# The Nuffield Farming Scholarship Trust
# A Trehane Trust Award

**To study the profitability and management practises of different milk production systems.**

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**Table of Contents**

## 1.0 Introduction

At the time of undertaking this study in September 2002 I was the manager of Roden Estate in Shropshire and Weston Hall Estate in Cheshire.

My main area of responsibility was for 1250 cows producing 11 million litres of milk per annum.

The purpose of my study was to consider the profitability of different milk production systems and to understand the management practices which drive their success.

## 2.0 The Area and Aims of the Study

The area of particular interest is the contrast between high input intensive systems and lower input grazing systems. To undertake this study I chose to visit the USA, Australia and New Zealand.

The USA has a production system based to a large extent on a high input intensive model. In contrast the farms studied in New Zealand and Australia have systems based more around the utilisation of grazed grass and follow a less capital-intensive production system.

Within these areas I also aimed to find successful farmers who were operating different systems outside the normal boundaries. I therefore met and interviewed farmers operating high input high yielding herds in New Zealand and Australia and graziers in the USA. The overall objective was to find world-class dairy farmers who were operating successful production systems and to understand the reasons for their success.

To look simply at management practices is not sufficient to fully understand the reasons for the differences in systems. Therefore the first part of my report intends to give an understanding of the industry in the different countries.

In the second part of my report it has been my intention to relate many of my observations back to a UK perspective and I hope the reader will find the following report interesting, relevant and informative. It is also my intention to stimulate debate and I hope I am successful because without debate nothing changes.

## 3.0 The USA

The USA has 9.15 million dairy cows and produces over 74 billion litres of milk per year.

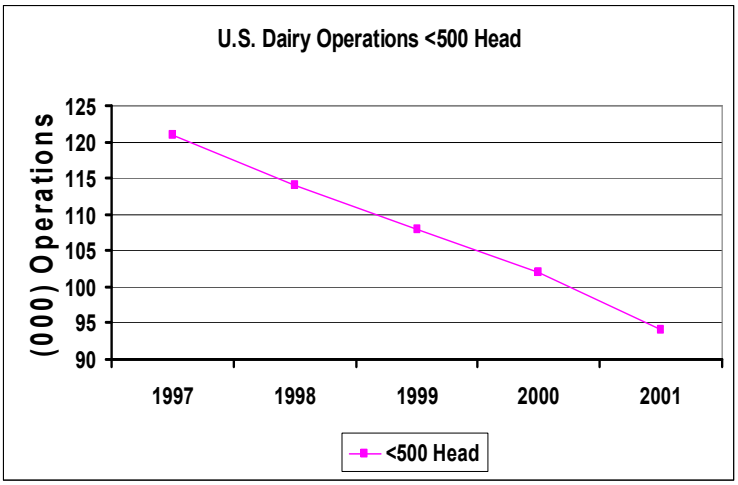
Two areas for study were chosen in the USA: Wisconsin in the north known as America's dairy land that until recently, with 1.28 million cows, was the largest milk producing state in the USA and California in the south west with 1.65 million cows that is now the most rapidly growing and greatest milk producing state.

The economic value of the dairy industry in both these states is highly significant providing employment directly and indirectly through the service industries.

### 3.1 The United States Dairy Industry.

Total milk production from the US dairy industry has steadily expanded and grown at a rate of between 1% and 3.5% per annum for most of the past 10 years. Over this period domestic consumption of dairy products in the USA has grown at a similar rate. This has created an environment with steadily increasing supply and demand where progressive producers have had the opportunity to expand and develop their businesses.

Since 1992 average production per cow has increased by 16% to a current US average of 8245 litres. Graph 1 below shows that herds over 500 cows have the highest yields per cow at 9273 litres per cow although these have remained relatively static over the period. The greatest increase in yield per cow has come from herds of less than 500 cows but the number of herds under 500 cows is steadily declining.




Graph 1: The decline in number of herd under 500 cows

However, the dairy herd ndustry by size of operation and location has changed significantly with production migrating to the southern and western states, in particular California, Idaho and New Mexico.

Large operators striving to increase their efficiency have increased their share of production. Dairy farms with more than 500 cows account for over 40 % of milk produced in 2002 compared to less than 25% in 1997.

### 3.2 Wisconsin

Wisconsin is situated in the upper Mid-West of the USA and is the largest producer of cheese and the second largest milk producing state. The traditional system of milk production in this area is the stanchion barn where cows are tethered.

Due to the inefficiency of this system there has been a rapid move towards free stall cubicle systems as farmers strive for more labour efficiency. Herd size has increased in an effort to maintain profitability, however over 50% of dairy cows are still in stanchion barn systems. (Photograph 1)

In the two years from 2000 to 2002 the average herd size has increased from 78 cows to 89 cows. However this is still small compared to southern states of the USA and reflects the fact that this area was originally settled by Europeans with a strong dairy heritage resulting in small family farms. Over this period the number of dairy herds has declined from 21,700 to 17,000 a reduction of 22%. The average milk yield per cow is 7,810kg.

Photograph 1: Typical Wisconsin stanchion barn.

Wisconsin is a net exporter of dairy livestock to the rest of the USA with over 110,000 cows and heifers sold in 2001. Over 7300 head were sold to California, 7,800 to Texas and 6,500 to New Mexico to assist expansion in these regions.

In contrast to California and other southern states, water is not an issue. Wisconsin is bordered by Lake Superior and Lake Michigan and the Mississippi river and in addition has 8,000 lakes and an average precipitation of 166.2 cm per year.

In Wisconsin the free-stall (cubicle) system is the one that most closely resembles the UK higher input systems with average farm size around 110 cows and many progressive farmers with herds in excess of 500 cows. Typically these cattle are housed in confinement systems all year with intensive management of rations at the feed barrier.

Interestingly the first farmer to milk 1000 cows in Wisconsin was a grazier. Despite the climatic disadvantages of the northern mid-west with winter temperatures below –30-centigrade intensive grazing systems are becoming more common. Analysis of financial data on 92 grazing farms in the great lakes region has provided a useful insight into the economics of this system.

These farms although utilising seasonal grazing have more in common with traditional UK summer grazing farms due to their need to winter house cattle. They are less comparable with New Zealand and Australian systems that do not require winter housing.

In general the majority of grazing herds are owner occupied and run by family labour. They typically graze from April or May until October or November and then winter house. Changes in the structure of the dairy industry are occurring due to a constantly increasing cost of producing milk while milk prices steadily decline in real terms.

Grazing is a system that with good management can reduce capital requirements and input costs and reduce the cost of milk production. It is also a system that can fit better with both business and family goals on owner occupied farm units due to lower labour requirement.

Confinement systems can also reduce fixed and variable costs by increasing milk volume but they are far more capital intensive. In a recent survey of the seasonal graziers surveyed 82% still milk the cows in a stanchion tie stall barn. Of these 94% of cattle are Holstein with the remainder being Jersey, Guernsey and Brown Swiss. (Photograph 2) Of farmers surveyed 98% feed grain and minerals through the season and 81% mechanically harvest surplus forage from the pastures.

It was also noticed that the majority of graziers have come from confinement style systems and carry a lot of infrastructure such as silos and barns that make valuable contributions to the needs of the herd but in most cases no financial value is placed on the asset. This is also a feature of many of the UK graziers who have their origins in more intensive systems.

Due to the lack of winter hardiness of perennial ryegrass it has not proved successful in the Wisconsin dairy systems and quality pastures are composed of temperate grasses such as cocksfoot, fescues, blue grass and legumes.

Photograph 2: Brown Swiss cross cattle on a Wisconsin grazing system.

### 3.3 California

Californian milk production has increased by 21 % from 1997 to 2002 to a total of over 15 billion litres p.a. The number of cows in the state has increased by 14% over the same period. In 2001 the dairy industry and milk products contributed £2.25 billion dollars to the Californian economy.

The reasons for the increase in production have been a more favourable climate, access to cheaper feeds, good management expertise and an expanding dairy processing industry offering good prices.

It is expected that Californian milk processing capacity will continue to expand to take advantage of the increasing milk supply. Hilmar Cheese Company in northern California is starting expansion plans, Leprino Foods is completing construction of a Cheese Plant in Lemoore and a Mozzarella plant operated by Cheese and Protein International has recently opened in Tulare.

