



CALF MILK PASTEURIZING SYSTEM

Custom made for your farming needs!

Holm & Laue

passion for calves




















Calf Manual

Information for Healthy and
Performance-aware Calf Rearing



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Holm&LAUE

Year	Milestones
1991	Founding of company and development of the first calf feeders HL 2000 and HL 25
1994	Holm & Laue develops weight-responsive ration quantities for calf feeders
1996	Introduction of the HL Joker calf feeder with two blending units
1998	The Holm & Laue jumbo igloo is introduced; the TOM water blending system is awarded the DLG silver medal.
2000	The H&L 100 calf feeder replaces the HL Joker
2002	The H&L IglooSystem is expanded into a well thought out natural outdoor climate rearing concept
2004	EuroTier 2004 - DLZ Press innovation award for the H&L IglooVeranda
2005	The H&L MilkTaxi complements the portfolio
2006	Introduction of a pasteurizer for calves' milk as an optional item for the MilkTaxi

Year	Milestones
2009	The CalfGarden and the MultiMaxVeranda are developed and the portfolio expanded with the Calf-Tel Individual Igloos and the Pen System
2010	The coloQuick colostrum management system is introduced, and both coloQuick and MilkTaxi win DLZ's Innovation Award of that year
2011	The FlexyFence for Calf-Tel individual hutches is developed
2013	Launch of the CalfGuide management software for the H&L 100
2015	HygieneStation – new hygiene standard at automatic calf feeders
2016	MilkTaxi 4.0 receives DLG silver medal, TwinHutch: the first calf hutch for mini groups of 2-3 calves
2018	DoubleJug and MiniFlash complete the whole milk strategy

Year	Milestones
2019	CalfEx feeder
2020	Developed
2021	Brix-T and th
2022	Weight produ



Passionate about healthy calves

stones
Expert, the new innovative generation of automatic
s
Development of the ConceptBarn
S Sensor in the CalfExpert wins DLG silver medal
the French InnovSpace
Control weighing scales system added to the
product range



Welcome to Holm & Laue

Since 1991, we have been supplying products that have established themselves all over the world as the cornerstones of state-of-the-art and performance-aware calf rearing. Again and again, the products that we developed were able to make your work for the calves easier, to improve the state of health and the performance of the animals and to reduce the cost and work time needed for rearing calves.

At Holm & Laue, you can be sure that you will be supplied with tried and tested products which have been developed exclusively by people who know your everyday practice because they are rooted in a farming operation themselves. Because Holm & Laue provides you with more than just modern machinery: we want to be your partner for everything to do with rearing calves. Our team is at your service providing advice on planning your new calf housing facility, tips for daily calf feeding practice and improved calf health. It is only when you are 100 percent satisfied, when your work has become easier and your results have improved that we, too, are satisfied.

Our calf handbook is intended to provide an overview of our work. We look forward to a productive co-operation.

A. Laue
Hans-Joachim Laue

Hans Joachim Holm
Hans Joachim Holm



CALF MILK PASTEURIZING SYSTEM

Custom made for your farming needs!



Calf-Star Headquarter, New Franken, WI, USA

Welcome to Calf-Star

Calf-Star has been manufacturing pasteurizers since 2003. Our products lay the foundation of healthy calf raising by reducing the bacteria load your calves are exposed to every day. This will improve your calves health with reduced necessity to use antibiotics.

Supplying farmers all around North America, we know the demands of different farms sizes and structures. Our biggest strength was always to react on the individual demands of our farmers. Today Calf-Star has established a worldwide dealer network offering turn-key solutions in pasteurizing calf milk.

In 2010 Calf-Star developed a distribution relationship with Holm & Laue Calf Feeders from Germany. Calf-Star is the North American distributor for the H&L 100 and the MilkTaxi. With the Holm & Laue products we are able to complete the Calf-Star product portfolio allowing us to have the complete calf solution for every dairy. That's why we are able to offer you the full range of calf feeding products from day of birth until weaning.

Try it out and ask us or one of our dealers in your area about the possibilities to rear better calves with better performance on your farm. We stand at your service!



Greg Abts



CalfExpert



The **trendsetter** in
calf feeders



Calf feeding made easy

Calf feeders from Holm & Laue are sturdy, easy to operate and always guarantee healthy and strong calves thanks to individual mixing and hygienic preparation of the milk diet. The CalfExpert is a feeder that sets new standards in the market. The result: Even more intelligence, even faster and even more functions to make your work easier and guarantee optimum feeding of your calves. You will quickly notice how the CalfExpert revolutionizes the work with your calves: You always have all important information at your fingertips: at the feeder, at the HygieneStation or on your mobile phone. Not only preparation of the milk diet is speeded up, automatic cleaning is faster too. At last, whole milk feeding is just as convenient as feeding milk replacer (CMR). In combination with the DoubleJug milk cooling tank, the CalfExpert controls its functions automatically, including the cleaning of all lines and tanks. We are particularly proud of the operation of the CalfExpert: we consciously decided against touch control – or have you never tried to use your mobile phone with dirty fingers, wearing gloves or in the winter? We are convinced that our SmartKeys and the 7" display provide you with the ideal operating concept. Take a look at the next few pages and discover the many possibilities provided by the new CalfExpert calf feeder.



Gain greater freedom through increased work flexibility. Data analysis via app aids professional management.



Better rearing performance thanks to weight measurement with scales. Lower veterinary costs through automatic animal monitoring and early alerts.



Support natural drinking behavior: many individual feeds support calves' healthy development.



Individual animal feeding

Feeding a large number of calves with a fresh mix adapted to each individual calf is an enormous challenge. The CalfExpert has mastered this perfectly.

Always freshly mixed

The milk for each calf is always freshly mixed by the CalfExpert. Any residual milk is kept warm and flushed out of the system following longer drinking breaks. Other calf feeders work with a central milk supply. In milk stored this way at 40 °C, the germ count doubles every 20 minutes. In contrast, the CalfExpert guarantees maximum hygiene and feeding suitable for every individual animal.

Individual adaptation

A central milk supply has another decisive disadvantage: modern feeding programs (e.g. the metabolic programming) require a higher MAT concentration at the start of rearing (e.g. 160 g/l) to give a power pulse. In the milk reduction phase however, a lower concentration is needed (130 g/l). This individual animal feeding can only be achieved if the mix is prepared individually for each calf, as is the case with the CalfExpert!

"QuickChange" logic for more performance

With the new CalfExpert we have designed the mixing process and calf changeover to be even faster and thus optimized utilization of the HygieneStations. The fast mixing ensures that the milk is at the stall after only 3 seconds. After the last mix, the system changes immediately to the second stall and a further calf is fed. In addition, priorities can be specified in the CalfExpert menu so that young or sick calves are given preferential treatment. The tried-and-trusted flexitime program is an additional guarantee that the calves' feeding times are spread very evenly throughout the day without the animals clustering around the stalls. This reduces waiting times for high animal capacities and ensures calves have a positive "visit experience".

QuadroFlex: simultaneous and yet flexible feeding

With the new QuadroFlex system, four calves can feed at the same time at two PowerMixers. The CalfExpert mixes the milk freshly when calves wish to drink. This means no tank supply system is required. The feeding quantity is determined precisely for each calf by maintenance-free sensors. If a calf requires a special mix e.g. including medicine or electrolytes, only the sister stall at the same PowerMixer is switched off. Calves can continue to feed at both stalls at the second PowerMixer. This allows 120 calves to be fed at 4 HygieneStations. Thus the capacity of the CalfExpert has been increased by approx. 20 – 30 % compared to its predecessor H&L 100.



Enjoy calm and compliant calves

Since the CalfExpert does not restrict feeding to certain times of day, calves can come and drink at any time. The calves will no longer see you as a nurse and will therefore remain calm when people enter the barn. Younger and weaker calves have all the time they need to drink their full ration. And since the CalfExpert works with an intelligent credit logic, all the calves have drinking credit at different times. This means fewer animals crowd out the stall. And the anti-pirate valve ensures that stronger calves do not steal milk. The result: extremely uniform, relaxed groups of calves!

Weaning process

The CalfExpert is very gentle as it prepares the calves' transition to concentrate and forage feed. It reduces the amount of feed at the end of rearing in small steps of 0.1 l per day and thus stimulates the development of the forestomach system.



Flexible feeding programs

Modern feeding programs should always be adapted to the age, race, personal rearing target or health of the calves. You can implement all this ideally at the CalfExpert.

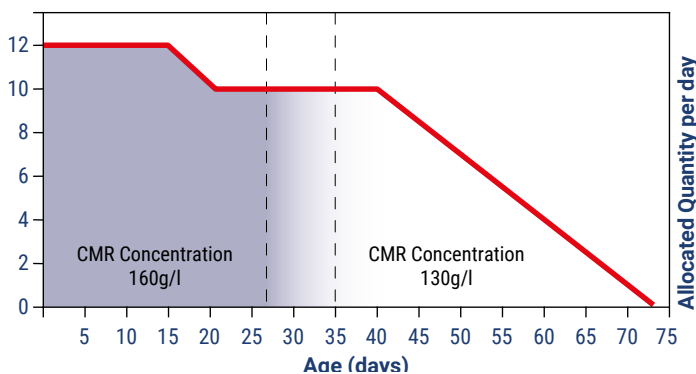
8 feeding curves for maximum flexibility

With the CalfExpert, every feeding program can be implemented in reality. The feeding curves can be adapted extremely flexibly in each of the 8 groups. Up to 16 "turning points" allow you to fine-tune your personal feeding concept down to the last detail. Or you decide in favor of one of the proven and pre-set feeding programs in the CalfExpert.

Metabolic programming

Intensive feeding in the first few weeks of a calf's life will usually lead to significantly higher milk production later. However, the right reduction of milk for calves e.g. after an ad libitum phase presents every calf owner with special challenges. With the CalfExpert, every calf is weaned slowly off a high milk consumption in terms of both volume and concentration.

Metabolic Feeding Programme with the CalfExpert



Effective mixing of milk replacer powder

Flexible feeding also means that a wide range of CMRs and additives have to be prepared in an optimum and lump-free way. The continuously variable PowerMixer guarantees a soft start to avoid splashes and then stirs the milk replacer powder intensively. This means the calf receives its freshly mixed milk directly at the teat in just 3 seconds.

And if things should take longer?

The feeding process can sometimes take longer where young or weak calves are involved. We prevent the separation of the milk replacer powder by slow permanent stirring. And if it gets colder, the heater in the mixer always ensures the mix is kept at a constant temperature, for no matter how long the calf needs.

Specific additive feeding

Minimal doses of feed additives can be added to the milk diet in order to stabilize the gastro-intestinal system. Sick calves can be treated with medicines in the milk. You can use two powder dosing units and two liquid dosing units. As with the milk program, you can program different feeding curves for these additives as well. This means maximum flexibility for top calf health!



Higher income thanks to improved performance

Calves supplied with a lot of energy start lactation at an earlier age and produce more milk later on. With the CalfExpert you also have the best pre-conditions for perfect animal health. This means a lower death rate and more animals in the herd reared from your herd offspring. This in turn gives you the opportunity to select the offspring in a targeted manner and to sell surplus heifers at a profit. And last but not least: by saving working time, you are freeing up capacities on your farm that can be used profitably.



Clean & reliable

A calf feeder is designed to make your work easier and perform continually for 24 hours. To achieve this it has to work reliably under the rough conditions of a calf stall, like the CalfExpert does.

Hose cleaning including the teat

All tube systems used to have deposits of contaminated milk because they had not been cleaned often enough or thoroughly enough. The HygieneStation rinses the entire milk tube through to the teat during longer drinking breaks. In addition, the complete milk system is cleaned several times every day. When the DoubleJug is used, the supply line to the CalfExpert is automatically cleaned with it. This will reduce a calf's exposure to bacteria, improve the health of the calves and save on manual cleaning.

Two cleaning agents

To optimise cleaning even further, the CalfExpert can use two different cleaning agents: Either alternatively for each cleaning cycle or combined in one cleaning process: (alkaline, rinse, acid, rinse). The cleaning agent pumps are fitted on the outside. They can thus draw directly from the tanks. This is safe and convenient. In addition, the CalfExpert generates automatic messages as soon as a canister is empty.



Integrated operating instructions

The 7" display is not only for the convenient reading of all calf data. Pressing the key with the book icon opens help texts and information from the operating instructions on every program level.

Fly shield as standard

Two large doors protect the critical compartment in which the mixer bowls are installed. This keeps flies away from the milk and avoids problems in the milk system. The doors can be locked so children cannot get harmed or injured.

Ready to work whatever the weather

Calves love the outdoor climate, your CalfExpert does too! It is equipped with an anti-freeze program that is activated automatically as soon as there is a risk of frost. Sensors in every HygieneStation and in the CalfExpert mixing chamber measure the ambient temperature and then adapt the mixing temperature and intensity of the anti-freeze program accordingly. You can clean the outer surfaces of the automatic feeder with water, since all the sensitive components are water spray-proof.

Simple maintenance

Regular inspection of the technology is easy: you can test all the important CalfExpert components quickly and easily in the maintenance menu. You can also carry out calibration quickly yourself, because the software always tells you exactly what to do. We recommend that you have your CalfExpert serviced by a qualified technician at least once a year. This provides you with the peace of mind that the automatic feeder will be ready for the next rearing cycle.



Work smarter

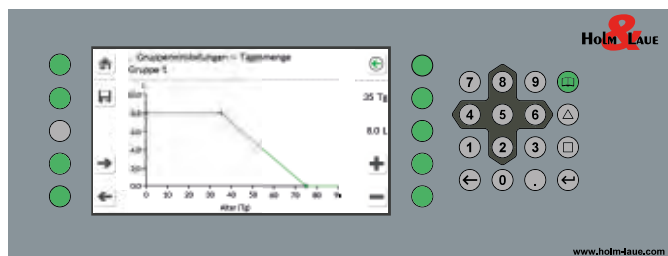
Kill two birds with one stone: the CalfExpert not only relieves you of tiresome and tiring jobs, it also increases feeding quality.

Gain time and flexibility

Look after your calves on YOUR OWN time rather than allowing the calves to rule how you organize your day. There are often other jobs and responsibilities to be taken care of in the mornings and evenings in particular: milking and feeding the cows, making breakfast for the family or getting the children to school... The CalfExpert feeds your calves. You only have to manage the machinery and the animals. And training is reduced to a minimum with the new HygieneStation.

CalfExpert software

The completely new control software offers maximum clarity and simple operation of the CalfExpert. All calf data with individual feeding curve, alarm lists, technical parameters etc. can be opened on the 7" display. Via the Wi-Fi connection you can also access individual data on mobile devices or receive push messages in the event of fault messages.



SmartKeys

By consciously doing without touch technology and using so-called SmartKeys, the CalfExpert can be operated reliably even in frosty conditions, in the rain, through gloves or even with dirty fingers. The illuminated SmartKeys guide you through the program.

AmmoniaDetect

Ammonia irritates the mucous membranes of calves, even in small doses. This can lead to bronchitis in the long run, which can soon turn into pneumonia. Ammonia is only perceived as an odour when it is already in the harmful range. AmmoniaDetect is an electrochemical sensor that permanently measures ammonia levels in the barn air. It is installed directly in the lying area, protected from the calves by a pipe. CalfExpert analyses the measured values continuously and documents them in a chart. This enables you to optimise the ventilation of the calf barn and determine the best time for mucking out.

Automated work routines

With the CalfExpert, all employees know what they have to do and when. They carry out inspections, teat changes etc. at regular times. The CalfExpert generates empty messages for milk replacer powder, whole milk or cleaning agent in good time. And to avoid a hectic rush, the CalfExpert does not inform you that the "milk replacer powder tank is empty", it reminds you a few hours in advance of the low filling level.

CalfGuide app

CalfExpert comes with a WiFi interface as standard. The CalfGuide app allows you to access important information directly on your mobile phone. This includes the general calf feeder data and details of the calf lists with the entire calf history. You can easily modify calf information and feeding curves in the app. In addition, CalfExpert sends messages about CMR fill levels or empty cleaning containers. A particularly practical feature is a HealthCheck, which allows you to objectively assess the health of your calves.

A feeder that has growing potential

With 4 feeder stalls, your CalfExpert is capable of feeding up to 100 calves, in certain circumstances even up to 150 calves! If the number of calves you are feeding now is lower, the intelligent modular design of our automatic feeder system allows for future upgrades at any time, with all available options. So you save money now but can still make use of all the possibilities later.

Hygiene  Station



New **hygiene standard** for
calf feeders



Focus on the calf

So far we have learned that the CalfExpert always mixes freshly, according to individual calf needs at the right temperature. It goes without saying that the CalfExpert cleans all tubes automatically as well. However: the place where the calf drinks the milk is woefully neglected where conventional calf feeders are used. This is the reason why many vets fear the transmission of illnesses at the teat. Here, the HygieneStation from Holm & Laue is setting THE new benchmark, not only in terms of hygiene but also by making work easier.



Save time with useful features. The learning function and the quick-release teat fastener make your work easier.



The animal weighing scales save feed costs through weight-controlled feeding, making it easier to monitor your calves.



Healthy calves through the highest standards of hygiene. Teat cleaning and tray rinsing guarantee low bacterial concentration.



Ideal calf health

Do you know where the highest germ count can be found in the calf box? Exactly! Where all the calves come to drink their milk several times a day. The HygieneStation now ensures cleanliness.

Always have a clean teat

With the new HygieneStation, the teat is cleaned from the outside with pressure and fresh water after every visit. Germ contamination on the teat thus drops by 80 %!



Cleaned saliva bowl

Every calf produces saliva when drinking. With the HygieneStation this is collected together with the cleaning water of the teat in a mucus bowl and washed away after each feeding process. This means that the floor area within the feeding station stays clean and dry.

Natural drinking approach

The teat at the feeding stall is positioned so that it slants downwards in a similar way to the teats on the suckler cow. This encourages the natural drinking position of the calf. When the head is stretched, this encourages the natural reflex of the esophageal groove and reduces the risk of milk passing into the rumen.

LED teat lighting

Practice has shown that the calves can orientate better when the teat is illuminated. Milk consumption increases at night and the feeding processes are distributed more evenly over a 24-hour period.

Reduced workload

For many dairy farmers, a reduced workload is one big argument in favor of calf feeders. The new HygieneStation now makes the work that still has to be done significantly easier.

Calves teach themselves

As soon as a calf lifts the teat, a small amount of milk flows into its mouth. This stimulates the calf's initial drinking impulse; manual learning is necessary in only exceptional cases. Should manual learning still be necessary, milk can be pumped into the teat by pressing a key.

Can be tilted to clean

Many feeding stalls are installed directly in the pens. The HygieneStation can be tipped forward at a 90° angle so that manure can be removed and the whole area can easily be cleaned with the use of a tractor.

Quick-release teat fastener

The teat can easily be changed in no time thanks to a quick-release fastener.

Milk pump valve

The possibility of triggering extra mixes at the CalfExpert is a great advantage if the milk can be run off conveniently straight into a bucket. At the milk pump valve you can decide whether a calf is to be fed



in the stall or the milk is to be pumped straight into a feeding bucket.



Control according to weight

All dairy farmers want their calves to gain plenty of weight. Yet weighing calves is strenuous and requires a lot of discipline. An animal weighing scale at the HygieneStation collects important information almost in passing.

Individual weaning

The CalfExpert records the daily growth of calves using the forefoot weigh scale. Calves that grow quickly can start feeding concentrate and hay at an early age and can thus be weaned off milk early on the basis of their individual weight development. This supports the development into a ruminant and saves money!

Better control

The animal weighing scales not only detect growing calves, they also register a decline in growth. This information is used to keep separate alert lists and helps identify sick calves at an early stage. Thus they can often be treated before the illness reaches a serious stage.



Weight information makes selection possible

At the end of rearing, you obtain valuable information about the development of each individual calf. This will help you make important decisions about which female calves should supplement your herd of dairy cows and which animals should be sold due to poor growth.

Please also read the technical article on this topic on page 78.

Useful features

When you are in the pen, during animal training for example, you often wish you could take a quick look at the feeder display. This wish has now been granted thanks to the new display on the HygieneStation.

HygieneStation display

Mounted directly on the HygieneStation or even on the wall, the HS display indicates relevant information about the calf in the calf group. The calf number is displayed in very large digits, making it very easy to read, even from a distance.

Credit and alarm status

At the push of a button you can also have the calf numbers of the credit or alarm list displayed sequentially. This means it is no longer necessary to move constantly between the calf pen and the CalfExpert display. You can read off the remaining quantity conveniently and estimate how much longer the current visit is going to take. The alarm status is also easy to recognize on the basis of a scale.

Lockable HygieneStation

There are calves that tend to suck one another. Although the entire functional principle of the CalfExpert and HygieneStation is designed to prevent this, it can sometimes be helpful to lock the animals in while they are feeding at the station so that they can feed in peace. The lockable door works pneumatically and needs a compressed air connection at the HygieneStation.





