

## Cow-reared Calf Husbandry in Dairy Farming

Housing Systems for Species-specific Rearing  
with Mother Cows and Nurse Cows





**Mother-bonded and fostered calf rearing is attracting growing interest in practice. More and more dairy farmers are seeking to extend the time that calves have with their mothers for longer than just a few hours while still milking the cows. This extended time gives the cow and her calf the opportunity to experience a much closer and more natural relationship.**

**The methods and lessons learned from livestock farmers experienced in mother-bonded and fostered calf rearing were collected and are made available to others in this technical guide. The guide provides numerous suggestions for the implementation of mother-bonded and fostered calf rearing and for on-farm equipment requirements.**

**Throughout this document we use the term “nurse cow” for cows, that foster foreign calves, “mother cows” that rear their own calf and “fostered calf rearing” for systems that use nurse cows. The term “cow reared” includes mother cows and nurse cows, the term “mother bonded” only mother cows.**

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## **An Exciting Challenge**

Common agricultural practice calls for the separation of calves from their mothers on their first or second day of life, so that the mother cows can be milked. The calves are then fed twice a day with fresh cow’s milk, which they suck from teat buckets. This method is well understood 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 allows this more natural relationship between dairy cows and their calves. Based on these experiences, this guide was written to provide information about field-tested methods of mother-bonded and fostered calf rearing. This type of dairy farming not only requires knowledge of the animals’ natural behaviour, but also an assessment of the essential and non-essential aspects of animal husbandry, and of the potential of the animals to adapt. It also requires a commitment by the farmer to develop a new approach to working with his or her animals.

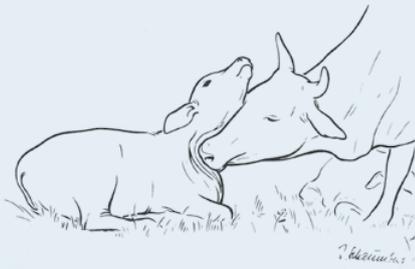
# The Natural Relationship between Cow and Calf

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 featured illustrations were made based on a herd of semi-wild cattle in Kenia.

The Natural Behaviour of Cows and Calves	Conclusions for Species-appropriate Rearing
<p><b>Around Calving</b></p> <p><b>A few hours before calving</b>, 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>	 <ul style="list-style-type: none"><li>• Cows should be moved to a calving pen <b>shortly</b> before calving; unless they clearly do not wish to be separated from the herd.</li></ul>
<p><b>A short time after calving</b>, the cow will start to intensely lick her calf dry. During this process, the cow utters deep, growling mooring 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>	 <ul style="list-style-type: none"><li>• If this behaviour does not occur, assistance may be required by dry rubbing the calf and helping it find the teats and suckle.</li><li>• If the cow is required to foster a calf, the best time to introduce it is shortly after calving.</li></ul>
<p><b>In the first hours and days after calving</b>, 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.</p> <p><b>After about 3 days</b>, 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.</p> <p>Some cows behave aggressively towards humans at this stage.</p>	 <ul style="list-style-type: none"><li>• 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.</li><li>• The mother's licking improves the blood circulation of the calf.</li></ul>

1 to 14 Days after Calving

The calf rests a lot during this period. It drinks about 6 to 8 times per day for an average of 7 minutes respectively. 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 respectively. 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 foreign calf suckles the nurse cow 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 nurse cows. Calves suckle without problems from nurse cows, if they allow it.
- Foreign 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.

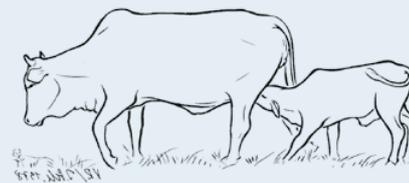
- Although still quite young, weaning of the calf is acceptable from the age of 5 months. The separation of mother and calf will produce feelings of loss for both animals, so it is important to wean the calves in a gradual manner and offer enough distraction to the animals after separation.

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 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.

The amount of globulins in the milk decreases continuously after birth. However, the calf has not developed its own immune system until it is 4 weeks old. Therefore, its risk of falling ill is particularly high between 2 and 4 weeks of age.



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

- The calf should be given the opportunity to suckle, because it is a reflex that it cannot suppress.
- The calves must receive colostrum from their mother or from a cow on the farm (total of at least 4 litres in the first 8 hours of life; at least 2 litres in the first 2-3 hours of life).
- The calf should preferably suckle initially from its own mother.
- The calf must be given whole milk so that the reflex that forms the closed groove to the abomasum is optimally triggered.
- If the calf only receives milk twice a day for a short time, it must be given warm whole milk or whole milk acidified with yoghurt, vinegar, fruit juice, kefir or sour milk in Bio Suisse quality. Cold milk should be given in small quantities.
- In order to prevent diseases, all calves between 2 and 4 weeks of age must be looked after extremely carefully (good hygiene, avoid stress!).

## Mother-bonded and Fostered Rearing Systems

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 could be considered.

The main distinguishing features are, firstly, the **animals involved**, i.e., whether only the mothers or also nurse cows suckle and whether all calves or only some of the calves suckle. Second, the **daily contact times** as well as the total duration of contact and suckling opportunities may vary over the rearing period. Other distinguishing characteristics include the **frequency of milking**, the **barn areas** where animals are together or congregate, and how **weaning and separation** occurs.

### Suckler Cows

- Mother cow
- Nurse cow
- Combination of mother cow and nurse cow

In almost all systems, the calf has initial contact with its mother. In purely mother-bound systems, the calf can suckle on its mother until weaning; in other systems, a change to nurse cows takes place sooner or later. The nurse cows are usually also the mother of one of the calves. In addition, there are former dairy farms that have stopped milking and raise or fatten (purchased and/or own) calves on their cows. So, nurse cows are used purely for feeding calves and are no longer milked.

In the cow-reared systems, the cows are usually milked:

- Once or twice a day or with the milking robot.
- Only after the calves are weaned.
- Nurse cows foster as many calves as possible so that no milk is left in the udder after feeding. The nurse cows can be milked again after the calves are weaned or in the next lactation.

### Suckling Calves

- All calves suckle.
- Only rearing calves suckle.
- Only veal calves suckle.

Not all systems require all calves to be cow-reared. Whether all calves are raised cow-reared depends, among other things, on the amount of milk needed for sale and the amount of work required to raise the calves. However, from an animal welfare and consumer acceptance perspective, the goal must be to raise all calves in a cow-reared system. In this way, all calves remain on the birth farm, which is positive.

### Contact Duration and Frequency

- Permanent
- Restrictive (from short-term contact to half-day contact)

In permanent contact systems, the calves are kept with the cows in the cow shed. In half-day systems, the calves either go out to pasture with the cows or are only in the barn together with the cows, depending on the system. Short-term contact takes place on many farms during barn time. Cows and calves are left together twice a day primarily for suckling. Depending on procedures in the barn and how the lactating cows are milked, suckling occurs before or after milking. Suckling at nurse cows often happens during milking, so that after milking all cows are milked and all calves are fed.



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



Two foreign calves suckle the udder of the nurse cow from behind when her own calf is suckling.

## Area of the Cow-calf Contact

- Cow shed
- Calf pen
- Separate area

## Total Duration of Contact Time

- Short term
- Until weaning
- Additional feeding

There are systems in which the calves continue to be fed with the bucket or also at the automatic feeder after the time where they suckle at the cow. For a short time at the end of the suckling period, this can facilitate weaning. Early switching to the bucket or automatic feeder does not meet the needs of the cow and calf. In systems with limited contact or milk supply, it is possible to continue to feed milk in addition to and at the same time as suckling.

## Weaning from Milk and Separation from the Cow

- Abrupt or step-wise/gradual
- With or without contact to the cow

Most systems have adopted a step-wise or gradual approach to weaning and separation from the cow. This allows the animals to slowly adapt to the new situation, over several days or weeks, by changing only one situation at a time (e.g., no more milk, separation from mother, new barn, different feed, etc.). Basically, three strategies for weaning can be distinguished:

1. Gradual reduction of cow-calf contact.
  2. First separation from the mother, then weaning
  3. First weaning, then separation
- Strategy 1, 2 and 3 can be combined

Exactly how these strategies work and how they can be used to reduce stress during weaning in cow-calf rearing can be read in the FiBL technical guide “Approaches to fattening dairy calves”, [shop.fibl.org](https://shop.fibl.org), order no. 1598 as well as in the practice abstract “Separation and weaning of calves reared in cow-calf contact systems” (in German) [orgprints.org](https://orgprints.org).

### Disadvantages of Abrupt Separation

However, there are also systems that separate abruptly and thus wean at the same time. They then keep the animals far apart so that the cow and calf do not hear each other’s calls. This is clearly associated with a lot of stress. Even if the calf is slaughtered right after being separated from the cow, the mother (less so the nurse cow) experiences an abrupt loss of the calf.