The historic structure of the Californian industry has its roots in feedlot dairy systems in the Chino basin area near Los Angeles. This has meant that the system approach to large-scale operations milking in excess of 1000 cows has become well established. Therefore the management skills necessary to expand production with increasing farm size have been readily available.

The incentive to move and expand out of the Chino Valley has come from the increase in pressure from urban development as Los Angeles has expanded and competed for the essential resources of land and water. This has provided capital

for both expansion and relocation. Development land from the sale of feedlots has provided “windfall profits” of up to $500,000 per acre.

Many of the relocated dairies have moved north into the dry land areas between Bakersfield and Fresno where the supply of land has not limited expansion of the dairy business. Here ample water is pumped from ground water aquifers to provide irrigation to grow forage crops.

Until recently Californian local county authorities particularly in Tulare, Kings, Madera, Fresno and Kern Counties have been extremely supportive of these businesses. They have allowed permits and permission for developments of dairies up to and in excess of 10,000 cows on individual sites.

Infrastructure such as roads and other services have been provided, however in the past few years concerns over the environmental impact of these “super dairies” has started to limit their development. Tulare County has not issued a new dairy permit for three years but expansion has continued as producers have grown on existing dairy permits. In Madera county milk production rose 45% between 1998 and 2002.

### 3.4 The Californian system

The Chino Basin is the historic heartland of the south Californian dairy industry. The feedlot systems in this area were initially encouraged 30 years ago to feed the demand fuelled by the rapid expansion and population growth of Los Angeles. Many of the early feedlots were built using public funding from the local county and initially leased to dairy farmers who subsequently purchased them and became owner operators.

Virtually all cattle feed here is purchased due to little or no feed production near the feedlots. The main forage source has been alfalfa hay that is purchased from arable farms and transported onto farm by trucks. The concentrate feeds are cottonseed, maize corn, canola (rape seed) and Soya. In addition to these feeds, products such as brewer’s grains are used and waste by products such as bread and cotton hulls are also fed.

Buildings for housing cattle have not been necessary although sunshades are provided to reduce heat stress in the summer. This is a major problem particularly for breeding cows. However, under El Nino conditions very heavy rain can also be a problem making corals unmanageable in certain years.

The manure generated from the cattle corals is transported back to arable farms at a cost to the feedlot.

Most of these units have been family owned and operated with any employed labour being largely Hispanic in origin. Cows are milked through twin or double parlours that vary in size according to the unit but are either herringbone or parallel configuration often with rapid exit systems.

California produces 20% of US milk production and in 2002 nearly 25% of California’s milk came from Tulare County. From the Chino Basin to Tulare

County is a geographically convenient move for dairy producers to relocate and expand.

The producers in Tulare County still operate dry land feedlot style systems but are housing cattle in simple free stall barns using cubicle houses to reduce the problems associated with cattle management. (Photograph 3) The main areas of concern are extremely hot or wet weather conditions.

Where traditionally the Chino dairies have produced little or no home grown feed, the newly relocated farms are purchasing land and improving both efficiency and self-sufficiency by growing their own feed and forage crops. This includes alfalfa hay and forage maize as well as cotton and corn maize. The very low rainfall in this dry land area means that all the land relies on irrigation to produce crops.

The majority of this land is laser levelled and irrigated using flood systems and is highly productive producing exceptional forage maize crop yields of up to 35 tonne per acre (100t /ha) at over 30% dry matter.

The average size dairy unit in this area is 1,215 cows producing 10,168 litres per cow. Cubicle sheds are built with flood wash systems to clean passages and walk ways. This water is then separated from the solids and pumped into holding lagoons for flood irrigation onto cropping land as a fertiliser. The solids that are separated are dried and composted for 8 to 10 weeks and then reused as a cubicle bedding material, used as a fertiliser or sold. This creates a system that is extremely efficient in the recycling and utilisation of resources

Photograph 3: Housed cattle on a dry land feedlot in Tulare County.

Most of these units remain family owned but due to their extreme size operate with a lot of employed labour. Many units still milk through twin or double parlours as in the Chino basin, however rotary parlours of up to 80 points are

becoming the favoured option due to their efficiency and throughput for large numbers of cows. (Photograph4)

Photograph 4: Milking on an 80 point Westphalia external rotary parlour.

### 3.5 Performance of high yielding herds

What are the highest performing cows in US herds achieving?

The following results (Table 1) were produced from a survey of high producing herds in Washington State and illustrate the production potential of the high yielding Holstein cow (Mean rolling yield 12727litres per cow per year using BST)

| Herd Size. Cow Nos. | Number of cows in test | Milk Yield kg/day in test | Rolling Herd Yield (kg) pa | Dry Matter Intake (kg) | Dry Matter Intake (%) Body Wt. | NDF % | Forage to Conc ratio (DM) | Crude Protein % |
|---|---|---|---|---|---|---|---|---|
| 600 | 58 | 49.4 | 12727 | 25.68 | 3.89 | 30.6 | 39:61 | 18.5 |
| 582 | 80 | 46.32 | 13147 | 25.5 | 3.88 | 34.5 | 43:57 | 17.8 |
| 382 | 119 | 50.45 | 14188 | 26.5 | 4.39 | 35.6 | 43:57 | 18.7 |
| 535 | 109 | 49 | 13740 | 25 | 3.73 | 35.4 | 43:57 | 18.5 |
| 386 | 87 | 48.9 | 12995 | 22.77 | 3.46 | 35 | 40:60 | 21.6 |
| 1398 | 128 | 45.45 | 13090 | 27 | 4.18 | 34.3 | 43:57 | 17.8 |
| 785 | 98 | 41.63 | 12774 | 26.72 | 4 | 33.6 | 41:59 | 19.7 |

Table 1: High Yielding herds performance.

The highest yielding herd milks 4 times per day with a daily average 50.45 kg milk yield per cow in milk during the test. High levels of milk production can be

achieved with these very high dry matter (DM) intakes due largely to the good quality high DM of the forages available.

However the highest DM intake at these levels does not necessarily mean the highest yield and this is due to other factors such as the physical effectiveness of the neutral detergent fibre (NDF) part of the ration and the balance of protein, sugar and starch.

This shows the extreme levels of production that are achievable with the best fed herds but it does not give any indication of the other essential elements of profitable milk production i.e. is the cow able to breed and retain fertility at these extreme levels of production. Feeding for the highest level of production will not necessarily result in the greatest profit if cows are unable to breed effectively due to negative energy balance and heat stress.

The table in Appendix 1 shows the estimated costs of milk production in costs per litre of different systems of milk production in the USA.

**4.0 New Zealand**

The New Zealand dairy industry punches way above its weight in the world market due to the fact that 95% of what it produces is for export. Direct agriculture GDP represents 8% of New Zealand's total GDP and the dairy industry is a major export earner for the economy. In the words of a Director of Fonterra, "if agriculture sneezes the whole New Zealand economy catches a cold".

In New Zealand I visited dairy farms from the Waikato to Taranaki and Hawke Bay in North Island and from Central Otago to Invercargill in the South Island.

New Zealand milk producers share many common factors. They have low fixed cost bases due largely to the fact they do not house cattle and winter store large quantities of feed.

They have a low milk price that reflects world prices, at around 9 to 11 pence per litre. They feed predominantly grazed forage and tend to be block calving.

They have a flexible response to milk price in terms of variable costs. With high milk price at a UK equivalent of 13-14p per litre they will increase stocking rates feed more purchased feeds and use more fertiliser to maximise and benefit from increased output. If the milk price drops to a UK equivalent of 9-10 p per litre they will reduce stocking rates and "regress" to a more extensive and less intense system. Appendix 2 shows estimated production costs in New Zealand.

It is possible to do this largely for the reason that they operate very low fixed cost systems that mean as prices fall they tend to reduce the variable cost part of their operating costs.

They operate simple systems that the most successful farmers have replicated to expand and grow their businesses. The movement of entrepreneurial dairy farmers from North to South Island has resulted in an increase in milk production

on the South Island in previously undeveloped dairy areas particularly in Southland.

The growth of the capital base of these businesses has been remarkable where buying low cost farms and converting them to efficient milk production have achieved increases in asset value. This increase in the farms asset value has often been more profitable in real terms than the improvement in production potential.