Options and features

CalfExpert basic configuration

- 2 PowerMixers
- Milk freshly prepared on an individual basis for each animal
- CalfExpert feeding software with integrated operating instructions and help functions
- 7" graphic display with SmartKeys
- 8 feeding curves pre-set (including metabolic feeding curve), with adaptation possibilities for individual animals
- Rinsing of mixing tank and suction line
- Two detergent pumps for the automatic cleaning of all milk-carrying components with automatic empty message
- Wash temperature up to 65 °C
- Easy-to-clean surfaces made of stainless steel or plastic
- Powder store for 50 kg CMR with only 112 cm filling height
- Powerful powder-conveying auger suitable for various CMRs
- Early empty warning for milk replacer powder
- Automatic registration of new calves
- Flextime feeding capabilities, to avoid stressful regular feeding hours
- QuickChange logic for faster credit changeover between the calves
- Up to 250 calves' data in memory
- Anti-freeze program that is activated automatically
- Fly shield supplied in the standard model
- Wi-Fi as standard in the calf feeder

CalfExpert optional extras

- CalfGuide app
- QuadroFlex
- Additive doser
- Powder chamber extension
- Whole milk diet option

CalfExpert technical specifications*

Power supply and heating performance	400 V 16 A (6 kW) or 230 V 16 A (3 kW)
Capacity with 4 feeder stalls	up to 100 calves (up to 150 calves in certain cases)
Identification system	Multireader HDX and FDX
Storage tank for milk replacer powder	90 l / 50 kg
Powder filling height	1.12 m
Heater capacity	12 l
Dimensions of CalfExpert	0.6 x 0.7 x 1.21 m
Space requirement for CalfExpert	1 x 1 m

* Technical specifications subject to change





Comparison of the two HygieneStation models:

HygieneStation Standard

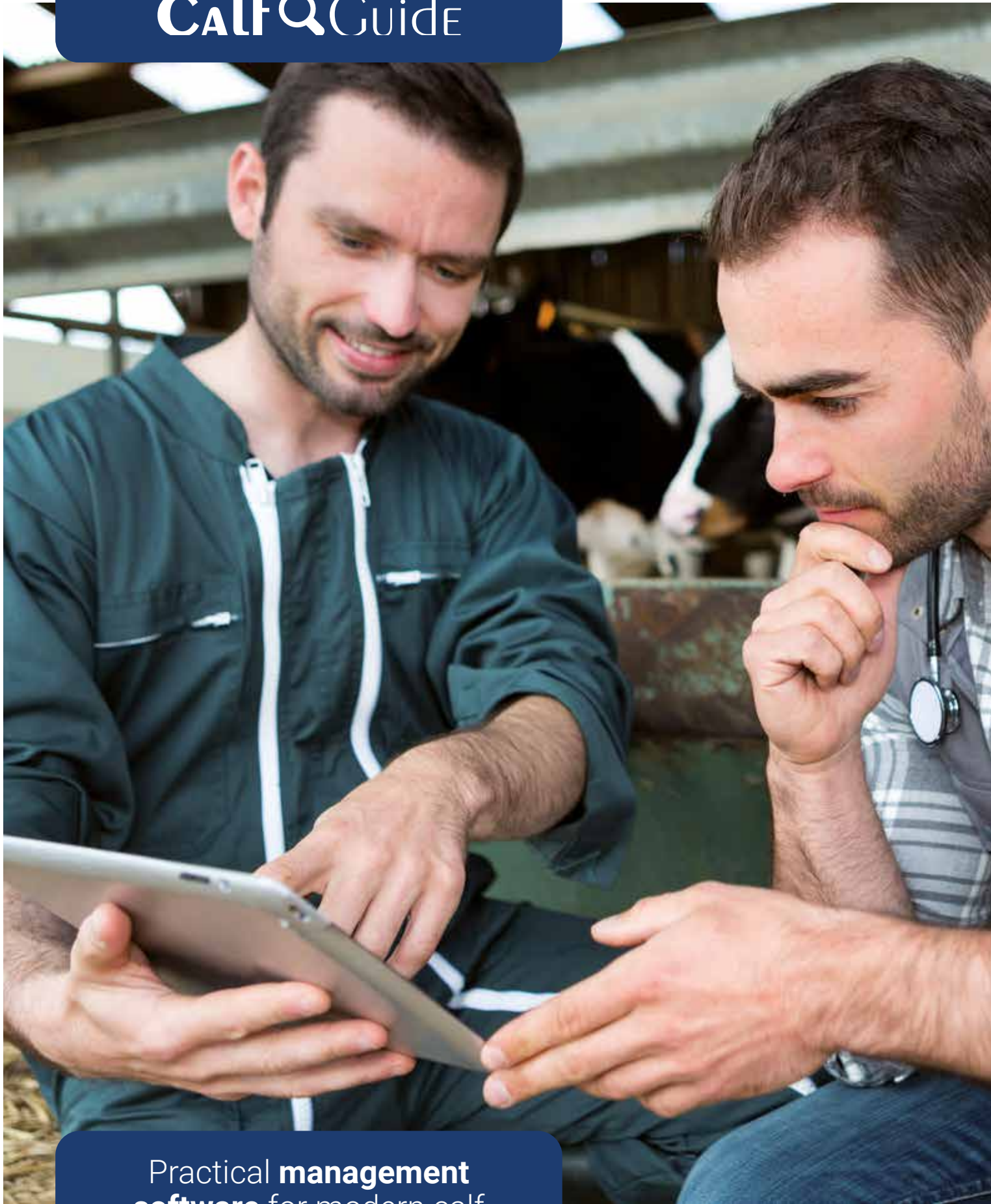


HygieneStation HeavyDuty



Typical field of application	Rearing dairy calves	Rearing calves for fattening
Dimensions (LxWxH)	1.31 x 0.47 x 1.00–1.15 m	1.54 x 0.60 x 1.10–1.25 m
Interior width	27–36 cm	37–50 cm
Number of stations per CalfExpert	Four	Four
Animal recognition via H&L collars or ISO ear tags	Half and full duplex	Half and full duplex
Anti-pirate milk valve to prevent milk theft	yes	yes
Quick-release teat fastener	yes	yes
Milk transport to the teat	yes	yes
Learning aid (milk to mouth)	Automatic and manual	Manual only
Standing distance to the CalfExpert feeder	Up to 7 m	Up to 7 m
Height adjustable	yes	yes
LED teat lighting	yes	no
Temperature sensor for frost protection	yes	yes
Teat rinsing	Standard option	Standard option
QuadroFlex (4 calves can feed)	Optional extras	Optional extras
HygieneStation display	Optional extras	Optional extras
Saliva bowl	yes	no
Can be folded away when mucking out	yes	no
Tilt safety device	Optional extras	Not required
Animal weighing scales	Optional extras	no
Lockable station	Optional extras	no
Milk pump valve	Optional extras	no
Weight fully equipped	Approx. 50 kg	Approx. 90 kg

CALFQ Guide



Practical **management software** for modern calf rearing



All calf data at a glance

Wouldn't it be nice if you could access all the information about your calves at your PC or on mobile devices at any time? And what about networking all the devices you use in rearing such as CalfExpert calf feeders, MilkTaxis and CalfControl animal weighing scales so that they automatically exchange data and complement each other? And if your employees could then see the alarm lists on their own smartphones or tablets and could work through tasks, all the workflows in the calf barn would be clearly defined. How would you feel about that? This is all possible using CalfGuide, your central data and management system for calf rearing. The central CalfGuide server collects all the data from all of your feeders, MilkTaxis or WeightControl animal weighing scales and makes them available to you in a clearly structured form.

With the new CalfGuide you can also control and configure all devices centrally. And a practical export interface provides other herd management programs with the most important data after rearing has been completed. Thus CalfGuide is the interface between the rearing management of your calves through to their further development into high-performance cows.



Never miss a thing thanks to smart data management for all mobile devices.



A comprehensive data pool allows performance monitoring and provides analysis options.



Healthy animals through networking of all devices and early alerts.



Current calf data

CalfGuide gives you a complete overview of all calf feeders and all calves on your farm.

Calf management

Taking clear lists as the starting point, you navigate directly to the feeding and growth curve of individual calves. A calendar function enables you to track past incidents and plan future tasks. This makes it easy to have a good overview or analyze individual animals in great detail.

Health index

CalfGuide calculates an alarm index on the basis of a wide range of data such as feeding consumption, drinking speed, visiting frequency, weight development etc. This allows you and your employees to see immediately which of the calves need your attention first. In addition, abnormalities such as illness can be recorded in an "event diary" and are thus clearly documented.

Archive

CalfGuide doesn't forget anything. After your calves have been weaned, all data such as feeding quantities, weight development, treatments etc. are saved permanently in an archive. In other words, CalfGuide allows you to see – even years later – how you fed your best cows when they were just calves. This helps you to optimize your feeding programs in the long term.

Support tools

All employees know what they have to do and when, and you can keep an eye on all the working steps and development of your calves at all times. Urgent tasks are displayed immediately.

Bidirectional control

Important calf data can be adapted and configured directly in the CalfGuide program. These include e.g. age, group assignment, feeding curves, individual changes in feeding plans and much more besides. Once the configurations have been set, they are automatically transferred to the CalfExpert or MilkTaxi.

Task manager

CalfGuide organizes your work and reminds you what is to be done. Move to a new stall after xxx days? Separate the male calves after xxx days? You simply define all recurring tasks once in the form of events or ToDos, and CalfGuide will remind you and your employees every day of what needs to be done.

Technical fault messages

CalfGuide shows you all the technical fault messages concerning your calf feeder, even the ones CalfGuide has resolved itself. Empty messages for cleaning agents or an early warning system for a low whole milk or CMR level at the CalfExpert are sent via the CalfGuide system.

Pasteurizing log

Pasteurizing is a particularly sensitive process because the quality of the milk can suffer if there are temperature problems during the process. You are on the safe side with CalfGuide, because it always records the precise temperature curve for you and indicates whether there were any inconsistencies.

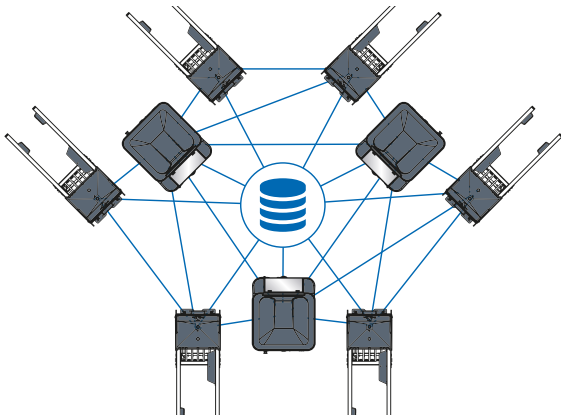


Cross-system networking

Anyone can be excused for losing track in this "big data" era. And your calves do indeed generate a huge amount of data in the CalfGuide network. CalfGuide processes this flood of data so that you can concentrate on the most important information.

LAN/Wi-Fi - tablet or PC

The data from your automatic feeders are recorded and managed centrally on a server. The CalfGuide system then provides a Wi-Fi connection in the calf barn so that you can use all the functions at any time e.g. with a PC tablet. It goes without saying that you can integrate CalfGuide in your farm network, allowing you to use all the CalfGuide functions from your office. The optional connection of the CalfGuide system to the internet even permits external access via the CalfGuide Cloud.



CalfGuide app

A limited selection of information can be accessed directly on your mobile phone using the CalfGuide app. This includes the box list with details for the MilkTaxi or details about the calf lists on the CalfExpert. In addition, messages can be received and tasks requested from the calf feeder events or ToDos.

With the CalfExpert, this even works without CalfGuide, directly via the Wi-Fi interface of the calf feeder.

CalfGuide Cloud

With the CalfGuide Cloud you can access your CalfGuide server via the internet. This allows you to access your data and information from anywhere in the world or permit service technicians to take a look at the technology if any problems should occur.



Milch  TAXI



More than a mobile milk tank: **individual feeding** and optimum hygiene



New bucket feeding methods

In 2005, Holm & Laue revolutionized bucket feeding with the invention of the MilkTaxi. It put an end to hauling buckets around and ensured that every calf received an optimum mix at just the right temperature. Today, helpful extras such as the electrical drive, the wireless-controlled dosing pump, the possibility of pasteurizing and cooling, the hot water heater and the drenching probe for cows have made the MilkTaxi an indispensable tool for modern dairy farms. The latest generation 4.0 has revolutionized bucket feeding yet again. Now, the MilkTaxi permits reliable feeding and weaning depending on calf age – which was only possible with a calf feeder before. It recognizes every calf hutch and calculates the correct current feeding quantity for the calf! This means the MilkTaxi recognizes the milk quantity required for the next feed and prepares the mixture step by step, including fortifying of whole milk. This way, faults or carelessness are no longer possible. And the highlight is that all the feeding data can be saved permanently and retrieved at any time via tablet or PC. This allows feeding faults to be localized and eliminated immediately.

Read the following pages to find out which options for the MilkTaxi 4.0 are important for you and how you can reap the benefits.



Bucket feeding made easy: feed calves conveniently and quickly, making work enjoyable.



Resource-saving feed costs thanks to pasteurization of whole milk and use of individual feeding curves.



Precise feed preparation ensures balanced feed and healthy calves. Efficient tank and bucket cleaning ensure optimum hygiene.



Simpler preparation

Many of the strengths of the MilkTaxi are not immediately obvious: how it mixes milk replacer lump-free in seconds or gently heats whole milk without it burning surprises everyone who sees the MilkTaxi for the first time.

Powerful base-mounted agitator

The 250 Watt agitator mixes any milk replacer lump-free in seconds. In addition, the agitator supports the heater through short mixing intervals. **IMPORTANT:** These intervals are adapted to the milk quantity. Its location in the base guarantees maximum working safety and means nothing gets in the way during tank cleaning.



Gentle heater

The MilkTaxi works with a surface heater over the entire base area. Unlike with spiral heaters, this prevents the occurrence of "hotspots" where milk can burn and stick. Thus the milk is heated quickly yet its quality is retained. The display always informs you of the current temperature of your feed.

Time control

Many functions such as heating and pasteurizing can be programmed using a digital timer. The intelligent cooling program only cools when the tank actually contains liquid which is too hot, and stops cooling in good time before heating in order to save energy costs.

SmartMix

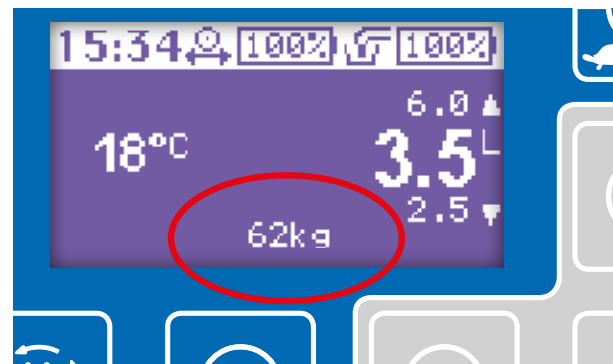
Up to now, there were a lot of potential mistakes to be made during preparation. That is now passé, because the new MilkTaxi guides you step by step to the perfect mixture.

Mixing calculator calf milk replacer

From now on, you define the required CMR concentration (percentage of dry matter content) and your scoop size just once. Then you fill the MilkTaxi up to the required feed quantity. SmartMix adds the necessary amount of CMR automatically and tells you how many scoops of CMR you need. Even the solubility of the CMR is taken into account, because 20 kg CMR dissolved in 100 l water is less than 120 l milk (namely 114 l). The MilkTaxi 4.0 automatically corrects this fault.

Exact filling level display

The MilkTaxi automatically how much milk or water has already been filled into the tank and shows the current fill quantity constantly on the display.



Whole milk supplement with calf milk replacer

And if whole milk and CMR are to be mixed? What if your milk has a dry matter value of 12.3% but you need an overall mix with 13.5% dry matter? Then SmartMix recognizes how much whole milk has been filled and determines how much water and CMR have to be added to get the required milk quantity in the required concentration.



Better feeding

The saved feed quantities, the remote control with the tubing up to 10 m long and the drip-free dispensing make feeding child's play.

Simple dispensing

With 9 freely programmable dosing levels you can dispense almost any feed quantity without any tiresome dripping. In addition, the handle has been ergonomically adapted and is nice and light. Thanks to the integrated battery, you are independent of the power supply near the calves. This leaves you completely flexible in your choice of positioning of individual igloos and allows you to feed calves in different places.

Wireless remote control

With the remote control on the dispensing arm you can conveniently feed even the calves that are up to 10 m away from the MilkTaxi without needing a cable. It goes without saying that the quantities can be adapted individually at the dispensing arm in this case too.



Statistics function

In the MilkTaxi display menu you can check the most important working steps via a special statistics function. Every pasteurizing cycle, every feeding and every cleaning is documented. This information is still available even weeks later through a calendar function, allowing you to control the workflows on your farm perfectly.

SmartID

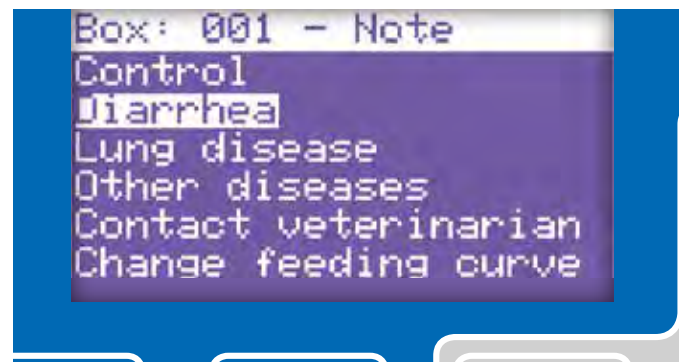
The same question always arises when feeding: how old is the calf and how much milk is it supposed to have? This is no longer necessary, because the MilkTaxi recognizes every pen and the calf's age.

Wireless detection of the calf pens

The MilkTaxi detects each pen wirelessly as it moves past and the pen number is shown on the display. The operator now selects the right amount of feed for the calf or group of calves, presses the release button, which causes the milk to be filled into the buckets. The weight fed is registered and stored for each pen.

Intelligent pen management

Smart-ID works both for single and group pens. For groups of calves, it indicates how many calves are in the group and whether they are fed using individual buckets or "teat bars". When used in conjunction with the CalfGuide management application, information can be stored for individual pens and automatically retrieved at the next feeding. This is how staff members are alerted to sick animals or other unusual circumstances. An enormous improvement in work quality, particularly where there are changes in staff.





Easier transportation

Easy milk transportation has been THE great help for our customers for more than 10 years now.

Stable 4-wheel undercarriage

The MilkTaxi is extremely stable on 4 wheels with a low center of gravity. It does not topple over even when moved quickly, over uneven terrain and full. Unevenness or small thresholds are not a problem thanks to the 40 cm front wheels and the generous ground clearance. The 260 l model is also available as a single-axle trailer as an alter-



native.

EL-AN electrical drive

You can move all models forwards and backwards at two different speeds using the stepless electrical drive. This not only makes calf feeding fun, but it also goes easy on your back.

HeavyGrip

The new, well-gripped tires for the MilkTaxi provide grip on slippery surfaces or steep terrain. Almost better than driving a tractor!

Failsafe tires

Unbreakable! No nasty surprises with flat tires. The elastic filling of the wheels offers the best conditions for rough conditions.

Pasteurizing

Mastitis bacteria play an important role in illnesses in the calf pen too. Pasteurizing eliminates up to 99.5% of these bacteria and is already part of the calf feeding standard on many dairy farms.

Pasteurizer

During pasteurizing using the so-called batch method, dangers pathogens are destroyed to 99.5% at a temperature of 63 °C over 35 minutes. As an alternative to this program, the MilkTaxi offers two different heat treatment methods at 60 °C over 60 or 70 minutes. All the starting times can be freely programmed. Thus the milk has already been pasteurized when you arrive in the barn for feeding in the morning.

Automatic cooling function

With the MilkTaxi Pasteurizer water cooling is part of the standard package. This allows the milk to be stored fresh until feeding or pasteurizing. The automatic cooling programs are particularly practical when robotic milkers are used. It records the fill level and temperature for automatic filling. In addition, the cooling process is programmed in such a way that it makes optimum use of the required energy.



Hot water-fired heater

If you want to cut costs on energy and if you have plenty of hot water, then an optional hot water-fired heater saves on precious money otherwise incurred for heating the milk.



Comfortable work

At the end of the day, it is the convenience that makes your work easier. User-friendly display, easy cleaning through to possible uses beyond feeding calves: you will never want to do without your MilkTaxi again.

Glove compartment – for small and large aids

This practical storage box offers space for all the small tools needed in the calf pen. Everything has its place in the practical glove compartment, whether ear tag pliers, thermometer, weight measuring tape, disposable gloves, barn lists or other important items. What is more, the level cover serves as an excellent writing surface. All these things are quickly at hand in other places because the entire box can be detached from the MilkTaxi and transported very easily.

Bucket transport

The hinged frame you can use to transport up to two milk churns is especially practical. But it can also be used for transporting other things such as dry feed or tools. The 8 l colostrum jugs are particularly practical. Inserted in the larger can with hot water, the milk remains at the perfect temperature before it is fed to the calves.



Cleaning and hygiene

FlushMaster bucket cleaning

Cleaning feed buckets is time-consuming, as you have to collect the buckets and take them to the washing area. The FlushMaster allows you to clean the buckets using a rotating nozzle in the MilkTaxi, directly at the calf pen. The FlushMaster is also ideal for thorough tank cleaning, leaving a clean interior from cover to base. This practical aid can be retrofitted to all MilkTaxi models with a pump.

Automatic cleaning

Since the lid can be fully opened, cleaning of the tank is extremely easy. The semi-automatic cleaning program guarantees optimum hygiene. Residual quantities can be emptied completely, even from the pump and hose. Supplementary cleaning with a brush improves the result, and your MilkTaxi is ready to go again after just a few minutes.



FoodSafe.

Do you sell some of your milk directly? The FoodSafe edition of your MilkTaxi is also suitable for transporting food, enabling you to transport your milk easily and hygienically from the milk tank to the milk filling station. All components used comply with the specifications of the German Food, Commodities and Feed Code (according to VDE Prüf- und Zertifizierungsinstitut GmbH).



Perfectly illuminated

It is often pretty dark in the early morning hours or in the winter months. Nevertheless, the MilkTaxi will make light work for you.

Lights off – spotlight on

The SpotLight mounted on top of the MilkTaxi brings light into the darkness: the completely flexible gooseneck provides a 360° all-round view at working height.



Dark? No problem

Thanks to the integrated LED drive light you always see where you are going. So feeding calves in more remote calf hutches in the evening is no problem.



Useful accessories

And there are even more special options for the Calf Star MilkTaxi: for example, a jacket or drenching set.

MilkTaxi jacket

Calf milk can cool down between warming and feeding on particularly cold days. Our new jacket for the MilkTaxi keeps it warm for about twice as long as without the jacket, according to our own trials (in the trial at - 13 °C, the milk lost about 1° C after 8 minutes without the jacket, but only after about 17 minutes with the jacket).



Drenching cows

A cow drenching option is also available. In the MilkTaxi, the drenching fluid can be mixed and temperature-controlled ideally, taken to the cows and then drenched to the rumen gently via the pump. Rather than struggling with a manual pump, you can concentrate completely on the cow thanks to the MilkTaxi.





MilkTaxi 400 Litres

The large trailer model for up to 100 calves or 800 litres of feed per day (2 x 400l).

Would you like a little more?

Sometimes even the largest MilkTaxi to date with 260 l is not enough. This is not only because farms are getting bigger, but also because more milk is being fed per calf. The 400 litre MilkTaxi now also offers larger farms virtually all the advantages that the tried and tested smaller models have. Even the
 function is available as an option, leaving nothing to be desired with the 400 model.



Made for rugged surroundings

The MTX 400 is built particularly sturdy not only because of its higher payload. The spring-loaded axle ensures that the transport of milk to the calves is steady and smooth, especially on uneven tracks.



MilkTaxi Dosing Unit

Do you already have a mobile milk tank and would like to use it as a "MilkTaxi"? The MilkTaxi's dosing unit makes this possible.

MilkTaxi XXL

If the tried and tested MilkTaxi models are not large enough, the dosing unit offers an ideal opportunity to convert existing milk tanks into an XXL MilkTaxi. The dosing unit consists of the battery-operated pump with dispensing arm. Display and control element are conveniently integrated in a separate unit in the driver's cab.



Temperature and fill level measurement

The dosing unit also measures the milk temperature and determines the fill quantity in the tank by means of the integrated SmartMix sensor. This means that all sizes farms can benefit from the advantages of precise dosing and optimum temperature control when feeding their calves. Turn your tank into a MilkTaxi XXL!





