



Calf Handbook

Information for Healthy and
Performance-Aware Calf Rearing



H&L MilkTaxi



CalfExpert with HygieneStation



Calf Star Milk Jug

"Innovative Products – Healthy Calves"





CALFEXPERT	8
Individual animal feeding	10
Flexible feeding programs.....	11
Clean & reliable.....	12
Smarter work – better performance.....	13



HYGIENESTATION	14
Ideal calf health.....	15
Reduced workload.....	15
Control according to weight	16
Keeping track of everything	16
Further HygieneStation options.....	17



DOUBLEJUG	18
DoubleJug – unique in whole milk storage.....	19
Options and Features.....	20
Technical Specifications	21



CALFGUIDE	22
Data collection	23
Data processing and analysis	23
Current calf data	24
Support tools.....	24
Cross-system networking	25



MILKTAXI	26
Simpler preparation.....	28
SmartMix.....	28
Better feeding	29
SmartID	29
Easy Transportation	30
Pasteurization	30
Comfortable work.....	31
Options and Features.....	32
Technical Specifications	33



CALF-STAR DISPENSER TANKS	34
Feeding calves in buckets or bottles is easier with the UTV Dispenser Tank.....	35

CALF-STAR CALF MILK PASTEURIZER	36
MiniFlash – efficient pasteurizing	37
Medium frame.....	38
Large frame	39



CALF-STAR MINI BATCH	40
Good start with MiniBatch	41
Pasteurizing Colostrum in the MilkTaxi.....	41



H&L IGLOO **42**

Healthy Micro Climate 43
 The Flexible Problem Solver 43

H&L IGLOO VERANDA **44**

Focus on Animal Welfare and Wellbeing..... 46
 Easy & Economical..... 46
 Options and Features..... 47
 Technical Specifications 47

WEIGHTCONTROL **48**

Decisions are taken on the basis of information 49
 Just the right application..... 49

CALF HEALTH **50**

RT10™ Cow-Side SCC 51
 Why Somatic Cell Count is Important..... 51
 Calf-Star Calf Jacket 51
 Calf-Star Bottle Washer 52
 Calf-Star Pail Washer 52

CALF FEEDING SPECIALIST ARTICLE **54**

COLOSTRUM MANAGEMENT..... 54
 Higher Milk Yield Through Early Metabolic Programming 55
 The Digestive System of a Calf 56
 Excursus: “Ad Libitum Feeding”..... 57
 New Recommendations for Calf Feeding Using Automatic Feeders 58
 “You can’t manage what you can’t measure.” – Peter Drucker..... 60
 Pasteurization of Whole Milk..... 62
 How do I set up my barn for installing and using an automatic calf feeder?..... 63

LAYOUT EXAMPLES FEEDERS **64**

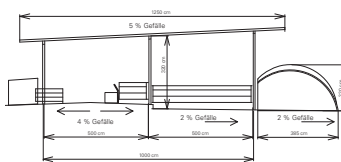
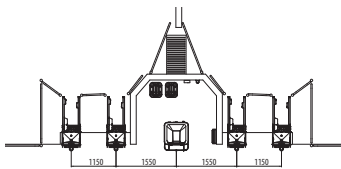
CALF HOUSING SPECIALIST ARTICLE **68**

Calf Housing: Practical Tips..... 68
 Planning an Igloo Housing 69

LAYOUT EXAMPLES IGLOO BARN **70**

SERVICE **72**

Service, training, events 74
 Digital goodies for you 75
 YouTube and Facebook..... 75



"From now on, it is about me... and about you!"





Holm & Laue company grounds in Westerröföfeld



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 provide 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 rearing handbook is meant as an overview of our work. We look forward to a productive co-operation.

Hans-Joachim Laue

Hans Joachim Holm



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 from Germany. Calf-Star is the North American distributor for the H&L 100 automatic calf feeder 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!



CALF FEEDING SOLUTIONS

Custom made for your farming needs!

Greg Abts



CalfExpert

The new trendsetter among calf feeders

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 new feeder to the market and sets new benchmarks. The result: even more intelligent, 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 programming 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.







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 pool of milk. In milk stored this way at 40 °C (104 °F), 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 pool has another decisive disadvantage: modern feeding programs (e.g. the metabolic programming) require a higher CMR concentration at the start of rearing (e.g. 160 g/l) to give a power pulse. In the weaning 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: feeding at the same time yet still flexibly

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 milk pooling 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: an extremely uniform, relaxed group of calves!



Milk reduction process

The CalfExpert is very gentle as it prepares the calves' transition to concentrate and forage feed. At the end of the milk diet stage, it reduces the allocated quantity in small steps of 0.2 l per day, thereby stimulating 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 possible feeding program can be implemented. 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 weaning for calves e.g. after an ad libitum phase confronts 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.



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 steplessly controlled 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, no matter how long the calf needs.



Specific additive feeding

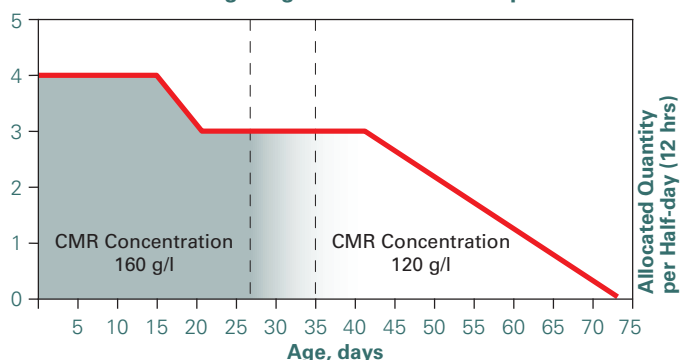
Minimal doses of feed additives can be added to the milk diet in order to stabilize the gastro-intestinal system. Medicines can be added to the milk diet of sick calves, or electrolytes can be supplied with a specific dietetic program. You can use two powdered additive dosers and two liquid dosers. As with the milk program, you can program different feeding curves for these additives as well. This means maximum flexibility for top calf health!



EvenMilk: intelligent whole milk feeding

Whole milk is ideal for calves to digest and leads to top performances. With the CalfExpert whole milk program you can set whole milk proportions or supplement the whole milk in the feeding program flexibly. What happens with your feeder when the whole milk supply has been used up? Does it then feed powdered milk? This causes changeover stress with your calves and is likely to cause digestion problems. "EvenMilk", our intelligent whole milk control, knows how much whole milk is available and how much is to be fed. It makes sure that whole milk and CMR are mixed in balanced proportions even when whole milk quantities fluctuate daily.

Metabolic Feeding Program with the CalfExpert





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 barn, like the CalExpert does.



Tube 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 CalExpert 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 optimize cleaning even further, the CalExpert 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 CalExpert generates automatic messages as soon as a canister is empty.



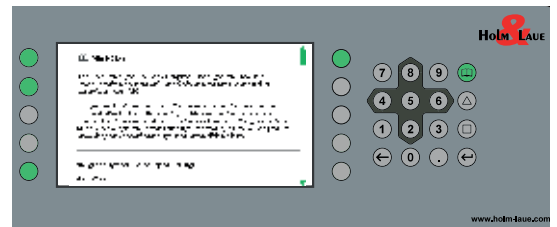
Fly shield as standard

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.



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.



Ready to work whatever the weather

Calves love the outdoor climate, your CalExpert 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 CalExpert mixing chamber measure the ambient temperature and then adapt the mixing temperature and intensity of the anti-freeze program accordingly. You can wash 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 CalExpert 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 CalExpert 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.



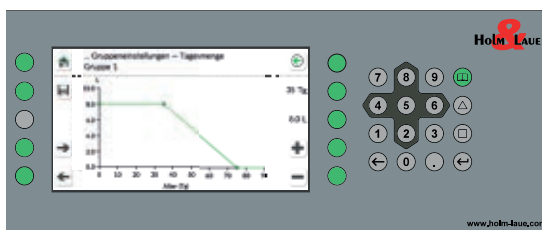
SMARTER WORK – BETTER PERFORMANCE

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



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.



More income thanks to improved performance

Calves which are 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. In turn, this provides you with the possibility of selecting your offspring systematically and selling off 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.



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.



Automated work routines

With the CalfExpert, all employees know when they have to do what. 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

The optional CalfGuide software, with the CalfGuide Cloud on request, makes things even more convenient. Here, calf data can be evaluated even more clearly, information supplemented and exported later. Further information can be found from page 22 onwards. CalfGuide also offers helpful "To-do management" and tells you or your employees in the morning what jobs need doing during the day.



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.



HygieneStation

New hygiene standard for automatic calf feeders

So far we have learned that the CalfExpert always mixes fresh, 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 a new benchmark, not only in terms of hygiene but also by making work easier.





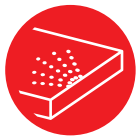
IDEAL CALF HEALTH

Do you know where the highest germ count can be found in the calf pen? 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 training 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.



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 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 scale not only detects growing calves, it registers a decline in growth. This information is used to keep separate alarm 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.

Find more information about this topic in the article on pages 72/73!



KEEPING TRACK OF EVERYTHING

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. In addition, you can read off the remaining quantity and the alarm status. At the push of a button you can also have the calves with credit or alarm displayed sequentially. This means it is no longer necessary to move constantly between the calf pen and the CalfExpert display. It is also possible to stir an extra mix for a calf directly at the HS display, and feed this or pump it into a bucket.



Credit and alarm status

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.



Would you like some more?

It is also possible to stir an extra mix directly at the stall via the HygieneStation display, and feed this or pump it into a bucket.



FURTHER HYGIENESTATION OPTIONS

Several equipment variants of the HygieneStation have already been presented. You will find a few more helpful options below.



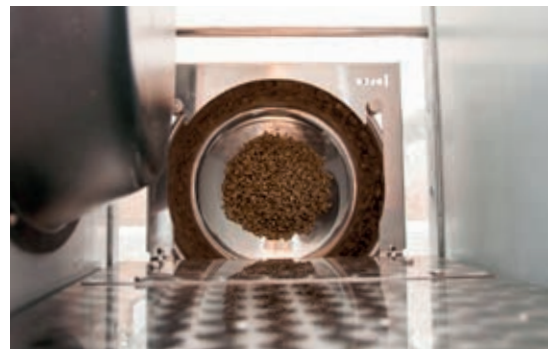
Milk pump valve

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 tap 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.



Concentrate feeder stall

Alongside the HygieneStation, concentrate feeder stalls can feed concentrate or cereals to the calves. How much feed each calf has eaten is precisely recorded, since residual quantities are taken into account. A particularly interesting aspect is that individual weaning off milk according to the current consumption of concentrate is possible too. So calves whose digestive system has already adapted to the consumption of dry feed can be weaned off milk at an earlier stage, leading to significantly reduced feed costs.





DOUBLE MILK JUG 

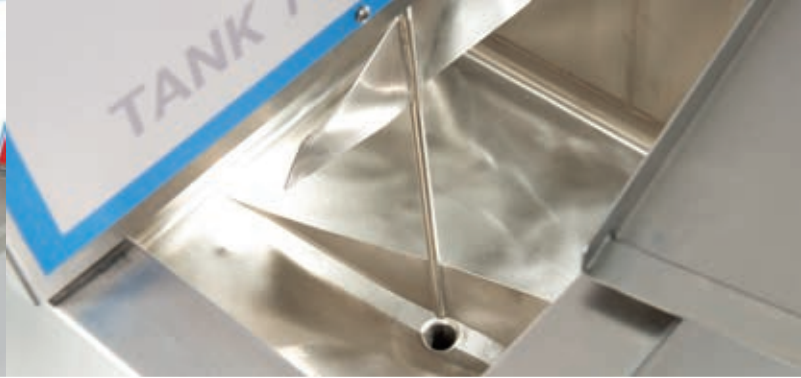


The dilemma of whole milk storage

Whole milk feeding is becoming more and more 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 refilled and cleaned. This is often simply drained. 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 Cal-fExpert. Find out on the next page how the DoubleJug solves all the problems described above.



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 and in CalfGuide at any time. There is an information unit attached directly at the DoubleJug which indicates the most important information such as temperature, filling 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 quantity 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 room

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

- Double tank system with
 - AutoFill function: when one tank becomes full during filling, the system automatically switches to the other tank.
 - AutoEmpty function: when one tank becomes empty, the DoubleJug automatically switches to the full tank.
- Fast cooling to reduce bacteria growth in the insulated tank.
- Ideal for the CalfExpert, but also for other calf feeders.
- Clean-in-place washing program (CIP system); 10 minutes washing cycle.
- Digital tank control via the CalfExpert (synchronization of the cleaning cycles of CalfExpert and DoubleJug).

Technical specifications DoubleJug*

Power supply	240V, 16 Amp
Water supply	Hot and cold water necessary
Drain	Floor drain necessary
Dimensions 2 x 100	1.63 x 0.66 x 1.57 m (64"L X 26"W X 62"H)
Dimensions 2 x 200	1.63 x 0.87 x 1.55 m (64"L X 34"W X 61"H)
Space requirement	2 x 1 m

* Technical specifications subject to change!



OPTIONS AND FEATURES

Basic version

- 1 PowerMixer with SoftStart logic and heater
- Milk freshly prepared on an individual basis for each animal
- CalfExpert feeding software with integrated operating instructions and help functions
- 7" display with SmartKeys
- 8 feeding curves pre-set (incl. 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 storage 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
- Flexitime 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

Options

HygieneStation

- Up to 4 feeding stalls per CalfExpert possible
- Pump as an automatic and manual training tool for calves, as it delivers milk diet to the teat
- Anti-pirate valve to prevent stealing of milk
- Distance of up to 7 m between feeder and stall possible
- Animal recognition via H&L collars or ISO-compliant ear tag identification (half-and full-duplex mode)
- Can be tilted away for mucking out
- LED teat lighting
- Saliva bowl

Teat cleaning

- Teat is rinsed by water following every visit

HygieneStation display

- Display of animal number and alarm status
- Indication of alarm and credit calves
- Release of an extra mix

Animal weighing scales

- Forefoot weigh scale in the feeder stall for individual calf management and individualized weaning function

Concentrate feeder stall

- Concentrate feeder stall with recording of quantities and weaning function

CalfGuide (available from Spring 2019)

- Management software with own server
- Bidirectional control of the CalfExpert
- Locally functioning variant (without internet), integrated Cloud connection

CalfGuide app (available from Spring 2019)

- The most important information on your smartphone
- Push messages for warnings (e.g. CMR empty soon)

Second PowerMixer

- Simultaneous feeding of two calves
- With SoftStart logic and heater

QuadroFlex (available from mid-2019)

- Simultaneous feeding of 4 calves, with flexible adaptation to individual calf needs

Additive doser

- Two powder dosers for powdered additives and medicines, with dietetic program to prevent diarrhea
- Two liquid dosers for liquid feed additives and medicines

Extension of powder chamber

- Stacking frame for another 25 kg CMR (filling height 138 cm (4.5'))

Whole milk diet options

- Whole milk system for variable dispensing of whole milk percentages from 35 - 100 %, equipped with an effective heat exchanger spiral and automatic cleaning as standard

DoubleJug milk cooling tank

- Double cooling tank (2 x 50 gallon, 2 x 100 gallon, 1 x 150 gallon, 2 x 300 gallon)
- Control via the CalfExpert
- Fully automatic cleaning of the supply line



TECHNICAL SPECIFICATIONS

Technical specifications CalfExpert*

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	24 gallons / 110 lbs
Powder filling height	3.5'
Heater capacity	3 gallons
Dimensions of CalfExpert (w x d x h)	1.9' x 2.3' x 4'
Space requirement for CalfExpert	3' x 3'

* Technical specifications subject to change!