One highly successful dairy farmer claimed to have grown equity in his business by 40% per year over 20 years from his start in the industry as a share milker to his present ownership and equity share in several successful dairy businesses.

## 5.0 Australia

Australia's dairy industry has a volatile history with large swings in levels of production linked to world market prices and currency fluctuations. It has a relatively large domestic market compared to New Zealand and access to a rapidly developing and potentially lucrative market in the Far East.

As with New Zealand, the USA and the UK, the number of dairy farms has historically followed a steadily declining trend. However in recent years this decline has slowed significantly and is now almost static.

In terms of total production, despite the volatility of the 80s and 90s, the more recent general trend has been towards increasing production as a result of both increasing cow numbers and average production on a per cow basis. Average production per farm in 2001 was just over 900,000 litres.

New South Wales and Queensland produce more milk for domestic consumption and variations in production have been less influenced by world markets. However Victoria produces almost 60% of Australia's total dairy production and produces the most manufactured milk. This is the area in which I based my study. (Photograph 5)

Milk production in Victoria is in many ways similar to the New Zealand model with the difference being in most years they have access to cheap grain feed because Australia is usually a net exporter of cereals. As a result of this greater level of grain feeding yields per cow tend to be higher. However it must be noted that at the time of writing Australia, due to the drought situation in 2002 has recently been a net importer of grain.

Appendix 2 shows estimated production costs in Australia. It can be seen that the costs of production in pence per litre for the well managed Australian dairy farm are the lowest of any of the cost compared with other systems.

In a good year with a high world price of milk products the Australian producer can achieve high levels of net farm income and high returns on capital invested. However the volatile nature of the milk market means that there remains a high

probability that even the best producers will struggle to remain in profit when world prices drop.

Photograph 5: Milking facility with feed bins and flood wash system in Victoria

## 6.0 The Technology Treadmill.

Many producers on high input capital-intensive systems in the UK and the USA have the same solution for two different scenarios.

When the milk price is high they produce more, the aim being to increase profitability by increasing cow numbers or by increasing yield by adopting new techniques or technology to spread production costs.

In the USA, BST, genetically modified crops and the steadily increasing size of dairy units have all contributed to improve efficiency of production and lower unit costs. However they have also resulted in an increased milk supply. If there is not a corresponding increase in demand this in turn leads to lower prices.

As the milk price falls due to increasing supply the producer with a high fixed cost base attempts to maintain profitability on a capital-intensive business by increasing volume of production to dilute fixed costs. This continued pressure on supply ultimately results in lower farm incomes and inefficient producers leave the industry.

Those people who are first to adopt more efficient techniques and technology initially enjoy a brief period of advantage. However as more farmers adopt the technique to maintain income the advantage fades. Due to the fact that farmers have little or no power when negotiating price the advantage of improved

efficiency quickly migrates up the food chain to the processor, retailer and ultimately the consumer.

Power in the market place is desirable; if farmers have better bargaining power they can hold onto the advantage for longer. In a global commodity market for milk, farmers are small fry in a large ocean and near the bottom of the food chain. They compete with much bigger fish for a share of the consumer purchase price. In the UK if dairy farmers held the same power in the market place as the big five major retailers it would be the processors being pressurised and forced to improve efficiency.

It would be naive to think that a similar situation does not exist to some extent in Australia and New Zealand; however there is a fundamental difference.

Due to the relative simplicity and the very low fixed cost base of their systems, they have the option to regress back to a lower cost production system as the milk price falls. The fact that they do not need to house cattle due to their climate gives them a huge advantage because their systems are less capital intensive.

During periods of higher milk price Australian and New Zealand Farmers will increase production by increasing stocking rates and spending more money on feed and fertiliser to supplement grazing. However if the price drops and the advantage of additional feeding declines, the producer who has not increased his fixed costs can regress back to a grazing system with a lower stocking rate. This process of regression balances the supply and demand situation better in a kind of “dynamic equilibrium.”

Another advantage of the Australian and New Zealand systems is that because they have adopted simple uncomplicated non capital-intensive systems they are easy to repeat and manage successfully.

## 7.0 The mind set and environment for dairy farming success

Throughout the countries visited the “family” business is the mainstay of many successful dairy farms. As I travelled I met interviewed and enjoyed the hospitality of husband and wife teams who were running large successful farming businesses. Very often the wife as well as making an important contribution to the physical management of the farm was the main bookkeeper, financial manager and administrator and involved in all business planning decisions.

The strength of this family commitment to the business where all pull together is a main reason for the success of these businesses and suggests a degree of truth in the old adage “behind every successful man there is a good woman”. Another interesting observation was the strength of certain groups of farmers. It was noticeable how influential and successful in many dairy areas the people of Dutch ancestry have been with their strong sense of family values and work ethic.

To quote from one New Zealand dairy farmer, “There is nothing like a big overdraft and mortgage to motivate success”. The pressure that drives many dairy farmers is the absolute need to succeed and the fear of failure.

New entrants into the industry, particularly if they carry big borrowings can often be at the leading edge of innovation and be the most successful. Their lack of baggage in terms of what can or can't be done often allows them to push the boundaries in a system. The New Zealand Westpac Trust & NZMP dairy farmer of the year 2002 was an ex truck driver!

**8.0 Nutritional Management.**

Regardless of the system the nutritional management of the dairy cow is fundamental to ensuring optimum profitability. The single most important factor affecting milk yield in a healthy cow is dry matter intake and there is a direct link to cow health and fertility. This rule remains equally true for intensive feedlot systems or extensive grazing systems.

**9.0 Nutritional Management of Confinement Systems.**

On well-managed confinement systems feed management is geared to maximise DMI with attention to detail at every stage of the feeding process.

On a 2800 cow farm in California there were three separate barns for different grades of alfalfa hay that was graded according to quality. The feeder wagon weigh cells were linked directly to a radio transmitter that enabled the manager to observe on the office computer the feeding process to assess its accuracy and efficiency. (Photograph 6) At the end of each day a report could be printed which allowed an analysis of the days feeding with an error report accurate to + or - 1%

Photograph 6: Feed wagon weigh cells linked to a radio transmitter.

The majority of confinement system herds were feeding total mixed rations with minimum dry mater levels at 45% and the typical range between 50% and 60%. Badly mixed rations were rarely seen and auger wagons appeared to be preferred to paddle wagons due to their better mix consistency.

On the majority of farms I visited, cows were fed once a day. However where feeding on the biggest herd was virtually a full time job the highest yielding early lactation groups were fed twice per day to further stimulate appetite and voluntary food intake.

The quality of forages presented to cows was of a consistency and quality that we in the UK can rarely achieve. The dryer and more predictable climate allows them to consistently make high quality high dry matter forages such as maize, lucerne, grass silage and hay.

Considerable importance is placed on the correct function of the rumen and on several farms visited the physical nature of the diet is analysed to optimise performance. The size of chop on forages is important and feed samples are sieved and the proportion of the mix at different sieve sizes calculated to an optimum level.

Particle size, particularly the availability of long fibre is considered important. Long fibre assists rumen function and prevents displaced abomasums that are a major concern on high concentrate diets. On some farms dung samples are also washed sieved and analysed to ensure that feed is not passing through undigested. It is worth noting that on the high input feedlot systems displaced abomasums are a major problem particularly during periods of heat stress when falling dry matter intake considerably increased the risk.

Management of the transition cow on most farms was considered highly important. Generally the view was held that high DMI pre calving ensured higher DMI post calving. Keeping the rumen full and stretched during the dry period and ensuring the cow was properly rehydrated and fed quickly post calving were considered essential for high milk yields.

The period immediately post calving for the high yielding cow was also taken seriously with a lot of management time and attention given to this area. The general consensus was that it was worth 500 to 1000 litres per cow over the lactation if this period was managed correctly.

All the farms visited had a post calving “special treatment “area where cows were kept for close observation for 5 to 10 days post calving. Great importance was placed on taking cows temperatures and monitoring health and feed intake during this period. Because many of the cows were head yoked at feeding it was relatively easy to handle and restrain cattle for these purposes.

**10.0 Nutritional Management of Grazing Systems**

There is to some extent a UK view held that the nutritional management of a grazing system is an easier option. You just open the gate and let them graze. However the quantification and utilisation of the grazing element of a cow’s diet requires a high degree of specialist skill and knowledge. Much of the research and development funding in the NZ dairy industry has focused on a greater understanding of this process.

