Seasonal Milk Pricing

"Holy Smoke or Holy Grail"

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Introduction

Historically the New Zealand Dairy Industry has paid seasonal milk producing farmers the same price for milk irrespective of the month in which it was produced. Over the last ten years a number of attempts have been made to review this practice. Some schemes have been put in place that more closely reflects to the farmer the value of the milk in the month in which it was produced. Many of these have been short-lived although the failure was not always brought about by the scheme itself.

The issue of seasonal milk pricing is currently being debated as New Dairy Group have indicated that it is reviewing its payment system. Some farmers have also raised the prospect of seasonal milk payments improving on-farm profitability. However, very few attempts have been made to evaluate the benefits of seasonal milk payments starting on the farm and through to the market. This is important to the NZ Dairy Industry as the value chain from the farm to the market place is co-operatively owned and any effects at one point are likely to impact elsewhere in the business.

The aims of this project are to review previous work and research in the area of seasonal milk payments, and then to make an attempt to model the outcomes of seasonal milk pricing on one of the farms owned by Puketiro Farm Partnership.

Executive Summary

- The New Zealand milk supply curve is one of the most seasonal of the major milk producing countries. New Zealand dairy farmers harvest pasture with cows as it grows. Therefore the milk curve is very closely related to the pasture growth curve.
- This poses a problem right through the value chain. The farm system has to cope with large fluctuations in workload through the season. The dairy processing Co-operatives need to provide facilities that are only fully utilized for a month or less each year. And lastly, the marketer of the milk products is faced with challenges dealing with changing volumes of product in a market that doesn't necessarily demand this.
- Over the last 10 years various attempts have been made to reflect the cost of seasonal milk supply in the payment system to dairy farmers. None of these attempts have lasted very long (with possible exception of winter milk contracts).
- On-farm research of the implications of seasonal pricing has been quite limited and has not shown large benefits to either the farmer or the dairy Co-operative.
- The study undertaken on Puketiro Farm has also shown that any benefit is marginal and limited changes in farm management are possible.
- The author would suggest further research is required to ascertain the real cost of seasonal milk supply right through the value chain. Considerable effort should also be put in to model farm systems to value the implications of any farm management changes that might be undertaken by farmers.
- The real risk to the New Zealand dairy industry is the signals that seasonal pricing might give to farmers might undermine the competitive advantage New Zealand enjoys.
- **Any attempt by Dairy Company's to introduce Seasonal Milk pricing should be withheld until the on-farm implications are better understood.**

Seasonal Milk

What is it?

New Zealand dairy farmers supply milk to the manufacturing companies in a seasonal pattern during the course of a year (see figure 1). This pattern has been well established for most of the dairy industry's history in NZ and is due do a number of important reasons;

a) A dairy cow's milk output follows a pattern set by biological limits within the cow and to a lesser extent by some genetic modification of the cow population over time (lactational persistence – see Jensen 1986). The comprehensive equation suggested by Wood (1979) is as follows

$$y = an^{.b} * e^{.-cn}$$

Where y = average daily yield in the nth week
a = scaling factor fixing the height of the curve and relates to the average production level of the herd and the potential of the individual
n = the week number for the yield estimation required
b and c describe the curve up to and after the peak
e = base of natural logarithms.

b) The seasonal nature of pasture growth means that NZ dairy farming is predominantly based on grazing pasture in the field. The milk curve is closely co-related to the pasture growth curve.

c) Because of the situation outlined in b) nearly all cows in NZ are calved in the 12 week period starting in mid-July and ending in mid-October

d) Only 5% of NZ total milk production is required to meet local milk consumption. Therefore, very few cows or herds are milked through the winter months to meet this demand.

e) Milk has a very short storage time. Under refrigeration milk on farm has an acceptable storage time of 48 hours plus a further 12 hours to transport and process to stage where degradation can be controlled or mitigated. Therefore, the ability to hold milk in storage to smooth the downstream processing is not significant.

f) The majority of export milk is sold as long shelf life products (i.e. milk powder, butter, casein etc) and hence product can be made at any stage of the year and sold when required.

How Seasonal is it?

There are a number of different ways of describing the amount of seasonality in the milk supply to NZ manufacturing companies.

a) The curve illustrated in figure 1 shows the general nature of the supply of milk and the timing of that supply. It also demonstrates the rapid rise of milk supply in July to October to a peak in November, and the slower decline through the summer into autumn.

b) The utilization of processing capacity throughout the year also helps to understand the seasonality of supply. If an even supply of milk throughout the year was possible and the manufacturing capacity was equally matched to this, then utilization would approach 100%. Under current supply conditions utilization is 53% to 55%. Levels of 80% plus are achieved in other parts of the world, most noticeably those countries with very high domestic consumption compared with supply and high levels of grain feeding of dairy cows.

c) Peak Day Equivalents (PDE's) is a similar method to that outlined in b). If all the seasons milk is divided by the peak days supply then an index of the capacity required is developed. PDE's for NZ Dairy Group is 184 days. Within that supply base the North Island is 179 days, and the South Island is 196 days.

d) A measure of "Flush" (milk supplied per day per farm over the peak month) against the "Shoulder" (milk supplied in February). This is currently 57%. This means that production has dropped 43% from peak in October to February.

Of the major milk producing nations in the world NZ has the most seasonal milk curve. European Union utilization figures range from approximately 60 % (UK) to 80% plus (Germany).

Is This a Problem?

The Dairy Company

Where a Dairy Company has to build a new processing plant (or replace an old one) a considerable capital investment is required by the Co-operative. One of the criteria used to decide the capacity of the plant is determined from the peak milk supply. The current cost of building processing plants is approximately $50 per litre of peak milk (NZDG Peak Milk Rights Booklet Oct 2000).

Therefore the cost per litre of milk supplied under NZ conditions would be approximately $50 / 185 PDE's or 27 cents per litre of milk supplied throughout the season. But the variation within NZ is quite large. A processing plant built in the middle of the Waikato would be nearer to 28 cents per litre, and in the Canterbury or Southland region would drop to 25 cents per litre. The processing plant represents one of the largest items of fixed cost associated with processing milk. Clearly any attempt to reduce the fixed cost component of milk processing is likely to be of benefit to the Company.

