

Mother-bonded and Fostered Calf Rearing in Dairy Farming

The practice of mother-bonded or fostered calf rearing is attracting growing interest among dairy farmers. More and more, dairy farmers seek to extend the time that calves are left with their mothers, while continuing to milk the mother cows. In this way, the cow and her calf are given the opportunity to experience a much closer and more natural relationship. Some farmers have gained experience with mother-bonded or fostered calf rearing and developed their own methods. This technical guide describes their experiences; making them available for other farmers. The brochure provides numerous suggestions for the implementation of mother-bonded calf rearing and for on-farm equipment requirements.



An Exciting Challenge

Common agricultural practice is to separate calves from their mothers on their first or second day of life, so that the mother cows can be milked as usual. The calves are then commonly fed twice a day with fresh cow's milk, which they suck from teat buckets. This method is tried and usually works well, but it prevents the development of a natural relationship between the mother and her calf.

Working with their animals, some farmers have sought to find a suitable alternative system that

fosters a natural relationship between dairy cows and their calves. Based on these experiences, this guide provides information about field-tested methods of mother-bonded and fostered calf rearing. This type of dairy farming not only requires knowledge of the natural behaviour of the animals, but also needs an assessment of the essential and non-essential aspects of animal husbandry, and of the potential of the animals to adapt flexibly. It also requires a commitment by the farmer to develop a new approach to working with his or her animals.


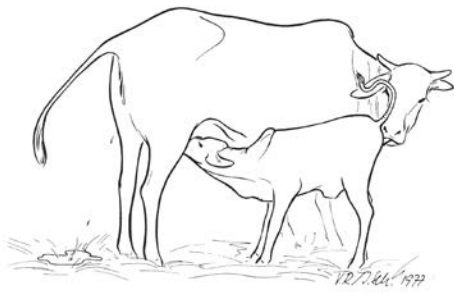
The Natural Relationship between Cow and Calf

What happens during natural calving? How do cow and calf behave after calving? How frequently, for how long, at what intervals and how exactly will a calf suckle if it is allowed?

Knowledge and understanding of the natural, species-typical behaviour of cows and calves, as well as knowledge of their anatomy and physiology, forms an important basis for decisions about the

method of mother-bonded and fostered calf rearing, and also for motherless calf rearing.

The following descriptions are based on textbooks and observational studies of wild and semi-wild living animals, as well as of animals living in a farm environment. The drawings were made in a herd of semi-wild Camargue cattle.

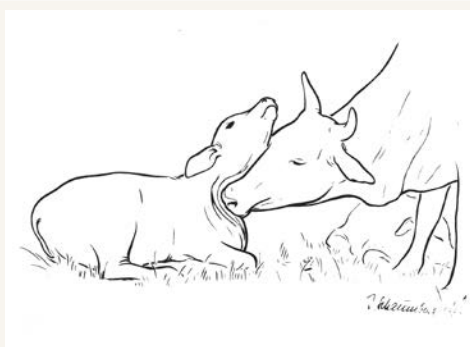
The Natural Behaviour of Cows and Calves	Conclusions for Species-appropriate Rearing
Around Calving	
<p>A few hours before calving, cows normally seek a quiet, dry and slightly elevated place away from their herd. In open areas without structure, they sometimes calve close to their herd. Their choice of where to calve also differs due to individual preferences.</p>	 <p>› Cows should be moved to a calving pen shortly before calving; unless they clearly do not wish to be separated from the herd.</p> <p><i>Shortly before calving, the heavily pregnant cow distances herself from the herd.</i></p>
<p>A short time after calving, the cow will start to intensely lick her calf dry. During this process, the cow utters deep, growling mooing sounds. The cow often eats the afterbirth. Within 10 to 30 minutes of its birth, the calf is usually standing, and 45 to 95 minutes after birth it seeks out the cow's udder to suckle.</p> <p>All healthy calves stand and suckle within three hours. This enables them to absorb valuable colostrum. During this valuable and necessary phase, the imprinting of the calf by its mother takes place; after which the cow recognises her calf. Imprinting is also possible with a calf from another cow.</p>	 <p>› If this behaviour does not occur, assistance may be required by dry rubbing the calf and helping it find the teats and suckle.</p> <p>› If the cow is required to foster a calf, the best time to introduce it is shortly after calving.</p> <p><i>The cow will nurse her calf in reverse parallel position. It will sniff and lick the calf and so stimulate it to urinate and defecate (meconium).</i></p>

Around Calving

In the first hours and days after calving, the cow continues to lick the calf intensely, so strengthening the bond between them. The cow calls the calf to suckle, if it does not do so of its own accord.

After about 3 days, the cow and calf recognise each other by voice, and the cow recognises the calf by smell. However, they do not always recognise each other by appearance.

Some cows behave aggressively towards humans at this stage.



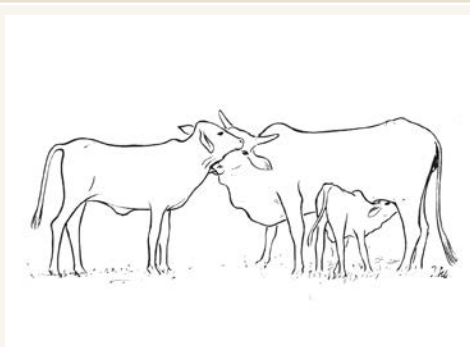
This calf is thoroughly licked by its mother.

- If the calf is to be separated from the mother before a bond is formed, it must happen in the first 24 hours after birth.
- The mother's licking improves the blood circulation of the calf.

1 to 14 Days after Calving

The calf rests very much during this period. It drinks about 6 to 8 times per day for an average of 7 minutes. It mostly suckles from just one or two teats. Some calves remain in a well-hidden place while the mother goes to eat nearby, returning regularly to lick and suckle it.

Mature cows begin to leave their calves alone sooner than younger cows. However, some calves follow their mothers to the herd from their second day of life (this is especially the case with animals living on open areas). In such cases, the cow stays with her calf on the edge of the herd.



A cow suckling her young calf (a few days old), while licking her 13 months old female calf at the same time.

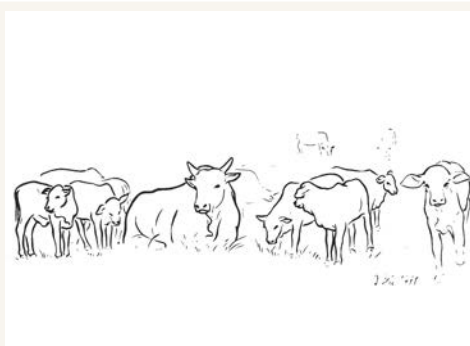
- Depending on the nature of the calf, it may stay alone in the calving pen for a longer or shorter period. This provides the opportunity to feed and milk the cow outside the calving pen. The cow should still have access to the calf several times a day.

2 to 8 Weeks after Calving

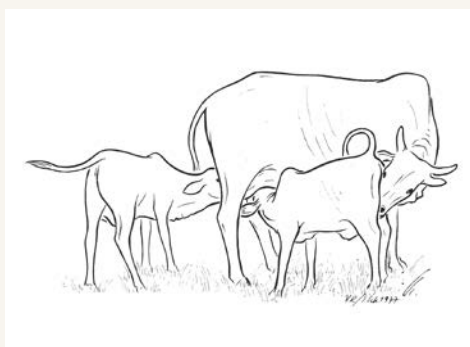
In this period, the mother cow accompanies her calf to the herd. The calf joins a group of young calves. The calves are always guarded by a cow or a bull. The mother cow grazes with the other cows. The calves rest, play and frolic. The mother cow normally seeks out her calf to suckle it, and sometimes only to check if it's there or to lick it.

Cows only lick their own calves. In general, they also only let their own calf suckle. Other calves are often chased away briskly. Cows recognise their own calf by its smell as it suckles in reverse parallel position. Calves like to try and suckle from other cows, too. They do this from behind and preferably when the cow's own calf is sucking. In this way they evade the usual odour identification process.

Now and then, calves call for their mothers when they are hungry. The mother cow usually responds and goes to the calf, while the calf runs to meet her. The calves suckle now 4 to 5 times per day for about 10 minutes. The cow's aggressiveness towards humans lessens.



The group of calves is guarded by the old bull.

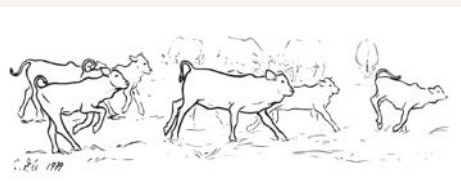


While the cow is nursing and licking her own calf, the alien calf suckles the surrogate mother from behind.

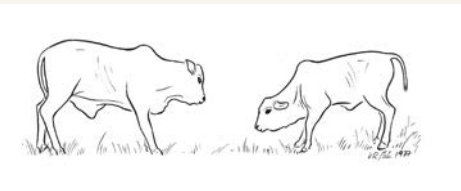
- Groups of calves should have a separate place in the barn. The temporary separation of mother cow and calf is now easily possible.
- Not all cows are suitable as foster cows. Calves suckle without problems from foster cows, if they allow it.
- Alien calves are best accepted by the cow when its own calf is sucking simultaneously.
- Calves should be given the opportunity to suckle milk several times a day for about 50 minutes in total.

2 to 5 Months after Calving

The calves integrate more and more into the herd. However, they still like to be together with calves of their own age; to play, run around as a group and fight playfully. The male calves use their horns to play-fight with one another; they mount and fight more often than female calves do. The calves also often play with their mothers. The suckling times and frequencies remain the same as in the first weeks of life.



Calves frolic in their group.