The New Zealanders have developed and refined the grazing system to maximise the production and utilisation of grass. They aim for well-managed highly productive pastures that allow the cow to graze and maximise her dry matter intake. The assessment of available feed and the prediction of future feed drive the management of the system.
The constant strive to “get the system right” requires regular measuring and assessment of grass growth to allow adjustments to grazing intervals, stocking rates and fertiliser rates to avoid nutrient limitations for the cow. The aim is to feed the cow to its productive and reproductive potential for the maximum number of days possible.
Measurement and monitoring of the production and utilisation of grass is fundamental to the success of this system. The conservation of grass is used as a means of managing surpluses and deficits through the season.
Well-managed pastures avoid pasture damage through “poaching” because this will reduce yield potential by between 30-60% for up to a year after the event. This is achieved through well-managed well fenced and well laid out paddock systems with good track access.
Flexible grazing rotations allow them to optimise grass growth and production. By grazing grass too low (i.e. below 1250 kg DM ha) or too long (i.e. above 2900 kg DM ha) it is possible to be losing up to 40% of growth potential during the season. The best managers on good farms may be achieving up to 14,000 kg DM per hectare per year. The ability to grow and utilise this grass is a key driver to profit.

## 11.0 Fertility Management of the High Yielding Herd

This was the “Achilles Heel” of the large herd USA confinement dairy systems. There appeared to be, in many situations, a direct link between larger herd size and poorer herd fertility.

One of the underlying factors that result in poor fertility is a very high milk yield resulting in prolonged negative energy balance and weight loss for the cow in early lactation. This is particularly true of those farms that use BST to stimulate milk yield.

Other causes of infertility are heat stress, lameness, diseases such as Johnnes and BVD and metabolic stress caused by poor nutrition resulting in poor health and subsequent fertility problems.

The smaller herds of the upper Mid West generated surplus heifers and were able to sell them. The large expanding herds in California and the other southern and western states were net importers of breeding cattle and had very high herd replacement rates of up to 35% to 40 %.

This was not simply due to the increase in herd size in recent years. The main reason for high replacement rates was poor fertility and cows leaving the herds as barren. This high replacement rate also results in high heifer value of around £1000 per head for average commercial heifers.

As herds increased in size the problems of breeding management became more serious. However many large herds often delegate herd fertility to breeding companies who would have technicians visiting the herd daily identifying cows in oestrous by tail painting and the use of breeding records. It could be argued that breeding companies have a vested interest in high culling rates and low fertility because it means they sell more semen.

These visits even on large herds of up to 2,000 cows would rarely exceed two hours and little if any emphasis was placed on observed heats such as cows mounting. The detection of cows on heat was therefore generally poor and pregnancy rates were also low and typically varied between 10 and 20%.

Although this was a problem on many herds there were several farms visited where considerable emphasis was put on excellent breeding management. People were well trained motivated and encouraged to observe and detect natural oestrous. (Photograph 7) This system when used with tail paint breeding records and head locks proved to be an effective way of managing large number of cows.

Photograph 7: Headlock restraint and Artificial Insemination. (Chino California)

In herds where breeding was under the direct daily control of the “primary manager” or owner generally heat detection and fertility were better. On several herds a bonus scheme was in place where employees would get a $5 bonus for positively identifying a cow in heat resulting in a service.

On large herds there was also considerable emphasis on the use of artificial breeding programmes such as Pre-sync and Ov-sync programmes.

## 12.0 Herd Replacement Rates and Fertility

In the UK it is a well-documented fact that dairy cow fertility has been in steady decline in recent years, possibly by as much as 1% per annum. I believe that a similar trend exists with the high yielding systems in the USA. In the high yielding high input management systems the financial cost of poor fertility is often not fully understood or appreciated. This is true of both the USA and the UK.

With high yielding cows the direct cost of delayed fertility can be reduced with extended calving intervals because of high productive performance. However the reduction in fertility and the consequential losses of fewer young stock and the costs associated with purchasing replacements is a major influence on profitability.

In the feedlots of the US high replacement rates of 35% and upto and exceeding 40% are not uncommon and these farmers rely heavily on an availability of young stock for purchase from other areas to continue this system. These replacements are at a considerable financial “cash” expense to the business.

The underlying fact that they cannot breed replacements quick enough to match the culling rate must mean that ultimately they may be unsustainable and this can certainly have an influence on the growth of these systems. Their failure to maintain a closed herd by breeding their own replacements also makes them vulnerable to disease and can in turn further compromise herd fertility.

In New Zealand and Australia the generating of surplus stock has long been a main factor in the growth and success of the share milking system. Capable mangers with low replacement rates and good fertility performance can quickly generate surplus young stock which increases their net worth and allows them to grow their business.

The rigid disciplines of block calving essential for efficient seasonal grazing means that over the years cows that have failed to conceive on these systems have been culled from the herds.

This process has tended to improve overall herd fertility and “empty rates” as low as 4 to 5 % are achievable and not uncommon on these systems. However success in reproductive performance has no doubt been at the expense of production performance in terms of overall yield.

## 13.0 Cross breeding and Herd Management

There has been considerable renewed interest in recent times in the UK and in the places visited in cross breeding. This has been for several reasons. There is a commonly held perception that the high yielding high genetic merit Holstein dairy cow is becoming too finely bred and lacks the desirable health and fertility traits to stand up to the demands of modern production systems.

The emphasis on breeding for highly heritable and economically desirable production traits has in many herds meant that the ability of the cow to achieve

high production yields has exceeded the manager's ability to achieve successful nutrition and fertility management of these animals.

High genetic merit Holstein cows are almost always high maintenance cows requiring the very best of management to consistently achieve success in the expensive high input systems. They are the Olympic athletes of the dairy industry.

The interest in crossbreeding to achieve the benefits of hybrid vigour was seen in all the areas visited. In Wisconsin a grazier with 1200 cows was crossbreeding all his animals with Brown Swiss to improve their health and fertility traits and winter hardiness.

A renowned breeder of Holstein bulls managing a feedlot system in the Chino Valley in California was experimenting with 160 of his own cross-bred Jerseys on his 1800 cow herd. They were block calved and nearing the end of their first lactation.

He stated that production performance on an identical system was approximately 1.25 litres per day lower than their Holstein pier group. However better milk composition meant they achieved a higher milk price, and their feet, general health and reproductive performance was considerably better than the Holsteins. He intended to continue crossbreeding particularly on his poorer genetic merit cows with health and fertility problems.

Where block calving on a 12-month pattern is essential as with the New Zealand grazing systems the easiest breeding solution particularly on large herds is crossbreeds. They tend to be lower maintenance cows, easier calving with fewer feet and udder problems and have better fertility.

In New Zealand it was common practice for herdsmen with large numbers of cattle, sometimes serving up to 40 animals a day to make their daily breeding decision on the basis of "how black or brown is the animal". With an AI flask of well proven Jersey and Friesian semen, the blacker animals were served to Jersey and the lighter coloured to Friesian. The risk of inbreeding was low and the length of time required to make breeding decisions was minimal.

Despite the fact that Victoria relies heavily on the grazing system to produce milk the incidence of crossbreeding was much lower. The majority of cattle were bred to Holstein. I believe one of the key reasons for this was that the availability of cheap grain and the willingness of dairy farmers to feed it when the milk to grain price ratio was favourable.

This meant that they could feed these higher genetic merit cows to a higher nutritional specification than the graziers in New Zealand who rely almost entirely on grass. The feeding of grain on the milking platform effectively prevented the energy deficit that higher yielding cows commonly experience on pasture-based systems.

Another noticeable feature of the Holstein cows grazing in Victoria was the absence of major feet problems that are a common problem of top Holstein

genetics in the UK and the USA. I concluded that their better foot health was probably due to several factors.

The animals walk considerable distances daily to pasture and effectively trimmed their own feet. The all year round grazing meant there were no extended periods when animals were forced to stand in slurry or on deep-bedded yards at any time in their lives as calves or mature animals. The feeding of high protein “hot rations” was not practised, and nutritionally induced foot problems seen in the UK often a result of feeding acidic grass silage was not an issue.

