HIGH PERFORMANCE CALF REARING

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What is high performance calf rearing?

- Reliably producing high quality calves to weaning, regardless of changeable factors like weather and staffing.
- Producing those calves as efficiently as possible.
- Understanding that good reproduction and production of our cows starts the minute the calf is born.

What is the aim of this session?

- Be able to go home and take a critical look at your calf rearing system. Am I getting my calves to target liveweights? Could I be doing it quicker, cheaper, faster or easier? Where is my system vulnerable to environmental changes like weather, insufficient staff or disease outbreak?
- Understand the 'gold standard' basics and why they are recommended.
- Acknowledge where you cut your corners and how you can un-cut them if the wheels start to fall off.

1. Introduction

Over the past decade, we have become increasing aware of the important role young stock play in maintaining a highly productive and efficient dairy system. As national herd fertility rates have declined, we have increasing examined how we rear our heifer calves. The InCalf project nominates producing well grown young stock as one of the key 8 'pieces of the cake' required to achieve optimal herd fertility (The InCalf book, DairyNZ 2007). As we move to an era of more volatile pay-outs, more variable climatic conditions, increasing marginalisation of grazing land and industry changes such as the banning of routine inductions, the need to produce reliably well grown heifer calves in an efficient manner is paramount. A 2012 NZ study showed most calves (98%) were reaching adequate weaning weight relative to liveweight targets set using the individual animals liveweight breeding value (LWbv) (McNaughton and Lopdell, 2013)) This however gave us no information about how we are achieving this, how many calves are lost along the way and what the sanity status of the calf rearer was at the end of it all.

2. Building a robust system for rearing calves

Working as a vet, I am often faced with clients whose pre-weaned calves are failing to meet expectations. My own calves sometimes fail to meet my expectations! This may be in slow growth rates, low meal consumption rates and high rates of illness and death, usually due to diarrhoea. There is a huge range of different facilities, products, methods, and theories out there, so what are the key factors for a successful heifer rearing system?

2.1 Have a plan

Put together a robust system that can still produce good quality heifer at reasonable cost even if poor weather, 'terrible' season, poor quality or insufficient staff. Don't leave it to chance. Most people that produce good quality heifers do so every year regardless of the environmental factors, **because they have a plan**. In the large scale New Zealand study comparing actual heifer liveweights to targets (McNaughton and Lopdell, 2013) the largest variation occurred **between** farms. This was more significant than the birth year, breed, age at weighing and region. Good management is key to a reliably good outcome.

Example: NZ studies have shown that approximately 50% of calves left with their mothers for >6hrs, did not receive enough colostrum to fully protect them in the neonatal period (Wesselink R, Stafford KJ et.al)) These studies were conducted on relatively small herd situations, in flat country in the North Island. It is a fair assumption that the situation would be worse when you have more than 50 new calves a day, on a hill in a blasting South Island southerly. Picking up your calves once a day may be sufficient, when the weather is dry and mild but be pre-prepared to do extra pick-ups if the weather is poor. Don't wait for a problem to get started – head it off at the pass.

2.2 Have the best facilities you can

Not many of us are blessed with the 'perfect calf shed', however even an old, converted shed can be made better by a few small changes. Work backwards by thinking about previous

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seasons. What were the major animal health problems faced and did the facility contribute to it? Changes could include swinging gates, splitting large pens to make management easier, better lighting, a small concrete area to wash up on or even better lighting and running water.

Example: All in-all out management of calves is considered to be the best method of housing calves (Vermunt, Parkinson and Malmo 2010) as calves are grouped on age and there is less transfer of disease. In large pens designed to house 20+ calves, this can be very challenging as it may take several days to fill a pen meaning a range of abilities and drinking speeds in the same pen. A relatively cheap solution is to purchase 5-6 lightweight, alloy sheep pen gates which easily hinge together by pins. These can be used to partition the pen which is currently being filled, into two sections. One which contains the new calves needing special attention and the other, those calves which can drink from a teat. When the pen is full, the gates are simply removed, washed, disinfected and placed into the next pen to fill.