Options and features

MilkTaxi basic configuration

- MilkTaxi model version 100 l, 150 l and 260 l with stable and maneuverable chassis on 4 wheels; front tires 40 cm
- Electronic control with liquid level sensor, thermometer and statistics function
- Powerful base-mounted agitator mixing at regular intervals in heating mode
- MilkTaxi, model version 260 l and 400 l, built as a trailer with jack wheel
- Tank made of easy-to-clean, polished stainless steel
- Lockable lid with sealing ring; opens to full radius
- 1 ¼" drain tap for complete draining
- LED headlight
- Semi-automatic cleaning program

MilkTaxi pasteurizer basic configuration

- MilkTaxi model version 100 l, 150 l and 260 l with stable and maneuverable chassis on 4 wheels; front tires 40 cm
- Electronic control with liquid level sensor, thermometer and statistics function
- MilkTaxi, model version 260 l and 400 l, built as a trailer with jack wheel
- Tank made of easy-to-clean, polished stainless steel
- Lockable lid with sealing ring; opens to full radius
- 1 ¼" drain tap for complete draining
- LED headlight
- Semi-automatic cleaning program
- Pumping, mixing, heating as standard
- Up to 6 programmable pasteurizing start-up times
- Integrated water cooling
- Three selectable programs: 65 °C for 35 minutes, 60 °C for 60 minutes, 60 °C for 70 minutes

MilkTaxi options

- Smart-Mix
- Smart-ID (except trailer models)
- CalfGuide for MilkTaxi
- Pump
- Floor heating (3 kW, 5 kW, 6 kW or 9,7 kW)
- Tilt-up churn support frame for two 30 l milk churns
- Colostrum jug
- Wireless remote control dispensing arm
- EL-AN electrical drive
- Failsafe tires
- HeavyGrip tires
- Cow drenching function
- Glove compartment
- FlushMaster

MilkTaxi pasteurizer options

- Smart-Mix
- Smart-ID (except trailer models)
- CalfGuide for MilkTaxi
- Tilt-up churn support frame for two 30 l milk churns
- Colostrum jug
- Wireless remote control dispensing arm
- EL-AN electrical drive
- Failsafe tires
- HeavyGrip tires
- Cow drenching function
- Glove compartment
- FlushMaster



MilkTaxi technical specifications*

	Useful tank capacity	Total tank capacity	Width (cm)	Length (cm)	Height (cm)	Power supply	Pump performance	Heating power	Agitator	Tire size
MilkTaxi 100 l	100 l	115 l	60	126	109	230V / 16A	Approx. 40 l/min	3 KW	250 W	400 / 265 mm
MilkTaxi 150 l	150 l	180 l	75	129	109	400V / 16A	Approx. 40 l/min	5 KW	250 W	400 / 265 mm
MilkTaxi 260 l	260 l	290 l	76	133	119	400V / 16A	Approx. 40 l/min	6 KW	250 W	400 / 265 mm
MilkTaxi trailer	260 l	290 l	120	140	125	400V / 16A	Approx. 40 l/min	6 KW	250 W	400 mm
MilkTaxi 400 l	400 l	480 l	130	220	140	400V / 16A	Approx. 40 l/min	9.7 KW	250 W	570 mm

* Technical specifications subject to change



Double Jug



The **intelligent whole milk** tank for automatic feeders



The dilemma of whole milk storage

Whole milk feeding is becoming increasingly important in calf rearing. However, there are a few technical obstacles to be overcome for feeding at the calf feeder. There has to be a constant supply of milk in the storage tank, for example, because the calves come to feed all day long. But if the calves drink more than usual, the tank is empty too quickly and the animals do not get any milk for a certain time.

On the other hand, there is often some milk still left in the tank when it is to be filled and cleaned. This is often simply thrown away. Since this is expensive, however, the fresh milk is often just added to the old milk in the tank and feeding continues without the storage tank being cleaned properly.

In addition, conventional milk tanks start to freeze over when the level in the tank is very low, which is a problem. It damages the milk and puts a strain on the technology.

For this reason, we have developed the ultimate solution for you for the storage of whole milk for calf feeders like the CalfExpert. Find out on the next page how the DoubleJug solves all the problems described above.



Save energy and working time: with the help of automatic cleaning and automatic tank change.



Optimum use of whole milk resources thanks to intelligent control.



Healthy, contented calves thanks to unrestricted access to fresh whole milk.



DoubleJug – unique in whole milk storage

The DoubleJug is a milk tank that has been designed especially for automatic calf feeders. Since there are two tanks integrated in one unit, milk is always available and optimum hygiene is guaranteed.

24 hours whole milk feeding

The CalfExpert calf feeder draws its milk from one of the tanks. Should this tank become empty, the DoubleJug switches automatically to the second tank and the CalfExpert can continue to feed without interruption. This means no waiting times and no interruptions in feeding, thus making ideal use of the high performance of the CalfExpert.

Controlling the DoubleJug via the CalfExpert

The DoubleJug is controlled via the CalfExpert and programmed at the feeder display. This allows the tank status to be viewed directly at the feeder as well as in CalfGuide at any time. An information unit can be fitted to the DoubleJug as an option that displays the most important information such as temperature, fill level etc. directly in the barn.

Automatic cleaning

As soon as the first tank is empty, it is cleaned automatically. This means maximum hygiene and best milk quality. The cleaning cycles are coordinated by direct communication with the CalfExpert. Thus the daily cleaning of the milk line between the DoubleJug and the CalfExpert only takes place when the milk tank itself is being cleaned. This minimizes any waiting times for the calves.

Refilling whenever convenient

Once a tank has been cleaned, DoubleJug is ready for filling. Usually both tanks are filled to take advantage of the maximum capacity of the DoubleJug. The advantage of the two-chamber system is that the DoubleJug can be filled at any time without having to wait for the exact moment the milk tank is empty. There are neither residual quantities nor times during which the CalfExpert stops feeding due to lack of milk.

Cool stuff

The DoubleJug is equipped with a cooling unit for both tanks. Even small amounts of milk are cooled efficiently without freezing.

Space even in the smallest of hutches

Thanks to its square design, the tank does not take up much space in the calf barn. This means it can be positioned close to the calf feeder.



Characteristics

- AutoFill function: when a tank is empty and clean after automatic cleaning, it can be automatically refilled by a suitable continuous pasteurizer.
- Auto-empty function: when one tank becomes empty, the DoubleJug automatically switches to the full tank. The empty tank is then cleaned together as part of the cleaning cycle of the CalfExpert.
- Fast cooling to reduce bacteria growth in the insulated tank.
- Ideal for the CalfExpert, but can also be used with other calf feeders.
- Automatic washing program based on the CIP system.
- Digital control of the tank through the CalfExpert including combined cleaning of CalfExpert and DoubleJug.

Technical specifications DoubleJug*

Power supply	380 V, 16 Amp
Water supply	Hot and cold water necessary
Drain	Floor drain necessary
Required air pressure	5.5 to 7.5 bar
Dimensions 2 x 190 l	1.63 x 0.87 x 1.16 m
Dimensions 2 x 380 l	1.63 x 0.87 x 1.55 m
Space requirement	2 x 1 m

* Technical specifications subject to change



Mini Flash



MINI FLASH 2.0



Healthier calves thanks to pasteurized milk

Studies and practical experience show that calves grow better when they are fed with whole milk. In relation to the dry matter, the protein content is approx. 28 % and fat approx. 30 %. Corresponding powdered milk replacers are not usually available on the market. Yet fresh cows milk contains bacteria that can be dangerous and are suspected of causing diarrhea in calves or mastitis later in cows. Pasteurizing can destroy up to 99.5 % of the bacteria and thus turn contaminated milk into a high-quality food. You can find more detailed information in the specialist article included later in this calf handbook.

The pasteurizing method used by the MilkTaxi is known as "batch pasteurizing". It is extremely suitable for pasteurizing quantities of up to 70 gallons milk. If larger quantities are required, the technology reaches its limits. In such cases, the so-called "HTST method" (high-temperature-short-time method, pasteurizing at 73 °C (163 °F) for 15 seconds) has proved itself in flow-type pasteurizers. Milk is pasteurizing continuously, the runtime is determined by the quantity available.

See the next page for details of how the Mini Flash 2.0 Pasteurizer can be integrated perfectly in farm processes and works with optimum energy efficiency.



MINIFLASH – EFFICIENT PASTEURIZING

The Mini Flash has been a staple product for Calf Star for over 15 years. Now we have completely revamped the Mini Flash, enhancing the system with new up to date technologies. The Mini Flash 2.0 is an integrated storage and HTST pasteurizing system, flexible milk output to supply various calf feeding systems and an integrated self-cleaning CIP system.

Save money

Why should you discard milk that cannot be marketed if it can be pasteurized and used for feeding? By using pasteurized milk you can benefit from the advantages of whole milk feeding, save on costs for powdered milk and rear healthy calves with low veterinary costs.

Integrated raw milk tank

The entire "calf milk" is collected in the integrated raw milk tank during milking. Regular mixing prevents the formation of cream on the milk and the integrated cooling feature prevents unwanted bacteria growth. The cooling is set in such a way that there is no freezing in the tank even if the fill levels are very low.

Integration in automatic milking systems

Where robotic milkers are used, milk is separated off throughout the day for calf feeding. The milk can be pumped continuously into the storage tank on the Mini Flash 2.0. It is kept cool and fresh there until pasteurizing begins.

Energy-efficient HTST system

The principle of HTST pasteurizing uses intrinsic process heat to pre-heat the cooled milk. This significantly reduces energy consumption compared with the batch system. As well as the pasteurizing temperature (73 °C/ 163 °F), the required end temperature can also be set. So if you wish to carry out feeding directly after pasteurizing, you do not have to heat the milk again. In addition, you can program all start times so that the Mini Flash 2.0 starts all its work automatically.

Feeding with dispensing system or calf feeder

Once pasteurized, the milk can either be pumped directly into a MilkTaxi or into the storage tank (Double Jug) of the calf feeder. This makes the Mini Flash 2.0 the central link for whole milk feeding on the farm.

Cleaning and hygiene

The Mini Flash 2.0 is equipped with a completely automatic cleaning system. It ensures maximum hygiene and biosecurity in 4 stages (preliminary rinsing, alkaline cleaning, acid cleaning, post-rinsing). The precise dosing of the cleaning agents is guaranteed by hose pumps.

COMPAQ FLASH

COMPAQ FLASH



Calf Star would like to welcome the Compaq Flash to our family of HTST (High Temperature Short Time) pasteurizers. Its revolutionary design cherry picks the proven features of its HTST cousins, but is now enhanced by offering: a digital on-the-fly output temperature control, separate Raw Milk tank, and other features to provide total custom flexibility for your per-feeding needs.

To compliment the Compaq Flash we have taken the already popular Milk Jug and created a new design called the Compaq Jug. The Compaq Jug is directly connected and controlled by the Compaq Flash. By integrating the two you will now have total control over your calf feeding needs.

Features of the Compaq Flash:

- Efficient electric boiler
- Pasteurizer and raw milk tank wash separately, allowing flexibility for daily milk requirements
- 'Regen System' that reclaims heat from pasteurized milk and preheats the incoming milk
- Digital control of output temperature, easily adjusting to seasonal weather changes
- Total integration between the Compaq Jug and Compaq Flash, or you can choose to manually connect to your existing raw milk tank
- Flow meters on the chemical wash lines to assure accurate and robust washing
- Remote access available with internet connection
- Dual CIP Wash, Detergent and Acid



How Does the Compaq Flash Work?

Step - 1

After milking, milk is chilled and kept at 38°F (4°C) in the Compaq Milk Jug



Step - 2

Milk is heated to 161°F (72°C) in the Compaq Flash and held for 15 seconds



Step - 3

After pasteurization, milk goes through a second 'heat exchanger' (Regen), extracting the heat from pasteurized milk, transferring it to the raw incoming milk.

Specifications/Compaq Flash:

Electric Requirements: 240V 80Amp Service
Electric Boiler
Air: 100PSI Minimum
Water: Hot & Cold Water Required

COMPAQ MILK JUG



COMPAQ Milk Jug



Specifications/Compaq Jug:

Electric Requirements: 220VAC, 20 AMP

Water: Hot & Cold Water Required

Compressor: 3/4 HP

Refrigerant: 134A

Models/Sizes-Compaq Jug

With a small footprint on all sides (34"x34") the Compaq Milk Jug fits through a standard 36" door, making it very versatile for most settings and a convenient partner for the Compaq Flash.

-50 gallon unit: 34"x 34"x 60"

-100 gallon unit: 34"x 34" x 62"

-200 gallon unit: 34" x 34" x 83"

Features of the Compaq Jug:

- Insulated to store raw milk
- Chills and stores raw milk prior to pasteurization, greatly reducing bacteria growth compared to water cooled tanks
- Space saving design
- Controlled and monitored by the Compaq Flash, providing a totally integrated pasteurizing process



MEDIUM FRAME

The Medium Frame HTST pasteurizer is a very energy efficient unit by utilizing heat from the pasteurized discharged milk and transfers it to the incoming milk. Farms ideal for this unit start from 200 calves up.

Energy efficient HTST Pasteurizer

The Medium Frame pasteurizes at 1.5 gallons per minute with the electric boiler option (comes standard). It can pasteurize up to 3 gallons per minute by upgrading to a gas boiler. By upgrading to a gas boiler pasteurizing becomes more cost effective due to gas being cheaper to run than electric in most areas.

Heavy duty construction

The Medium Frame not only comes in a commercial stainless steel construction, it is also equipped with an efficient CIP (clean-in-place) wash. Chemical injection pumps with easy to change hoses make sure cleaning and sanitation is always on highest standards.

The Medium Frame is more compact than the Large Frame model at only 54" wide x 18" deep and 64" high.

The total volume of pasteurized milk is variable. Make sure you add sufficient size cooling tanks for untreated waste milk and ready pasteurized calf milk. Milk Jugs can be an ideal option.

Easy to operate

A PLC touch screen make control and operation of the Medium Frame and Large Frame very convenient. All information is just a fingertip away. The PLC touch screen allows more options for the user than our previous designs. Users are able to start pasteurization automatically, choose how many gallons to pasteurize, choose what temperature the milk is to be at discharge, choose which tanks to wash at one time, and many more..



Technical Specifications Medium frame*

Power	220 VAC
Water Supply:	minimum of 30 psi, 2gpm of water
Air Supply:	minimum of 10 cfm at 80-120 psi
Dimensions	54" wide x 18" deep x 64" high

* Technical specifications subject to change!





LARGE FRAME

The Large Frame Pasteurizer is the unit for farms specialized on calf rearing with more than 500 calves. Custom built and installed by professionals to your special needs and demands.

Multiple options available

There are variable options when it comes to the capacity of the Large Frame Pasteurizer. Quantities anywhere from 3.5 gallons per minute to 30 gallons per minute are possible.

Best timing to kill most bacteria

A timing pump is engineered to put a positive pressure on pasteurized milk to prevent cross-contamination. This will allow the best log kill of bacteria

Heavy duty construction

The Large Frame not only comes in a commercial stainless steel construction, it is also equipped with an efficient CIP (clean-in-place) wash. Chemical injection pumps with easy to change hoses make sure cleaning and sanitation is always on highest standards.

The total volume of pasteurized milk is variable. Make sure you add sufficient size cooling tanks for untreated waste milk and ready pasteurized calf milk. Milk Jugs can be an ideal option, depending on the size of the operation.

Technical Specifications Medium frame*

Power	220 VAC
Water Supply	minimum of 30 psi, 2gpm of water
Air Supply	minimum of 10 cfm at 80-120 psi
Dimensions	84" wide x 27" deep x 80" high

* Technical specifications subject to change!



Easy to operate

Digital touch screens feature incoming milk temperature, pasteurization cycles, outgoing milk and flow rates along with cycle durations. Tank selections are made on the touch screen. The screen allows the user to program how many gallons of milk, from which tank to pasteurize and when to start pasteurizing.

The wash screen allows for setting specific amounts of acid and detergent to be used for each tank/cycle. It can also specify which tanks to be washed. Acid and detergent levels in the source barrels are also monitored. The pasteurizer can wash up to four other tanks besides itself.

There is a service portal and a user portal for allowing trouble shooting on the farm. We also have an added option to add remote access to the machine so some technical support can be done from the dealership rather than taking a trip out to the farm.

Quality control is very important in pasteurization. This includes the handling of the milk pre and post pasteurization, monitoring your pasteurization times, monitoring your pasteurization temperatures, and pasteurizer cleanliness. With all of the Calf-Star HTST pasteurizers there is an integrated clean in place design. The PLC touch screen also offers all the tools to properly monitor your pasteurizing times and temperature to assure excellent quality.

Features:

- Accurate Timing Pump for the best Log Kill of bacteria
- Fully-automated CIP (clean-in-place) wash system.
- Efficient pasteurization using HTST (high temperature, short time).
- Captures heat from outgoing milk and reclaims it to incoming milk in the heavy-duty re-gen section.
- Easy to use touch screen plc

Mini BATCH



The ideal start in life

Pasteurization is a standard procedure to treat cow's milk before feeding to calves. But pasteurizing colostrum can be a difficult task, since it has a different composition than normal cow's milk.

When properly done pasteurizing colostrum can eliminate the spread of disease to the rest of your herd and even improve the IgG absorption. Resulting in better immunity and better performance of your calves.

To receive the best result when pasteurizing colostrum it is important to pasteurize it with the batch system at 140°F for 60 minutes. This will reduce the bacteria count without affecting the IgG levels or viscosity of the colostrum.





GOOD START WITH MINIBATCH

The Mini Batch is a smaller scale colostrum pasteurizer. Fitting for the needs of any dairy when it comes to giving your calves a good start in life.

Small and compact unit

Space is often limited in the parlor area. That's why the Mini Batch comes as a small unit with a wall mounted controller, optional chart recorder and a small container to pasteurize. It comes in either a 3.5 gallon or a 10 gallon size. Since the recommendation is to feed approx. 1 gallon of colostrum in the first hour after birth, this would give enough colostrum for 3 to 10 calves, depending on the unit you are using.

A simple process

The Mini Batch heats colostrum or milk up to 140° or any other desired temperature. A jacketed tank with water heating assures that the pasteurization is gentle to the milk to preserve the valuable nutrients and antibodies. The Mini Batch holds the temperature for an hour or any other desired time and finally cools it down with cold water to the desired temperature for either feeding or storage. A buzzer sounds to let you know when the process is complete.

Shining quality

The Mini Batch comes with a full stainless steel jacketed tank. Heating and control unit is mounted with a compact box to the wall. The integrated agitator makes sure that the colostrum is evenly warmed and remains homogeny.



PASTEURIZING COLOSTRUM IN THE MILKTAXI

Since the Milk Taxi also uses the batch method it can also be used to pasteurize colostrum. Special software features allow the necessary adjustments.

Bags with colostrum

Plastic bags have proven to be an ideal way to pasteurize individual portions of colostrum. With a 1 gallon bag you have the recommended amount for the first meal of a calf. Check your colostrum quality with a refractometer and if it is sufficient, you can fill it in bags. After pasteurization these bags can be stored in refrigerators for several days or deep frozen even for months.

The special program

Colostrum is pasteurized in the Milk Taxi with a special 140°F and 60 minute program. It is recommended to pasteurize roughly 5 bags at a time in the Milk Taxi. A bracket at the bottom of the tank keeps the bags from getting stuck in the agitator.



Feeding right from the bag

If milk is stored in bags, it thaws much easier than if in bottles. The outer surface is larger which allows a better heat exchange. After thawing in a water bath (the Milk Taxi can be used here again) the milk is ready to be fed to the calves. This happens right from the bag with teats, which are fixed right to it.

COLOSTRUM CARE CENTER



The Colostrum Care Center is a leading-edge colostrum processing center designed to offer complete handling of colostrum, from cow to calf. It's leading-edge technology offers:

Bagging, Pasteurizing, Cooling, Rewarming and Feeding of Colostrum, all in one package.

Borrowing from our Milk Jug Lacto-Thermal technology, we use both sides of the refrigeration system to cool and heat the water baths used to Pasteurize, Cool, and Rewarm the Colostrum.

This technology provides the means to carry out the complete process of preparing colostrum for feeding calves in the most efficient and economical means.

How It Works:

There are three water bath zones in one enclosure (about the size of a small horizontal chest freezer) that are always ready to carry out the three tasks of preparing colostrum. After the cows first milking, the colostrum is collected and put into 1-gallon colostrum bags. These bags should be tamper-proof and will securely maintain the integrity throughout the pasteurizing, chilling, storage, rewarming, and feeding process. (Calf Star Colostrum Bags and accessories are available for purchase with the Colostrum Care Center).

Specifications:

Electric Requirements: 220VAC

Water: Cold Water Supply (softened preferred)

Air: Air Supply Required



Accessories:

Bag Filling Station: 2 or 4 station



Colostrum Bags and Esophageal Tubes



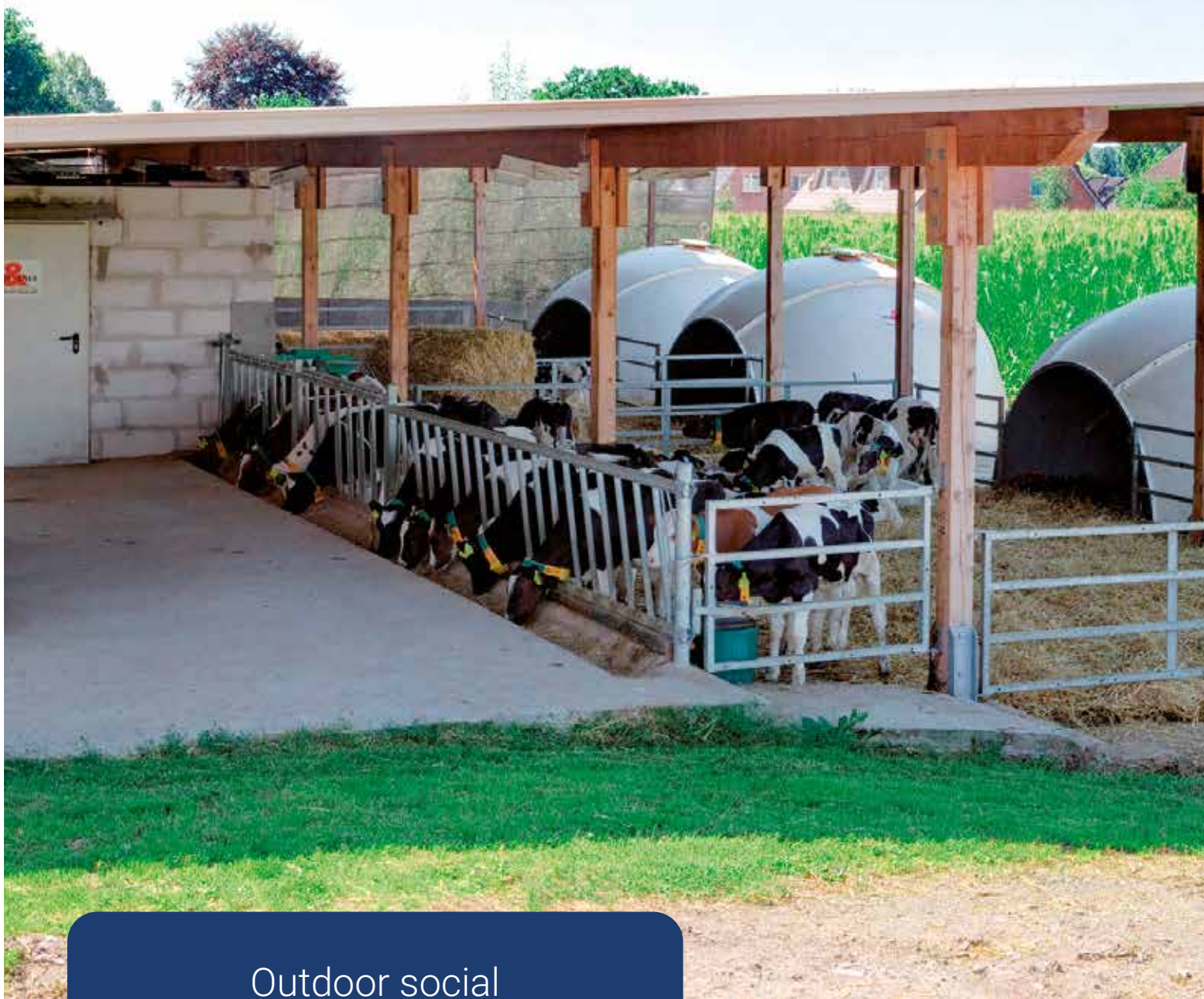
Insulated Bag Carrier With Shoulder Strap



The **Cooling Zone** contains a chilled water bath of 36°-38°F (2°-4°C) used to immediately chill the post-pasteurized colostrum to stop bacteria growth, then keeps it refrigerated until it's time to feed to the next calf 'or' to put it in the freezer for longer term storage.