## 14.0 Co-operation

“The only way you can get two UK dairy farmers to sit in the same room and fully co-operate is to shoot one of them.” (Anon)

In New Zealand and parts of Europe, successful farm co-operation is deeply ingrained into the psyche of dairy farmers. This has come only with the success of a strong co-operatively owned processing industry.

In the words of one director of a highly successful New Zealand sheep meat marketing and processing co-operative UK farmers have not co-operated;

“Because things in the UK are still not bad enough”

He went on to state that successful co-operation in his business had only come about as a result of an absolute economic necessity. The rules of the co-op had also been enforced with absolute integrity, discipline and commitment from all members. This enforcement was to the point of immediately expelling members from the co-op for any breach of the rules. This applied to all members of the co-op including the directors.

The UK desperately needs the existing producer co-operatives to be successful. It is essential in my opinion that strong successful supply co-operatives balance the see saw of the supply chain against the weight of the big supermarkets.

At the present time the ineffective bargaining power of the farmer selling his milk has permitted the processor in the middle to maintain his margin by reducing milk price. It is my opinion that compared to the USA and New Zealand the UK processing industry is relatively inefficient often working out of outdated and inefficient premises while the more modern plants are often under-utilised in terms of their operating efficiency.

The ability to keep farm prices low has meant that processors have not needed to improve their operating efficiencies to maintain margins. If the farmers held the same power in the market place as the retailers it would be the processor being forced to improve efficiency or manage on lower profit margins.

## 15.0 Investment and Dairy Land Value

A major reason for investment and the expansion of dairy operations in many parts of the world is that land remains a good long-term investment.

This is particularly true when further investment in infrastructure can significantly increase the land's asset value over and above the cost of the infrastructure investment. This has been the recent trend in parts of California in the USA, Victoria in Australia and Southland New Zealand.

In many situations the majority of the wealth created for farmers in the medium and long term has not been from trading profits of milk production, but from rises in the asset value of their land and infrastructure investment. The production of profitable milk has merely been a means of financing the process of growth and development.

**16.0 Staffing Issues**

When asked where in the USA are the most profitable dairy businesses the answer given by a senior agricultural accountant was simply "wherever the best manager is."

Management will always be the single most important factor in business success. Well-motivated well-trained farmers and farm managers with a financial "invested" interest in the success of the business are often drivers of success in the best dairy businesses. In New Zealand the "share milker" system is an example of this.

From my experience of travelling and visiting many dairy farms across the world it became apparent within a few minutes of arriving on a unit and having the opportunity to see the cows and meet the people that there was a direct correlation between the people's enthusiasm and cheerfulness and the health and productiveness of the herd.

What makes a good manager or a good employee?

Employees respond to the philosophy of "look after the business and the business will look after you". This needs to be regularly demonstrated through career progression or perks such as good facilities and where employees are regularly consulted and made a part of the business decision-making process.

Managers who look after their people get the payback in productive performance.

On one 1300 cow unit in Wisconsin lunch was cooked for all the staff every Thursday and everyone sat together over a meal and discussed the business. The importance of open and direct quality communication with staff was viewed as crucial to their business success.

The calendar in the same farm office was marked with significant dates such as employee birthdays and anniversaries of each year's service and letters of thanks and congratulation were sent to staff. Despite the problems of employee recruitment in Wisconsin this farm actually claimed to have a waiting list of people wanting to work for them.

On big herds the importance of building a good team spirit by playing to the strengths of individuals must be stressed. One manager likened it to a Football

team where you have your attackers, your defenders, and a reserve team waiting to take the field.

It was the opinion of several people that businesses end up “with the staff they deserve”, and one farmer told me that he worked hard to look after his people because “it was the people that looked after him.”

**17.0 Welfare Standards**

Cheap milk production is not always consistent with what many UK farmers or consumers would consider as “good farming practice.” It is not always “nice to look at”. The sight of cattle outside on a cold wet winter day does not inspire the consumer with confidence anymore than the sight of a fresh calved cow being pumped full of fluids intravenously. (A practice seen on high yielding USA herds) To many consumers, and all too often a vocal minority, these “perceived” welfare issues could be a major driver of public opinion.

However, it is fair to say from my study, it is almost always possible to play the welfare card and it does not matter if you are on a feedlot in the USA or a grazing farm in New Zealand.

As farmers we must be aware of these issues and always seek to operate in a way that educates and also minimises public and consumer concern in these areas. As an observation I would say that the UK is probably much further advanced on these issues than the countries visited.

**18.0 The Environment**

Increasingly we are also expected to operate in a way that conserves and enhances the landscape in which we operate, by the avoidance of pollution of water, air and soil and by the enhancement of the natural fauna and flora.

With the proposed changes to the Common Agricultural Policy (CAP) and the introduction of the Mid Term Review (MTR) reforms, the importance of reducing environmental impacts and promoting sustainability in dairy production will gain increasing emphasis for UK farmers. The EU envisages the reforms will encourage farmers to produce to market signals rather than to subsidy incentives and reduce damage to the environment.

Waste management and pollution control are potential high costs that New Zealand will have to cover in the near future, particularly in intensive production areas such as the Waikato. There is increasing evidence in the USA and New Zealand of national and local governments concern over environmental issues. These will ultimately place a burden of cost on these producers.

The UK farmer is in the most part aware of these issues as are the more progressive of our counterparts in the USA, Australia and New Zealand. However their awareness is not necessarily reflected in their willingness to deal with the issues. The economic reality of producing milk for low milk prices and with small profit margins means that cash is not available for environmental initiatives.

## 19.0 Farm Assurance

Due to the impact of BSE and the rising consumer awareness of food issues in the UK, the significance of Farm Assurance has come to the fore.

My experiences suggest that there is considerable awareness elsewhere of the issues relating to farm assurance, however, none of the countries visited appeared to have made the same progress on a national scale as the UK. They were not burdened with the same level of administration and because they are not expected to meet the same bureaucratic standards they are able to retain a competitive advantage.

However on the majority of the units visited the standards of production were very high and issues of quality assurance seemed to be based on practical measures that could be recorded and monitored. For example cell counts; bactoscans, butterfat levels, milk urea levels and milk temperature were all considered important measures of milk quality. The emphasis was on monitoring and recording to improve these factors.

On one large Californian unit the temperature of the milk silo was monitored and recorded 24 hours per day on a “tachograph style” readout that was taken by the tanker driver to the processor daily. (Photograph 8) This was practical quality assurance in action. Where daily temperatures can reach 45 degrees Celsius it was a “critical control point” and it was monitored because financially it really mattered.

The large size of dairy units meant that full tanker collections were normal for individual farms this meant that issues of traceability were easier to resolve than in the UK where multiple collections are more common.

Unfortunately farmer led assurance initiatives in the UK such as the Assured Combinable Crops Scheme (ACCS) and the Little Red Tractor have been hijacked by other parts of the food supply chain and potential farm benefits have been discounted to zero.

The powerful retail lobby under the apparent influence of the consumer has helped established a processing industry that demands farm quality assurance and traceability without the desire to pay for it.

The present “tick box” system of farm assurance in the UK is likely to remain a cost burden to the industry and there is little prospect of adding real value to farm gate milk. For prices to increase, farm assurance must be demanded and delivered to a standard where the failure rate is sufficient to ensure that the supply of milk is limited.

Photograph 8: Milk silo temperature monitors. (Tulare California)

## 20.0 The UK industry in a world perspective

Despite the present problems facing the UK dairy industry, to many of our trading partners and competitors in the rest of the world, the UK remains in an enviable position. It has a huge domestic market and market access to the EU and developing markets of Eastern Europe.

Our inability to address the issue of a low milk price due to lack of negotiating power in the market place has meant that after several years of low or non existent profitability many dairy farms are in a poor financial position to face the challenges ahead.

Structural change in the UK dairy industry is happening at an unprecedented rate as farmers strive to increase efficiency. This change has been forced on the industry by severe economic conditions. Unfortunately the lack of profitability has meant that investment capital to develop and improve efficiency is unavailable. This lack of investment capital is affecting the industry's ability to retain a competitive advantage in the UK market.

However those businesses able to invest and grow with good management, could maintain a competitive advantage over other producers elsewhere in the world. The harsher economic environment in which the UK dairy farmer has been forced to operate will have provided the catalyst to improve efficiency. This should help those producers retain competitiveness in UK markets.

