DAIRY **WOMEN'S** NETWORK

success through inspiration

PARTNER WEBINARS

SUCCESSFUL CALF REARING FAQS

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SealesWinslow

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Dairy for life

Housing & Pen Design

Was barley straw included in the bedding study?

No, barley straw was not included in the bedding study.

What do you think of barley straw as a bedding material?

Having straw and hay is great, particularly if it is cost effective for you to be able to do so. Just make sure that it is dry at all times. Don't remove the bedding, just top it up, and make sure you are keeping it dry. Make sure you are keeping calves away from any wet patches, and watching for mould and mycotoxins, too.

Do calves really need stimulating toys in their pens? Would things like Swiss balls just encourage the spread of bugs?

The key is that whatever toy or enrichment that goes into each pen, stays in each pen. They're already going to be licking each other, eating the same meal and drinking from the same water trough. If you're trying to swap out an enrichment into different pens — for example, Pen 1 gets the tennis ball the first week and Pen 2 gets it the next week, and you move things down the pens — then you can get crossover and risk of contamination. Even if your enrichment is something as basic as some rope that is tied to the fence or gates, or hung from the ceiling, make sure it's not accessible in the neighboring pen.

If you've got a Swiss ball that your think is too big for your calf, give it to your cows - they like something to play with as well!

Is lime a good use for a disinfectant in the calf pens?

Lime is not really suitable as a disinfectant.

Being alkali (meaning it has a pH over 7), adding lime to bedding is likely to increase the pH. Bacteria which convert urea in urine into ammonia are more suited to these higher pH environments, so ideally we want to try and keep the pH of bedding materials in animal housing lower.

A high pH in bedding material can also cause the waxy layer on animal skin to breakdown, removing some of the animals natural protective barrier against infection.

In the event of the high bacterial count within the bedding, the use of a good disinfectant is essential. Ideally bedding should not be removed until the sheds are no longer in use, i.e. the calves have all been moved outside. When bedding is removed, some of the bacterial can become air born and increase the bacterial load in neighbouring pens. If calves are still in the pens and the bedding is wet, the use of a disinfectant and additional bedding to be laid on top of the existing bedding is best practise.

Exposure to sunlight can help reduce bacteria loading, but again this is only effective at the surface (which is exposed to the sunlight).

There are products available which are designed to work in bedding material to help reduce litter pH, reducing ammonia production and which also act to dry out the bedding and thus limit pathogen growth.

Would putting down salt before laying down wood chip do anything?

You will need to think of what is it going to do, is it to kill bacteria? It might make a slightly less hospitable environment for bacteria underneath the chip, but that won't affect bacterial levels on the surface.

If you were designing a calf shed from scratch, what would you consider the optimum number of calves to have in each group?

Guidelines usually say 10-12 calves per pen. In part this is because of how many it's practical to feed, but it's also because smaller groups allow for better containment if there's an outbreak of disease. To make sure every calf gets fed you should have at least as many teats on the feeder as there are calves in the pen.

What factors would you consider when deciding what bedding to use in calf pens? Is there a "gold standard" bedding?

Focus on what you want the bedding to be:

- Clean, dry, and comfortable
- Sustainability and what to do with it as an end product

Most people use a type of wood by-product, so shavings or chips because they have good drainage, are reasonably comfortable, and are biodegradable. It's important to have plenty of spare bedding available so pens can be topped up if they become wet or soiled.

Research conducted by AgResearch suggested that rubber chip was the best bedding from a calf health and welfare perspective, but there are practical challenges around cleaning and/or disposal at the end of the season.

What are some of the best calf shed set ups you have witnessed and why?

9 times out of 10, the sheds are not purpose built so we must make do with what is available.

Something that's recommended but often not implemented is having solid walls between pens to provide shelter and reduce disease spread. In Gore, there was a covered yard with hay or straw stuffed down between the pens. Not only did this provide shelter and separation, but the calves were also nibbling the hay which will drive rumen development. In terms of best practice, we talk about feed availability of approx. 35cm per calf, so by having high walls or stuffed walls where there is access to them and that being topped up means less competition for feed.