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

Criterion	Benefits	Disadvantages and Challenges
<b>Species-appropriate Behaviour</b>	<ul style="list-style-type: none"> <li>• A species-appropriate, natural behaviour of cow and calf is largely possible.</li> <li>• The calf does not intake any air, suckles in a natural position and at a natural speed.</li> <li>• No competition or stress at feeding time (can occur with restrictive contact with the nurse cow)</li> </ul>	<ul style="list-style-type: none"> <li>• If weaning is not done gradually, greater weaning stress for mother and calf in comparison to very early weaning within the first day.</li> <li>• In a lot of systems the calves can only suckle twice per day, which doesn't correspond to their natural behaviour and only get the first or the last milk output, except when there is a 2 hour break between suckling and milking.</li> </ul>
<b>Health of the Calf</b>	<ul style="list-style-type: none"> <li>• The preconditions for less diseases than in bucket drinkers are good 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. However, the whole "calf management" on the farm is more important for calf health than the type of feeding alone.<sup>1,2</sup></li> <li>• The mother cow licks the calf during suckling; thus promoting blood circulation to the skin.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Some calves increasingly suffer from diarrhoea, because they drink too much milk.<sup>1</sup> This can lead to infectious diarrhoea; presumably when ill-digested milk containing pathogens reaches the intestine.<sup>2</sup></li> <li>• Foster cows normally do not lick the calves of other cows and therefore have a less health-promoting effect than mothers.<sup>2</sup></li> </ul>
<b>Weight Gain of Calves</b>	<ul style="list-style-type: none"> <li>• Often increased weight gain during suckling phase than in conventional rearing, as the calves drink more and, if they receive the last milk output, even fatter milk.<sup>1,2</sup> This is especially the case in systems where the calves are with the cows for several hours a day. In restrictive systems, the gains are comparable to bucket feeders at the same milk volumes.<sup>1,2</sup></li> <li>• Calves suckled by their mothers also sometimes show better development after weaning; they calve at an earlier age and have a higher milk performance during the first lactation.<sup>2</sup></li> <li>• Because of the milk, the calves eat less or most of the time no concentrated feed at all<sup>2</sup></li> <li>• Simply the presence of the mother cow can improve the calf's weight gain, even if the calf is not allowed to suckle from her.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• After weaning, the weight gain may decrease faster than in conventional calf rearing.<sup>1,2</sup></li> </ul>
<b>Rearing</b>	<ul style="list-style-type: none"> <li>• Animals reared in such a way rarely suckle each other and often do less licking of objects and farming equipment. Any suckling of each other can be largely eliminated by switching to mother-bonded or fostered calf rearing:<sup>1,2</sup></li> <li>• The calves show better social behaviour.<sup>2</sup></li> <li>• Calves bred within a mother-bonded rearing system make much more confident mothers themselves.<sup>1</sup></li> </ul>	<p>Since suckling one another hardly ever occurs in mother-bonded calf rearing, an anti-suckling device like a nose ring isn't often necessary. However, a nose flap can be used for weaning.</p>



1 Oral statements of farm managers

2 Scientific studies; more information is available from the authors upon request.

Criterion	Benefits	Disadvantages and Challenges
<b>Human-Animal Relationship</b>	<ul style="list-style-type: none"> <li>• Due to the time required for the good observation of individual processes of cows and calves, an intense human-animal relationship is created.<sup>1</sup></li> </ul> 	<ul style="list-style-type: none"> <li>• Calves can easily run wild, especially in systems with permanent or half-day cow contact. The relationship with them must therefore be maintained.</li> <li>• The system requires interest in animal observation and time, as well as the willingness to adapt the system again and again. Otherwise it will not work.<sup>1</sup></li> <li>• Heifer cows must be especially well cared for and monitored.</li> <li>• 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.</li> </ul>
<b>Calves' Stress</b>	<ul style="list-style-type: none"> <li>• Stress is less than in rearing systems using automatic calf feeders and bucket feeding.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• If the calves are not used to the presence of humans, but have to endure them, this may cause stress.</li> </ul>
<b>Health of the Cow</b>	<ul style="list-style-type: none"> <li>• 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.<sup>2</sup></li> <li>• Cows with chronic udder problems can be cured by suckling calves.<sup>1</sup></li> </ul> 	<ul style="list-style-type: none"> <li>• Udder injuries may occur if several older calves suckle a foster cow. The regular monitoring and care of the udder is therefore very important! Typically, the teat skin will become more rough.<sup>1</sup></li> <li>• 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.<sup>2</sup></li> <li>• There are also isolated cases of <i>Pasteurella</i> and <i>Mycoplasma bovis mastitis</i>. These are probably transferred from the mouth of the calf to the udder.<sup>1,2</sup></li> </ul> <p>Regular udder control and care are especially important in the case of suckler cows.</p>
<b>Milk Performance</b>	<ul style="list-style-type: none"> <li>• Studies show either a higher, or the same level of milk yield of cows compared to animals milked normally.<sup>2</sup></li> <li>• However, milk sold is often lower in cow-bonded calf feeding systems than in conventional systems because calves drink more milk in cow-bonded systems.</li> </ul>	<ul style="list-style-type: none"> <li>• It is difficult to monitor yield accurately. The correct procedure for milk recording is described in the FiBL technical guide "Milchleistungsprüfung in Herden mit kuhgebundener Kälberaufzucht", <a href="http://shop.fibl.org">shop.fibl.org</a>, no. 1409 available in German.</li> <li>• The milk performance may decrease when the cows do not release all the milk while milking and are not suckled completely empty.</li> <li>• The fat content in the milk samples is low when only the initial milk is milked and high when only the final milk is milked.</li> </ul>

1 Oral statements of farm managers;

2 Scientific studies; more information is available from the authors upon request.

Criterion	Benefits	Disadvantages and Challenges
<b>Milk Let-down, Emptying of the Udder</b>	<ul style="list-style-type: none"> <li>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.</li> </ul> 	<ul style="list-style-type: none"> <li>The calves suckle, in almost 90% of cases, only 1 to 2 teats, preferably at the front quarters of the udder.</li> <li>The milk flow during milking is sometimes significantly reduced.<sup>2</sup></li> <li>Cows that also foster calves often retain the high-fat alveolar milk.</li> </ul> <p>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.</p>
<b>Workload</b>	<ul style="list-style-type: none"> <li>Labour savings by eliminating the heating and feeding of the milk and the need to wash the feeding buckets or automatic feeders.</li> </ul>	<ul style="list-style-type: none"> <li>Animal observation and flexible planning are time-consuming.</li> </ul>
<b>Marketing of the Milk</b>	<ul style="list-style-type: none"> <li>The demand for milk from mother-bonded and fostered calf rearing is increasing.</li> </ul>	<ul style="list-style-type: none"> <li>To date, only limited marketing opportunities exist for this form of rearing.</li> </ul>
<b>Marketing of the Calves</b>	<ul style="list-style-type: none"> <li>In the case of selling fattening calves to farms with fostering systems, the calves are already familiar with udder suckling</li> <li>Farmers can simultaneously raise and fatten calves.</li> </ul>	<ul style="list-style-type: none"> <li>Suitable buyers must be found for all weaned calves not required for rearing if the calves are not (further) fattened on the farm.</li> <li>If fattening calves are sold as drinkers to fatteners with bucket drinkers/automatic drinkers, they must be taught to drink from bucket drinkers beforehand.</li> </ul>

## Male Calves

As a matter of principle, all calves in cow-reared systems should be weaned on-farm. Only then is the use of the term “cow-reared system” justified and corresponds to what is promised to the consumers.

- This means that before the introduction on your farm, there should already be possibilities for **marketing the calves** that are not raised for replacement. This concerns especially the male calves.
- The **rapid sale** on the market of male calves or calves not required for breeding is **adverse for animal welfare**. This is because they have so far only drunk their milk from the udder. On the one hand, the cow loses her calf completely unprepared, which means great stress for her. On the other hand, the calf is burdened with the abrupt separation from its mother in addition to the stress of transport, stall and feed changes.

Moreover, it does not know how to get milk at the automatic feeder because it has not yet suckled on an artificial teat. There is a great risk that the calf will not be able to feed itself sufficiently and will be even more vulnerable to germs.

- The best option is to wean all female and male calves together.** If this is not possible on a farm, one option would be to sell the calves to a farm with nurse cows, where the calves can continue to drink at the udder. Or, the calves can be adapted to drinking from the bucket before sale. In either case, the buying farm should be aware of the situation so they can adequately care for the calves. In these cases, however, the stress still remains for the cow that suddenly no longer has her calf.

## Legal Basis

### Switzerland

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. The new milk hygiene ordinance in force since 2020 allows mother-bonded calf rearing without restriction.

#### Animal Welfare

The Swiss Animal Protection Ordinance (TschV of April 23, 2008; as of June 1, 2022) requires the employment of species-appropriate methods when feeding, which includes frequency of feeding. For calves, this is only really guaranteed if the calf can suckle on the udder of a cow. The mutual sucking calves on each other when not allowed to nurse which occurs very frequently as a behavioural disorder with bucket feeders (also with teat buckets) suggests that the intake of milk from the bucket is not appropriate for the species.

#### Milk Hygiene Regulation

The legal basis is the Ordinance of the FDHA on Hygiene in Milk Production (VHyMP of Nov. 23, 2005; as of July 1, 2020). Section 4, Art. 8 is authoritative: "Only unblemished milk with unaltered content may be delivered, which comes from animals whose general state of health is good." and the FDHA Ordinance on Food of Animal Origin (VLtH of Dec. 16, 2016; as of July 1, 2020; Ch. 10, Art. 32): "Milk is the product of the normal udder secretion of one or more animals of the mammalian species referred to in Article 2, obtained by milking once or several times."

#### Milk from Systems with Cow-reared Calf Rearing

If the milk fat content of the milk does not correspond to the normal value as a result of the suckling of the calves, this milk does not meet the requirements of the Milk Hygiene Regulation. By mixing the milk in the tank with milk from cows with normal fat content, all the milk will have normal fat content and can be delivered.

#### Milk Recording

Despite the lower milk volumes and often unusual milk contents, milk yield control should also be carried out on animals that suckle their calves, which can be used for milk recordings. This ensures an overview of udder health and milk production, and the data can also be used for statistics and breeding value estimates. The Association of Swiss Cattle Breeders (ASR) has worked out a solution for this together with FiBL. For details see the FiBL technical guide "Milchleistungsprüfung in Herden mit kuhgebundener Kälberaufzucht", only available in German and French at [shop.fibl.org](http://shop.fibl.org), order no. 1409 / 1647.

#### Organic Farming

The legal basis is the Federal Organic Farming Ordinance of Sept. 22, 1997; effective Jan. 1, 2023. The authoritative provision is Art. 16b, para. 2: "Young mammals must be fed on the basis of unaltered milk, preferably mother's milk."

### Germany

The Milk Quality Ordinance and the Milk and Fat Act, to which the Reich Law Gazette of 1931, p. 150 belongs, apply. "Milk is the milk obtained by regular, complete milking out of the udder and thoroughly mixed milk from one or more cows from one or more milking periods, from which nothing is added and nothing is withdrawn."

### Austria

- Regulation (EEC) No. 1898/87 on the protection of the designation of **milk and milk products** when placed on the market: "The designation 'milk' is reserved exclusively for the product of normal udder secretion obtained by one or more milkings, without any addition or withdrawal."
- Regulation (EC) No. 853/2004 laying down specific **hygiene rules for food of animal origin**: "Raw milk is the unaltered milk of farmed animals that has not been heated above 40 °C and has not undergone any treatment having a similar effect."