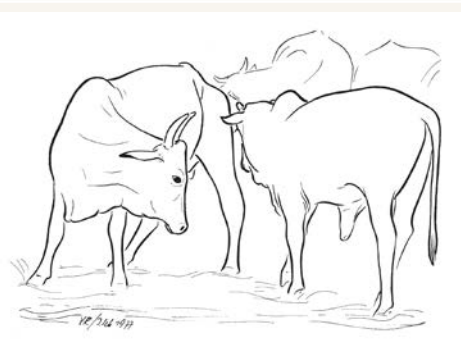
The bull calf on the right is challenging the bull calf on the left to playfully fight using their small horns.

- › Calves of similar ages should be kept together and have enough space to play and frolic.
- › Calves still require approximately 50 minutes suckling time per day.

5 Months after Calving and subsequently

After about 5 months, the calves begin to graze together with the adult animals, often right next to their mothers.

At about 8 to 9 months of age, the mother cow will wean its heifer calf, but will delay weaning a bull calf until it is 11 to 12 months old. The close relationship between mother cow and calf continues to exist even after weaning and after the birth of sibling calves. In comparison to unrelated animals, related animals will graze together and lick each other more often. The mother cow and siblings are the main social partners of the lower-ranking young animals.



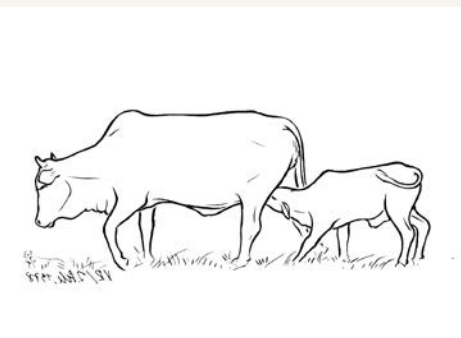
The cow is weaning its 11-month old bull calf.

- › Although still quite young, weaning of the calf is acceptable from the age of 5 months. The separation of mother and calf will produce feelings of loss for both animals, so it is important to offer enough distraction to the animals after separation.

Anatomical and Physiological Aspects

The calf has a strong sucking reflex from its first few minutes of age, which is triggered when the young animals' oral mucosa is touched; developing into a chewing reflex as the calf gets older. Over chemoreceptors, the warm milk triggers reticulum ("honeycomb", "bonnet", "kings-hood") contractions, which lead to the formation of a closed groove between the oesophagus and abomasum, so that the milk flows directly into the abomasum instead of first passing through the rumen (paunch).

At the beginning of its life, the calf will not yet have developed its own immune system. It receives the necessary immunoglobulins with the colostrum. Calves that suckle from their mothers get more globulins than those that are fed with teat buckets, since the globulins break down very quickly and some are lost in the period between the milking of the cows and the feeding to the calves.



This calf suckles its own mother from behind, because the cow does not want to interrupt its grazing.

The amount of globulins in milk decreases continuously after birth. However, the calf will have only developed its own immune system primarily after 4 weeks. That is why the risk of disease with calves is at its highest between 2 and 4 weeks of age.

- › The calf should be given the opportunity to suckle, because it cannot turn off this reflex and this need.
- › The calf must receive warm milk, because it triggers the reticulum contractions perfectly.
- › The calf must suckle preferably from its own mother from the outset.
- › In order to prevent diseases, all calves between 2 and 4 weeks of age must be looked after extremely carefully (good hygiene, avoid stress!).

Systems of Mother-bonded Calf Rearing

Depending on the dairy system and equipment employed; the characteristics of the herd; and preferences of the farm management, a variety of mother-bonded and fostered calf rearing systems may be considered. Three systems can be distinguished that go beyond the widespread practice of the brief suckling from the mother cow during the colostrum phase:

- A. **Long-term, restrictive suckling with additional milking:** the cows and the calves are brought together twice a day specifically for suckling. Usually only the mother cow's own calf suckles, but it can be managed in a way that other calves can suckle as well.
- B. **Long-term suckling with unlimited access and with additional milking:** the cows and the calves have contact with each other for several hours per day or unlimited contact. In addition, the cows are milked 1–2 times per day. Usually only the mother cow's own calf suckles, but it can be managed in a way that other calves can suckle as well.
- C. **Long-term suckling (whole suckling period) without additional milking:** The cows are permanently together with 2–4 calves each. There are always alien calves around, meaning that the cows are foster cows. After a short suckling period, only the mothers of the alien calves are milked. The foster cows can be milked again after weaning or in the next lactation period.

Other Differences in Management

Especially within the first system, there are many different ways the **cows and calves can meet each other**.

- A. **Time of the meeting:**
 - › Before milking
 - › After milking
- B. **Time interval between meeting and milking:**
 - › Immediately before milking
 - › Immediately after milking
 - › e.g. one hour before milking
 - › e.g. one hour after milking
- C. **Location of the meeting:**
 - › The cow goes to the calf.
 - › The calf goes to the cow.
 - › The cow and the calf meet in the exercise yard or in the waiting room for the cows.



The simultaneous milking and suckling is useful at the beginning of lactation, especially with heifers which do not like to be milked.

In addition, several **weaning processes** are possible:

- A. The calves suckle from their mother until weaning.
- B. The calves are separated from the mother before weaning.
 - B1. The calves suckle from a foster cow after separation from the mother.
 - B2. The calves suckle from a bucket or an automatic calf feeder after separation from the mother.



On pages 9 to 24, ten farms are presented: each operating a different system. All of the presented farming businesses are operated on an organic basis and sell their milk, process it themselves and sell the products, or both. The farms all have good udder health and somatic cell counts permanently below 200,000. They very rarely have sick calves.





Suckler cows and calves in the waiting area in front of the milking parlour.

Advantages and Disadvantages of the Mother-bonded and Fostered Calf Rearing

Practice and scientific studies showed both advantages and disadvantages of the mother-bonded and fostered calf rearing system.

Criterion	Benefits	Disadvantages and Challenges
Species-appropriate Behaviour	<ul style="list-style-type: none"> › A species-appropriate, natural behaviour of cow and calf is largely possible. › The calf does not intake any air, suckles in a natural position and at a natural speed. › No competition or stress at feeding time. 	<ul style="list-style-type: none"> › Greater weaning stress for mother and calf in comparison to very early weaning within the first day. › In most systems the calves can only suckle twice per day and only get the first or the last milk output, except when there is a 2-hour break between suckling and milking.
Health of the Calf	<ul style="list-style-type: none"> › Less diseases than in bucket nursing because the calf receives very fresh and warm milk containing all intact immunoglobulins that the cow produces due to the germs existing in the cow shed.^{1,2} › The mother cow licks the calf during suckling; thus promoting blood circulation to the skin as well as taking on existing germs and forming antibodies against them.¹ 	<ul style="list-style-type: none"> › Some calves increasingly suffer from diarrhoea, because they drink too much milk.¹ This can lead to infectious diarrhoea; presumably when ill-digested milk containing pathogens reaches the intestine.² › Foster cows normally do not lick the calves and therefore usually have less beneficial effects for the calves' health than their own mothers would.²
Weight Gain of Calves	<ul style="list-style-type: none"> › Increased weight gain during suckling phase than in conventional rearing, as the calves drink more and, with the last milk output, even fatter milk.^{1,2} › Calves suckled by their mothers also show better development after weaning; they calve at an earlier age and have a higher milk performance during the first lactation.² › Because of the milk, the calves eat less or no concentrated feed at all.² › Simply the presence of the mother cow improves the calf's weight gain, even if the calf is not allowed to suckle from her.² 	<ul style="list-style-type: none"> › After weaning, the weight gain may decrease faster than in conventional calf rearing.^{1,2}
Rearing	<ul style="list-style-type: none"> › Animals reared in such a way rarely suckle each other and do less licking of objects and farming equipment. Any suckling of each other can be largely eliminated by switching to mother-bonded calf rearing.^{1,2} › The calves show better social behaviour.² › Calves bred within a mother-bonded rearing system make much more confident mothers themselves.¹ 	 <p><i>Since suckling one another hardly ever occurs in mother-bonded calf rearing, the nasal spine is not necessary.</i></p>
Calves' Stress	<ul style="list-style-type: none"> › Stress is less than in rearing systems using automatic calf feeders² and bucket feeding. 	<ul style="list-style-type: none"> › If the calves are not used to the presence of humans, but have to endure them, this may cause stress.
Human-Animal Relationship	<ul style="list-style-type: none"> › Due to the time required for the good observation of individual processes of cows and calves, an intense human-animal relationship is created.¹  <p><i>New born calves should have contact to humans.</i></p>	<ul style="list-style-type: none"> › Calves can easily run wild. The relationship with them must therefore be maintained. › The system requires interest in animal observation, otherwise it will not work.¹ › Heifer cows must be especially well cared for and monitored. › Human presence during calving, and people speaking to and stroking the new born calves are important in order to imprint them in a positive way with regard to humans. If human contact is limited to applying ear-tags, the imprinting will be somewhat negative.

¹ oral statements of farm managers; ² scientific studies; more information is available from the authors upon request.