The **Pasteurize Zone** utilizes the heat generated from the chilling system to preheat the water. When the pasteurizing cycle begins, it will then utilize an electric element to supply any additional heat needed to achieve and maintain a pasteurizing temperature of 140°F (60°C).

The **Rewarming Zone** is crucial in preparing the colostrum for the first feeding of the calves without damaging any of the key elements of the colostrum. The Rewarming Zone will bring the pasteurized colostrum to feeding temperature gently and quickly (15 minutes for chilled and 20-25 minutes for frozen colostrum).



Outdoor social
group husbandry



Healthy outdoor housing

Today it is hardly imaginable: 20 years ago there was no other way to keep larger groups of calves professionally in an outdoor climate apart from expensive barns. It was the invention of the H&L Igloo that brought about the breakthrough of outdoor climate housing for calves in animal-friendly group housing. Today everyone knows that calves grow up healthiest in a group in the fresh air and achieve the optimum performance there.

An easy-to-transport igloo for up to 15 calves with optimum air circulation, favorable temperatures both in summer and winter made of almost indestructible GRP (glass fibre-reinforced plastic) is still the only option for many farmers today.



The roof not only protects the calves and the feed, but also creates a pleasant and protected place to work.



In the mobile IglooVeranda, as a new building in the IglooSystem or also as an extension to existing calf barns. The Igloo is always an affordable alternative.



Healthy group housing in an outdoor climate. The calf decides where it feels most comfortable: in the sheltered igloo or in the covered run.



Healthy microclimate

An impressively simple design bridges the gap between a maximum exchange of air and a draught-free resting surface.

A place of retreat for your calves

Everyone knows that draughts in your calves' resting area stress them and make them sick. On the other hand, conventional calf barns need a high air flow rate to replace stale and contaminated air. Especially calves in the first weeks of life that cannot yet compensate for these negative influences through their own body heat production. You can offer up to 15 calves a draught-free yet well-ventilated shelter with the large-capacity H&L Igloo.

A unique ventilation system

The hemispherical shape of the Igloo ensures ideal ventilation: Winds that blow across the outside of the igloo create a negative pressure at its highest point (Bernoulli's Principle). Stale air is actively drawn out of the Igloo. Since the inlet opening is 12 times larger than the exhaust openings, the air velocity in the resting area remains extremely low. There are therefore no undesirable draughts in the calves' resting area.



Never make it too warm – and never too cold

A special coating on the Igloo ensures maximum reflection of solar energy. For this reason, the Igloo does not heat up unnecessarily even on hot summer days and offers the calves a cool resting area. Even in winter, the temperature inside the Igloo hardly differs from the temperature outside. The animals do not start to sweat, which would lead to considerable problems.

Solve problems flexibly

Every farm has its own special requirements. It is therefore necessary to create barn construction solutions that are perfectly adapted to these conditions. The H&L Igloo will always integrate ideally into your farm.

Quickly set up

Two people need only 30 minutes to put up an Igloo. Precisely pre-drilled elements, the high-quality workmanship of the shells and easy-to-understand assembly instructions all help.

Mobile or fixed barn

Whether you prefer the mobile IglooVeranda (see next page) or a fixed calf pen along the lines of the IglooSystem, the concept of igloo housing offers ideal accommodation for your calves on your farm.

Solutions for existing buildings

Do you not have suitable outdoor space for an IglooSystem? Would you prefer to use an existing building? Simply open the building to ensure maximum ventilation and the Igloo will provide the necessary microclimate inside. This permits you to use existing structures without expensive conversions and, alternatively, you can also use the room as a machine shed, for straw storage or the like.

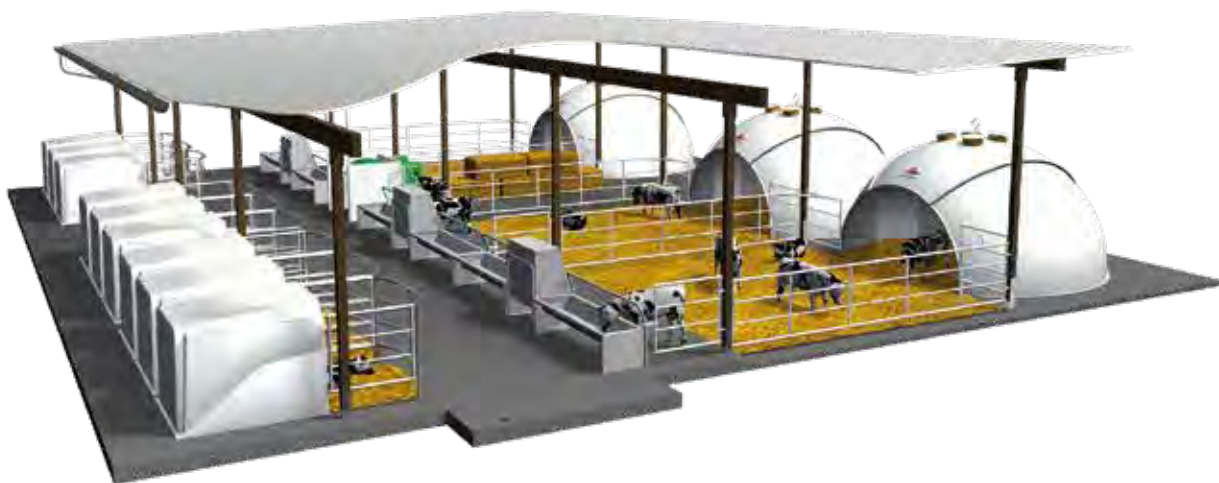




H&L Igloo technical specifications*

Recommended number of calves	15
Resting area	Approx. 14 m ²
Length x Width x Height	3.9 m x 4.4 m x 2.2 m
Height of Entrance	1.40 m
Volume	Approx. 20 m ³ /h
Weight	220 kg
Material	Hand-laminated glass fibre-reinforced plastic
Basic configuration	4 exhaust vents, transport hooks
Options	side curtains in the entrance for better weather protection in extreme conditions

* Technical specifications subject to change





Weather protection for
outdoor group housing



Mobile calf husbandry

Keeping calves outdoors is ideal and the H&L Igloo provides the perfect housing. However, the Igloo only comes into its own when combined with a covered run. Whether with a fixed roof or mobile as an IglooVeranda, calves benefit in both cases from the maximum amount of fresh air while enjoying protection from bad weather. It is not only the calves who appreciate the protected working area, but also humans. What's more, feed supplies and bedding stay dry. Mobility means flexibility, which in the case of the IglooVeranda is not only noticeable when mucking out, but also when developing the farm, when the calf barn can change location just like that. Discover the benefits of this innovative concept for yourself, which will also be easy on your pocket.



Wherever you wish to keep your calves, the veranda is mobile and easy to move at any time.



Flexible calf housing: grows incrementally with your farm, keeping construction costs low.



The dual area principle: the calf can either lie protected in the Igloo or play in the run.



Focus on animal welfare

It is only when an animal is comfortable that it will deliver the desired performance. Nowhere is this principle more true than in rearing young calves.

Dual-area principle: the calf decides

Practice has shown that it is best to provide separate resting, activity and feeding areas. Calves at rest are then not disturbed by calves happily playing and jumping around. A calf in the IglooVeranda can decide for itself where it feels most comfortable: in the draught-protected Igloo or running, lying or feeding in the covered area out in the fresh air.

Protection against the weather for humans and animals

The calves' outdoor area features a spacious canopy, and the H&L large-capacity Igloo offers up to 15 calves a draught-free yet well-ventilated retreat. And your working area is also protected from the rain, of course.



Plenty of space and movement

The H&L IglooVeranda consists of a resting area 5 x 5 m in size, also called the basic set-up. Together with the area in the Igloo, this offers the calves 2.8 m² of space in which to lie down, eat or run around. This is almost twice as much as is legally required in the EU. The optional roof measuring 7 x 7.5 m ensures sufficient protection from precipitation and excessive sunlight. It can be extended to a width of 8 m on request.

Simple & economic

When the healthiest calves come from the most affordable calf barn, which is also easy to manage, then the choice is actually already made: for the H&L IglooVeranda.

Mucking out made easy

You can easily transport the Igloo and the Veranda with a front loader, with the calves staying locked in the Veranda and migrating with it to their new "home". Whether on the silo floor in summer or in front of the machinery shed in winter: At all times, you will find room for the H&L IglooVeranda. When you relocate the veranda every time you muck out, the calves always move to a new, clean location with low bacteria levels. UV rays, fresh air and rain provide disinfection.

Low investment costs

Conventional calf barns require an elaborate barn structure and ventilation systems. We recommend that you dispense with this and instead we offer the IglooVeranda with a play area and protected microclimate area. This solution is up to 70 % cheaper than conventional calf barns.

Variable feeding area layout

The 14 feeding places are equipped with a special locking safety fence. It is not possible for the calves to be caught unintentionally. Side elements and FeedFences can be exchanged flexibly. Stainless steel tilting troughs are standard equipment in the feeding area. Optionally, nursing teat buckets and normal drinking buckets can also be used. The IglooVeranda, therefore, is your ideal choice for feeding calves with the MilkTaxi.



Cleaning of calf stalls for 56 calves in 1 hour and 46 minutes.

To the video (YouTube) QR code or <https://youtu.be/FZ3kzaXfjQM>



Options and features

IglooVeranda basic configuration

- 2 H&L FeedFences for Calves, 7 feeding places each
- 2 Stainless Steel Tilting Troughs
- 1 Transport Hook for the Front Loader
- Facility for a H&L Feeder Stall

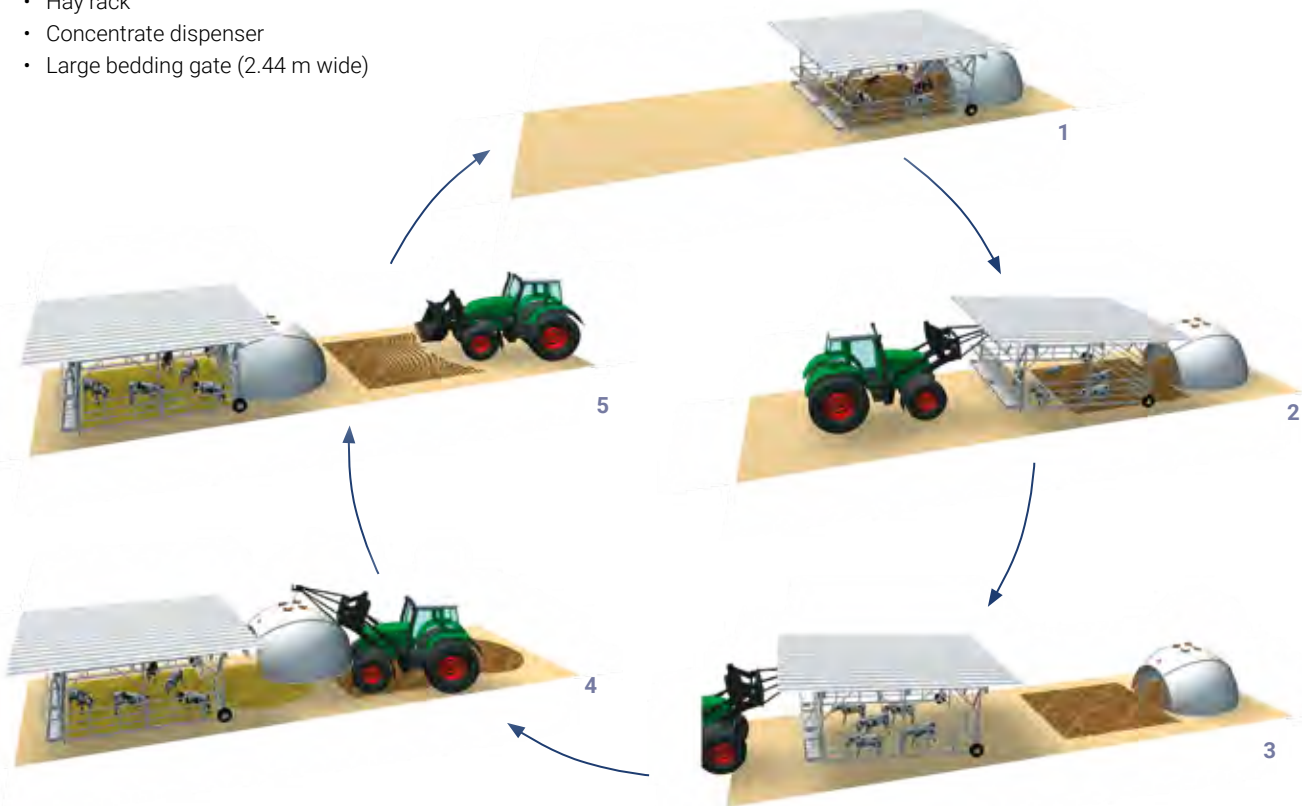
IglooVeranda upgrade options

- Roofing with drain hose dimensions 7 x 7.5 m or optionally 8 x 7.5 m
- Nursing teat bucket support
- Bucket holder (rings)
- Hay rack
- Concentrate dispenser
- Large bedding gate (2.44 m wide)

IglooVeranda technical specifications*

Recommended number of calves	14
Dimensions of basic structure	5 x 5 m Max. height 2.5 m
Roof area	7 x 7.5 m 8 x 7.5 m
Resting area	25 m ² under roof, 14 m ² in igloo (2.78 m ² per calf)

* Technical specifications subject to change



Moving and mucking out the IglooVeranda



BOTTLE TRAILER

Introducing the Calf Star Bottle Trailer. Pulled by an UTV or tractor, this all stainless steel structure on a tandem axle makes transporting feeder bottles easy. Fill, feed and wash all in one with minimal labor and avoiding the task of hand-washing bottles. The trailer features rotating and lockable bottle pans, adjustable bottle filling speeds with easy valve access.



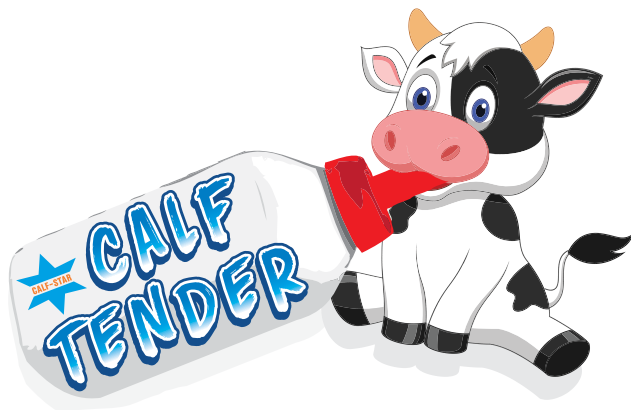
Check out a real-time video of the Bottle Trailer in operation!



UTV DISPENSER TANK



UTV DISPENSER TANK



Make feeding your calves easier with our Utility Vehicle Tank Dispenser!

The Milk Taxi comes in a compact design with a maximum capacity of 68 gallons. For some dairies or specialized calf raisers this might not be a sufficient quantity. That's why we offer you a range of different sized dispenser tanks which fit on any vehicle, and allows feeding a predetermined ration to your calves rapidly and accurately. Our single pump can dispense about 5-7 gallons per minute.

A new feeding option which is similar to our dispenser tanks is our new Calf Tender.

This tank comes on a stand up utility vehicle that is an inexpensive and an efficient way to feed calves.

This vehicle has a very short turning radius allowing users to use this tank and vehicle combo to feed calves in calf barns with small aisles.

The Calf Tender has an all steel frame with dual front wheels and an adjustable backrest. This vehicle is able to hold up to 1,000 lbs, making it a perfect vehicle for feeding calves. The current tank size for this vehicle is 150 gallons.



FEEDING CALVES IN BUCKETS OR BOTTLES IS EASIER WITH THE UTV DISPENSER TANK.

There is no more guessing on the amount of milk put into the bucket with the 9 selectable rations calf feeding is more consistent. With Calves consistency is always a key importance.

Working principles

Pasteurized waste milk is pumped from the pasteurizer with the requested feeding temperature into the dispenser tank. After carting the unit to the calf hutches you can choose from 4 different feed amount settings. Then simply push the dispense button on the feed handle to distribute the milk to your calves. Dispensing can either be done by a hand push button or foot pedal.

Sizes (standard stock sizes):

- 100 gallon: 44" x 40" x 14"
- 200 gallon: 44" x 40" x 27"
- 250 gallon: 44" x 40" x 34"
- 300 gallon: 44" x 40" x 41"
- any other sizes are possible but would be custom.



Easy cleaning

When finished, the tank can be attached to the pasteurizer to wash by pushing the wash button on the tank control box. A spray ball inside the tank makes sure the whole tank remains spotless clean. If you are not washing with a pasteurizer, you can add on an automatic wash option. This option includes a separate PLC control box with chemical pumps and mounts to the wall and uses a 110 electrical hook up.

Features:

- Mounts in UTV box
- Pasteurized milk is pumped into unit.
- Dispenses easily with a push of a button.
- Tank can be hooked up to a pasteurizer to wash.
- Can be ordered either single wall or double wall insulated
- Large acrylic manhole inspection cover to see inside the tank
- All stainless steel construction



FEED FENCE



Safe and practical **feeding
place design**



The right feeding place for any barn

Any calf barn, whether it is an outdoor climate barn such as the IglooVeranda, the solid structure of a conventional barn or even just a quick barn conversion, requires a well thought-out feeding system. This saves unnecessary walking and makes calf feeding faster and more reliable.

The options available to you are as varied as your personal desires and your calves' needs. Whether you feed your calves with the CalfExpert calf feeder or with the MilkTaxi essentially determines which FeedFence you use. What matters is making the right choice without restricting your future options too much.



Easy handling and flexible feeding place layout for different requirements.



Cost-effective calf housing, as installation is also possible in old buildings.



Safety and calm for your calves thanks to quick securing in V-shaped feeding place openings.



Flexible adaptation to every situation

The needs of calves should also be taken into account when choosing the FeedFence. You can house your calves in an animal-friendly way with the right equipment.

Safety for your calves

The H&L FeedFence Headlocks are designed with V-shaped openings at every feeding place that allow the calves to insert their head and pull out safely. It is not possible for the calves to be caught unintentionally. A side grate on the bucket ring and the teat protection basket on the teat bucket holder prevent milk from being stolen. This means you can also feed larger groups of different ages individually without any problems.

Lock calves in quickly

Do you have a problem with reciprocal suckling? Then secure the calves in the fence for 30 minutes after feeding to prevent navel infections. The whole group of calves can be quickly secured thanks to a practical handle. Stragglers can also be secured individually.

Fast access

The H&L FeedFence can be equipped with a rotating mechanism so that you can open it along the full front. This provides easy access to the pen for cleaning it completely. The manway with a lockable gate allows you to enter the pen and reach the calves quickly and safely.

Varied feeding place layout

The locking FeedFence is designed for 6 - 12 feeding places. A novel telescoping design allows the fence to be placed between any two posts from 2.20 to 4.40 m apart. An ideal solution for old buildings. Just determine the distance you need; we will gladly advise on which telescoping FeedFence is best for you. Each FeedFence comes with a matching stainless steel trough. It is easy to access and feed remains can be tipped out effortlessly.



FeedFence with bucket ring holder, side barriers and trough



FeedFence with trough and teat bucket holder



Options and features

Feeding fence basic configuration

- V-shaped feed opening
- Neck size adjustment
- Central locking with handle
- Individual lock
- 6 cm square tube for easy assembly

Feeding fence upgrade options

- Varying lengths (see table)
- Teat bucket holder with teat protection basket
- Bucket ring holder with side barriers
- Manway
- Turntable with quick release
- Posts with and without base plate



Manway in the FeedFence

FeedFence dimensions

Standard FeedFence for calves*

H&L FeedFence (7)	Length 2.44 m, 7 feeding places, each 30 cm in width, not variable
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Telescoping FeedFence for calves*

H&L telescoping FeedFence (6 – 8)	Length 2.20 – 3.15 m: (8 feeding places with a variable length of 2.76 - 3.15 m; reduction to 2.20 m minimum possible for 6 or 7 feeding places by separating one or two feeding places); width of feeding place: 33 cm
H&L Telescoping FeedFence Headlocks (9 - 10)	Length 3.16 – 3.80 m: (10 feeding places with a variable length of 3.40 - 3.80 m; reduction to 3.16 m minimum possible for 9 feeding places by separating one feeding place); width of feeding place: 33 cm
H&L Telescoping FeedFence Headlocks (11 - 12)	Length 3.81 – 4.40 m: (12 feeding places with a variable length of 4.04 - 4.40 m; reduction to 3.81 m minimum possible for 11 feeding places by separating one feeding place); width of feeding place: 33 cm

*Technical specifications subject to change



Concentrate dispenser

Concentrate feed should be given fresh and in small quantities at all times, so valuable feed does not get moist. This is difficult to achieve when distributed throughout the day. With an ad libitum dispenser only the exact quantity previously consumed by the calf is replenished. When feeding the calves concentrate, we recommend using our stainless steel concentrate dispenser with a capacity of approx. 50 l. This is easy to affix to concrete by using its base. Also optionally available as a wall mounting.

Concentrate dispenser technical specifications*

Width	1 m
Volume	50 l



*Technical specifications subject to change

Roughage trough

A trough ensures that the calves cannot push the feed away. This ensures a high feed intake. The stainless steel trough is two meters in length. The supplied neck rail features an angled fixation that encourages a good body position during feeding, even with larger calves.

Roughage trough technical specifications*

Width	2 m
Options	With galvanized neck latch

*Technical specifications subject to change

Hay rack

Calves like hay. It is important, however, that the hay is clean and can be accessed at any time. The large H&L hay rack is 1.5 m in width and can be safely placed on a pen separator. This is why refilling it is particularly easy, directly from the hay and straw reserve next to the pen.

Hay rack technical specifications*

Width	1.5 m
Options	Supplied with hooks that allow hanging it on a pen separator

*Technical specifications subject to change



Diagonal FeedFence

Diagonal FeedFences can be used in the calf pens as an alternative to troughs. This design is recommended, in particular, when calves are fed from a feed table. With a length of five meters, the H&L diagonal FeedFence is equivalent to 17 calf feeding places. Bear in mind that the feed table should be raised by 15 cm. This is the optimum height difference for a calf feeding place.