Technical specifications HygieneStation*

Power supply [VDC]	24 V
Water inlet	½"
Optional teat and grid rinsing Permissible water pressure	1.4 - 8.2 bar
Weight of fully equipped HygieneStation	approx. 110 lbs
Permanent sound pressure level	< 70 dB
Dimensions of HygieneStation (w x d x h)	1.54' x 4.3' x 3.5'
Space requirement for HygieneStation	1.6' x 7.5'

* Technical specifications subject to change!





CalfGuide

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.



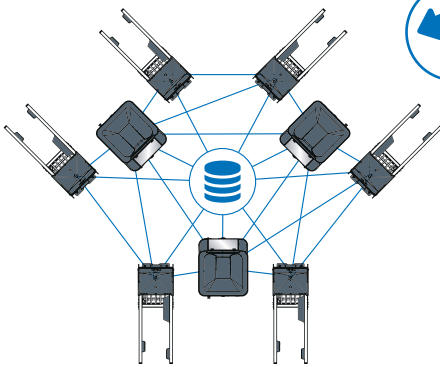
DATA COLLECTION



MilkTaxi: Check on the status of the MilkTaxi and configuration of feeding curves and box data



WeightControl: Recording of weights and other data e.g. at birth, determination of daily weight increases



CalfExpert: Detailed feeding history for all calves and networking of multiple CalfExperts



Work assignments: Preparation and planning of routine activities and current activities every day

DATA PROCESSING AND ANALYSIS



CalfGuide browser: Convenient control of all devices from the office or via mobile devices



CalfGuide Cloud: Completely flexible access to all data from anywhere



CalfGuide app: Selected CalfExpert parameters directly on your mobile



External interface: Data exchange with other herd management programs



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 done, the configurations are automatically applied by 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 CalfExpert 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.



Pasteurization Log

Pasteurization is a particularly delicate process, because the quality of the milk can suffer from temperature problems in the process. With the CalfGuide you are on the safe side, since it always records the exact temperature profile for you and indicates whether any discrepancies have occurred.



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.



Networking of several MilkTaxi and CalfExpert calf feeders

CalfGuide is the central interface in the calf barn. Once a calf is registered in the system through an electronic ear tag e.g. after birth at the WeightControl animal weighing scales, the data is imported on to every device the calf is logged at. Even if the calf moves from one CalfExpert calf feeder to the next, feeding will continue at the next CalfExpert at exactly the right point on the feeding curve and all data already recorded is imported.



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 watch 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.



Communication with external herd management systems

The importance of calf rearing for the performance of the animals in later life is well known and described in detail in this manual. So it makes good sense to export the most important information about your calves to your herd management program for cows after rearing them. CalfGuide offers a wide range of export protocols for this.



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.

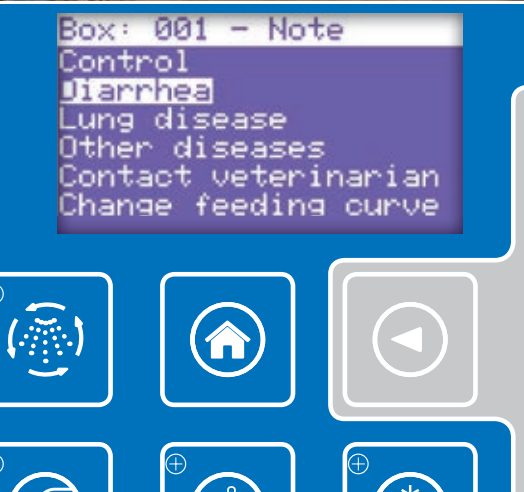
Today, helpful extras such as the electrical drive, the wireless-controlled dosing pump, the possibility of pasteurizing and cooling, the hot water heater and the drenching probe for cows have made the MilkTaxi an indispensable tool for modern dairy farms.

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 igloo 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 supplementing through 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.





Innovation Award EuroTier 2016
from DLG for the MilkTaxi 4.0



Innovation award from publisher div for
the piglet MilkTaxi in the pig feeding category



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.



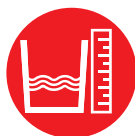
SMARTMIX

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.



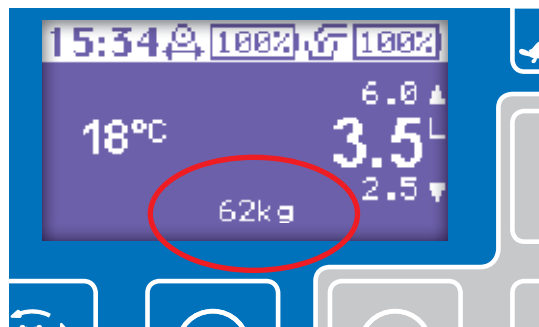
Mixing calculator calf milk replacer

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 (26 gal) water is less than 120 l (31 gal) milk (namely 114 l (30 gal)). The MilkTaxi 4.0 automatically corrects this fault.



Exact filling level display

The MilkTaxi automatically recognizes 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 33' 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 pasteurising 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

When feeding the calves, you constantly ask the question: How old is the calf and how much milk does it get? Say goodbye to this task, because the MilkTaxi recognizes every pen and the age of the calf!



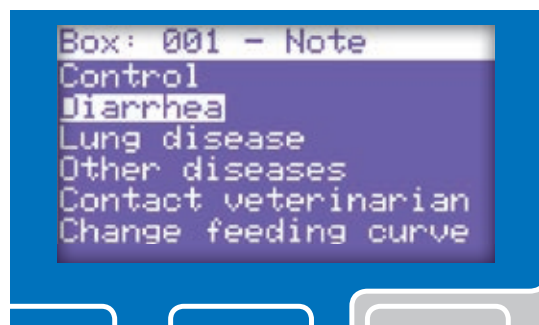
Radio Frequency Identification of the CalfPens

The MilkTaxi uses radio frequency identification to detect each pen as it passes by, and the pen number is indicated in the display. The employee now only needs to choose the right feeding amount for the calf or the group of calves presses the release button and dispenses the milk into the bucket. The quantity fed to the calf will be registered and saved.



Intelligent pen management

Smart ID works for both individual and group pens. In the case of groups of calves, it displays how many calves are in the group and whether they are fed in individual buckets or via "teat bars". In combination with the CalfGuide management program individual notes can be saved for individual pens. They will automatically pop up in the screen at the next feeding. In this way the employees will be informed by sick calves or other particular events. A tremendous improvement in working quality, especially when workers alternate.





EASY TRANSPORTATION

The easy and convenient transportation of the milk has been THE decisive contribution to making our customers' work easier for more than 10 years now.



Sturdy 4-wheel Chassis

Set on 4 wheels with a low centre of gravity, the MilkTaxi is extremely sturdy and stable. Even if it is driven fast, or on uneven ground and with a full load, it does not tilt over. With the 40 cm front wheels and high ground clearance, unevenness or small obstacles are not an obstacle. Alternatively, the Model 260 I is also available as a trailer with one axle.



EL-AN Drive

On all models, the electric drive lets you move forward and in reverse in two adjustable speeds. This not only makes feeding the calves fun, but also puts less strain on your back.



Dark outside? No Problem

You can always see where you are going thanks to the integrated LED headlight – which means you can even feed calves in more remote barns in the evenings.



PASTEURIZATION

Mastitis bacteria also play an important role in disease and illness in the calf stable. Pasteurization eliminates up to 99.5% of those bacteria and is already a standard part of the calf feeding process on many farms.



Pasteurizer

In the "batch pasteurization process", 99.5% of harmful pathogens are killed over 35 minutes at 63 °C (145 °F). As an alternative to this program, the MilkTaxi also offers two different heat treatments at 60 °C (140 °F) for either 60 or 70 minutes. All start times are freely programmable. Therefore, the milk is already pasteurized when you come into the barn for the morning feeding.



Automatic Cooling Function

The water cooling system is a standard component of the MilkTaxi Pasteurizer. This allows the milk to be stored fresh until it is fed or pasteurized. The automatic cooling program is particularly handy when used with milking robots. It detects the filling level and temperature during the automatic filling process. In addition, the cooling process is programmed in a way that optimally utilizes the required energy.



Warm Water Heating

If you want to cut energy costs and if you have plenty of hot water, then an optional hot water heater reduces your energy consumption, thereby saving on expensive energy costs when 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 box - For small and large accessories

The practical storage box provides space for all the small aids needed in the calf barn. Whether refractometer, ear tag pliers, thermometers, weight measuring tape, disposable gloves, check lists or other important things, everything finds its place in the practical glove box. In addition, the straight lid is ideal as a writing pad. Since the entire box can be easily detached from the MilkTaxi and carried away, these things are also quickly available at all other locations.



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.



Automatic Cleaning

Since the lid can be fully opened, the tanks are very easy to clean. The semi-automatic cleaning program ensures optimal hygiene. Residues, for instance in the pump and hose, can be completely emptied. A supplementary cleaning with the brush improves the results and your MilkTaxi is ready for use again after just a few minutes.



High Quality

You have to attend to so many things every day, the technology just has to work! Therefore, we manufacture all components in the highest quality and thus ensure high reliability. The high-quality stainless steel milk tank is easy to clean and has a long service life. Pumps and motors are protected, and the entire design, without unnecessary cables or cable ties, guarantees easy maintenance and therefore long, problem-free operation.



Drenching Cows

A drenching function for cattle is available as an option. In the MilkTaxi, the drench fluid can be optimally stirred and brought to the right temperature, driven to the cows, and then gently drenched into the rumen via the pump. Instead of struggling with a manual hand pump, the MilkTaxi lets you optimally concentrate on the cow.





OPTIONS AND FEATURES

Basic

- MilkTaxi model version 26 gallon, 40 gallon, 70 gallon with stable and manoeuvrable chassis on 4 wheels; front tires 15"
- Electronic control with liquid level sensor, thermometer and statistics function
- Powerful base-mounted agitator mixing at regular intervals in heating mode

- MilkTaxi, model version 70 gallon, 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
- 1¼" drain tap for complete draining
- LED headlight
- Semi-automatic cleaning program

Pasteurization function

- Pumping, mixing, heating as standard
- Up to 6 programmable pasteurizing start-up times
- Integrated water cooling
- Three selectable programs: 65 °C (149 °F) for 35 minutes, 60 °C (140 °F) for 60 minutes, 60 °C (140 °F) for 70 minutes

Energy-saving warm-water heating

- Dual wall as heat exchanger jacket on the outside
- Hot water temperature monitored by sensor
- Programmable heating start-up (up to 6 times)

SmartMix

- Precise fill level detection, flow measurement and programming of the end times
- Mixing calculator for optimum calf milk replacer concentration
- Calculation of whole milk supplement after determining the dry matter content, e.g. using a refractometer (not included in the scope of supply)

SmartID

- Wireless detection of pens
- Plug number system with RFID transponder

CalfGuide for MilkTaxi

- Calf lists, MilkTaxi status report, work logs, etc.

Tilt-up churn support frame for two 8 gallon milk churns

- For transporting colostrum, drinking water and feeding buckets or similar

Pump function

- Up to 9 freely programmable dosing quantities
- Battery-powered stainless steel pump
- Dispensing arm with ergonomic handle
- Maintenance-free battery and charger
- Electronic quantity control

Electrical surface heating

- Gentle milk warming, to avoid any burnt milk
- Model-specific power ratings (3 to 6 kW)
- Programmable heating start-up (up to 6 times)

Wireless remote control dispensing arm

- Distance to MilkTaxi up to 32' (with optional longer tubing)
- Possibility to preselect the dispensed quantity at the dispensing arm

EL-AN electrical drive

- Stepless 24 V drive, two speeds (forward and reverse) with charger

Failsafe tires

- 4 failsafe tires
- Durable soft, elastic polyurethane filling

Cow drenching equipment

- 5' drenching probe with quick release fastener and flow reducer

GloveBox

- storage box for work utensils
- suitable for all MTX models (also previous versions)
- removable with carrying handle

Options



TECHNICAL SPECIFICATIONS

Technical Specifications*

Power supply	230V / 16A or 400V / 16A
Pump capacity	ca. 10.5 gal/min
Heating power	3 KW, 5 KW or 6 KW
Agitator power	250 W
Tire size	400 / 265 mm

Dimensions*

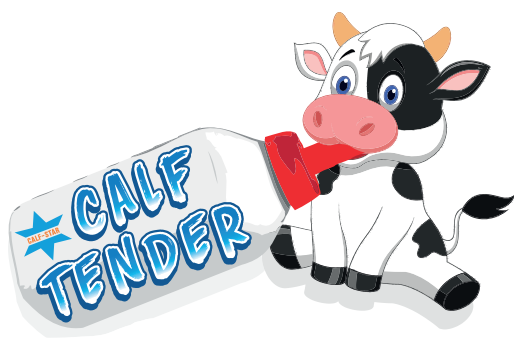
	Usable Tank Capacity	Total Tank Capacity	Width	Length	Height
MilkTaxi 100 l	26 gal	26 gal	23"	50"	43"
MilkTaxi 150 l	40 gal	47 gal	30"	51"	43"
MilkTaxi 260 l	68 gal	76 gal	30"	52"	47"
MilkTaxi Trailer	68 gal	76 gal	47"	55"	49"

* Technical specifications subject to change!





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. If you upgrade to our double pump system it will dispense about 8-10 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 4 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.

New! – Add on a second selecting switch to allow for up to 6 different ration settings.



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.



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.



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





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.

Characteristics

- HTST flow-type pasteurizer with efficient plate heat exchangers.
- Storage tank for raw milk 40 gallon or 80 gallon with cooling and agitator.
- Digital control with control display (temperature curves etc.)
- Up to 3 pasteurizing times can be programmed
- Automatic cleaning with alkaline and acid cleaning
- Complete stainless steel structure
- Simple installation
- Ideal supplement to automatic milking systems

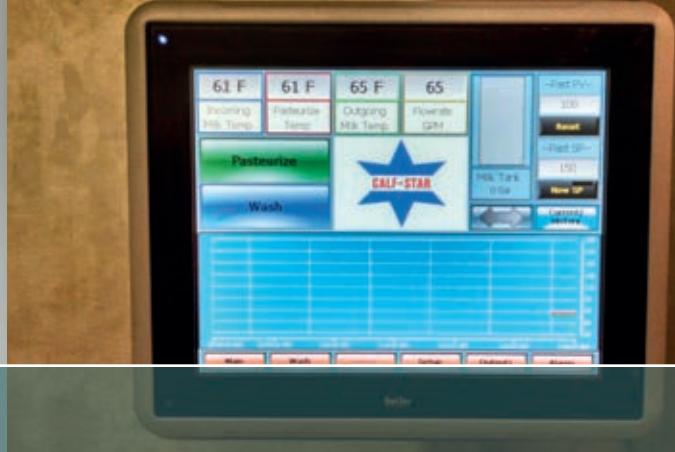
Technical specifications Mini Flash 2.0*

Power supply	380 V, 16 Amp
Capacity	40 gal tank: 1 gal / min 80 gal tank: 2 gal / min
Water supply	Hot and cold water necessary
Drain	Floor drain necessary
Dimensions MiniFlash 40 gal (w x d x h)	50"L x 27"D x 63"H
Dimensions MiniFlash 80 gal (w x d x h)	64"L x 27"D x 62.5"H
Space requirement	5' x 3.5'

* Technical specifications subject to change!



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.