There are further complexities to the peak milk issues. The Dairy Companies attempt to build processing facilities to cope with only the peak milk i.e. cheaper short run plants are built to cope with milk over a 2-month period. The product is often of lower value than the potential products that could be made with the milk. For example AMF (liquefied milkfat) is produced over the peak, as it is quick and cheap to make, it is then reprocessed back into product later in the season. This adds overall cost to the manufacturer as well as reducing the range of products that the AMF can be reprocessed back into.

There have been various attempts by Dairy Companies to estimate the cost of the seasonal nature of the milk supply. These have varied depending on a number of issues a) how far through the value chain the costs have been estimated, b) whether the cost of capital has been added (i.e. the cost of building new plant or just better utilization of existing plant) and c) the cost/benefit to different companies depending current seasonality and product types. A number of dairy companies have had short-lived attempts at seasonal pricing. These will be outlined later.

The Farmer

New Zealand dairy farmers have been quite successful at maximising the utilization of seasonally grown pasture into milk. This has manifested itself in a number of areas.

Firstly, very short (by world standards) calving periods of typically 8 to 10 weeks for 95% of the herd to calve. As a result of this service industries have also responded by providing products to match this, e.g. Livestock Improvement's provision of low cost liquid semen at very low sperm concentration rates.

On-farm research has had a large focus on maximising profitability from seasonal pasture growth without the addition of imported feedstuffs. Areas of research in New Zealand contrasting directly to the Northern Hemisphere are: - reproductive efficiency, pasture management, controlled feeding of cows on pasture and labour efficiency in the farm dairy.

The seasonal nature of pastural dairy farming, results in large fluctuations in on-farm workload. Typically on a New Zealand dairy farm of 200 cows the hours worked change from a required 20 hours per week in June through to 70 plus in September. This provides a challenge for the farm manager to best utilise the available staff on the farm. This has seen the dairy farm labour market suffer from a poor image as people work long hours in spring for apparent poor wages at that time. Also, the stress of long hours in the spring has taken a toll on the timing of on-farm decisions and general well being of the workforce. Dairy farm discussion groups regularly report poorer attendance and attentive levels during August and September (LIC Consulting Officer Service).

The upside of the farm labour issue is that some specialization of labour is possible and a long period (3 months) of down time allow for time off, relaxation and pursuit of off farm activities.

The on-farm capital requirement to meet a seasonal system is reflected in such areas as the need for larger farm dairies, larger calf rearing facilities, and in some instances more staff accommodation to meet peak demand.

On the positive side because of climate advantages and the willingness of NZ farmers to meet the challenges of the seasonal pasture growth curve the cost of milk production is one of the lowest in the world. This is also reflected in the milk price paid to NZ dairy farmers and in the 1999 year the NZ milk price was $31 per 100 kg's compared to

Japan	$138 per 100 kg's
US	$ 61
UK	$ 54
Aust	$ 35

(Source – IDF World Dairy Situation)

The Marketer

As outlined above, the majority of NZ milk exports are in a form that is capable of long-term storage. Long ship voyages to the market, necessitates the need for good storage capabilities and the associated costs.

Despite this the market generally views our seasonal nature of milk supply as a disadvantage on the world stage. Rabobank (large Dutch Co-op bank specializing in agricultural lending) lists NZ's very seasonal milk supply as one of its 3 major weaknesses in the world dairy market (Adrie Zwanenberg – meeting with NZ Dairy Group Shareholders Council Oct 2000). The primary drives of this weakness are two fold;

- Firstly, there is cost associated with either storing the large peak of milk processed to even out product supply, or the need to deal with the very low volumes of product during the winter either by keeping inventories or purchasing from outside NZ.
- The milk product sector with the largest growth in the international market is fresh milk products. This poses a problem for NZ's current supply pattern as almost no milk is produced from mid-May to mid-August.

A problem that is common to both the Dairy Companies and the Marketer is the changing composition of milk throughout the season. This has effects on the type of products that can be made, the taste, functionality or colour of the milk products. Clearly the processors and the marketers would support a more consistent base milk composition. The challenge is to put a value on this. Work is currently underway to quantify the size of this benefit.

However it should be pointed out that there are some upsides to seasonal milk supply patterns. The success of the Colostrum project undertaken by NZ Dairy Group was only possible because large numbers of cows calve in a very short space of time (collections of colostrums were for 6 weeks only).

The seasonal nature of milk supply in New Zealand has some cost associated with it from the farm level right through to the market place. How much the total cost is, is hard to quantify but attempts have been made at various levels in the industry. Some of the earlier attempts at placing a value on the seasonal milk supply by the manufacturing companies will be outlined below. But to date the underlying driver of the milk supply pattern has been the constant attempt by farmers to match the pasture growth curve to the intake requirement of their cows. This has been refined over time by research and by the general lack of cheap feed alternatives to pasture.

Past and Current Pricing Models

It is worth noting that the price paid for milk in New Zealand has predominately been a fixed price per year. The major exception to this has been the prices paid to small groups of farmers to produce and supply milk during the winter months. This milk has been used solely to meet the fresh milk requirements of the New Zealand population. New Zealand has a high per capita dairy product consumption by world standards (WHO), but despite this, domestic consumption of fresh milk, cheese, yoghurts etc has still only equated to 5% or so of total annual output of milk per year.

Bay Milk

In three seasons in the mid-1990's Bay Milk Products introduced a system of paying suppliers a higher price for milk supplied in the "shoulders" of the season. The shoulders were defined as those months outside the peak milk supply of October and November. The extra payment made in the shoulder months was sourced from a lower milk price in October and November.