## Stable Construction for Cows and Calves

Dairy barns are usually not designed for prolonged housing of dairy cows and calves together. Therefore, they do not provide for a cow-calf contact area. Thus, it is often necessary to adapt or even expand the barn to provide adequate space for all calves and to allow cow-calf contact. Because every barn offers different conditions and possibilities and every system of mother- and nurse-bound calf rearing needs different conditions, it has to be checked individually which adaptations are reasonable and feasible.

### Calf Barn and Calf Pen

For cow-reared calf rearing, a larger calf barn is usually needed. It should preferably accommodate all calves born on the farm.

For permanent systems or systems with contact over several hours (e.g. half-day contact), it is advisable to set up a calf pen integrated into or attached to the dairy barn. The calves tend to withdraw from the cows when kept together with the cows for a longer period of time and are together in the calf group. There, special feed can be offered for the calves (the best is hay) and the drinkers can be adapted to calf size. The climate can also be better adapted to the needs of the calves in this area.

**Tip: A closable calf pen helps with weaning and separation from the mother or nurse cow**

By closing the access, the calf area can be used well for gradual weaning.

Especially for the cows, it can ease the pain of separation if they can continue to seek contact after separation from the calf, for example through or across a gate, or at least see the calf. It is generally advantageous to place the calf pen adjacent to the cow pen.



When the barn is expanded, the calf pen can be integrated into the dairy barn.

### Calving Pens, Cow-calf Pens

In a barn with mother-bonded and foster calf rearing, sufficient calving pens or cow-calf pens must be provided. For an undisturbed development of the mother-calf relationship, it is advantageous if the cow and her calf are kept separately from the other cows and calves for a few days. For the acclimatization of calves to a nurse cow such a box can also be useful. Depending on the number of cows, calving season and length of time the animals stay on the farm, more or less of such boxes will be needed.



Calves can withdraw from the cow herd into the calf pen with microclimate zone.

## Design of the Cow and Calf Barn

How cow and calf pens are best designed depends primarily on the contact time in the chosen system.

### Permanent Contact or Contact over Several Hours

If the calves are kept with the cows in the dairy barn for a longer period of time during the day, the barn must be designed in a way that is suitable for calves (like a mother cow barn).

- The barn facilities must be **calf-proof and injury-free**.
  - The partitions must be sufficiently deep and the distances between the pipes must be sufficiently narrow, also at the milking robot.
  - Pinching should not be able to happen at the feed fence. The feeding table height is ideally lower than for dairy cows when the calves are feeding there.
- Calves need **sufficient space to lay down, feeding areas and watering facilities**. In cubicle barns, calves can block cubicles for cows or, in exceptional cases, a calf can be crushed. Sufficient lying areas outside of the cubicles should be available, in a calf pen as described above, but also close to the cows, because the younger calves tend to lie with their mothers. A lying area in front of the head space of the cubicles is a good idea, as is often found in mother cow barns. For the calculation of this calf lying area, however, the head space itself must not be counted as part of the calves, it belongs to the cubicle (at least the standard dimension according to animal welfare).
- The floor must be particularly slip-resistant. A slatted floor is permissible for calves (maximum slat width for small calves is 30 mm).

### Restrictive Contact

Cows and calves have a limited amount of contact time together in the barn.

- **When all barn areas are close together, it is easier to move the animals**. In most cases they are happy to move from one area to the other, but the effort increases with long, complicated paths.
- **Gates or partitions** should be chosen that are easy and quick to open.
- If **milking is done during the meeting and suckling periods**, there needs to be a part of the barn that can be operated independently of milking, i.e., without occupying the waiting or eating area.

- **If cows go into the calf pen**, there should be a gate that is large enough for calves to pass, but too small for the cows. Consider that the deep litter in the calf pens can suffer under the cows because the material is not as firm and is damaged by the heavier cows.
- A separate area must also be **cleaned separately**.

Experience shows that on most farms the systems of mother-bonded and fostered calf rearing developed over the years. It is therefore advantageous to plan as flexibly as possible, to think ahead about possible separation options and to set up generous deep litter areas.

### Tethered Barn

Calves can also be reared in a tethered housing system with their mothers and nurse cows. In this case, the Animal Protection Ordinance must be observed. Article 40 of the Animal Welfare Ordinance states that “calves from tethered mother and nurse cows may only have short-term access to their mothers or nurse cows in the barn for feeding.” In other words, suckling may only happen with restrictive contact while the cows are tethered in the barn. If the contact time is moved to the pasture or outdoor run, the time is not restricted. If the calves go to the pasture with the cows, a double fence is recommended.



If space in the barn is limited, a wood chipped area can also serve as a meeting area if contact is restrictive.

## Presentation of Rearing Variants Based on Selected Practice Examples

All farms presented are managed organically and deliver their milk and/or process it themselves. All farms also have good udder health with a tank milk cell count consistently below 200 000. The calves on these farms are very rarely sick.

### Example No 1: Suckling on Mothers and Nurse Cows

#### Farm Profile

Hofgut Rengoldshausen

Mechthild Knösel

88662 Überlingen, Germany

- Breed: Original Brown Swiss
- Herd size: 50 cows + 50 calves per year + 3 breeding bulls and about 50 young animals
- Housing system: Box barn for the cows and the cow-calf group, deep litter barn and group igloo for calves, littered barn compartments for the fattening bulls and the fattening heifers (flat litter)
- Calf rearing: long-term udder feeding with mothers and nurse cows
- Marketing: direct marketing of the meat and milk (Demeter preferential milk)

#### Milking Timetable

- 1) The older calves (from 4 months of age) each meet their mothers in a separate stall area before milking, where they drink from their mother's udder. The oldest suckling calves, who have already been weaned from their mothers, also come to this area and drink from the mothers of the slightly younger calves.
- 2) Meanwhile, the non-suckler cows are milked. After milking, they go to the feeding fence in the stall compartment of the non-permanently suckler cows.



After suckling, calves are returned to the calf pen, which is adjacent to the exercise yard.

- 3) Then the suckler cows are milked. After milking, they also go to the feeding fence: the mothers of calves more than 12 weeks old go back to the stall compartment of non-permanent suckler cows, the mothers of younger calves go to the stall compartment of suckler cows with calves or to the appropriate separate pasture.

#### Timetable from Birth Onwards

- **1<sup>st</sup>–2<sup>nd</sup> day of life:** For calving, the cows go to the calving boxes where they stay together with their calf for 1 or 2 days. From the second day, the cow goes into the milking parlour.
- **From the 2<sup>nd</sup> day of life onwards:** The calves live with their mothers in the pens (cow-calf herd) in a separate barn area with an extra calf compartment until about the 12<sup>th</sup> week of life. In summer, they go together to a separate pasture. These cows are also milked twice a day.
- **13<sup>th</sup>–16<sup>th</sup> week of life:** From the 13<sup>th</sup> week of life onwards, the calves are housed in separate deep litter pens and in group igloos with outdoor access (divided according to age groups). From the 13<sup>th</sup> to the 15<sup>th</sup> week of life, calves only go to their mothers twice a day to drink.

- **16<sup>th</sup>–17<sup>th</sup> week of life:** In the 16th week of life, the calf is separated from the mother with a transition period of 8 days, during which the mother comes to the calf only once a day. Afterwards, the calf drinks twice a day from the mothers of younger calves. The mothers then go back to the herd of cows that are only milked.
- **From the 18<sup>th</sup> week of life onwards:** In the 18<sup>th</sup> week of life, the calves are weaned gradually within two weeks: initially, the calves are allowed to go to the nurse cow only after the younger calves, then only 1 time per day. This gradual approach reduces stress. After weaning, the young bulls are placed in groups of similar age in the littered stall compartments or on pasture. The young females are also housed in separate littered stall compartments or on pasture. The bulls and fattening heifers are slaughtered at around 24 months of age.



During the suckling period, the cows and calves also have time for social contact. This cow licks her own calf extensively while other calves suckle on her udder.

### Health of Calves

- The calves are fitter than before in the bucket feeder system and grow faster.
- Diarrhoea is rare and, when it occurs, it is not problematic. The calves then continue to drink without restriction.
- Coughing and lung problems sometimes occur in moderate form in winter.

### Important Prerequisites for the Proper Functioning of the System

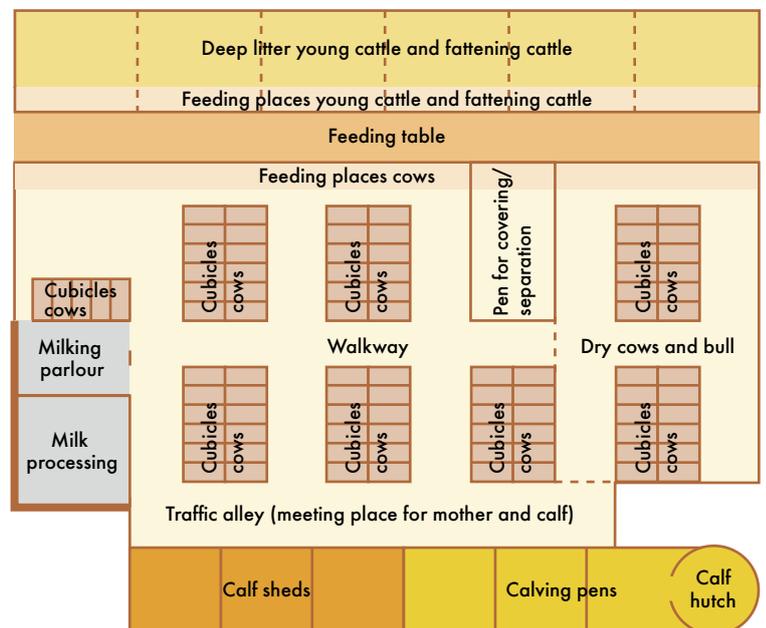
Mechthild Knösel

- The cows accept foreign calves as long as their own calf is present.
- Staggered weaning of cows and calves facilitates separation: calves call and answer their mothers less after weaning, so the latter call for their calf for less time.
- Regular udder inspection is essential.