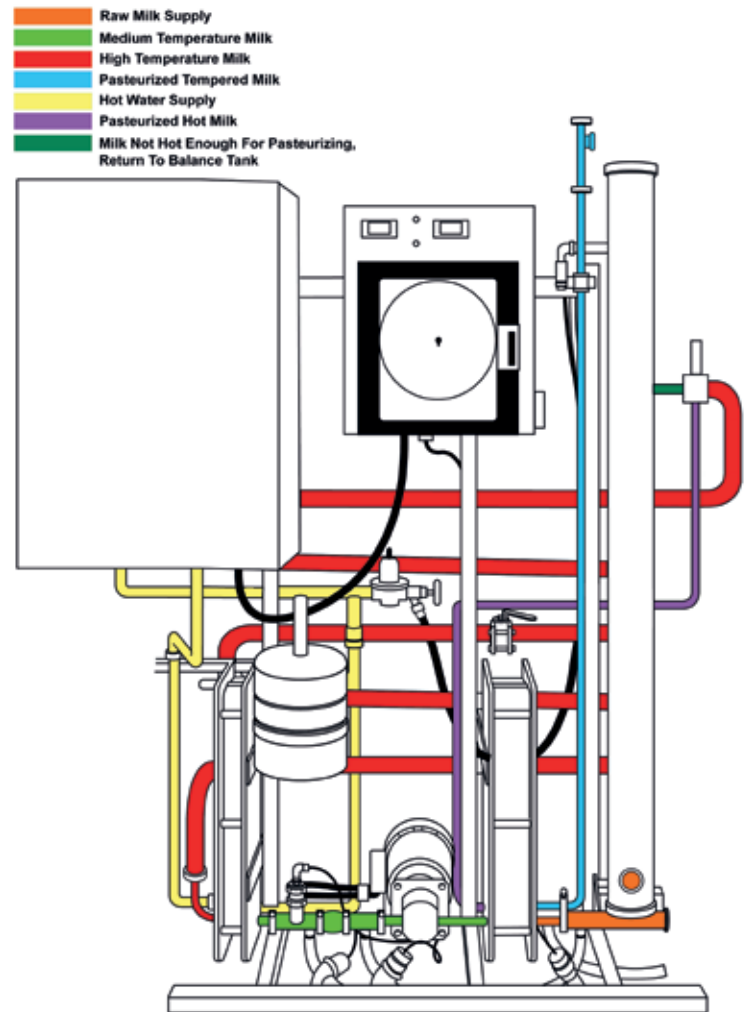
Easy to operate

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 always 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



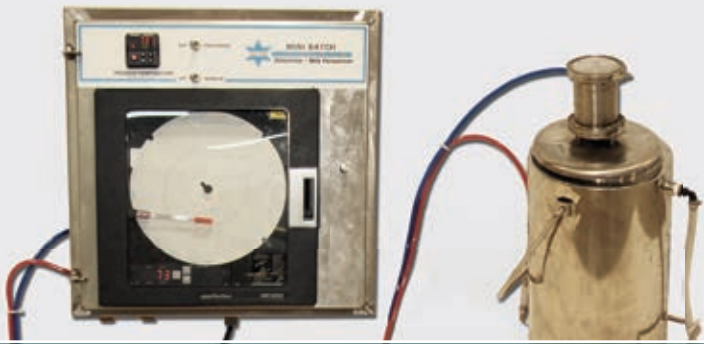
The ideal start in life

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 appr. 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.



H&LIgloo

Healthy Outdoor Housing

Today, it is hard to even imagine: 20 years ago there was no option for professionally housing larger groups of calves outdoors, except for expensive calf barns. The breakthrough came with the invention of the H&L Igloo – an innovative system for housing groups of calves in the natural climate outdoors. Today, everyone knows that calves that are housed in groups in the fresh air grow up to be the healthiest and perform the best.

An easy-to-transport igloo for up to 15 calves made from almost indestructible GFRP (glass fibre reinforced plastic), with optimal air circulation and comfortable temperatures both in the summer and in the winter, was then and still is the one and only alternative for many farmers.





HEALTHY MICRO CLIMATE

An impressively simple design creates the balance between maximum air circulation and a draught-free resting area.



A Shelter for Your Calves

It is well-known that draughts in the resting area put stress on your calves and make them sick. However, conventional calf housing facilities require a high airflow rate in order to ensure the circulation and removal of stale and bacteria-contaminated air. In particular, calves that are only a few weeks old are unable to compensate for this undesired effect by producing their own body heat. With a spacious H&L Igloo, you offer up to 15 calves a draught-free, yet well-ventilated shelter.



A Unique Ventilation System

The hemispherical shape of the igloo provides the ideal ventilation: Winds that blow across the outside of the igloo create a negative pressure at its highest point (Bernoulli's Principle). The stale air is positively discharged from the igloo. Since the entrance is 12 times larger than the exhaust air openings, the air speed in the resting area is extremely low. As a result, the calf resting area stays comfortably draught-free.



Never Too Hot – Never Too Cold!

A special coating on the igloo ensures maximum reflection of the solar energy. For this reason, the temperature does not rise excessively inside the igloo and it offers the calves a cool resting area, even on hot summer days. In the winter as well, the temperature inside the Igloo does not differ much from the outdoor temperature, so that animals will not begin sweating, which would lead to considerable problems. Every farm has its own special requirements. Therefore, it is important to create calf housing solutions that optimally adapt to those needs and conditions. The H&L Igloo will also be an ideal fit for your farm.



THE FLEXIBLE PROBLEM SOLVER

Every farm has its own special requirements. Therefore, it is important to create calf housing solutions that optimally adapt to those needs and conditions. The H&L Igloo will also be an ideal fit for your farm.



Quick Set-up

It only takes 30 minutes for two people to set up an igloo. Custom-fit, pre-drilled elements, high-quality manufacturing, and easy-to-understand assembly instructions are all included to help make the set-up even easier.



Mobile or Permanently Installed Calf barn

Whether you prefer the mobile Igloo Veranda (see next page) or a permanently installed calf barn based on the Igloo System, the igloo housing concept offers the ideal accommodations for your calves on the farm.



Solutions for Using Existing Buildings

No suitable outdoor area available for an igloo system? Do you prefer to use an existing building? Then open the building to provide the maximum ventilation and the igloo ensures the necessary microclimate inside. With this approach, you can use existing buildings without the need for expensive remodelling and can also alternatively use the space as a machine cabinet, straw storage room, etc.

Technical Specifications H&L Igloo*

Recommended no. of calves	15
Resting area	approx. 46' squared
Length / Width / Height	13' x 14' x 7'
Height of entrance	4.5'
Volume	approx. 20 m ³
Weight	485 lbs
Material	Hand-laminated glass fibre reinforced plastic
Standard equipment	4 air outlet hoods, transport hook
Options	Hanging tarps at the side of the entrance for better weather protection during extreme conditions

* Technical specifications subject to change!



IglooVERANDA



Mobile Igloo Housing

Natural-climate outdoor housing is ideal for calves, and the H&L Igloo is the perfect solution. But the igloo is not complete until it is combined with a roofed exercise area. Whether with a fixed roof or mobile one in the form of the Igloo Veranda, the calves always benefit from optimal access to fresh air while having shelter from inclement weather at the same time.

And it is not only the calves that appreciate the protected work environment, you, your employees and family will, too. In addition, feed stocks and bedding remain dry.

Mobility means flexibility, which is not only a benefit of the Igloo Veranda when it comes to mucking out, but also advantageous if you expand your farm, since the calf housing can be easily relocated.

Check out the advantages of this innovative and affordable concept.



Innovation Award in the "Cattle Husbandry" category



FOCUS ON ANIMAL WELFARE AND WELLBEING

An animal can only perform well if it is healthy and comfortable. Nowhere is this principle more true than when rearing young calves.



Two-area Principle – the Calf Decides

Practical experience has demonstrated that it is best to establish separate resting, activity and feeding areas in the calf pen. This way, resting calves are not disturbed by active calves playing or running around. In the Igloo Veranda, the calf decides which area it prefers to be in: either in the protected, draught-free igloo or out in the fresh air in the covered exercise, resting or feeding area.



Weather Protection for People and Animals

The fresh air area for the calves is large and covered, and with the spacious H&L Igloo, you can offer up to 15 calves a draught-free, yet well-ventilated shelter. And, of course, that also means your work environment is protected from the rain, too.



Ample Space and Movement

The H&L Igloo Veranda consists of a resting area 5 x 5 m in size, also called the basic set-up. Together with the area in the Igloo, the calves have a total of 2.8 m² of space to rest, eat and romp around in. That is almost twice the amount of room that is legally required in the EU. The optional roof, 7 x 7.5 m in size, offers optimum protection against precipitation and excessive sunlight. Upon request, it can be extended to a width of 8 m.



EASY & ECONOMICAL

When the healthiest calves come from the most cost-efficient calf pen, which is also very easy to manage, then the decision has actually already been made: for the H&L Igloo Veranda!



Mucking Out Made Easy

The igloo and veranda are easily transported using a front loader. The calves remain locked in the veranda and move with it to their new "residence". Whether on a silage bed in the summer or in front of the machinery shed in the winter, you'll always find a space for the H&L Igloo Veranda. If 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 are natural disinfectants.



Low Investment Costs

Conventional calf pens require expensive, complex barn designs and ventilation systems. We recommend foregoing all that and using the Igloo Veranda, with its exercise area and protected micro-climatic shelter, instead. This solution is up to 70 % less expensive than traditional calf barns!



Variable Feeding Place Options

Each of the 14 feeding places is equipped with a special safety feeding fence. It is impossible for the calves to be accidentally caught in it. Side and front feed fencing segments are flexibly interchangeable! Stainless steel tilting troughs are supplied as standard equipment in the feeding area. Optionally, nursing teat buckets and standard drinking buckets can also be used. The Igloo Veranda is therefore ideally suitable for feeding calves with the MilkTaxi.



OPTIONS AND FEATURES

Basic

- 2 H&L safety feeding fences, each with 7 feeding places
- 2 Stainless steel tilting troughs
- 1 transport hook for front loader
- Installation option for H&L feeding stall

Options

Expansion Options

- Roof with rain pipe, dimensions 7 x 7.5 m or (upon request) 8 x 7.5 m
- Nursing teat bucket support
- Bucket holder (rings)
- Hay rack
- Concentrate feed dispenser
- Large bedding gate (width: 2.44 m)

TECHNICAL SPECIFICATIONS

Technical Specifications Igloo Veranda*

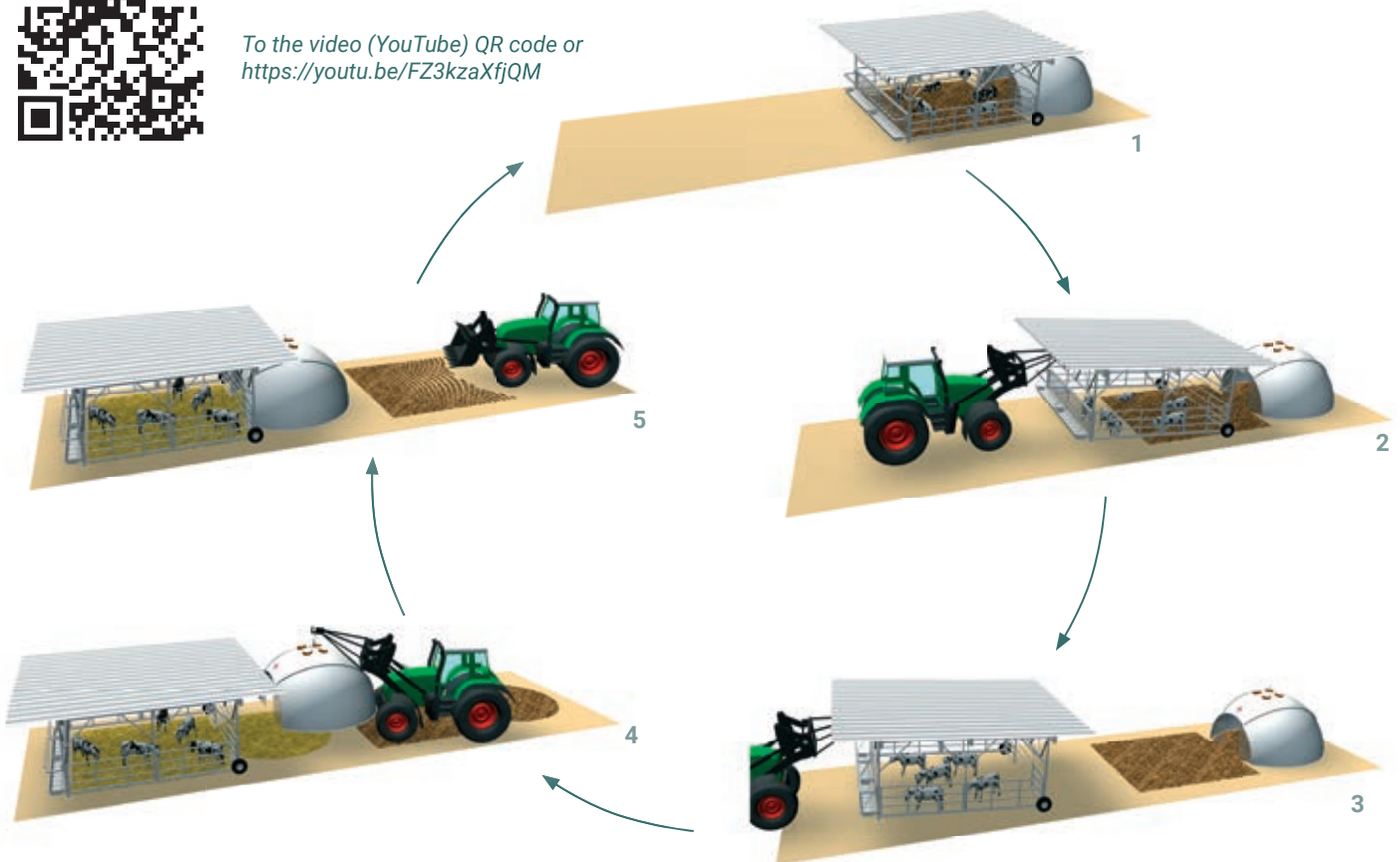
Recommended no. of calves	14
Basic set-up dimensions	16' x 16', max height 8'
Surface area of roofing	23' x 25' 26' x 25'
Resting area	85' squared 46' squared 9' squared

* Technical specifications subject to change!



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

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



Moving and mucking out the Igloo Veranda



WEIGHTCONTROL

"You can't manage what you can't measure."

Peter Drucker (1909 – 2005)



This wise observation by management guru Peter F. Drucker applies throughout agriculture. Yet many decisions are still made on the basis of instinct.

This is true for calf rearing too: many farmers accept and strive to achieve the target of 1.7 lbs. - 2.2lbs weight increase per day. Yet this important management parameter cannot be determined without weighing the calves regularly. Less than 12 % of farms weigh their calves during the milk-diet phase. And only 9 % of farms weigh their calves at least twice (own research, survey of 424 farms in 2016). In other words, 91 % of farms have no information whatsoever available about the individual performance of their calves. How do these farms expect to make important decisions about feed strategies or animal selection?

Find more information about this topic in the article on pages 72/73!



DECISIONS ARE TAKEN ON THE BASIS OF INFORMATION

Further data can be recorded every time the animals are weighed. Information about the gender, origin, calving process, colostrum consumption and other information relevant for the future can be registered when the birth weight is recorded, for example.



WeightControl – more than just a scale

The new calf scales make the recording of weights and other information child's play. The system is based on two different types of animal scales combined with electronic animal identification and an additional input terminal where relevant data can be entered very easily.



CalfGuide connection

All the data is not only saved in the WeightControl animal scale but also transmitted automatically to the CalfGuide management program. You can read off information about the calf's history, such as daily increase in weight, or other information about connected MilkTaxis or calf feeders both in CalfGuide and directly at the scale's terminal. This means complete integration of all calf rearing data in one system.



Basis for important selection

At the end of rearing, these data can be exported automatically to other management systems and provide a basis for management decisions such as selection, feeding strategies or the optimization of work processes.



JUST THE RIGHT APPLICATION

There are numerous animal scales on the market, even for calves. Yet different applications make individual solutions necessary. That is why we have two different scale systems on offer with WeightControl.



Stationary platform scale

The platform scale is designed to be driven onto with small transporters or carts for calves (e.g. the CalfBuggy). Every time a calf is transported, you just drive over the scale and record the current weight in no time. Ramps make the whole process even easier.