The aim of the scheme was to reward those suppliers who produced more of their milk in the shoulder months and to encourage farmers to look at methods of improving the milk flow in those months. The company identified that its profitability could be improved if more milk was received in the shoulder months and the overall payments made to the shareholders could be improved. The reasons for this improvement in profitability are those outlined in the above section on the costs of seasonal milk to dairy companies.

Initial payment by the company was an extra 40 cents per Kg of milk solids in the shoulder months. This represented a 13 to 15% variation in price through the season. After three seasons the payment scheme was suspended as Bay Milk merged with New Zealand Dairy Group.

The success is hard to determine as the scheme probably needed to run for 5 or more years to allow for any farm management changes to take effect. However in the three years that the payments were made little if any discernable effect was measured. The biggest obstacle to measuring a positive or negative effect on the seasonal milk flow is the difficulty in trying to separate out any climate affects.

Tui

Tui undertook a similar scheme to that described above. In 1993 the company introduced a scheme to pay a 60 cents per Kg Milk solids in the peak (October and November) and an extra 26 cents outside the peak. The reasons for the introduction were essentially the same as those proposed by Bay Milk Products. The results were the same and any further work in this area was suspended in 1997. The major difference with this trial was that Massey University undertook some study to try and predict farmer responses to the price changes. These will be outlined later.

Town Milk Prices

"Town Milk" or "Winter Milk" has been a feature of the NZ dairy industry for most of its history. As seen in other dairy farming countries, New Zealand has also had an ongoing demand for a year round supply of fresh milk to the general population.

In the past some dairy companies sole purpose was to collect, manufacture and supply milk to the urban population with any surplus milk being sold to a neighbouring dairy company to process for export. This no longer exists in New Zealand as the "Town Milk" companies have been brought or merged with larger co-operatively owned Dairy Companies whose major activity is the processing of milk products for export.

The common feature of the Town Milk industry was a varying price paid for milk from suppliers throughout the year. Also associated with this varying milk price was some form of contractual arrangement between the supplier and the Dairy Company for the volume of milk supplied in the winter months. This was most often called a "Quota" although it is now referred to as a winter milk contract. The reason behind the contract was to guarantee the dairy company with enough milk to meet demand from May through to September.

The requirement for the farmers to produce milk in the winter and to meet the agreed level of supply meant that the price paid was significantly higher in the winter months. There was also an implicit acceptance that supplying milk during the winter months reduced the total milk output of the farm by 10% to 15%. The major reason was that feed supply (generally grass growth) during the year did not match feed requirements. As a result of this there were some inefficiencies at a farm level e.g. turning grass into silage or buying in high priced grains etc.

The one noticeable effect of the "Town Milk" system was that the milk supply curve to the Town Milk Company was much flatter or not as seasonal as the neighbouring seasonal supply Company. However the inefficiencies on-farm were paid for out of the market price for milk.

The mergers of "Town Milk" companies with their neighbouring seasonal companies has resulted in some major changes in the price being paid for milk. The pricing is more consistent with the seasonal price for most of the season with a different price being paid only in June and July. The margin between the winter price and the rest of the season is also much closer. For example in 1990 the winter price paid for milk in many areas was $5.70 per kg MS compared to a base seasonal price of $1.85 per Kg MS. Also this price was paid over the 4 months of May through to August. In 2000 the proposed price is $6 per Kg MS compared to a base price of $4.40 and only for 2 months, June and July.

TAPPS

This was a proposal by New Zealand Dairy Group in the early 1990's. In most aspects it was similar to the methods tried by Tui Milk Products and Bay Milk Products in the mid 1990's. It was not implemented as the Company received insufficient shareholder support to proceed. However the Company is currently reinvestigating the seasonal milk pricing issue but has made little public progress at the time of this report.

Peak Milk Rights

Again this is a proposal by New Zealand Dairy Group. The Company has attempted to isolate the cost of building new processing plant and then ask that new milk at the company peak (milk over and above current peak in 2000) pay for the capital cost of building extra processing capacity.

The method of capturing capital to build new processing facilities is for the company to issue peak milk "rights" at $30 per litre. As illustrated above the current forecast cost of building processing capacity is $50 per litre. The Company generally funds this from retained profit (60% of total cost) and from borrowings (40%). Therefore the Company has argued that the 60% fraction of the total cost should be the contribution that new milk should make.

The rights will be tradable between suppliers so that farms that increasing supply can purchase from those that are exiting dairying or reducing their peak milk output. If the total amount of milk exceeds the total amount of peak rights (i.e. the Company milk supply is growing) then the company will issue more rights at $30 per litre. The reason the company is using rights instead of traditional shares is to reduce the risk of a "run" on the Company's capital.

The effect that these peak milk rights will have on the seasonal nature of the milk supply is unknown. The Company is yet to get shareholder approval and the on-farm effects have not been well studied. What is clear is that if a farmer is increasing his peak milk supply to the Dairy Company he/she will have to evaluate the merits of doing so in light of the considerable capital cost incurred.

Research Studies

Limited research work has been carried out in the area of seasonal milk supply or how it may be altered to be of advantage to the farmer, Dairy Company and/or the marketer. Some work has been undertaken by Dairy Companies, as illustrated above, but this has been primarily around how to alter payment to suppliers to reflect the changing costs and returns to the company through the season.

The three studies undertaken to determine whether farmers can profitably alter the shape of their supply curve and the price signals required to encourage these changes, all came to a similar conclusion. (P A Yuretich 1992, Blackwell LIC 1994, and Dairying Research Corporation DRC 1992). Unless the price signal was very large (2 or 3 times the price paid at the peak) then very little farm management changes could be affected to improve farm profitability.

Seasonal milk pricing is currently being restudied by New Zealand Dairy Group but with 6 to 8 years having past since the last major study the question is - has anything changed?

Case Study

Puketiro Farm

Case Study

Puketiro Farm

The objective of this brief case study is to ascertain what price would need to be paid to encourage one of our farms to consider changing there supply pattern.