### See also:

- Mother-bonded and fostered calf rearing on [bioaktuell.ch](http://bioaktuell.ch) > Tierhaltung > Rindvieh > [Kuhgebundene Aufzucht](#) (in German)
- FiBLFilm "Muttergebundene Kälberaufzucht auf dem Hofgut Rengoldshausen (mit Mechthild Knösel)", on [youtube.com](https://www.youtube.com/watch?v=FiBLFilm) > FiBLFilm > Playlist "Kuhgebundene Kälberaufzucht" ("Cow-reared calf rearing", with English subtitles)

### Sketch of the stable 1: 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.



Whether in the pasture or in the exercise yard, the calves can drink from the foster cows at any time.

## Example No. 2: Suckling on Mothers with Permanent Access to the Dairy Herd

### Farm Profile

Ferme la Source

Heiderose and Till Huber

2616 Renan, Switzerland

- Breed: Original Brown Swiss
- Herd size: 20 cows
- Housing system: cubicle housing with existing tethered stall, feeding and milking place
- Full pasture
- Calf rearing: Maternal calf rearing, each calf suckles its own mother
- Marketing: Spielhofer cheese dairy in St. Imier (Demeter)

### Milking Timetable

All cows that give milk go to the milking barn. The dry cows and the bull remain in the cubicle housing stall. All cows are milked at both milking times. The cows with a suckling calf still do not always give all the milk, especially in the front half of the udder, or they are already almost empty. After milking, the udders are cared for with ointment (i.e. milking grease) if necessary.

### Timetable from Birth Onwards

- **1<sup>st</sup>–5<sup>th</sup> day of life:** The cow calves in the calving box, which is integrated into the calf pen area. After calving, the cow stays in this area with the calf for at least 5 days so that the cow and calf can get to know each other well and the calf gets enough colostrum. The cow goes into the milking pen with the other cows for milking at milking times.
- **2<sup>nd</sup>–12<sup>th</sup> week of life:** After milking times, the cow goes to the normal free stall area, where the calf can join the herd at any time through the calf pen. In summer, they go out to pasture together. Thus, except during milking times, the calf can always be with the mother and drink milk, or simply get to know the herd life.
- **12<sup>th</sup>–17<sup>th</sup> week of life:** At weaning, the calf is given a “quiet wean” suction guard in the nose at 3 months of age, which prevents it from continuing to drink from the udder. In 90 % of the calves, the suction protection works. Sometimes the calves are smart enough to still get to the udder. The calf remains in the dairy herd for another 3–5 weeks. This allows for a slightly gentler separation.
- **From the 17<sup>th</sup> week of life onwards:** The calf is placed in a separate group of young animals.

## Health of Calves

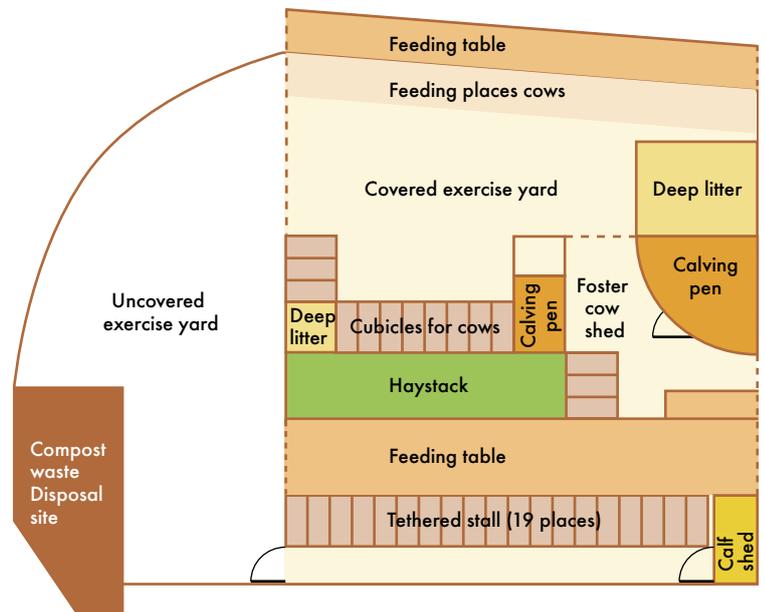
- Diarrhoea is rare and it is not problematic when it occurs.

### Important Prerequisites for the Proper Functioning of the System

Family Huber

- The first days after birth are crucial for the vitality of the calf. Care should be taken to ensure that the calf gets enough colostrum. If in doubt, it should be bottle fed.
- With cows, it is important to monitor udder health. Especially when weaning the calf, as the cow is then milked "only" two times a day.

## Sketch of the stable 2: Ferme la Source



## Example No. 3: Suckling at the Mother and Nurse Cows after Milking

### Farm Profile

Randenhof

Sharmila und David Stutz

8225 Siblingen, Switzerland

- Breed: Original Brown Swiss
- Herd size: 20 cows
- Housing system: deep litter housing
- Calf rearing: long-term suckling with additional milking; suckling at the udder of mother cows and nurse cows twice daily, mostly after milking
- Marketing: direct marketing of dairy production on-farm and of Demeter products at organic stores

### Milking Timetable

- 1) At milking time, the nurse cow (usually only one) is released from the feeding fence into the free lying area. All other cows are fixed in the feeding fence or are in the milking parlour.
- 2) Now the gate between the calf pen and the lying area is opened (the lying area can be closed off). The calves are still locked in their feeding fence and receive hay there.
- 3) First, the young calves are let out of the feeding fence. They use the ramp to access the free lying area of the cows where the nurse cow is already waiting and immediately start suckling.
- 4) Then the mothers of the youngest calves (up to 14 days old), which have already been milked, are let out of the feeding fence so that they can still suckle their own calves. The very young calves suckle only from their mothers at first. In time, they will also try to suckle from nurse cows. As soon as they suckle well at the nurse cow, the mother is milked normally again and is no longer allowed to see the calves.
- 5) When the young calves have been suckled, the older ones are let out of the feeding fence. They then suckle the udder of nurse cows and of the mothers of the youngest calves until empty. After all calves have been suckled, the cows are



The foster cows already wait for the calves in the lying area. The calves use the ramp to go from the calf pen to the cow pen. On the free lying area they are suckled while the non-suckling cows are feeding. After suckling, the mothers and foster cows also return to the feeding fence, and the calves then have the entire lying area to themselves for romping and playing.

again fixed at the feeding fence and the calves run and romp around on the free lying area. After about five minutes, the calves are driven back to their stalls via the ramp or go back on their own accord to feed.

#### Timetable from Birth Onwards

- **1<sup>st</sup>–2<sup>nd</sup> week of life:** The cows mostly calve on the free lying area in the free stall. Only afterwards they are brought with the calves into a calving pen, where they both stay for about three days. However, the cows are taken away from their calves to the feeding fence at feeding times and are also milked afterwards. After about three days, the calf is moved to the calving pen. The cow goes back into the herd completely and is only partially milked in the milking parlour. The calf then suckles the udder until it is empty. If the cow does not give 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 stall. After a few days, she gives milk even without the calf being next to her. If this does not work, she becomes the new nurse cow, and the previous nurse cow is milked normally again. Because of the heavy use, the nurse cow's teats must be checked daily and greased if necessary. Cows with delicate teats are not suitable as nurse cows.

- **2<sup>nd</sup>–3<sup>rd</sup> week of life:** The calf gradually suckles less from its mother and more from a nurse cow until it suckles solely from the nurse cow. Nurse 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 nurse cow. Some mother cows do not let down the milk well but can usually be milked normally after approximately three 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.

- **4<sup>th</sup>–16<sup>th</sup> week of life:** The calves still go twice per day to the nurse cow for suckling. They spend the rest of the time together with other calves in the calf shed with exercise yard. Around the 16<sup>th</sup> 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 rearing 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 two to three weeks as a transition to pure roughage feeding. The fattening calves continue to drink until about 24 weeks of age. Currently, only 20 % of the fattening calves stay on-farm for fattening and are not sold; this proportion will increase in the coming years.

## Health of the Calves

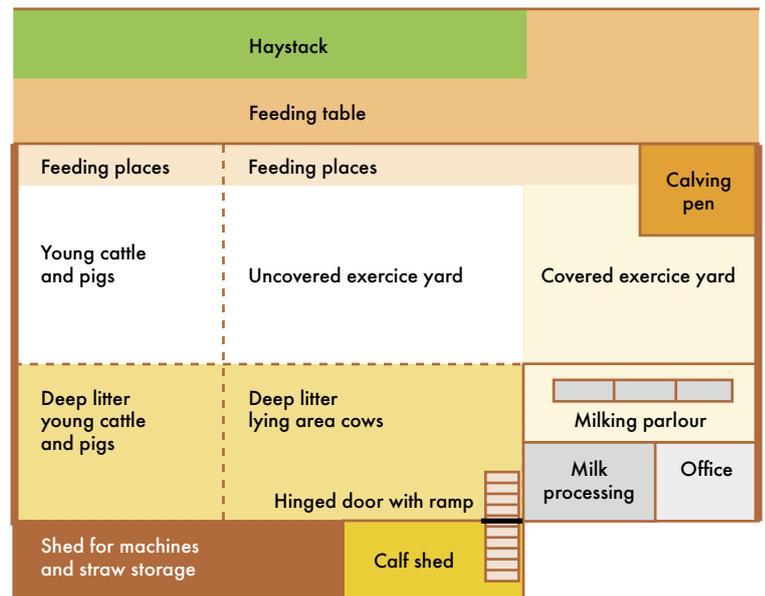
- Diarrhoea occurs when young calves drink too much milk or milk with too much fat (last milk output). This kind of diarrhoea is not problematic.

### Important Prerequisites for the Proper Functioning of the System

Sharmila and David Stutz

- Good observation of the animals is necessary in order to be able to adjust the system individually.
- Changes must not be made abruptly, but always require a transition phase.
- Due to the individuality of the calves and cows, it takes trust to come up with the right solution in every situation.
- We also often switch between nurse and mother-bound and calf suckling before and after milking, depending on how old the calves are and how good the milk quality of individual cows is or is not.