Criterion	Benefits	Disadvantages and Challenges
Health of the Cow	<ul style="list-style-type: none"> › In general, there is no difference from normally milked cows. Scientific studies even show that the udder health of dairy cows tends to be better when calves suckle them.² › Cows with chronic udder problems can be cured by suckling calves.¹  <p><i>Regular udder control and care are especially important in the case of suckler cows.</i></p>	<ul style="list-style-type: none"> › Udder injuries may occur if several older calves suckle a foster cow. The regular monitoring of the udder is therefore very important! Typically, the teat skin will become more rough.¹ › The first oestrus of the mother cows may be delayed, but there are also studies that do not show any differences in respect to the reproductive performance.² › There are also isolated cases of <i>Pasteurella</i> and <i>Mycoplasma bovis</i> mastitis. These are probably transferred from the mouth of the calf to the udder.^{1,2}
Milk Performance	<ul style="list-style-type: none"> › Studies show either a higher, or the same level of milk yield of cows compared to animals milked normally.² 	<ul style="list-style-type: none"> › It is difficult to monitor yield accurately since the milk suckled by calves is difficult to quantify. › The milk performance may decrease when the cows do not release all the milk while milking and are not suckled completely empty. › The fat content of the milk is low in milk samples from the first milk output, and high when taken from the last milk output.
Milk Let-down, Emptying of the Udder	<ul style="list-style-type: none"> › If several calves suckle, the udder will typically be emptied. The number of calves must be coordinated with the amount of milk the cow produces in such a way that no milk remains in the udder, and yet all calves are satisfied.  <p><i>In combined rearing systems with mother cows and foster cows, the number of calves per cow must be constantly checked and adjusted for optimal functioning of the system.</i></p>	<ul style="list-style-type: none"> › The calves suckle, in almost 90% of cases, only 1 to 2 teats, preferably at the front quarters of the udder. › The cows have larger amounts of residual milk during milking if they also have suckling calves. Therefore, their milk often has a lower fat content than usual. › The milk flow during milking is sometimes significantly reduced.²
Workload	<ul style="list-style-type: none"> › Labour savings by eliminating the heating and feeding of the milk and the need to wash the feeding buckets. 	<ul style="list-style-type: none"> › Animal observation and flexible planning are time-consuming.
Marketing of the Milk	<ul style="list-style-type: none"> › The demand for milk from mother-bonded and fostered calf rearing is increasing. 	<ul style="list-style-type: none"> › So far there is neither a label nor any specific marketing platform for this farming method.
Marketing of the Calves	<ul style="list-style-type: none"> › In the case of selling fattening calves to farms with fostering systems, the calves are already familiar with udder suckling. › Farmers can simultaneously raise and fatten calves. 	<ul style="list-style-type: none"> › In the case of selling fattening calves to farms with bucket feeding systems, the calves have to first be taught to drink from the teat bucket.

¹ oral statements of farm managers; ² scientific studies; more information is available from the authors upon request.

Which Legal Bases Apply?

There are no laws that focus on the mother-bonded rearing of dairy calves, but there are several laws that affect this practice, namely the Animal Welfare Law and the laws for milk production; the Law on the marketing of foodstuffs; and the Organic Regulations.

Legal bases in the European Union:



EU legislation applies in the European Union with the following regulations:

- › Council Regulation (EEC) No 1898/87 of 2 July 1987 on the protection of designations used in marketing of milk and milk products: "The term 'milk' shall mean exclusively the normal mammary secretion obtained from one or more milkings without either addition thereto or extraction therefrom."
- › Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules on the hygiene of food stuffs of animal origin: 'Raw milk' means milk produced by the secretion of the mammary gland of farmed animals that has not been heated to more than 40 °C or undergone any treatment that has an equivalent effect."



The mother-bonded calf rearing is well practicable under the existing legal framework, but there is room for interpretation.

Legal bases in the UK



There are effectively three sources of regulation that preside over the UK dairy production industry.

- › EC Regulations 852/853/854-2004 (Hygiene issues)
- › The Welfare of Farmed Animals (England) Regulations 2007
- › Food Safety and Hygiene (England) Regulations 2013

Implementation of the regulations is supported by the «Code of Recommendations for the Welfare of Livestock» which is produced by the Department for Environment, Food and Rural Affairs (DEFRA), and a publication for farmers produced by the Food Standards Agency (FSA) entitled «A Practical Guide for Milk Producers».

Virtually all milk produced commercially in the UK is produced under the Red Tractor Assurance scheme, administered by Assured Food Standards (AFS). The scheme standards are positioned to be slightly above the legal requirements set out in the various regulations relating to dairy production, and primarily focus on the area of food safety.

In summary, there is nothing within current regulations that either prohibits, nor actively encourages the practice of mother-bonded calf rearing. Despite this, it could be argued that the DEFRA Code of Recommendations for the Welfare of Livestock, based as they are on the Farm Animal Welfare Council's «Five Freedoms», would support mother-bonded rearing, as it clearly meets with the «Freedom to express normal behaviour».

Milk Performance Testings

The provisions of the milk performance assessments require that the total amount of the milk produced must be weighed by the milk inspector and that the milk contents must be determined from the total milk output. This is not easy to achieve with suckling cows, but the information gathered from sample weighings is important because it enables the assessment of the health condition of the udder and of the milk performance of the animals.

On the day when milk samples are taken, calves can be fed by bucket (if they have learned to suckle on the teat bucket) or they can be let to their mothers a few hours later. It works best when the calves are not allowed to go to the cow for two milking times, and when only the milk of the second milking time is weighed, subject to the condition that the cow is accustomed to the calf suckling before milking. The cell counts in milk samples taken from suckling cows are realistic. The milk performance and the milk contents will be less representative.

Presentation of Rearing Variants Based on Selected Practice Examples

Example No. 1: Suckling mother cows and foster cows, half an hour after milking

Farm profile:

Hofgut Rengoldshausen, D-88662 Überlingen
Mechthild Knösel

- › Breed: Original Braunvieh
- › Herd size: 40 cows
- › Rearing system: cubicle housing
- › Calf rearing: Long-term calf nursing with mother cows and foster cows 2 times daily, ½ hour after milking
- › Marketing: Demeter-certified raw milk



Following the suckling process, the calves are returned to the calves barn which is located next to the outdoor run.

Milking timetable:

1. The suckler cows are all milked first, before the other cows are milked.
2. In the milking parlour the suckler cows are milked by means of a milking machine in so far as they release their milk (about 80% of the cows are not completely empty afterwards).
3. After milking, the suckler cows stay at the feeding barrier and, when all cows have been milked (about half an hour later), they go as a group, together with the calves («suckler group»), to a separate area located between cowshed and calf shed. They stay in this area, which otherwise serves as exercise yard for the cows, for about $\frac{3}{4}$ of an hour to an hour. The calves drink during the first 20 minutes. Later they still suckle sometimes and otherwise have social contact with the cows.
4. After about an hour, when all calves have finished suckling and there has been enough time for the interactions between mother and calf, the cows will be separated from the calves.
5. After suckling, when the cows are back at the feeding place, all udders are greased and checked as to whether they are empty.
6. If a cow's udder is not completely emptied during several suckling periods, one cow is removed from the group, so that the calves may empty the udders of all suckler cows.

Timetable from birth onwards:

- › **1st–2nd week of life:** The cow spends the whole day with her calf in the calving pen and only comes into the milking parlour for milking.
- › **3rd week of life:** The cow is approximately 12 hours (usually at night) with the calf in the calving pen and is with the herd for the rest of the time. During this time, the cow and her calf become accustomed to going to the suckler group. When a cow's own calf is present, she usually has no problem in accepting other suckling calves. From this point, most of the cows no longer let down all their milk during milking.



After the dairy cows have been milked, they are reunited with the calves at the exercise yard. Each cow nurses her own calf along with one or two other calves.

- **4th–7th week of life:** The calf is now in the calf shed day and night, while the cow is with the herd. The calf suckles twice a day from its mother. Additionally, 1–2 older calves suckle from the cow, so that its udder is completely emptied.
- **Approx. 8th–13th week of life:** After an average of 8 weeks (varying according to the total number of mothers), the cow is removed from the suckler group. The «weaning» of the cows takes place in stages: in the first 5 days the calves are only separated during one milking time. From a Thursday the cows start to go to the suckler group only in the evening; and from the following Tuesday evening, the cows no longer go to the suckler group. After the separation, calves with an “extreme bond” to their mothers will sometimes not drink anything for 2 suckling times, before they start suckling from other cows. From that time on they belong to the group of older calves that drink only from foster cows, which are the mothers of the younger calves.

After weaning, some cows do not at first let down all the milk in the milking parlour. However, this has never led to mastitis up to now. The milk output of each cow will quickly normalise.

- **Approx. 14th–16th week of life:** It takes a period of approximately two weeks to remove the calves from the suckler group and wean them. In the first week of weaning, the calves come about 10–15 minutes later in the morning and in the evening to join the suckler group, so that there is only a small quantity of milk left for



Dairy cows and calves are given the necessary time for social bonding during the suckling time. The cow licks her calf intensively, whilst other calves suckle at her udder, too.

them. In the second week of weaning they only join the suckler group in the evening (again 10 to 15 minutes later).

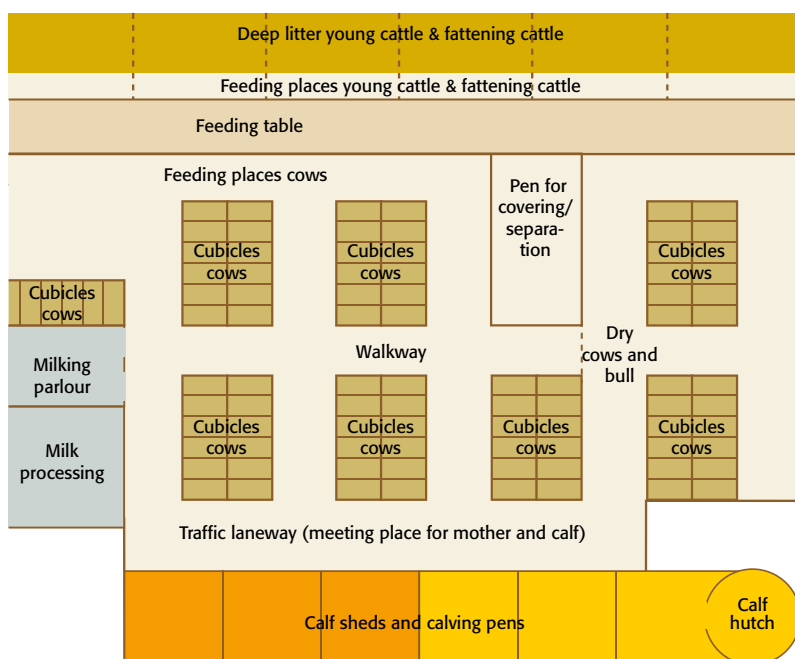
The weaning is always done in small groups (with a minimum time interval of 2 to 3 weeks), so the time of weaning may vary slightly from one calf to another.