Mobile trot-through scale

Thanks to its large wheels, this scale can be moved to wherever calves need weighing. The doors are designed that they open to the same side. This makes it possible to operate the scale from one side. Operation is powered by a rechargeable battery, permitting use in more remote areas such as outdoor calf hutches.



Simple operation directly at the terminal

Electronic ear tags are recorded quickly using an ISO stick reader and automatically saved in the system. The weight measured is displayed on the 7" screen. For every additional weighing process, WeightControl displays the increase for the day and a comparison to the herd average in addition. Further information about the calf (e.g. gender, calving process, colostrum quantity etc.) can be entered and saved via the WeightControl display.



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 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 MilkTaxi, H&L Automatic Feeder or H&L Igloo Veranda, 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.



RT10™ COW-SIDE SCC

Why Somatic Cell Count is Important

Somatic Cell Count (SCC) is an indication of cow health. Low SCC in milk means a cow is relatively healthy and can also result in milk premiums, but high SCC can indicate infection of the udder (mastitis). Extremely high SCC counts are visible to the naked eye when a cow has a clinical case of mastitis. Usually her milk is withheld from the bulk tank so she can be treated and fight the infection. If your instance of mastitis is low, but your SCC are still too high to receive milk premiums, your cows are likely subclinical. They tend to have higher SCC counts, but have no other symptoms of mastitis and are extremely difficult to identify what to do about the issue. Until now... With the use of RT10™ Cow-Side SCC, you can easily identify those high SCC or subclinical mastitis cows and make better decisions to lower your overall SCC.

Guided Management

Not only does the RT10™ Cow-Side SCC provide an accurate reading of a cow's SCC, it can provide an indication of the type of bacteria that is most likely to have caused the high SCC. This can aid your decisions in treating mastitis within your herd. This tool can also allow you to export your data into a spreadsheet or email a file to share with others who may help in the decision making on your farm.

mpengoDairy App

This app is available for download in the App Store. The app is what allows you to take samples, keep accurate records and even export the results of your samples. You can easily choose to identify your milk sample to a specific cow and label for a specific quarter. Or you can do a "Quick-Test" which allows you to take a sample without specifying a cow; i.e. bulk tank test. Your results appear in less than one minute, allowing you to quickly make important management decisions based on your SCC.



CALF-STAR CALF JACKET

Always Well-Protected in Winter – The Calf-Star Calf Jacket

The Calf-Star Calf Jacket provides optimal protection for your calves during low temperatures. It reduces the energy required to maintain body heat by up to 30%.

An ideal supplement for energy-intensive calf breeding with metabolic programming.

If calves become ill, despite the healthy outdoor climate in the igloo, it is advisable to keep them in their usual environment and protect them with a calf jacket, since moving them into a poorly-ventilated "warm stable" with higher ammonia and bacteria levels can even worsen the problem. The calf jacket features adjustable leg straps and practical velcro closures on the chest and can be easily adjusted to different body sizes.

Excellent quality of workmanship

- 600 denier PU coated Polyester outer shell
- 200 Grams of polyester insulation-
- Taffeta nylon interior
- webbing 100% polyester.





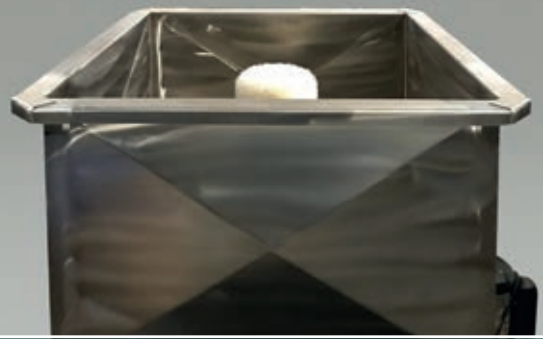
CALF-STAR BOTTLE WASHER

Performance is everything when prepping for calf feeding. Depend on the reliability of the Calf-Star bottle washer to help you with your calf feeding needs.

Features & Benefits

- Automatic Start and Stop
- built in chemical metering pumps for detergent, sanitizer, and rinse
- 4 different time cycles: 72, 90, 120, or 360 seconds
- drain/fill switch
- all stainless steel construction
- upper and lower spray arms
- clean up to 46 racks per hour

Operating Cycle:	72 Sec.	90 Sec.	120 Sec.
Operating Capacity: (Racks Per Hour)	46	37	30
Wash Time:	37 Sec.	45 Sec.	55 Sec.
Rinse Time:	24 Sec.	30 Sec.	50 Sec.
Drain Time:	11 Sec.	15 Sec.	15 Sec.
Wash Tank Capacity:	1.75 Gal.		
Wash Pump Capacity:	57 GPM		
Recommended Wash Temp:	140°		
Water Inlet:	¾"		
Drain I.P.S.:	1.5"		
Wash Pump Motor:	1 HP		
Dimensions:	2.25"D x 2.25"W x 67"H		
Table Height:	34"		
Max. Clearance for Dishes:	17"		
Standard Dish Rack:	20" x 20"		
Shipping Weight:	280 lbs		
Electrical Rating:	120v 60Hz, 240v 50/60hz		
Load Amps:	14,7		



CALF-STAR PAIL WASHER

This easy to use pail washer is an easy solution for dairies feeding by buckets and looking for a fast sanitizing cycle for their buckets.

Features

- 110 hook up
- Rotating brushes clean the buckets
- Motor for the brushes runs when you step on the foot pedal
- Very easy for any employee to run

To operate the pail washer you will need to put the hot water and detergent into the reservoir and plug in the machine.



Once you do so you can take your bucket and put upside down on the brushes and push the foot pedal to run the brushes. The brushes will then clean the buckets and you can turn them off when you feel they are cleaned sufficiently.

"The following pages are filled with lots of practical tips to make my life better!"





COLOSTRUM MANAGEMENT

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.

Pasteurization of Colostrum

Pasteurization is a standard procedure to treat cow's milk before feeding to calves. By pasteurizing properly all common pathogens are reduced in both colostrum and waste milk. Pasteurizing colostrum can eliminate the spread of disease to the rest of your herd and improve IgG levels.

Colostrum is pasteurized differently than regular waste milk. Colostrum has a different density of nutrients than whole milk. The fat content of colostrum can be as much as 2x greater than that of whole milk and protein in colostrum can be 4x greater than that of whole milk. If you pasteurize colostrum at too high of a temperature you will get a thicker result that will be hard to feed and ruin equipment. To receive the best result when pasteurizing colostrum it is important to pasteurize the colostrum at 140°F for 60 minutes. This will reduce the bacteria count without affecting the IgG levels or viscosity of the colostrum. Due to the

temperature and time required for pasteurizing colostrum the only type of pasteurizing that will work is Batch pasteurization.

An unexpected finding of research studying pasteurized colostrum was that calves fed pasteurized colostrum absorbed more IgG. In a Minnesota study, 24-hour serum IgG was 22.3 mg/mL in calves fed pasteurized colostrum compared to 18.1 mg/mL in calves fed raw colostrum. Apparent efficiency of IgG absorption was also improved in the calves fed pasteurized colostrum (35.6 versus 26.1 percent).³

This phenomenon was observed in two different experiments at Penn State, as well. In one study, calves fed colostrum heated at 140°F for 30 minutes had serum IgG of 22.6 mg/mL at 24 hours compared to 19.6 mg/mL for calves fed raw colostrum. The higher blood IgG levels remained for the first five weeks of age. Absorption efficiency was 33.2 percent for pasteurized colostrum and 27.7 percent for raw. In a second Penn State study, calves fed pasteurized colostrum had blood IgG levels of 26.7 mg/mL compared to 20.2 mg/mL at 24 hours of age for calves fed unheated colostrum. Efficiency of absorption was 43.9 percent and 33.9 percent for pasteurized and raw colostrum respectively.⁴

In these three studies, feeding pasteurized colostrum increased 24-hour serum IgG levels by 25 percent and absorption efficiency by 28 percent compared to feeding raw colostrum. Improving absorption efficiency can have huge impacts on calves as they are able to attain significantly higher blood levels of IgG when fed the same quality of colostrum. Based on past research, we know that increasing 24-hour blood IgG levels can have significant positive effects on calf health.⁵

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

3, 4, 5 Heinrichs, J., Jones, C (2010). Pasteurizing colostrum: the next step to controlling disease. Hoards Dairyman, Sept. 10, 2010
<http://hoards.com/article-1793-Pasteurizing-colostrum-the-next-step-to-controlling-disease.html>



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 850-1,113kg during the first lactation.

There are numerous other studies which come to similar conclusions.

Reason enough to realize 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 diarrhea.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 utilized 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. Thus 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 diarrhea: 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 programmes 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 programmes, 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 programmes 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

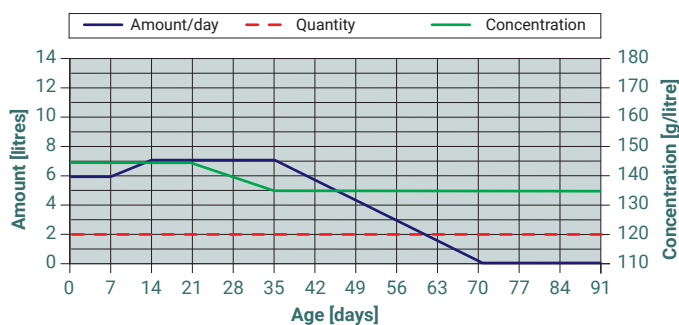
As a first step, every farmer should decide how intensively he or she wants to feed and raise the calves. Intensive ad libitum feeding during the first 2-3 weeks is not the right path for everyone (* see the excursus "Ad Libitum Feeding").

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.



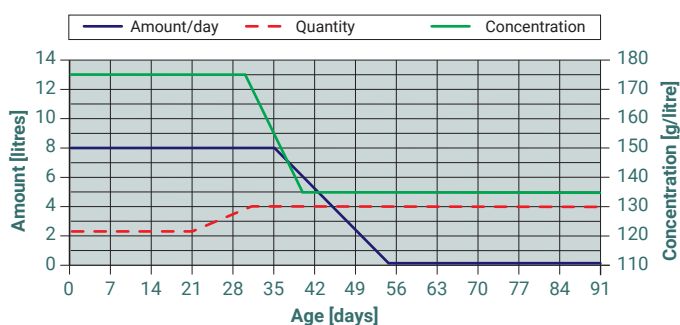


It is essential that the quantity per visit should be set to 2 litres right from the start. With this method, calves “in training” that miss their second meal at half-day will still intake about 600 g of energy (CMR) per day, which at least covers the energy requirements of the calf. This will prevent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

To succeed with such programmes, 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 diarrhea, 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 behaviour 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 6th week (kg) Actual	Target: BW x 1.5	Date	Weight 8th week (kg) Actual	Target: BW x 2.2	Date	Weight 12th week (kg) Actual	Target: BW x 2.5	Daily increase (500-1,000g)	Week	Growth per day	Absolute weight kg
															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 requirements of our calf feeders can be equipped with animal weight scales and with our management system "Balfader" 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 analyzed.

1 See also „Higher Milk Yield Through Early Metabolic Programming“ on page <?>.

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 diarrhea 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 diarrhea can often be avoided by an early treatment, reducing the use of medicine.

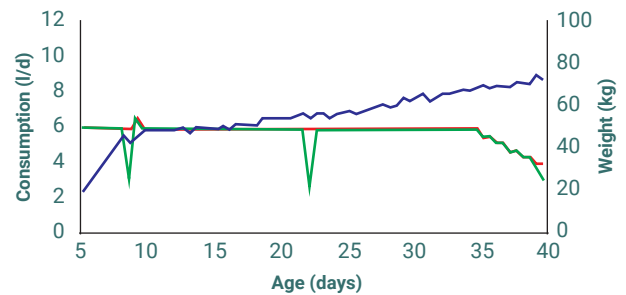
The second important reason for equipping a calf feeder with weigh scales is the possibility of weaning the calves on the basis of their individual weight development. By this method, calves which consume concentrate and forage at an early stage are weaned more quickly. This saves the cost of milk replacers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

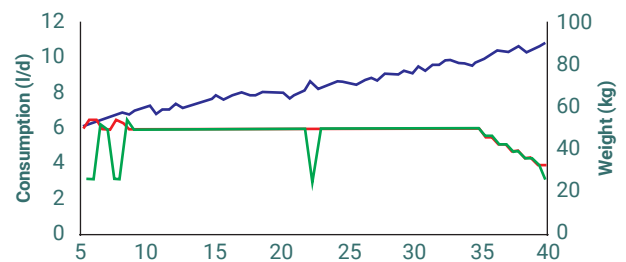
Thus, in addition to the genetic value of the calf, the information on the animal weight provides additional important information with regard to the following question: which heifers will remain on the farm to be reared and which animals will be sold? Particularly in times when a conservation of resources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

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

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!



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 pasteurize 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.

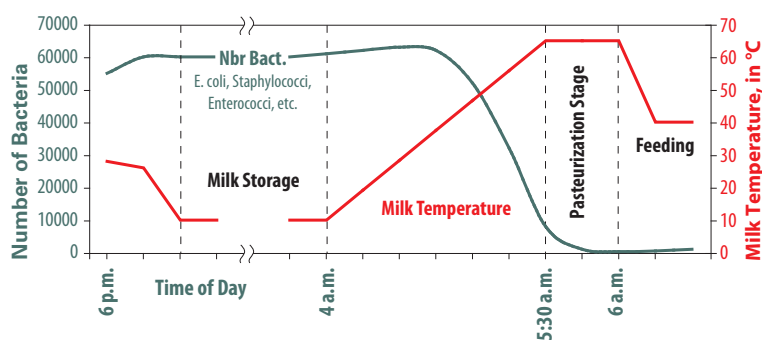
What kind of milk should I pasteurize?

