

Growth in dairy farming

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Abstract. In this paper the findings of an investigation into the processes of growth of dairy farm businesses are reported. Farmers expanded their business in response to the risk of becoming uneconomic or to utilize surplus capacity of resources. They did it when they realized they could do it. Even so, growth involved unanticipated challenges and adjustment costs and much learning during the transition phase. The analysis confirms that growth in dairy farming is very much supported by the attitudinal framework of the farmer.

Keywords: Dairy farming, business growth, profit, risk, growth process

Introduction

Half of the dairy farm businesses in Australia have less than 200 cows and a gross income under \$200,000 (Reference ??). Increasing real costs of production and decreasing real price received for milk, and small annual increments in productivity, mean the choice for average sized dairy businesses is to accept low returns or grow.

The aim of this research was to understand the process of growth of dairy farm businesses. *Growth is defined as changing the farm system with the aim of increasing net worth in the future.* Growth can also mean 'increased net worth'. To understand the process of growth of a dairy farm business it was necessary to find out about the experiences of some dairy farmers as they expanded their businesses. This was done in the context of theories about firm growth. Three broad research questions were asked:

- Why expand a dairy farm business?
- How does the situation on a dairy farm business affect ensuing business expansion?
- How does the process and achievement of expansion affect the subsequent operation of a dairy farm business?

Justification of the study

The research questions were analysed within the theoretical framework of farm management economics, using the case study method. The following eight propositions summarise the main findings from past research on growth that justify this exercise:

- Business expansion will lead to larger returns on capital (Vlastuin et.al. 1982 and Teese 1998)
- Unused productive capacity and indivisibility of resources is an inducement to firm growth (Penrose 1995)
- There will be a transition period after growth that will inhibit further firm growth for some time (Kakabadse 1982, Marris 1964, Penrose 1995)
- The entrepreneurial ability of a farmer is a major factor in determining the extent of growth undertaken by the business (Upton and Hawthorn 1987 and Penrose 1995)
- The goals and values of the farmer and the farm family change as growth proceeds (Patrick and Eisburger 1968)
- Farmers do not usually borrow to the point where the external financial constraint inhibits growth (Ockwell 1979)
- Internal financial constraints, caused by financial risk, will stop some farmers from expanding (Heady 1952)

- Assets will be fixed in agriculture for a range of prices. When the price of milk reaches some critical level, technology will be replaced (Salter and Johnson ????)

The first two propositions relate to the first broad research question (explaining why a farmer would expand their business). The next construct relates to the effect of growth on a farm business and the final five constructs deal with how a farm business affects business expansion.

Method

Five dairy farm businesses were studied. [How were these selected?] Data was collected using open-ended interviews, direct and indirect observation, and from records. Analysis occurred in two stages. The first stage was analysis within each case. A summary of the case study reports are provided in table format in the appendix. Eisenhardt (1989) said that the overall aim of this step is to define each case as a 'stand alone' entity. It also allows the researcher to see unique patterns in each case. This is helpful when it comes to cross-case analysis. The second stage of analysis was to compare the cases to identify commonalities.

From the two-stage analysis of the five case studies a model was derived, see Figure 1 (Appendix). In the first part of this model the growth process of a dairy farm business is presented. In this, the distinction between the two types of growth and their affects are highlighted. In the second part of this model is detail about what was involved at specific times and the means used to expand. Here the answers to the questions about how a business/farmer affects ensuing growth, why a farmer expands a business, and how expansion affects growth, are shown. In the rest of this paper, the detail behind this model is discussed alongside theory.

Case study findings

A finding of this analysis of cases was that the state of the business, the characteristics of the farmer, and the external environment all affect the choice of whether or not to expand, and the extent and rate of business expansion.

After a period of operating a farming enterprise in a dynamic environment a farmer has three choices: expand the business through minor growth; expand the business through major growth; or make no change. The third choice, staying the same, is not a realistic option. The business that does not change in response to change occurring around it will suffer declining profits.

In this study, the distinction between major and minor growth is important because the consequences from each type of growth are different.

Why expand a dairy business?

The two main motivations of the case study farmers are discussed below.

(1) *The farmers wanted to ensure future business survival and to build wealth* The farmers in this study expanded their businesses when expansion was not immediately necessary for survival. The businesses were not experiencing cash short-falls or negative profits. Further, all the businesses were in a sound financial position when they expanded. Farmer A was managing 330 cows on approximately 140 hectares. In the year preceding expansion, the business had a return on assets of 6.7 per cent and operating profit of \$62,500. Farmer B had increased their equity in the business to 50 per cent, from 25 per cent. They were milking 280 cows. The business had a return on assets of 3.8 per cent and an operating profit of \$51,000. Farmer E had reached a point where his business was set up to be operated simply. The business had a return on assets of 2.1 per cent and operating profit of \$20,000. Farmer C had reasonable equity (72 per cent), was meeting debt servicing commitments and had a positive net cash flow. Annual operating profit in the year prior to expansion was \$98,978 and return on capital was 5.5 per cent.

A belief common to the farmers was that increasing costs and declining milk prices meant there was an unacceptable risk of financial difficulties if they did not expand their businesses. Farmer A wanted a higher profit to have more choices later in life. Farmer B had five children to raise and educate. Farmer D wanted to expand to employ labour. Farmer E needed to support two families.

(II) *Greater utilisation of resources* The farmers expanded their businesses to make more use of resources. The first expansion for Farmers A and E was to increase the productivity of existing resources. Both farmers had financial means (either through the landowner, or through cash reserves) to improve the pastures to feed more cows.

In the case of Farmer D two brothers were managing a 200 cow dairy farm. They had spare labour, so they bought a second dairy farm. Next, they intensified.

For each farmer, learning more about the potential of their resources was a catalyst to change. For example, Farmer A, learned more about pasture management by being a focus farmer¹. Farmer B entered dairy farming with prior knowledge that underpinned their plans to expand; they had degrees in agricultural science and experience in managing people and projects. Operating a 170-cow farm was not allowing sufficient scope for using their skills.

Expanding a business to utilise resources fully lead to changes in costs and benefits. Farmer B increased the herd from 280 to 380 cows without changing the 10-a-side herringbone dairy. Using this shed to full capacity meant milking took most of the time available. When the existing dairy was replaced with a bigger one, he was motivated to milk even more cows to utilise fully the new milking shed.

How does the situation on a dairy farm business affect ensuing business expansion?

The state of resources, the size of operation, and the economic and financial situation, all affected growth. The farmers' experience in farming, confidence in their ability, family situation, knowledge, peer support, goals, attitude to current consumption and attitude to risk, affected the opportunities they saw and pursued. Each of the farmers started with a farm that could be improved and stocked more heavily, but their financial situation limited what they could do and how quickly they could act.

Profit Profit and net cash flow of the three farms that expanded, indicated the businesses would be too small in the future to meet needs. The estimated return on assets for these three businesses prior to expansion was less than what could be gained in alternative similarly risky uses of the capital, such as term deposits, government bonds, other property investments and share market investment. It was also less than larger dairy businesses were earning. The farms had relatively high overhead costs, mainly the cost of labour (operator and permanent employees). Expanding the business would spread this fixed cost over more resources and output.