Solid partitions between pens stop calves directly passing disease to each other between pens, but it doesn't stop equipment, airborne or person borne transmission. That's why good hygiene practices are so important, especially after dealing with any sick animals.

Automatic calf feeders generate calf effluent. Have you witnessed some great examples in dealing with this? As regional councils will ping us at some point on this.

As calves cluster around one area when feeding, you could build an underground containment space that you can access to clean it out.

If in the shed, it would depend on what you shed is built on - dirt or concrete pad, and the setup of the feeder – could have it on a concrete pad then build up bedding around it to be able to replenish the bedding on top rather than remove and lay new bedding down. You will need to ensure it is kept as clean as possible. Or you could set it up so that the calf needs to walk up a slope to the feeder.

Feeding & Meal

Do you have any tips for succcessful once-a-day feeding?

Remember that the calf has got a very small capacity to be able to take on a huge volume of milk, so, if you're looking at once-a-day feeding, actually giving them time to be able to drink is important. The milk is going directly into their abomasum and you need to make sure that you aren't feeding them a high volume of milk because any overflow is going to spill back into the rumen. This can cause nutritional scours that way because the milk will end up fermenting in their stomach. Typically, there has been some success with having less calves per pen with a once-a-day feeding system, because then they are not fighting each other nearly as much when it comes to feeding time. Make sure there is enough meal in the pens, and hay. If you're feeding them milk in the morning, put the meal in the pen in the afternoon so you're not trying to fill the abomasum and the rumen at the same time.

One of the reasons that the routine and the time is important is because the way that the calves digest the milk fluctuates with time. If you delay too long, and you go past 24 hours since their last feed, then you may see a reduction in the amount of acid in their stomach. Therefore, the milk isn't going to clot properly and that can contribute to scours as well. That routine part is really important here, but yes you can quite successfully rear calves on a once-a-day milk feeding system.

Natalie stated that they weaned Jersey calves at six weeks and 65 kilograms. I thought best practice was not to start weaning until calves are at least 12 weeks old and then based on weight. Six weeks seems too early – what is this based on?

Please do not wean your calves at six weeks! That ag-research trial was from a milk perspective, when you start looking at the cost of milk versus the cost of meal versus the cost of grass. You obviously want to be able to grow the calves and make sure that you're meeting those liveweight targets but the quicker you can do that, typically the more economical it is, was the component around that research. The aim was to wean the calves at 65 kilos, and see whether it could be done in six weeks. About 47% of the calves that were fed a 20% crude protein meal got to that 65 kilos within six weeks.

How long should calves stay on meal after weaning to cover the risk of coccidiosis?

You should typically feed them meal until they're about 100 kilograms. Make sure that they are eating enough meal for their liveweight. One of the things that seems to crop up every year is that yes, meal has coccidiostats in it, but we need to make sure that we are feeding enough of the meal to build up that resistance. It's the same with calf milk replacer, that might have coccidiostats in it as well. Just because you're feeding a couple of litres of milk replacer doesn't mean that it's going to be protective. Ultimately it depends on the farm and the farm system. There is a table in the meal and feeding webinar that is based off typical inclusions, but one of the best things to do is to contact who you're buying your meal from and find out what those weights are, to make sure that how much you're feeding is according to the weight of the calf.

Will calves get protein scours from feeding 20% calf meal while they are still being fed milk?

In a nutshell, it will depend on the protein that is in the feed. Different types of protein degrade differently within the rumen and so if the proteins are rapidly being degraded and essentially shooting through the calf, there can be an issue. However, there are some really good brands out there that can support that. One of the best protein sources that you can give your calves is soybean meal; the amino acid profile of it is exceptional and the digestion within the calf is really well suited. Feeding a 20% crude protein diet shouldn't cause nutritional scours, and investigate what else is in their diet if that is the case.

Is it best to feed calves 16% calf meal while they are being fed milk, and then change them to 20% calf meal once they are weaned from milk? Can I do this with confidence or will this impact my calves' development?