The Farm
Puketiro Farm

Size	- 240 ha's
Cows	- 700
Altitude	- 400 metres
Current MS Production	- 200,000 kg's
Current Supply Curve	- see figure 2
Average annual pasture Production per ha	- 10,500 kg's DM

New Zealand Averages (Farm Statistic's LIC 1998)

Size	- 75 ha's
Cows	- 225
Current MS Production	- 64,000 kg's
Supply Curve (Company Average)	- see figure 1

The farm concerned has been in dairying for 8 seasons. It is in a high rainfall area (1900 mm per year) and is 400 meters AMSL. For the exercise an average production of 200,000 kg's of MS is assumed and profitability is based on the cost structure of the last 2 seasons and a milk price of $4 per kg of MS.

The on-farm variable costs and income are outlined below;

Milk Income	$800,000
Stock Income	$ 72,000
Other	$ 5,000
Total	$877,000
Wages	$110,000
Animal Health	$ 19,600
AB & HT	$ 15,000
Shed & Power	$ 21,000
Feed	$122,000
Hay/Silage etc	$ 15,000
Fertilizer	$ 75,000
Total Variable	$377,600

The general farming pattern has been similar over the last 8 seasons with calving starting in early to mid-August and the herd dry by late April or early May. Seasonal variation is not high but is greatest at the start of the season and again at the end (see figure 5). The variation described in the graph is the average deviation from across the 8 seasons. It is in this area of greatest variation that it would be reasonable to assume that a potential would exist for changing the farm management to maximise the benefit under a seasonal pricing system.

Pasture growth rates have been measured over most of the eight seasons and so an estimation of the feed supply and demand curves can be developed (see figure 4). Inputs into the current system are as follows;

Pasture eaten	10,300 kg's DM per Ha
Nitrogen	115 kg's of N per Ha
Maize Silage Brought	110,000 kg's DM
Grazing Off	200,000 kg's DM

Pricing Scenario

The current payment system for milk places no value on what time of the year the milk is supplied to the Dairy Company. For the case study a base price of $4 per kg of MS has been used.

For a seasonal price comparison a peak price of $2 for the months of October and November and a shoulder price of $4.90 per kg MS has been used. The total income from milk is unchanged if the milk curve is unchanged.

The changes in income through the year are as follows (also see figure 3);

Month	$4 Price	$2 Peak $4.90 Shoulder
August	$ 27,043	$ 33,116
September	$103,002	$126,134
October	$126,990	$ 63,495
November	$120,963	$ 60,481
December	$114,809	$140,593
January	$ 97,209	$119,040
February	$ 76,938	$ 94,217
March	$ 75,875	$ 92,915
April	$ 52,410	$ 64,181
May	$ 4,762	$ 5,832
Total	$800,000	$800,000

The benefit of the seasonal price is an extra $29,200 dollars in the spring and an extra $30,000 in the autumn (March, April and May). The disadvantage is a loss in the cash flow of $124,000 in the peak.

The real question here is what farm management options are available to the farm manager to take advantage of these price signals.

Firstly, two simple options were looked.

One is adding more Nitrogen fertilizer in early spring. Recent research from the DRC (Farmers Conference Proceeding 1996 to 1999) suggests that up to 200 kg's of Nitrogen can be used per ha per year without detrimental affects on the environment, without reaching a diminishing return or effecting long term farm sustainability.

Buying grain feeds during the spring and possibly the autumn to boost cow production during those times. Reponses to the grain is estimated from DRC trail work in the 1994 to 1997 seasons.

Two more complex systems were studied.

Shifting the calving date forward by 20 days to get more days' in-milk while the price is higher in early spring. Some milk was foregone in the peak (due to a shortage of feed) and drying-off was brought forward by 15 days.

Calve later, but milking later into the autumn to benefit from the higher milk price. The later calving was to compensate for the extra feed eaten in the autumn.

The Model looked at the changes in the feed budget for each scenario and also the resultant milk supply curve. From these outputs it is then possible to develop some estimates of the changes in milk income and farm costs.

Method used to capture seasonal pricing	Extra Dry Matter	Extra Value in Milk solids (12 kg's DM per Kg of MS)	Extra Costs	Positive net Benefit
More Spring Nitrogen	70,500 kg's of DM	$25,000	$7,500 plus extra cows	Yes
Purchased Grain Feeds	3 kg's DM per cow per day = 88,000 kg's DM	$32,500 worth of MS plus maybe some carryover benefits	$50,000 plus feeding costs	No
Calve 20 days earlier	117,500 kg's DM	Approx $98,000 Worth of MS	$80,000 of milk foregone and extra feed	Maybe
Milk Later into the Autumn	60,000 kg's DM	$24,500	Extra Autumn Feed $9,000	Yes

Discussion

Of the four options looked at two have some potential benefit. The simplest is to apply more urea up to the amount per ha that research suggests is an upper limit. The likely reason that urea is a variable option is due to the low cost feed that the urea generates. The cost per kg of DM for the urea option is approx 10 cents compared to the purchased grain option of 50 to 60 cents. It is worth noting that urea, as an input is economic without the addition of seasonal milk pricing.

The more complex method of trying to gain benefit on-farm from seasonal pricing is changing the calving date. The above example illustrated a benefit from milking into the winter, whereas an earlier calving date was a marginal gain at best but both these options are predicated with more risk. These risks include greater variations in spring and autumn production due to climatic conditions. The graph in figure 5 describes the variation at each end of the milk production season and a significant part of this is due to variable weather patterns.

As well as climatic risks, changes in calving date of the magnitude suggested in option 3, can be expensive to achieve on-farm especially if the change is required inside one or two seasons. This cost was not factored in but could add $5,000 extra cost in the first season as more cows would require veterinary help to have their calving shifted forward. Conversely, shifting the whole herds calving date back (as suggested in option 4) would save some normal on-farm cost in the first season perhaps of a smaller amount.

It is worth noting that anecdotal evidence from the Bay of Plenty winter milk farmers is that the more the farm moves away from a standard seasonal calving pattern the lower the total milk solids output for the year. To illustrate this, the farms that have moved from winter milk to seasonal milk total milk per farm per year have improved by 10 to 15%. It is difficult to determine whether this should be factored into any assessment of the costs and benefits of changing milk curves but if the calving dates were to be changed by large margins then some account would be required.

