Happiness of pigs
Modern pig farming doesn’t always allow the animals to display their natural behaviour. They’re often not able to root around, for example. The German company H+L considers this to be detrimental to the pigs’ health, which is why it combines profitable pig farming with animal welfare. Thanks to its use of innovative technology, H+L is a leading company in this field.

Richard Hölscher was raised on the pig farm where his father, together with Peter Leuschner, founded the livestock equipment manufacturer H+L. That was in 1966, 50 years ago. After his study he subsequently hired by McKinsey, an international management consulting firm.

In that role, he was able to spend 18 months working with his family’s company H+L. Soon afterwards he decided to join the company as one of the two managing directors. The other managing director is Marc Leuschner, son of a co-founder. He is responsible for the sales in Germany and administration.

PARTNERSHIPS WITH ACADEMIA

In addition to the livestock equipment manufacturing company H+L, Richard also took over his parents’ farm with 4,000 fattening pigs and 220 hectares of arable land, so he is a farmer too. He can test the products H+L devises and develops on his own farm. Richard doesn’t have any problems with livestock farming as such, but he does object to how the animals are treated sometimes. ‘At H+L we’ve developed numerous solutions to improve animal welfare,’ Richard says. ‘One of which is the H+L outdoor pen, which gives the animals the opportunity to root.’

SOCIAL ACCEPTANCE

Richard is convinced that animal welfare is important in terms of the social acceptance for pig farming, which is why welfare is playing an ever-bigger role in the sale of pork. ‘This topic will be a deciding factor in the future success of pig farming in central Europe, and that’s our motivation for making animal welfare the top priority.’

INNOVATIVE TECHNOLOGY

Marc explains that an innovative company like H+L is ideally positioned to help farmers
take the next step towards pig-friendlier methods. ‘We make use of innovative technology to achieve optimum results while improving animal welfare at the same time,’ he says.

When utilizing any kind of technology, pig farmers depend on the supplier for advice, technical support and service. H+L is fully geared up for this. ‘We develop and manufacture all our technology ourselves,’ comments Marc. ‘So we’re able to provide the pig farmers with the very best advice and service relating to our equipment. We don’t just sell the technology, but also offer advice on feeding, housing, health, genetics and management.’

H+L develops and produces climate-control, sorting and supplementary feeding systems. ‘We supply complete solutions,’ states Marc. ‘We connect all the technology to the professional database called Smart Pig Chain. This contributes to excellent results for pig farmers as well as information exchange within the chain. H+L is keen to work together with professional pig farmers and chain partners to help improve animal welfare within pig farming.’

Pioneer in imaging technology

H+L in Emsbüren is a pioneer in technology for professional pig farming and in particular in imaging technology. In 2002 the company won a DLG Gold Medal for its innovative Optisort sorter for fattening pigs which is based on camera technology. The Optisort has provided the foundation for further innovation, resulting in H+L becoming the undisputed European leader in group housing systems for fattening pigs. H+L also applies its imaging technology to determine the condition of dairy cows (Opticow) and in its new sorter for sows (Sow Welfare Optimized Feeding). This sorter enables gestating sows to feed as often as they like, leading to both fantastic production results and animal welfare. The same technology is also used in the handheld Optiscan, which allows pigs to be weighed quickly and accurately.

Marc Leuschner (l) and Richard Hölscher, managing directors of H+L
Engineers at Texas Instruments introduce a new technology. They build and market the first commercial products with silicon-based transistors, providing a cornerstone for the digital devices that would later conquer the world.
H+L introduces innovative technology for selecting, controlling and feeding pigs. This marks the start of a new approach to pig farming based on improved animal welfare and better technical results.
Innovative housing fattening pigs

The Optisort sorter by H+L gives you access to innovative technology that facilitates animal-friendly housing for pigs while producing excellent technical and financial results.

Animal welfare is central to the H+L housing concept. The pigs are housed in large groups, which fosters them a calm and stress-free life. They enjoy lots of space. These large groups are characterized by minimal aggression. The pigs are not restricted in their natural behaviour and they can move around freely. They have access to feed and water whenever they want. The feed is provided in a separate area, which ensures optimum calmness during feeding. H+L also offers a range of toys and distraction materials such as a straw rack, a bath, a shower, a licking block, a rubbing post and rooting places.