## 21.0 The Cost-Price and Margin Squeeze

Over the next few years it is likely that the average price of a litre of farm-gate milk in the UK will remain in real terms at around the 16 to 20 pence litre price

range. In real terms this price will probably continue to be eroded by inflation at 3-4% per annum.

The cost of many of the inputs and raw materials will continue to rise by an amount similar to inflation. This is the cost-price squeeze.

In real terms the cost of a litre of milk on the supermarket shelf also continues to decline. The supermarkets are reluctance to significantly increase milk price. This is because milk is a key benchmark product in their “customers shopping basket” and they want to keep the price as low as possible. However demand for milk is very inelastic and price changes do not significantly alter customer demand.

The reality of this situation is that milk price could be increased to provide a better farm return without influencing customer demand.

The share of the milk price returned to farmers will in probability remain low at around 30 to 35% of the supermarket price. (During the days of the MMB this was nearer 50%). On occasions when there has been a moderate increase in price on the supermarket shelf the reality of the return to the farmer is that the minimum is paid.

In the year to August 2003 farmers could have realised 2.6p per litre in increased prices if returns from retail price rises had fed through, however the reality is that the producer has received a fraction of this figure. The reason for this is complex, being influenced by how milk is utilised and also how margins change between the processor and retailer.

The option of “last resort” for processors i.e. milk products into intervention (IMPE) has been, in the recent past the underlying reason quoted by processors for low farm gate milk prices. A low IMPE price has required low farm gate milk prices. However despite the IMPE price being in the region of 19.25 pence per litre at the time of writing the majority of producers are still receiving considerably less than this figure for the farm gate milk price.

In real terms the economics of milk production in the UK are competitive with other parts of the world when you consider that we exist in a much higher cost index society. The supermarkets want UK milk produced at world prices the reality is that in the Southern hemisphere they can produce and export into the UK cheaper than we can produce commodity milk products.

In my opinion the cost of processing and distribution of milk and milk products in the UK is very high compared to New Zealand the USA. The size and efficiency of their milk processing plants is rarely matched by processors in the UK.

In New Zealand the creation and development of Fonterra has ensured processing efficiency from a well-managed producer owned co-operative. In the USA the balance between the aggressive processing businesses wishing to return a shareholder profit and the producer owned co-ops being forced to be efficient to compete for the same markets has created an aggressive and cost effective supply chain.

I believe that a strong farmer owned co-operative sector is essential in the UK milk market to balance the power of the rest of the supply chain to ensure a fair return at the farm gate.

**22.0 What is your Market?**

How many dairy producers actually ask this question?

Can the UK graziers rely on the spring milk price remaining high enough to return them good enough prices for their milk? Or will seasonality punch a large hole in the economics of their production system. The demise of United Milk and the prospect of losing processing capacity for 2 million litres of milk per day during the “spring flush” meant that for a while the outlook for the grazier’s milk price was considerably less optimistic.

Even with the United Milk processing capacity remaining in farmer’s hands through the co-ops, a fall in the IMPE price and a decline in the value of its commodity products on the world markets still mean this system is vulnerable to market volatility and price fluctuations. The demise of United Milk even with its Phoenix like rise from the ashes should have provided a wake up call to UK spring milk producers that world market economics still dictate their future.

With the changes to intervention pricing as a result of the Mid-Term Review (MTR) and the likely consequential closure of processing capacity, the business wisdom of maximising production during the period of least demand and highest supply must be questioned.

There is likely to be a major re-structuring of the UK processing industry as a consequence of the MTR, the proposed sale of ACC by the Co-operative Group is an indication of this process. Surely the long-term business case for spring milk production on a free world market can only stack up if the UK producer can produce and supply the market profitably at the same cost as his New Zealand and Australian competitors.

The winter milk producer who matches his supply profile to his customer’s demand has a product benefit for which he should be paid. However the additional cost of operating this system is rarely reflected in the price received with many milk buyers expecting to buy “winter milk at spring prices.” They want to buy at a world commodity price index and sell at a UK price index!

However it would be fair to say that those milk buyers mainly supplying a liquid milk market have in recent years returned better than average farm gate prices even if it falls below costs of production for many farmers.

With the milk price in all probability set to remain low, can high input systems return sufficient profits for reinvestment in their businesses at a level which will allow them to continue following the high input route, or will they rely on other sources of income to fund development.

In Australia and New Zealand I visited some producers who were practising high cost systems and trying to adapt them to New Zealand and Australian markets. They had been to some extent lulled into a false sense of security by temporarily

higher milk prices in Australia and New Zealand at the UK equivalent of 15 to 16 pence litre.

These systems had investment in expensive fixed costs. Feeder wagons and sheds to house cattle and the labour and management of these high input feedlot style systems are difficult to justify on Northern Hemisphere milk prices. In my opinion they are completely unsustainable in the long term in Australia and New Zealand where milk price on a UK equivalent are likely to be nearer 10p litre. Regrettably one of these businesses has recently ceased trading.

Is there a successful hybrid system that combines the best of both systems and allows a high profit business with relatively low capital investment?

## 23.0 Conclusions

### 23.1 A Global View

Australia and New Zealand can produce milk economically at world prices. It could be arguable that their milk price reflects a “true world price”. Their systems have lower fixed costs mainly because they do not have costs associated with housing cattle.

They have a low fixed cost base and can reduce costs when prices fall. This creates a kind of “supply and demand equilibrium” where as price falls milk production tends to fall. They have an ability to regress with their business back to a system which at its basic level requires very low levels of “cash cost inputs” A very high level of their total production costs are variable and the proportion of their total costs that are fixed is much lower than the high input systems.

For example in New Zealand if the milk price falls and there is a shortage of “cash” being generated in the business they can quickly cut costs on variable cost inputs such as purchased feed and fertiliser by reverting to a more “extensive system” i.e. by reducing stocking rates. When prices increase they will increase variable costs and use more fertiliser and purchased feeds and again intensify production from their land area.

In the intensive systems of the USA and UK which have higher fixed costs, when prices fall they must increase production to spread these costs. If your costs are tied up in buildings, machinery such as feed wagons and fuel and labour to run the system you can not regress to a lower cost more extensive system quickly and easily.

The USA has a high cost of production similar to the UK and a protectionist view of their market. This market is currently in an over supply situation and has as a consequence falling milk prices.

The USA producers have to a large extent been successful at managing falling prices because there have not been quota limits on production and they have enjoyed the benefits of an increasing domestic market demand.

However despite the huge scale of some producers in California and New Mexico production costs for many farmers are not significantly lower than the best producers in the UK.

Level playing fields do not exist between farming neighbours so why should they exist on an international scale? World market battles will never be fought on a level playing field. It is a fact that costs of production can vary between farming neighbours as much as they do between different countries.

If you want to produce cheap milk on a truly international market go where the lowest costs of production, relative to milk price and the best markets, are available for your milk products. With the potential growth markets in the Far East and the relative low costs of land, labour, capital and inputs at the present time temperate parts of Australia appear to have a significant competitive advantage.

The New Zealand farmer's stated aim of keeping government out of agriculture is a policy with merit. In the EU, despite being constantly told by politicians that farmers must move closer to their markets, the distortions imposed by short term policies have a remarkable ability to create long term structural problems.

The UK farmer presented with the uncertainty of the present MTR can take no comfort from the fact that all too often the overriding factor in policy decisions is the protectionist agenda of individual national parliaments.

This results in compromises that often work in conflict with rational policy decisions. Politicians constantly try to use agricultural subsidies to manage Europe's social policy and have created a complex and bureaucratic framework upon which "Eurocrats" thrive. They may have the political will to change the framework by painting it a different colour (i.e. green) but the framework will still remain.

### 23.2 An EU View

The dairy sector is politically very important in the EU. Within the MTR it is the part which is least likely to be significantly reformed by the proposed changes. Despite the commitment to move towards a free market the continued existence of quotas set at an EU level of supply greater than demand, ensures that there remains a need to export surpluses. International trade agreements will make this increasingly difficult to do at subsidised levels.

The existence of quotas inflates the cost of milk production possibly by as much as 10-15%. It also creates a barrier to restructuring of the industry and a barrier to new entrants.