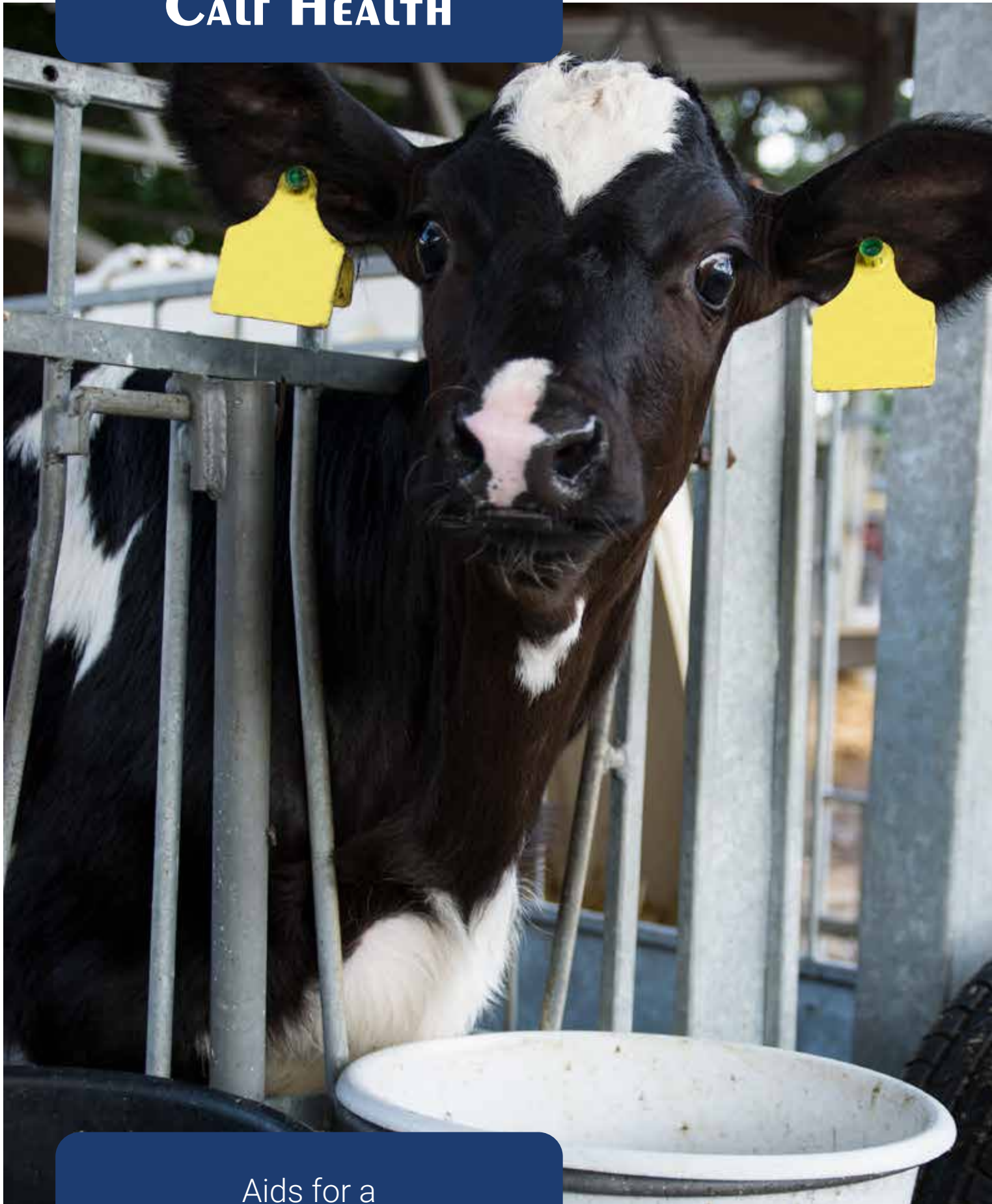
Diagonal FeedFence technical specifications*

Width	4.85 m
Options	17 feeding places Diameter of upper and lower pipe: 2 inches

*Technical specifications subject to change



Calf Health



Aids for a
healthy start in life



Small aids - significant effects

Calf-rearing also has many procedures which have to be carried out in addition to the everyday tasks such as feeding, littering down or monitoring the animals. Thus calves have to be frequently moved during the first weeks of their life. Or sick calves require special attention. For many of these areas there are practical aids which simplify day to day work.

In addition to the familiar products such as the MilkTaxi, H&L Calf Feeder or H&L IglooVeranda, Holm & Laue have included several of these innovative aids in the range. They make the task of transporting the calves easier, provide support when calves are born weak or shelter the young animals from extreme weather conditions in winter for example.

At Holm & Laue the same standards apply for these small aids as for all other products: smart handling, longevity, innovative functions and maximum hygiene. We will be presenting a few of these products on the following pages.



Making your work easier with practical aids



Healthy calves mature into high-performing dairy cows



Promoting animal welfare and calf health with helpful products



CalfBuggy

CalfBuggy – simple and safer transport for calves

Transporting calves on the farm is a difficult task and tiring, particularly if one is on one's own. Pulling the calf across the yard on a halter and rope takes a long time and strains the nerves of all involved. Such situations can quickly turn dangerous too, if the strength required to lift the calf onto a wheelbarrow is not there or it is in danger of falling out.

The CalfBuggy lets you easily transport your calves over longer distances without putting safety at risk. The buggy is easily operated to lower it to ground level enabling the calf to be simply loaded by a single person.

Simply unlock the twist lock to lower the cart to the ground. The calf can be ushered in comfortably through swing doors at the front and back and exit at the other end.

Once the calf has been loaded, simply press the grip downwards until the twist lock has engaged and the wheels are positioned for transportation.

The plastic grille on the floor of the CalfBuggy ensures that the calf stands safely and is quickly cleaned.

Thanks to the large-size wheels uneven and rough terrain as well as slush and snow are never a problem. They also provide ideal weight distribution to make pushing child's play.

A restraining device at the front of the CalfBuggy ensures that the animal can be held calmly and safely in place, for example for medical treatment.

What's more, the CalfBuggy is ideal for transporting other things too such as feed, straw or tools for example.

CalfCoat calf jacket

In winter well protected – the Calf Star Calf Coat

The Calf Star calf jacket provides ideal protection for your calves at low temperatures. It reduces the energy required to maintain body heat by up to 30 %.

An ideal addition for intensive energy rearing with metabolic programming.

If in spite of a healthy outdoor climate calves are sick in the Igloo, it is advisable to leave them in their familiar surroundings and provide additional protection with a calf jacket. Because moving to a poorly-ventilated warm barn causes additional exposure to bacteria and ammonia. The calf jacket is easy to adapt to different body sizes with adjustable leg straps and a practical fastening with Velcro at the chest.



Excellent quality of workmanship

- breathable Thinsulate material
- washable at 30 °C and disinfection with mild disinfectants
- low-wear edge reinforcement
- water-repellent outer material



CalfVital calf resuscitator

Lifesaving – the CalfVital calf resuscitator

It is essential to act quickly when calves are born weak. It often happens that the newborn calf is not breathing or the presence of fluid can be heard in the respiratory tract. The CalfVital calf resuscitator is a dual purpose pump which provides help quickly.



Draw off mucus

Amniotic fluid can be quickly removed from the respiratory tract with the pump's suction attachment (yellow). Two to three fast piston strokes are often quite sufficient.



Gently ventilate

If the calf subsequently fails to breathe, the CalfVital calf resuscitator helps to effectively ventilate the calf by means of a second attachment. An integrated valve prevents excessive pressure from building up. This protects the delicate pulmonary alveoli.

Cleaning and disinfecting are extremely simple since all components are made of plastic and furthermore can be quickly dismantled.

The storage bag is extremely practical and keeps the resuscitator clean and protects it. The CalfVital can therefore be kept directly accessible in the calving area.

Holm & Laue refractometer

Determine the quality of colostrum quickly and easily

Newborn calves have an insufficient level of antibodies and absorb these important protective proteins solely through their colostrum. This means that the young calves must be fed high-quality colostrum as soon as possible in order to develop a strong immune system.

The H&L refractometer determines the quality of the colostrum and in this way helps to ensure sufficient basic immunity. The digital refractometer measures the light refraction in the colostrum to calculate the so-called "Brix value" in %. This value correlates closely with the protein content of the milk and thus allows conclusions to be drawn about the quality of the milk.

The H&L refractometer is used in three important areas:

Testing colostrum

Good colostrum should have an IgG concentration of 50 mg/ml. This value corresponds to a Brix result of 22% and more. Samples returning a Brix value of less than 20% should not be fed to newborn calves. However, this milk still constitutes high-quality food for older calves.

Testing blood serum

Testing the protein content in the blood serum determines whether a calf has received a sufficient supply of antibodies. An immunoglobulin content of 10 mg/ml (7.8% Brix), measured after 24-48 hours, can be assumed to provide good basic immunity.

Determination of dry matter in whole milk

In addition to the actual Brix value, the H&L refractometer also determines the dry matter of the milk. This makes it possible to determine whether the milk contains enough ingredients or whether it needs to be enhanced with milk replacer powder.

SPECIALIST ARTICLE



Valuable information on all aspects of calf husbandry



Always up to date with Calf Star

Metabolic programming, daily gains, calf flu, diarrhea, pair housing, heat stress, pasteurization ... There are countless important issues in calf husbandry and rearing that need to be kept in mind and considered. After all, healthy, strong calves are the foundation for a farm that works well economically. As farmers, you save on veterinary costs and can enjoy calves that will develop into productive dairy cows. However, it is often difficult to keep up to date with trends and new developments in calf rearing. The following articles provide you with interesting background reports and practical tips for your everyday work in the calf barn.

Stay up to date at all times. Whether scientific studies, case studies, webinars or announcements of dates: you will never again miss out on vital information with Calf Star calf experts - and that through a variety of channels.

Visit us!



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Colostrum Management and Standard Operating Procedures (SOP)

Every farmer knows that the supply of colostrum for newborn calves is critical. But since the timing of a birth can never be precisely planned, providing good initial care for the calves is always a big challenge.

Building Up Immunity is Top Priority

When the calf is born, it is essential to ensure maximum sanitation and hygiene and avoid infections. But there is much more to it: to develop a good immunity, the calf must consume more than 200 g of immunoglobulin IgG within the first hour of life. Since it should be assumed that only about 40 % of the milk from the first milking has an IgG content of more than 50 g IgG per litre, the calf must drink over 4 litres of milk right after birth – and it has to be high-quality milk.

Studies show that calves which have been fed this way are more robust and produce more milk later on. For example, Faber et al.¹ found that calves that drink 4 litres of colostrum produce more milk later as grown-up cows (1st lactation + 950 kg, 2nd lactation + 1,650 kg). These results, based on only 68 calves, were corroborated by a field study conducted by Soberon et al.² that covered 1,800 calvings. According to the findings, calves that drank 4 litres of colostrum produced 1,027 kg more milk in two lactations than calves that drank only 2 litres.

However: not all mother cows have colostrum of good quality, and very few calves drink 4 litres from the dam's udder within the first hour! Moreover, it's a given that calves always tend to be born when there is no time to attend to them. So, how can the new findings be put into practice?

Standard Operation Procedures (SOPs)

This management method is nothing more than a clear definition of the steps that must be completed in order to accomplish a particular task. The initial care of the calves is an ideal example.



By creating a "bank" of the best colostrum, which you freeze in disposable bags, defrost and warm later in a double boiler when needed, and then feed to the calves directly from the bag. Using the following two examples, the steps for this can be described in SOPs:

SOP "Colostrum Feeding for Newborn Calf"

1. Birth: Check the cow's and calf's state of health. Then leave the calf with its mother for approx. 30 minutes, so she can lick it dry.
2. During that time, take frozen colostrum from the refrigerator or deep freezer and defrost it in the coloQuick for about 20 minutes.
3. Move the calf to an individual hutch, disinfect the navel, give an iron supplement subcutaneously or orally.
4. Feed the calf 4 litres of colostrum directly from the bag within the first hour of life.

SOP "Build Up Colostrum Bank"

1. Milk the colostrum from the mother cow in a clean and sanitary way (thoroughly clean the udders; pre-milk by hand)
2. Check the quality of the colostrum using a colostrometer or refractometer.
3. Pour only colostrum of good quality into the bag, then label the bag with the quality reading, cow number and date.
4. Pasteurize then freeze colostrum.

Add your own notes, laminate the SOPs and hang them in the calving pen and calf stable. Discuss the individual points in your team so that everyone understands the reasons behind them. This will improve your employees' job performance and result in more satisfied employees because they know exactly what is expected of them. And, of course, the calves get an optimal start to life and are ready for good growth and excellent, long-term performance.



1 Faber, S. N. et al., University of Arizona, The Professional Animal Scientist 21 (2005), 420-425
 2 Fernando Soberon, Cornell University, June 2012



Higher Milk Yield Through Early Metabolic Programming

The calf is still “immature” when it is born into the world, and many organs are not yet fully developed. For example, computer tomography scans have found that full maturation of the lungs takes about three weeks.¹ All of the other organs likewise show strong development of the cellular tissue in the first few weeks of life. If the development of the calf is supported by providing more than the previously recommended amounts of energy and a better supply of nutrients, these organs develop even better and form the basis for good performance and a higher milk yield later on.

For good performance and a high milk yield, the cow needs a well-developed udder. In view of this, the following study is very interesting: Brown et al.² have found that early udder development can be positively influenced by intensive feeding within the first eight weeks of life.

Development of the parenchyma of the udders of calves, according to BROWN et al. (2005)

Energy Level 2nd to 8th week of life	Medium		High	
Parenchyma (g/100 kg body weight)	1.9		6.2	
Energy Level 8th to 14th week of life	Low	High	Low	High
Parenchyma (g/100 kg body weight)	16	15	24	23

This study clearly shows that the udder tissue already starts developing at the tender age of 8 weeks. It is a small development, but still strongly dependent on the energy supply the calf receives. We can therefore positively influence the udder system by feeding the calf the proper diet right from the start, during the first weeks of life. However, the second row is even more important: If we miss the window of opportunity and then try to promote the udder development later on by supplying more energy, it is no longer possible!

Other studies have shown that feeding excessively high amounts of energy to older calves (six months of age and older) up until the time of oestrus leads to severe adiposity of the udders, which is associated with poorer performance and lower milk yield.

Studies on other animals (e.g. laboratory rats) even show a another positive effect: When the organism is exposed to a high energy pulse for a certain period of time during its early life, insulin is released, which is necessary for a highly efficient body. Interestingly, however, there is a kind of memory effect in the body's **metabolism**. If the high energy supply is stopped (e.g. in the case of heifers, in order to prevent too much adiposity), but then resumed at a later time (e.g. intensive feeding of the cow during its first lactation period), the body “remembers” its **programming** from earlier and is able to optimally support the metabolic processes of the body by producing a high volume of insulin.

This memory effect is called „**Metabolic Programming**“.

Soberon, Cornell University, 2012

On this matter, Soberon³ conducted extensive studies on the subject of metabolic programming in cattle on two farms with a total of 1,800 cows.

Here are a few excerpts from his results:

- The milk drinking phase of a calf is the period of life in which the udder tissue reacts positively to an increased energy supply. This leads to a higher milk yield later on.
- Calves fed ad libitum have a lower first calving age by one month.
- For every kilogram of higher daily weight gain in the milk drinking phase, the animals achieve an increased milk yield of 850-1,113 kg during the first lactation.

There are numerous other studies which come to similar conclusions.

Reason enough to realise that we have to rethink traditional feed programs which reduce the calves' energy intake of milk for the purpose of attaining early intake of concentrate feed.

We are pleased to offer our practical recommendations on this topic on the following pages of this Calf Handbook.

1 Dr. Bernd Linke, 18273 Güstrow, Germany

2 Brown et al. (2005)

3 Fernando Soberon, Cornell University, June 2012; <http://www.ncbi.nlm.nih.gov/pubmed/22281343>



The Digestive System of a Calf

When feeding calves, it is important to remember that the calf's enzyme system is aligned to digesting the milk of the mother cow. In this early phase, the chymosin enzyme, which is responsible for coagulating the casein in the milk, is most prevalent. 80 % of the distributed enzymes are attributed to this enzyme, which is also called "rennin". This means that in the early phase, calves should only be fed whole milk or milk replacers with a high proportion of skim milk powder. Whey protein is mainly digested by the pepsin enzyme, which in the early phase is only distributed in the abomasum in the amount of 20 %. For this reason, plant proteins cannot yet be absorbed and digested. Therefore, milk replacers made from whey powder in the early phase can lead to reduced performance (growth) or, if plant proteins are intermixed, even to problems with diarrhoea.¹

The phase of the exclusively milk diet lasts approximately 4 weeks. Only after that period can the calves gradually digest plant proteins because the enzyme spectrum changes. Accordingly, when feeding the calves a milk diet in the early calf rearing period, we have to take two different feeding phases into account:

- a) Start phase: In the first four weeks, energy is supplied solely via a milk diet. Highly digestible whole milk or, alternatively, milk replacer containing at least a 30 % proportion of skim milk should be used for the feeding.
- b) Feeding phase: Starting from about the fifth week of life until weaning, when the digestion has to quickly adapt to plant nutrients. During this phase, the calves should be prepared for the increased intake of dry food.

How much energy does the calf have to ingest?

According to DLG dietary tables, a calf with 50 kg body weight and daily growth of 400 g requires approximately 15 - 16 MJ ME per day. This corresponds to approximately 6 litres of whole milk or 1,000 g of milk replacer per day.

However, when the above-mentioned metabolic effects are taken into account, a 400 g daily weight gain is not sufficient. In its Gold Standards, the American DCHA (Dairy Calf and Heifer Association) states that the goal should be a doubling of the body weight until the time the calf reaches weaning at eight weeks, and thus a daily weight gain of 1,000 g. However, growth rates of 1,000 g per day require an energy intake of more than 20 MJ ME per day, which means more than 8 litres of whole milk or at least 1,250 g of milk replacer per day.

At temperatures below 10 °C, these amounts even need to be increased, since the general energy requirements of the calves rise in winter. When the frost temperatures drop very low, it is difficult to raise the energy intake in a way that continues to enable a daily weight gain of 1,000 g day. In these times, calf jackets have proven to be very helpful, because they reduce the energy requirements by 30 %, which lets more energy from the milk be utilised for growth. Studies in the UK have shown that calves who wore calf jackets in winter gained 5.3 kg more weight, and the jackets also lowered feed costs by 2.90 pounds sterling.² Additional measures such as sufficient dry bedding, good tasty feed and draught-free housing support good growth even during cold temperatures.



¹ Dr. Hans-Jürgen Kunz, Chamber of agriculture S.-H., 2016, Article: „Wie funktioniert die Verdauung!“ http://www.lksh.de/fileadmin/dokumente/Bauernblatt/PDF_Toepfer_2016/BB_36_10.09/52-53_Kunz.pdf
² Gill Dickson; Simon Marsh, Harpers University, 2014, „Faster growth and lower feed costs from Calf Coats“



Excursus: “Ad Libitum Feeding”

Feeding acidified whole milk in the ad libitum process is a proven method that supports metabolic programming of the calves. In this process, the calves always have a full bucket of milk available and drink as much as they want. An intake of more than 15 litres a day can be observed after 2-3 weeks.

This feeding method leads to very strong growth and daily weight gain, in some cases more than 1,000 g per day. If the method is carried out properly, the calves become very robust and resistant. For the ad libitum feeding process to be successful, the following points must be taken into account:

- Only highly digestible milk such as whole milk or milk replacer with at least 50 % skim milk powder is suitable for ad libitum feeding.
- To ensure that the milk in the bucket remains fresh for an extended period of time (also in summer!), it must be acidified to pH 5.5. A stronger acidification is not recommended, since it lowers the palatability of the milk substantially and the calves do not intake a large quantity.
- Acid complexes which function at different temperatures and with different milk compositions should be used for the acidification. Formic acid, which was previously widely used, is not always the best choice.
- Even when the milk is acidified, the storage quality can deteriorate at summer temperatures above 25 °C. Therefore, the milk should be pasteurized beforehand, because pasteurized milk does not exhibit any significant bacteria growth at temperatures of 30 °C for 12 hours.
- The milk is fed at a max. temperature of 20 °C and remains at room temperature. Excessive heating can cause the milk to coagulate during the acidification.
- The milk buckets should be equipped with a fully closing lid to keep flies and dust away.
- To ensure that the calves do not drink too quickly or guzzle too much at once, the buckets must be filled at all times. This makes sure that the calves are not starving before the next meal and thus drink only a small amount.

- Ad libitum feeding must start immediately after birth. Calves that were initially fed restrictively should not be abruptly switched to ad libitum feeding, as they tend to guzzle too much milk at once.
- The ad libitum phase should not last longer than 3 weeks. However, it is important to carefully and gradually prepare for the subsequent weaning phase. The metabolic feeding curve on the CalfExpert¹ has proven to be an effective aid in this..

Misconceptions About Ad Libitum Feeding

Too much milk causes diarrhoea: In the process described above, the calves drink their milk over the course of several visits. Even though they have a full bucket available, they only drink small quantities.

Too much milk impedes the early intake of concentrate feed: Actually, the opposite is true. Experience in practice and many scientific studies show that calves which drink a large amount of milk have a higher intake of concentrate feed. This appears to be related to the increased metabolic requirement for high energy throughput.

The buckets freeze in the winter: It is a fact that when there is frost, there is a risk of the buckets freezing. Then it can be difficult to get the frozen milk out of the buckets and teats. However, the calves like drinking the lukewarm milk in the winter and also show a higher energy intake and correspondingly better growth as compared to rationed feeding.

A lot of milk is rejected before each meal: True, especially with young calves, a large amount of milk may be discarded. However, these costs are more than compensated by better growth rates and an earlier first calving age.

¹ See article 'New Recommendations for Calf Feeding Using Automatic Feeders' in this handbook



New Recommendations for Calf Feeding Using Automatic Feeders

To successfully implement these scientific findings on metabolic programming in practice and thus raise healthier calves with a better performance potential and higher milk yield, the previous dietary recommendations have to be revised.

Traditional feeding programs pose a risk!

Traditionally, feeding programs based on the principle of 3 litres per meal, with each meal including 120 - 130 g milk replacer (CMR)/l, were recommended. With these programs, the calves are supplied with approximately 750 g of CMR per day. Up to 2010, this was a very common recommendation in the sector. These programs were also used in automatic feeders.

However, in addition to the low energy concentration, automatic feeders also pose another risk: calves starving due to missed milk feedings.

Since the total amount of milk is distributed between 4 and 6 visits per day, each calf receives only 120 - 150 g of CMR per visit. When teaching the calves to use the feeder, there are always a few animals who need a few days to get used to the feeding method. They often miss one or more meals. If a calf misses its second visit and then only gets one or two meals on the next feeding day, that means that instead of the desired 750 g per day, it often only receives half the amount of CMR. These calves do not even intake enough energy to cover their own energy requirements, and then become very susceptible to illness and disease.

Thus, the supposed advantage of offering many small portions in the automatic feeder is also actually a risk factor in certain cases!

Calf Feeding Redefined

In view of all this, we need to rethink the approach to calf feeding.

1. Feeding parameters must be adjusted to the individual needs of the calf, using precise and individually adapted feeding curves.
2. Calf feeding until the calf is weaned from milk is divided into two phases:
 - a. **Start phase:** intensive feeding at the time of organ maturity (first 28 days of life)
 - b. **Weaning phase:** to support the calf's development into a ruminant animal
3. As a measure of the calf's nutrient and energy intake and supply in the start phase, the "metabolic factor" can be defined. It tells how

much CMR or dry matter of whole milk the calf has absorbed until day 28. The higher this figure, the higher the future performance potential and milk yield of the calf.

