



FACT SHEET

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PROFITABLE CALF REARING

Approximately 1.5 million calves are reared annually in New Zealand, both as dairy replacements and for the beef industry. Various studies were undertaken from 1999-2010 to compare differing calf rearing systems and provide advice and information to calf rearers about which systems provide the best advantages for raising calves.

Calf rearers may expect greater success in calf rearing and reduced costs by using the good management practices identified in this research project.

CALF REARING IN NEW ZEALAND

Calf rearing is a significant activity in the New Zealand dairy and beef industries, with approximately 1 million dairy heifers and around 500,000 bull calves reared artificially every year. Artificially reared calves account for approximately 65% of New Zealand's beef output through the slaughter of bulls, surplus heifers and cull cows. The profitability of calf-rearing depends on the purchase price of calves, the input costs of calf milk replacer and meals, and the price that can be realised for the 12 week old calf.

There are a wide range of inputs, costs and animal health issues that must be considered to ensure that calf rearing is successful and profitable.



POUKAWA CALF REARING PROJECT

The Poukawa calf rearing project was run at the Poukawa Research Farm in Hawkes Bay from 1999-2010.

A number of differing calf rearing practices were tested and results from this work now form the basis for advice given to farmers raising calves in both the beef and dairy industries.

INDUSTRY CALF REARING PRACTICES

Two telephone surveys were completed in 2004 and 2005 to investigate calf rearing practices in New Zealand. The first was a dairy farm survey in 2004 of 297 farms, and the second in 2005 a survey of 100 specialist calf rearers, all of whom were non-dairy farmers. The results showed that a wide range of calf raising practices were used by those surveyed, but in general it was found that dairy farmers fed more milk than specialist calf rearers (316 L per calf compared to 155 L per calf) weaned their calves later (average of 9.7 weeks compared to 6.5 weeks) and had higher labour inputs.

A SUMMARY OF THE RESEARCH — THE KEY CONSIDERATIONS WHEN RAISING CALVES

IMPORTANCE OF COLOSTRUM

Studies in 2000, 2002 and 2007 investigated the influence of colostrum on calf survival and growth rate. These studies found that 10-40% of calves are deficient in colostrum. Colostrum deficient calves had higher death rates and slower growth rates through to 14 weeks of age. In the first study in 2000, 40% of colostrum deficient dairy calves died.

ONCE-A-DAY FEEDING

Studies in 1999-2006 compared feed systems recommended by feed manufacturers and the Poukawa system; a cheaper variation of feeding where calves were fed a restricted quantity of milk replacer (200 g/l) on a once-per-day basis. On the Poukawa system calves were raised to 5 weeks old without roughage and with no apparent ill-effects. The biggest advantage of the once-a-day feeding system was the reduction of labour costs when compared to twice daily feeding alternatives.

HIGH AND LOW VOLUME MILK SYSTEMS

In 2006 and 2007 high and low volume milk systems were compared for raising Friesian heifer calves.

Table 1: Milk Systems Comparison.

	Low Volume	High Volume
Milk consumption (L)	92	310
Pellet consumption (kg)	75	32
Number of feeds	52	109

There was no effect on live weight at mating or subsequent pregnancy rates between the heifers, showing that low volume systems were suitable for raising dairy heifer calves.

MILK REPLACERS

When reared by natural suckling, calves receive numerous small feeds of whole milk, which curd in the stomach (abomasum) because of the presence of casein proteins. Milk replacers fed to young calves should contain whole or skim milk powders which contain casin proteins and therefore curd.

In 2006 the performance of calves on a non-curding diet was compared to those on a curdling diet.

Non-curding diets are not recommended for younger calves, however when non-curding replacements were used as a finishing diet (calves older than two weeks) there was no effect on animal health or live weight gain.

In 2007, the quality of 10 different calf milk replacers was compared. The products included whey based replacers, budget milk powders and products for older calves. Not all of these products were produced in New Zealand. Most were true to the label with regard to protein and fat, but there was little or no additional information about the actual ingredients making it difficult to make an informed purchasing decision based on the information on the bag.

WEANING STRATEGIES

Calf rearers typically wean calves off milk slowly, usually by providing half feeds of milk for a week. In 2002 it was shown that there was no difference in performance when calves over 63 kg were weaned "cold turkey" or fed at half rations for a week.