If the calves are no longer allowed to go to the suckler group, they receive feed in order to be distracted, while the smaller calves leave the calf shed.

Health of calves

- The calves are fitter than they were in the bucket feeding system and they grow faster.
- Diarrhoea is rare and it is not problematic when it occurs. The calves then drink as usual.
- Moderate and isolated coughs and lung problems sometimes occur in winter.
- Bovine dermatophytosis occurs on a few occasional instances with weaker animals.

Sketch of the cow sheds at the Hofgut Rengoldshausen



The meeting place for the calves and suckler cows is ideally located between the cows' loose-housing shed with cubicles and the deep-litter shed for the calves.

The most important prerequisites for the proper functioning of the system

Mechthild Knösel, farm manager:

- The cows accept other calves as long as their own calf is also present.
- The suckler cows should not let down all their milk in the milking parlour.
- The delayed weaning of cows and calves eases the separation. In this way the calves call less for their mothers after weaning and also respond less to the calling of their mothers, consequently the cows calling for their calves is shorter.
- Daily observation of the animals is very important; as is the proper assessment of the relationship between the number of calves and the quantity of milk from cows and the quantity of milk from cows that have recently calved.
- Regular udder monitoring is essential.

Example No. 2: Suckling in a permanent foster cow group

Farm profile:

Ferme la Source, CH-2616 Renan
Anna Tschannen and Daniel Glauser

- › Breed: Original Braunvieh
- › Herd size: 20 cows
- › Rearing system: cubicle housing with existing tethered stall as feeding and milking place
- › Full pasture
- › Calf rearing: short-time mother-bonded suckling before milking, then long-time suckling, without additional milking, i.e. the (foster-) cows and 2–4 calves are unlimitedly and permanently together.
- › Marketing: cheese dairy Renan (Demeter)

Milking timetable:

1. Cows that are not foster cows are brought into the old tethered stall from the exercise yard (in the winter) or the pasture (in the summer), where they are fed and milked.
2. At least in the colostrum phase, the newborn calves are allowed to suckle from their mothers before milking.
3. The foster cows are kept in a separate barn compartment or on a separate pasture. In winter, the foster cows and their calves are allowed to stay in the large exercise yard during milking and the feeding time of the other cows. When the calves finish suckling and the milking is over, the cows will be let back into the exercise yard (with feeding place) or on the pasture. Their calves go into the calf shed.
4. After the colostrum phase, the calves suckle from a foster cow (except when their own mother is also the foster cow). Foster cows are not milked. The other cows will then be milked again normally.

Timetable from birth onwards:

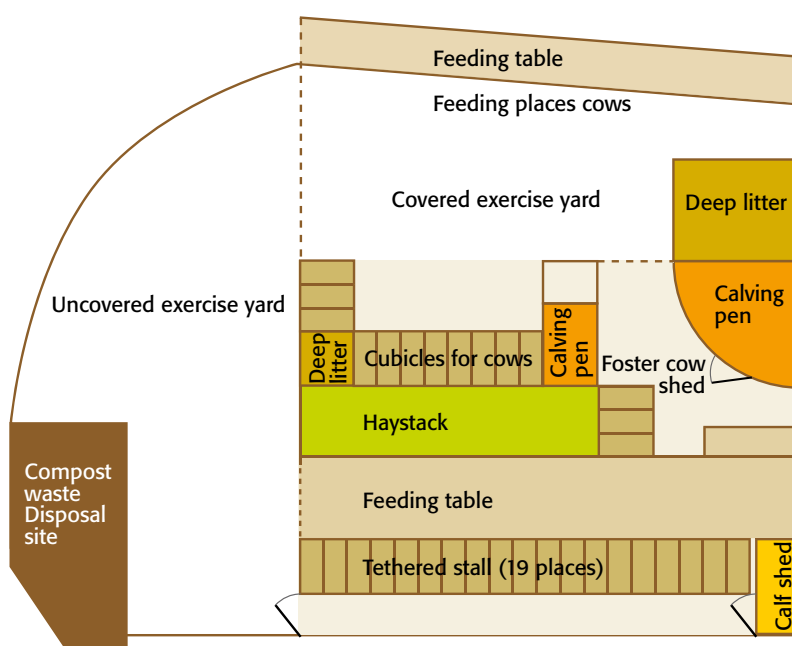
- › **1st week of life:** The cow is with the newborn calf in the calving pen until the afterbirth occurs (about 1 day after calving). Afterwards the cow goes back into the herd and the calf is placed in the calf shed. The cow comes into the old tethered stall for milking, where it is tethered along with all the other cows. The calf and the other newborn calves will also go into the tethered stall and suckle from their mothers before milking. Male calves will suckle from their mothers in the morning and in the evening for about 2–3 weeks until they are sold to the fattening farm. The female calves for rearing will suckle as long as the colostrum phase lasts.
- › **2nd–26th week of life:** Preferably immediately after the colostrum phase, calves for rearing will



Whether they are on pasture or in the exercise yard: the calves can drink anytime from the foster cows.

be distributed to foster cows. In the main calving season (January), foster cows are the cows that have just calved themselves. They are selected according to different criteria. One criterion could be the lack of udder health. Another criterion is that they accept additional calves. A previously milked cow in late lactation can still become a foster cow for a calf. The calves stay with the foster cow day and night and can suckle as often as they like. They stay with the foster cows in separate barn compartments or on a separate pasture. In winter, the foster cow group and the dairy cow group see each other regularly in the exercise yard, but they cannot go to each other. Mothers and calves can meet every day in the shed, even when the calves do not suckle from their own mothers. Some cows do not mind this arrangement, while others call for their calves. The calves however rarely call for their mothers.

Sketch of the cow sheds at the Ferme la Source



The old tethered stall is used as feeding and milking place. The calves go to the foster cows quite early, but still can meet their mothers with a fence between them.



Regular contact with the calves prevents them from running wild.

- **Approx. 26th week of life:** Towards the end of the grazing period, which is when the majority of the calves born in the main calving season should be weaned, the quantity of milk in the foster cow group is reduced by removing foster cows from the group. The foster cows either start their dry period or they are milked again. Calves that were born later are in the foster cow group, so older calves will also be removed from the suckling group. This means that they

Example No. 3: Seasonal calving and suckling in permanent foster cow groups in the tethered stall

Farm profile:

Ferme Clair-Vent, CH-2616 Renan
Peter Mika and Vera Kaiser

- Breed: Fleckvieh
- Herd size: 17 cows
- Rearing system: tethered stall with large exercise yard
- Full pasture
- Seasonal calving (March and April)
- Calf rearing: short-time suckling before milking (mother-bonded), then long-time suckling, without additional milking, i.e. the (foster-) cows and 2–4 calves are unlimitedly and permanently together.
- Marketing: cheese dairy Renan (Demeter)

Milking timetable:

Evening:

1. The calves and the cows are brought together in the exercise yard about 1.5 hours before milking.
2. In the exercise yard, the calves suckle from their mothers until they are satisfied.

are weaned abruptly after a suckling period of at least 6 months. The younger calves will then have enough milk from the remaining foster cows. The weaned calves are reared as a separate cattle group.

- The foster cows can be kept as dairy cows again: either directly afterwards or in the next lactation period.

Health of calves

- Diarrhoea is rare and it is not problematic when it occurs.

The most important prerequisites for the proper functioning of the system

Anna Tschannen, farm manager:

- The cows have to accept alien calves.
- The calves for rearing need regular attention from humans, so they do not run wild.
- The teats of the foster cows are highly stressed and therefore need to be checked and greased daily.
- In the future, calvings will take more place seasonally, so that a fixed milk cow group and a fixed foster cow group can be put together and the calves may stay together with their foster cows for the whole season.

3. The cows are then tethered again and milked in place (or not milked anymore). The calves go back to the calf shed.

Morning:

1. In the morning, the calves are first brought to the tethered cows and suckle from their mothers.
2. The cows are then milked, while some calves are still with their mothers. The cows tend to let down the milk very well.

Once the grazing season begins, the calves go with the foster cows onto a separate pasture, while the other cows are milked again completely.



In the morning, after suckling in the tethered stall; the fully fed calf lies between the cows that are still in the process of being milked.

Milking timetable:

› **1st week of life:** The cow calves in the calving pen where the mother and calf stay together for 1–7 days. The cow is milked in the first 24 to 48 hours by hand. From the 2nd day on, the cow goes twice per day, at milking times, to its place in the tethered stall and then returns to the calf in the calving pen (some animals remain without the calf at the tethered place by the 3rd night).

› **2nd–4th week of life:** After the time spent in the calving pen, the cow is brought back into the tethered stall, while the calf goes to the calf shed.

The calf now suckles from its mother twice per day before milking. Fattening calves that are meant to be sold at around their 3rd week of life are taught to use the teat bucket by skipping one suckling time and feeding with bucket the next time. In general, they learn quickly (especially if one mimics the licking of the mother cow with intense pats before suckling). Now the foster cows will be selected from the herd.

› **4th–24th week of life:** The calves assigned for rearing go with the foster cows onto a pasture (depending on the calving date, this step will take place when the calf is 2 to 4 weeks of age).

All other cows go to a separate pasture and are milked normally. At first, the cows call for their calves. However, since the calves are satisfied with the foster cow, they do not respond, and the cows soon stop calling.

