Moving towards low-chemical and caring farming systems

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Abstract

There is awareness and a growing interest amongst sheep and beef farmers towards the potential opportunity that low-chemical and organic markets offer. However, the ability to supply to these specifications is seriously constrained by a general lack of information among livestock producers of the practicalities of conversion to a low-chemical or organic supply system. This paper reports on a recently completed study that examined the knowledge gaps among livestock producers with an interest in further investigating low-chemical or organic production.

The challenges confronting the producer are substantial if the opportunities that low-chemical natural and organic markets offer to the sector is to be realised. It is not a get-rich-quick option, and will require a medium to long-term planning and investment horizon. There is considerable ignorance, and hence confusion about the challenges and the conversion process.

The study emphasised the importance of conversion planning, including the need for a pre-conversion period on most properties. Developing decision rules for managing at-risk livestock forms an integral part of the conversion plan as they ensure preservation of the production base, maintenance of high animal health and welfare standards, and management of risk. Contrary to popular belief, conversion to organic supply does not have to result in a cessation in the expansion of the production base or a loss in the performance of the current production base. An integral part of the conversion planning process is the continued development of the farm operation's production base.

Keywords: conversion planning, decision rules, livestock farming, low-chemical, organic

Introduction

There is an ever-increasing market expectation that meat products will come from farm systems that use lower levels of chemicals and are caring towards both animals and the environment. As an example of the expanding markets associated with safer, caring systems, organic meat and dairy products in Europe are predicted to be worth £1.0 billion annually by 2002.

There is awareness and a growing interest amongst sheep and beef farmers towards the potential opportunity that this market offers the industry. However, the ability to supply to these specifications is seriously constrained by a general lack of information among livestock producers of the practicalities of conversion to a low-chemical or organic supply system. There is also a lack of physical production data and financial performance information on these farming systems.

This paper reports on a recently completed project (Mackay *et al.* 2001) that examined the knowledge gaps among livestock producers from both the North and South Islands with an interest in further investigating low-chemical or organic production.

Method

Sheep and beef farmers from throughout New Zealand were invited to take part in the study. Their interest was solicited from a number of public meetings and through consultancy businesses. Two Focus Groups were formed in 1999. The 21 livestock producers that made up the North Island Focus Group came from Northland, East Coast, Taranaki, and Southern Wairarapa. The South Island Focus Group of 17 producers also represented a wide diversity of producers, with properties from North Canterbury to Southland. Their farms represented a wide diversity of enterprises ranging from large extensive sheep, deer and beef operations through to intensive breeding and finishing, to mixed cropping and livestock. They covered all the major geographical regions and hence a wide range of climatic conditions.

Reasons for producer involvement also varied, with all agreeing that producers must be more in tune with the needs of the consumer. While most of the producers were conventional farmers with an interest in examining the challenges in conversion to low-chemical or organic supply, several were registered or close to converting to organic supply.

Each livestock producer in the study:

- Identified the issues to be addressed in conversion to organic supply on their farm.
- Developed a list of options to address the challenges in conversion for their farm.
- Developed a conversion plan for their farm.
- Determined the production, profitability and resource consequences that occur during conversion from a conventional to an organic supply system.
- Assessed the feasibility of implementing the conversion plan.

The Focus Groups met four times over 6 months (February to July 2000) to work through each of the steps listed above. While the producers worked to the organic production standards of BIO-GRO New Zealand (BIO-GRO New Zealand Ltd 1998), the process developed could be used for other low-chemical or organic production specifications, such as CERTENZ of AgriQuality New Zealand (AgriQuality New Zealand 2000).

A detailed production and financial analysis, using *Stockpol,* was completed on three group members' conversion plans. Results for one are presented in this paper. Information on the other two is contained in the full Meat NZ report (Mackay *et al.* 2000).

Output from the Focus Group activities included documenting the issues a prospective producer would need to address in conversion, a list of potential options for addressing the challenges, conversion planning guidelines, and an assessment of the feasibility of implementing the plan. The Focus Group activities culminated in the preparation of a draft conversion plan for their own property and an assessment of the feasibility of implementing that plan. This material forms the basis of the information presented in this paper.