Financial risk The financial risk these farmers were prepared to accept affected the rate and extent of growth. Farmers A, B and E (and probably D) were prepared to accept increased financial risk. Each reduced their equity in the business to around 20 per cent at the time of major growth. One of the reasons they did this was that they perceived the size of their business put them at more risk of not surviving in the future than did the financial risk from increasing leverage to expand.

Farmer C was the only farmer in this study who was especially wary about expanding 'too fast' and increasing the financial risk. Farmer C had foregone the opportunity to purchase more land. The rate of growth of Farmer C's business was slower than the rate of growth for the other farmers in this study.

For Farmers A, B, E the risk of failure because of inability to service debt increased once they had expanded their businesses. Farmer A said at the second interview:

You do not get a chance to come back if you over-step the mark – it is not like if you put on too many cows, it is easy to remove the extra cows, rather if you over-borrow it is very difficult to come back.

Farmer A would not allow his equity to fall to 20 per cent again. He believed that attitude to equity depended on the stage of farming career and family life. He now has more capital invested in the business and would only let his equity fall to 50 per cent. Having expanded their businesses, Farmers B and E were not prepared to borrow again to the same extent. This was because they now had more of their own capital to lose. As well, the risk of their business not surviving is lower than before growth. Both the need and desire for growth had diminished.

Consumption The decision of a dairy farmer to use more of the annual cash surplus for consumption results in less cash surplus available for debt servicing and investment. This slows the rate equity, or the business, grows. During expansion, Farmer A, B, D and E lived in old farm houses and invested on farm for greater future consumption, rather than use surplus cash flow for present consumption. The farmers who had gone without a new house and extras in the years prior to growth, wanted to consume more after growth. They felt they had invested for future consumption and that it was now the time for some modest increase in consumption.

Infrastructure The capacity of infrastructure on farm was found to be both a constraint to growth and a motivation for growth. One of the most challenging issues for the farmers prior to, or during, an expansion phase was the question of when to replace capital infrastructure. The farmers considered their financial position and the economics of replacing the dairy. At the time of major growth Farmer B decided they would not replace their existing dairy. Their existing shed with current employees would be suitable. Two things happened after major growth. First, milking the increased herd took 11 hours a day. These farmers and their employees could barely do the other essential farm work. Farmer B had no time to contemplate other business opportunities. The situation was exacerbated because he had to manually change irrigation throughout the night. Second, higher than normal milk prices occurred. The unexpected cash surpluses earned from high milk prices meant they were able to pay for half the cost of a replacement dairy.

Farmer E replaced the dairy when he was milking 250 cows in a shed and yard designed for 150 cows. Like Farmer B, Farmer E waited until the labour required to operate the older equipment increased and the price of labour increased. Milking more cows than the existing infrastructure efficiently allowed reduced the time Farmer E could put into other business activity. Farmer D replaced their dairy when milking was taking five hours a day, which was more time than initially budgeted.

Farmer C also found that the size of the current infrastructure was stopping them from increasing the size of the milking herd at the rate that they wanted. They replaced the infrastructure before they experienced any significant increase in the time of milking the cows, unlike the other three farmers. This change was instigated by receiving an interest rate subsidy through the Productivity Enhancement Program of the Rural Finance Corporation.

For four out of the five case study farmers, the capacity of the existing capital equipment prevented further growth for a time. In contrast, Farmer A replaced the dairy within the first few years of farming with a dairy that had a much larger capacity than required by the herd at the time. Consequently the capacity of capital infrastructure became an inducement for further growth for Farmer A. Farmer A was in a different situation to the other four farmers because at the time of replacing the dairy he was a sharefarmer. The owner of the farm business paid for the replacement dairy.

The impact that the capacity of capital infrastructure has on business expansion is related to other factors than the dairy. Farmer B installed a labour intensive feed system in the dairy when they first began farming. This feed system involved manually taking the feed to troughs. They fed the cows like this for five years. With this system it was difficult to feed more cows. Their milk company offered an interest rate subsidy for a loan that was used to upgrade the feed system in the dairy. Comparing the costs of the two systems, the replacement technology was better. Upgrading capital infrastructure changed milking time and the quality of milk.

In this study, it was repeatedly seen that when the farmers bought extra land, the whole farm needed improvement. Farmer E for example, found that on all the properties he bought, the fences and other infrastructure were dilapidated and the pastures and the farm layout needed improvement. On these properties the previous farmers had decided not to replace capital infrastructure preceding the time of 'shut down'. Eventually over many years it gets to the stage where all infrastructure needs to be 'replaced' (improved). Farmer E not only had the capital cost of buying the land, but also the capital cost of improving that land. The farmers considered that it would have been more economical if they had started with a 'green-fields' site, rather than becoming a large dairy farm business by buying adjoining but run-down dairy farms.

The farmer's nature Attitudes to risk and business confidence affected the opportunities they saw for business expansion and how they responded. These entrepreneurial characteristics developed over time. For example, at the time of doubling their farm size Farmers A and B planned to expand

the herd to 200 or 300 cows – not to 600 or 1000 cows, which was the size these farms eventually became.

It is interesting that each of the farmers in this study spent the first few years of their farming career steadily increasing cow numbers and learning about pasture management and feed management. There appears to be a time period, in the early years of a farmer's career, where farmers develop skills in the technical management of the farm. Early on, the case study farmers spent time dealing with problems and learning from experience. In this study the farmers themselves linked important events to times where they learnt something important and their confidence improved. In the first few years of farming, Farmer A managed the farm during a run of adverse seasons. This experience, and the success of the management strategy used, built self-belief in his capabilities and confidence.

Farmers A, B, D and E went beyond their own experiences for ideas for expansion. Farmer A visited large farms in New Zealand that alerted him to new possibilities in dairying. Farmer E used findings from experiments at the local research centre to learn about land-forming and feed management. Farmer E also learnt from his farm consultant and a progressive group of dairy farmers who were all intent on expanding their businesses. Farmer D read about large farms in the United States of America.

The case study farmers gathered information from different settings. They applied new ideas to their farm before they became widespread and the industry 'norm'. Farmer A trialled grain feeding before agricultural research centres and other farmers were using grain. Farmer E trialled land-forming when it was just starting to be investigated at the local research centre. Farmer B adopted grain feeding before it became widely used.

This study has started to provide evidence that entrepreneurial abilities of people running businesses that grow, are also continually growing.

The farmer and family The farmers who ended up operating large businesses began to expand their business before family issues took precedence. Once the family grew their desire and/or time available to give to expansion was reduced.

The goals of his/her family affected growth. The farmers initially wanted to expand to reduce the risk of failure by improving profit; to free up 'management time'; to achieve a better lifestyle for their children; and, for some, to attain a good reputation. Each farmer wanted to be better than others.