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 Pasteurization Cycle



1 See article 'The Digestive System of a Calf'
 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 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:

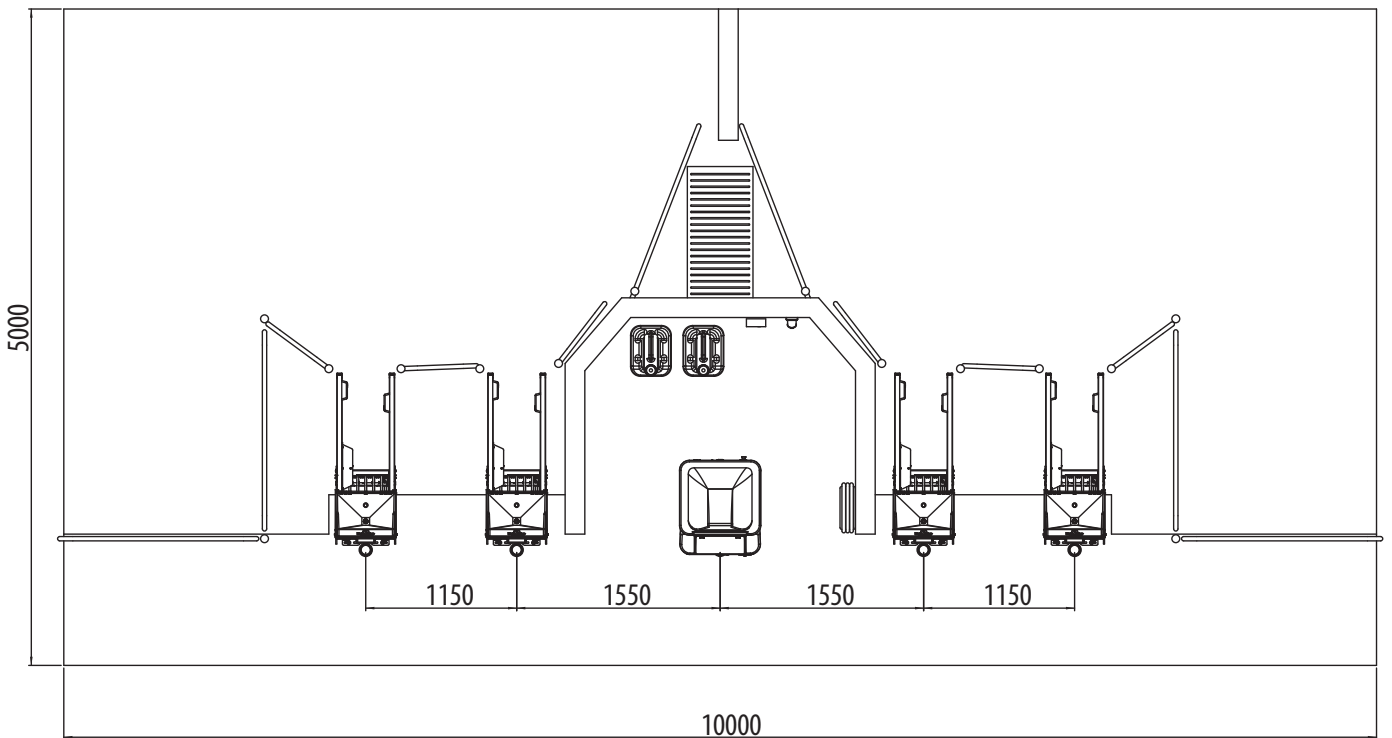
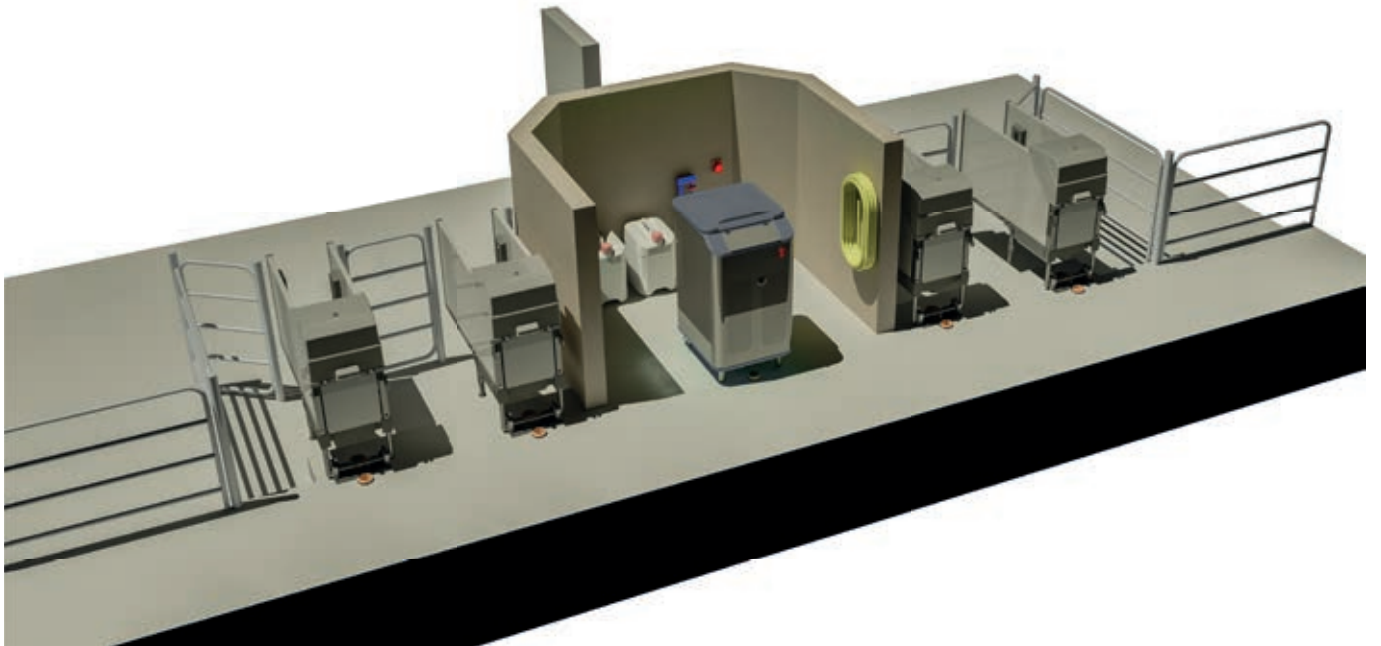
- Install the HygieneStation on a base raised approx. 15 cm.
- Install a liquid drain or gutter under the station. The drain or gutter can flow into the drainage duct required for the HygieneStation.
- Position the station outside of the main area of the pen.
- Clean this area regularly. The tilting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



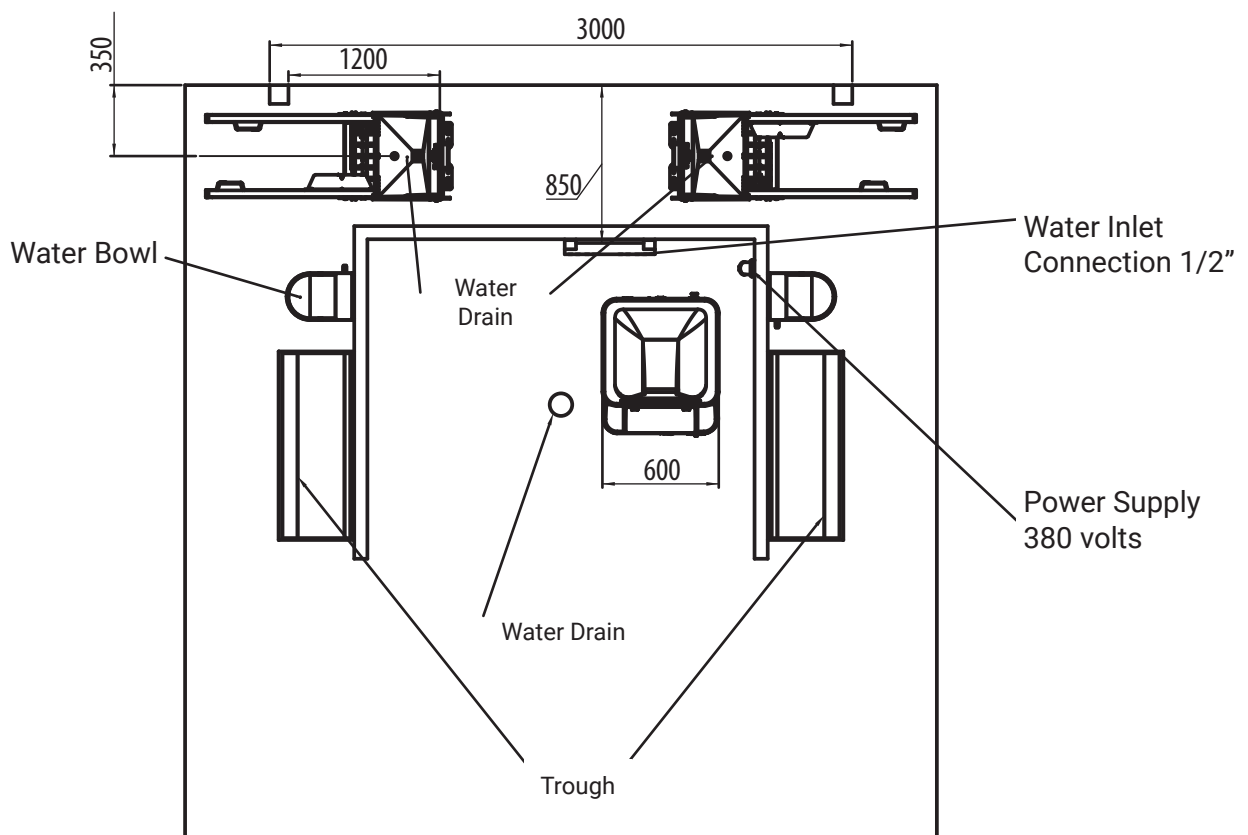
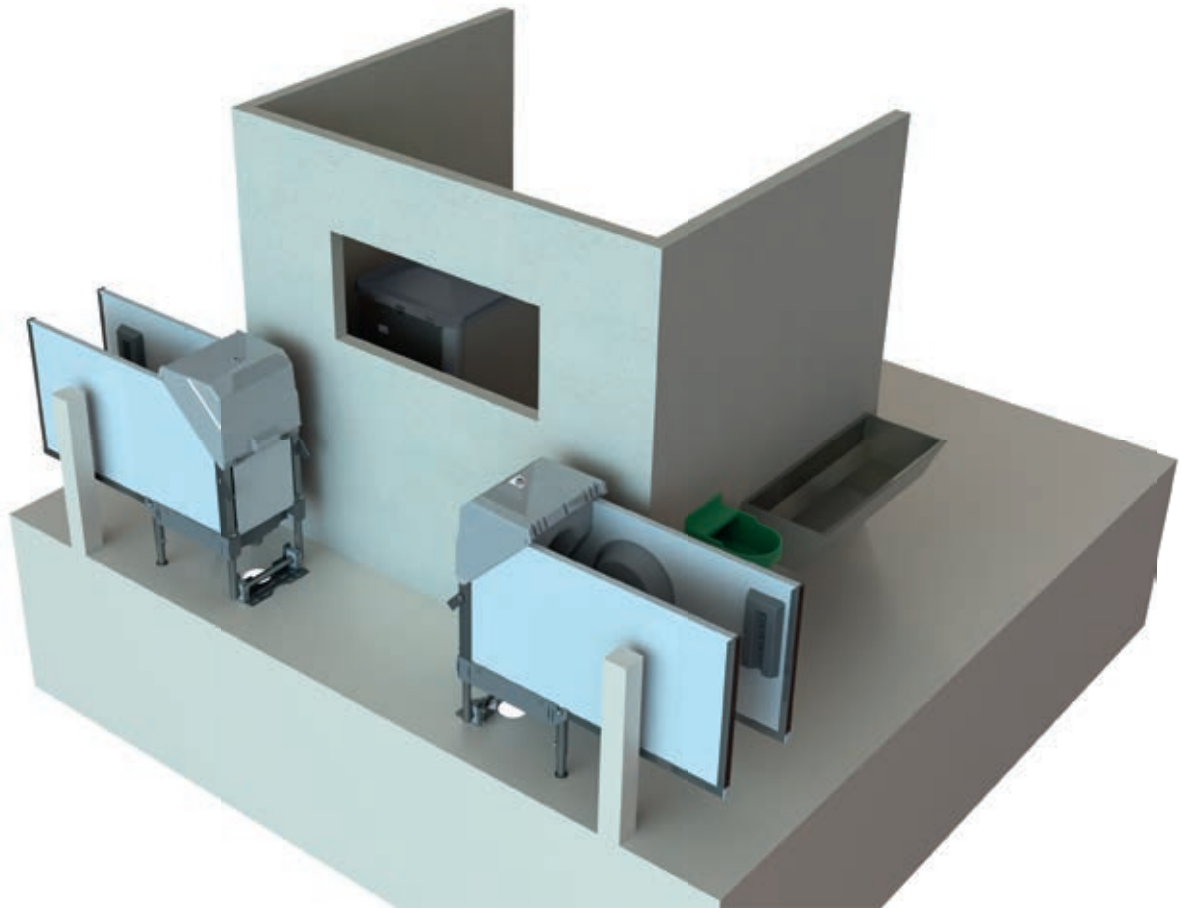
- Place a water hose with a sprinkler head next to the machine to clean the surfaces quickly and easily.
- When planning the design and layout, be sure to allow enough space around the automatic feeders and HygieneStations. This will tremendously facilitate routine tasks later on, such as pouring milk 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 Double Jug).

- 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.

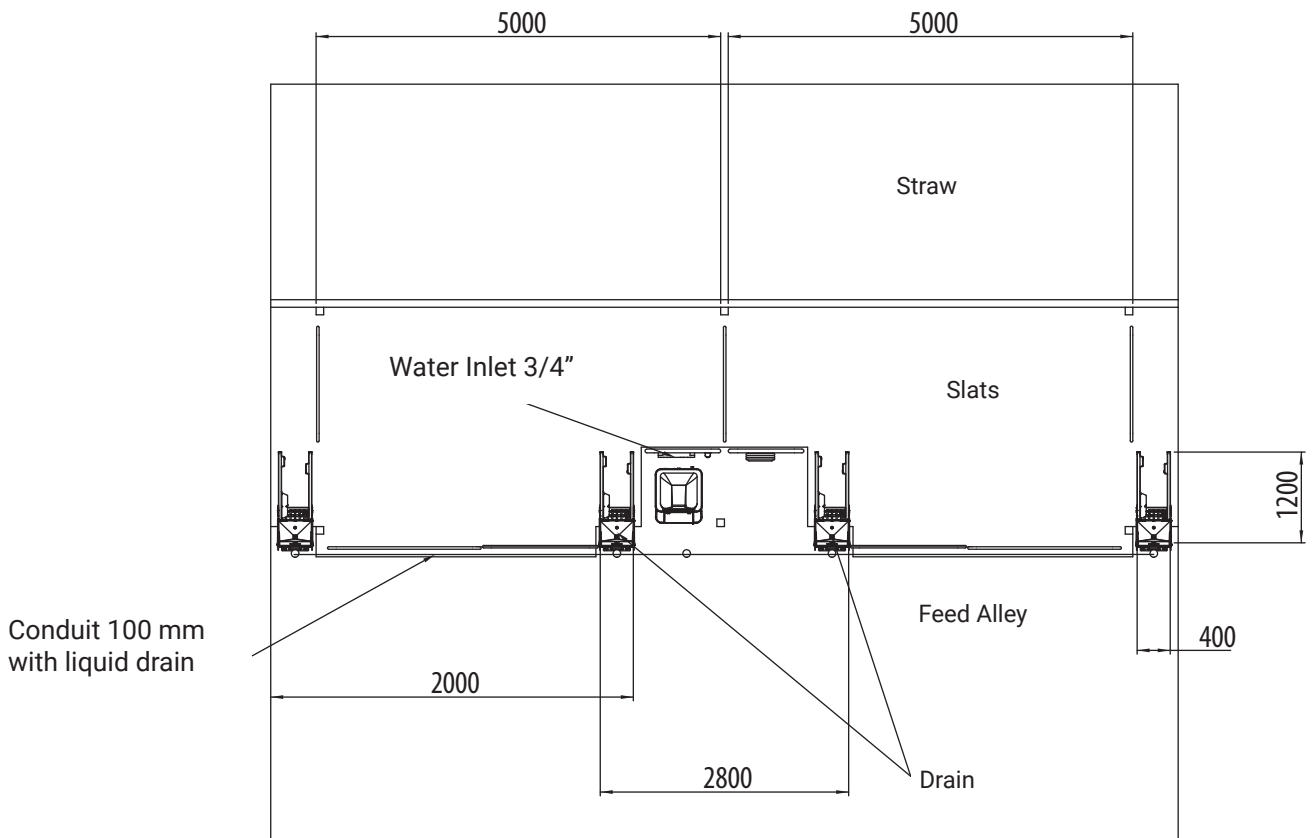
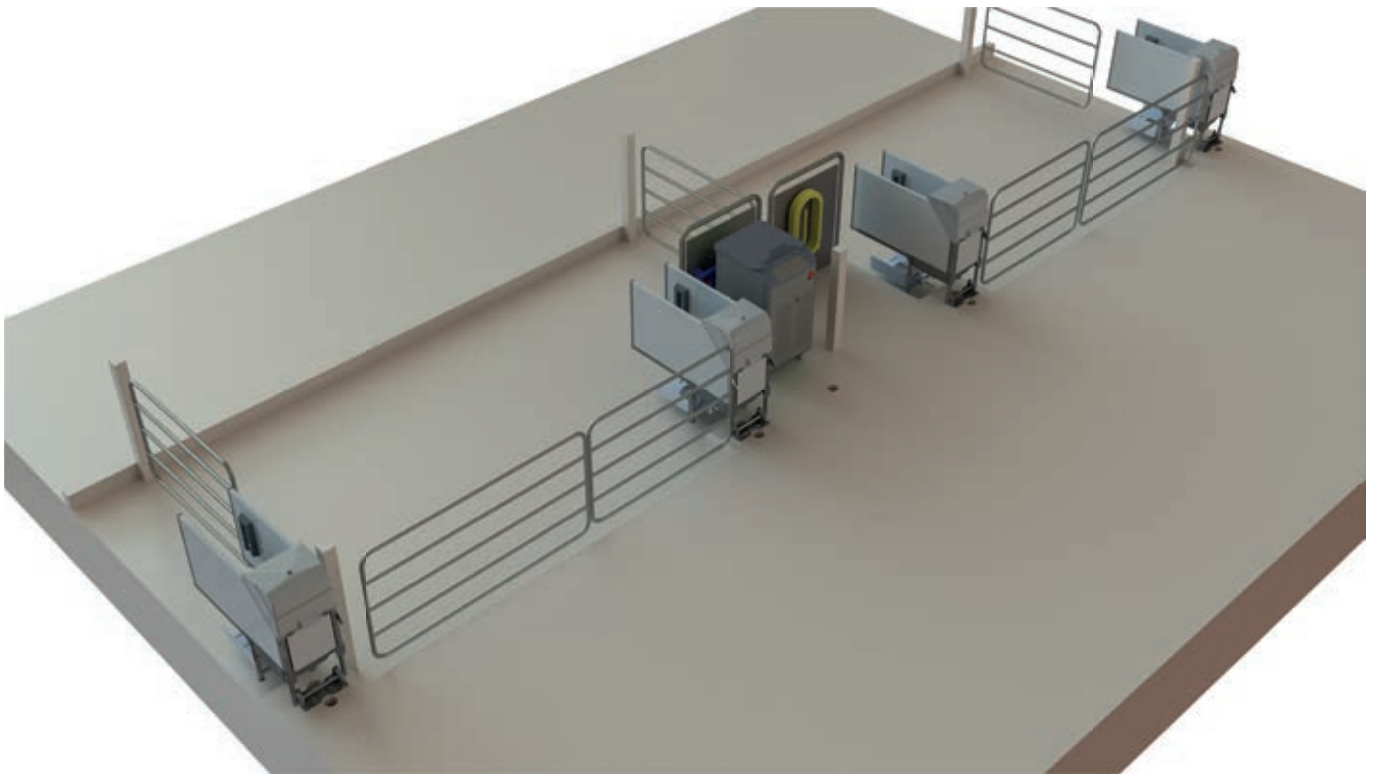
See the following pages for a few installation options for setting up the CalfExpert with the HygieneStations.



