams from Focus Genetics (FocusPrime and Texel), Kelso and Suftex breeders, who are working with AgResearch and Beef + Lamb New Zealand Genetics to ensure the low density test for meat quality and other production traits is implemented in the industry on a permanent and ongoing basis.	129		
4.1.4	Data collection and validation cattle	GBS development-results from 2013/14 year included in scientific publication of method to ensure outcome are validated through peer review.	1. Conference proceedings paper comparing SNP chip and GBS data submitted. 2. Lawson Monitor farm utilised GBS for sire assignment.	4		
4.1.5	Data collection and validation deer	GBS development- results from 2013/14 year included in scientific publication of method to ensure outcome are validated through peer review.	1. GBS implemented into the deer industry-this is a direct outcome from the initial investment FarmIQ made in investigating new genotyping technology for the livestock industry. 2. Deer GBS parentage manuscript preparation underway.	4		
<b>Total</b>				\$393		

## Intermediate Outcome 5

Title	<b>Processing</b>
Aim	The objective of this project is to put in place the necessary traceability infrastructure and develop new technologies and capabilities to enable meat yield and quality information to be collected during processing. Through this collection and subsequent analysis, the project will allow meat yield and quality improvement through genetics, animal health, farm management and smarter processing systems.
This will be achieved by 2017 by:	<b>IOO 5.1 Traceability</b> 1. Full implementation of EID and RFID on all slaughter and boning sites by Oct 2011 2. Successful trial of boning station equipment by Dec 2013 3. Demonstration of traceability systems in 1 boning room for each species by Dec 2015
	<b>IOO 5.2 Meat Yield Measurement</b> 4. Installation of yield measurement equipment on sites to allow recording for each individual carcass processed
	<b>IOO 5.3 Meat Quality Measurement</b> 5. Installation of meat quality measurement equipment to allow recording for each individual carcass processed
	<b>IOO 5.4 Process Optimisation</b> 6. Development of systems to maximise the value of each individual animal using traceability and yield/quality measurement systems with a demonstration site completed by June 2016.
	<b>IOO 5.5 Meat Quality Improvement</b> 7. Undertaking a series of meat quality improvement initiatives, with projects on Confinement Odour, Omega-3 and Tenderness improvement projects complete by June 2013
Key indicators of success	1. Meat can be traced from the market back to the individual farm and individual animal 2. Measurement results of meat yield and meat quality of individual animals are available to farmers 3. Revenue from each animal increased, as measured by comparison to batch processing revenue 4. Meat quality improved by comparison with 2010 data.
Start date	30 July 2010
End date	30 June 2014

IO leader	Grant Pearson
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IOO	IOO Description	Planned Activity 2013/14	Outcome	Budget (2013/14) \$000	Project ed (2013/14)
5.1	Traceability	<ul style="list-style-type: none"> <li>Complete RFID installations on all beef sites (December 13)</li> <li>Install 1 Venison boning room traceability system (December 13)</li> </ul>	<ul style="list-style-type: none"> <li>Beef – Belfast &amp; Te Aroha complete; Hokitika progressing; other beef sites on hold.</li> <li>Venison – complete.</li> </ul>	1,791	
5.2	Meat Yield Measurement	<ul style="list-style-type: none"> <li>Continue development of microwave fat depth measurement system (June 14)</li> <li>Continue DEXA system development for meat/fat/bone ratio assessment (June 14)</li> <li>Continue contract for lamb carcass dynamic modelling.</li> <li>Progress CT scanning contract of lamb primals (June 14)</li> <li>Install one beef rail yield grading system (June 14)</li> </ul>	<ul style="list-style-type: none"> <li>Further trials carried out with microwave system</li> <li>Promising results from Finegand DEXA.</li> <li>ABI lamb carcass modelling contract continuing.</li> <li>CT scans completed</li> <li>Rail grading at Hokitika set up for venison and beef.</li> </ul>	1,093	
5.3	Meat Quality Measurement	<ul style="list-style-type: none"> <li>Complete mass spectrometry trials on forage differences December 2013</li> <li>Install 1 beef NIR units subject to successful proof of concept (June 14)</li> <li>Install 1 lamb SmartStim system subject to successful proof of concept (June 14)</li> <li>Install 3 beef SmartStim systems subject to successful proof of concept (June 14)</li> </ul>	<ul style="list-style-type: none"> <li>MS trials not progressed.</li> <li>Beef NIR system not installed as proof of concept not demonstrated sufficiently.</li> <li>Lamb SmartStim at Pareora still undergoing trials.</li> <li>Beef SmartStim at Finegand still undergoing trials.</li> </ul>	907	