Over time the farmer's desire to 'maximise' profit and wealth and security decreased and spending time with the family and fulfilling other goals became more important. These 'non-economic' goals constrained the rate of growth that ensued. Farmer A was looking at decreasing the size of his farm business in the future because his focus was no longer on profit and wealth maximisation. It had changed to improving lifestyle.

Employees The problems with labour that Farmers A, B, D and E experienced, which ultimately resulted in growth being slowed, were:

- The owner-managers having to change and let someone else take over jobs that they previously did;
- Lack of skills in farm employees. This was a more significant problem for farmers who were expanding geographically;
- The time taken to train labour;
- The time taken for labour to be integrated fully into the business and be fully effective;
- Employees were not as motivated or would not work as hard as the farmer. Some of the farmers considered that to achieve better quality and greater motivation in employees they would need to be paid more or offered better conditions than the farmers could afford;

- Employees could leave at any time. These farmers found they could manage if one employee left. It would make the farm difficult to manage at that time but it would be possible. However a number of employees leaving at the same time caused greater problems;
- Employees had difficulty in seeing the 'overall picture'. Farmer B had an excellent farm manager who could do all the jobs on the farm at a very high standard, but he could not be left to manage the farm alone for a period of greater than three weeks or in the crucial times. This farm manager had difficulty in managing the different elements of the system as an integrated farm system;
- Employees had difficulty in setting priorities; and
- Employees often reacted to a problem rather than 'stepping back' and thinking about a solution that will not cause further problems in the future.

Over time, the labour constraint on growth for Farmers A, B and E became less of a problem. Finding skilled employees became easier because these farmers had learnt to train employees. Employees came to them because they had a good reputation within the industry. They had become employers of choice. Farmers A and B had managers in place and had possible replacement managers in mind in case one of the current managers left. Rewarding and motivating labour became the main labour problem as the businesses expanded. This constraint was managed by offering incentives related to the production of the farm, and by leasing land and/or cows from employees. The employees felt greater 'ownership' of the farm business.

Technical limits There was perceived to be a limit to the number of cows that could be milked in a predominantly grazing-based dairy farm, beyond which major diseconomies of size might arise. The factors which limited the maximum size of the farm included:

- The distance cows could walk per day before time and energy requirements become excessive (some suggest that it is 4.5km);
- The quantity of pasture cows can consume at grazing is limited by grazing habit and time and rumen capacity to around a level that will produce 5000 litres per year
- The number of cows that the current infrastructure (paddock size, yard size, shed size, lane way size, gateway size and so forth) can handle;
- The number of cows that can be managed logistically. That is, a shed can be used 24 hours a day and the herd could be split. Nevertheless, it is not usually possible to utilise the infrastructure to this extent without the added logistical and time problems increasing costs.

Replicating the current farm system on a spatially separate site is a sound option, but this is not straightforward. The two case study farmers who were managing more than one farm and managing a considerable number of people explained that this caused a lot of added management complexities.

The maximum number of farms that can be managed was constrained by the following factors:

- How key individuals within the management team felt about changing their role into a management position with less 'hands-on' work, and giving employees greater responsibility.
- The size of the management team, which constrained how much growth can be contemplated
- Whether the work force could manage a larger, more finely-tuned system that required greater understanding of how the parts of the system link

Factors outside the farm business that affect business expansion

It was found that the external environment, which includes financial institutions and the influence of peers affected the expansion that was undertaken.

Financial institutions Financial institutions constrained growth. Farmers A, B and E who expanded their businesses rapidly, borrowed to the limit of external financial constraints. Farmer E, who had business skills and performance history could buy only one adjoining dairy farm when he had the opportunity to buy two, because of the external financial constraint. Farmer C, who expanded their business slowly over time, never borrowed to the point where the external financial constraint stopped business expansion. To overcome the external financial limits Farmer A leased land. Another option for farmers to remove the external financial constraint is to recruit an equity partner. However, these farmers were reluctant to recruit an equity partner. Farmer D believed that an outside equity partner would erode his control of the business. Farmer E would have an equity partner if they had a small share. Farmer A would consider an equity partner if he was going to lease a third farm, but was reluctant because it would increase the number of people involved in decisions. Farmer B would have an equity partner if the circumstances suited and the partner was 'right'.

Non-price rationing factors affected the farmers' ability to obtain finance. Several of the farmers mentioned that they had to go to a number of banks before their plans could be financed. Farmer E presented the banks with three plans – one he really wanted to do, one that he was prepared to do if needed, and a readily acceptable plan. Farmer C used a management consultant to create a business plan when they were buying the home farm and building a house. Farmer B drew on their education and past work experience to help them to prepare cases for loans. To borrow the farmers needed plans, and needed to demonstrate their knowledge and ability to carry out the plan.

Peers The influence of peers had both positive and negative affects on business expansion. For the farmers in this study who were managing large farm businesses, meeting managers of larger farms (through study tours or through discussion groups) gave them greater knowledge and increased belief in their own ability. Farmer A said 'I discovered that these men and woman managing these large farm enterprises were no different to myself. Such an experience made me realise I can do that too'. Other positive experiences from peers came from consultants and conferences that inspired them.

Two of the case study farmers (Farmer E and C) mentioned that peers could have a negative effect on their decision to expand. Farmer E said

My local discussion group has a narrow view and focus on issues that in the 'big picture' are irrelevant. It is only through being a part of a discussion group that includes farmers who all are undertaking major business expansion I am able to learn and to gain confidence that the plan I have for my business is obtainable.

Farmer C found the experience of their peers valuable when they were contemplating expanding and employing labour saying: 'other neighbouring farmers have been looking for an employee for 12 months and we are concerned that we could be in the same position'.

How does expansion affect a dairy farm business?

Growth increased the profitability of the businesses studied. Growth affected the skills required of management and labour. Major growth involving significant changes to infrastructure, labour and land in a relatively short time affected the profitability, financial viability and management of the farm business. In contrast, minor growth did not significantly affect management and labour.

Major business expansion resulted in adjustment costs Immediately following expansion, the farmers of case studies A, B, D and E experienced unplanned adjustment costs. For all these farmers the adjustment costs were in management and livestock. The farmers of case studies A and D, who expanded to a new region, had additional adjustment costs relating to the difficulty of finding and training skilled labour. Case studies B and E expanded the area of the home farm. They had additional adjustment costs relating to infrastructure and land. In each case the adjustment costs were exacerbated by external factors such as unexpectedly low milk price and unfavourable climatic conditions.

During this transition period, where the businesses had to deal with unanticipated adjustment costs, the case study businesses faced increased risk of business failure. This was because the amount of milk produced per cow declinedⁱⁱ at the same time their costs increasedⁱⁱⁱ. Further, external factors that decreased cash flow^{iv} also reduced the amount of cash surplus available for

reinvestment back into the farm. This slowed the gains from growth and exposed these businesses to greater periods of risk. Added to this business risk, each of the farmers had decreased their equity in the business significantly - by up to 30 per cent in a couple of the cases - which consequently increased their financial risk.