Implementing the Findings into the Programming of Computerised Automatic Feeders

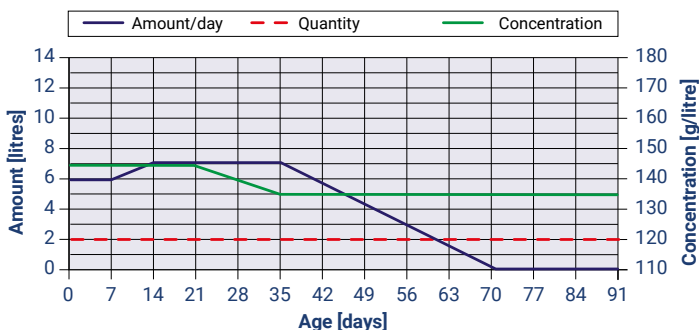
As a first step, every farmer should decide how intensively he or she wants to feed and raise the calves. Intensive ad libitum feeding during the first 2-3 weeks is not the right path for everyone (* see the excursus "Ad Libitum Feeding").

Therefore, two are two different feeding strategies:

"Economy Feeding Curve"

The standard curve of automatic feeders should allow a daily intake of 1,000 g CMR in the first four weeks. This corresponds to the recommendations for moderate rearing with average growth of about 400 - 500 g per day.

This can be achieved by starting with an initial milk quantity of 6 to 7 litres per day. If this amount is used, we recommend increasing the CMR concentration to 145g/l in the start phase and then reducing it to 135 g prior to the actual weaning phase. After 35 days, the calves are weaned in very small increments, so that they are fully weaned off milk after 70 days. With this feeding curve, each calf would consume a total of approx. 50 kg CMR. However, even more important is that more than 50 % of the energy (27 kg CMR = metabolic factor) has been dispensed and consumed within the 28-day start phase.



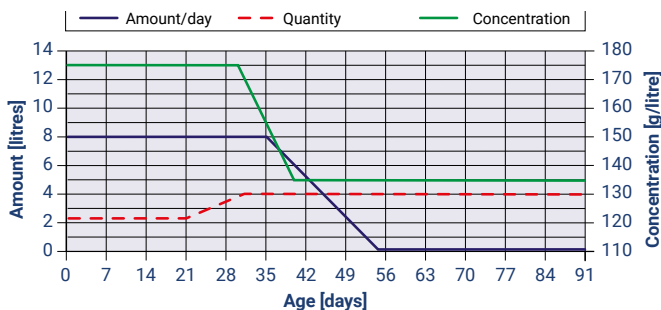


It is essential that the quantity per visit should be set to 2 litres right from the start. With this method, calves "in training" that miss their second meal at half-day will still intake about 600 g of energy (CMR) per day, which at least covers the energy requirements of the calf. This will prevent the calves from starving during the teaching phase, as mentioned above.

Metabolic Feeding Curve for Better Performance

Alternatively, for farmers who want a significantly better performance and higher milk yield, we recommend a "metabolic feeding curve".

This feeding curve foregoes a gradually increasing feeding phase and instead feeds 8 - 10 litres of milk per day during the start phase. In this case, the farmer accepts that the calves may not retrieve and consume the entire amount at the beginning. The concentration starts with 175 g CMR/l. The daily intake of CMR in the first start phase is 1,400 g and higher. This enables the calves to achieve a daily weight gain of 1,000 g and more! With this high supply, the calves convert additional CMR quantities into body mass at the ratio of 1 kg CMR: 1 kg! The metabolic factor in the 28-day start phase is approximately 38 kg



CMR. In feeding curves recommended in the past, this quantity of milk powder was not even fed until the end of the rearing period, at 10 weeks!

As with the economy curve, the metabolic feeding curve also integrates an early reduction of CMR concentration to prepare for the actual weaning of the calves. This ensures that the calves are prepared early on for the intake of concentrate feed. This process marks the start of the **weaning phase**. The amount of energy supplied is slowly reduced, which motivates the calves to satisfy their hunger pangs by consuming dry feed. In addition, the calves still continue to receive a good quantity of milk for a certain period of time, which can suppress the tendency towards mutual cross suckling.

The metabolic feeding curve is ideal for weaning calves that were

previously fed ad libitum in individual crates or hutches¹. In this case, relocation of the calves should take place no later than in the third week of life.

When using the metabolic feeding curve, the farmer can consider shortening the milk phase by two weeks, down to eight weeks of life. When weaning at eight weeks, the theoretical CMR consumption is approx. 56 kg; a 10-week milk feeding phase would result in a consumption of more than 70 kg, depending on the actual quantity of milk the calf intakes.

Prerequisites for Intensive Feeding Programs

To succeed with such programs, there are three important prerequisites:

1. High-quality, highly digestible milk replacer or whole milk must be used. Lower quality MRs or milk may cause diet-related diarrhea.
2. The feeding technology must be capable of feeding the calves on an individual basis, since the adjustments in the quantity and concentration can only be implemented if each portion is freshly prepared for each calf.
3. The farm manager and his/her employees must have a good eye for the calves. Despite better health, the calves may occasionally have diarrhoea, which is difficult to distinguish from the thin, liquid excrement caused by a high consumption of milk. Management systems can be useful in this regard, since they precisely analyze the visits and feeding behavior of the calves and clearly show the farm manager on a PC, tablet or mobile phone which calves need special attention (e.g. the CalfGuide).

¹ See excursus 'Ad Libitum Feeding' in this handbook



“You can’t manage what you can’t measure.” – Peter Drucker

This is also true for calf rearing: the goal of a daily increase from 800 – 1,000 g is accepted by many farmers and is often pursued. We are now aware that calves which grow faster due to intensive rearing will produce more milk in the future. This effect is called metabolic programming.¹

But it is not possible to determine the precise weight of the calves without weighing them regularly. Fewer than 12 % of farms weigh the calves during the milk phase. And only 9 % of farms weigh the calves at least twice.² This means that 91 % of farms do not ascertain the daily increase in weight of their calves and thus have no information about the individual performance of their calves. How do these farms intend to make important decisions about feed strategies or the selection of animals?

In this article, you will find out more about the different methods of weight recording and their benefits for successful calf rearing.

There are basically three ways of determining the weight of the calves:

- a) Measuring tapes
- b) Mechanical or electronic animal weigh scales
- c) Integrated scales in automatic calf feeders

Calf measuring tapes and barn charts

The easiest and most cost-effective method of recording animal weights is with measuring tapes which measure the animal’s girth. The weight can be simply read off a scale on the measuring tape and recorded on barn charts. It is necessary to bear in mind that the weight is, only an estimate. But if calves are repeatedly measured with the measuring tape, the calculated increases are definitely informative.

It is important to take measurements several times during the milk phase (at birth, after 4, 8 and 12 weeks). This is the only way to get a complete image of the development of the calf.

The weights are then entered on barn charts and compared with the targets.

Animal weights											It could be like this...				
Calf No.	Date of birth	Birth weight (kg) Actual	Date	Weight 4th week (kg)		Date	Weight 8th week (kg)		Date	Weight 12th week (kg)		Daily increase (200-1,000g)	Week	Growth g/d	Absolute weight kg
				Target BW x 1.6	Actual		Target BW x 2.2	Actual		Target BW x 2.6	Actual				
													Birth		40
													1	600	44.2
													2	700	49.1
													3	800	54.7
													4	900	61
													5	1,000	68
													6	1,000	75
													7	1,000	82
													8	1,000	89
													9	1,100	96.7
													10	1,100	104.4
													11	1,100	112.1
													12	1,100	119.8

Note: The target weights specified here should be adjusted according to the breed and your individual rearing targets. However, a higher intensity with increases of more than 800 - 1,000 g has positive consequences on the future performance of your animals.

You would like to automatically measure and store your animal weights?
The HygieneStations of our calf feeders can be equipped with animal weigh scales and with our management system "CalGuide" you can always keep an eye on all of the data.

Mechanical or electronic animal weigh scales

Animal weigh scales can record the weight more accurately. Here too, it is necessary to weigh the calves several times during rearing. As with the measuring tape, the values should be recorded on a barn chart and compared.

Newer electronic animal weigh scales can be equipped with RFID antennae, record the weights and then store them automatically for the relevant calf. The data can often be exported and then further processed.

The data is much more convenient and informative if it is transferred automatically to management software. This makes the actual weighing work much easier for the staff. There are already systems on the market which allow the entry of additional information during weighing. When the birth weight is recorded, information on the calving process, colostrum intake etc. is entered directly into the terminal of the animal weigh scales. Thus, important information is stored, which can later be supplemented in the software by other information from calf feeders or MilkTaxis and holistically analysed.

¹ See also "Higher Milk Yield Through Early Metabolic Programming" on page 73.
² Own international survey with 424 farms (2016)



Integrated scales in automatic calf feeders

The most comprehensive weight information is provided by animal weigh scales which are integrated directly into the feeder station of calf feeders. At each visit, the weight of the calves is recorded and extensive data records are created which provide information about the development of the calves on a daily basis.

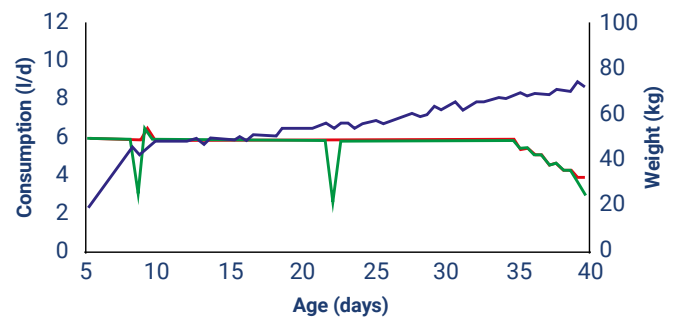
As calves which are suffering from diarrhoea instantly lose weight, even though they are still drinking really well, it is possible to identify these calves more quickly via the alarm list by weight than via the alarm list relating to milk consumption. Severe cases of diarrhoea can often be avoided by an early treatment, reducing the use of medicine.

The second important reason for equipping a calf feeder with weigh scales is the possibility of weaning the calves on the basis of their individual weight development. By this method, calves which consume concentrate and forage at an early stage are weaned more quickly. This saves the cost of milk replacers or whole milk and promotes the subsequent development of the calves into ruminants.

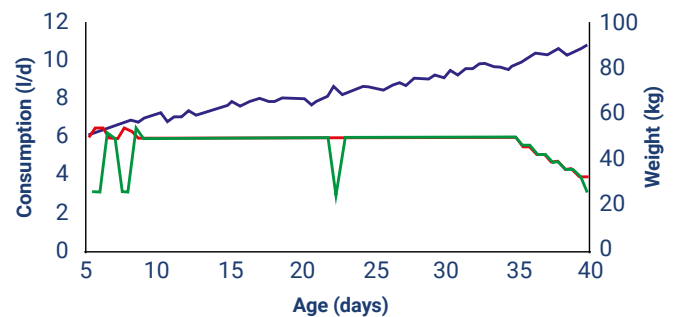
Furthermore, the animal weigh scales, in combination with management programs and analysis software, provide very detailed information about the future performance of the calves in their evaluation. Various investigations on the subject of "metabolic programming" show that calves with a high feed intake and an above average growth later also have a higher milk output during lactation. Thus, Soberon et al. have found out that 85 – 111 kg more milk is produced later during lactation for every 100 g of increased daily weight gain as a calf.³ So if the calves grow by 1000 g instead of 600 g per day, 450 kg more milk can be expected in their first lactation.

Thus, in addition to the genetic value of the calf, the information on the animal weight provides additional important information with regard to the following question: which heifers will remain on the farm to be reared and which animals will be sold? Particularly in times when a conservation of resources and environmental constraints often raise the question of whether all animals should be reared, these additional selection parameters are becoming increasingly important.

It is also important to find out when the calves have grown. In the graph below, you can see the feeding and weight trajectories of two calves. Both calves were unremarkable with regard to their consumption and almost always consumed their full quantity. But it is clear that the top calf weighs just 75 kg at the end of the rearing, whilst the bottom calf ends the milk phase with a weight of approx. 90 kg. The first calf gained almost no weight in the period up to 20 days, whilst the second calf constantly grew at a rate of approx. 900 g / day. The first 3 – 4 weeks in the life of a calf are decisive for the metabolic programming and the early udder development. Thus, the second calf should clearly be preferred over the first calf in the selection for the future dairy herd.



The feeding and weight trajectories of calf number one.



The feeding and weight trajectories of calf number two.

These points show that the quote from Peter Drucker is more topical than ever. It is rarely good to make management decisions based on human instinct. Choosing options based on little information is no better. In calf rearing, a lot of information must be gathered to set the right course on the farm. "Calves are the future of the farm!" says every second publication on the subject. Let us finally begin to act accordingly!

3 Fernando Soberon, Cornell University, June 2012; <http://www.ncbi.nlm.nih.gov/pubmed/22281343>



Pasteurization of Whole Milk

Whole milk is nutritious, valuable feed for calves.¹ Unfortunately, this milk is often contaminated with bacteria. Bacteria that cause mastitis in the cow (*E. coli*, staphylococci, streptococci) also play an important role in problems in the calf barn. If present in the milk, these bacteria directly penetrate the digestive tract of the calf and can cause diarrhoeal diseases. Practical experience warrants the assumption that heifers previously fed with contaminated milk are later susceptible to mastitis.

Pasteurization is a method in which the milk is heated to kill bacteria. In the USA, pasteurization of calf milk has been a standard procedure for decades. The flash pasteurizers which are commonly used there heat the milk to 73 °C for 15 seconds². However, the method is very complex and generally worthwhile for farms that need to pasteurise more than 500 litres of milk.

For other dairy farms, the batch pasteurization method, in which a temperature of 65 °C is maintained for 35 minutes, has been found to be suitable in practice. After this time, 99.5 % of the important disease pathogens are destroyed, while the critical nutrients in the milk are preserved. This method is also used in the MilkTaxi Pasteurizer.

To preserve the quality of the milk until it is pasteurized, it is vital to cool it, especially if it will be dispensed over the next 12 hours. The MilkTaxi Pasteurizer is equipped with a simple and economical water cooling system. As a rule, temperatures between 10 - 20 °C are sufficient to keep the milk stable for half a day.

How does milk pasteurization fit into my workday?

As the pasteurization process generally takes between 2 and 3 hours, it would often be too long a wait to feed the calves right after milking the cows. Automatic, time-controlled pasteurization in the early morning hours is thus an ideal option. In the morning, the pasteurized milk, at exactly the right temperature, is ready to be fed via the MilkTaxi. Therefore, we recommend the following procedure (using the evening milking as an example):

- 7:00 p.m.** Pour the milk into the MilkTaxi and cool it down to the temperature of the water. Program the timer of the MilkTaxi to start the cycle in the early morning hours (e.g. 4:00 a.m. in this example).
- 4:00 a.m.** The MilkTaxi begins heating the milk now (programmed time).
- 6:00 a.m.** The pasteurization cycle is completed and the milk is at the desired drinking temperature, ready to be dispensed.
- 7:00 a.m.** After cleaning the MilkTaxi, pour the milk from the morning milking into it and cool down the milk that is going to be pasteurized and fed in the afternoon.

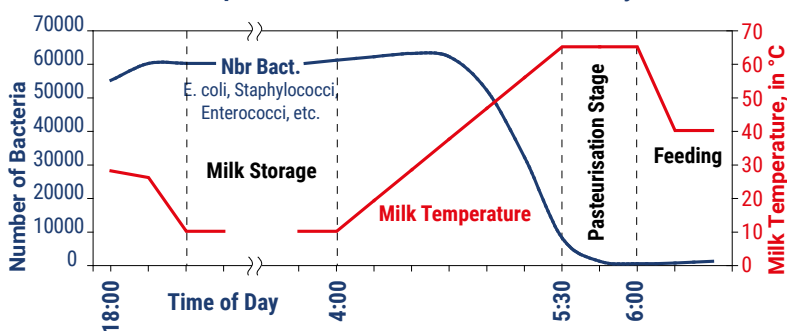
What kind of milk should I pasteurize?

For safety reasons, whole milk should generally be pasteurized. Even if there are no disease problems among the calves, the potential risk is reduced if one of the pathogens creeps into the herd. In particular, however, it is essential to pasteurize milk unfit for human consumption (milk of mastitis cows, etc.) prior to feeding it, since it carries the risk of transferring diseases from the cows to the calves.

Especially in the case of ad libitum feeding, it is advisable to pasteurize the milk, since it improves the stability and "shelf life" of the acidified milk in the feeding buckets.

In general, we do not recommend pasteurizing colostrum or milk that has undergone previous heat treatment. Milk containing antibiotics should never be fed to calves because of the risk of developing germ resistance. Pasteurization does not inactivate the antibiotic effect.

Process Steps in an Automatic Pasteurisation Cycle



1 See article "The Digestive System of a Calf" on page 74
 2 Further information can be found at www.calfstar.com



How do I set up my barn for installing and using an automatic calf feeder?

When choosing an automatic feeder, be sure to opt for a unit that offers as much flexibility as possible and can be upgraded with all options at a later time. This will ensure that you will not have to make any compromises when you install and operate the system.

In addition, there are a few other factors you should take into account:

- Ensure a reliable and appropriate power supply.
- Use good quality drinking water and install a water filter .
- Maintain a clean environment around the feeding stall. This is the area visited by the calves most often, and it may get dirty very quickly.

Therefore:

- Install the HygieneStation on a base raised approx. 15 cm.
- Install a liquid drain or gutter under the station. The drain or gutter can flow into the drainage duct required for the HygieneStation.
- Position the station outside of the main area of the pen.
- Clean this area regularly. The tilting feature of the HygieneStation is especially helpful with this task.
- Place a water hose with a sprinkler head next to the machine to



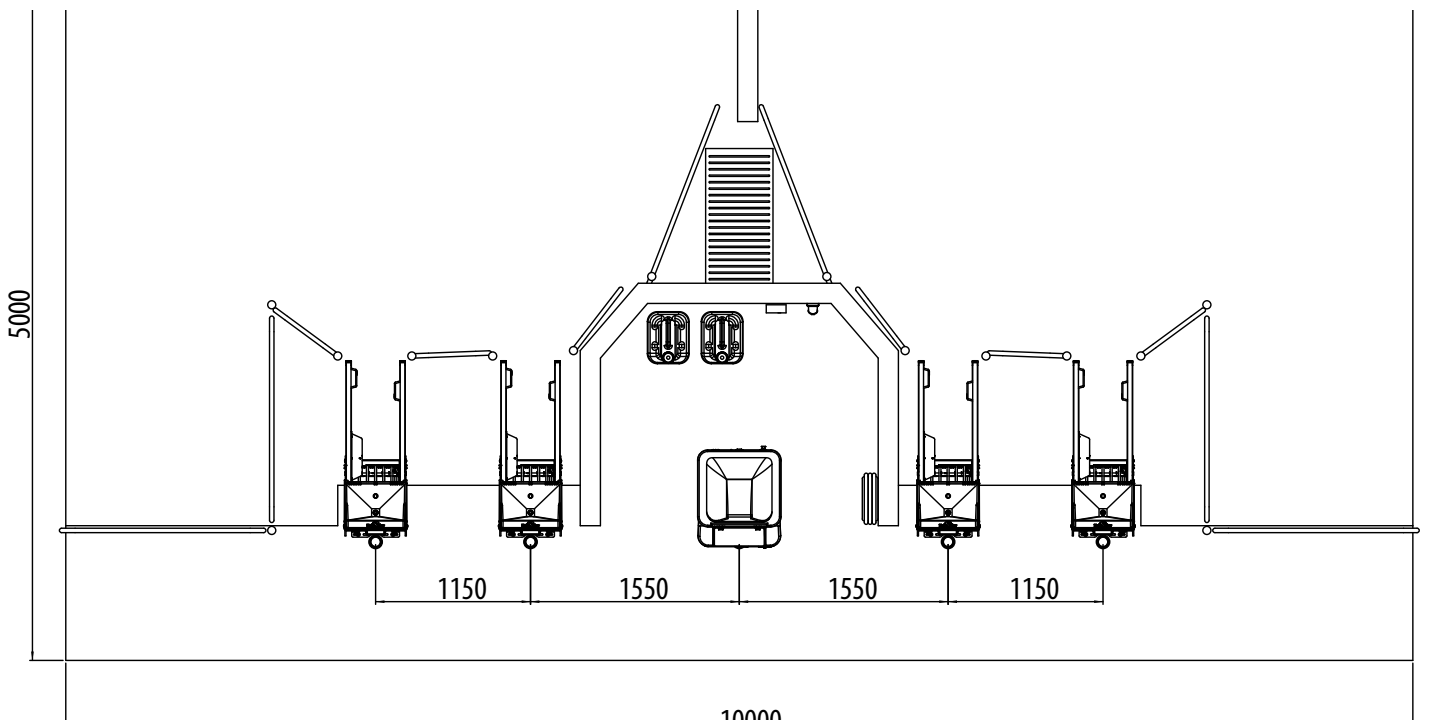
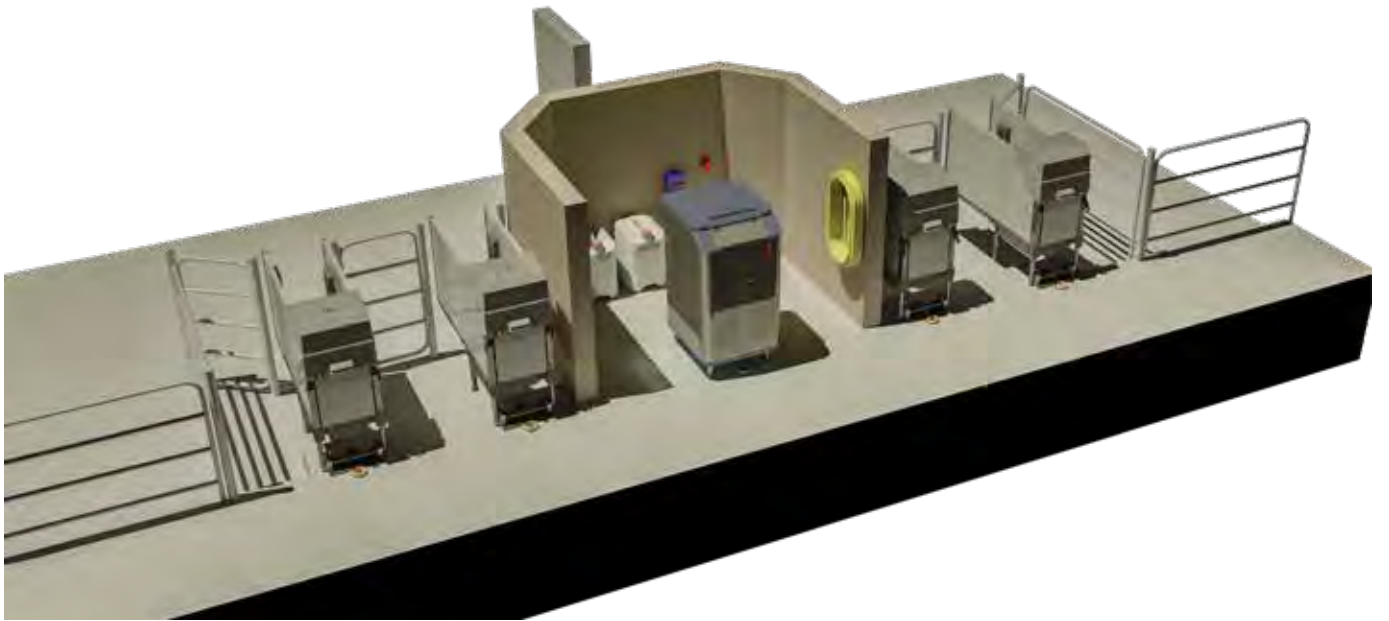
clean the surfaces quickly and easily.