5.4	Process Optimisation	<ul style="list-style-type: none"> <li>• Design prototype system for integration in RTL lamb middle automatic bone-in-processing machine (Dec 13)</li> <li>• Undertake middle machine pilot project (June 14)</li> </ul>	<ul style="list-style-type: none"> <li>• Modelling work continuing at ABI.</li> <li>• Results not advanced sufficiently for RTL implementation yet.</li> </ul>	111	
5.5	Meat Quality Improvement	<ul style="list-style-type: none"> <li>• Undertake study of purge mechanisms (June 14)</li> <li>• Complete evaluation of meat stretching technology (June 14)</li> <li>• Complete trials with FoodCap bins (June 14)</li> <li>• Carry out rapid cooling trials with immersion freezer (June 13)</li> <li>• Trial beef cut stimulation</li> <li>• Undertake trials on hot water pasteurization for bacterial control on lamb, calf carcasses</li> <li>• Carry out high pressure processing trials to assess meat quality effects</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing trial work by Carne on purge mechanisms.</li> <li>• Meat stretching trials completed.</li> <li>• Waiting on upgraded Foodcap bins to continue trial work.</li> <li>• Immersion freezing machine trials completed with report to finalise.</li> <li>• Beef cut stimulation trials being carried out by Carne. AMP unit evaluated.</li> <li>• Hot water pasteurization technology evaluated but trials not undertaken</li> <li>• Data analysis of last taste panel testing of HPP samples completed with report to finalise. Laboratory analysis of HPP samples by Lincoln University underway. Further testing on effect of digestion to be carried out by the Riddet Institute.</li> </ul>	1,099	
<b>Total</b>				<b>5,001</b>	

## Intermediate Outcome 6

Title	<b>Farm Productive capacity</b>
Aim	<p>To drive improved on-farm production and performance through best practice production systems, capturing data (both farm and animal centric) and aligning this with the integrated value chain.</p> <p>This will be achieved by:</p> <ol style="list-style-type: none"> <li>1. Improving farm management systems and animal nutrition</li> <li>2. Improving animal health</li> <li>3. Improving equipment infrastructure design and development</li> <li>4. National improvement in kilograms of red meat per hectare by 2017</li> </ol>
This will be achieved by 2017 by:	<p><b>IOO 6.1 Farm Management systems and Animal nutrition</b></p> <ol style="list-style-type: none"> <li>1. To improve on-farm production and performance through the capturing of farm and animal data</li> <li>2. Aligning this with the integrated value chain to influence the production of in specification red meat, supplied on time and in a sustainable manner.</li> <li>3. Quantification and refinement of farm factors associated with meat yield and quality</li> <li>4. On-farm proof of concept of factors affecting meat yield and quality and the development of a farm/animal level input/output scoring system and sustainability audit tools</li> <li>5. To provide the linkage between FarmIQ the customer and 3<sup>rd</sup> parties or associated partners, achieving the desired outcomes for all parties involved</li> </ol> <p><b>IOO 6.2 Animal Health</b></p> <ol style="list-style-type: none"> <li>1. The link between meat yield and quality with animal health practices and disease prevalence and incidence from farm of origin throughout New Zealand will be identified and incorporated into the Database. The management of identified factors will contribute to improving the capacity for a New Zealand red meat farmer to produce meat to specification and on time.</li> <li>2. Harvest and analyse data from IQF and Regional Participant Farms (RPF) to quantify the impact of clinical and sub-clinical disease on the yield and quality of red meat.</li> <li>3. On-farm proof of concept of animal health factors affecting meat yield and quality and the incorporation of these in to supply contracts</li> </ol> <p><b>IOO 6.3 Equipment / infrastructure design and development</b></p> <p>In the context of the inter-dependent business processes required in an integrated value chain, the objective is to:</p> <ol style="list-style-type: none"> <li>1. enable advances in the quantity and integrity of data coming off farm, and</li> <li>2. enable delivery of relevant inputs directly to farm action points</li> </ol> <p>This objective will be met by:</p> <ol style="list-style-type: none"> <li>1. providing relevant support and training in the use of on farm technology,</li> <li>2. introducing technology advancements, and</li> <li>3. reducing technical barriers</li> </ol> <p>This enables farm toolsets and processes with a high level of data integrity and integration in the context of the projects that make up these value chain developments</p>