Results and discussion

1. Challenges and options

Of the technical issues identified by the Focus Groups behind the farm gate, internal parasites, flies and weeds were by far the most common and offered the greatest challenge. The control of animal disease, the difficulty of sourcing certified stock or stock with the right genetics, information and knowledge gaps, the lack of infrastructure, finances, and markets were also seen as major challenges by the producers involved (Mackay *et al.* 2001). From the challenges identified by each producer a list of potential options for addressing the challenges was then compiled. This included comment on current knowledge of the potential effectiveness or otherwise of the alternative options. Endoparasite control, for example, offers a number of diverse options including:

- Genetics (e.g., breeding for resilience to endo-parasites. Utilising breed differences may be another possibility).
- Plants (e.g., using high protein forage, erect species, forage shrubs, tannin-containing plants, plants with anthelmintic properties).
- Pathogens/bio-controls (e.g., nematophagus fungi).
- Management (including good nutrition level, low stress, livestock species mix, age structure of herd/flock, soil fertility level as it influences forage quality and seasonality of supply, timing of weaning, cropping and mowing as a pest-control practice).

Most of these options offer a method for reducing the endoparasite challenge to the animal. Climatic conditions, livestock, landform, and the skills of the operator, will all influence the options that can be used and their effectiveness. None will be an effective alternative to an anthelmintic drench once a nematode burden has accumulated in the naïve animal. One of the difficulties of fully utilising the above list of options is the lack of information on their effectiveness. Implementing many of these options will require significant changes to the enterprise and a change in priorities such as a greater emphasis on pest management than forage utilisation. Greater use will be required of integrative models of forage supply and pest cycles.

2. Conversion planning

Once a list of challenges and options had been compiled, each producer developed a conversion plan. It became apparent that many producers required a pre-conversion period, as some of the required changes would take more than 3 years to implement. The conversion process can therefore be divided into two phases, a pre-conversion and conversion phase.

The pre-conversion period provides the opportunity to implement changes in genetics, sheep-to-cattle ratio, and management practices, and to develop additional skills for managing these production systems. To separate the pre-conversion from the conversion planning process, the position the farm should be in to successfully achieve certification following the 3-year conversion period is "described" (e.g., required stock policy, genetics of flock or herd, skills and knowledge of farming without chemicals). This sets the target for the pre-conversion plan.

2.1 Production base

An integral part of the conversion plan is the continued uptake of new technologies and information throughout

the conversion period to ensure the continued expansion of the production base. For example, the continued building of soil fertility through the use of RPR and elemental sulphur should be a component of the plan.

Contrary to popular belief, conversion to organic supply does not have to result in a cessation in the expansion of the production base or a loss in the performance of the current production base. Without planning, however, conversion of a conventional livestock farm to organic production is likely to result in an immediate loss of production and income, and this may continue following certification when produce is receiving a premium.

2.2 Decision rules for treating stock

Developing a proactive approach for treating at-risk animals (animals that are unable to perform within the organic regime) is a key component of the conversion plan. The triggers for invoking the decision rules should be set to preserve the production base, ensure that acceptable levels of animal health and welfare are maintained, and to minimise risk to the business. The basis for setting each rule and the trigger for invoking the rule would depend in part on the individual producer's aspirations. While the organic production standards of BIO-GRO-NZ prohibit the routine use of drenches, vaccines, antibiotics, dips and other chemical remedies, individual animals that are suffering or show signs of ill thrift must be treated. Animals that require treatment are placed in a designated quarantine paddock for twice the withholding period of the product used and then returned to the flock or herd. The decision rules might include the following elements:

- The bottom 10% of lambs at weaning are drenched and finished under conventional management in the quarantine area.
- Weaner cattle falling below a preset condition score or liveweight gain target would be treated at each 6-weekly weighing from weaning until mid-spring. Animals treated would be held in the quarantine area following treatment.

2.3 Proportion of stock finished to full certification

During the conversion period and in the initial years of certification, it is unlikely that 100% of stock can be finished to specification. Targets are set, for example, to finish 50% of lambs and cattle to full BIO-GRO certification in the first year following conversion, and finish 70% of stock to specification 5 years after certification. The balance of stock would be finished in a conventional manner on the quarantine area or sold on the store market based on for example, the stock prices or the feed situation.

2.4 Scale and rate of conversion

If the plan is to convert only part of the farm or only one enterprise initially, it is important in developing the conversion plan to include a description of the "how and when" for the balance of the property. This will act as a check to ensure all the implications of partial conversion to the operation of the whole farm business have been considered. The whole property should be registered from the day of registration, with "how and when" for the balance of the property included in the conversion plan.