In 2008 it was shown that early weaning did not appear to disadvantage the post weaning weight of calves. Calves in this study were weaned at 6, 7 or 8 weeks of ages after they had gained a minimum of 14 kg from the time they entered the calf rearing shed on a once-a-day regime.

There was no significant difference in their post weaning growth rate as a result of weaning at these different ages, provided the calves were eating sufficient solid feed to support rumen development.

Whilst 14 kg was the figure worked towards for this particular study, it is recommended that the weight of each calf is known before entry to the shed and gains 18 kg before they are weaned off milk.

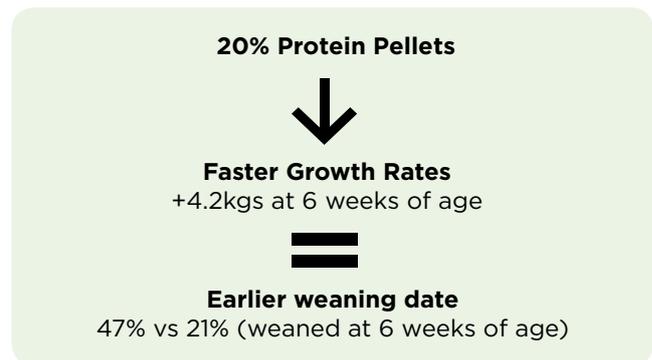
EARLY INTRODUCTION OF SOLID FEED

The early introduction of solid feed for a calf is a key component for ensuring the early development of

the rumen system. If feed is not readily consumed by calves, rumen development is slow and milk feeding needs to be prolonged.

Studies undertaken in 2008 suggest that the form of the meal (whether pelleted, hammer milled or roller milled) has little effect on feed intake and live weight gain of calves. Therefore there is little merit in going to the extra cost of pelleting calf rations. Including soy meal instead of peas as a protein source in solid feed gave better feed intakes and growth rates for calves.

Specialist calf rearers sometimes use lower protein content calf pellets as a means of reducing costs. In 2002 the benefit of feeding 20% protein pellets for the first 6 weeks was compared to feeding with 16% protein pellets.



The cost saving gained from using the lower protein content feed was not as great as the value of early weaning of the calf on the higher protein diet.

The value of feeding calves with crushed barley, palm kernel or copra meal were all investigated as part of this project in 2005. This study found that while the cost of feeding was reduced, calves raised on crushed barely showed poorer and more variable calf performance and young calves reduced feed intake when either palm kernel or copra meal was added to their diets.

Feeding palm kernel at 1.5 kg/head/day to older calves (5-6 months of age) did prove to be a cost effective supplement for calves when pasture feed quality is limiting.

IMPROVING GROWTH RATES OVER SUMMER

The decline in pasture quality over summer months makes maintaining growth rates in calves difficult.

Through 2002-2008 the project investigated feed supplementation with the concentrates crushed maize, crushed barley, calf pellets and palm kernel expeller (PKE), as well as the use of pasture and maize silage. All of the supplements were shown to improve summer calf growth rates if the available pasture was low or of poor quality (less than 10 ME). The amount of supplement which must be fed is dependent on the quality of pasture.

If pasture quality is poor, concentrates can be fed to calves to improve growth rates. Studies have shown that calf growth rates of 0.65 kg per day, can be raised to 0.9 kg/day by supplementing with 1 kg per day of crushed barley, maize, calf pellets or palm kernel.

The use of brassica for feeding calves was investigated in 2007. It was found that in order to ensure maximum calf performance and brassica re-growth, calves need to be break fed and moved before they eat into the stems. Calves also need time (approximately 3 weeks) to adjust to brassica.

Rape proved to be outstanding in terms of animal performance, with growth rates averaging 0.63-1.0 kg/day during the adaption phase and 1.1-1.2 kg/day once calves have adapted.

BREED EFFECTS

When dairy industry Breeding Values (BV's) for live weight were used as a basis for predicting bull performance for Friesian, Jersey and Friesian-Jersey cross calves in 1999-2001, the correlation between the BV for live weight and actual live weight was poor, suggesting that this BV is of limited use for the bull beef industry.