	<b>IOO 6.4 Technology Transfer - Plate to Pasture demonstration farm</b> 1. The purpose of the pasture to plate demonstration farm sub project is to seek ways to accelerate technology transfer and achieve more rapid uptake of the advances made in genetics and farm management systems.
Key indicators of success	<ol style="list-style-type: none"> <li>1. Establishment of Regional focus farms and on-farm trials of forage and animal management practices on IQF as per the plate to pasture business plan sub project 7.1, section 4.3 (or subsequently amended plan)</li> <li>2. Analysis of data completed to identify best practice forage and animal management as per the plate to pasture business plan sub project 7.1, section 4.3 (or subsequently amended plan)</li> <li>3. Go/no go decision by PSG on proof of concept: determination of whether there is a high degree of association between aspects of on-farm management and desirable production attributes (31 August 2013)</li> <li>4. Development of animal management systems with 85% success rate completed by 30 June 2012 based on EID (electronic identification) as per intermediate outcome objective 6.3</li> <li>5. Customised production systems linked to specification are developed and are phased in by 2016 on IQF and becoming available to all participants</li> <li>6. The potential for farm productive capacity improvement has been proven in the plate to pasture demonstration farms</li> </ol> <p>This will contribute to the vision by: enabling the increased productive capacity of value chain participants</p>
Start date	30 July 2010
End date	30 June 2017
IO leader	Collier Isaacs/ Todd White

Intermediate Outcome Plan 16/17 Year:

IOO	IOO Description	Planned Activity 2016/17	Outcome	Budget 2016/17 (\$000)	Actual (2016/17) (\$000)	Variance (\$000)
6.1	Farm management systems and Nutrition	<ol style="list-style-type: none"> <li>1. Update the data capture plan that specifies the on-farm measurement of animal performance and allows the comparison of forage species and cultivars on IQ Farms (IQF) and extrapolate using LCF</li> <li>2. Where system data permits use BeefEQ process to follow animals grown on various trial cultivars throughout the value chain to obtain end product attribute data and customer feedback where feasible. Supported by the development of the SFF Eating Quality Manual for distribution to prime beef producers.</li> <li>3. Support the sustainability functionality built in partnership with AgFirst and BLNZ, e.g. LEP's and overseer within FMS and align with data from throughout the value chain. Also integrate with BLNZ initiatives in the sustainability area, e.g. McDonalds Sustainable Beef pilot programme.</li> <li>4. Outputs (field days, publications, web videos) from IQF on-farm trials and BAU data collection in FMS drive best practice on-farm that is aligned with processing and consumer feedback to create awareness and support uptake of FarmIQ System.</li> <li>5. Continue to provide the training and support of system users so that data is accurately and completely entered into the FMS. Collate on-</li> </ol>	<ol style="list-style-type: none"> <li>1. Data capture plans were performed with all the IQ farms at the start of the year related to their IQ farm projects. The farmers have transitioned to using the Farm Management Plan part of the FIQ System to develop animal health and general farm op plans</li> <li>2. Over half of the IQ Farms submitted beef animals for kill through the BeefEQ programme in 2016/17. Pass hit rates have improved from an average of 12.7% in 2014/15 to 14.7% in 2015/16 to 19.4% in 2016/17. There weren't enough animals to determine a cultivar or other management effect but it is apparent that hit rates are improving. They are likely to be higher this last year due to better feed but also from improving other factors outlined in the SFF Eating Quality manual.</li> <li>3. LEP package has been developed in the FIQ system with the help of AgFirst consultant. Some of the IQ Farms have used this functionality to develop plans for their own properties</li> <li>4. IQ Farmers undertook final year projects that looked back over their tenure as an IQF and identified the tangible (production, profitability) and intangible (confidence, risk management, planning) benefits of the programme. These programme reports and presentations will form the basis of outputs for creating awareness of the benefits of the FarmIQ System. (case study examples)</li> <li>5. The IQF continued to have support from the FIQ support team and BM team. This was especially so this year and the final year</li> </ol>	698		