FINANCIALLY ATTRACTIVE
The H+L housing concept is financially attractive for pig farmers. It requires less investment than traditional housing that is divided into smaller pens. The concept reduces labour; the equipment helps the pig farmer to conduct checks and ensures that the animals are fed automatically. Because there are relatively few dividing walls, the pig house is easy to clean. The Optisort sorter selects the animals on the pig farmer’s behalf, sorting the pigs accurately based on the desired weight and, if necessary, carcass quality. The excellent technical results of the pigs are a key feature of this concept. The growth and feed conversion ratio are particularly good because the housing system ensures that the pigs are fed in line with their weight. Furthermore, this precise selection process achieves a higher price when the pigs are sold.

HOUSING IN LARGE GROUPS
Thanks to the Optisort sorter the pigs can be...
kept in large groups of 300 pigs or more. The animals are housed in the living space where they can sleep, walk around and play. If they want to be fed, they enter the sorter. The sorter guides each pig based on its weight into the feeding area for light or heavy animals, where it receives the right type of feed in line with its weight. If necessary, the sorter guides the pig into the selection area.

**EXPERIENCE**
Since 2002, hundreds of pig farmers have already experienced the H+L housing concept for large groups and the Optisort sorter for themselves. This approach produces good technical and financial results. In addition pig farmers enjoy working with this animal-friendly housing concept.
**H+L LIQUID FEEDING**

Profitable feeding

The H+L liquid feeding releases feed in line with the pigs’ needs and monitors the group’s feed intake. This innovative feeding method produces excellent growth results.

The technology behind the H+L liquid feed system is fully aligned with the circumstances associated with feeding pigs in large groups. The technology measures how full the trough is and how quickly the pigs feed. This enables the H+L liquid feed system to dose the feed with precision in line with the pigs’ needs. This technology also automates pig feeding and ensures that the pigs have access to fresh feed at all times.

The H+L liquid feed system is suitable for use with sows, piglets and fattening pigs. The mixer is made of stainless steel and it can be used to provide access to components and by-products as well as other feed components such as minerals and premixes. An automatic cleaning program keeps the system hygienically clean. The H+L Liquid Feeding is computer-controlled and it can also be operated using a smartphone. H+L can perform remote maintenance on the system via an internet connection.

The liquid feed system gathers a wealth of data about feed quantities and raw materials used. This data can be accessed and analysed via the Smart Pig Chain technology to enable optimization of the pig feeding activities. The combination of the H+L housing concept, the Optisort sorter and the innovative liquid feed system provides a well-balanced pig farming solution.

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**OPTISORT SORTER**

State-of-art technology

The Optisort sorter is the heart of the H+L housing systems for fattening pigs. Equipped with a unique optical system, the Optisort controls the pigs, leads them to the right feeding area and collects data about their weight and condition.

Every time that pigs go to feed, around four or five times a day, they enter the Optisort sorter through the access gate. A camera scans the pig in a matter of seconds and uses the image to calculate the animal’s weight and carcass quality.

The pigs can be sorted based on weight or carcass quality, but it is also possible to sort pigs that have been marked with a marker pen, e.g. for a vaccination or treatment. The sorter also checks the growth and health of the pigs. Furthermore, the sorter provides both current and historical data about the animals’ growth, behaviour and feed intake. By combining the H+L liquid feeder with Optisort you can achieve closed-loop feeding, a highly developed feeding system which leads to very good growth, feed conversion ratio and body condition, while optimizing the feed costs.