CALF REARING AT POUKAWA – A SUMMARY AND PRACTICAL TIPS

SUCCESSFUL CALF REARING:

While there are a wide range of calf rearing systems; there are advantages, both in the success of calf rearing and cost saving, to be gained through:

- Ensuring calves have enough colostrum early in life
- Hygiene and attention to animal health
- Once-a-day feeding with low volume milk systems and feed supplementation
- Early introduction of solid feed
- The use of high protein meal
- The use of curdling milk replacers in the first two weeks of life.

REARING FACILITIES

While the type and construction of calf rearing facilities is not critical, all facilities must have good drainage, dry weather vehicle access for unloading calves and milk feeding. Pens should be clean and dry with fresh bedding added regularly. There should be no draughts at calf level and adequate ventilation at a high level, to prevent build up of ammonia and risk of pneumonia. Pens should have a covered area of approximately 1.5 m² per calf.

CALF SELECTION

When purchasing calves for rearing it is recommended that 4 day old calves should be a minimum of 35 kg and have been fed at least 2 litres of colostrum. Lighter calves (<35 kg) tend to grow slower and have more health problems.

FEEDING

All calves at Poukawa are initially fed twice per day on arrival then reduced to once-a-day feeding after 2 days (for calves >37 kg on arrival) or after 10 days (for calves <37 kg on arrival). Calves receive a restricted volume of milk (200 g milk powder/ per one litre of milk) and free access to cereal based meal or pellet for the rapid development of rumen tissue. Calves are also given free access to fresh water and kept off pasture for 4-5 weeks to encourage pellet consumption.

WEANING

Weaning off milk generally occurs when calves are >60 kg in live weight and consuming sufficient pelleted feed to meet their maintenance needs (typically 1 kg/head/day). Once weaned of milk pellets/meal and gradually grass make the calf's energy requirements. Introduce

animals to sheltered paddocks with high quality pasture but continue to be fed a lower cost calf pellet on a restricted basis (0.5 kg /head/day) until they are 10 weeks of age. At 12 weeks of age calves are considered to be fully adapted to pasture and ready for sale.

ANIMAL HEALTH

Because calves arriving at Poukawa are typically transported long distances, they are usually fed with a proprietary electrolyte to replace fluids lost in transportation. The calves are checked for navel infections and problem calves identified and treated with antibiotics. Slow drinkers and those refusing to drink are given milk or electrolytes by gastric tube.

Scouring calves (caused by overfeeding, viral or protozoa infections) are isolated, removed from milk and fed electrolytes to replace lost fluids. Calves with nutritional scours are removed from milk and fed electrolytes at least three times per day, until there are real signs of improvement. Calves with infectious scours are fed milk twice a day, with an electrolyte feed at midday. If a large number of calves are affected it is important to identify the cause of the problem (e.g. by faecal testing) and seek veterinary advice where necessary.

Coccidiosis also causes scours and poor growth rates in calves and normally only occurs once concentrate feeding stops. The problem can be minimised by putting the calves back on pellet or meal (at 0.5 kg per head per day). Up until 6-9 months of age oral combination drenches offer the most cost effective protection against gastro-intestinal parasites, however these should be used in conjunction with a suitable endectocide for lice control.

During the early calf rearing period a broad spectrum virucide should be sprayed around calf pens on a weekly basis, avoiding calves, water and feed troughs.

The calf shed should be fully cleaned and sprayed with disinfectant at the end of the season.

Table 2: Average data for fresian calves collected over trials from 1999-2010 at Poukawa Research Farm.

4-day weight (kg)	43.7
Growth weight to weaning (kg/day)	0.56
Weaned	5 weeks
Weaned weight (kg)	63.5
Growth rate to 12 weeks (kg/day)	0.75
12 week weight (kg)	100



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B+LNZ RESOURCES

 www.knowledgehub.co.nz

PDF DOWNLOADS

- Guide to New Zealand Cattle Farming resource book
- Growing cattle fast on pasture fact sheet
- Using PKE blends to improve young cattle growth rates fact sheet

EXTERNAL RESOURCES

- www.nzcalfrearing.com
- NZAgbiz Calf and Lamb rearing handbook – www.nzagbiz.co.nz/Calf/Calf-Rearing-Guidebook
- Calf care – www.dairynz.co.nz/animal/calves
- Calf rearing using a once-a-day milk feeding system - what can the dairy industry learn from the bull beef industry. P Muir, C Fugle and N Smith. On-Farm Research Ltd. SIDE (2005), 226-234.

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