The adjustment for the farmer The farmer in this study who expanded his business through minor growth (Farmer C) had to develop new skills; this farmer had time to adjust and found learning new skills did not slow (or even stop) growth. Farmer C took growth slowly and found the changes required were 'evolutionary'. Pursuing minor growth, Farmer C increased the herd size by a small percentage each year, or took on more adjoining land, and slowly improved that land whilst waiting for their own replacements to utilise that land. The skills required for this growth were needed in the early years of Farmer C's farming career. Farmer C applied those same principles to more cows or more land over time. Accordingly, for minor growth, few new skills are required quickly. Rather, minor growth required fine tuning of technical farm management skills (that is, pasture management, feed management, basic herd management).

Farmers A, B, D and E not only had to fine tune technical farm management skills but also had personal adjustment costs immediately after embarking on the major growth phase. As the expansion process was implemented, the work efficiency of each of these farmers decreased as they had to manage unexpected circumstances. Farmers A, B and E all felt, to differing degrees, stress, depression, and some disbelief that the expansion was not delivering all the benefits they had expected. They had expected that by expanding, they would have more time off, would not need to do night work, and would be able to employ more people, which would give them more time with their family. It did not happen this way – not for quite some time. Once time had passed and they had developed the necessary skills, and learnt to accept that others could do their work, and had updated the infrastructure that was needed, then efficiency increased.

The extent growth affects the new skills a farmer requires depends on the rate of growth. Farmer A doubled business size at once, rather than over a few years. The difficulty with rapid expansion was the new knowledge and skills the manager and his employees needed to acquire rapidly. These challenges were exacerbated because the manager on the second farm soon left. Unlike Farmer A, Farmer E experienced little extra pressure and few difficulties. This was partly because he anticipated the problems, but also because major growth occurred over a number of years. Farmer E bought a property and spent the next two years upgrading it. He employed someone at the start of the major expansion phase who stayed with the business for the entire major expansion phase. Farmer B also purchased a dairy farm that needed improvement. He spent a year improving farm layout and building a new dairy. The slower growth rate for Farmers E and B reduced the rate and extent of personal adjustment required.

The adjustment for the 'management team' Growth affected the management team adversely when new personnel were recruited and had to perform well almost immediately. This happened when Farmer A had to find a replacement manager for his second farm when his manager left shortly following expansion. It also happened when Farmer D took on a third farm and they were relying on finding a person who could quickly develop the skills needed to manage that third farm.

Further, when a business gave an employee time to 'develop' within the business before taking on a role as manager, the adjustment costs of expanding the management team were reduced. Farmer E expanded the management team at the same time as he began the four year expansion path. The rate of growth affects the degree of impact the growth has on the management team.

The affect of expansion on the economic and financial state of the business in the 'steady state' Expansion increased capital efficiency (asset turnover) and revenue generation and cost control (operating profit), and therefore increased the return on capital. Return on assets (profitability) was increased by increasing operating profit and increasing the asset turnover ratio. Operating profit was increased by spreading fixed costs over more output; by lower prices for inputs through volume purchases; and by higher prices for milk for increased volume. Four of the case study farmers increased their asset turnover by making greater use of resources. Since expanding, all the farmers had increased their net worth.

The change in role of the farmers The specific areas of the businesses that were highlighted as changing as a result of major growth were: labour management, financial management, office management, owner/manager's role, technical management and young stock management. Skills

in herd management and logistical management also needed to improve. In the following, the requirements of management in each of these areas are described.

Labour management As these farmers expanded their businesses, their role became more specialised and less directly involved with the daily operations of the farm. There was less physical work and more management work. After a major growth step, Farmers A, B and E were not able to do all the jobs on the farm themselves and had to pass responsibility to others. All the case study farmers who were managing large farm businesses experienced difficulties caused by the quality of the first farm labourers they employed. When managing larger dairy farming businesses they needed to recruit better calibre employees than their present employees.

Each of the case study farmers in this study had strategies for recruiting quality labour. One employed a sharefarmer, another a family friend, another promoted a farm labourer to manager and employed an existing employee to be manager on the home farm. The farmers also employed contractors for specific tasks.

The farmers found they needed good negotiating skills and communication skills in order to manage labour successfully. Building strong relationships with the managers was important; involving them in decision making and encouraging them to attend discussion groups and to undertake further training was also important.

Financial management The dairy businesses with high equity and around the average size had rudimentary requirements for financial management, compared to the expertise needed for the larger operations. Financial management became more important as the farmers expanded the business. The farmers had borrowed and reduced their equity percentage to finance growth. Farmer B, for example, reduced the equity percentage from 50 per cent to 20 per cent in order to expand the business. It was at this time that financial risk was great, and the farmers needed to monitor their cash flows closely, and to enhance skills in managing their finances.

High gearing ratios meant the farmers needed high-level negotiating skills in the financially difficult years (difficult because of a decrease in milk price or difficult because of severe climatic conditions). Farmer A explained that it was important to communicate regularly with the people who had a major share in the business (the banks) to let them know what was happening during the difficult years.

Office management For a farmer managing 100 to 200 cows, the extent of office management was writing cheques, with some cash flow control. As a farm expanded, office management became a greater proportion of the farmers work and the farm became a more complex business to manage.

Office management on a large farm involved:

- Researching new ideas;
- Organising the jobs that needed to be done and setting priorities;
- Organising time off for employees;
- Planning what jobs were needed on the farm;
- Analysing and dissecting the events on the farm;
- Implementing decisions (for example, implementing the staff superannuation plan);
- Paper work associated with employing labour;
- Financial management (previously discussed);
- Keeping track of the set goals (one of the farmers said that it was very easy to become disillusioned when you have such a huge debt. He said that you almost feel as though you are working to pay the bank back. But he said the key was to keep your mind on the end goal); and

- Juggling the different demands of the farm (from practical farm work to office management work).

The time available to devote to office management was significantly less than the farmers had anticipated. Thus, time management was another skill these farmers had to develop. The farmers dealt with issues of time management by:

- Delegating jobs to their employees;
- Using contractors (however, they found that they needed to build up a relationship with contractors so that they would show up when they said they would and so that they did not need to be there to supervise the contractors work.); and
- Being flexible on the number of days spent in the office and the number of days on farm.

One of the farmers, who expanded to another spatially separate farm, spent six months planning for growth. This involved thinking through what changes needed to be done on the property, the labour required and his own change in role. Farmer E explained that a lot of planning went into replacing the dairy. Farmer D spent a lot of time planning new business activities. Farmer B spent every Wednesday planning.

Owners role The owner's role on a 500 plus cow farm involved spending some days in the office and some days helping on the farm. Farmer E described himself as filling in when someone is away or helping at the busy times on the farm. This gave more time doing other activities, such as increased involvement with research bodies. Farmer B also found that after the initial phase expansion gave time to explore other ventures.

Technical management Technical management – the management of the pastures, the herd, feeding, and so on was crucial no matter what size the business. However, as the business expanded, technical management became more complex and difficult. This was partly because the farm was on a much larger scale, which meant that problems were amplified. It also meant new problems and complexities evolved.