Protein is necessary for muscle, bone and tissue development, so the higher the protein the better. When the bugs are breaking down the feed they need that protein as well to keep them alive, and as they die off naturally and flow through into the intestinal tract they become available to the calf for the calf's own protein development. It's really important that you are giving calves enough protein, so go for a higher protein meal from day one.

What are your thoughts around feeding calves whole grains?

A whole grain usually has an outer skin around the kernel and unless that is physically broken down, the nutrients can't get out of it. Some kind of treatment process to a grain is probably a good idea if you're trying to maximize the nutritional value of a feed. If you're thinking about little calves, their ability to ruminate is still developing, so there will be less opportunity for that physical damage to occur to the grain. It is probably better for the calves to be fed sprouted grains instead of whole grains.

If you are thinking about feeding whole grains, or are feeding whole grains, have a look at the dung and the amount of either whole grains that are still passing through, or white flecks.

What about products like Bentonite/Trubond for calves to lick? Are there any proven benefits?

If you feed too many zeolites you can cause constipation, but calves seem to enjoy them. It is an ongoing area of research.

Is there any harm in giving electrolytes to calves daily in small amounts for a few weeks, if they are healthy? Just to boost their water intake and keep them sprightly.

There is little harm in giving calves electrolytes ongoing for a few weeks. It is best to ensure that this is given with at least a 2 hour window before or after milk feeds. e.g. if milk is being fed morning and night, give the electrolytes at midday. This is due to optimal absorption. Typically the reason that this is not done on an ongoing basis is cost and time requirements.

When combining whole milk with a pre-mixed CMR, do you need to adjust the volume fed?

The key to calf feeding is consistency: consistency of timing, consistency of feed type, and concentration. Any changes to the feeding regimen should be made slowly to give the calves time to adjust. Sudden changes in any of those factors can lead to a nutritional scour. Any changes you make, make them slowly.

Other things to consider are is it a casein or whey based CMR? Casein based powder will curd in the abomasum, which is important for proper digestion during the first four weeks of life. If you make your CMR too dilute or water down whole milk it won't curd properly and could cause scours.

Best practice would be to test the solids in the whole milk with a Brix refractometer and followed the recommended guidelines in terms of what that CMR is, to prevent the dilution.

What are your thoughts on a feeding regime of 3 times in 2 days like a 16hr milking program? Each feed being 3 litres. 9 litres over two days instead of 8.

Calves get used to a feeding routine so long as it is consistent and the interval between each feed is as even as possible.

You will need to ensure that they are also getting enough meal, hay or roughage that is available to them that is outside those feeding times.

Is hay important for calves? Or does this restrict their meal intake? Ie any nutritional value in hay?

Both kinds of hard feed are important for rumen development. The fermentable starches in meal drive rumen surface growth, and the bulk of high fibre feeds like hay helps stretch the rumen, encouraging muscular development and rumination behaviour.

One of the key components around hay and good quality roughage is as we feed starches and sugar as we grow the rumen papillae (the lining of the of the rumen has little finger like protrusions), the good roughage can help separate those. When they grow too quickly, they can stick together, and it creates this sort of scratch factor around that rumen. It also helps build and support the muscle development within that rumen and rumen wall.

The nutritional fact is that hay is a stalky type of fibre, and we need to more look at the chop lengths. If we give something really long, it's going to take the calf a long time to chew it down until they can digest and eat. But if we give them a really good size muzzle width lengths of chopped hay, that is where it really helps having that scratch factor which helps support the butyric Acid develop and the papillae development.

What is your opinion on coccidiostat in milk such as a calf type milk additive containing Bovatec every day till weaning (ad-lib meal given coccilstat as well) versus Vets are recommending a new product to oral drench them after weaning called turbo and say is better than putting a coccidiostat in milk leading up to weaning a waste of time?

It's uncommon to see coccidiosis before calves go out onto pasture, unless you have a specific issue on your farm you probably won't see any benefit to adding coccidiostat to the milk of housed calves.

