

# R&D success stories and principles to practice

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## Abstract

Meat New Zealand invests in Research and Development (R&D) projects to increase pastoral industry profitability. It annually seeks to measure the benefit to industry by independent benefit:cost analysis on completed projects. The analysis to date shows an eight to one return for each dollar invested. The Sheep and Beef Videos have been very successful projects carried out by Meat New Zealand. These successes are outlined along with an Australian beef industry project “BeefCheque”. Common threads are drawn from each of these programmes such as peer support and commitment, participatory learning, industry partnership, learning expertise and farmer ownership. Meat New Zealand has implemented these principles in other R&D investment areas and encourages other industry participants to do the same.

**Keywords:** behaviour change, Monitor Farm Programme, motivation, groups, profitability

## Introduction

Meat New Zealand R&D’s vision is “Helping to position New Zealand meat-based products as products of choice that command premium prices and which achieve sustainable profitability”. We do this through developing technologies that will enhance our competitive advantage, increase consumer confidence, increase product differentiation, and increase production and processing efficiency. The New Zealand Grassland Society’s goal is to provide a forum for farmers, researchers, educators and commercial people to share the latest ideas, trends, opportunities, problems and developments. Given these goals, it is appropriate to share Meat New Zealand success stories involving these participants.

How do we define success? In Meat New Zealand’s case, this is measured by increased industry profitability. Secondly how do we measure success? We annually use independent analysts to carry out benefit:cost analysis on several completed projects. Table 1 shows results from projects analysed over the

last 4 years. On average, every R&D dollar yields eight dollars for industry.

This paper considers three industry projects, two from Meat New Zealand, and a third from Australia seeks to identify common success factors for application.

The three successful examples are:

- The Monitor Farm Programme
- Sheep and Beef Videos
- BeefCheque

**Table 1** Summary of Meat New Zealand Investment in R&D benefit:cost analyses.

Project	\$(000s) Meat NZ costs	Net benefit (NPV)
<b>1998</b>		
More efficient lamb production system for Southland	450	7800
Slow release bolus for facial eczema	370	2900
Manufacturing meat value added*	108	
Energy modelling software for meat processing plants*	72	
Monitor Farm programme #	625	13400
<b>1999</b>		
The Process Hygiene Index (PHI)	680	430
Development of sheep semen diluents	680	3020
Breeding for resilience and resistance to nematodes	1300	4110
Pastures containing protected proteins	140	8770
Gas injection to reduce grain strain during pelt removal	220	14450
<b>2000</b>		
“Meat Quality- the pH factor” campaign	51	1070
Breedplan research and extension activities for beef cattle	166	2057
Factors influencing the pathogenicity of <i>Listeria monocytogenes</i>	385	28
A farmer-based approach to sustainable land management	237	373
Farming with Pictures & No 8 Wired video	1650	11700
Total**	6329	50612
Total net benefit to cost ratio	8.00	1.00
Average cost and benefit per project	465	4218

\* Research project benefits were unable to be quantified

\*\* Total does not include projects where benefits could not be quantified  
NPV – discounting expected future cash flows by applying an interest rate in order to analyse competing projects.

# Monitor Farm Programme was analysed to show net benefit per annum and is not considered in the total figures. Total net benefit to cost ratio 21.4.

### The Monitor Farm Programme (MFP)

The MFP was established in 1991 when 23 properties nationwide became Monitor Farms. The Monitor Farms (MFs), were administered by a coordinator appointed by Meat Research Development Council (MRDC, now Meat New Zealand R&D) in conjunction with a community group. Each MF runs for 3 or 4 years. A second group of 25 monitor farms were established in 1995/96 and third group of 31 farms in 1999. The MFP was initially funded by MRDC (Meat Board levies) with ANZ as a principle sponsor. ANZ withdrew sponsorship in 1996 while Wools of New Zealand became a funding partner in 1995. Currently the programme is funded by Meat New Zealand and WoolPro (A New Zealand Wool Board subsidiary) with sponsors playing varying roles in each region.

The objectives of MFP are as follows:

1. To plan and implement a programme that will increase farmers' awareness of manageable factors affecting their business.
2. To motivate farmers to modify their systems to increase productivity and profitability while minimising risk
3. To encourage farmers to adopt a business-like approach to farming through the preparation of individual business plans
4. To identify specific quality targets and implement monitoring systems to allow these to be achieved.
5. To encourage farmer members of the community groups to adopt the principles and practices that have been successfully applied on monitor farms.
6. To provide a focus for the wider farming sector by publishing the ideas and practices used by the community group.
7. To ensure that Meat New Zealand and WoolPro are identified as the facilitating agencies and that all possible opportunities are taken to incorporate other information transfer programmes and agribusiness interests to achieve maximum efficiency of resources.
8. To actively encourage the co-operation of agribusiness sectors so that a team approach to identifying and developing solutions to problems is evident.
9. To ensure minimum duplication of agribusiness resources and projects.