2.3 Avoid overcrowding

Possibly the most common scour outbreak scenario I see as a vet is a patch of wet weather around the 4th-6th week of calving when we usually have our second batch of calves in the pens. Calves get kept inside longer due to poor weather and an outbreak of diarrhoea follows.

The recommended floor space required for calves is a minimum of 1.5 sq. m/calf, when they will be housed inside for 4-6 weeks. (Vermunt, Parkinson and Malmo. 2010) When the stocking rate goes over this, the levels of contamination may rise to a point when the calves immunity won't cope and diarrhoea results. Consider building a bit of fat into your system for example such as leaving one pen spare which could be used as an overflow or keeping all pens at slightly less than recommended density so calves can be kept inside slightly longer without going over the recommended density.

Example: If no sheltered paddocks are available on farm for young calves to go out into, consider temporary shelters. This could be in the form of 3-6 large straw bale shelter in a Y shape or a removable tunnel shaped shelter. These can be erected by one person in less than an hour and represent a very cost effective and flexible shelter option.

2.4 Colostrum, colostrum, colostrum

As vets, we are often accused of 'bleating on' about colostrum but its importance is paramount in rearing successful calves. A new-born calf is born with no natural immunity at all, so receives all its immunity and antibodies via the first colostrum. At birth, the calf can absorb

almost all the antibodies it receives via colostrum into its blood stream. By 12 hours, it can absorb about half of the antibodies and by 24 hours, almost none will be absorbed. (Figure 1) Giving a calf which is greater than 12 hours old extra colostrum will still not raise immunity levels sufficiently. Calves which do not receive enough colostrum are at a higher risk of disease and lower growth rates (Parkinson, Vermunt and Malmo 2010)

It doesn't matter how you get it into them, just get it into them!

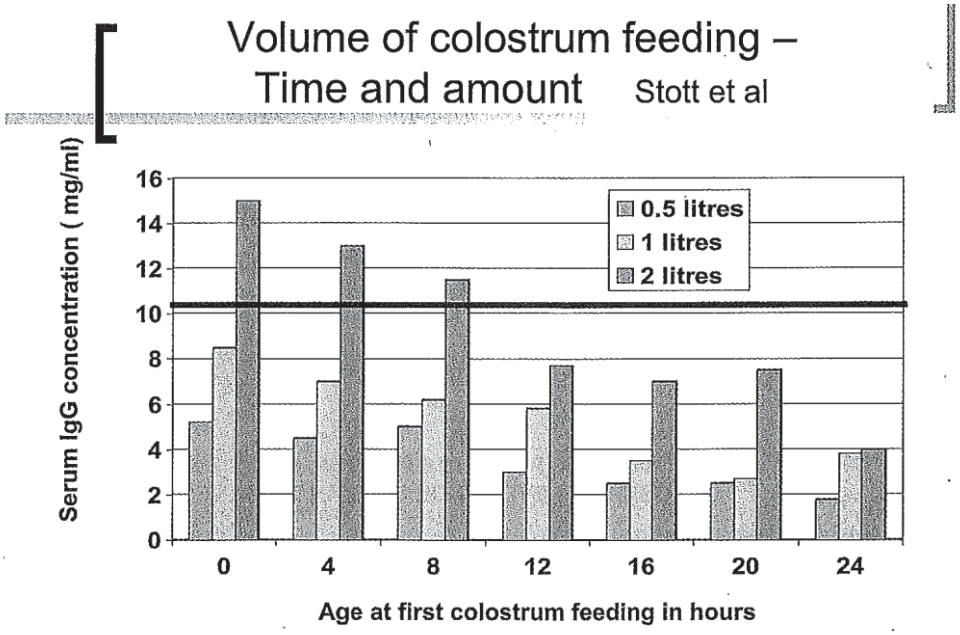

Figure 1.

Example: If it not possible to get farm staff to collect calves in the morning and afternoon, consider how you could still achieve good colostral intakes. If a member of staff is checking cows in the evening, prepare a couple of 5 litre containers of warm colostrum and a clean oesophageal feeder for them, so they can tube calves as they are tagged.