## Sketch of the stable 3: 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.

## Example No. 4: Suckling on Mother Cows after Milking until the Sixth Week of Life, afterwards on Nurse Cows

### Farm Profile

Hof Gasswies KG  
Alfred und Silvia Rutschmann  
79771 Klettgau, Germany

- Breed: Fleckvieh
- Herd size: 58 cows
- Housing system: cubicle housing, full pasture
- Seasonal calving, in two rounds
- Calf rearing: long-term suckling with additional milking; suckling on mother and nurse cows, twice daily after milking
- Marketing: Schwarzwaldmilch Freiburg i. Br. (Bioland)

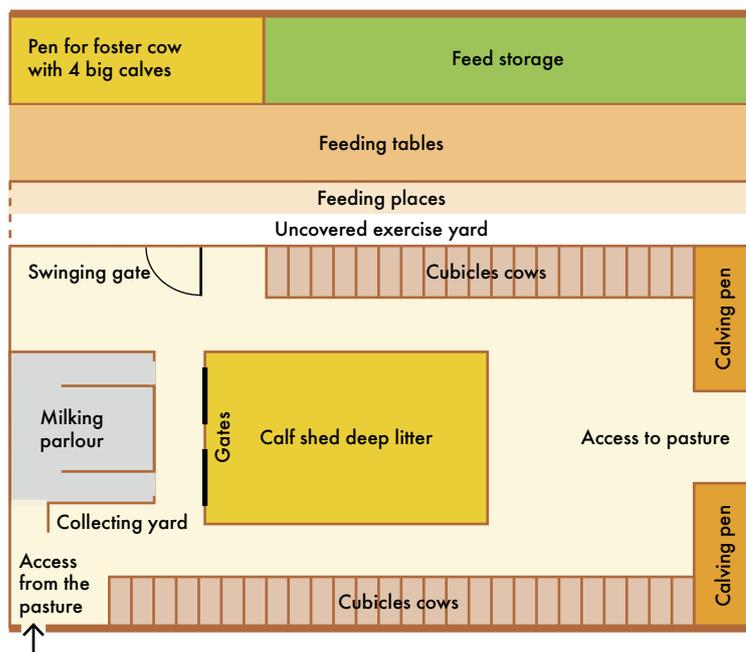


The calf pen is located in the middle of the cows' pen. The calves are let through a gate to join the cows after milking. Each calf then suckles at its mother.



After milking time, the calves go from the calf pen to the waiting room to their mothers or foster cows and stay there until they have finished drinking.

#### Sketch of the stable 4: 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.

#### Milking Timetable

- 1) The cows come directly from the pasture in summer or from the feeding area in winter to the waiting room. Then they go one by one to the milking parlour, an automatic tandem double-quad milking parlour with milking technology from Siliconform. You can enter "cow with calf" or "cow without calf" into the milking program. Therefore, it is stored which cow is currently suckling her calf. Most cows that have a suckling calf give milk quite well. In the milking parlour, there is a display per milking place with the milk curve of each cow, so that it is clear when to stop milking so that there is still enough milk left for the calf.
- 2) The cows fostering calves are returned after milking by means of a selection gate to a waiting area where they can eat. The cows without calves go to a separate area of the feeding axis.
- 3) When all cows have been milked, the currently suckler cows are let out of the pre-waiting area back into the waiting area. If necessary, the waiting area can be divided several times by means of gates so that the suckler cows can be divided into groups. These groups are based on the age of their calves or they are different groups of suckler cows. The calves are let out from the adjacent young cattle barn to these groups. The calf pen is closed again. Healthy calves quickly find their mother or even a nurse cow and suckle her dry. Calves

with health problems can be identified at this moment.

- 4) When the calves have finished drinking, the cows go through a swing gate back to the herd to the feeding place or to the pasture. The calves are brought back to the calf pen where they also receive feed. However, the calves can already return to the calf pen on their own, which is made possible for them by a specially constructed folding gate. In summer, the calves go to a separate pasture. In the foster group, four nurse cows graze together with 10 older calves.

### Timetable from Birth Onwards

- **1<sup>st</sup> week of life:** The cows calve in the calving pen or sometimes on the pasture in summer. Calving on the pasture is rather inconvenient. Cow and calf then stay three to four days in the calving pen. On the first day, the cow is milked one time, from then on two times per day in the milking parlour. Thus, the cow and calf learn from the first day to be temporarily separated.
- **2<sup>nd</sup> week of life:** The calf suckles twice every day from its mother; after the cow has been milked. Cow and calf spend half an hour to an hour together in the morning and evening.
- **3<sup>rd</sup>–12<sup>th</sup> week of life:** The female and male calves continue to drink from their mothers or nurse cows two times a day after milking. A few of the male calves are sold to an organic fattening farm.

- **12<sup>th</sup>–16<sup>th</sup> week of life:** After three months, when the calves are expected to slowly wean from milk, they go into the nurse cow group. Gradually, the number of nurse cows is reduced until the calves are permanently separated. However, visual contact between the cow and the calf is still maintained. Thus, weaning is relatively gentle and weight losses are low. The male calves will then continue to be fattened on a leased farm. From 2024, they will be sold to an organic fattening farm. The offspring of about 10 calves are on pasture with three nurses all summer long. These calves always develop nicely.

### Health of the 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

*Alfred Rutschmann*

- The system requires very good observation of the animals.
- The transitions between the different stages must be smooth.
- The calves should not suckle too much milk so that they do not develop into fattening calves. Rather, they should become good roughage utilisers.
- The system requires a great deal of flexibility from both people and animals when it is introduced. As the season progresses and the years go by, the routines become established.



Cows that are particularly fond of suckling, nurse their own calf as well as other calves as nurse cows.

## Example No. 5: Suckling from the Mother or Nurse Cow, Followed by a Permanent Foster Cow Group Without Milking

### Farm Profile

Gut Rheinau

Andi Wälle

8462 Rheinau, Switzerland

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

### Milking Timetable

- 1) At the beginning of the milking, all cows are fixed and fed in the feeding fence.
- 2) After about one 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/nurse cows of calves up to four weeks of age also go into the calf shed next to the milking parlour. The exercise yard of calf shed for younger calves is next to the cows' collecting yard. The cows can be led through a connecting door to the calves. The nurse cows of the older calves are led to their calves in the calf compartment in another shed. The cows

stay with the calves for about one hour while the milking of the other cows takes place. The mother and nurse 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 fence. The nurse cows of the older calves go directly from the calf shed into the feeding barrier, because they are not milked.

### Timetable from Birth Onwards

- **1<sup>st</sup> day of life:** The cows calve in the calving pen, where the mother cow and the calf stay for about 24 hours. The calf sucks as much as it wants. The cow is milked one time in the milking parlour during this time.
- **1<sup>st</sup> week of life:** The cow goes back to the herd and is milked again two times a day. The calf goes into the large calf pen, which is next to the milking parlour. At least until day five, the calf suckles before its mother is milked. Then it is gradually determined which cow will become a nurse cow and which cow will go into dairy production (and which calves will be raised and which will be fattened). The freshly calved cows, which are particularly fond of suckling calves, continue to go to the calf pen to suckle before milking. The other cows are milked normally. Their calves have to find a nurse cow, but this works out without a problem. If the separation is difficult and the cow calls for the calf, she is allowed to go to it for a few days longer, which usually calms her down quickly.
- **2<sup>nd</sup>–4<sup>th</sup> week of life:** Some of the calves sold for fattening leave the farm after three to four weeks. Most of them go to an organic farm,

which fatten the calves with nurse cows. The others, mainly female rearing calves and fattening calves, continue to drink two times a day before milking at the mothers and nurse cows. Because fewer cows are now needed to care for the calves, only the most suitable nurse cows go to the calves.

- **4<sup>th</sup>–16<sup>th</sup> week of life:** Once a solid group of nurse cows with their calves is formed, the calves are moved to a separate compartment with deep litter next to the dairy cows. At the beginning of milking times, the nurse cows go there to suckle their calves. One nurse cow usually fosters three calves. They stay there until the end of milking time and are no longer milked in the parlour. In summer, the nurse cows are also together with their calves at grazing times (i.e. about 12 hours) on a separate pasture, which is located directly behind the calf compartment. The calves can then drink at the udder whenever they want.
- **16<sup>th</sup>–20<sup>th</sup> week of life:** The calves get a “nose ring” at the age of 16 weeks, so they can no longer drink milk from the nurse cows. However, they remain in the group with the nurse cows for another two to three weeks. Only then are they separated from the nurse cows and either taken to the farm’s own rearing and fattening farm, or individual fattening animals are taken to another organic fattening farm.



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

### Health of the Calves

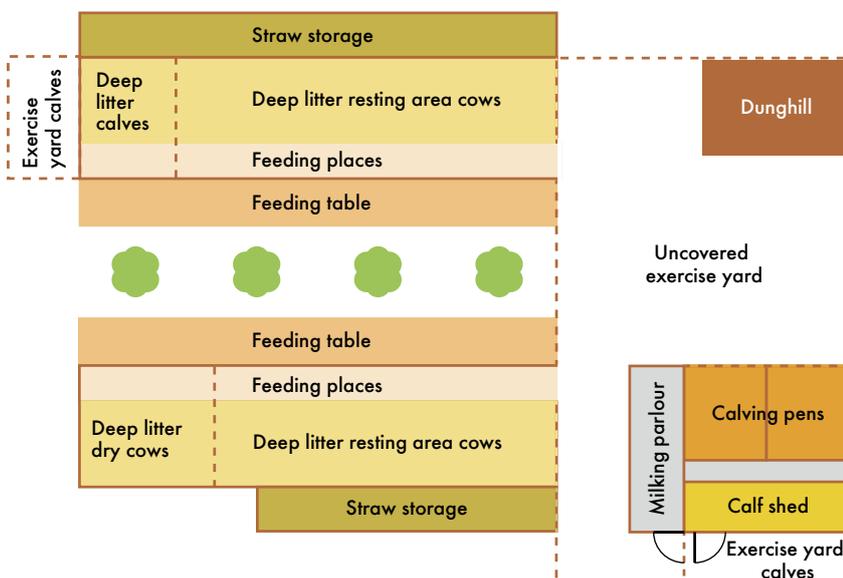
- The calves’ health is very good. The calves are robust and do not show any significant growth interruption after weaning.

### The most Important Prerequisites for a Good Functioning of the System

Andi Wälle

- 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 committed to it.