Young stock management The farmers found that to expand the business they had to remove young stock from the home property. They found that the land adjoining their property was best used for their milking herd. They either had to contract rear their young stock or they had to lease/buy a run-off block.

Herd management With around 100 to 200 cows, the farmers knew cows individually. As the number of cows in the herd increased the management of the herd changed. Before expansion, the farmers did not fully appreciate the added work specifically associated with increasing stock numbers. The farmers had considered the implications of milking more cows and the infrastructure requirements. However, they generally had not considered sufficiently the detailed logistics associated with moving more cows, joining more cows, feeding more cows, calving more cows, looking after more dry stock and rearing more young stock. The additional problems associated with managing more cows related to wear on the tracks, more cows to fit into the yards, more cows to go through the milking shed, and more cows to obtain access to water. These factors had major implications for feed management, the use of out-paddocks, contract rearing and so forth.

Logistics management The degree of improvement required in logistical management skills depended on the rate of major growth. The dairy farmers in this study who rapidly doubled their herd size did not have sufficient time to develop adequately the required logistical management skills for managing a herd of twice the original size, and experienced additional problems for this reason. Expanding the area of their home farm rapidly without replacing the old dairy caused further logistical problems. Some of the farmers at the time of expanding did not have the capital to replace their existing shed. They also doubted whether it would be economically sensible to replace the shed at that time. They believed that by dividing the herd into two, and then having two milkings in the morning and two milkings in the evenings, the current shed would be a viable solution. However, the logistics associated with organising two herds and the time involved meant that this 'solution' was inefficient and the farmers ended up spending much more of their day in the dairy shed than planned. The dairy farmers that expanded their businesses geographically experienced added complexity with managing the logistics of the human resources. These farmers had more people to manage, which were on two spatially separate farms.

Discussion

In the section that follows, the reasons why a farmer would expand and how the situation affects the decision to expand are discussed.

Why expand a dairy farm business?

Good reasons for a dairy farmer to expand their business are:

- to decrease the risk of the business not surviving because of inadequate size;
- to maintain or increase profit; and
- to utilise under-utilised resources such as management capacity and borrowing capacity.

A farmer's motivation to achieve these objectives will affect the rate, extent and path of growth.

Farmers want to expand in order to increase profits. Further, farmers wanting an improved lifestyle or farmers wanting a business that can provide for two families were significant reasons for expansion. Many farmers expand to reduce the risk of business failure caused by the business being too small to meet rising real costs and maintain real profitability. This perception of risk – this concern that the business may not survive if they did not expand – is different from the way risk is often viewed in analyses. Typically, within the agricultural economics discipline, risk is considered from the view of financial and business risk as a factor that constrains growth. However risk can be an inducement to growth too. There are two dimensions to risk here. Risk of the business not surviving is an incentive to grow. Importantly, risk creates returns. Taking on more risk is an essential part of increasing returns to capital.

A further reason for pursuing growth identified in this study was to increase utilisation of resources. This reason has also been documented by Penrose (1995), who argued that the internal inducements to expansion arise largely from under-utilised resources that can only be utilised through the business expanding. A firm will only reach a position in which it has no incentive to expand if all the problems posed by indivisible resources is overcome; if the same resources can no longer be used differently under different circumstances or in a specialised manner; and if productive services are no longer being created. Essentially, Penrose (1995) argued that a firm will always have a motivation to expand. There will always be resources that are needed for the operation of the firm which cannot be fully utilised because to do so would result in diseconomies of size. Furthermore, there will always be other alternative uses for resources or services. This could be through specialising the role of those services or because of the heterogenous nature of resources. It is apparent that a dairy farmer will always have an internal motivation to expand their business, but whether the firm owners choose to act on this motivation depends on a variety of other factors, discussed below.

How does the situation on a dairy farm business in Victoria affect ensuing business expansion?

It was found that the current state of a dairy farm business was either a constraint to further business expansion or an inducement. The economic and financial situation, factors relating to the farmer and his family, and the infrastructure and resources on farm, affected growth. These factors affected whether or not growth would be pursued and they affected the rate and extent of growth.

The current profit and cash flow situation affect whether a farm business will expand. Prior to expansion the current profitability and cash flow situation of the farm businesses indicated strongly that, to increase profitability and net cash flow, the business needed to grow. Once these businesses had expanded and had passed successfully through the transition period after major growth, indicators such as return on assets were at a level that were comparable to alternative investments. Thus, the economic situation within the business was no longer 'signalling' strongly that the business needed to expand. It is important to note that the farms in this study were all being run relatively efficiently before expanding.

Related to the above discussion on the affect of the economic and financial stimuli to business expansion is a farmer's risk preference. Farmers risk preference was both a constraint and an inducement to growth, depending on the business and farmers situation.

If a farmer believes that there is risk that the business will not survive in the future then he/she will expand the business. However, if the farmer believes that the financial risk involved in rapidly expanding the business is greater than the risk of the business not surviving (or providing for his/her family) then growth will be constrained. Further, for farmers with a lower preparedness to accept risk, but still wanting to expand their business then growth will occur at a slower rate.

Interestingly, for farmers who wanted a faster expansion rate because of the position they wanted their business to be in, had to accept a greater financial risk (or else consider using outside equity capital). The farmers that were reluctant to take on such a large financial risk had to accept a slower growth rate for their business. Further, how a farmer views risk changes over their lifetime. Penrose (1995) and Heady (1952) both argued that the way risk and uncertainty affect a business relates to the management ability of the farmer. In this study, as the farmers improved their management ability they also increased the amount of financial risk they were prepared to take in order to more quickly expand their business. Penrose (1995) and Heady (1952) both argued that risk and uncertainty can be reduced through management possessing sufficient information about factors that might determine future events. Heady (1952) also argued, the more information that is needed to be analysed, the greater the cost.

For farmers wanting to pursue a fast rate of growth, the borrowing capacity of the firm constrains growth (if the farmers are not prepared to seek outside equity capital). Further, the financing terms of the firm determine the path, rate and extent of growth. Borrowing ability was critically important to growth. Non-price factors such as the experience of the lender, the relationship of the farmer and the lender, the farmer's banking history, what the farmer was borrowing for, and whether the farm is perceived to be run as a business were important determinants of a farmer's ability to borrow capital.

In dairy farming, questions about the timing and extent of growth related actions and processes are intricately tied up with questions of old capital replacement and new capital investment. At any time in the dairy industry there exists a continuum of ages of plant – from plants in which the herd is about to be milked for the last time before being scrapped to new plants into which the first cows are about to be coaxed.

A farmer will be likely to replace individual capital equipment when the total of actual and near-future expected whole farm variable and fixed costs with the old capital equipment, are greater than the total of medium term expected whole farm variable and fixed costs with the new capital equipment.