		<p>farm data and integrate with processing data in FMS. Analyse to identify relationships between on-farm management and product attributes in the wider system.</p> <p>6. Relationships between farmers, FarmIQ and other expertise, founded on the data inputs and outputs from the FMS, drive optimal decision making that leads to increased business profitability. Including and extend the relationships with industry service providers (Farmlands, VetEnt, AgFirst, PGW, SFF, ANZCO, AGL, Tru-test, Allflex, Gallagher).</p>	<p>projects were completed. This often-required data extraction and analysis additional to what is normally undertaken in the FIQ System.</p> <p>6. For many of the IQF they used the services of Rural Professionals to look at some of the financial implications of their IQF projects. The ability to collate and analyse multiple year data or extract it from the system for further analysis showed the worth of FIQ as an information framework to RPs.</p>			
6.2	Animal health	<p>1. Use FMS to create animal health plans for IQF to ensure they are at or working towards current best practice in terms of animal health.</p> <p>2. Review how farmers are using the FMS to identify animal health issues and reduce disease and defect incidence</p> <p>3. Investigate the cost of disease and animal incidence in relation to meat quality/value (performed with SFF processing data).</p>	<p>1. Most of the IQ Farms used the Farm Management Plans tool in FIQ System to create animal health plans. Most rolled 2015/16 plan forward and used it as a basis for 2016/17 plan</p> <p>2. IQF can see in the FIQ system how their D&amp;D data relate to processing plant average D&amp;D data. They can identify the major defects for their property and source information on potential ways to reduce their incidence. They also work with their vet RP once the problem has been identified. For example, Waikawa used FIQ to identify inoculation site defects and changed on-farm vaccination practice to reduce the incidence. They also identified a higher than normal liver fluke incidence and set up a trial to determine best drench management to combat the issue.</p> <p>3. The cost of disease was analysed in 2010/11 and 2011/12 years as \$12m and \$9m respectively. The largest cost was pleurisy. The opportunity to reduce these costs led to the development of the disease reporting and benchmarking in the FMS. This also includes info sheets for farmer use. The system has also been used by AgResearch to monitor a pneumonia vaccine trial which would reduce the incidence of pleurisy.</p>	61		



6.4	Technology transfer – Plate to pasture demonstration farms	<ol style="list-style-type: none"> <li>1. Ensure each IQF is bench marked using the Baker and Associates FAB process. Independent analysis of through-time trends in production and financial data from FAB on IQF. Include IQF to be benchmarked against BLNZ Economic service data as well as Baker &amp; Associates averages.</li> <li>2. Each IQF farm to develop a data capture plan (DCP) in FMS</li> <li>3. Complete objectives as agreed in each IQF's DCP plan. Specifically, use FMS to capture all applicable farm activities and production data throughout the seasons.</li> <li>4. Conduct a national road show autumn/winter 2017 to present findings from IO1 to IO6. Include current on-farm trials, on-farm activities and data, alignment with meat yield and quality data, and general utility of FMS.</li> <li>5. Actively try easier ways of collecting and disseminating information to farmers to drive advancements in production and profit. Regularly provide technical information through the FarmIQ website and newsletters</li> <li>6. IQF to help identify the observations and conclusions from involvement in the IQ Farm Programme. Specifically, identify barriers of behaviour change and getting farmers to capture on-farm data. Concentrate on the learnings (financial value and subjective insights) of what worked, what could have been improved and what farmers did not take up: <ul style="list-style-type: none"> <li>- Equipment/data capture devices</li> <li>- EID</li> <li>- Advice/expertise/people</li> <li>- FarmIQ System input and output</li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>1. 2015/16 FAB completed. Yet to be completed is a full through-time analysis of IQF financial performance. A preliminary analysis was completed in Nov 2016 in preparation for the IQF conference in Wellington.</li> <li>2. As detailed above, achieved</li> <li>3. Individual IQ farmers vary to the extent their plans are being implemented. Most have achieved what was planned.</li> <li>4. Road show planning commenced autumn 2017. A different approach is being implemented where farmers have access to video reports of achievements of the FIQ PGP</li> <li>5. On-going. Farmer awareness sessions about the FIQ system are continuing this winter (2017). Blogs, Annual Insight reports, system instruction and benefit videos, online webinars are in progress or are planned for winter 2017.</li> <li>6. On-going. The final IQF conference was held in May 2017 at Telford. IQFs presented their final year projects on the value of FIQ to them. In preparation for this, the IQF completed a survey of questions that were designed to help the farmers reflect on their engagement in the programme, issues encountered and goals achieved. These survey responses form a valuable resource for communicating to the wider farming community about the benefits of the objective measurement approach of underlying the FarmIQ System and the Farm PGP</li> </ol>	726		
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		<ul style="list-style-type: none"> <li>- Planning</li> <li>- On-farm and processor data - capture, analysis and reporting, decision making (current vs historical, immediate reaction vs trends/benchmarking)</li> <li>- Financial incentives.</li> </ul> <p>7. Interim report by Dec 2016. Write up final report by 30 June 2017.</p> <p>Note: Investigating opportunity to work in more closely with RMPP and Deer PGP's in the tech transfer area.</p>	7. Final report write up still yet to be completed			
<b>Total</b>				\$1,928		