In 1998, Baker & Associates (Wairarapa) Limited were contracted to carry out a benefit:cost analysis of the MFP. This involved study of three MFs and surveying those closely involved with the farms. Of 210 farmers surveyed, 90 farmers responded (43%). These were divided into two groups, 35% who were closely involved with the project, e.g., community group member and 65% loosely connected, i.e., they attended a field-day, received a newsletter, read newspaper articles or heard radio reports.

The survey sought to quantify the impact the MFP had on adoption of key technologies, the financial benefit and to identify non-financial benefits received owing to MFP association.

Three common technologies, stock weight monitoring, pasture monitoring and sheep pregnancy scanning, and a technology specific to each MF were assessed. The specific technologies were: Rodney-Kaipara – hogget lambing/bull finishing; Hawke's Bay – intensification including subdivision, capital fertiliser and improved facilities and West Otago – physical monitoring including soil testing, herbage analysis, trace element monitoring.

The analysis quantified changes in the number of farmers carrying out these practices and sought to attribute what change farmers believed was owing to the MFP. Table 2 shows the extent of liveweight monitoring before and after involvement with MFP.

Overall, 18% of farmers nominated the MFP as the catalyst for change followed by farm consultants at 12%. Achieving target liveweights was the most important motivating factor for 36% of the farmers and increasing income was for 21%.

Pasture monitoring was also assessed. Table 3 shows the use of pasture monitoring before and after

**Table 2** Extent of liveweight monitoring on 90 surveyed farms before and after involvement with the Monitor Farm Programme.

	Ewes	Ewe hoggets	Sale lambs	Mixed age cows	Rising heifers	Sale cattle	Other
% before	63%	73%	73%	18%	56%	75%	63%
% afterwards	86%	93%	93%	29%	69%	86%	72%
Change	23%	20%	20%	11%	13%	11%	9%

**Table 3** Extent of pasture monitoring on 90 surveyed farms before and after involvement with the Monitor Farm Programme.

	Identifying target feed covers	Referring to kgDM/ha	Regular feed budgeting	Scoring average pasture covers
% before	38%	40%	32%	34%
% after	65%	74%	62%	65%
Difference	27%	34%	30%	30%

**Table 4** Changes in response to scanning information on 90 surveyed farms before and after involvement with Monitor Farm Programme.

	Differential feeding of twin/ single ewes	Lambing twinning ewes on safer paddocks	Differential weaning dates for twins/singles	Keeping replacements from twin ewes
% before	45%	48%	12%	25%
% after	77%	80%	24%	47%
Change	32%	32%	12%	22%

involvement with the MFP. Pasture monitoring attribution rates were 18% for the MFP and 15% for farm consultants. The ability to match feed demand and supply was the most motivating factor for 22% of farmers while 16% suggested it was the ability to plan and predict feed supply.

The third parameter was sheep pregnancy scanning. Table 4 shows the changes in response to scanning information before and after involvement with MFP. Vets and Farm consultants were both attributed 13% as influences in adopting scanning while the MFP was attributed with 12%. Better allocation of feed at 15% and better lamb growth at 12% were the main motivating factors for change.

The farmers were also asked to assess the dollar value to their business of these management changes, Baker & Associates then benchmarked these against their own knowledge base expectations. The results showed that the 90 farm businesses that participated in the survey believed they were receiving an annual net benefit of \$6700 as a direct result of their involvement in the MFP, which equated to \$1.50 per stock unit.

The survey identified 80 farm businesses per MF that were involved enough to realise the quantified benefit. Presuming all these farms realised the \$6700 benefit available from the project this would equate to \$536 000 per MF, over 20 times the annual cost.

The non-cash benefits or factors that motivated farmers to change were also studied. The survey asked "Did you obtain any non-cash benefits from your involvement with the MFP? Of the 90 replies, 81 were affirmative. Eight main factors were identified: motivation and stimulus ranked number one (consultant experience suggests this is closely linked with business success). Contacts and networking with other farmers, consultants, scientists and other agribusinesses was considered important and foundational to ongoing business development. Moral support and the group decision-making process was identified by farmers, this in turn gave them confidence to make changes. Business planning, goal setting and benchmarking were useful to farmers in identifying their strengths, weaknesses and opportunities. Hand in hand with this, the "seeing is believing" principle was important, a similar farm in the same environment making changes successfully was an important catalyst for community

change. When considering these benefits on top of the specific technologies considered it can be suggested that the twenty-fold return on investment is conservative.