Another factor within a business that affects the rate and extent of business expansion is infrastructure on farm and the infrastructure on the newly acquired farm. Johnson (1960), Johnson and Quance (1972), Salter (1966), Hathway (1963) all theorised about the principle of replacing capital infrastructure or investment/disinvestment theory. To summarise their arguments, an asset is fixed in production for a range of prices, whereby at the current prices there is no justification to acquire more of that asset (investment) nor is there justification to sell that asset off (disinvestment). Salter and Johnson?? (1966) explained that the way to decide this is to compare the whole farm operating costs with the current infrastructure, against the whole farm operating costs with new capital infrastructure. Johnson (1955) related it to marginal value product, whereby if the acquisition cost of an asset is greater than the marginal value product (MVP), and MVP is also greater than the salvage value, then the asset is fixed.

This study has found that the replacement of capital equipment is governed also by the cost of labour (which through this study it was also found to be the opportunity cost of labour), the amount of output produced, and the capital cost of new technology. From the results of the case studies it was evident that old capital equipment had a very high labour requirement. The effect of capital replacement on growth was that it slowed growth because a farmer often had to increase herd numbers and production before investing in new infrastructure. This resulted in existing infrastructure being used to the limit of capacity.

If goals other than profit are more important, then the rate, extent and path of growth will be constrained. Further, farmer and family goals change over time. When the case study farmers

wanted to maximise profit they expanded; when family and other lifestyle issues took precedence then the growth was constrained.

Another factor that affects growth, which is related to goals and the amount of current consumption foregone for future consumption, is the farmer's entrepreneurial nature. The opportunities for business expansion that a farmer can see, and their belief in their own ability affects the rate, path and extent of growth. Over time, because of the experiences a farmer has, and other external influences, a farmer's entrepreneurial ability develops. If a farmer cannot see what opportunities are available then the extent and rate of growth will necessarily be constrained.

Initially the farmers in this study were learning about the technical management of their farm. During such time they undertook minor or incremental growth. For these farmers at this time this was the only opportunity they could see for their business. Further, they had to demonstrate their competence as farmers to financial institutions and to themselves.

It was found in this study that the farmers' ability to see opportunities improved as they gained more experience. They met farmers who had expanded their businesses, and saw the operation of larger farms – all of which gave them more ideas for their own business. Further, a farmer has to have the ability to learn new skills in order for growth to occur. As a result of a farmer learning more about the resources they are managing and seeing more opportunities a farmer's entrepreneurial ability develops over time.

How does business expansion affect the subsequent operation of a dairy farm business?

Managing a 500 plus cow farm, compared with a 150 cow operation, requires a marked change in the use of staff and demands on the farmer's capacities. The processes and systems also change, as does the management of finance. Looking at the learning required for a farmer at the start of farming, and looking at the learning required of a farmer as their business expands to be a large farm, the differences between a 150 cow farm and a 500 cow farm are stark. Put simply, on the smaller dairy farm the emphasis was more about getting the technical management right and the majority of learning was associated with that end. The farmer was learning more about pasture management, herd management, feed management, with perhaps some financial management and cash flow management. For 300 plus cows, the farmer not only needed to get the technical management right, but also had responsibility for managing a greater financial burden, greater labour management, greater office management and also managing their own time. One of the farmers from this study stated that the key to management on a 500-cow farm was the ability to be able to combine, and manage, all parts of the system. It was important to understand how and why everything was able to work together. Another of the farmers stated that to manage a large farm, a farmer needed the ability to be a conceptual thinker – to be able to see the system as a whole and identify potential problems before they occur.

Minor growth does not have a significant affect on a farmer's management skills, labour structure or on the management team. In contrast, major growth results in a significant change to the farming enterprise, which has consequences for the resources on farm. Major growth affects the profitability and financial viability and the management of the farm immediately following expansion, and once the business reaches the steady state size.

As minor growth has fewer significant consequences for a farm business, the focus is on how major expansion affects the state of a dairy farm business? Major growth affects the farm business immediately and in the longer term. Ignoring the immediate effects of major expansion is missing an important element of the growth process. Studies of economies of size often consider the advantages and disadvantages of one size compared to another size but do not consider the internal processes and development that occurs during business expansion. Failure to include costs of this transition period leads to the benefits of expansion being over-estimated.

The three farm businesses that undertook major expansion immediately encountered unexpected costs, which reduced the ultimate profitability of expanding. The adjustment costs faced by management is another important adjustment cost, this time involved mental and physical stress. Management adjustment cost can significantly affect the farm business over a period of more than two years.

Like this present study, Kriegl (1998) found that the management adjustment cost is about making the transition from the person who does most of the physical work plus managing the farming

enterprise, to someone who does little to no physical work and who concentrates on managing all family and non-family labour. Kakabadse (1983) found the transition for an individual to believe they have the skills necessary to manage a significantly changed situation can take greater than two years. Employees also have to adjust.

The skills that the farmers had to develop immediately following growth ranged from managing labour, logistics and time, to more complex technical management, and enhanced financial management. A firm that expands at a rate that is faster than the rate at which individuals in the organisation can adjust runs into inefficiencies.

Concluding comments

The purpose of this study was two-fold. First, to find out what has happened, or might happen, to some people and their business involved in dairy farming who are pursuing or have pursued growth. Second, to present a perspective on growth, drawing on theory and findings from an investigation of dairy farm growth. It is important to keep in mind that conclusions from this study exhibit 'survivorship bias'; only farms that had successfully expanded were investigated.

The actual or potential benefits of one size of a business is sometimes compared to another size of that business, without considering adequately the dynamic processes and effects of growth that firms go through to reach a certain size. Findings from this study emphasized that the growth of firms is a process, with greater size and net benefits the by-product of this process. The factors and the changes that occur within the business and within the farmer during the growth process are critically important elements that help determine the success or failure of expansion.

Narrowly focussed views of the growth process can miss, or inappropriately weight, important factors that can significantly affect the profitability and the success of growth. Issues that are particularly critical are finance capacity, risk attitude, labour quality, labour management, and change-in-role of the manager. The development of the farmer in relation to the development of the firm was highlighted. In addition, it was found that immediately following major expansion the expected gains were not achieved; rather the farm businesses had unexpected adjustment costs.

This finding that the growth of the farmer and the growth of their farm business are intricately related is not explicit in some theory, in which a firm is considered as an abstract entity. During the early years of their farming careers, the farmers were learning about technically managing a dairy farm. Through the farmer learning about what opportunities are available and, as the farmers in this study expressed it, by developing confidence in their ability to take on such a change, they were emboldened to take the financial risk associated with borrowing to invest and expand their business. In addition, immediately after an expansion, further development was stopped or slowed until a farmer had developed the necessary skills to manage the enlarged business. Some farmers may not be able to develop the necessary skills and consequently expansion could fail.

Findings from the case studies also suggest that the needs of a farmer are different at each of these three different stages: the early years of farming; learning about opportunities for their business; and learning new skills once the business has been expanded. Of course, some farmers may never move beyond the first stage of learning technical management. While mastering the technology is one of the keys to successful farming, it is not enough. Growth requires a broader view than the narrowly technical. Indeed, it is when farmers stop obsessing about the narrowly technical that the bigger possibilities and opportunities emerge – and growth happens!