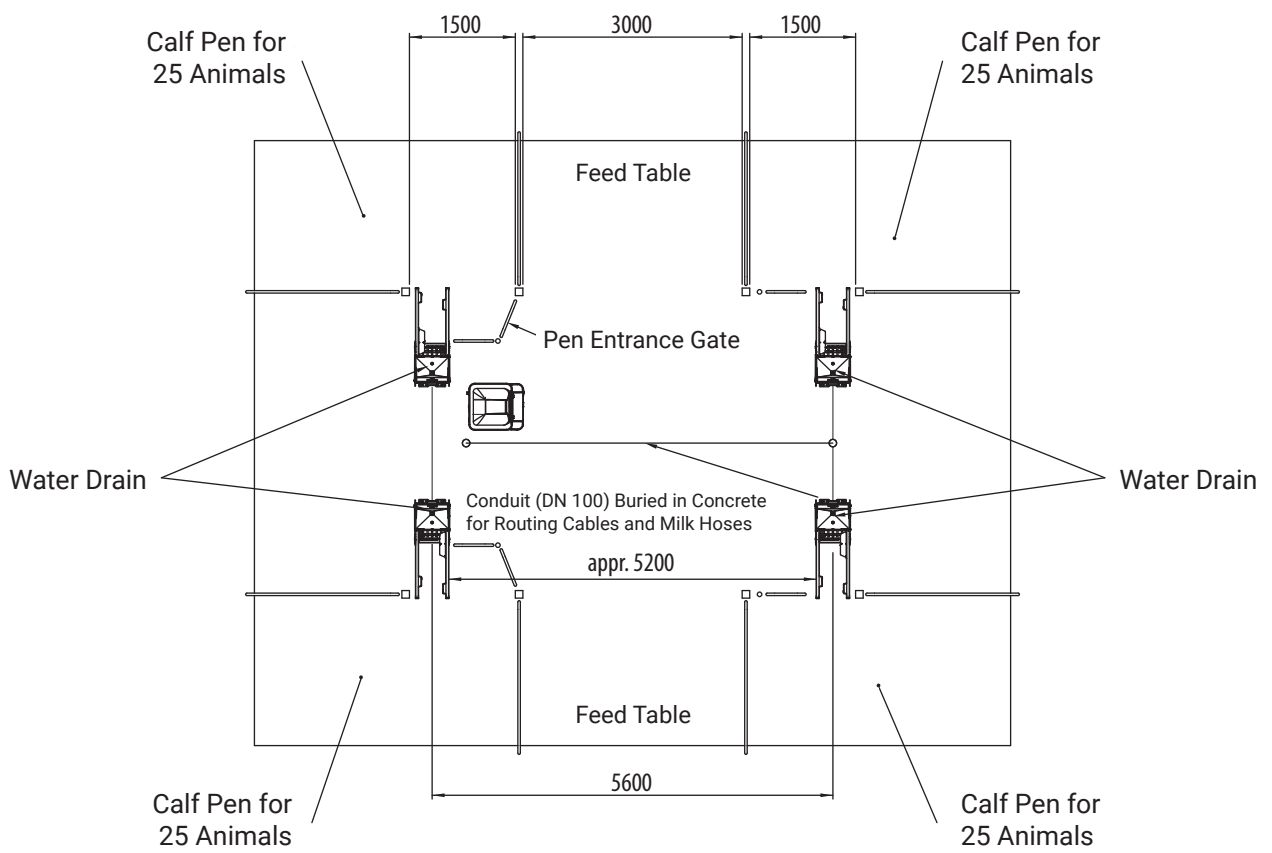
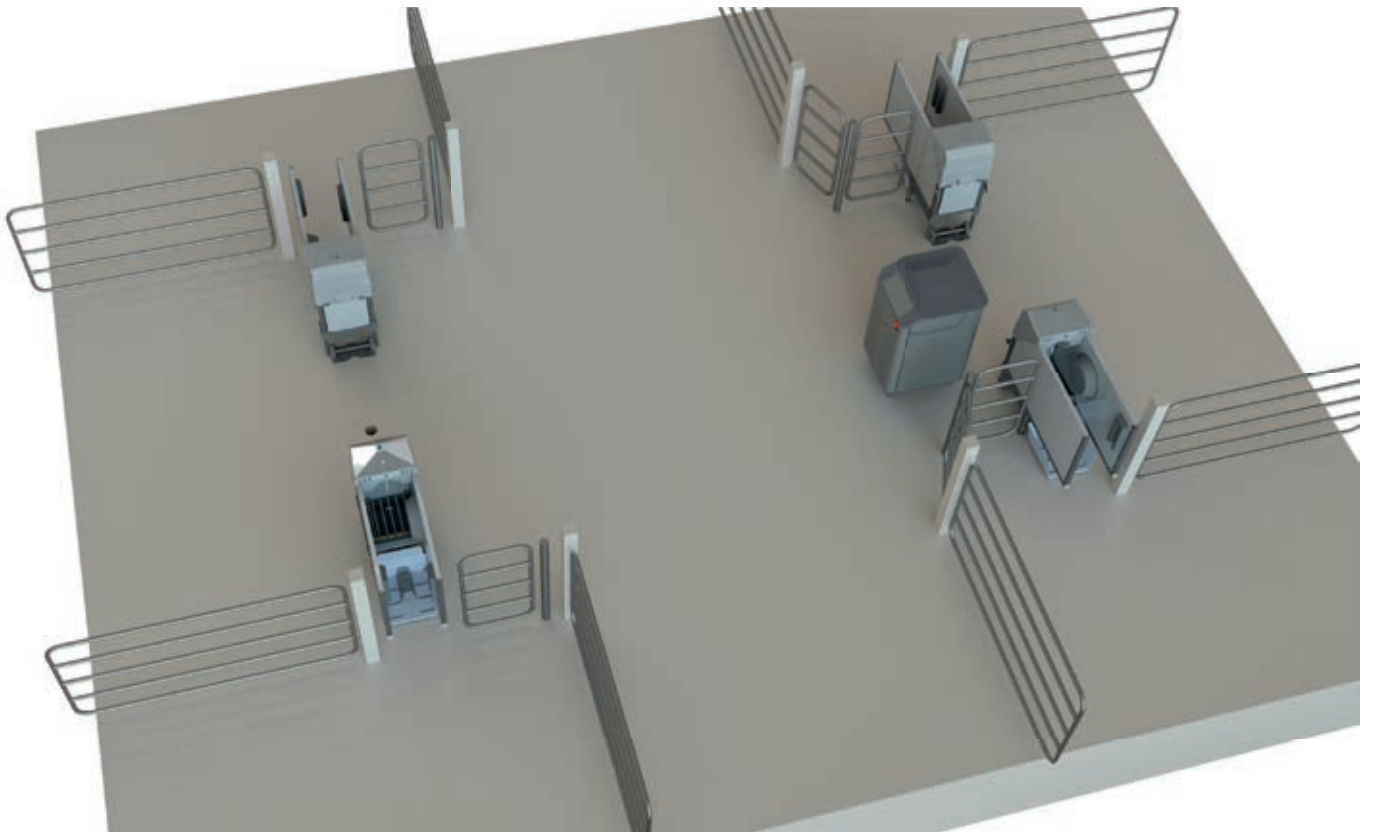
CalfExpert with 4 HygieneStations (two stations per group), access to the calf pen between the HygieneStations



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 programme 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

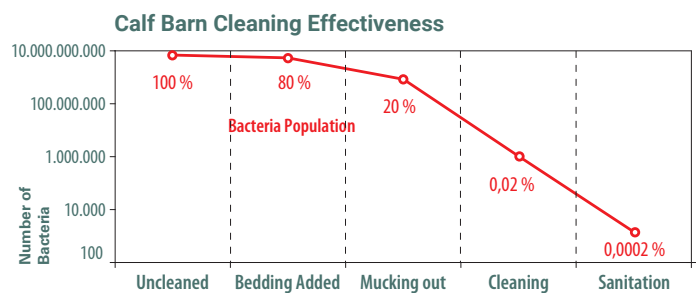
Do not be worried about low temperatures. The igloo housing has proven itself in very different climatic conditions worldwide. The calves adjust outstandingly well to their environment, even in the winter!

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 Igloo System 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.

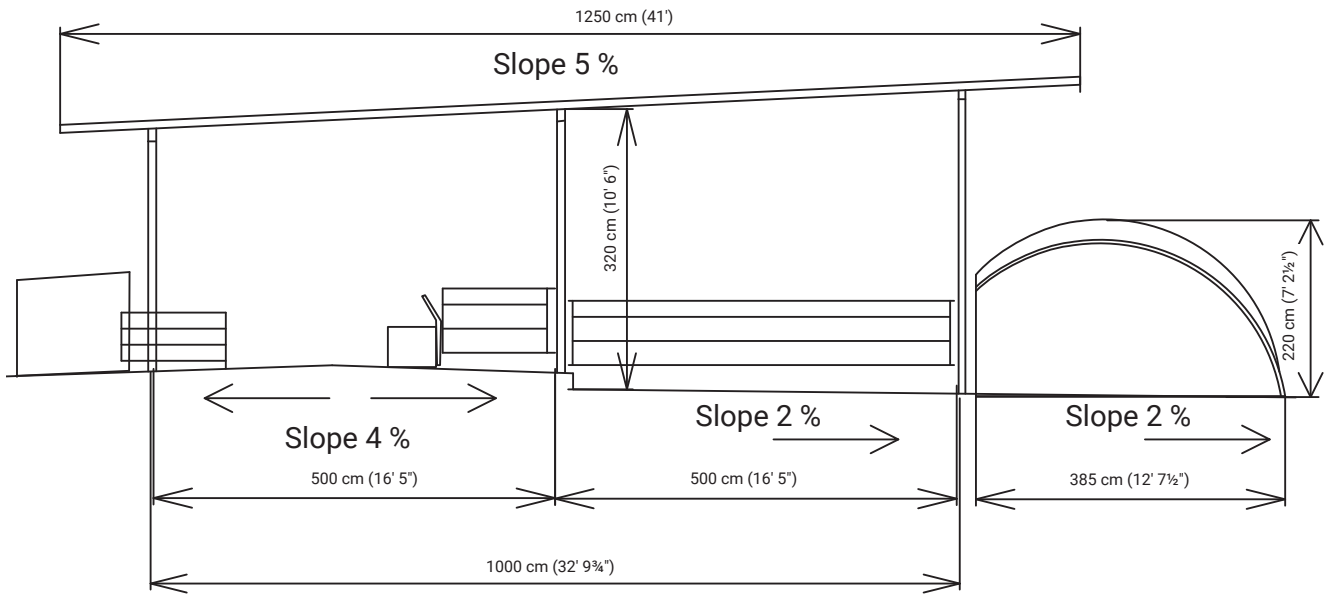
Is it necessary to protect the outdoor resting area in front of the igloo?

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 Igloo System, 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.

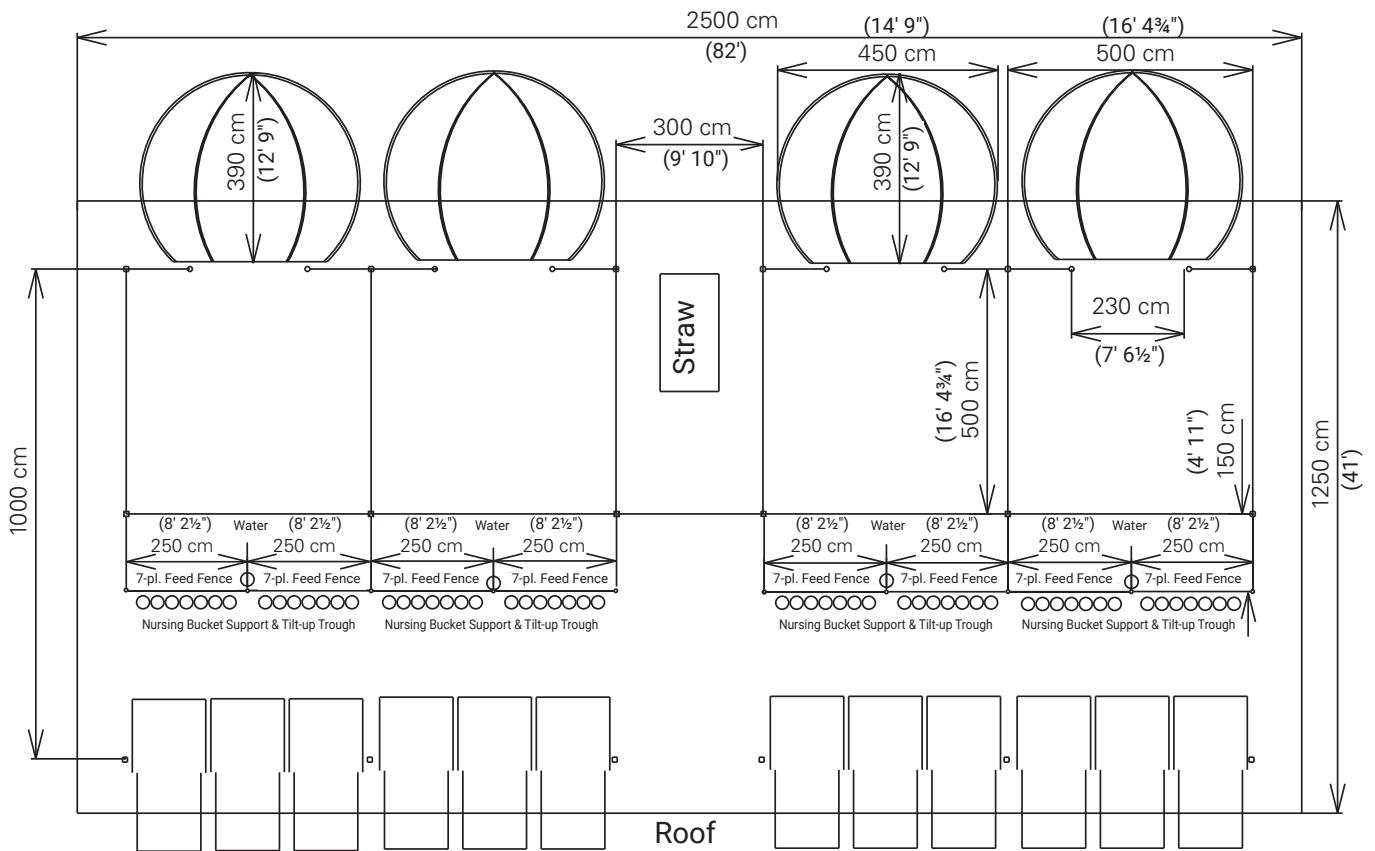
If extreme draughts occur, a proven method is to shut off the resting area up to the height of the fencing. With this design, the resting calves are protected, but the wind continues to ensure good air quality inside the "barn".