- When planning the design and layout, be sure to allow enough space around the automatic feeders and HygieneStations. This will tremendously facilitate routine tasks later on, such as pouring milk replacer in the hopper, replacing worn teats and tubing, and performing the annual system maintenance. Space for two pallets should be provided for the milk powder. If whole milk is used, sufficient space must be provided for a suitable milk cooling tank (e.g. the DoubleJug).
- As far as possible, place and route the tubing to the teats, wiring and cables in underground conduits. To avoid rodent intrusion, make sure

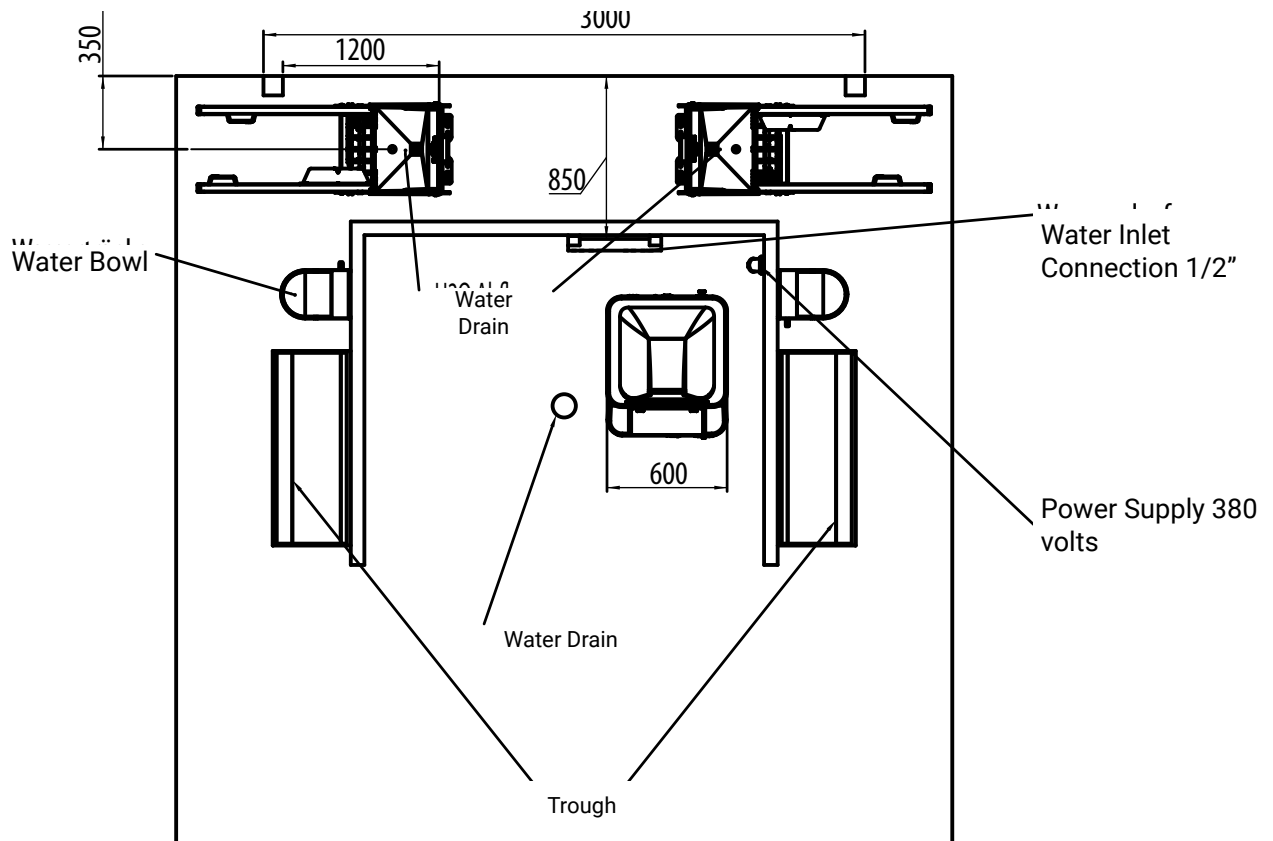
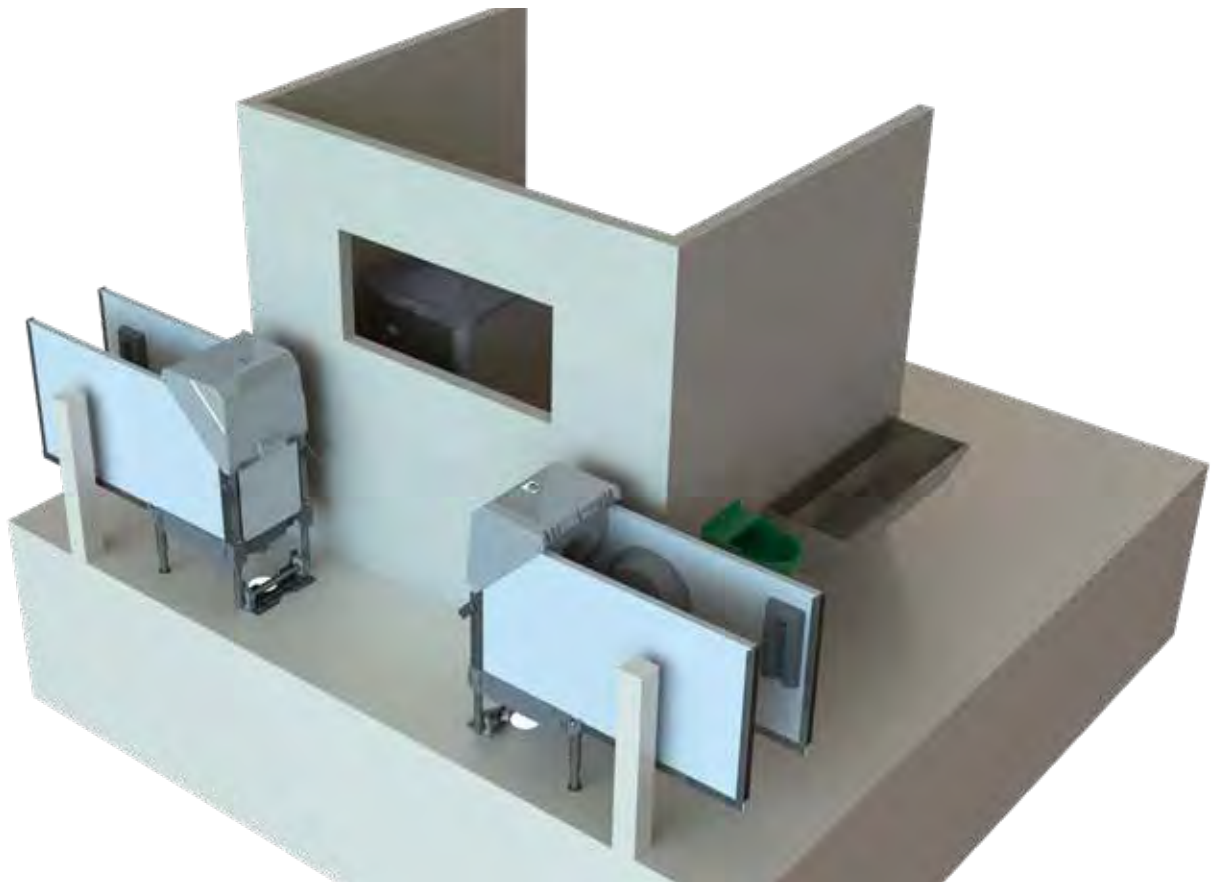
that the caps of the conduits are sealed.

- Directly at each hygiene station, you should install a water connection for the teat cleaning. This line can be integrated into the regular drinking water ring main used for the barn.
- In addition, you should install a lockable cabinet for medicines, tools, etc. If this cabinet is dry and dust-free, it is also the ideal space for the local CalfGuide server.
- From the CalfExpert, you should be able to look directly into the groups of calves. Then you can immediately compare the information from the lists with a glance at the calves.
- Although the automatic feeder is equipped with an anti-freeze function, you should additionally insulate the the tubing to the teats. Furthermore, ensure that the water supply line to the automatic feeder always stays frost-free.
- An entrance gate to the pen directly next to the feeder stall will allow you quick access into the pen during your daily calf monitoring rounds and can also speed up the process of teaching the calves how to use the system.
- Take into account future expansions of the automatic feeders. Prepare now for easy later installation of additional feeder stalls by reserving a place with a raised base and the empty conduits that will be required.

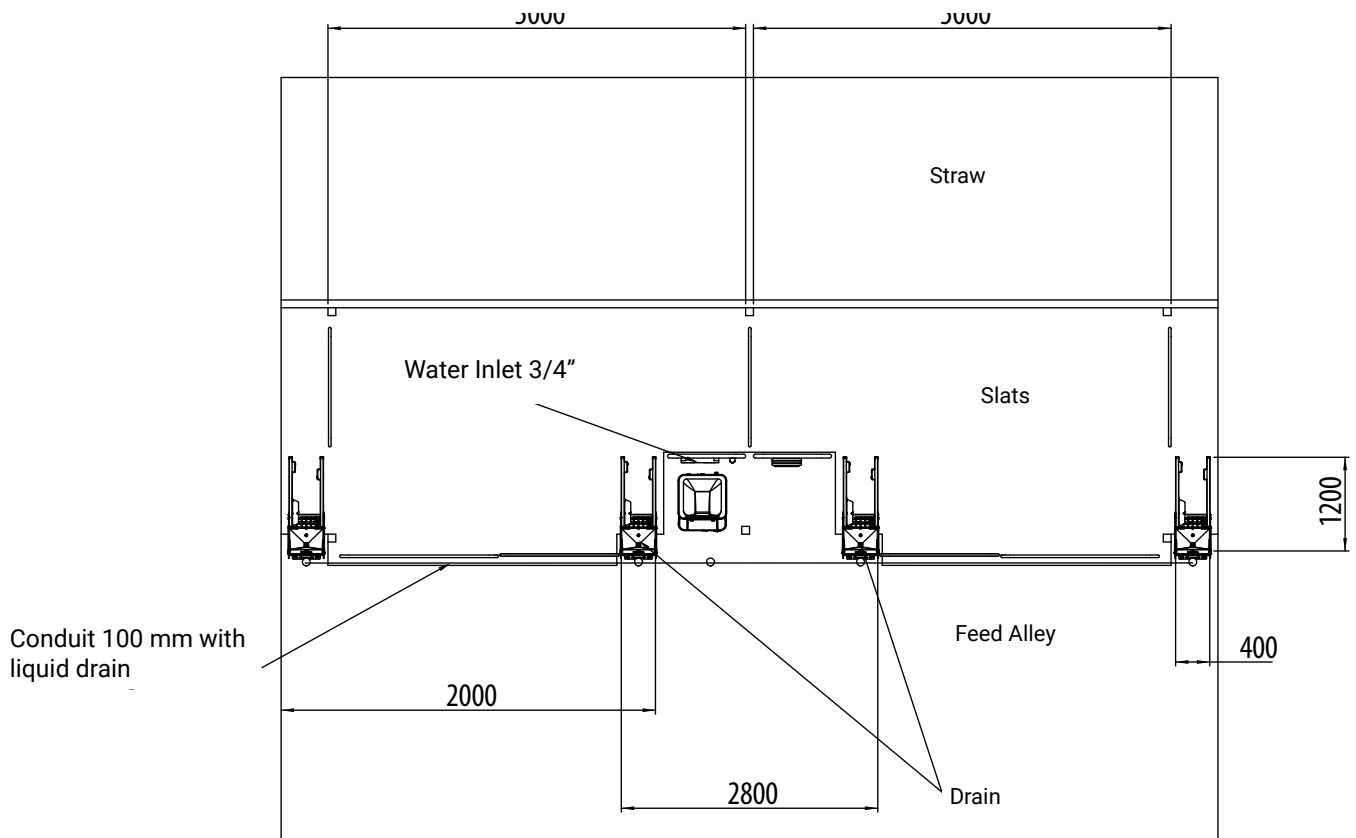
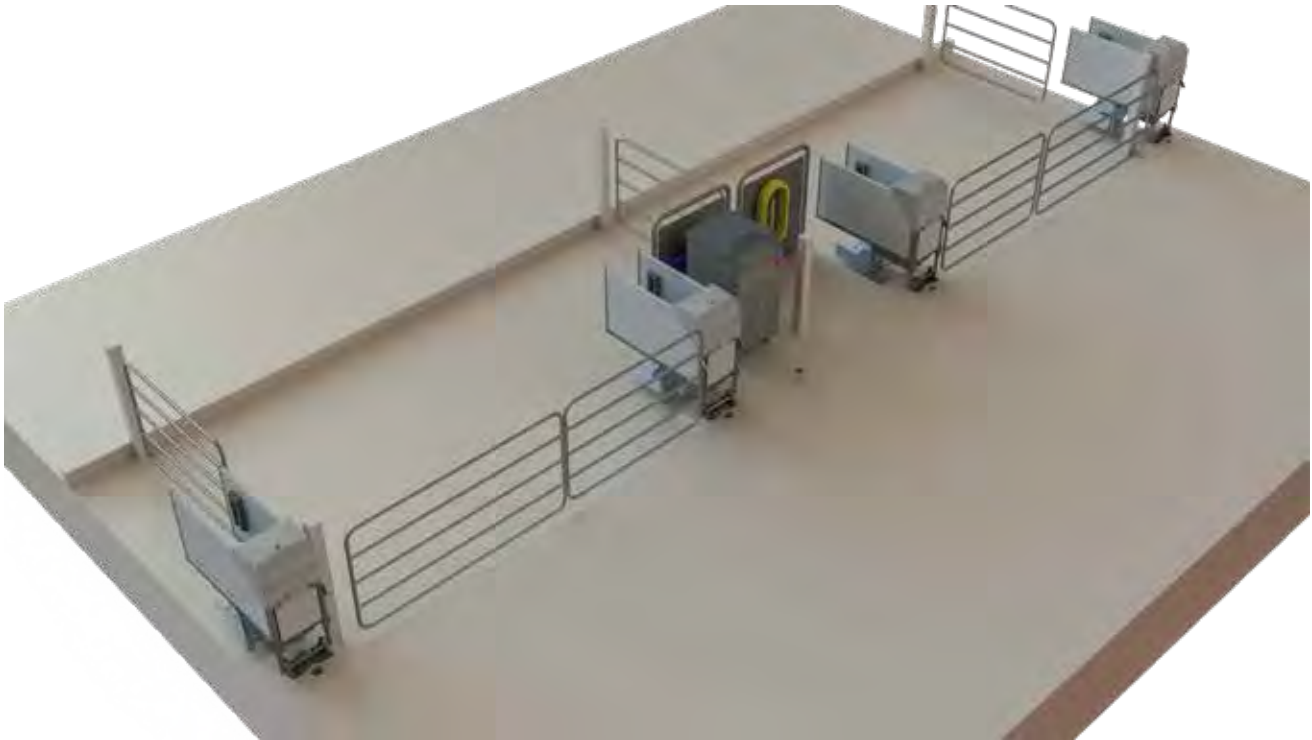
See the following pages for a few installation options for setting up the CalfExpert with the HygieneStations.



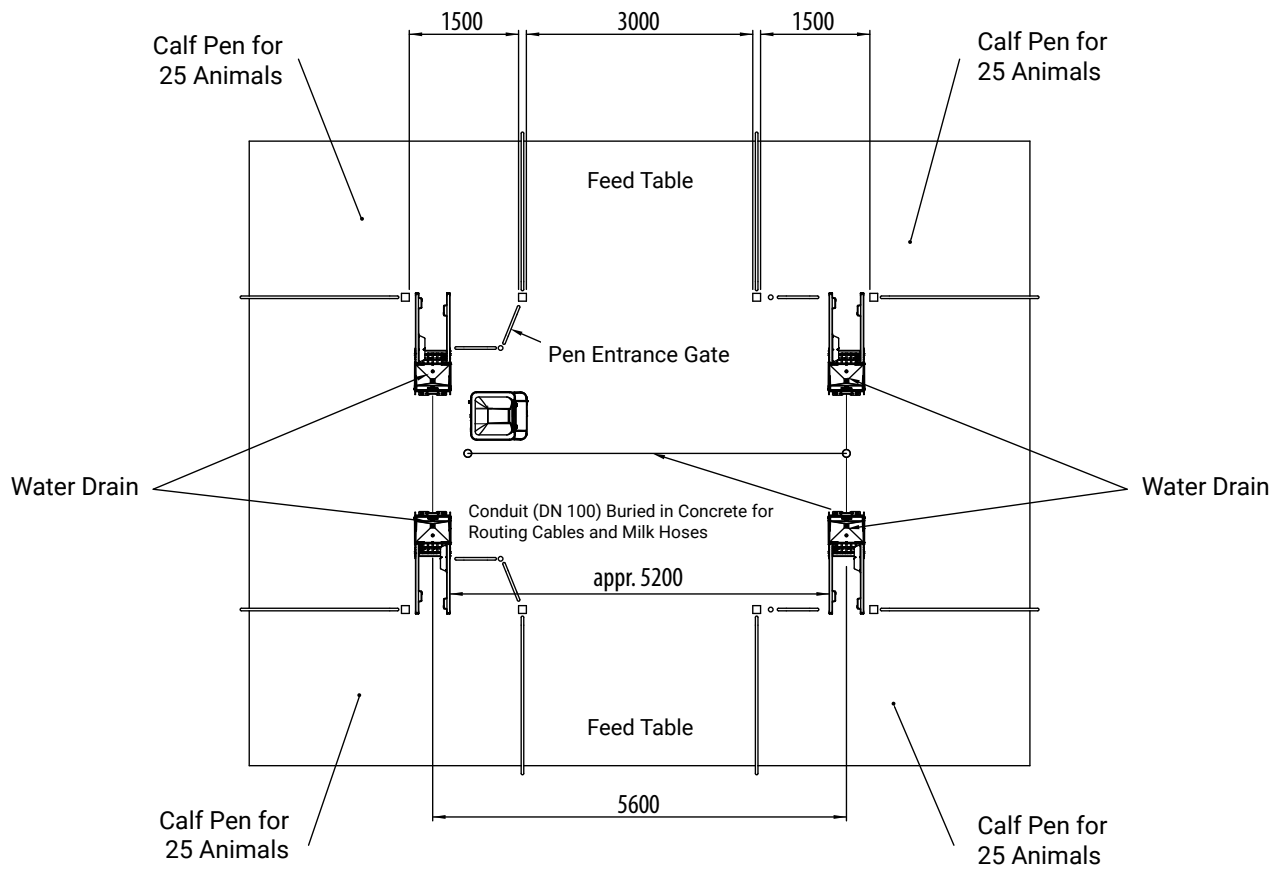
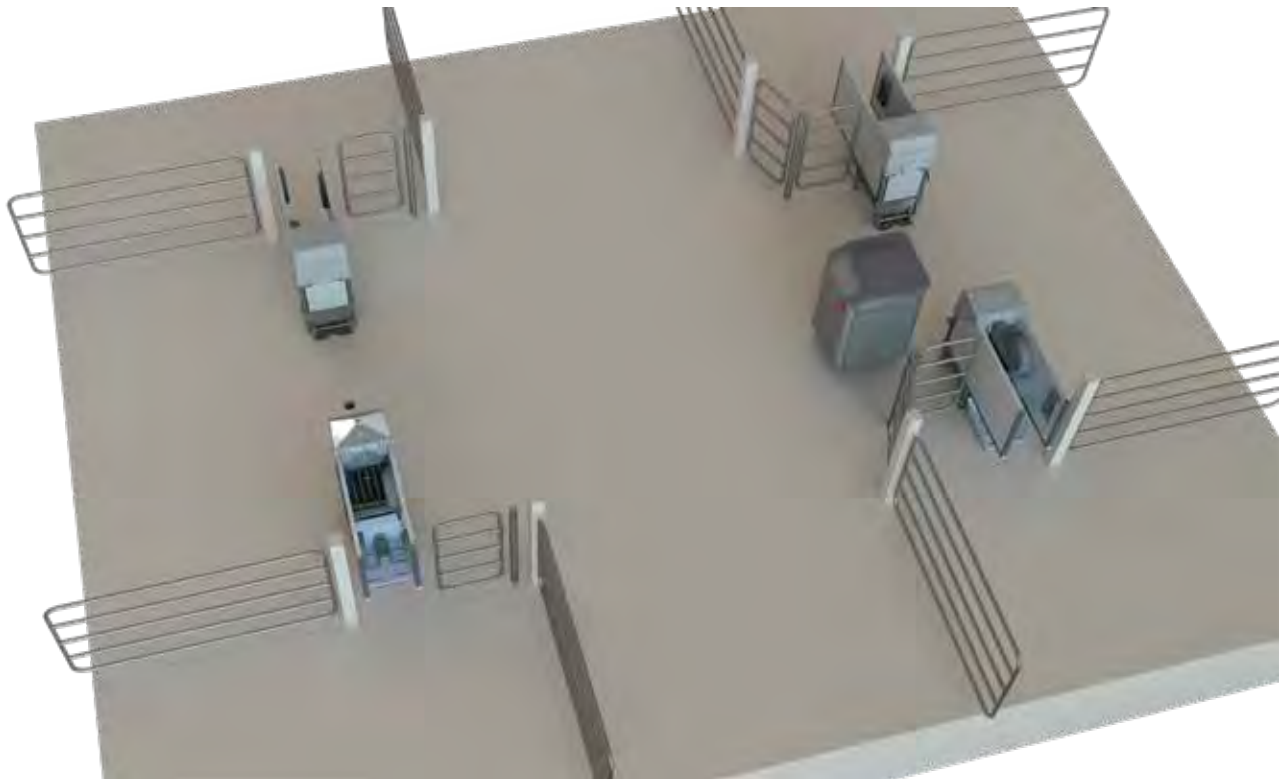
CalfExpert with 4 HygieneStations (two stations per group), access to the calf pen between the HygieneStations



CalfExpert (in the service compartment) with 2 HygieneStations outdoors



CalfExpert with 4 HygieneStations (one station per group), distance of farthest HygieneStation is 7 m



CalfExpert with 4 HygieneStations and central feed table



Calf Housing: Practical Tips

When should I take my calves to the outdoor housing facility?

It's best to do it right away, actually! Dry the calf properly after birth to avoid hypothermia, especially in the winter, and take it to the well-bedded individual igloo. It can be housed here during the colostrum phase, until it is fit enough to join the group and eat well. The best time to bring the calf into the group depends on the feeding program you are using. For intensive feeding (metabolic programming), we advise relocating the calf after approx. 3 weeks. If restrictive feeding programs are used, the calves can join the group after 7 to 14 days. It is important to note that the calves are sensitive to stress during this time, because the immunity boost of the first colostrum intake drops considerably and the calf's immunity is often not sufficiently developed yet.