› **With the end of the grazing season,** calves for rearing are weaned and move into a separate cattle shed. The foster cows then begin their dry period and go back to their old place in the tethered stall (or to the abattoir). Other cows can be foster cows in the following year.

Health of calves

› Diarrhoea is rare and it is not problematic when it occurs.

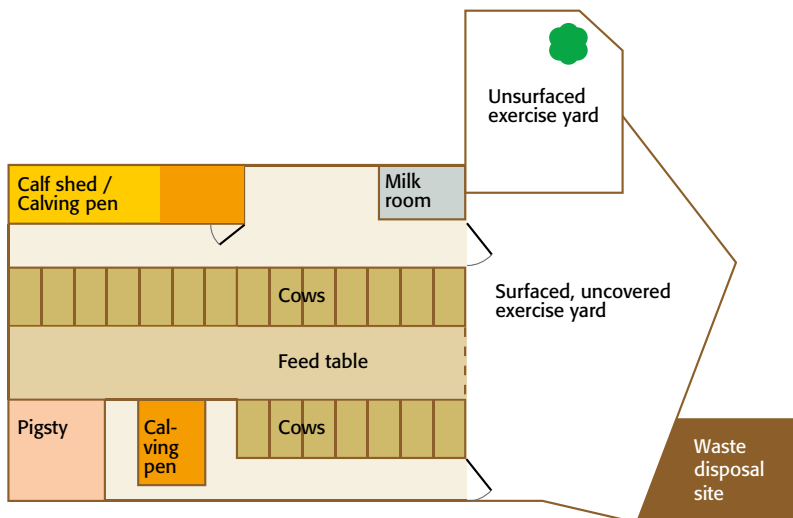
The most important prerequisites for the proper functioning of the system

Peter Mika, farm manager:

› The animal-human relationship must be maintained and all those who work with the animals should be willing to change a process spontaneously. Each animal should be given a «second chance» if something has not succeeded at the first attempt.

› Farm managers must be aware of what they want to accomplish with their herds, as this kind of rearing system requires flexibility and patience.

Sketch of the cow sheds at the Ferme Clair-Vent



A large exercise yard is part of the tethered stall, where the calves are nursed in the afternoon.



The first grazing before the separation of the groups: the calves and their mothers rejoice together over the new space.



In the first weeks of life, the calves suckle, in the evening, from their mothers in the exercise yard. Starting from the second to the fourth week of life, they stay only with the foster cows.

Example No. 4: Suckling the mother or the foster cow after milking

Farm profile:

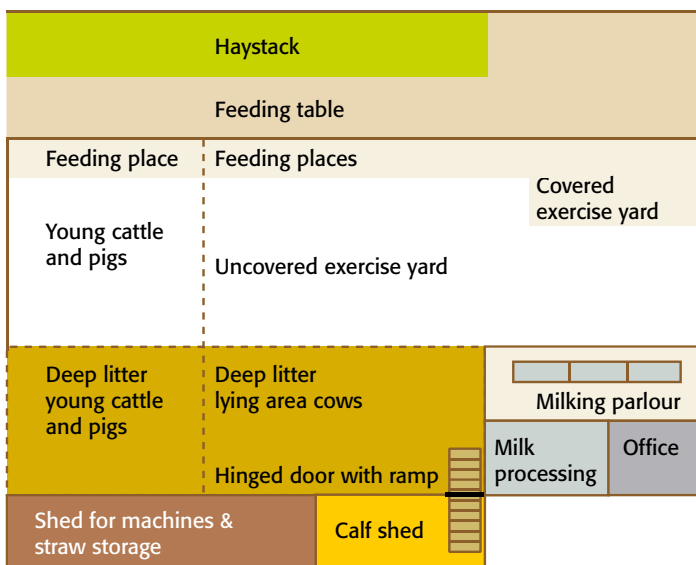
Randenhof, CH-8225 Siblingen
Herman and Regina Lutke Schipholt

- › Breed: Original Braunvieh
- › Herd size: 20 cows
- › Rearing system: deep litter housing
- › Calf rearing: long-term suckling with additional milking; suckling at the udder of mother cows and foster cows twice daily; mostly after the milking
- › Marketing: dairy production marketed directly from the farm and direct marketing of Demeter products at organic stores

Milking timetable:

1. At milking time, the foster cow (usually only one) is released from the feeding barrier into the free resting area. All other cows are fixed in the feeding fence or they are in the milking parlour.
2. The gate between the calf shed and the lying area is then opened (the lying area can be isolated). The calves are still locked in their feeding fence and have access to hay.
3. First, the young calves are let out of the feeding barrier. They run up the ramp to the cows' lying area to the already waiting foster cow, and immediately begin to suckle.
4. Then the mothers of the youngest calves (less than 14 days old), which have already been milked, are let out of the feeding barrier, so that they can continue to suckle their own calves. The very young calves suckle initially only from their mother, but as time passes they also try suckling from the foster cow. Once they suckle well from the foster cow, the mother will be milked again normally and will no longer be allowed to go to her calf.
5. After the young calves have been suckled, the older calves will be let out of the feeding barrier. They then suckle the udders of the foster cow and of the mothers of the youngest calves until empty. After all calves have been suckled, the cows are again fixed to the feeding place, and the calves run and frolic on the lying area. After about 5 minutes of letting off steam, the calves are driven back over the ramp into their own shed or return of their own accord to eat.

Sketch of the cow sheds at the Randenhof



A new access route consisting of a hinged door and a ramp was built between the deep litter area in the dairy cattle shed and the adjacent, slightly lower calf shed.



The calves are expected by the foster cow in the lying area. They come up the ramp from the calf shed to the cattle shed. They suckle in this lying area, while the non-suckler cows are eating. After suckling, the mothers and the foster cows go back into the feeding barrier, and the calves have the whole lying area to themselves where they can run and play.

Timetable from birth onwards:

- › **1st–2nd week of life:** Cows mostly calve on the lying area in the deep litter housing. They are subsequently brought, with their calf, to the calving pen, where the two remain for about 3 days. However, the cows are taken, away from their calves, to the feeding barrier at feeding times and are also milked afterwards. After about 3 days, the calf is placed in the calf shed, and the cow will go back to the herd. The cow is only partially milked in the milking parlour. The calf then suckles the udder until it is empty. If the cow does not let down milk during milking, the calf will be encouraged to suckle directly before milking. Then the cow will usually let down the milk. After milking, the cow goes to the calf in the deep litter. After a few days the cow will let down the milk without having the calf around. If this does not work, this cow then becomes the new foster cow and the previous foster cow will be milked again normally. Because of their heavy use, the teats of the foster cows must be checked daily and greased, if

necessary. Cows with delicate teats are not suitable as foster cows.

- **2nd–3rd week of life:** The calf gradually suckles less from its mother and more from a foster cow until it suckles solely from the foster cow. Foster cows are not milked and serve only to suckle the calves.

The mother is milked normally again as soon as the calf is suckling well from the foster cow. Some mothers cows do not let down the milk well but can usually be milked normally after approximately 3 days. So far, no udder health problems have occurred.

Mother cows call for their calves after the separation, but the calves do not answer, as they are fully fed, so the cows soon cease to call. The pain of separation is not high because the mothers and calves can see each other now and then, when the cows go to and return from milking.

- **4th–16th week of life:** The calves still go twice per day to the foster cow for suckling. They spend the rest of the time together with other calves in the calf shed with exercise yard. Around the 16th week of life, the calves show less interest in milk and often prefer to stay at the feeding place. Then the weaning of the calves for rear-

ing takes place. When the smaller calves go to suckle, the older ones remain fixed in the feeding barrier. At weaning, the calves will be fed oat flakes for about 2 to 3 weeks as a transition to pure roughage feeding.

Fattening calves suckle milk until their 24th week of life.

Health of calves

- Diarrhoea occurs when young calves drink too much milk or milk with too much fat (last milk output). This kind of diarrhoea is not problematic.

The most important prerequisites for the proper functioning of the system

Herman Lutke Schipholt, farm manager:

- Good observation of the animals is necessary to be able to adapt the system individually.
- Changes should not be carried out abruptly. They always require a transition period.
- Due to the individuality of the calves and cows, farmers have to be adaptable to seek the most appropriate solution for each individual case.

Example no. 5: Suckling after milking, only from mother cows until the 12th week of life

Farm profile:

Hof Gasswies, D-79771 Klettgau
Silvia and Alfred Rutschmann

- Breed: Fleckvieh
- Herd size: 50 cows
- Rearing system: cubicle housing
- Full pasture
- Seasonal calving
- Calf rearing: long-term suckling with additional milking; suckling only on mother cows, twice daily after milking
- Marketing: Schwarzwaldmilch Freiburg i. Br. (Bioland)

Milking timetable:

1. In summer the cows come in from the pasture, and in the winter from the feeding place, and go directly into the waiting room. This room is isolated from the rest of the cow shed.
2. After milking, the suckling cows go to a separate barn area around the calf shed. After all the cows have been milked, the door of the calf shed is opened, so that all calves can come out at the same time.
3. The calf shed is then closed again. Healthy calves quickly find their mothers and suckle

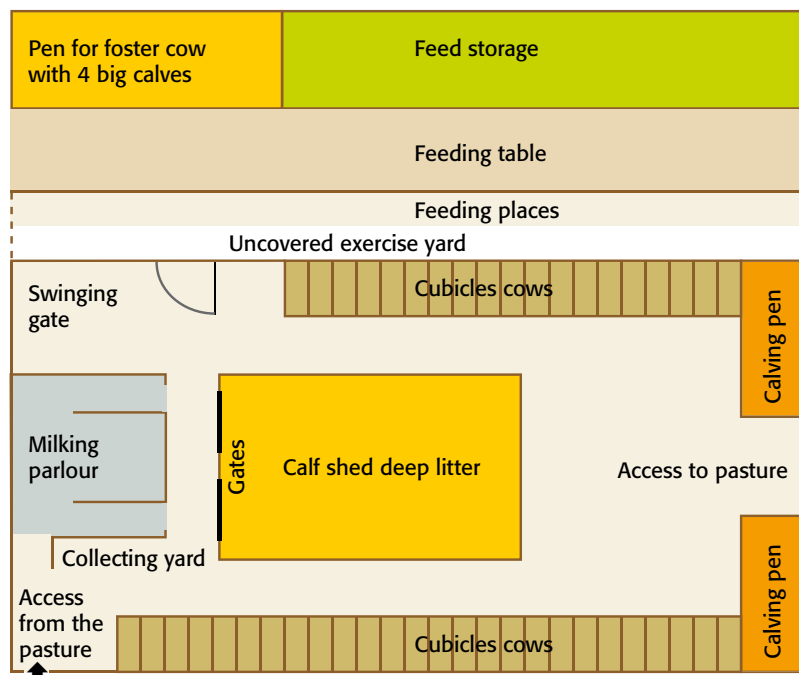


The calf shed is located in the middle of the loose housing barn of the dairy cows. Following the milking process of the dairy cows, a gate allows the calves to have access to their mothers. Then each cow nurses her own calf.

them until they are empty. Any problems with the calves' health can be readily and early recognised at this point.