Related to the development of the farmer is the notion that what the farmer has already done with their business affects the further development of the business – that is, history matters. Whilst incremental productivity-increasing change is continual, the major growth steps are discrete and often so demanding of the farmer's resources and resourcefulness that there may be only a few times in their farming career that dairy farmers will embark on a big growth step in their business. Pursuing and achieving growth, and achieving a desired business and lifestyle state of affairs, changes motivations. So does time. This is different to how growth is often represented - as growth of an impersonal business entity irrespective of the history of growth or the people involved. Growth of a business is a very human process.

The main theoretical tenets about growth found in economic, capital, finance, management and labour theory, accord generally with the experiences of the dairy farmers studied who were pursuing and achieving growth of their businesses. Still, technical, financial, logistical, management

and human detail of dairy farm systems create some dimensions of difficulties and costs that are not always well-captured by theory. Such factors are critical in determining whether or not the potential gains from growth become reality and whether the goals that motivate growth are fulfilled.

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Appendix

Figure 1 The process of growing in dairy farming

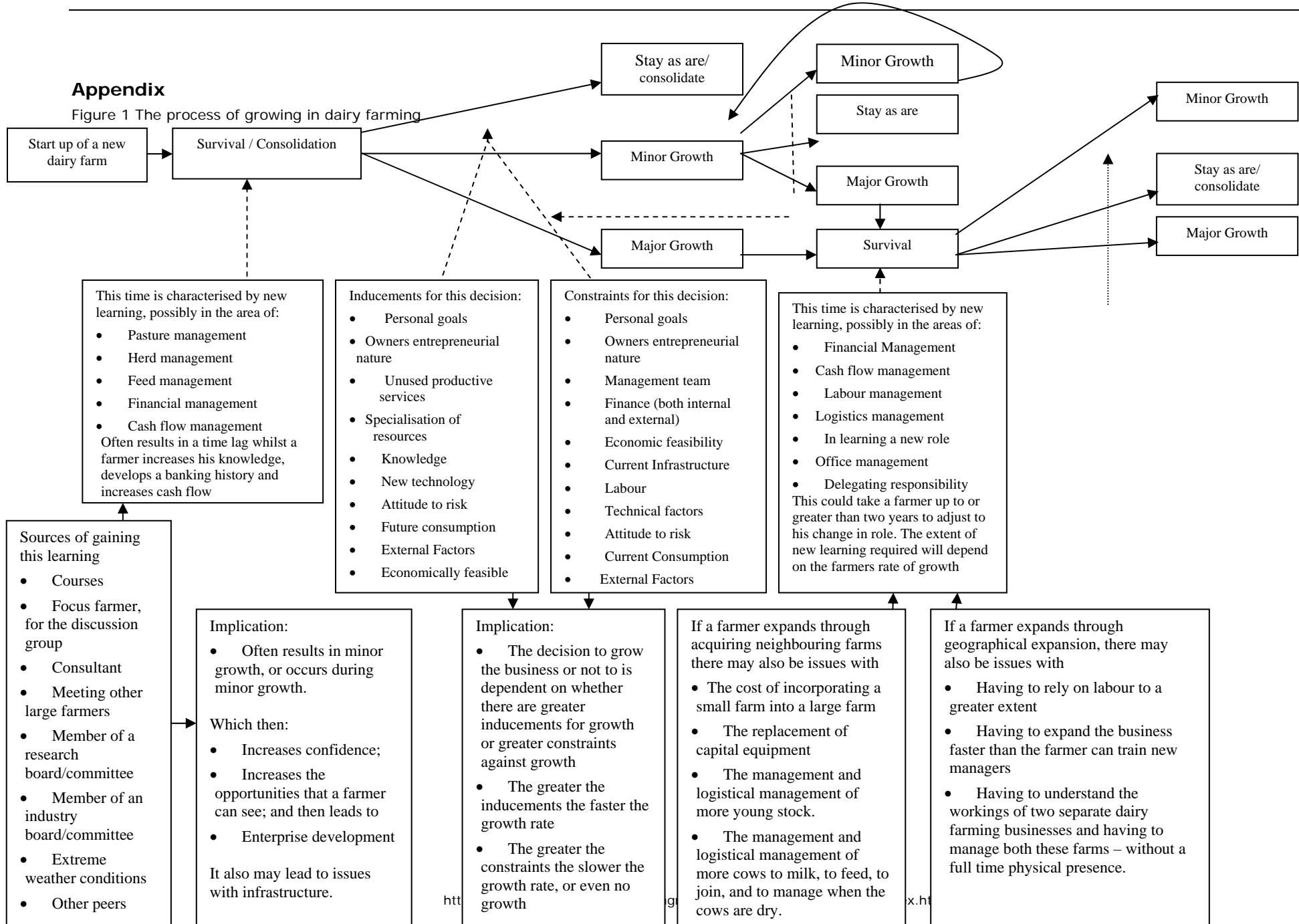


Table A1 The history of dairy farm business case study 1

Time	Action	Consequence
1984	Milker on his brother's dairy farm.	Provided Farmer A with an idea of the work involved with dairy farming.
1985	Came to this current property (which was struggling to feed 100 cows) and worked for wages.	Milking 100 cows on 103 ha in a 12 unit walk through dairy.
1986	Took on a share farming contract on the current farm. The landowners built a 20-swingover dairy shed with room for another 4 sets of units. As cash flow improved, they were able to improve pastures and laneways and so forth.	Increased cow numbers to 120. They did not have a very intensive culling program, they reared more heifer calves and occasionally they bought heifer calves.
1988	Put in another 4 sets of units in the shed. Employed part-time labour unit. Farmer A went on his first trip to New Zealand.	Allowed for further increases in cow numbers Decreased his wife's role He started to see some large dairy farms, which he said showed him the possibilities for creating a large profitable dairy farm.

Time	Action	Consequence
1989	Employed the services of a farm consultant as part of the focus farm project.	Learnt more about pastures and feed management, able to see more opportunities for the business. Still increasing cow numbers.
	Took on an exchange student who assisted on the farm for a number of	The farmer and this student spent a lot of time brainstorming and thinking about the various

months.		opportunities and options Farmer A had available to expand the business.
1990	Second trip to New Zealand.	Farmer A said this increased his confidence in his own ability and showed him and his wife other opportunities they had for their business.
1991 milking 250 cows	Changed to establishing a leasing arrangement Started to feed grain manually and eventually invested in an automated grain feeding system.	Increasing cow numbers.
1992	Leased another 40 hectares and spent \$40,000 improving the new leased land.	Area available to rear extra replacements, that were either going to be sold or used if they were to lease another dairy farm.