Optisort selects pigs of a certain weight for transport to the slaughterhouse. There is a choice of three selection criteria:

- Weight (live weight or carcass weight)
- Meat content (Fom)
- Carcass quality (Autofom)

The commercial analysis is seamlessly aligned with H+L’s Smart Pig Chain technology, which enables data about the growth and quality of the pigs to be shared with other chain partners. The sorter is constructed from robust materials, stainless steel and durable synthetics that are sturdy enough to withstand the everyday conditions in the pig house. Farmers have been using Optisort since 2002 and the system has proved itself to be very durable and reliable over the years.
Improved welfare with an outdoor pen and rooting area

The H+L outdoor pen is even more closely aligned with the pig's needs, as they can go outside for some fresh air and to root around. At the same time it enables a commercially attractive approach to pig farming and achieve good technical results.

An outdoor pen is a good option when pigs are housed in large groups. In the H+L concept, the Optisort sorter checks and takes care of the animals.

This system provides enough room to house all the animals comfortably. The additional outdoor pen can be accessed freely by the pigs. This pen is covered and comprises a rooting area, a feeding area and a slatted floor. Many pigs tend to defecate as soon as they go outside. In this case, the excrement passes through the slatted floor and is removed.

The rooting area allows the pigs to express their natural instinct to root, which makes this housing concept particularly animal-friendly. Outside, you can feed the pigs roughage.

OUTSIDE

The pigs go inside and outside by passing through access doors. In order to prevent draughts, which can be harmful to pig health, the doors are usually closed. Whenever the access doors are opened so that the pigs can go inside or outside, the ventilation system is switched off and an signal sounds. The pigs then have several minutes to pass through the doors. These kinds of doors or gates are commonplace in group housing for pigs.

You can regulate the access to the outdoor pen yourself. For example, if you want to clean the rooting area with your tractor, you can close the access doors so that all the animals remain indoors. This method also enables you to keep the animals inside in the case of bad weather or a risk of infectious diseases.

COMPLETE CARE

The pigs receive complete care indoors. The pig house is divided into several different areas: the feeding area, where the pigs can feed undisturbed, and the living space where there is room for the pigs to lie down, play and walk around. The floor consists of a comfortable synthetic floor and a metallic or concrete slatted floor. In the play areas, the pigs have access to straw racks, a rubbing post, a licking block, toys and a shower. This housing concept is extremely suitable for pig production chains that strive to achieve a high degree of animal welfare.
Animal welfare in pig

PIG
- No fear, no stress
- Natural behaviour
- Optimal, limitless feeding

FARMER
- Cost efficiency
- Excellent technical results
- Control growth, feed intake and feed conversion

SLAUGHTER-HOUSE
- Select based on weight and carcass quality
- Control over supply
- Pork with added value

BENEFIT FOR ALL
- Technology reduces manual labour
- Monitor behaviour
- Control growth, feed intake and feed conversion
- Pork with added value
- Boost consumer image of product
- Affordable pork
- Cost efficiency
- Natural behaviour

CONSUMER
HAPPY PIGS, SATISFIED CONSUMERS

We believe that farm animals have the right to be treated with respect and to lead a good life. Therefore H+L is one of the most innovative and progressive companies in the field of animal welfare. Our systems provide the foundation for socially acceptable pig farming, which in turn benefits every link in the chain. Happy pigs mean satisfied consumers.
The fundamental idea is that scientists from different fields (agricultural, technology, veterinary medicine) are working on is as follows: to partially combine feed for gestating sows with roughage in such a way that they consume precisely the right amount of energy and nutrients while feeding unlimitedly. Professor Kamphues is already familiar with the idea of providing roughage to sows: 'I grew up on a farm and, when I was young, it was commonplace to allow sows to

Gestating sows are given around 3 kg of feed per day, which they consume within minutes and then have to wait for a whole day for their next feed – during a long time with an empty stomach. This is far from ideal. Professor Kamphues and Professor Visscher from the Institute for Animal Nutrition at the University of Veterinary Medicine (TiHo) Hannover are working with H+L on a breakthrough in sow feeding: unlimited feed intake for gestating sows, under the umbrella 'Sow Welfare Optimized Feeding'.
Ng favours animal welfare

Professor Kamphues (right) and professor Visscher use the H+L sorter to feed gestating sows unlimited.