Cows with a suckling calf will never let down all the milk in the milking parlour. When a cow lets down the milk very badly (this is especially the case with heifers), her calf may be allowed to suckle the cow in the milking parlour. If necessary, it can suck on a teat while the milking machine is milking the other three teats. This is usually only necessary during the first days of lactation.

Sketch of the cow sheds at the Hof Gasswies



The calf shed is located in the middle of the loose housing shed of the dairy cows. Following the milking process of the dairy cows, a gate allows the calves to access their mothers. Then each cow suckles her own calf.



Visual and tactile contact between the calf and the cow remain possible in non-suckling time.

4. When the calves have finished drinking, the cows go through a swinging gate to the feeding place and back to the herd. The calves do not go with them because they (usually) do not manage to walk through the swinging gate. They are driven back into the calf shed, where they are also fed.

Timetable from birth onwards:

- **1st week of life:** The cow calves in the calving pen (or sometimes on the pasture in summer, which is rather inconvenient). Cow and calf then stay 3 to 4 days in the calving pen. During this time the cow is milked only once a day in the milking parlour (thus they learn from the very first day that they can be temporarily separated). The cow then goes back to the herd and is again normally milked twice daily. The calf goes to the large calf shed located in the middle of the loose housing.
- **2nd week of life:** The calf suckles twice every day from its mother; after the cow has been milked.
- **3rd–12th week of life:** The male calves are sold after 3 weeks to a fattening farm. The female calves continue to suckle twice a day from their mothers after milking.
- **12th–16th week of life:** After 3–4 months, when the calves should slowly be weaned, they are initially allowed to suckle from their mothers once a day and later only every second day, until they are finally separated permanently. Visual contact between the cow and the calf remains. This way, weaning proceeds in a relatively gentle way and weight loss is reduced.

Health of calves

- The health of the calves has been very good since the introduction of mother-bonded calf rearing.

The most important prerequisites for the proper functioning of the system

Silvia and Alfred Rutschmann, farm managers:

- The calves should not suckle too much milk from their mothers because they otherwise become too fat.
- At the beginning, the system requires a high degree of flexibility from both man and animal. During the season and over the years the processes settle increasingly.
- The animals must be observed closely.
- The transitions between the different stages must be fluent.

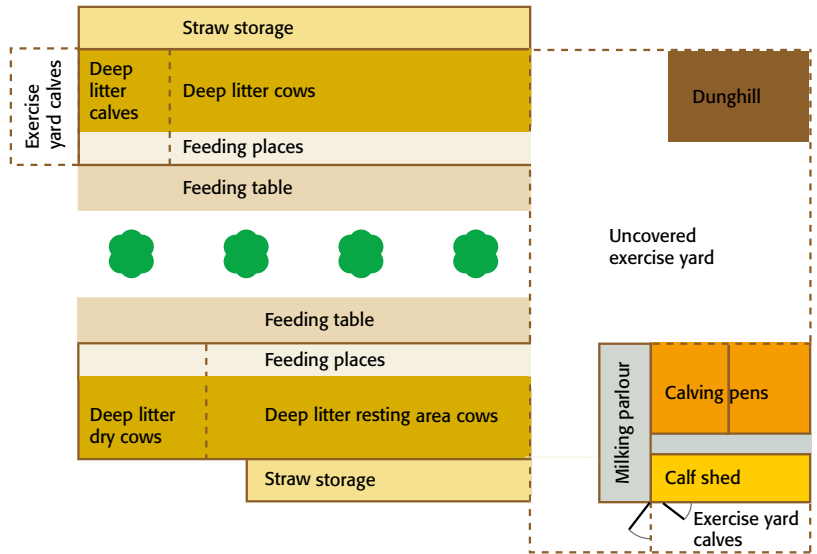
Example No. 6: Suckling from the mother or the foster cow before milking, followed by a permanent foster cow group without milking

Farm profile:

Gut Rheinau, CH-8462 Rheinau
Andi Wälle

- › Breeds: Swiss Fleckvieh and some other breeds
- › Herd size: 60 cows
- › Rearing system: deep litter housing
- › Calf rearing: long-term calf nursing with mother-cows and foster cows with milking combined with a permanent foster cow group without milking
- › Marketing: delivery of Demeter-certified milk to the Molkerei Biedermann

Sketch of the cow sheds at the Gut Rheinau



As both calf sheds are located next to the cows' housing, the cows can easily be brought to the calves.

Milking timetable:

1. At the beginning of the milking, all cows are fixed and fed in the feeding barrier.
2. After about 1 hour and before the milking starts, the freshly calved cows go to their calves in the calf shed next to the milking parlour. The mothers/foster cows of calves up to 4 weeks of age also go into the calf shed next to the milking parlour (calf shed 1). The exercise yard of calf shed 1 for younger calves is next to the cows' collecting yard. The cows can be led through a connecting door to the calves. The foster cows of the older calves are led to their calves in the calf compartment in another shed (calf shed 2).

The cows stay with the calves for about 1 hour while the milking of the other cows takes place. The mothers and foster cows of the younger calves are brought for milking into the milking parlour at the end of milking time and then go into the feeding barrier. The foster cows of the older calves go directly from calf shed 2 into the feeding barrier, because they are not milked. In summer, the older calves spend 12 hours of grazing time together with the foster cows and may suckle whenever they like.

Timetable from birth onwards:

- › **1st week of life:** The cow calves in the calving pen and cow and calf remain there for about 24 hours, during which the calf suckles as much as it wants. Additionally, the cow is milked once during this period in the milking parlour.
- › **On the second day of the calf's life,** the cow returns to the herd and is normally milked twice daily. The calf goes to calf shed 1, which is located next to the milking parlour. The calf suckles from its mother before the cow is milked until at least the fifth day of its life. Afterwards the farmer gradually determines, which cows are to become foster cows, which

cows will go into dairy production, which calves will be reared, and which will be fattened. Cows that have recently calved and which are particularly fond of suckling calves continue to go into the calf shed for suckling before milking, while the other cows are milked as usual. The calves of the dairy production cows have to find a foster cow, which is not a problem in this system of rearing in the group of calves. If a cow has trouble with the separation and calls for the calf, it can sometimes spend a few days longer with her calf. Afterwards they mostly calm down.

- › **2nd–4th week of life:** The calves that are sold to a fattening farm leave the farm after 3 to 4 weeks. The others; especially female calves for rearing, continue to drink twice a day before milking from the mothers and the foster cows. Only the most appropriate foster cows go to the calves because it takes fewer cows to supply the calves at this point.



Through close contact with the cows the calves quickly learn to eat solid food.

- **4th–12th week of life:** Once a solid group of foster cows and their calves has been formed, the calves are transferred to a separate deep litter compartment next to the dairy cows (calf shed 2). At the beginning of milking time, the foster cows go there to suckle their (usually 3) calves and stay there until milking is finished, as they are no longer milked in the milking parlour. In summer, (during grazing season), the foster cows additionally spend about 12 hours a day together with the calves on a separate pasture, which is located directly behind calf shed 2.
- **12th–20th week of life:** Depending on the development and the composition of the permanent foster cow group, weaning of the first calves will start at 12 weeks, while the last calves will be weaned at 20 weeks. For this purpose, these calves are temporarily tied by the collar to the feeding rack and fed with good hay or grated carrots, before the foster cows are allowed into the group of calves. The older calves are

only untied when the younger calves have drunk enough and there is only little milk left in the udders, The number of foster cows will also be reduced at this time. By gradually decreasing the amount of milk, calves are weaned until they are no longer untied when the foster cows are there. It is preferable to remove those cows from the foster cow group who have good milk quality, which can be tested by the California Mastitis Test (CMT). The conversion of the foster cow to a dairy cow needs a little time, but the cows completely let down the milk at least once a day after no more than a week, and can be milked completely empty at both milking times after no more than two weeks.

- **From the 20th week of life:** In summer, the weaned calves are placed on a pasture together with two old cows that guard them. These cows are still suckled by some of the calves, while other calves are no longer interested in the milk. In winter, the weaned calves go to the young cattle shed.



For older calves, a compartment was set up by separating the rear part of the deep litter barn. The foster cows, that are not milked, can easily go to the calves when the gate is opened.

Health of calves

- The calves' health is very good. The calves are robust and also do not show any significant growth interruption after weaning.

The most important prerequisites for a good functioning of the system

Andi Wälle, farm manager:

- The animals must be observed very well.
- Mother-bonded and fostered calf rearing can be practiced anywhere, but the people who manage the system must be convinced of it.