The option of buying in extra feed to improve the intake of the cows either by increasing the quantity or quality is highly unprofitable. This is due to the high price of purchased barley or maize grain in the local area. However this option might be profitable in areas of the country where the feed is available at reasonable cost.

The results of these four options compare with previous work carried out on seasonal milk pricing (DRC, Massey University). These studies and this one provide evidence that where feed can be sourced at very low prices it is profitable to include it in the farm system. However, where the feed source is cheap and reliable it will most likely be worth including with or without the addition incentive of seasonal milk pricing at the levels suggested above.

One possible long-term consequence of seasonal milk pricing is the influence that this might have on the National Bovine Breeding Objective (NBO). The NBO is the framework that LIC, some other dairy cow breeding companies, and NZ dairy farmers use to provide guidance for long term dairy cow breeding targets. These objectives are set from the economic weighing attached to the various components involved in breeding dairy cows. Those components that are of greater value (MS output or survivability) and are of greater heritability have a higher economic value. Currently the degree of genetic influence over the shape of a pasture fed dairy cows lactation curve are not well understood. But if some heritability exists then breeding cows with a milk curve that maximises any seasonal milk pricing might be possible.

Summary

Would it be wise to consider introducing seasonal milk pricing?

A number of points should be made to attempt to answer this.

1) The comparative advantage that New Zealand enjoys, as a milk producer in the world scene is it's low cost of production. This is driven almost exclusively from NZ's temperate climate and perennial ryegrass/clover pasture production. The distinctive difference between NZ and many other dairying nations is the significantly lower use of purchased feeds to feed cows. Purchased feeds are an expensive item to other dairy farmers and account for much of the difference between countries in the cost of milk production.

The problem with seasonally pricing milk so that incentives are provided to produce milk outside the supply curve derived from pasture growth is that it will probably add cost on farm. For a country competing for sales with milk products on price, with other nations, any move to add costs at a farm level should be very carefully examined.

2) The nature of a biological production system is that it is subject to a large number of variables, not all of which are controllable. The most common influence of milk production levels through the season on NZ dairy farms is the weather. In the example farm used the greatest variation in production from season to season was in spring and autumn. These two times are critical periods in the pasture based dairy system as much of the subsequent milk production is influenced by the pasture availability at during spring and autumn (especially the spring period). As a result of this any inputs or changes in farm management need large positive benefits to provide confidence of a repeated result. The options that offered a positive pay back in the example (Nitrogen and milking later into the autumn) would work even without seasonal milk pricing. In fact significant farm extension work has been carried out over the last 5 years in these areas without the possibility of extra milk prices during the shoulders of the season.

3) Past attempts by Dairy Company's to try and promote shoulder milk production have had limited success, if any at all.

4) Clearly there is some benefit in trying to flatten the NZ supply curve. These benefits would accrue mostly to the processing company and to a lesser extent to the marketer. Because the NZ dairy industry is currently co-operatively owned these benefits would be available to its members, the farmers. Where these benefits are easily identified they could possibly be passed back to the farmers who contribute the most to their creation. How large these monies would be is yet to be established.

The answer is probably no in light of the afore mentioned points, but what is clear is that more work should be undertaken in the following areas

- **Establish the cost/benefits to the dairy companies and the marketer.**
- **Undertake some more on-farm studies of the likely impacts of seasonal pricing on profitability at the farm level and the implications at the market level.**
- **Quantify whether the NZ dairy herd could be genetically altered over time to improve the shape of the lactation curve**

Figure 1

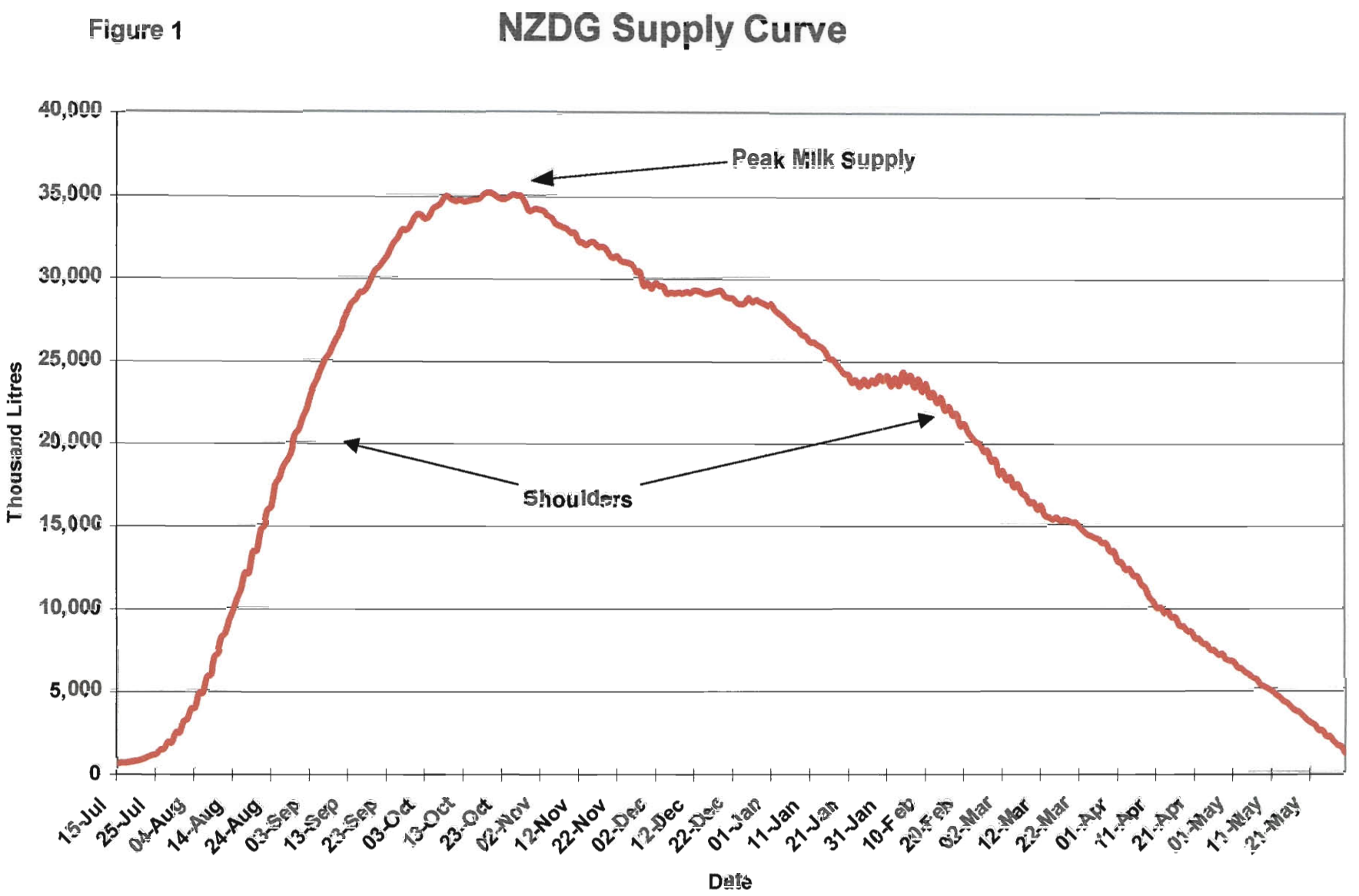
NZDG Supply Curve
Peak Milk Supply
Shoulders
Thousand Litres
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
15-Jul
25-Jul
04-Aug
14-Aug
24-Aug
03-Sep
13-Sep
23-Sep
03-Oct
13-Oct
23-Oct
02-Nov
12-Nov
22-Nov
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Figure 2