Table A1 The history of dairy farm business case study 1 continued

Time	Action	Consequence
1994	Leased second farm (140 hectares) Pastures, layout and dairy shed were completed and ready when this farmer began farming on the leased land.	Hired the exchange student who had worked on the property in 1989 as the manager on the second farm. He bought cows so the farm was almost fully stocked from the start of the lease.
1997	Leased 35 hectares adjoining home farm.	Increased cow numbers.
2001	Leasing more land next to the home dairy farm.	Increasing to 550 cows.
2002	All heifers on home farm not on second farm.	Close to half the herd on the home farm will be heifers.

Table A2 The history of dairy farm business case study 2

Time	Action	Consequence
1989	Share farmed on a property in Northern Victoria.	They purchased 170 cows, with 100 of these cows financed through the Commonwealth Development Bank (using the cows as collateral). They kept their house in town. Farmer B2 worked with an apprentice and Farmer B1 continued to work in town.
1990	Purchased 43 hectares, and leased 13 hectares and 8 hectares all adjoining. Put feed troughs in the dairy, bought a 40 tonne silo and a roller mill. Their equity in the business dropped to 25 per cent They had no surplus cash flow to improve the farm.	Increased to 197 cows Farmer B2 worked with an apprentice (the son of the original owner). Farmer B1 continued to work in town, but within a year, he started full time work on the farm. They increased their herd numbers through not culling cows (their guide on whether to cull a cow or not, was: 'if she could walk into the dairy she could be milked') and through keeping extra replacements. They fed the extra cows through manually feeding grain;
1994	Nestle was offering a price premium for milk collected from February to August. Nestle was also offering to pay the interest for three years on a loan used to build a feed system.	Went to winter milking. This was the time they decided to be high quality, high intensity dairy farmers. Installed an orga, mixer and another silo for lupins.
1994	Purchased one of leased blocks.	Milking 245 cows. Continued

employment of farm worker. Farmer B2 reduced her role in the daily running of the farm. Farmer B1 worked with their employee.

Table A2 The history of dairy farm business case study 2 continued

Time	Action	Consequence
1995	Leased another block 13 kilometres away. Leased 20 hectares (which is almost adjoining the home property) and 50 cows from new employee.	Removed young stock from home property. Increased cow numbers to 280.
1996	Their equity in the business increased to 50%. Purchased 57 hectares and purchased 100 cows.	Doubled farm size - milking 380 cows. Milking was taking 11 hours a day. In addition, because there were no timers on the irrigators the farmers were not only spending most of the day milking the cows but were also up through the night moving the irrigators.
1997	Milking in the completed rotary dairy. Purchased 50 acres adjoining	Increased cow numbers to 410
1997	Purchased 63 hectares a bit further away. It is close enough to have the cows walk to it the few times in the year they need	They hoped the purchase of 63 hectares would decrease the need for purchased fodder, and it would be somewhere to rear dry cows.
	Purchased 8 hectares adjoining	Because of all the purchases, equity decreased.
1998 – 2001	Improved efficiency of irrigation and increased grain	Farmer B increased cows numbers to 600

Table A3 The history of dairy farm business case study 3

Time	Action	Consequence
1985	Leased current property 79 hectares.	Started farming with 90 cows, with young stock agisted.
1986 112 milking cows.	Bought an out-paddock.	Used this outpaddock to rear young stock and to increase cow numbers
1991	Bought a second out-paddock. Increased to milking 160 cows.	Used this block to rear their beef herd. They started learning more about pastures and herd health
1994 milking 168 cows	Bought the land adjoining the property they are leasing (49 hectares).	This property needed to be improved. Within 12 months of purchase they had it the way they wanted it.
1996	Bought the property they were leasing and bought a feed wagon (and built the house).	Increasing their assets. Milking 177 cows.
1998 Milking 215 cows	Bought another adjoining property (47 hectares) Young stock now reared on home property	With this property they started work on it straight away, they are still working on it now (8 out of 13 paddocks are done).
1999	Sold second out-paddock	Because this was sold after the purchase of the adjoining property these farmers did not purchase an extra 41 hectares which was also available.
2000	Built new dairy (15 double up)	Increased cow numbers by 30.

Table A4 The history of dairy farm business case study 4

Time	Action
1987	leased their parent's 80-hectare
1988	purchased parent's 80-hectare farm (milking 200 cows) and purchased a neighbouring property of 65 hectares milking 140 cows
1996	purchased the third farm

Farmer D only wanted to be involved in one farm interview, at which he provided very limited information on their business growth process. Consequently, this summary table is less detailed. During this time, they have also increased the size of the business through increasing the stocking intensity.

Table A5 The history of dairy farm business case study 5

Time	Action	Consequence
1970 – 1980	Partnership with father and brother (father still main overall manager)	The partnership bought the dairy farm that was visited (110 hectares and milking 100 cows). It needed major repair work on farm layout, fences, and so forth. During this 10-year period, they concentrated on improving the structures – new dairy, machinery and hay sheds, and a new house.
	Concentrated on structural improvements.	Toward the end of the partnership they did the first survey work for irrigation.
1980 milking 120 cows	Partnership dissolved Laser graded the first 20Ha	This farmer's role changed to be the overall manager when he took the farm over.

Time	Action	Consequence
1982	Laser graded 90 ha and started automatic irrigation Increased the milking shed to 8 a side	Increased cow numbers to 130
1983	Increased the number	Increased cow

	of units in the shed to 12 a side and increased yard size to handle 150 cows	numbers to 135	(run down block, with a disused dairy, house and out fall wheel)	consequence of this is the farmer had to learn how to manage the farm from a distance.
1986/87 milking 150 cows	Joined a progressive discussion group	Encouraged growth and gave validity to his thinking	40 hectares were laser graded	Increased the herd size to 500 cows
1988 milking 200 cows	Purchased 43 hectares (adjoining the home property) which had a disused dairy and a house. Laser graded half this property in the first year (funded out of cash reserves) Started to become more involved in research and development committees	Employed a share farmer Bought another 50 heifers so could start with the land being stocked and began to increase cow numbers – through own replacements (Milking 200)	Feed system in the dairy	Changed the feed management system to make it simpler and easier to manage (no longer using the feed pad to feed daily supplements – it will only be used in Autumn when silage is being fed)
1989	Laser graded the other half of the new 43 hectare property	Increased cow numbers to 220		

ⁱ The focus farm project is where one dairy farmer elects to have his dairy farm business examined by a group of local dairy farmers and a farm consultant, each month for 12 months)

ⁱⁱ bought-in and cull cows were being milked

ⁱⁱⁱ Due to increased labour, feeding more cows, or no time to fix other problems

^{iv} a decrease in milkprice, a change water prices, or severe weather conditions which increased feed purchases

Time	Action	Consequence
1990	Started to build a rotary dairy to be ready for 1991 for the 300 cows (funded through borrowed capital)	Increased cows numbers to 250
	Built a feed pad	Started to increase debt. Therefore had to learn debt management skills
1991 – 1996	Rotary dairy completed	Increased cows numbers till eventually reached 400 cows, which is a stocking rate of 5 cows per hectare of irrigated summer pasture
1996	Purchased 130 hectares	Employed a second sharefarmer – the