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.

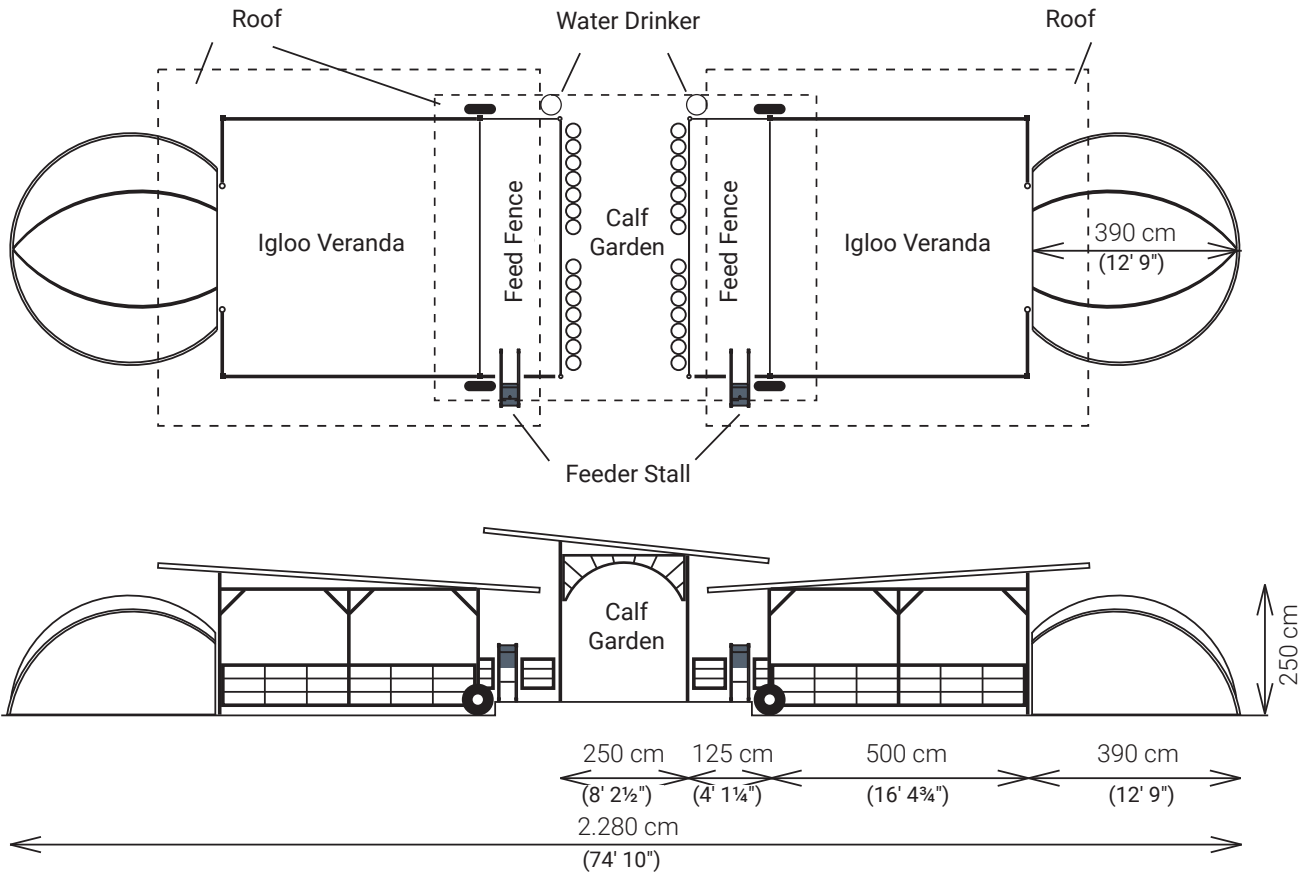
¹ Prof. Dr. Ken Nordlund, University Wisconsin, Madison, USA, 2014



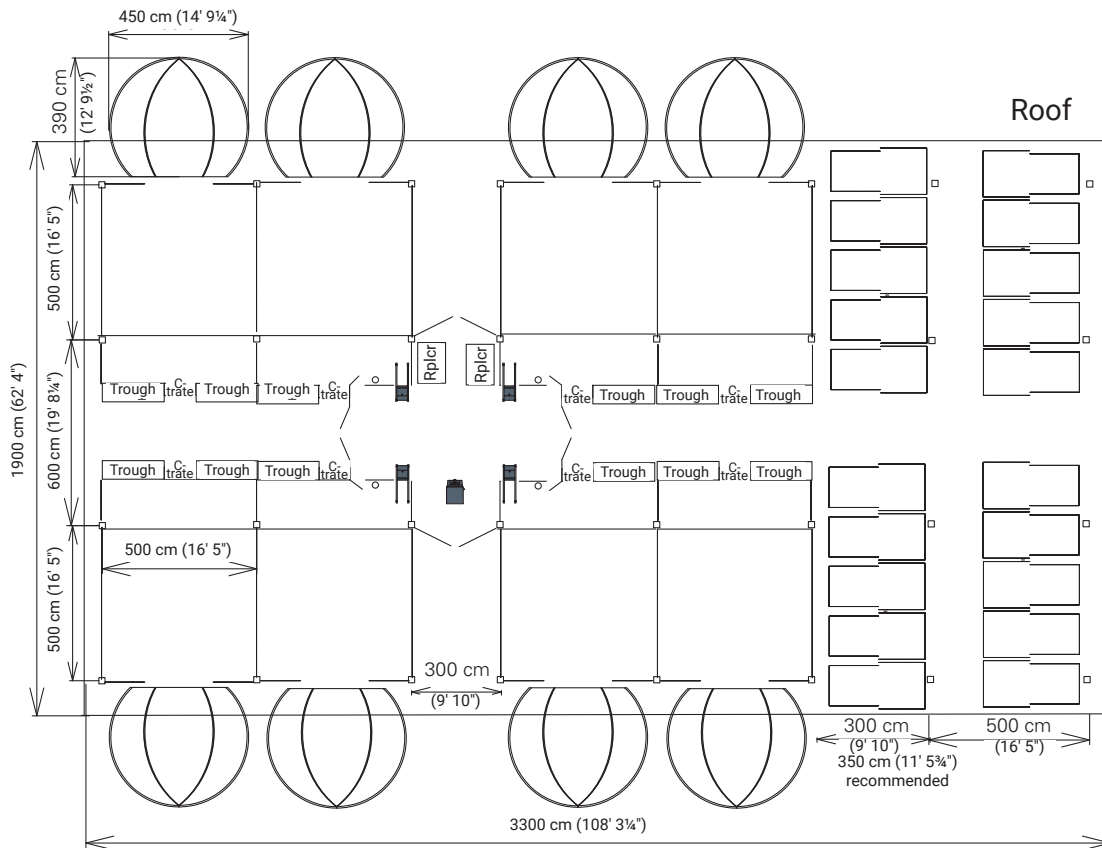
Lateral View of Igloo System



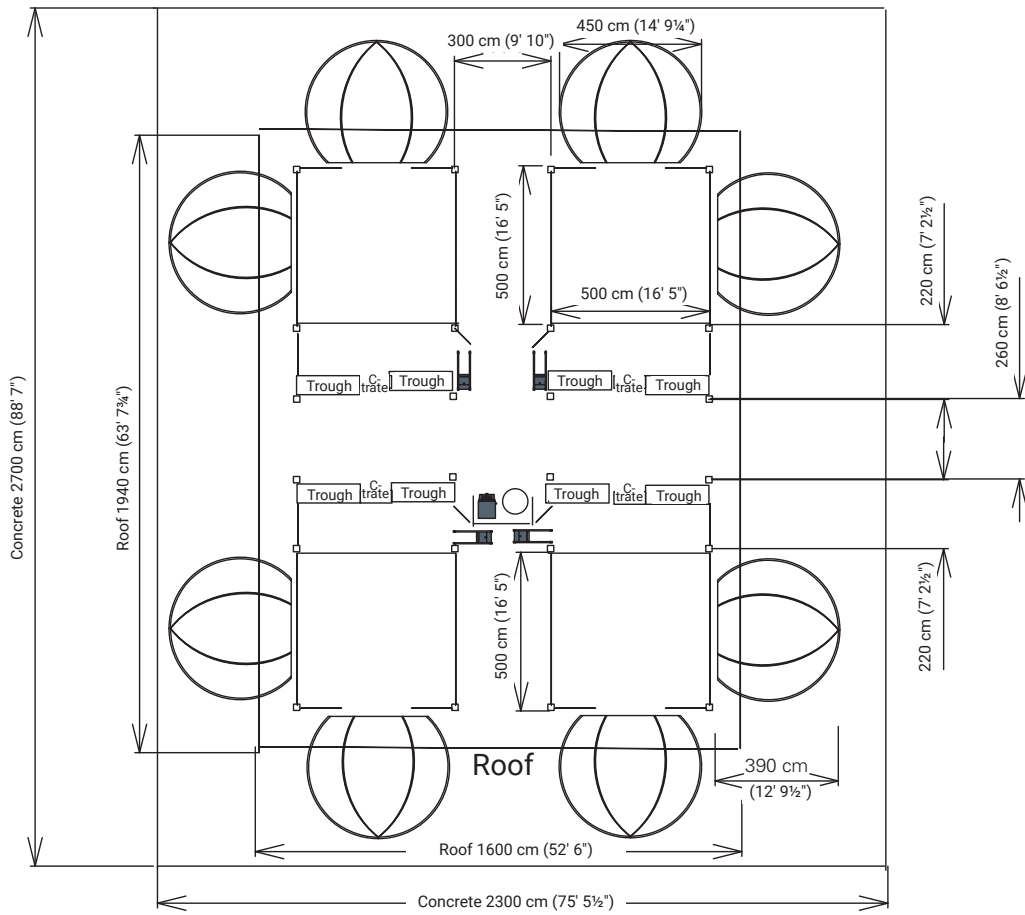
Igloo System with integrated feed fences



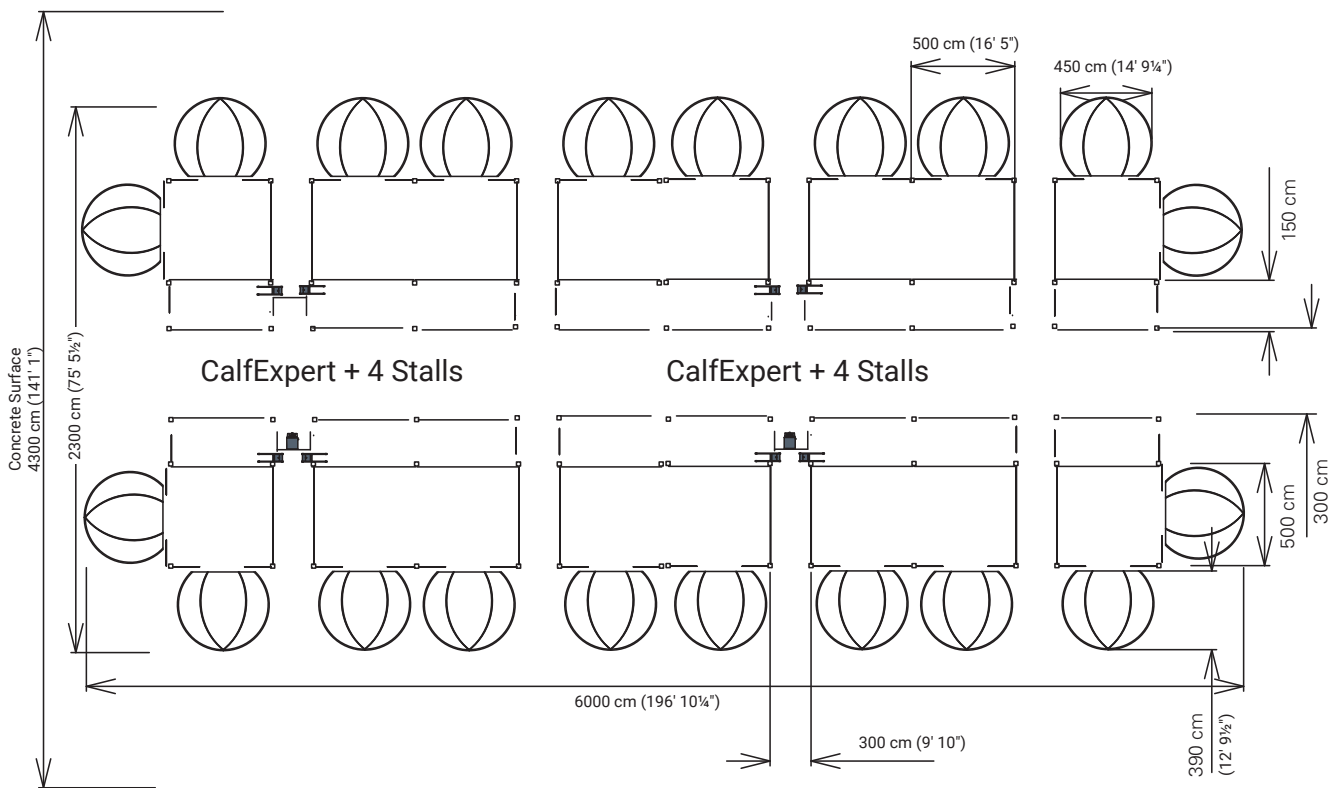
Smart solution: A combination of Igloo Veranda and CalfGarden to include an CalfExpert