However removal of quotas under the current systems of production would almost inevitably result in increased production and lower prices in the short term as farmers seek to dilute cost by increasing volume. Prices could fall to world market levels which are currently around 25% lower than EU prices. In the medium term lower prices will make inefficient producers leave the industry and supply should fall. Prices would then rise and the market should achieve supply and demand equilibrium.

It may be politically desirable to cushion such a move towards the free market with further subsidies. However there is the real risk that these subsidies will further distort the market and allow inefficient producers to remain in the industry

for longer. This has happened in the USA where subsidies geared towards smaller producers are believed by many to have delayed the necessary restructuring of the industry.

Regrettably the political desire to manage social policy by managing agricultural subsidies tends to move farmers away from their market. Decoupling of support would be aimed at preventing this occurring, however, it remains to be seen how effective decoupling will be.

It is argued that if payments are decoupled and farmers do not have to produce to receive money they will cease production. However farmers in the UK have been able to lease out quota for many years and receive an income which does not rely on them producing milk.

Despite this the UK has almost always reached its annual quota. Farmers have not exited the industry at a rate which has ever resulted in quota flooding the market and reducing its value to a nominal level. In fact for most of the period that quota has been traded over the past decade its annual cost to lease or buy has exceeded in pence per litre the profit achievable. This defies conventional business logic.

Unfortunately the current uncertainty means that planning dairy businesses forward into the medium and long term is extremely difficult.

**23.3 A UK View**

The UK public require a supply of high quality milk and dairy products at prices which are perceived as good value. We need a secure, profitable, healthy and dynamic dairy farming industry, to supply a processing industry with a target market population of 60 million people.

The dairy farming business must be focused on supplying its own domestic market, and be competitively driven through cost control and good management. It must focus on supplying its own valuable liquid milk market and those prosperous home based markets that can add value to the milk through specialist processing.

Work with your customer to add, “True value” and remove cost from the supply chain. Both should benefit from the efficiency and savings. We must avoid following other supply industries down the road where the favoured “cost plus contacts” of the processors and supermarkets ensure a basic subsistence survival where others profit at your risk.

We do not want to be chained to our buyers with “golden handcuffs”, we need to be independent free thinking entrepreneurial business managers supplying well identified markets.

The fact is that the overwhelming majority of producers in the UK, regardless of whose data you use are making losses. Milk price is around 18p to 19p litre and true costs for most producers are between 20 and 23 pence a litre. Most producers take no account of capital required for re-investment, costs of family

labour or the true opportunity cost of their assets and therefore underestimate their costs by anything up to 20% (RABDF).

One of the features of current investment in UK dairy farming is the fact that much of the money for capital investment and growth is not coming from reinvested dairy farm profits but from high borrowings or windfall profits from sale of capital assets such as barns for conversion, land, building plots and so on.

The present trend towards bigger herds does not necessarily mean more efficient production (this is certainly the case for many larger units in the USA) and in an agricultural industry that is losing skilled people at an unsustainable rate the staffing problems of managing larger units are becoming increasingly difficult.

All too often the farmer who has successfully managed a farm of 150 to 200 cows does not have the skills necessary to manage the staff required on a 400 or 500-cow unit.

Why do we have to rely on retail initiatives to increase the value of UK farm gate milk? This should not be necessary if the correct “market signals” are allowed to operate. Unfortunately the present situation with 4 major retailers a dozen or so major processors and 20,000 dairy farmers does not allow a free market. It does not take an economist to work out who holds the balance of power in this relationship. There is a complex monopoly at work in the UK milk market to the disadvantage of the milk producer.

It was rewarding to visit and enjoy the company of farmers who have succeeded with skill ambition and a strong work ethic. They have expanded and grown in markets where less regulation and more co-operation without unnecessary government intervention has encouraged growth and development.

The cost and burden of regulation and quotas in the UK has created an environment where agricultural bureaucrats, agents, lawyers and consultants have thrived and a whole new industry has been created riding on the back of the UK dairy farmer. Unfortunately the present political status quo in the EU tends to encourage their multiplication. To quote a New Zealand dairy farmer “there is no problem in agriculture that politicians can not make worse by trying to help”

Successful farmers must focus attention on those factors that they can control and the best dairymen constantly strive to improve their technical performance in the key areas that most influence profit such as nutrition, production, fertility, milk quality and longevity. On all dairy farms there is potential to improve technical achievement and the importance of benchmarking to measure this performance is paramount.

## 24.0 Recommendations

### 24.1 Financial Management

Establish where you are at the moment with your business and understand what drives profit in your system.

Be prepared to sit down and plan, the best operators do this and regularly review their performance.

Do not underestimate the importance of health and fertility as a driver of profit.

Benchmark against industry standards and similar businesses, work to your plan and identify and adopt the best practises.

Manage your nutritional management to the highest standards, measure monitor and calculate feed quality and costs. Calculate the value and quality of your home produced forages and benchmark your production against others.

Join a discussion club that is well organised and shares “genuine” financial information.

Are you in the top 10% at what you presently do?

If not where are the areas you need to improve?

Practise what you are good at and work hard to improve your weaknesses.

You will probably get better profit and increases your return from investment from doing what you presently do, but doing it better, before you embark on a major investment decision.

If you are consistently in the top 10% - 20% of your benchmarking group and are confident in your ability to manage your business through a period of change, then make that well researched and appraised investment decision.

### 24.2 Investment Decisions

Do not look for the quick fix investment “cure-all” that will put everything right because it almost certainly does not exist.

Do not get caught in the middle with a high input high fixed cost system with low technical performance and low returns.

If you are in this situation, can you significantly reduce your fixed costs? If you can, then consider a lower cost system.

If you are locked into a high cost system due to large costs of finance or land in the medium to long term, your only option may be to increase output to dilute your fixed costs.

Highly intensive high input production systems require a very high level of expertise and management skill to consistently achieve profit.

Successful high input systems are the domain of the very best operators and for people to aspire to consistent success at these levels they need to be operating consistently in the top 10% of their benchmarking group i.e. “Premiere league”.

Be aware that highly intensive systems of milk production have a lifestyle costs!

Be prepared to “sweat your assets” One 500 cow herd visited in Wisconsin with average yields of over 12500 litres per cow was milking the entire herd through a

single 10/10 parallel parlour 21 hours per day on three 8 hour shifts. This was an outstanding example of someone fully utilising a fixed cost.

On the positive side, those who achieve success on these systems at high milk prices achieve outstanding returns. However the cost of failure is expensive and in the UK too many producers carry the fixed costs of the intensive systems such as feed wagons and high tech parlour equipment and consistently fail to move out of the average performance league. “Second division”.

It is also worth noting that in recent years some producers who have recently adopted more extensive grazing based systems have done this successfully on farms that were previously geared to high input systems. In many of these situations the original investments in buildings, silage pits and such like have to a large extent been “written off” and are now providing a low cost infrastructure base upon which their successful grazing system still relies.

The costs of the long-term investments and pay back on fixed assets such as silage pits and cubicle sheds mean that once locked into the system regression back to a simpler system is not an easy option. The cost of not fully utilising fixed cost assets is expensive, and if the operator cannot make the system work he is unlikely to be happy with the consequences. Second hand concrete does not hold a great resale value! (Unless you can build houses on it)

**24.3 You and Your People**

Look after your people because they are the people who will look after you!

Train them, invest in them and trust them, they are the future of your business.

If possible give them a financial interest in the success of the business.

Treat them with respect and listen to their ideas. Employers usually end up employing the people they deserve!

Look forward don’t look back, and associate with and learn from people who are better than you at what you do.

Do not be afraid of change; learn how to manage it!

**25.0 What do successful dairy farmers do?**

They believe in and have a passion for what you do.

They breed or buy their cows to suit their system.

They measure and benchmark their physical and financial performance.

They plan and budget accurately and review them frequently.

They plan to optimise production of quality forages from their own resources.

They set targets and understand the factors that drive profit in their system then constantly ask the question…

“Is what I am about to do getting me closer to what I am trying to achieve”

And finally remember, most dairy farmers are price takers not price makers. Therefore:

Aim to market your milk don't just sell it and remember the true cost of milk production should always be less than the price you receive.

This fact remains true regardless of the system; the ability to do it depends on your skill as a manager.

**Outstanding memories: Words of Wisdom**

Being told by a Californian dairy farmer that he could tell me the costs of his milk production, but if he did he would have to shoot me.