2.5 Treat colostrum like gold

Educate your milking staff about the importance of collecting and storing colostrum correctly. It is a hugely valuable resource for ensuring good growth rates and low incidence of

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disease. The antibody level in colostrum is at its maximum at the first milking, but has suffered a 10 fold decrease by day 2 (Lacy-Hubert et al 1996) so take the time to collect and store first milking 'gold' colostrum separately.

Key factors here are:

- Clean collection – Make sure no faeces get into the test bucket.
- Clean storage – a clean, vat or drum with a lid. Don't store it all in one drum or vat as you could lose the lot if it spoils.
- Do a visual check of quality – If it's not thick and creamy don't use it for feeding at the first feed but it can be added to the stored colostrum for older calves.
- Preserve colostrum by refrigeration, turning it into yogurt or acidification.
- Stir it regularly or you will lose a lot of the fat and antibody content in the crust which forms on top.
- Anecdotally, colostrum which is contaminated with blood doesn't store well but still has a lot of antibodies in it so is perfectly ok to feed fresh to new calves.

2.6 The human factor

- The people who rear the calves make a huge difference.
- Caring, well trained staff will make all the difference. Don't underestimate the power of looking as more is missed by not looking, than not knowing. It is easy to 'assume' a sick calf has a scour but often navel infections, joint infections and other diseases are present at times of scour outbreaks due to insufficient colostrum intake in new-borns.
- Write up clear, concise diagnosis and treatment plans if you expect your staff to be able to diagnose and treat calves in your absence. **This will decrease the vulnerability of your system because if staff member leaves or is injured, it will be easier to train the next one!**
- Manage frustration, impatience or loss of enthusiasm in your staff so that calf care doesn't suffer – chocolate and a day off may be required!

2.7 Keeping sane

Don't be too hard on yourself- Grouping 100+ neonates together in group housing is not a 'normal' situation.

Problems occur even in the most organised, well set-up calf sheds. New-born calves have immature immune systems and therefore have less resistance to common pathogens present in the environment, carried by cattle or other animals such as dogs which they have contact with. This makes them more susceptible to disease and increases their shedding of pathogens once

infected. As new-borns, they have very small fat reserves and have little physical reserve to recover if they become ill.

- It is not always your fault!!! When problems occur, go back to your plan and try and work out which corners you have cut. Then make some high-impact changes where it matters most.
- Look after yourselves – reach out to others in the same situation, have a good radio station playing in the shed and a supply of cooked meals stashed in the freezer.

2.8 Paddock to pen

The rearing of a good calf starts even before the calf hits the ground. Healthy calves come from healthy, well managed cows. Calves which have a prolonged birth caused by dystocia or metabolic disease are slow to stand and suckle, making them less likely to receive enough colostrum. Colostrum from well fed cows, which have adequate levels of trace elements have higher quality colostrum (McGee, Drennen and McCaffrey 2006). Generally, reducing stress in these calves will get them off to the best start. This means **gentle handling, keeping warm and minimal bacterial contamination of the environment.**

2.8.1 The Trailer of DOOM.

If a calf's first trailer ride is not well managed, it could well be its last. Soft bedding and not overcrowding the trailer (less than 10 calves/pen) are critical for ensuring that fresh, exposed umbilical cords don't get damaged and infected. If calves are left in trailers for a long time, they can become hungry which increases the amount of licking and sucking they do, both of each other and the trailer and bedding. In a calf < 12 hours old, the gut lining is specially adapted to allow the absorption of large immunoglobulin molecules for immunity. This very same quality can have a negative affect here as it also allows for free absorption of virus', bacteria and parasitic organism that can be present in a contaminated, dirty trailer. Get calves out of the trailer as soon as possible or tube them while still in the trailer if there is going to be a delay in unloading them. Trailers should be covered wherever possible or backed into a shed if

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waiting as wind chill and rain can cool the core temperature of a calf very quickly without the cow there to shelter it.

2.9 Good system for identifying, recording and treating sick or under preforming calves

If you have more than just yourself rearing the calves, make a laminated chart for the wall with how to do a brief examination of a calf. I've found it useful to use a basic grading system for sick calves so we are all talking in the same language. You're staff's idea of a 'sick' calf and yours might be quite different. Record brief details of those animals sick or that received treatments – you will be amazed how many of them turn up empty as rising 2 year olds.