### Sketch of the stable 5: Gut Rheinau



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



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

## Example No. 6: Suckling Only from the Mother Cow, One Hour before Milking

### Farm Profile

Brüederhof

Simon und Martina Knoepfel

8108 Dällikon, Switzerland

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

### 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 two 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

- **1<sup>st</sup> week of life:** For the first one to two 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 three and six days old, the mother cows join the other cows at the feeding barrier at feeding times. Otherwise, they are with the calf in the calving pen.
- **2<sup>nd</sup> week of life:** The mother cows come to the calving pen twice per day to suckle the calf.
- **3<sup>rd</sup> to around 14<sup>th</sup> week of life:** The calves live in the calf shed and go twice per day into the cow shed to suckle from their mothers.
- **Around the 14<sup>th</sup> week of life:** The calves are weaned gradually over two weeks. Then they enter the cattle barn and from that time on they have no visual contact with the cows. During the first few days, the cows and the calves call to each other. Often the cows do not give milk well during the second milking period after weaning. However, after that they let themselves be milked normally again. Generally, the cows give milk very well in the milking parlour.



The calf goes back to its stall on its own.

### Health of the Calves

- Calf diarrhoea occurs, but it is rarely problematic.

### Special Facts

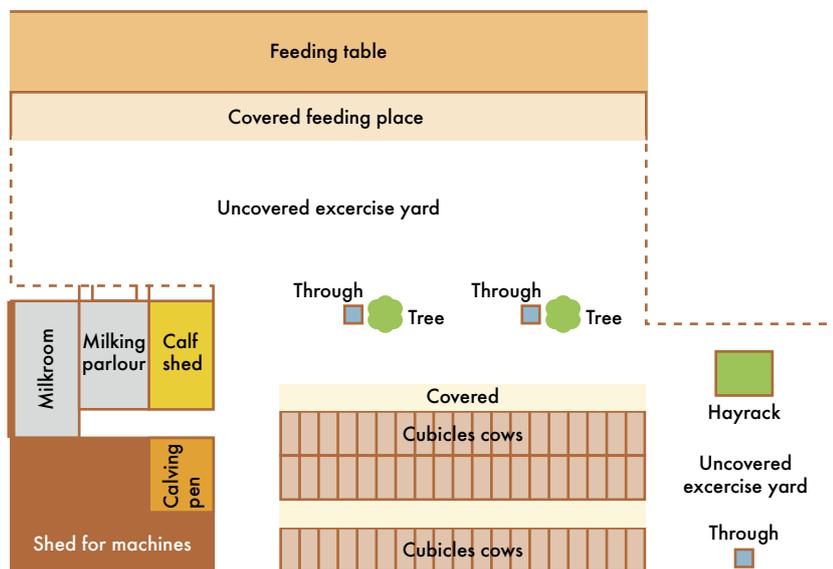
- This calf feeding system has been practiced on the farm for 32 years. An in-house comparison in terms of animal health is therefore not feasible.
- The udder health is good.
- There are also isolated cases of *Pasteurella* and *Mycoplasma bovis-mastitis*, probably transferred from the mouth of the calf to the udder.

### The most Important Prerequisites for the Proper Functioning of the System

*Kaspar Günthardt, previous farm manager and found of the 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 stable 6: 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.



In summer, the older calves go to a separate calf pasture during the day, the younger ones together with their mothers or nurse cows.

## Example No. 7: Half Day Suckling with Mother and Nurse Cows

### Farm Profile

Lehenhof

Hans und Sandra Braun

Aareweg 46

4852 Rothrist, Switzerland

- Breed: Swiss Fleckvieh
- Herd size: 60 cows + 60 calves per year + 1-2 breeding bulls
- Housing system: cubicle housing for the cows and the cow-calf group, deep-litter shed for mothers and calves in the first 10 days after calving.
- Calf rearing: Long-term suckling with mother and nurse cows. Cows and calves without concentrates and corn.
- Marketing: Direct marketing of the meat and milk (farm shop) and marketing to ALDI with the label "Retour aux Sources RAS" (In English: Return to the source).

### Milking Timetable

- 1) In winter, in the morning, first the mothers are milked, then they go to the feeding area. After two hours they go to the calves in the separate barn. In summer, the mothers, who are also nurse cows, without being milked, after checking the udders in the milking parlour, go to the pasture with the calves.
- 2) In the morning, the non-suckler cows are milked after the mother cows. In the evening, only the non-suckler cows are milked. After evening milking, all cows go together to the feeding fence in winter, and to the pasture in summer (without calves).

- 3) The calves are never fed, not even at the beginning. Out of 60 calves, there are between one and three that are given help at the beginning.

### Timetable from Birth Onwards

- **1<sup>st</sup>–10<sup>th</sup> day of life (winter) or 1<sup>st</sup>–21<sup>st</sup> day of life (summer):** For calving, the cows are in the deep litter area, where they stay together with their calf for 10 or 21 days. Immediately after birth, they are kept with their mother in a separate box made of panels for one to two days. From the second day, the calves are separated at night in the deep litter area in a calf compartment, but they can see their mothers and the mothers can also lick them.
- **2<sup>nd</sup> or 3<sup>rd</sup>–11<sup>th</sup> week of life:** The calves live with their mothers in the box pen (cow-calf herd) in a separate barn area. At night, the cows go into the cow herd without the calves, where they also eat. The calves eat alfalfa and hay in the separate barn. The cows are milked once a day, in the morning. In summer, about 30 calves and 13 cows (mothers of the younger calves) go together to a separate pasture during the day. At night, these cows go to night pasture together with the other cows. The calves stay in the calf pen. These cows are not milked at all, but each morning the udders are checked, and the teats are greased. In the summer, they are then together day and night on the pasture.
- **12<sup>th</sup>–17<sup>th</sup> week of life:** From the 12<sup>th</sup> week, the calves drink only from nurse cows. Their mothers are back in the cow herd and are milked two times a day. Usually there are three calves per nurse cow. The nurse cows are not milked. However, they go through the milking parlour, where their teats are greased. They are marked on the legs and head so that they are not accidentally milked.
- **17<sup>th</sup>–21<sup>st</sup> week of life:** The calves go to another barn compartment. There they still see the cow-calf group, but they can no longer join them.

They no longer are fed any milk. They go to a separate calf pasture during the day and stay in the barn at night.

- **From around the 21<sup>st</sup> week of life onwards:** The calves go either to the rearing farm or to one of the pasture fattening farms with which the farm cooperates.

### Health of the Calves

- The calves are fitter and grow faster compared to the bucket feeder system used before.
- Diarrhoea is rare and, if it occurs, is not problematic. The calves then continue to drink without restriction.
- Coughing and lung problems sometimes occur sporadically in winter in moderate form.
- The calves are dehorned, and the males are castrated.

### Health of the Cows

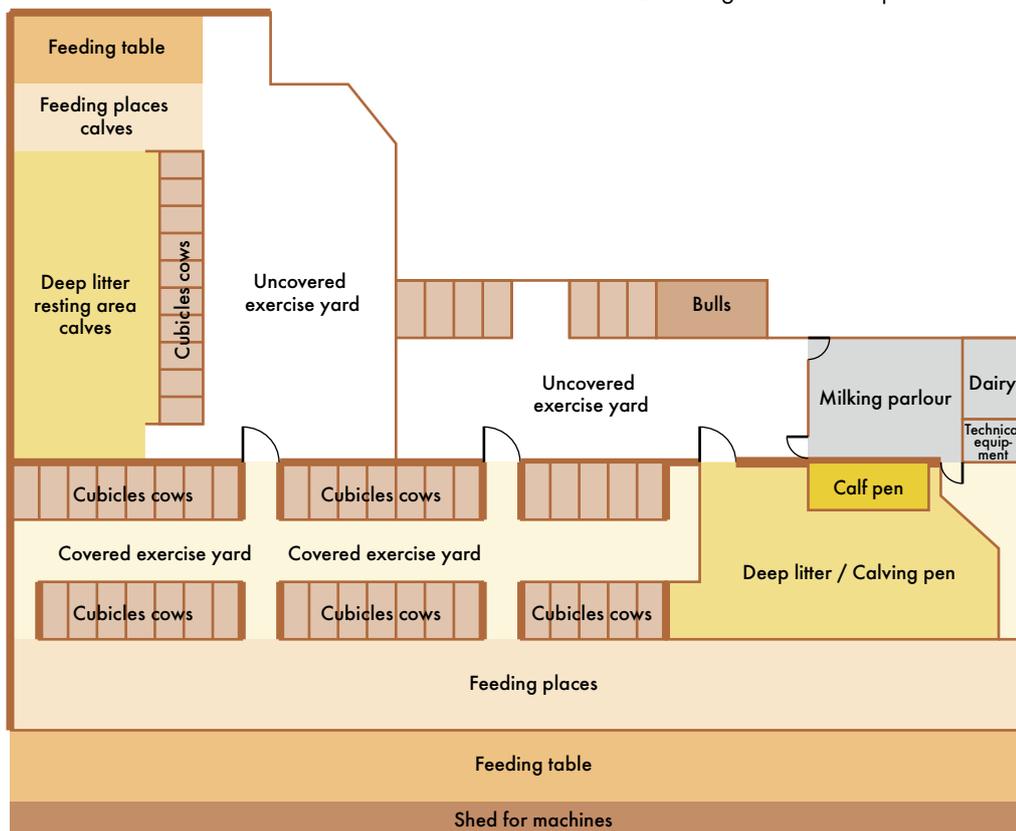
- Cell counts improved after the change to mother-bonded calf rearing.

## The most Important Prerequisites for the Proper Functioning of the System

Hans Braun

- Cows accept foreign calves in the beginning as long as their own calf is present. In a later phase, they accept the foreign calves without any problems.
- If the cows are not producing milk well, one must be patient and not get upset. Most cows give the milk without any problems. Sometimes, it can take some time until the cows produce milk at full capacity. If they do not give milk at all, it helps to blow into their vagina with a hose. You have to do this one to two times, after that they will produce milk (you should not do it more often, otherwise they will get used to it). If a cow gives only 2–3 liters, you can use the hose 1× at the next milking, then she will give the milk. Sometimes, it is enough to lightly push the udder with your hand and the milk will flow. The calves also do it this way.
- It is very important that the freshly calved cows are milked already once a day.
- Time is saved because of less milking.
- It can occur that an adult cow, when she is stressed, starts sucking on another one, in that case you should put a nose ring on her.
- Daily observation of the animals is central.
- Regular udder inspection is essential.