Example no. 7: Suckling only from the mother cow, 1 hour before milking

Farm profile:

Brüederhof, CH-8108 Dällikon
Simon and Martina Knoepfel

- Breed: Swiss Fleckvieh/Red Holstein
- Herd size: 40 cows
- Rearing system: cubicle housing
- Calf rearing: long-term suckling with additional milking; suckling only at the udder of mother-cows, twice a day, 1 hour before the milking
- Marketing: direct marketing and delivery into an organic milk pool

Milking timetable:

1. The doors between the calf shed and the cow's exercise yard, where the mothers usually wait for their calves, are opened before milking. The calves go from the calf shed to the mothers and suckle for about 10 minutes. Some calves will be led to their mothers in the exercise yard if they are not waiting at the gate.
2. After suckling, the calves remain for up to 2 hours in the exercise yard. During this time, the milking of the other cows begins. The calves run around with the cows or lie down alongside them in the cubicles.
3. Approximately one hour after suckling, the mother cows come into the milking parlour for milking. The cows with calves are always milked last. The calves are either led back into the calf shed during milking or shortly afterwards.

Timetable from birth onwards:

- **1st week of life:** For the first 1 to 2 days after calving, the mother cows are always with the calves in the calving pen and are also fed there. When a calf is between 3 and 6 days old, the mother cows join the other cows at the feeding barrier at feeding times.
- **2nd week of life:** The mother cows come to the calving pen twice per day to suckle the calf.
- **3rd to about the 14th week of life:** The calves live in the calf shed and go twice per day into the cow shed to suckle from their mothers.
- **Approx. 14th week of life:** The calves are weaned abruptly. They are brought to the young cattle shed, and henceforth have no more visual contact with the cows. In the first days, the cows and the calves call each other. After weaning, the cows often do not let down the milk well in the second milking. Subsequently they can be milked again as usual. Generally, the cows let down the milk very well in the milking parlour.

Health of Calves:

- Calf diarrhoea occurs, but it is rarely problematic.

Special facts:

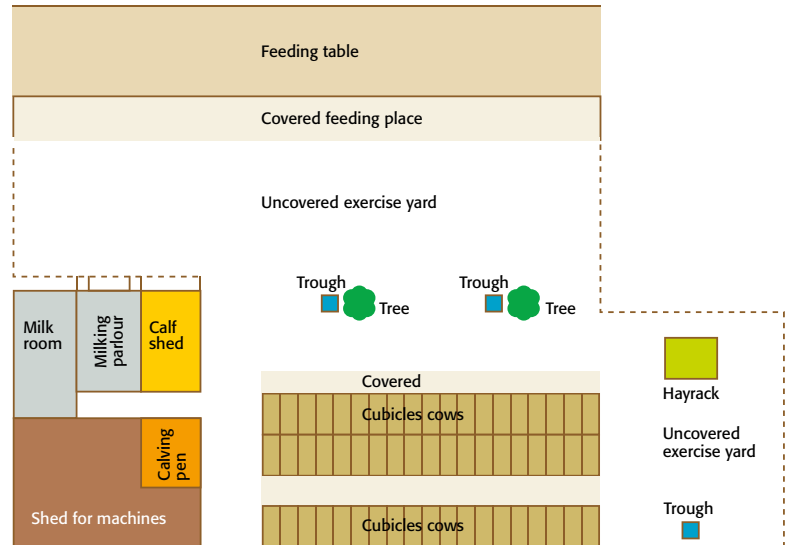
- This calf feeding system has been practiced on the farm for 27 years. An in-house comparison in terms of animal health is therefore not feasible.
- The udder health is good.
- There are also isolated cases of *Pasteurella* and *Mycoplasma bovis* mastitis, probably transferred from the mouth of the calf to the udder.

The most important prerequisites for the proper functioning of the system

Kaspar Günthardt, (former farm manager and inventor of this system):

- You have to observe the animals very well and to be able to react flexibly.
- A calm and friendly interaction with the animals is important.

Sketch of the cow sheds at the Brüederhof



The calf shed is adjacent to the exercise yard of the cows. Before milking, the calves are let out of their shed and into this area.



After suckling, the calves remain in the exercise yard for approximately 2 hours.



The calf returns to its shed alone.

Example no. 8: Calves and suckler mother cows or foster cows are always together

Farm profile:

Hofgut Reichardt Matthes GbR,
D-04749 Ostrau, Pulsitz
Sabine Reichardt

- › Breed: Holstein Friesian (HF) x Deutsches Schwarzbuntes Niederungs-rind (DSN)
- › 50 cows
- › Rearing system: deep litter housing
- › Calf rearing: long-term suckling with additional milking, with mothers and foster cows; calves and suckler cows are always together
- › Marketing: milk processing on the farm, direct marketing from the farm and delivery to organic food stores, Demeter fresh milk sold to the «Gläserne Meierei» in Berlin

are not completely empty being milked. Most lactating cows let down their milk well in the milking parlour.

3. From the milking parlour, the suckler cows go back to their feeding places. Towards the end of the feeding time the calves are allowed to join the cows. Then, the calves usually start to suckle.
4. A cow often suckles 2–3 calves. The cows accept the alien calves best when fixed in the feeding barrier. The own calf then sucks from the side, while the alien calf sucks from behind. Ideally a cow suckles more than one calf, so that more cows can be milked normally.

Timetable from birth onwards:

› **1st week of life:** For the first 3 to 5 days, each mother cow stays with her calf all day in the calving pen, until it is suckling well on its own. From the outset, the cow will continue to eat at the feeding place and go to the milking parlour for milking. The cow also gets her feed and water in the calving pen.

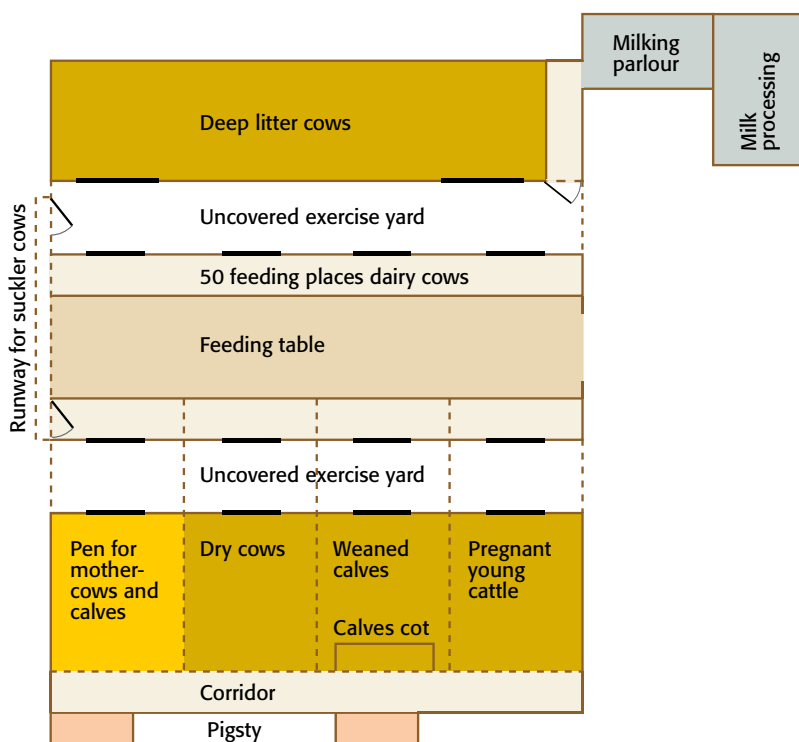
› **2nd–3rd week of life:** The cow and the calf move to the pen for mother cows and calves, along with the other calves and mother cows. Male calves are sold in the 2nd week of life to a fattening farm and their mothers stay for another 2 weeks in the pen for mother cows and calves where they suckle other calves. They cannot join the group of milking-only cows, because the bull runs with them, and they should not be covered yet.

The mothers of female calves are also suckled by older calves. The farm staff ensures that the cow's own calf gets enough milk, so it is rarely necessary to remove the older calves. Some cows are suckled completely empty by several calves and give no more milk in the milking parlour, while others still have a lot of milk remaining in the udder.

› **4th–6th week of life:** The mother cow is brought back into the group of cows without calves and may be covered by the bull again 4 to 6 weeks after calving. The mothers of female calves now often call for their calves, while the mothers of male calves bear no ill effect from the separation. The animals are administered the homeopathic remedy Ignatia C 200 (2 × 10 ml) on the day of separation (plus 1–2 days), so that they can better bear the pain of separation. Henceforth, the heifer calves will suckle from the mothers of the younger calves.

› **Approx. 5th–20th week of life:** The heifer calves remain in the group of mother cows and calves, with an alternation of mothers or foster cows, until they are weaned at the age of about 5 months. The weaning is always done in small groups of calves, which are then placed in the «young cattle pen». In the beginning, they are the youngest there, but can retreat into the calf pen,

Sketch of the cow sheds at the Hofgut Reichardt Matthes



The cow-shed consists of three buildings and two intermediate, uncovered exercise yards.

Milking timetable:

1. The suckler cows and their calves are kept in a separate pen. All non-suckler cows are milked first and then go to the feeding place while the suckler cows go for milking. The calves stay on the locked deep litter surface of the pen for mother cows and calves.
2. All suckler cows are carefully checked in the milking parlour, with only those whose udders

which cannot be used by larger cattle. The young calves are fed separately. In the first 2 to 3 days after weaning, the calves call for the cows. The calf pen is dismantled as soon as the young cattle are well integrated into the young cattle group.

Health of calves:

- › Diarrhoea is rare and occurs mostly when the calf has drunk too much milk. It is not problematic and the calves will then, almost always, suckle as usual from the cows.

The most important prerequisites for the proper functioning of the system

Sabine Reichardt, farm manager:

- › The system works well, but it requires constant observation of the animals.