Most high-quality calf meals contain some form of coccidiostat, but calves need to be eating enough meal to get a protective dose. The coccidiostat prevents the parasite from multiplying in and gut and causing disease, but the calf is still exposed to it and slowly builds immunity. The biggest risk period for coccidiosis is when calves are weaned off meal before they've built up much of an immunity to coccidia. Turbo is primarily a worm drench but is designed to also provide some residual protection for animals as they wean off meal.

If you use a coccidiostat in the milk or meal your calves need to be eating or drinking enough to be getting a protective dose. Check with your supplier what their recommended dose is for the volume you're feeding and adjust as needed.

There are farms out there that don't provide any form of coccidia mitigation, but they are placing themselves at much greater risk of a potentially devastating disease outbreak.

On whole raw milk when can you go once a day and how much do you feed?

There's no hard and fast rule. If you're going to go once a day, you can only feed them as much as they can consume in one feeding session. Basic rule of thumb is that 7% of live weight is around the size of the abomasum when they are a young calf around the age of 3-weeks.

The risk if you overfeed them, in particular the way that young calves digest milk is that it goes into their abomasum and it forms a curd and if you overfeed them then you interfere with that curd formation process, and you potentially will have milk spilling into the rumen and you get fermentation in the rumen, which can lead to bloating or scours.

Look at how the calves are coping, are they leaving milk behind because they can't drink anymore, or are they still hungry, what else are they doing? You do need to be led by them, because, depending on how well they're growing, and how old they are at the time, that will affect how much milk they can drink.

At what weight should I switch from 20% to 16% muesli. Is there any advantage to keeping them on the 20%?

It all comes back to what you are wanting to achieve and the feeding system you are using.

If you're weaning to a certain weight, obviously we want to do that as quickly and effectively as we can, and you want a really good source of proteins going in to help build that muscle development. You might want that higher quality level of protein. If you move to the lower level of protein, it might mean that you need to keep feeding a bit longer to be able to reach the weaning weight.

If you are weaning to a date or an age and conscious of pricing, then it makes sense to drop to 16%. Keeping on the 20% means that you are giving them a really good vegetable protein and at that time the calf doesn't have the capacity to get all the nitrogen that's in the pasture and stick it with the carbohydrate to convert it into an effective protein for them to grow.

Is it better to do OAD feeding for the first two weeks or do twice a day from day one?

When you look at how calves feed naturally, they are feeding 8-12 times a day, it is normal for them to be fed little and often.

Feeding them twice a day will minimize the risk of overfeeding and the calves will have a consistent digestive intake. Best practice would be to keep them on twice a day for as long as possible to ensure the abomasum is able to grow and stretch.

If only feeding them OAD from day one, then you risk underfeeding them slowing their growth, or overfeeding them leading to scour.

Milk & Colostrum

Has there been any research on the quality of water offered to young calves?

Yes and no; there is currently a PHD being under taken in Australia looking at the limits that are associated with water quality for stock. However this is not specifically to calves.

The big thing to look at is the ecoli level within the water and to ensure that the water troughs, buckets, etc are cleaned out every day. If the water source is coming from tank water, check the water quality and potential foreign objects (dead possums, birds, etc). When it comes to Bore water, test the iron levels. High iron can act as an antagonist, this means that it ties up the other minerals the animal is eating and therefore they may not be absorbed as effectively.

What are some practical ways to test colostrum quality when you've got 30+ new calved cows coming in at once? I have a brix refractometer but it's a lot of work to milk each individual cow into a test bucket and then test the quality. Any tips or ideas?

If you've got a Brix, fantastic! Strip the cows first, and then after you've stripped them out a little bit take a sample to put on your Brix before milking them into your bucket. It means that, for example, if you're got a couple of cows that all sit around that 22 mark, you can go 'here are my 22s' or 'here are my 23s' — and be able to allocate them accordingly. Just make sure that you do strip out those cows first in case they've been dry cowed or there's a different volume in that milk canal.

You could also use the characteristics of the cow to anticipate which ones may or may not have that colostrum. You know heifers aren't going to be as good, or if you have any ones who are leaking milk then they are likely to have a lower Brix reading.

Will first or gold colostrum tubes do the same trick as bottle feeding?