Calf Rearing in the Winter

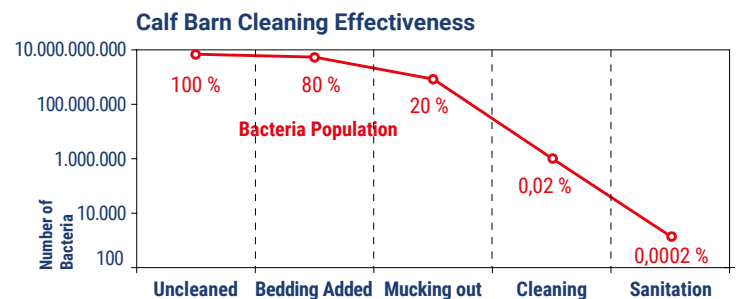
Do not be worried about low temperatures. The igloo housing has proven itself in very different climatic conditions worldwide. The calves adjust outstandingly well to their environment, even in the winter!

Please note the following important points:

- Get the calves used to the natural climate outdoors as early as possible (see above).
- Remember that more energy is required in the winter. Up to 40 % more energy must be fed to the calves via the milk diet when temperatures drop below the freezing point.
- Make sure that the bedding is always dry and add bedding material regularly. Dry bedding reduces the loss of energy that resting calves experience.
- Small, weak and sick calves should be additionally protected by having them wear a calf jacket. This body cover reduces the energy requirement that the diet must supply by up to 30 %
- Provide fresh water at all times in the winter, too. The water bowls should be heated.
- Offer your employees a warm jacket and gloves, the kind with removable fingertips. Keep in mind that people are much more affected by the cold than the calves they are attending to!

Effectiveness of Hygiene and Sanitation Measures on Bedding

Adding new bedding on top of the old bedding is just a superficial measure and merely creates the impression of cleanliness. Bacteria populations do not decrease much with this approach. Even mucking out only reduces the bacterial load by half. Only high-pressure cleaning, drying, and then subsequently disinfecting the surface provides real protection against high bacterial loads.



How do I clean my calf pens and igloos properly?

During the cleaning process, a high-pressure cleaner disperses large amounts of dirt and increases the ambient humidity in the calf barn. As this promotes bacteria growth, you should:

- Clean the calf pens and Igloos in a dedicated washing area away from the barn.
- Even with individual hutches, work according to the group-based all-in all-out principle, in order to be able to clean and disinfect the entire area.
- Only apply the disinfectant to dry ground and surfaces.
- Leave the cleaned and disinfected pen empty for several days and avoid contaminating (e.g. by animal traffic) a pen that was already treated.
- Apply an agent with a highly alkaline effect to the bedding (e.g. Desical®) to considerably inhibit bacteria growth!



Planning an Igloo Housing

What advantages does igloo housing have over a conventional pen?

Outdoor housing is the form of calf housing with the lowest germ and bacterial load. The wind blows all of the harmful gases and bacteria out of the calf area, and thus ensures a healthy environment for the calves.

Pens with natural or forced ventilation have an enormous germ and bacterial load in the breathable air. The following table shows what loads can be expected¹:

	Bacterial Load in Colony Forming Units (CFU) per m ³ of Air
Outdoor Air	100 - 1.000 KbE / m ³
Clean Office Air	1.000 - 2.000 KbE / m ³
Well-ventilated barn	10.000 - 15.000 KbE / m ³
Calf Pen in Calf Area	25.000 - 3.000.000 KbE / m ³

Conventional calf pens are therefore highly contaminated with harmful gases, germs and bacteria. Of course, they can be optimized with a good ventilation system (hose ventilation has proven successful), but they cannot reach the low levels of outdoor air.

Furthermore, the igloo housing, whether permanently installed or mobile in the form of the Veranda or CalfGarden, is a very cost-effective solution. For example, while a Holstein calf barn can easily cost 1,500 - 2,500 euros per calf space, the IglooSystem costs 650 - 850 euros per space.

The mobility of Verandas and CalfGardens also offer an advantage for farms that are continuously expanding. Because where the calf pen is today, a new cow barn or feeding hall may be built tomorrow. No problem with the mobile systems.

To help with planning your igloo, we have compiled the following tips:

How do I position the igloo with respect to the wind direction?

Since the H&L Igloo is protected on more than three sides, the wind direction is of secondary importance. However, the following points should still be considered when planning your igloo housing:

- Position the igloo in such a way that one of its sides faces the prevailing wind direction (e.g. when west winds prevail, the entrance should face north or south). This will ensure continued protection of the micro-climatic area even when the wind turns and blows from the opposite direction.
- Make sure that the igloo is adequately covered, so that precipitation is kept away from the area where the bedding is and does not penetrate it. In addition, a roof will shade the igloo and help it from heating up as much on hot summer days. Based on all these considerations, the ideal set-up would be a west-east orientation of the roofing structure, with the igloo positioned north of the roof.
- Always take the local conditions and setting into account. Buildings, hedgerows or trees may affect the way the air moves and make the wind suddenly blow from another direction.

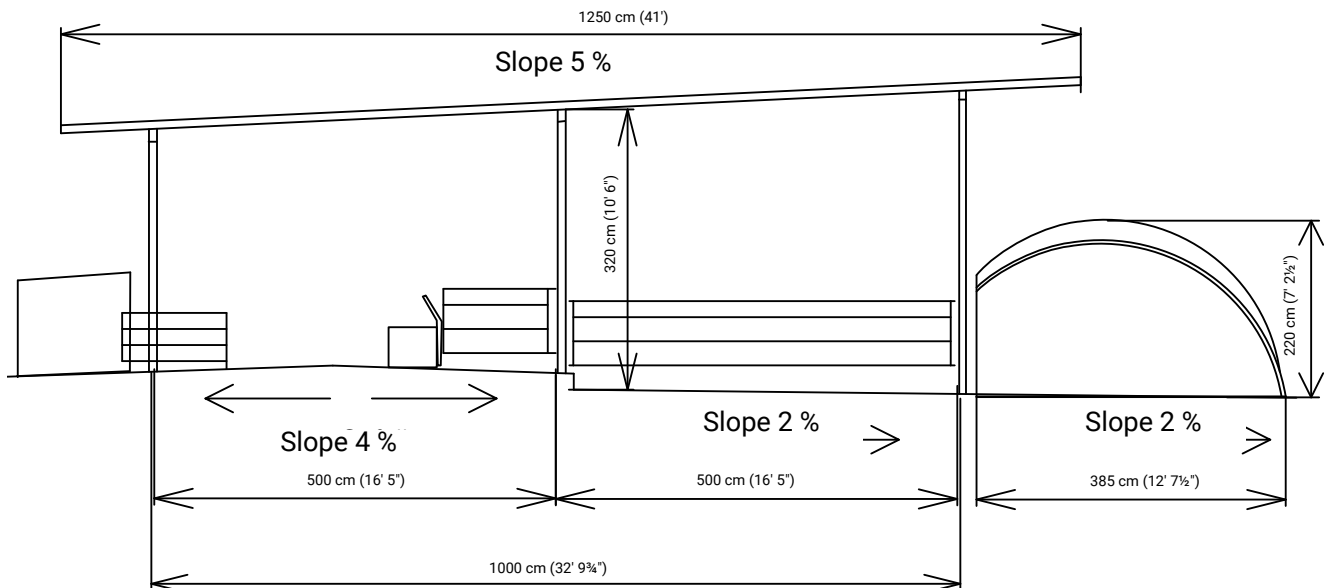
Is it necessary to protect the outdoor resting area in front of the igloo?

If you provide a sufficiently large roof overhang (roof overhang approx. 1 m for a roof height of 3.5 - 4 m), precipitation will not be a problem in most cases. Even in very windy locations, you should not wall up or close the sides of the IglooSystem, since that might channel the wind in the wrong direction. With each closed-in wall, fewer harmful substances are carried out and less fresh air is supplied.

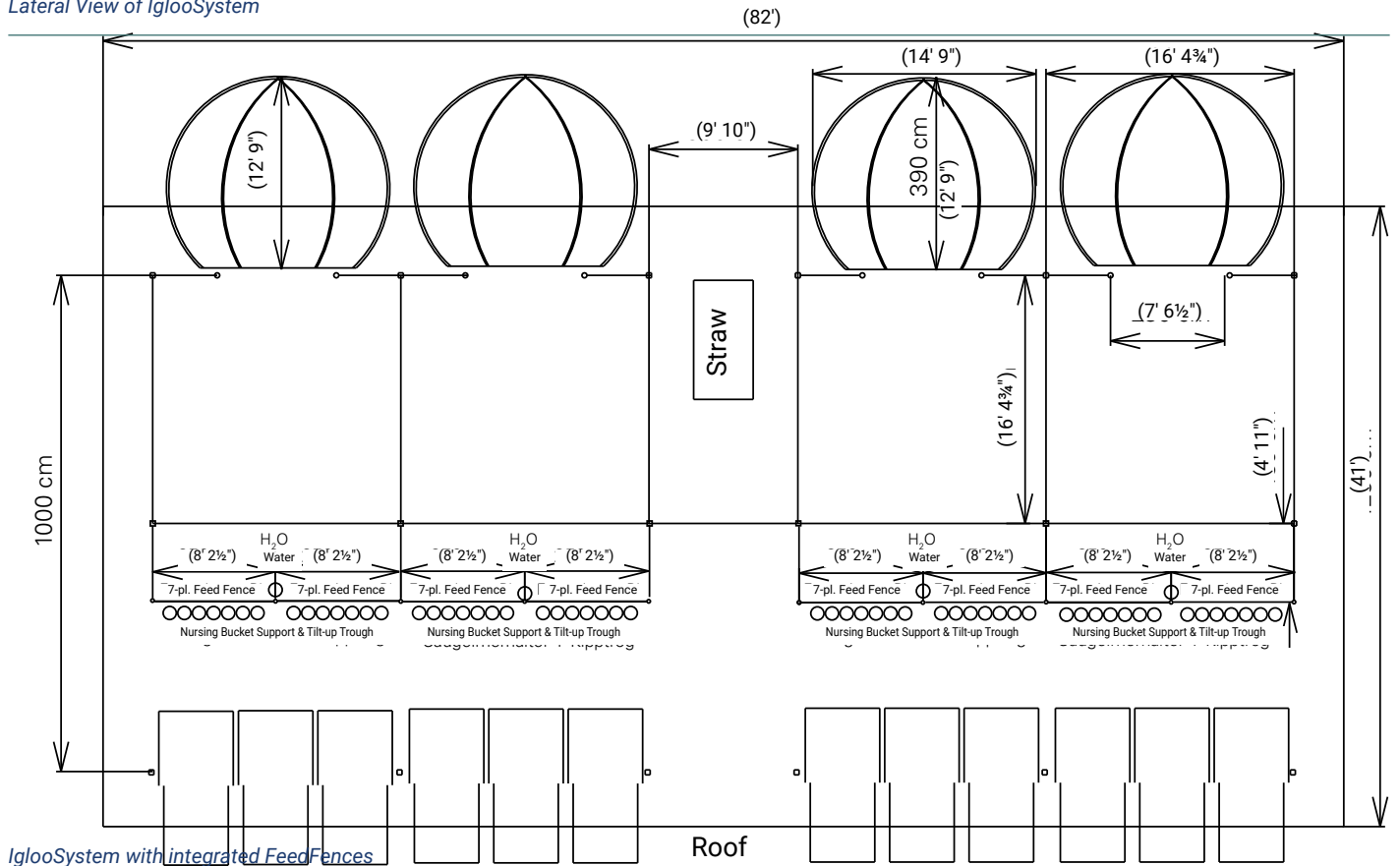
If extreme draughts occur, a proven method is to shut off the resting area up to the height of the fencing. With this design, the resting calves are protected, but the wind continues to ensure good air quality inside the "barn".

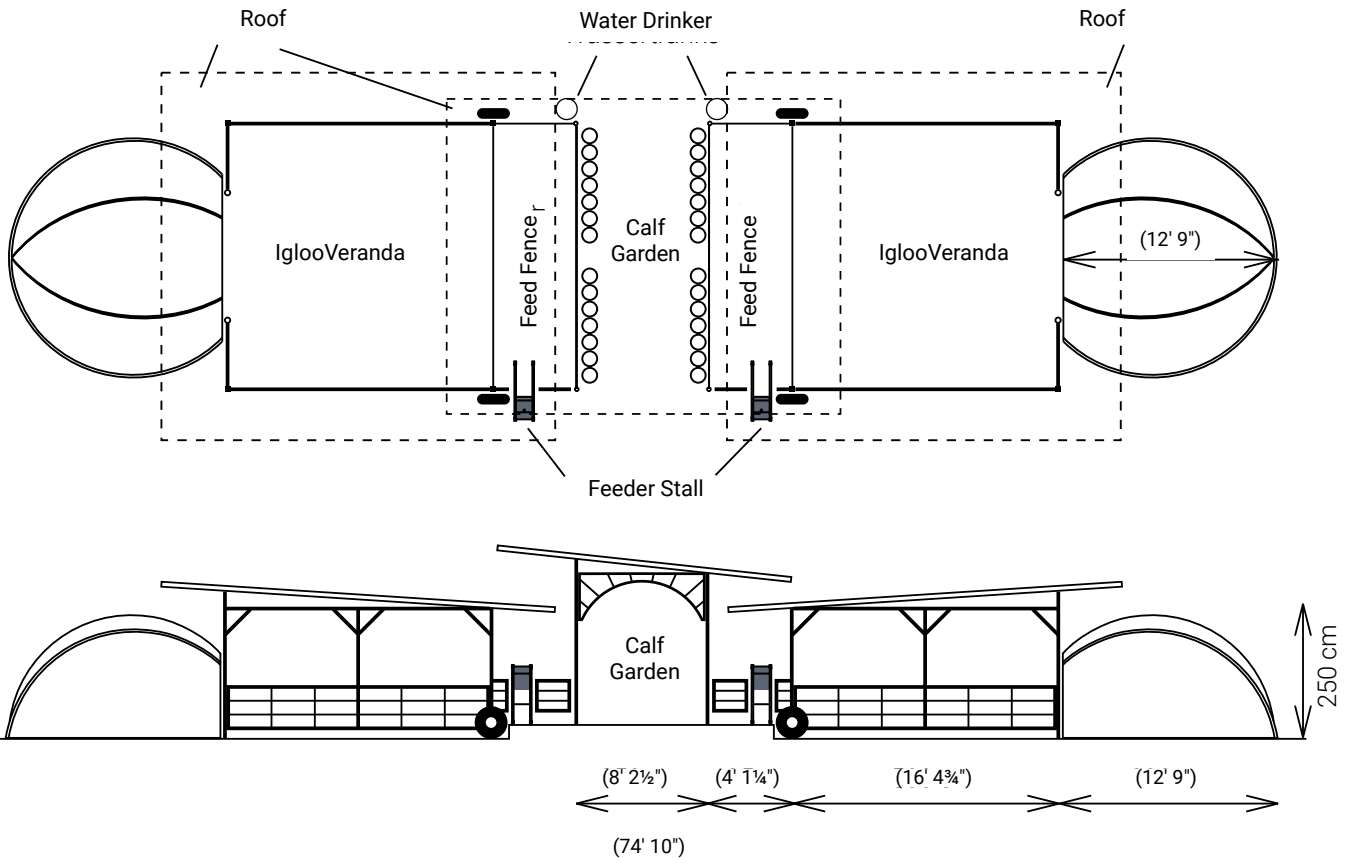
On the following pages, you can find some drawings illustrating various igloo housing layouts. If you are planning to set up such a housing system, please do not hesitate to contact your local H&L partner. He or she will be happy to assist you.

¹ Prof. Dr. Ken Nordlund, University Wisconsin, Madison, USA, 2014

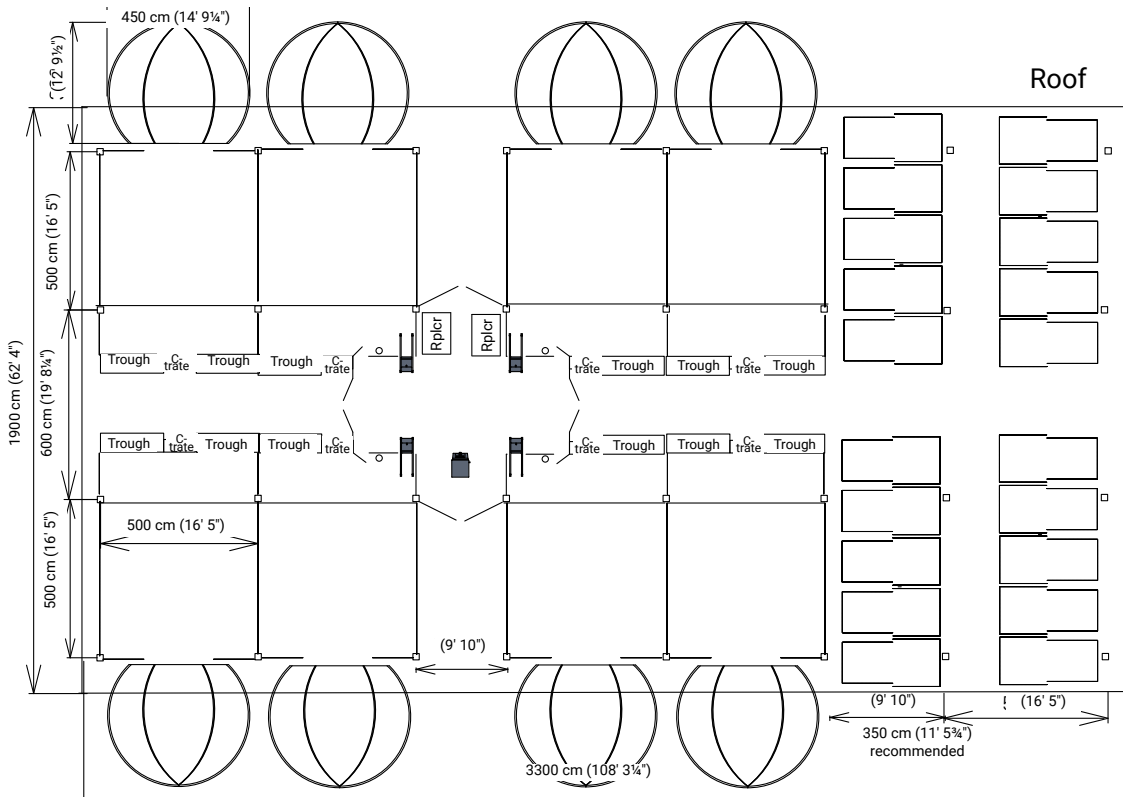


Lateral View of IglooSystem





Smart solution: A combination of IglooVeranda and CalfGarden to include an CalfExpert



IglooSystem for 140 Calves



Service, training, events

We want our products to make your daily work in the calf barn more successful and less strenuous. But that is not the whole story! For you always need humans to put successful concepts into practice. Therefore, we care enormously for all people who contribute to your success in the calf barn.

Your dealers/our sales partners

Our goal is to offer customers everywhere in the world, or at least in regions where calves are raised, the same highly professional advice that our customers next door, in Northern Germany, have come to appreciate. To be able to guarantee this quality, we have established a strong global dealer network and we invest regularly in their training.

Your contact in an emergency/our service partners

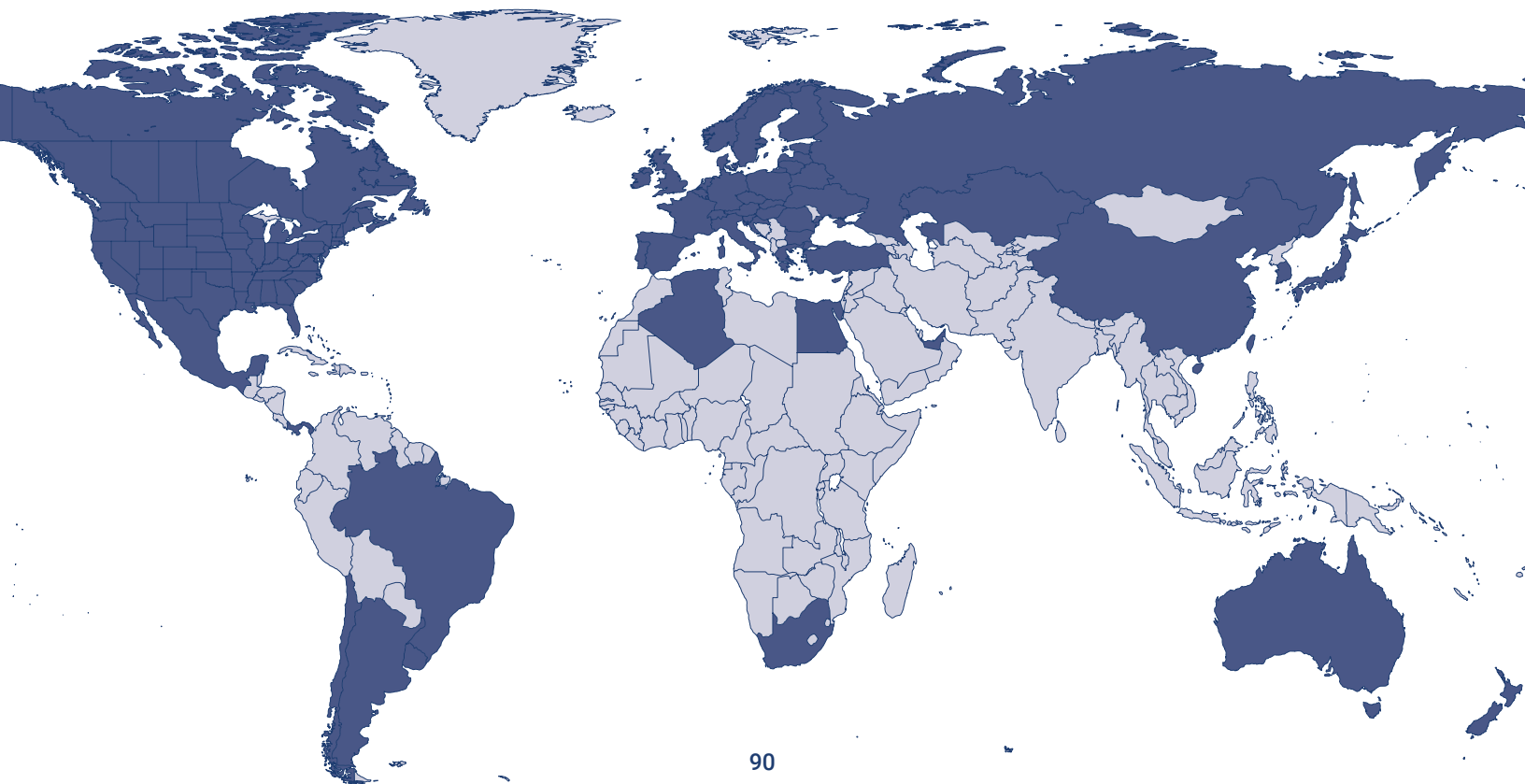
Even the best appliances need regular maintenance. Our service partners in your region are in charge of this and make sure that your operation can be run without a hitch. Every service person in the world

who looks after your H&L product was trained by us, attends regular advanced training classes, and can access our multilingual, on-line service portal with an expert knowledge base that assists in troubleshooting and provides all the necessary documentation. Of course, all service partners work in close contact with us and have the full support of our own service team. Working together, we find a solution to every issue!

You/our customers

Our calf handbook, study trips for our customers, lecture events on topics of modern calf rearing...

In everything we do, we try to give you suggestions and ideas to facilitate an even more professional approach to calf rearing. Contact us or the regional dealer to learn what is available in your vicinity. Or take a look at our website www.holm-laue.com where we regularly inform you about all our news.





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