SORTER IS CRUCIAL
In order to be able to feed each sow individually in line with her precise weight, condition and needs, the H+L sorter is crucial. Before the sows are allowed to feed, they enter the sorter for scanning and assessment of their body condition. Based on the assessment, they move into one of two feeding areas, where a liquid diet is offered ad libitum. The two diets differ markedly in the proportion of roughage in it. This enables them to eat as much as they want, with their nutritional needs being met so that they maintain precisely the right condition and achieve the right weight at parturition.

NEW APPROACH TO RATIONING
The new feeding system necessitates a new approach to rationing. Professor Kamphues and his colleague Professor Visscher are tasked with developing the rations. 'The underlying principle is that we manage the condition of the sow by adding certain feed components to a greater or lesser extent,' explains Visscher. 'If a lower energy supply is required then we add more roughage. The feed intake is also influenced by flavour, the need to chew and the sense of satiation the feed provides, so we take all of those factors into account too.'

When formulating the rations, Kamphues and Visscher use whole plant corn silage, eco-fermented wheat or rye, supplemented with concentrates, including protein rich ingredients and minerals. They develop the rations in such a way that the gestating sows can eat limitlessly without becoming too fat. 'If you let a gestating sow eat concentrates unlimitedly then she will get too fat in weeks. We want to avoid luxury consumption because it’s too expensive, non efficient and a risk for the sow’s health,’ says Kamphues. Therefore roughage is included and ground down to the exact same size as the particles in order to ensure good mixing. The H+L liquid feed system can easily produce mixtures made up of different amounts of diverse ingredients including various roughages/silages and byproducts.

RIGHT WAY FORWARD
Kamphues is convinced that unlimited feeding benefits the welfare of gestating sows: ‘Sows normally receive around three kilos of feed, yet they can consume more than twice that amount before feeling satiated. That means that they spend much of the day hungry, staring at an empty trough. Now, they can eat and drink as much as they want, whenever they want. Their stomachs and intestines are filled, which helps to keep them calm.’

‘Allowing sows to feed limitlessly also benefits the production,’ adds Visscher. ‘In the farrowing pen, they need a high feed intake to produce milk. With our system, the gestating sows are already used to a high food intake necessary at peak lactation. ‘Furthermore, roughage has a positive effect on the farrowing process which might be favoured by a more continuous energy supply from hind gut fermentation,’ says Kamphues. ‘The sows tend to farrow the piglets more quickly and easily.’

Both professors firmly believe that their approach marks a breakthrough in sow feeding and that it’s the right way forward. Kamphues: 'It is not only good for the animals, but also for the zootechnical and financial results.'

graze and to feed them beet or grass silage in the winter. Over the years this approach to feeding has been replaced by concentrates only.’

In modern pig farming, feeding roughage to sows is not feasible for many companies due to the high level of manual labour involved. Kamphues and his colleague Visscher are working with H+L on a completely new labour-saving method based on the latest technological tools.
Safe and healthy climate for pigs

The vacuum regulated ventilation (VRV) system by H+L combines two important functions: maintaining a good climate and ensuring sufficient fresh air in the case of a power cut.

A good ventilation system in pig housing must provide sufficient fresh air, maintain the temperature in the pig house and also prevent draughts. In practice, preventing draughts is often the most important and most difficult task. In the VRV system the air speed of the incoming air is regulated by the opening of a pneumatically controlled air inlet.

REGULATING MECHANISM
The regulating mechanism of the VRV system works as follows:
- The ventilation level (cubic metres per hour) is determined by the difference between the indoor air temperature and the target temperature.
- The speed at which the air should be drawn in is determined by the difference between the outdoor temperature and the target temperature.
- By measuring the vacuum it is possible to calculate and regulate the actual air speed (Bernouilli’s principle).
- The air inlet is pneumatically moved into the right position to achieve the desired air speed of the incoming air.
- The position of the H+L air inlet enables the system to benefit from the Coandă effect. The combination of the correct air speed and the Coandă effect ensures that fresh air is mixed with the indoor air without creating a draught.