### Sketch of the stable 7: Lehenhof



In the calf pen (upper part of the sketch), the calves have half-day contact with mothers and nurse cows until they are 11 weeks old, and then only with nurse cows. After weaning, the calves go to the converted, former tethering barn for the cows (separate building, not shown in the sketch).



The rearmost stall compartment is the pen for mother cows and calves. The second rearmost compartment is reserved for the heavily pregnant cows.

## Example No. 8: Calves and Suckling Mother/ Nurse Cows – Always Together

### Farm Profile

Hofgut Pulsitz

Sabine Reichardt

Pulsitzer Hauptstraße 14,

04749 Jahnatal, OT Pulsitz, Germany

- Breed: German Black Pied (Deutsches Schwarzbuntes Niederungsrind, DSN)
- Herd size: 50 cows
- Housing system: deep-litter housing with uncovered outdoor run
- Calf rearing: long-term suckling with additional milking, with mothers and nurse cows; calves and suckler cows are always together
- Marketing: direct marketing from the farm and to organic stores, Demeter fresh milk to the "Gläserne Meierei" in Berlin

### 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 in the locked deep litter area of the pen for mother cows and calves.
- 2) All suckler cows are carefully checked in the milking parlour, with only those whose udders are not completely empty being milked. Most lactating cows 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 between two and three calves. The nurse cows accept foreign calves best when fixed in the feeding barrier. Their own calf suckles from the side, while the foreign calf suckles from behind. Ideally a cow suckles more than one calf, so that more cows can be milked normally.

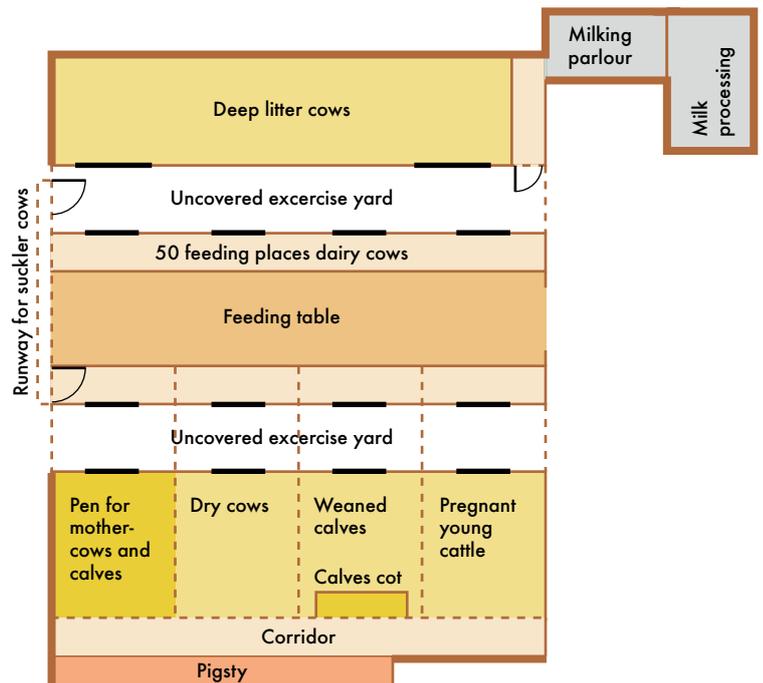
### Timetable from Birth Onwards

- **1<sup>st</sup> week of life:** or the first three to five 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.
- **2<sup>nd</sup>–3<sup>rd</sup> week of life:** The cow is with the calf in the mother-calf pen, together with the other calves and mothers. Male calves are sold to a fattening farm at two weeks of age. Their mothers go back to the milking group. However, they call for their calf first. Older calves also suckle with the mothers of female calves. Barn personnel make sure their own calf gets enough milk. Some cows are suckled completely empty by several calves and give no more milk in the milking parlour, others still have plenty of milk in their udders.
- **4<sup>th</sup>–6<sup>th</sup> week of life:** The cow is returned to the cow group without calves and is allowed to be mated by the bull again. The mothers of the cow calves now often call for their calf, while the mothers of the male calves have already gone through the separation. On the day of separation and the first days after, the animals are given the homeopathic remedy Ignatia C200 (2×10 ml) to help them better bear the pain of separation. From now on, the cow calf suckles from the mothers of the younger calves.
- **Around the 5<sup>th</sup>–17<sup>th</sup> week of life:** The cow calves remain in the mother-calf group with changing mothers or wet nurses until they are weaned at the age of about four months. Small groups of calves are always weaned together and brought to the “young cattle pen”. There they are the smallest first. They can retire to a calf pen where the larger cattle cannot access. There they are fed separately. In the first two to three days, the calves call for the cows. The calf pen is dismantled as soon as the young animals are well integrated into the cattle group.

### Health of the Calves

- Diarrhoea occurs rarely (about once in three years, usually because the calf has drunk too much milk). However, the diarrhoea is not problematic, and the calves then almost always continue to drink with the cows without any restrictions.
- Calves have a calf pen with a hayrack in the mother-child group. This is very well accepted.

### Sketch of the stable 8: Hofgut Pulsitz



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

## Example No. 9: Calves and Suckling Mother Cows Always Together

### Farm Profile

Hans Möller  
De Öko Melkburen  
24632 Lentföhrden, Germany  
deoekomelkburen.de

- Breed: German Black Pied (Deutsches Schwarzbuntes Niederungsgrind, DSN)
- Herd size: 25 cows
- Housing system: year-round grazing, milking once a day
- Calf rearing: Long-term suckling with additional milking; only with mothers; calves and suckler cows are always together.
- Marketing: farm processing (milk, curd, yogurt); direct marketing from the farm and delivery to food retailers.

### Milking Timetable

- 1) Cows are milked once a day (in the morning at 8 o'clock) in the mobile milking parlour (summer) or in the milking parlour in the barn (winter). Lactating and non-lactating cows are milked in sequence without any specific order. Immediately after weaning, milk flow may be impaired in some cows. During the milking period, calves are on pasture in summer or sometimes in the barn in winter.
- 2) During the milking process, the health status of the udders is checked. At the same time, it is checked whether the calves have suckled to ensure that they are consuming enough milk. Some cows have already suckled. After milking, the cows' teats are treated with a teat dip.
- 3) On pasture, calves can suckle from their mothers at any time. Since they suckle exclusively from their mothers, the suckling and non-suckler cows are on pasture together. Only the dry cows are kept in a separate pasture.



By feeding exclusively roughage (full pasture), the calves learn to eat grass very early. This facilitates weaning from the mother at 3 months.

### Timetable from Birth Onwards

- **1<sup>st</sup> week of life:** The cows calve still on pasture of dry cows. At the earliest when the newborn calves are three to five days old, the cow and her calf are integrated into the herd with the suckler cows. From this point on, the cow is also milked. At the beginning, the calves suckle their mother six to seven times a day.
- **2<sup>nd</sup>–12<sup>th</sup> week of life:** The suckling period is at least three months. The calves are always with their mothers except during milking time and can suckle. The behaviour and condition of the calves are constantly monitored to ensure that they receive enough milk.
- **Around the 13<sup>th</sup> week of life:** The calves are transferred, if possible, always in groups of three to five animals per weaned calf group, to a separate pasture with already weaned calves. Care is taken to ensure that no visual or auditory contact with the mothers is possible. A barn with deep litter serves as a resting area for the calves in bad weather. Due to the abrupt weaning, the calves and cows are restless and call each other during the first days. The calves usually calm down between one and two days, whereas the cows usually need a day longer. Individual animals are given homeopathic remedies for calming.
- **Around the 15<sup>th</sup> week of life:** After about two weeks, the calves are moved from the weaning pasture to a new pasture with other young animals. After weaning, the male calves are fattened on the same farm (pasture fattening) and the meat is marketed directly.

### Health of the Animals

- The calves are robust, vital and grow well.
- As soon as the calves are able, they can eat roughage at any time.
- Diarrhoea occurs only extremely rarely in individual animals and regulates itself through roughage feeding.

### Special facts

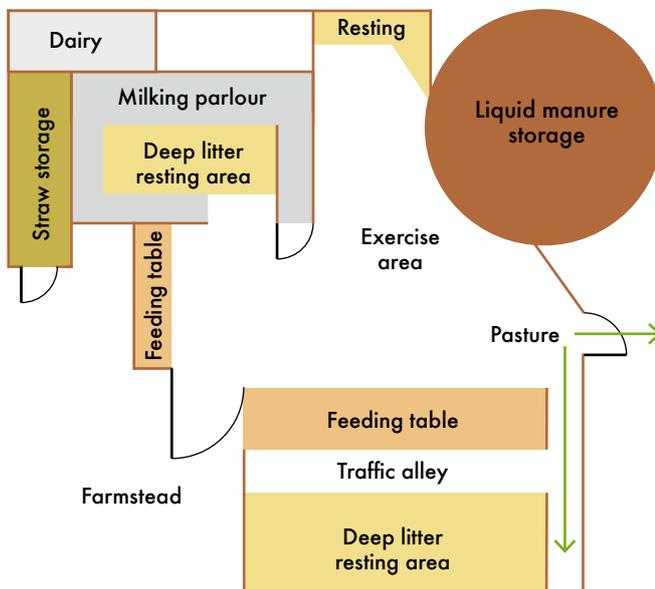
- The system of suckling calves (two calves per nurse cow) was practiced on the farm for five years. The calves suckled only during three to four days with the mother and then switched to a nurse cow. However, the process of socialisation between nurse cow and calf lasted one to three weeks. Despite a six-month suckling period, the young animals grew apart because the small calves received too little milk and the larger calves too much. Starting in the spring of 2015, we switched to a purely mother-based calf rearing system. The amount of work is low with this system and the social behaviour of the animals is relaxed and balanced.

### The most Important Prerequisites for the Proper Functioning of the System

Hans Möller

- A good human-animal relationship.
- It needs a well-thought-out management and consistent procedures.
- All people working with the animals must be familiar with the individual steps in order to not unnecessarily stress the animals.
- The attitude "less is more" takes the usual and unnecessary pressure to perform off the people and animals.