2.5 Choice, size and management of the quarantine area

The criteria for selecting the quarantine area should include ease of access, presence of shelter, availability of water, high quality productive pasture and good fencing, and ease of management. It does not have to be in one block, but can be separate areas strategically placed around the farm. The designated quarantine area should be of sufficient size to be able to feed all stock that require "treatment" at any time. It may increase or decrease in size as required. The quarantine area should be bigger rather than smaller in year 1 (C_0) of conversion, *and is only one year behind the certification of the farm.* If the objective is to finish 50% of stock to specification in the last year of conversion, the quarantine area must be of sufficient size to feed 50% of all young stock at critical times of the year.

2.6 Treatment of stock that will never gain BIO-GRO certification

Lambs or calves born and finished within the conversion period on the property do not carry certification. These could be managed in a conventional way without loss of certification of the land and as a tool for managing the conversion process. Calves born in C_1 (year 2 of conversion) gain full certification 12 months later. Treated animals or non-certified stock can graze only in the quarantine area. During the conversion process there is no shortage of uncertified stock. Once conversion is complete, the quarantine area could be maintained by finishing treated stock semi-conventionally. Stock could also be brought onto the property to manage the quarantine block.

2.7 Feasibility of conversion

To determine the impact of conversion on production, profitability and resource, *Stockpol* was used to model the existing operation of three of the sheep and beef farms in the two Focus Groups. Details of the analysis from one of the farms, a breeding and finishing unit, are summarised in Table 1. Five years out, the objective

of the business is to finish 70% of stock to a set of low-chemical specifications. The balance of livestock will be finished semi-conventionally. In a difficult climatic year or in a season with high pest numbers, the percentage of stock finished to specification will be reduced and *vice versa* in favourable years, the proportion finished to specification would be >70%. Decision rules for identifying at-risk and treating under-performing livestock therefore, become critical management tools.

Table 1 The performance of a case study farm converting to organic supply. The analysis is based on prices for the 1999/00 year. In 5 years, 70% of all finishing cattle and lambs will be finished to organic specifications. Compared with the current position, the analysis in 5 years assumes that lambs have a 30% premium and cattle a 15% premium, 100% of 5-year-old ewes have a 10% premium, 100% of cull breeding cows have a 10% premium, and there is a 20% premium on wool. The Gross Margin without the premium would be $601.

Description	Current system	In 5 years
Effective area (ha)	500	No change
SU/ha	9.5	10.8
Sheep SU	3605	3061
Cattle SU	1165	2329
Sheep:cattle ratio	76:24	57:43
Pasture production (kg DM/ha)	8378	9211
1 July pasture cover (kg DM/ha)	1539	1702
Lambing (%)	135	150
Lambing starts	9 Sept	25 Sept
Weaning date	15 Dec	20 Dec
Lamb weaning wt (kg)	27.2	23.9
Calving starts	1 Sept	No change
Calves weaned	30 March	No change
Ave calf weaning wt (kg)	267	247
Gross margin/ha ($)	516	702

The case study farm has been working towards low-chemical supply for 7–10 years, so did not require a pre-conversion plan.

For the analysis, premiums of 10–30% on certified stock were used. Stock numbers and per-head performance will continue to expand over the next 5 years (Table 1). Gross margins will be lifted by 36% over that period. Of this increase 16% is due to ongoing developments resulting from investment in improved genetics, higher fertiliser inputs, improved pasture and animal management and refinements to the stock policies, and 20% from the premium paid for the livestock reaching organic certification. Additional information on this case study, including the effect of changing animal performance levels and the premium on gross margin, and the other two case studies is reported in the full Meat NZ report (Mackay *et al.* 2000), along with "working models" of dryland and irrigated organic livestock production systems constructed from production data collected on the Winchmore Irrigation Organic Unit.

Summary

The study examining the practicalities of conversion planning, emphasised the importance of conversion planning, including the need for a pre-conversion planning period on most properties. The pre-conversion plan provides the opportunity to implement changes in genetics, the sheep to cattle ratio and management practices, and to develop additional skills for managing these production systems.

Developing decision rules for managing at-risk livestock forms an integral part of the conversion plan as it ensures preservation of the production base, maintenance of high animal health and welfare standards, and risk management. Contrary to popular belief, conversion to organic supply does not have to result in a cessation in the expansion of the production base or a loss in the performance of the current production base. In fact, an integral part of the conversion planning process is the continued development of the farm operation's production base.

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