Taumata Road

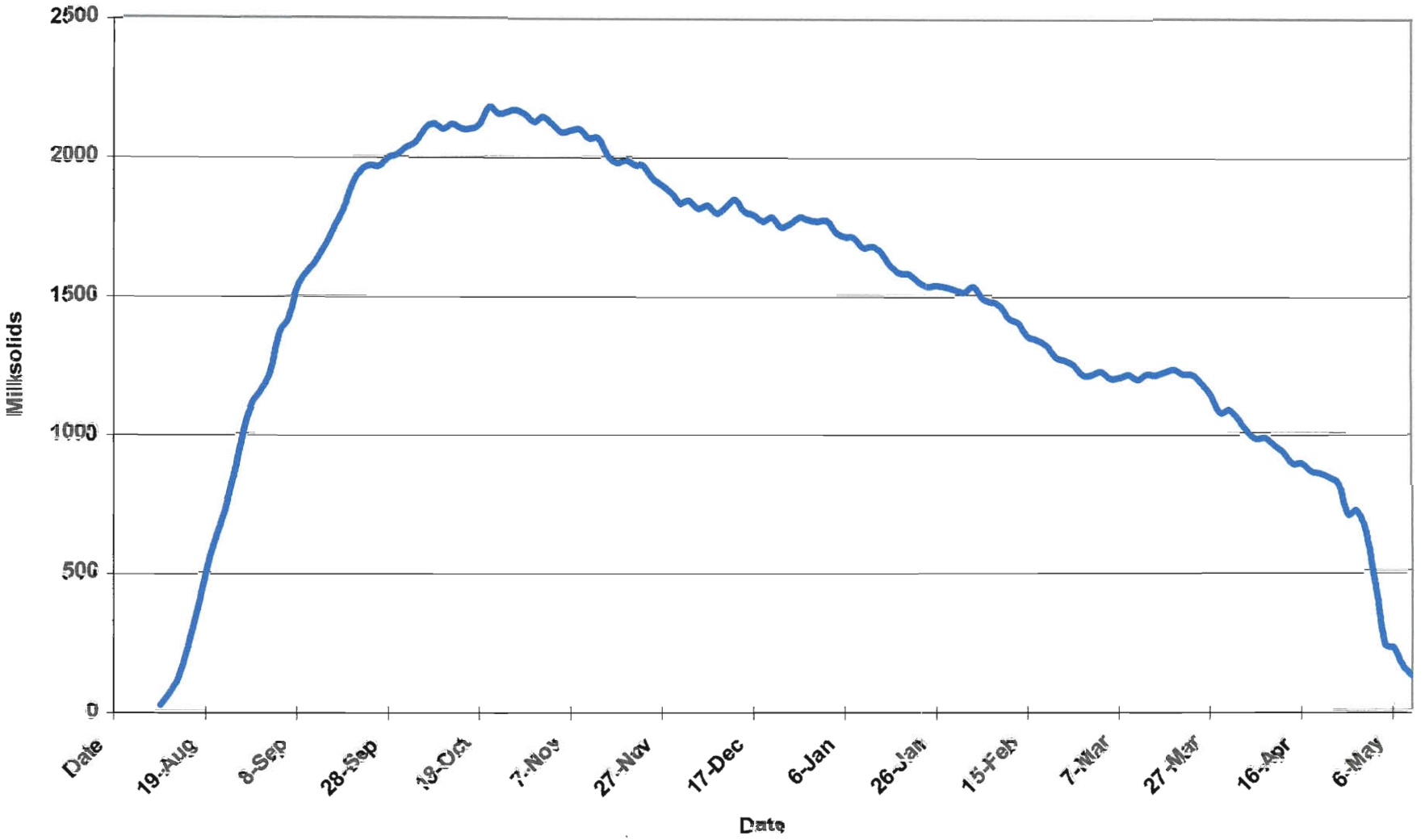


Figure 3

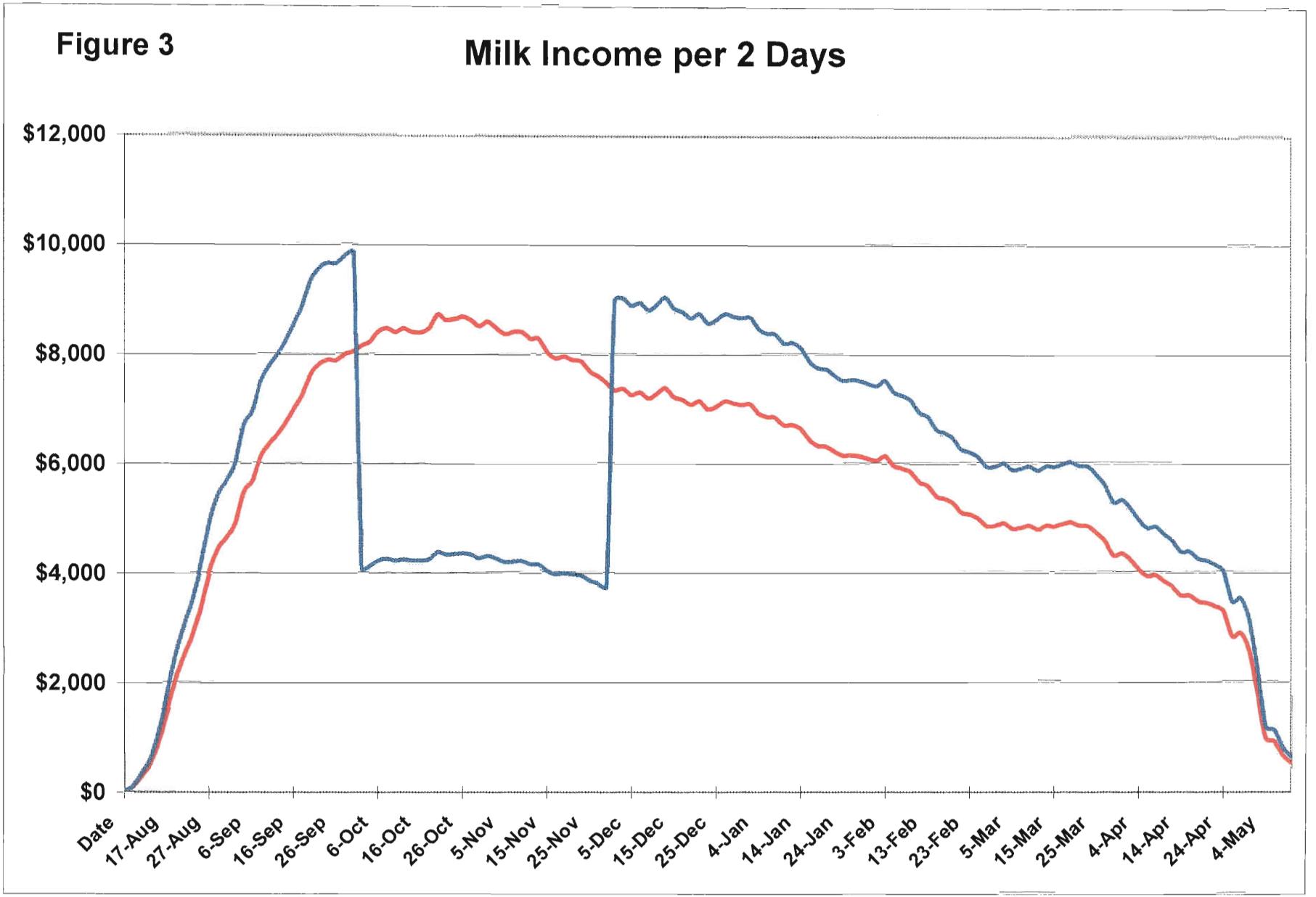

Milk Income per 2 Days
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Date
17-Aug
27-Aug
6-Sep
16-Sep
26-Sep
6-Oct
16-Oct
26-Oct
5-Nov
15-Nov
25-Nov
5-Dec
15-Dec
25-Dec
4-Jan
14-Jan
24-Jan
3-Feb
13-Feb
23-Feb
5-Mar
15-Mar
25-Mar
4-Apr
14-Apr
24-Apr
4-May