Best practice would obviously be bottle feeding and making sure that calves are getting the volume of gold colostrum that they need and the right quality. After the several hundred calves that have potentially gone through a shed our tolerance typically goes out the window, and that's where tube feeding is definitely an option. It's important to remember to get good quality colostrum down their throats quickly to make sure that they are getting the immuno-globulins and passive transfer to build their immune system. Remember as well, if we've got the option of bottle feeding, keeping it warm is going to be able to help the diversion of the colostrum into the abomasum. Confidence around tube feeding is important, if you're going to do that. Have a chat to neighbours around who have done it and who are confident in doing it.

How important is the temperature of milk? When I came to NZ I couldn't believe the amount of people who feed cold milk, but everyone seems to think it is just as good. Is there an age at which feeding cooler milk is OK?

We talk about the diversion of milk through the esophageal groove and one of the things that helps with that is temperature. In that case the temperature plays a huge role. We've also got to remember that we're calving cows in winter, and it's cold. Being able to warm up those calves with warm milk is massive. They do take energy to heat that milk once they've drunk it. If you imagine drinking 10% of your body weight in cold water, that's the amount of warming up that those calves have got to do before they can start digesting that milk properly. Part of how it curds in the abomasum is temperature-dependent because the rates of reaction happen by temperature. Yes, you can successfully rear calves with cold milk, but it's a risk. If you're successfully rearing calves with cold milk you're probably doing lots of other stuff right.

Do you feel there are benefits in pasteurizing milk for calf feeding? Also is the pasteurization process damaging to the immunoglobulins in colostrum?

Pasteurization is good. That stored colostrum in New Zealand tends to have very high bacterial counts because it's often in a plastic drum kind of sitting by the shed, so it's not refrigerated, it's often open to the air. The bacteria compete with the calf for the stuff that's in the colostrum and potentially degrade the IGG and spoil it. Although some will preserve it, depending on how you store it.

IGG is sensitive to temperature, but it will also be degraded by time and bacteria. Commercial pasteurisers are trying to aim for the sweet spot between killing as many bacteria as possible while having minimal impact on IGG.

Low bacterial counts are important for ensuring that good transfer of passive immunity when you're feeding that first colostrum feed and are a measure of quality of the milk that you are giving to the calves.

How are people finding once a day milking of colostrum cows/milkers for supply of calf milk? Are people running short?

During the colostrum period cows' production is still increasing, and the decrease in production associated with OAD milking doesn't normally become apparent until the cow is closer to peak milk. This should mean that calf milk supplies are unaffected by OAD milking, but even on OAD there still needs to be an eight-milking withholding period.

Achieving Liveweight Gains

If R1 heifers fall behind target weights but are able to gain the weight back prior to mating, will they still be negatively impacted in terms of productivity in the future?

There is some really interesting research out there around the fat being laid down within the mammary glands. If calves are putting on a huge amount of weight later on during rearing you can negatively impact the mammary glands and how they are structured, and you can reduce their milk potential later on down the track. In a perfect world you would want your heifers to be able to evenly gain weight the whole way through which is incredibly hard to do. However, if you can get them up into mating and be able to gain weight later on, then yes, there's a limit on how much you would want them to be gaining on a daily basis. Anything over 1.2 kilos per day, depending on what is being fed, can impact those milk secretory cells with fat deposition.

You've probably seen the really small but fat heifers who come into the herd and they've got problems because they're still small and they're going to be behind because they've still got that growing to do. They're more susceptible to bullying, they're probably at a bigger risk of having a difficult birth, and if they have normal mammary gland development that's going to be delayed as well in terms of their potential.

Can you please clarify; I thought fatty udder is growth before 12 months, not after 12 months, and fatty udder is much more affected by energy intake not feed intake or growth?

Yes, there are Parenchyma cells that are within the udder, and if you're looking at the amount of fat that is being laid down within that udder, there is still a component that is growing within there after 12 months. If you're going to be overfeeding them later on then you're going to have to feed a very high energy feed to be able to make them grow that quickly. Fat deposition would be one of the easiest ways for animals to be able to gain that weight. It can go anywhere within the animal so fatty udder is still potentially a risk but it would depend essentially on what that liveweight gain is looking like.