Being advised by a Wisconsin grazier that the 4 inches of snow on his grazing pasture would not knock his milk production.

Being cautioned and given a ticket on a train in Melbourne for resting my foot on the seat while reading a newspaper and then being pursued for a date by the ticket inspector. (She later withdrew the ticket but she never got the date!).

Travelling the length and breadth of South Island New Zealand on less than £40 of petrol.

Mount Cook in the sunshine on a beautiful spring day.

Sequoia National Park at sunset, Yosemite at sunrise.

“There is nothing like a big overdraft and mortgage to motivate success”. The pressure that drives many successful dairy farmers is “the absolute need to succeed and the fear of failure”.

The reason UK farmers co-operatives do not succeed are because things are still not bad enough.

Getting lost in the Redwood forests of California’s Sequoia National Park and seeing my first, second third and forth wild bears at close quarters all within 3 hours.

Being told by a Dutchman in Wisconsin that the reason for the Dutch dairy farmers international success was “wooden shoes, wooden head and wouldn’t listen”.

Put your money into appreciating assets i.e. land and livestock not depreciating assets such as machinery.

Watching Dolphins in the early morning surf on a Californian beach.

Arriving in Sydney the same week as the “Gay Games” and feeling a little bit out of place.

Being told, “use the information your accountant provides but never let them run your business” and ”let your managers manage, It’s what you pay them for”.

Being informed I was about to see the biggest cheese factory in the world twice in a week; once in California and again in New Zealand.

Never being anywhere for as long as you would like to be.

The friendliness and hospitality enjoyed from dairy farmers and hosts around the world and the anticipation of being able to repay the debt when they visit the UK.

## Declaration

The views expressed in this report are my own and do not necessarily represent the opinions of the Nuffield Farming Scholarship Trust or of my Sponsors the Trehane Trust or any other sponsoring organisation.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The information sourced for the tables below for Appendix 1 and 2 has been correlated from multiple sets of data and is for the year 2001 to 2002. It has been standardised to a common exchange rate set in October 2002 for comparison purposes.

## Appendix 1: Estimated costs of milk production in the USA

| | Wisconsin Intensive | | | | Wisconsin Grazing | | | | California Feedlot | |
|---|---|---|---|---|---|---|---|---|---|---|
| No Cows | 190 | | 500 | | 78 | | 1178 | | 2510 | |
| Litres milk sold | 9483 | | 10300 | | 7900 | | 6123 | | 9389 | |
| Stocking rate acres/cow | 1.7 | | 1.4 | | 1.7 | | 1.5 | | | |
| Value of dairy production | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) |
| Total Output | 2057 | 21.69 | 2310 | 22.43 | 1560 | 19.75 | 1089 | 17.79 | 1926 | 20.51 |
| Purchase feed per cow | 412 | 4.34 | 454 | 4.41 | 375 | 4.75 | 187 | 3.05 | 728 | 7.75 |
| Variable costs | 300 | 3.16 | 372 | 3.61 | 229 | 2.90 | 135 | 2.20 | 54 | 0.58 |
| Labour costs | 255 | 2.69 | 256 | 2.49 | 117 | 1.48 | 198 | 3.23 | 141 | 1.50 |
| Other Fixed costs | 460 | 4.85 | 436 | 4.23 | 409 | 5.18 | 283 | 4.62 | 268 | 2.85 |
| Total Interest | 143 | 1.51 | 134 | 1.30 | 72 | 0.91 | 37 | 0.60 | 100 | 1.07 |
| Land Rent/Lease | 93 | 0.98 | 73 | 0.71 | 33 | 0.42 | 23 | 0.38 | 15 | 0.16 |
| Machinery & building depn. | 211 | 2.23 | 224 | 2.17 | 167 | 2.11 | 98 | 1.60 | 42 | 0.45 |
| Livestock depn. | 61 | 0.64 | 134 | 1.30 | 2 | 0.03 | 12 | 0.20 | 176 | 1.87 |
| Total costs | 1935 | 20.40 | 2083 | 20.22 | 1404 | 17.77 | 973 | 15.89 | 1524 | 16.23 |
| Income-costs (Margin) | 122 | 1.29 | 227 | 2.20 | 156 | 1.97 | 118 | 1.93 | 402 | 4.28 |
| Net Farm Income | 23180 | | 113500 | | 12168 | | 139004 | | 1009020 | |
| Gain/Loss sale Capital assets | 4750 | | 4635 | | 579 | | 1890 | | 0 | |
| Net Farm Income | 27930 | | 118135 | | 12747 | | 140894 | | 1009020 | |
| Estimate investment capital | 1102000 | | 2900000 | | 243256 | | 1987634 | | 10285980 | |
| Return on capital invested | 2.50% | | 4.07% | | 5.24% | | 7.01% | | 9.80% | |

## Appendix 2: Estimated costs of milk production in Australia & New Zealand.

| | Australia Grazing | | | | New Zealand Grazing | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No Cows | 210 | | 805 | | 178 | | 392 | | 1320 | |
| Litres milk sold | 7664 | | 6904 | | 4781 | | 5047 | | 5595 | |
| Stocking rate acres/cow | 1.1 | | 1.5 | | 0.81 | | 0.79 | | 0.96 | |
| Value of dairy production | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) | Per Cow (£) | Per Litre (Pence) |
| Total Output | 1018 | 13.28 | 873 | 12.64 | 615 | 12.86 | 643 | 12.74 | 709 | 12.67 |
| Purchase feed per cow | 167 | 2.18 | 190 | 2.75 | 28 | 0.59 | 89 | 1.76 | 122 | 2.18 |
| Variable costs | 114 | 1.49 | 71 | 1.03 | 69 | 1.44 | 84 | 1.66 | 111 | 1.98 |
| Labour costs | 111 | 1.45 | 110 | 1.59 | 94 | 1.96 | 124 | 2.46 | 126 | 2.25 |
| Other Fixed costs | 39 | 0.51 | 103 | 1.49 | 69 | 1.44 | 55 | 1.09 | 41 | 0.73 |
| Total Interest | 41 | 0.54 | 32 | 0.46 | 27 | 0.56 | 33 | 0.65 | 31 | 0.55 |
| Land Rent/Lease | 19 | 0.24 | 22 | 0.32 | 23 | 0.48 | 36 | 0.71 | 25 | 0.45 |
| Machinery & building depn. | 32 | 0.42 | 24 | 0.35 | 10 | 0.21 | 19 | 0.38 | 14 | 0.25 |
| Livestock depn. | 85 | 1.1 | 92 | 1.32 | 64 | 1.34 | 73 | 1.45 | 76 | 1.36 |
| Total costs | 608 | 7.93 | 644 | 9.31 | 384 | 8.03 | 513 | 10.16 | 546 | 9.75 |
| Income-costs (Margin) | 410 | 5.35 | 229 | 3.33 | 231 | 4.84 | 130 | 2.58 | 163 | 2.92 |
| Net Farm Income | 86100 | | 184345 | | 41118 | | 50960 | | 215160 | |
| Gain/Loss sale Capital assets | 0 | | 0 | | 0 | | 0 | | 0 | |
| Net Farm Income | 86100 | | 184345 | | 41118 | | 50960 | | 215160 | |
| Estimate investment capital | 468889 | | 805102 | | 454197 | | 568586 | | 2025471 | |
| Return on capital invested | 18.36 % | | 22.89 % | | 9.05 % | | 8.96 % | | 10.62 % | |

**Post script**

In March 2003 we received the planning consent necessary to take our 400 cow herd at Roden in Shropshire to 1000 cows with the intention of “creating a world class dairy business”. A few months later my employers, the Co-operative Group took the executive decision to exit dairy farming.

In March 2004 after over 100 years of milk production the last “Co-op dairy cow” was milked and sold from Roden Estate in Shropshire, this was ironically, the first farm the Co-operative Wholesale Society purchased in 1896.

From being the single largest milk producer in the UK to exiting the industry in less than 12 months created a uniquely challenging management experience.

I would like the final words in this report to pay tribute to the loyal and dedicated staff of the dairy business. Through their determination and hard work they made the exit and sale an outstanding success in the face of considerable adversity. They departed with hard earned respect to face new challenges.

Paul Fox (Spring 2004)