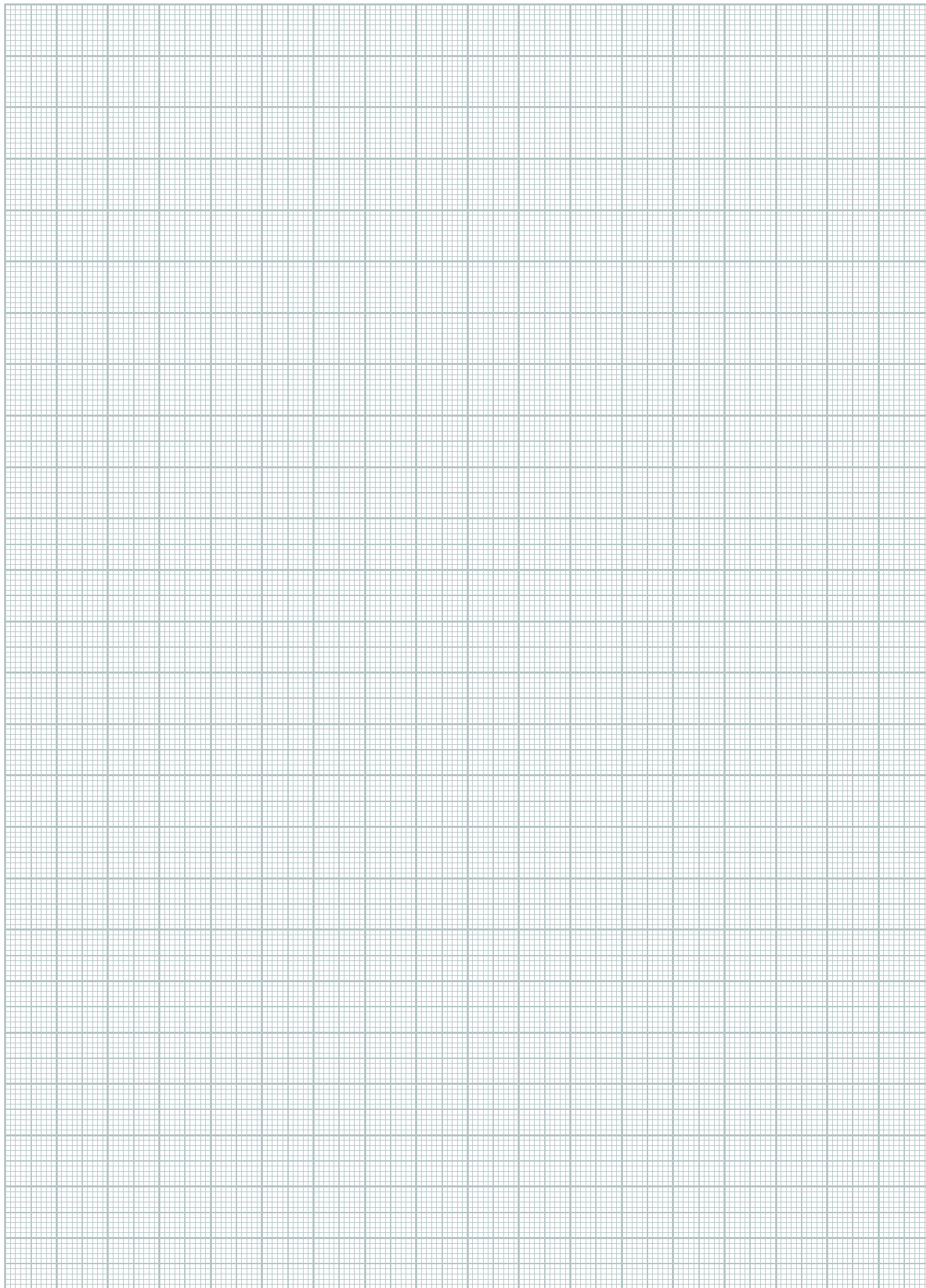
Igloo System for 140 Calves



Igloo System "Clover Leaf" (4 x 25 calves)



Igloo System for 250 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 Wisconsin, 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

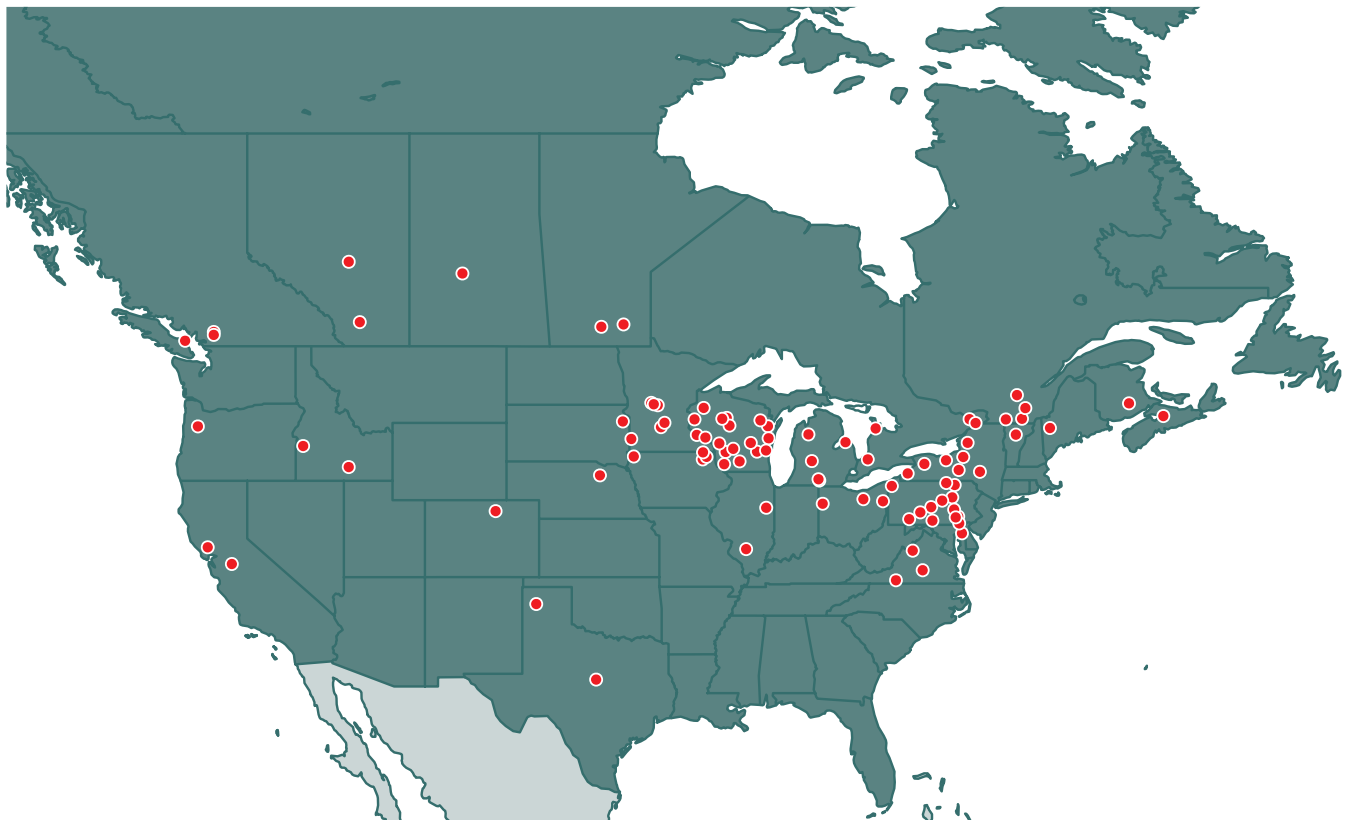
Even the best appliances need regular maintenance. Our service partners in your region are in charge of this and make sure that your operation can be run without a hitch. Every service person in the world who looks after your Calf-Star

product was trained by us, attends regular advanced training classes, 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 customer news bulletin, our Calf Manual, study tours offered to our customers, presentations on topics regarding state-of-the-art 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.calfstar.com where we regularly inform you about all our news.





DIGITAL GOODIES FOR YOU

On our website you will of course find all relevant information about our company, our products and our dealers all over the world. But there is even more to discover:

Download section

In our comprehensive download section you will find brochures, checklists, guidebooks.

Calculators

Do you like being given on-line advice, at any time of day and night, without any commitment on your part? Then take advantage of the online configurators on our website. Find the optimum device configuration for your automatic calf feeder, Milk Taxi or various igloo systems.

Gallery

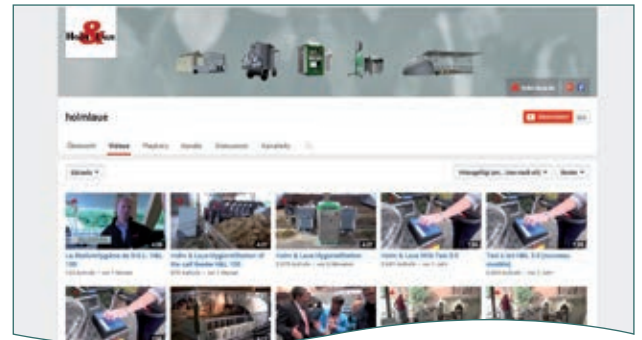
Why reinvent the wheel? Scroll through our galleries to see how customers use our products in the daily running of their operations. You are sure to get some great new ideas of your own!



YOUTUBE AND FACEBOOK

We are particularly proud of our videos, which show almost all our products in action, for you to observe: See on our website or YouTube channel how calf barns for 56 calves are easily cleaned by 2 persons in 1 ¼ hours, how you can ensure optimum colostrum supply at any time of day and night and much more besides...

www.youtube.com/user/HolmLaue



Holm & Laue YouTube channel
www.youtube.com/user/HolmLaue

Follow us on Facebook and keep up-to-date with all our news.

www.facebook.com/HolmLaue

www.facebook.com/calfstar

or visit our website

www.calfstar.com

Fax Form

Detach and return by fax to
920-866-9819

Sender

Phone

For the products checked on the right, please

- provide further information
- submit an offer
- provide advice

Desired Date for a Meeting:

Notes

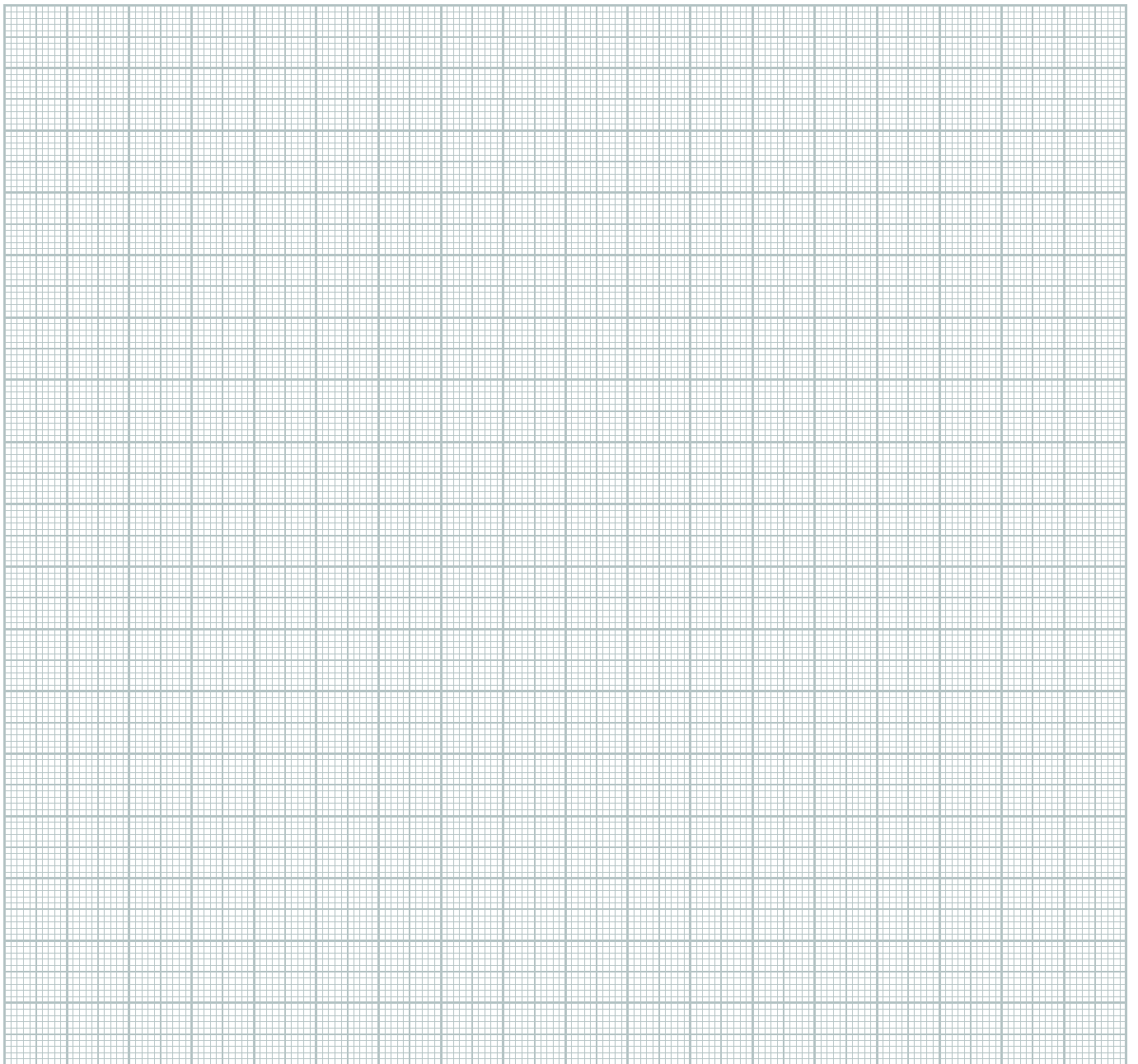
I am interested in:

- H&L 100 Automatic Calf Feeder
- HygieneStation
- Calf-Star Milk Jug
- Milktaxi
- CalfGuide
- Milktaxi Pasteuriser
- Calf-Star Dispenser Tanks
- Calf-Star HTST Calf Milk Pasteurizer
- Calf-Star Mini Batch
- H&L Igloo
- Igloo Veranda
- RT10™ Cow-Side SCC
- Calf Jacket
- Calf-Star Bottle Washer
- Calf-Star Pail Washer
- Feeding Technology Service



Take Your Time!

We are confident that reading our handbook has given you a lot of new impressions. What we now recommend: is that you lay down the handbook, sit back, and think about what you could change in your calf rearing procedures. What are your personal objectives? How could your operation further improve in the calf barn?





Holm & Laue GmbH & Co. KG
Moorweg 6
24784 Westerrönfeld
Germany

Phone: +49 4331 20 174 0
Fax: +49 4331 20 174 29
E-mail: info@holm-laue.com
Web: www.holm-laue.com



Calf-Star
4324 N. County RD. P
New Franken, WI 54229
USA

Phone: +1- (920) 680-5976
E-mail: info@calfstar.com
Web: www.calfstar.com

We thank those companies and customers who have contributed photographs to this handbook.

Photograph Credits

Holm & Laue, Calvex, Calf-Tel, Landwirtschaftskammer Schleswig-Holstein, Elenathewise - Fotolia.com, goodluz/Shutterstock.com, Production Perig/Shutterstock.com, Iakov Filimonov/Shutterstock.com, iStock.com/JMickl

Calf Handbook, 6th edition
Subject to Errors and Modifications.

Nominal charge: €16

The product information in this handbook contains descriptions or performance characteristics which in specific cases do not always apply or which can change as a result of development of the products. Required performance characteristics are only binding if they have been specifically agreed when concluding the contract. Availability and right to make technical changes reserved.

The test results described in this handbook cannot be replicated in practice in every case. This is due to local conditions and management measures.

All product designations may be brands or product names of Holm & Laue GmbH & Co. KG or other companies. Their use by third parties for their own purposes can contravene the rights of the owners.

"Thanks a lot for thinking about us."





Holm & Laue GmbH & Co. KG
Moorweg 6
24784 Westerrönfeld, Germany

Phone: +49 4331 20 174 0
Fax: +49 4331 20 174 29
E-mail: info@holm-laue.com
Web: www.holm-laue.com



CalfStar
4324 N. County RD. P
New Franken, WI 54229
USA

Phone: +1- (920) 680-5976
E-mail: info@calfstar.com
Web: www.calfstar.com



H&L Igloo Veranda



Pasteurizer