How do you work out the weight or height targets? What about for mixed-breed herds? How would you recommend individual heifer monitoring where the mature weights are different among the herd?

For pure dairy animals there is a liveweight component to their breeding value and this is automatically taken into account by the Weight section of MINDA Live. For the farms that don't have MINDA you can weigh a cross section of the mature cows in the herd to get an estimate of mature weight, then use the targets to track progress. These targets are 30% adult weight at 6 months, 60% at mating and 90% at calving. More information can be found at www.dairynz.co.nz/animal/heifers/liveweight-targets/

Beef cross animals are a bit harder as their sire is unlikely to have a liveweight BV, but their economics aren't dependent on them getting in calf at a certain time.

We are farming on the West Coast of the South Island and generally have quite wet Springs. When do you recommend calves going outside?

Putting a set time around it is going to change depending on where you are and what your rainfall is, and what your regional seasonal space is.

A few things to consider

- How much space do you have in the shed? Is there capacity to be able to keep calves in the shed for 10-12 weeks?
- Is it economically worth keeping them inside? We want them eating grass to develop the rumen and fill in some of the dry matter intake from pasture.
- What is the state of the housing and bedding and what the calves are in?
- If you need to put them out early - what are opportunities in terms of shelter outside and how can you reduce or mitigate some of the cold stress?

What would the weaning weights for crossbreed calves off milk and then off meal be?

It depends on the system you are feeding. Once they start eating that kilo of meal for three consecutive days then you can start to wean them off milk.

The focus needs to be on the rumen development and making sure that when milk is removed from the diet that the calf can fully digest the pasture, meal, straw, or hay.

Using guidelines around is the calf ready to wean and what their intakes are, can be more useful.

By making these changes slowly, you're less likely to see a growth check or outbreak of disease.

You mention "are they ready to be weaned from milk" around rumen development. Are there any physical signs that could be looking out for to know when their rumen is functioning?

When they are at rest, are they chewing their cud and that is going to happen more when they are eating more fibre.

A sign that a calf might need more fibre in their diet is when a calf is regurgitating the liquid in their stomachs, and it is dribbling out of their mouths.

Neonatal Calf Nutrition & Disease

What are the pros and cons of whey-based CMR versus casein-based CMR for beef rearing? How would I know which is best for my system?

The protein in whole milk is 80% casein and 20% whey. This is important for young calves because their digestive tract is undeveloped and most of their protein digestion happens in the abomasum. Casein proteins form a curd in the abomasum which gives salivary enzymes time to break them down. Whey proteins do not curd and so pass quickly through to the small intestine without being digested. It takes a few weeks for the calf's pancreas and liver to start producing enough digestive enzymes to break down protein in the intestine, and until then CMRs high in whey carry a higher risk of maldigestion and scour.

You should always use a casein-based CMR until calves are four weeks old, but after that the type of protein doesn't matter as they can both be broken down into all the necessary amino acids.

What is your opinion on using Pro Calf?

There are a variety of probiotics on the market and you can find people who will endorse each of the different ones. The science of manipulating gut bacteria is still quite young, and the size of the effects seen in carefully controlled experimental conditions may not translate to the real world where there are more factors at play. There is value in these sorts of calf rearing supplements, but they aren't a substitute for doing everything else right. Your other practices need to be up to scratch before you get the full benefit of them.

What's your take on feeding probiotics as standard practice to all your calves?

The important thing to remember is that they're not a substitute for good calf rearing practices. You have to have that good calf rearing stuff down pat before you think about putting money into probiotics. Something else to consider is why are you feeding them in the first place, because you can still get really good liveweight gains and mitigate any illnesses with good management practice. Think about the intention behind using any additive, whether it's a probiotic or a prebiotic.

If you were to prepare a "first aid kit" of animal health products for the calf shed, what types of products would you want to have on hand?

- Electrolytes
- Purple spray or disinfectant to clean wounds
- Eye ointment
- Bandages
- Antibiotics – talk to your vet first