Figure 4

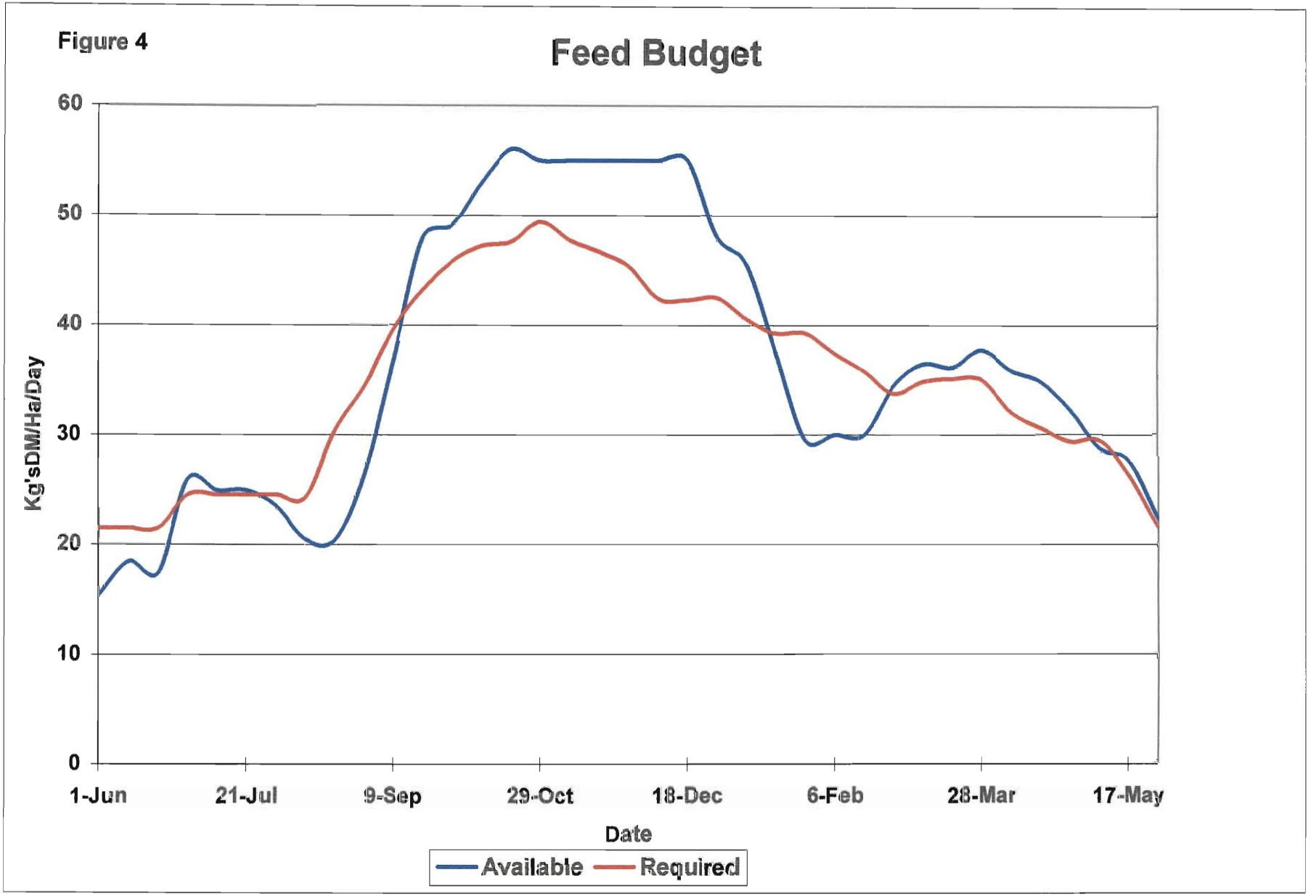
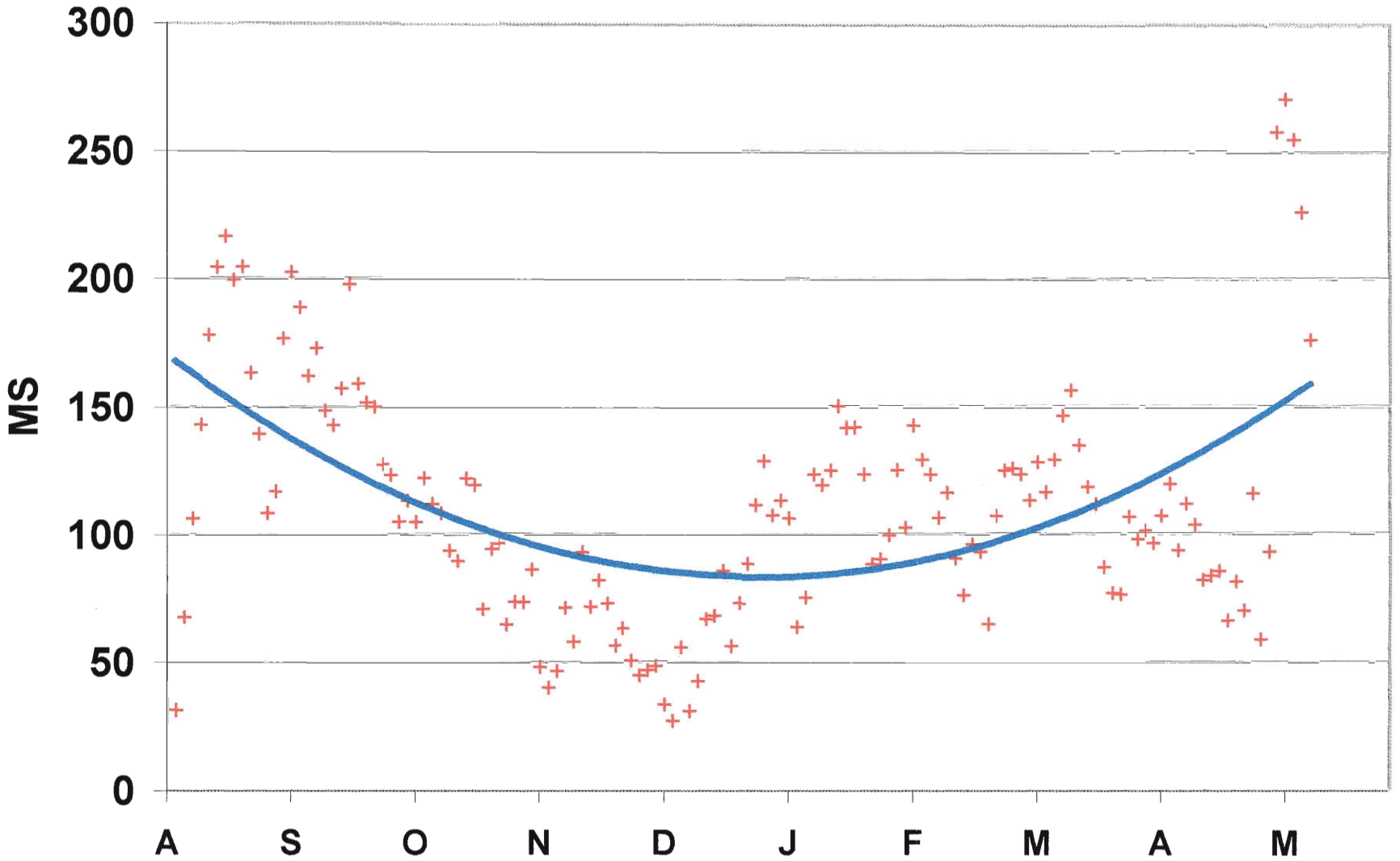

Feed Budget
60
50
40
30
20
10
0
Kg'sDM/Ha/Day
1-Jun
21-Jul
9-Sep
29-Oct
18-Dec
6-Feb
28-Mar
17-May
Date
Available
Required

Figure 5

Average Deviation



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