Get your vet clinic to help you make up a flow chart for treating sick calves.

Identify calves receiving animal health treatments or ones that you are keeping an eye on using a clearly identifiable **removable** method– Velcro neck bands are the best. A lot of spray paints are very irritant and will cause their coat to fall out. Have a whiteboard accessible from every pen and have a pen for each board so you don't have to leap over 3 fences to get one – this will ensure that the recording gets done!

While there isn't scope in this paper to cover all the important aspects of a robust calf rearing system, this provides an overview of some of the biggies. The next step is to have a close look at how your system runs.

3. How does your system compare?

Recording and monitoring some of these factors can help to establish where the 'holes' are in your system and where you could make gains or decrease vulnerability.

3.1 What do your results look like?

- How many calves do you treat for scours each season?
- How many of those die?
- How many other illnesses do you have? Joint ill or navel infections?
- How many days does it take on average to get a calf to weaning?
- How much meal does each calf consume prior to weaning?
- How many hours are you spending in the calf shed each day?
- What is the planned start of calving to first crying interval? (important scientific measure)

3.2 What does your system look like?

- How long do you feed calves twice a day for?

- Do you have more than 12 calves per pen? Is it affecting your ability to monitor them?
- Do you routinely tube calves or leave with the cow for 24 hours? Do you need to tube them?
- Do you have enough room for half the calves inside at once or are they out in the paddock at 1 week old?
- What are the potential risks? Overcrowding, poor weather, staff changes, outbreak of disease
- **Know where you cut your corners! This allows you to un-cut them if the wheels start to fall off!**

4. How to review your system

- Get a motivated group of calf rearers together in your area and visit each other's systems. Persuade your local DairyNZ consulting officer into helping with the facilitation.
- Identify a calf champion at your local vet practice – it might be a young vet who you get along with or who you can see potential in. Talk them into becoming an expert. They can help with assessing products, organise talks, and help with product selection and treatment plans. It will make them feel great and they'll work hard for you.
- Record, record, record. By measuring what you do and what effect it has, you can identify which changes can make an impact in your own system. If you can't find a good system for recording your results, make your own up and keep in a folder. If nothing else, use your bobby kill sheets, slink skins returns or sale receipts to get some numbers.
- Standardise your system or **write a procedure.** The process of writing it will really help you work out what you actually want your staff to do.
- Think about how you can make things easier so that you or your staff will actually do jobs on time. Examples might be several small cheap garden sprayers so you can disinfect pens while calves are feeding, or a convenient carry tray for carrying medicines, thermometers, spray cans etc.

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5. Making a plan

- Start with 'first principles', doing highest impact or most important things first. If you only get one thing right, get the colostrum intake for new calves right first.
- What is possible? How can you make it possible to get right outcome? For example, if calves are receiving insufficient colostrum, chances are you will either spend your time in the calf shed treating sick calves or time out in paddock picking up calves more often or tubing them. Prevention is always better than cure. Often it will need commitment from the entire farm team, not just the calf rearing team.
- Enlist extra help as required, your local vet clinic, consulting officer or other calf rearers in the area can all offer advice.

6. Summary

The rearing of quality heifers that meet their targets with minimal losses each year is no accident. It requires attention to detail, good planning and of course, endless patience. It doesn't require the flashest shed and sometimes amazing results are achieved using methods that would make most vets or calf rearing advisers shudder. The important thing is that it works!

Design your system around what works for you and your farm team, but stick to getting the basics checked off **every time** as this will ensure that calf health, welfare and growth doesn't suffer. Since putting on my farmer hat 8 years ago, I have learnt that a lot of corners can be successfully cut, but I also know there are some non-negotiable basics – cut them at your peril! What your neighbour can get away with and what you can get away with are not the same.

There is a huge amount of knowledge and resources out there. Take time to compare and discuss what you do with other calf rearers, vets, feed product salesmen and other rural professionals. They can help you sift through the shiny brochures and long standing myths and work out what is really important for improving your own system.

Look after yourselves during the season, and if things start to go wrong (e.g. outbreak of scours, high death rate), take a few deep breaths, pour a large glass of wine and think about any of the basics that you've been missing out. Fix the biggest problem first.

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