SAFETY IN THE CASE OF A POWER CUT
The valves in the VRV system are dimensioned so as to ensure a sufficient supply of fresh air even in the case of natural ventilation. In the event of a power cut, the valves open at maximum to allow fresh air to flow into the pig house. At the same time, the pig farmer is alerted to the situation. This enables him to manually adjust the valves as necessary if the indoor temperature should drop too severely. The VRV system provides certainty that the animals will always have fresh air, even in the case of a power cut.

* Air speed is based on and measured by pA (Bernouilli’s principle)

The ventilator speed is corrected if the measured pA is not the target pA.
NEW OPTISCAN

Rapid check of a pig’s weight

The new Optiscan handheld scanner with improved software represents a quick and easy method to check a pig’s weight. The Optisort sorter includes a camera that scans the pigs and measures their weight. This expertise has been utilized to develop the Optiscan handheld scanner which is fitted with a 3D camera. You simply stand next to the pig, hold the scanner above it and the weight will be measured in a matter of seconds.

The Optiscan is also ideal for use when sorting pigs ready for sale based on their precise weight. The pig’s exact weight is clearly displayed on the Optiscan screen.

AEROCLEANER

Clean, healthy indoor air

The H+L Aerocleaner keeps the air inside livestock buildings clean, resulting in fewer germs, less dust and hardly any smell. You can also use it to cool the barn or prepare it for cleaning.

The H+L Aerocleaner sprays a mix of water and essential oils into the indoor air, thus eliminating dust and harmful gases. 70 percent of dust is removed, as are harmful germs and fungal spores. Furthermore, the smell is largely neutralized. In addition to tackling dust and harmful gases, you can also use the Aerocleaner to soak the pig house in preparation for cleaning. In the summer, this device can help to cool the indoor air and it is also suitable for controlling flies.

SPECIAL OFFER

INTRODUCTORY DISCOUNT ON NEW OPTISCAN

Purchase the new Optiscan this year to benefit from an attractive discount. See www.hplusl.com
The pig is scanned on the left in the Optisort and guided into a feeding area. In the meantime, the processor in the Closed Loop Feeding system calculates the pig’s feed requirement and the relevant feed composition based on its weight, growth, feed intake and carcass quality, at least costs. Each pig receives precisely the right feed for efficient growth.
CLOSED LOOP FEEDING

Better growth and feed conversion ratio

Closed Loop Feeding is fully automatic, continuous multi-phase feeding in which the protein and calorie content of the feed is aligned with the pigs daily needs. This extremely precise approach to feeding reduces the feed costs and improves both growth and feed conversion ratio. It also improves carcass quality and reduces ammonia emissions.

When feeding pigs, farmers commonly use an estimate of the daily growth and feed intake as the basis for choosing feed with the required protein and calorie content. In practice, however, the growth and feed intake are often better or worse than estimated.

If the animals consume more feed than expected they will receive too much protein and too many calories. Their bodies will not utilize this efficiently, resulting in higher nitrogen emissions. They will also tend to become too fat. If the pigs consume less feed than expected, they will suffer a shortage of protein and calories. This will slow down their growth and also result in a poorer feed conversion ratio. In both cases, the utilization of the feed is sub-optimal.

THE SOLUTION: PRECISION FEEDING

Closed Loop Feeding optimally utilizes all the nutrients by feeding the pigs with precision. The key is to react quickly. In pig houses where H+L Optisort sorters are installed, the growth of the pigs is measured carefully every day. The H+L liquid feed system measures the daily feed intake. The Closed Loop Feeding system automatically adjusts the feed composition based on these measurements – you don’t have to do a thing. As a result, the pigs waste less protein and fewer calories and they grow more quickly with a better feed conversion ratio.

To influence the nutritional value three types of feed are being used, one of which has a higher crude fiber content such as whole plant corn silage or whole plant grain silage. The silage enables you to vary the protein and calorie content while still allowing the pigs to feed limitlessly. Limitless feeding is important for the pigs’ well-being. With Closed Loop Feeding you contribute to better animal welfare while also achieving better technical results and carcass quality combined with minimized feed costs.