### Sheep and Beef Videos

A second project that Meat New Zealand funds, jointly with WoolPro, was analysed in 2000. This was the Sheep and Beef Videos branded as Farming with Pictures and No. 8 Wired farming videos distributed to 21 500 sheep beef and goat farmers on a bi-annual basis since 1995. These aim to provide farmers with information (some of which may have been previously passed on in written form) where the adoption may be enhanced by providing practical demonstrations and enhancing the message with visual aids.

An editorial committee comprising farmers, veterinarians and scientists are used to formulate content covering subjects like animal health, pasture management, animal growth, reproductive management and business planning and management. A deliberate combination of farmer and consultant, scientist and vet were used to deliver messages.

A survey conducted by Nimmo-Bell and Company Ltd (2000) showed that 83% of sheep and beef farmers watched all or part of the videos and that they constituted 13% of the practical information pool they utilised. The benefit:cost analysis sought to identify what increases in farm productivity could be attributed to farmers having viewed the videos. The Meat and Wool Economic Service net productivity gains from the all-classes average farm were used as a baseline to measure the impact of information on farm improvement and specifically the videos. From 1995–2000 farmers considered that better information contributed to 28% of the production increases and of this, 3.5% was able to be exclusively attributed to the videos. An unbiased estimate of the project outcome was determined to be 20.8 million or 15:1 using Quantitative Risk Analysis (QuRA™) the Net Present Value (NPV) and benefit:cost ratio.

### BeefCheque

The third example, an Australian Beef Industry project known as BeefCheque, was carried out in the Gippsland region of Victoria from June 1995 to June 2000. It involved Meat and Livestock Australia (MLA),

Department of Natural Resources and Environment (NRE), Beef Improvement Association of Australia (BIA), private consultants and producers.

Beef Cheque's objective was to equip producers with skills to grow and use more pasture, produce more beef and make more money. Fifteen groups formed, each centred on a focus farm and featured monthly farm walks. A total of 420 producers participated in the project with 250 participants at any one time. Results from the project in 1996/97 and 1998/99 years (Walsh *et al.* 2000) showed an average of:

- 12.4% increase in pasture consumption per hectare
- 18% increase in beef liveweight output per hectare
- 10% increase in efficiency of pasture use (kg of liveweight output versus kg of pasture drymatter consumed)
- 18% increase in farm operating surplus.

At project completion, 75% of survey respondents were using five or more new grazing management strategies. Reactions to the project were very positive, 92% of participants saying they intend to continue to actively participate in a BeefCheque group. Two keys to success identified were a high level of commitment by all project partners and a comprehensive programme structure. This comprised an educational component, an on-farm demonstration component, a group support component, and a benchmark and feedback component, with most of the learning occurring in the paddock.

There are several commonalities of success that we can draw from these three successful projects and apply to our research, knowledge transfer, and learning and uptake programmes:

1. Peer support and commitment
2. Participatory learning
3. Partnership between science, consultants, farmers and other agribusiness individuals
4. Professionals (all projects involved learning and communication experts)
5. Practically harnessing the drive of farmers in developing and owning the project throughout its life.

Given the success of these programmes and the similar experiences from other writers (Maber & Perkins 2000; Weatherley *et al.* 2000; Stantiall 2000), the challenge for Meat New Zealand has been to maximise farmer ownership, involvement and interaction in R&D. There are several approaches being taken currently:

### **Farmer Mentor Groups**

Several current R&D projects have mentor groups. These are combinations of interested farmers, vets, consultants, etc, who meet several times per year with the project manager and researcher to discuss results and suggest changes to make the knowledge or technology more attractive and practical for the end user.

### **Farmer/adult learning expertise**

To design knowledge transfer and learning packages is an increasing focus as part of R&D projects.

### **Farmer Initiated Technology and Transfer (FITT)**

This is a programme that funds farmer groups to source expertise to solve problems or seize opportunities. Meat New Zealand/WoolPro have funded 90 projects since 1997. FITT reports are one of the most requested sources of information from Meat New Zealand's 0800 phone line.

### **Sheep, Beef and Goat Councils**

These are groups funded by Meat New Zealand to meet information needs and identify research needs. The Councils are farmers working with and for farmers, often using farmer speakers and experience to share farm management principles and practices. A recent survey carried out by the Beef Council shows that this is working very effectively and is well-received by farmers.

### **Demonstration Research**

Several projects are taking a demonstration approach to engage farmers and encourage uptake. Two such projects are Elite Lamb and Calf Rearing carried out by AgResearch at Poukawa Research Station, Hawke's Bay. Both projects have taken a higher risk approach than a commercial farmer might to identify opportunities. The calf rearing project has used nationwide demonstration farms to effectively spread new knowledge.

All these approaches utilise the five principles above and the principles will continue to drive Meat New Zealand's endeavours to increase the profitability of the industry through R&D investment. The challenge is for other industry groups to apply these principles successfully.

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