### Sketch of the stable 9: De Öko Melkburen



The lying areas are arranged around a large exercise yard. The calves are always with their mothers except during milking time.



It gives a lot of pleasure to see the eagerness with which the cows take care of their calves. The fact that the cows give us humans milk despite raising calves is an indication that this form of calf rearing is natural and should therefore be taken for granted.

## Example No. 10: Suckling Mothers and Calves Always Together Until Weaning At 18 Weeks Of Age

### Farm Profile

Hofgut Oberfeld Landwirtschaft AG  
Kathrin Goebel  
64287 Darmstadt, Germany  
landwirtschaft-oberfeld.de

- Breed: Holstein / Deutsches Schwarzbuntes Niederungs-rind (DSN)
- Herd size: 40 cows
- Housing system: cubicle housing with littered lying surface
- Calf rearing: Long-term suckling at the mother, weaning at about 18 weeks, rearing of all male calves as well.
- Marketing: Processing of the milk on the farm's cheese dairy and direct marketing of the dairy products.

### Milking Timetable

- 1) All calves are herded into the two calf pens and confined there.
- 2) The mothers go to milking and are then fixed at the feeding table in the feed fence. The group of mothers with the young calves up to about seven weeks is the first milking group and is then fixed in their compartment in the feeding fence. This also allows separate feeding of the freshly lactating cows.
- 3) After milking, all cows are fixed in the feed fence and work, such as bedding can be done. After that, all gates are closed, and the calf pens are opened.  
All cows can be milked well. Only during the weaning process can individual cows withhold their milk.

### Timetable from Birth Onwards

- **1<sup>st</sup> week of life:** In the first three to five days, the cow is together with her calf in the calving box. During this time, the animals do not go out to pasture. Twice a day the cow comes to the milking parlour for milking.
- **2<sup>nd</sup>–7<sup>th</sup> week of life:** The calf is with its mother and other mothers and calves of the same age together day and night in a partitioned area of the cow barn. During milking times, the calves go to a calf pen. After only 1 week, the calves go out to pasture with their mothers in the summer with the herd of cows.
- **8<sup>th</sup> week of life:** The calves transfer to the herd with their mother and are together there around the clock until weaning. During milking times, the calves go to a calf pen, which is also available to them around the clock. In summer, the calves go out to pasture with the herd of cows.
- **Around the 18<sup>th</sup> week of life:** The calves are weaned within four days. For this purpose, they get a nose ring inserted and are already separated from their mother either during the day or at night. They then move to their age group in another stall compartment. The pain of separation is usually over after a few hours, as the calves are already very independent at 18 weeks. Animals that are distressed are given the homeopathic remedy Ignatia C200.

### Health of the Calves

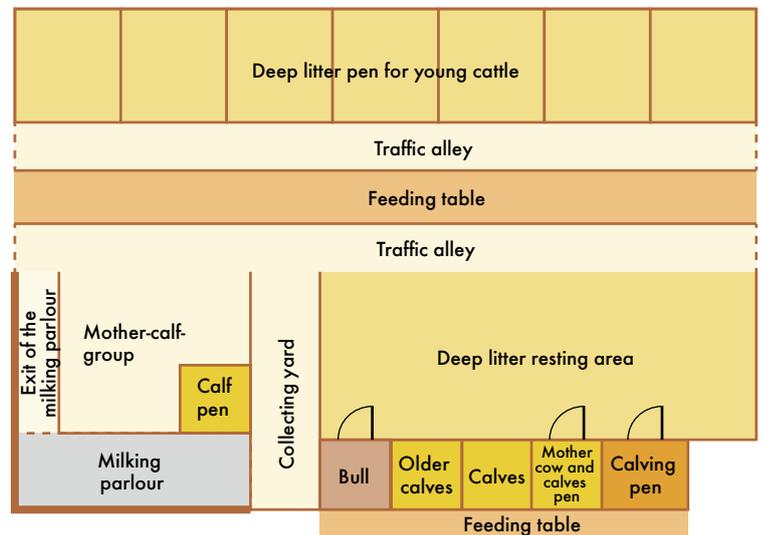
- Since the calves have been able to stay with their mothers for so long, they have not had any major health problems. Individual calves react with diarrhoea if they have drunk too much milk. However, this is not serious and has never led to serious illness.
- Occasionally, depending on the season, there are also infectious diseases, such as respiratory diseases or diarrhoea. Even with these diseases, contact with the mother is beneficial and milk intake on the udder is advantageous.

### The most Important Prerequisites for the Proper Functioning of the System

Kathrin Goebel

- The animals must be well observed.
- It may be necessary to create individual solutions for individual animals. The system requires openness to change.
- If a new barn is built, there should be a calf pen close to the cows and flexible spaces should be planned as much as possible.
- It is advantageous for the calf pen if it can be mucked out separately, the calves have their own drinking and feeding facilities and can be fixed in a feeding fence if necessary (for treatments or the insertion of a nose ring).
- It is important for calves to communicate with older animals (including the mother) and for older animals to pass on their experience to the young animals.
- Shared grazing with the calves following the cows during turn-out and turn-in additionally promotes trusting interaction with the calves and the calves become accustomed to the pasture fences in an uncomplicated way.

### Sketch of the stable 10: Hofgut Oberfeld Landwirtschaft AG



Next to the large stall compartment with deep litter are the stalls for the bull, the calves, the maternity area and the calving stall. On the other side of the barn is the young cattle compartment.



The first two months the calves are with their mothers during the day and night. The separation from the mothers is gradual.

## Example No. 11: Calves and Suckling Mothers Always Together Until Weaning

### Farm Profile

Foot Dairy Home Farm

Fiona Provan

Somerleyton, Suffolk NR32 5PR, GB

- Breed: Jersey
- Herd size: 16 cows
- Housing system: Deep-litter barn
- Calf rearing: long-term suckling on mothers (and sometimes nurse cows in the weaning phase) with additional milking; calves and cows are always together.
- Marketing: sale to the “micro-dairy”, raw milk is produced and marketed directly. The farm promotes its product as “milk with compassion”.

### Milking Timetable

- 1) The cows are milked once daily, in the morning, one after the other with a small, portable milking machine. They are called by name for this purpose.
- 2) The health of the udders and teats is closely monitored. Injuries caused by suckling are treated immediately.
- 3) Cows that are severely emaciated due to calf suckling are not milked.
- 4) During the day, cows and their calves are on pasture or in the exercise yard, depending on weather conditions.

### Timetable from Birth Onwards

- **1<sup>st</sup>–8<sup>th</sup> week of life:** During the first two months of life, the calf is with its mother in the herd around the clock.
- **9<sup>th</sup>–12<sup>th</sup> week of life:** If the health and weight of the calf are good, the weaning process can begin after the second month of life. The choice of timing depends on the individual needs of the animals.
- **Around the 13<sup>th</sup> week of life onwards:** At around 12 weeks, the calves are gradually (and individually) separated from their mothers. At this age, the calves already come themselves to the gate to the separate calf area, where the older calves receive hay and grass cubes. Initially, they are brought to the calf area for only a few

hours. It has proven helpful to have one to two nurse cows available to foster the calves when the calves do not have access to their mothers.

- Around the 21<sup>st</sup>–39<sup>th</sup> week of life:** The calves stay as a small group overnight in the calf area. The cows can stay near the calves and make contact with them through the gate. In the summer, the mothers sometimes stay in the barn with the calves for a few nights and do not go out to pasture with the other cows. After about one week, the cow and calf get used to being separated from each other during the night until after the next milking in the morning. When all cows are out to pasture, the calves are let out of the calf area and can now move around the entire stall. After the morning milking, all the animals are reunited in the herd until the barn work starts again in the evening. For suckling during the weaning phase, the farm has developed a procedure where the calf is allowed to suckle on only one quarter of the mother's udder, while the mother is milked on two other quarters. After suckling, the calves are separated by means of a gate. When calves are free to drink milk, they take in large amounts hastily, which can lead to seizure-like diarrhoea. Restricted suckling to one or two quarters with a time interval avoids this problem.
- Around the 40<sup>th</sup> week of life:** Depending on their development, the calves are completely weaned at 8–10 months. In order for them to become accustomed to suckling, they are separated from the cows for about one month. After this time, they are reintegrated into the herd. Some calves stop suckling by themselves and do not need to be separated. Calves that could not be reared for milk production are fattened and marketed as veal or beef, as needed.

### Health of the Cows

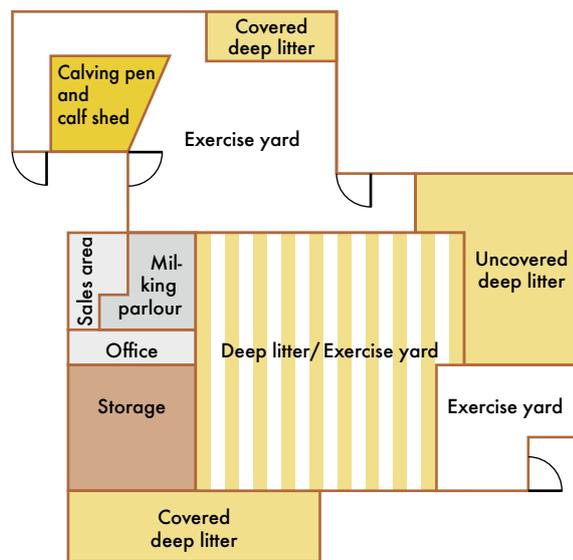
- By leaving the calves with their mothers, the calves are less stressed and seem to develop good defences. They are therefore less susceptible to diseases and infections.

### The most Important Prerequisites for the Proper Functioning of the System

*Fiona Provan*

- Each animal should be treated as an individual. Its natural instincts and desires should be met and accommodated with much respect. As a result, this system requires a dedicated, compassionate and flexible approach, with a focus on animal welfare, rather than profit.

### Sketch of the stable 11: Foot Dairy Home Farm



The cows and their calves have several deep litter lying areas to choose from. The weaned calves have their own area. When the cows are on pasture, the calves are let out of the calf area and can move around the whole cow shed.



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