COMFIFLOOR

Pig-friendly floor

Comfifloor is a synthetic floor that allows excrement to pass through it. Meanwhile, it is also a favourable surface for pigs to stand and lie on since it always remains clean and comfortable. That combination makes this type of flooring unique.

H+L produces Comfifloor from recycled plastic, making it an environmentally friendly product. The synthetic elements are designed in such a way that the gap is relatively narrow (a third of the size found in standard concrete slatted floors), however the faeces and urine can pass through quickly. The result is a dry and clean floor. Since the pigs are less likely to slip over they suffer fewer injuries, which is better for their well-being. The same holds true for the rounded elements and small gaps, as these ensure that the pigs can lie comfortably.

The floor is easy to clean, which is important for pig farmers. Furthermore, Comfifloor reduces ammonia emissions by removing the urine quickly. Made up of small individual elements, the modular floor is easy to assemble and can be installed anywhere. Comfifloor is a versatile flooring system which improves pig comfort and is easy to work with.
Being moved from one area to another is a stressful experience for piglets. That stress can be avoided by allowing the piglets to remain in the farrowing pen. H+L has developed the innovative Sow Take Away which gives the piglets a very favourable start in life.

One unique factor is that the piglets receive the same liquid feed as the sows. Thanks to the specially designed trough, the sow and her piglets can feed at the same time. Simultaneous feeding encourages the piglets to feed, meaning that they start feeding earlier, intake more feed and hence grow faster. Moreover, the early feed intake prepares the gastrointestinal tract for the moment ‘mums’ leaves. The piglets continue to use this trough even after weaning. They have access to fresh feed at all times. A sensor in the trough signals when the trough is empty and must be refilled with feed. After farrowing, the piglets have access to a warm piglet nest. The area where the sow lies, which generally has an excess of heat, is cooled.

A JOY TO WORK WITH
The Sow Take Away is a joy to work with for the pig farmer. He has easy access to the piglets and can adapt the sow’s area safely, even in the case of aggressive sows. Lactating sows must intake as much feed as possible in order to produce sufficient milk without losing considerable weight, which is why the Sow Take Away provides sows with unlimited access to feed.

Thanks to this innovative approach to feeding and the clever layout of the farrowing pen, the Sow Take Away gives a head start in rearing pigs successfully.
Smart Pig Chain is a modern digital technology which facilitates the connection of systems and exchange of data. This creates a powerful and versatile management system with unrivalled opportunities for pig farms and other companies, such as slaughterhouses.

As a manager in the pig chain or on a pig farm, you will often find yourself having to make decisions based on assumptions or incomplete information, leading to less-than-satisfactory results. There is now a solution to this problem. Every day, H+L systems gather a wealth of data about feed, growth, climate and slaughter quality. Smart Pig Chain makes all this data accessible so that it can be utilized by managers at pig farms and elsewhere in the chain. This objective and real-time information enables them to better manage their processes.

**INFORMATION WITHIN THE CHAIN**
Smart Pig Chain allows managers in the pig chain to maintain control over the delivery of pigs to the slaughterhouse, for example. As such a manager, you see the growth and quality scores of the pigs from the farms that supply to you. You can use this information to decide which pigs of a certain weight and specific quality should be delivered to you. This enables you to align supply with demand in the production process, thus optimizing your processing activities and saving costs.

**USEFUL MANAGEMENT INFORMATION**
At a pig farm, Smart Pig Chain collects all digital data and translates it into useful management information. For example, you can analyse the results of the dispatched pigs based on classification data. This reveals how much money the pigs have generated from the slaughterhouse and whether you could get a higher price elsewhere. It also calculates the optimal day of delivery to the slaughterhouse. Furthermore, Smart Pig Chain gathers on a daily basis all data about the pigs' growth, feed intake and feed conversion. If the growth, feed intake or feed conversion deviates from the plan, you receive an alert.

You can then use Smart Pig Chain to analyse the cause of the deviation. It’s very easy to include climate data in your analysis because Smart Pig Chain makes that information available too. Smart Pig Chain represents a valuable management tool that enables you to achieve excellent results on your pig farm. It also contributes to the transparency of the pig chain production by providing information about every pigs history, treatment and feeding.