The rearmost compartment of the housing is the pen for mother cows and calves. The second rearmost compartment is reserved for the highly pregnant cows.

Example No. 9: Calves and suckler mother cows or foster cows are always together

Farm profile:

The Calf at Foot Dairy Farm
The Suffolk Punch Trust
Hollesey, Woodbridge, Suffolk, IP12 3JR
Owner: Fiona Provan
www.the-calf-at-foot-dairy.co.uk

- › Breed: Jerseys
- › Herd size: 11 cows
- › Rearing system: Deep litter barn. Cows are on deep litter by night but go outside every day, weather permitting
- › System: all year calving (cows have a calf every 12–20 months)
All male calves are grown on for veal or beef.
- › Calf rearing: long-term suckling with additional milking, with mothers and foster cows; calves and suckler cows are always together.
- › Marketing: delivery of the milk to the micro dairy, which is a member of the Pasture Fed Livestock Association (100% grass-fed; hay in winter, grass and lucern pellets at the trough). The farm promotes its product as «Milk with compassion».
The micro dairy produces raw milk, which is sold directly to the public. Currently the raw milk is packed, chilled and sold at £2.50 per litre. At the time of writing, conventional dairy farmers are receiving 30–35p per litre for raw milk from their processors.

Milking timetable:

Non-suckler cows are milked once per day in the morning. Each cow has her own name and comes in for milking when called. Cows are milked one at a time with the use of a small portable milking bale.

Timetable from birth onwards:

- › For the first two months of life, the calf is with its mother 24 hours per day.
- › Subject to the calves health and weight, the weaning process can begin any time after two months of age. The exact timing is very much driven by each animal's specific needs.
- › At around 12 weeks of age, but again subject to the needs and behaviour of each individual animal, the calves are gradually separated from their mothers; at first for just a few hours. It has proven helpful to have one, or possibly two foster cows available to suckle the calves when they don't have access to their mothers.
- › During weaning, the farm has developed a process whereby the calf is allowed to suckle from just one quarter of the mother's udder, before the animals are separated, by means of a gate, while the mother has two quarters milked. The calf is then returned to the mother and suckles the fourth quarter. During the weaning process, when calves are away from their mothers overnight, calves will, if allowed, binge drink huge amounts of milk, which can cause bouts of diarrhoea. By restricting the calf to suckling just one or two quarters, with an interval in-between, this problem is avoided.
- › On average the calves are separated from their mothers at between five and six months and, subject to the animal's development, are usually fully weaned at eight to ten months.



Natural mother calf relationship in the protection and care of the herd

Health and behaviour of calves /cows:

- As a result of leaving the calves with their mothers, the animals are much less stressed. Calves are healthier and appear to have good immunity and are therefore less susceptible to disease and infection. Cows are calmer and more docile, and this is particularly noticeable when new animals are acquired and introduced to the herd. Even the most aggressive animal eventually becomes calm and relaxed as trust is built by allowing and supporting the natural mother/calf

Example No. 10: Calves and suckler mother cows and foster cows are always together

Farm profile:

Cream O'Galloway, Rainton, Gatehouse of Fleet, Castle Douglas, DG7 2DR. Scotland
 Owner: David Finlay
www.creamogalloway.co.uk

- Breed: Cross Montbéliarde, Swedish Red and Robust Holstein
- Herd size: 80 (110 planned for early 2015. Rising ultimately to 140)
- Rearing system: green cowsafe cubicles. (Flexible and moveable arms rather than traditional rigid cubicles. Due to the climate, cows are housed from October/November until April.
- System: 2 calvings per year; autumn & spring. All male calves are grown on for beef.
- Calf rearing: long-term suckling with mothers and calves always together (tried)

relationship. Vet bills are at their highest when new animals are introduced, but soon reduce as the animals become accustomed to this more compassionate farming approach.

- Udder and teat condition is monitored closely, and any damage that may be caused by calf suckling is treated immediately. No problems are experienced with calves trying to suckle each other, nor consequently with any of the associated mental and physical problems this could cause. Not surprisingly, allowing calves and cows to exhibit and indulge in natural behaviours, results in happier, healthier animals. The productive life expectancy of cows at Calf at Foot Dairy, is predicted to be at least 12 years.

The most important prerequisites for the proper functioning of the system

Fiona Provan, farm manager:

- Great emphasis is placed on treating each animal as an individual, and very much respecting and accommodating their natural instincts and desires. As a result, this system demands a committed, sympathetic and flexible approach focused on animal welfare, rather than profit driven.
- Fiona Provan, farm manager believes strongly that profit follows quality, and quality is what you get from healthy, happy, vibrant animals.

- Marketing: The Finlay family have been farming at Rainton since the 1920's and had experienced first-hand the post war drive to intensify production. In the mid 90's Rainton started to diverge from the intensive direction of the UK dairy industry, and moved to farming organically.

In addition to the dairy herd, Rainton Farm also produces beef cattle and lamb. The farm has a busy visitor's centre, which provides education and understanding of farming, for both young and old. A new Dairy building was erected in 2013; specially designed to house calves with their mothers. A public viewing area was designed into the building, so that visitors can see for themselves how the animals are housed and cared for. The farm is proudly «100% committed to cow contentment».

Cream O'Galloway, one of UK's leading artisan ice creams, has been produced on site for a number of years. Speciality cheese production has recently been reintroduced. The dairy produces around 10'500 litres of milk per week, (7'000 litres per cow per annum) which is all used within the onsite production facility.

Developing an own system of mother-calf rearing:

Over the years, the farm had recognised the beneficial effects of giving animals more space and better conditions, and this has posed the question of how far could you take this principal. New dairy housing was in construction, and the decision was made to include a calf creep within the design, so as to accommodate mother-bonded calf rearing.

Since this was a completely unknown practice in the UK, David Finlay carried out as much research as possible before implementing the trial, which necessitated visiting organic dairy farmers in the Netherlands. The Dutch farmers were weaning at three months which David felt was far too stressful for both the animals and themselves.

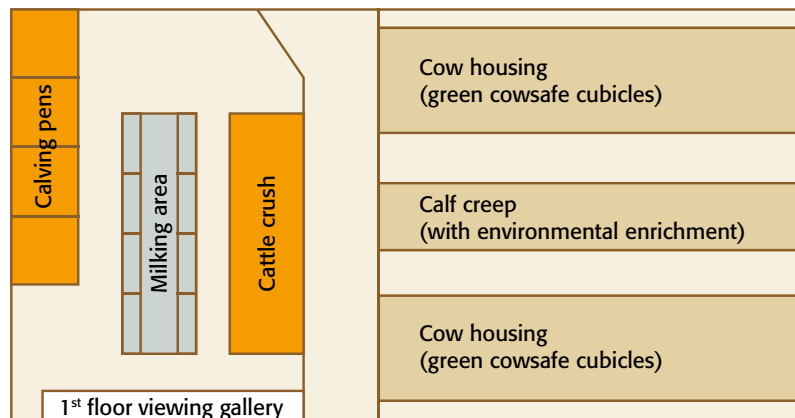
The trial focussed on 24 and 12 hour calf/mother access, with once and twice per day milking. Despite Canadian data, suggesting that a calf would be satisfied with 10 to 15 litres of milk per day, the calves at Rainton with 24 hour access to their mothers were in some cases drinking up to 30 litres per day, which corresponds to 75–80% of the milk. Clearly with this level of consumption, the impact on the farm was simply not sustainable. An additional challenge with the 24hour mother-reared calves was their reluctance to move to solids, an issue that was resolved with the 12 hour on/12 hour off regime

When access to the udder was restricted to 12 hours per day, the level of milk consumption by the calves was still significant. An initial evaluation would have concluded that the mother-calf rearing practice was not viable. Despite the challenges, David persevered with the trial, and the results were analysed by Glasgow Vet School & Scotland's Rural College SRUC.

The final evaluation of the trial highlighted a number of tangible benefits that only became apparent over an extended period; beyond that of the trial. In isolation, the financial impact of the loss of milk alone, would at face value, indicate that the practice of mother bonded calf rearing was not viable. However there were a number of clear positive impacts which ultimately demonstrated that with some minor adjustments, mother bonded calf rearing would deliver tangible benefits, sufficient to offset the loss in milk yield. The positive outcomes were as follows:

- Cows were calm, less stressed and were more docile with a new-found trust between animal and stockman.
- Beef finishing earlier at 18 months (formerly 24–30 months)
- Heifers served at 13–14 months (formerly 24–28 months)
- Dairy cows, anticipated 7–8 years of productive life (formally 5–6 years)
- Optimum time for weaning proved to be at 5–6 months.

Sketch of the cow sheds at the Cream O’Galloway Dairy Building



In the new building the calf creep was located in the middle of the cow's housing.



Cows and sucklers of different ages. "Green Cowsafe Cubicles" with flexible and moveable arms.



The mother and the calf stay in the calving pen for the first 2–3 days.

Outcome of trial

David is in the process of carrying out alterations to accommodate the introduction of mother bonded calf rearing across his entire herd from winter 2014. In addition, some alterations to the new dairy building will be required to create a more appropriate calf creep, reflecting the learnings from the trial, along with improvements to farm tracks, fencing and grouping areas.

Plans from winter 2014 onwards

- Cows will be milked once rather than twice per day.
- Calves will remain in the calving pens with their mothers for 2 to 3 days.

- From day 4 calves will be able to suckle from their mothers during the day (twelve hours per day).
- Overnight the calves will be accommodated in sight of their mothers in a central calf creep. Importantly, the calves will be able to respond to their mothers' calling.
- When calves are not able to suckle during the night, they will have access to a milk pool, which contains a rich milk stock made up of two thirds colostrum and one third water. While supporting healthy development, this mix also reduces significantly the instance of diarrhoea.

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