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EuroTier 2024: Trends in Pig Farming and Feeding Technology

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As the world's leading trade fair, EuroTier 2024 will showcase the latest trends in pig farming and feeding technology. The global demand for pork continues to rise. However, there are country-specific or regional trends that run contrary to this development. Due to a significant decline in the consumption of pork, but also due to social and political changes, there are other challenges in Germany that need to be overcome in contrast to global pork production. Cost leadership in the respective product sector is the basis for cost-effective operations.

Digitalisation in production

In order to achieve the necessary cost leadership, knowledge of the actual production process is an essential prerequisite for successful work. The data networking of the various technologies installed in the barn, which was already offered by a number of exhibitors, was further intensified in 2024. From climate control with a monitoring system for early detection of possible respiratory diseases, to feeding technology with recording of consumption quantities, through to optimised sales management in conjunction with weighing lock technology or camera systems - a great deal is already feasible. Various exhibitors will be offering further developments and additional features to map the production processes. This data network can also be used to record water consumption, control the curtain systems in the outlet, utilise high-pressure cooling or control automated bedding systems. With the help of simply designed user interfaces in the employee's national language, operation is intuitive and user-friendly and can simplify day-to-day work.

Filtering the decisive, relevant values for optimised production from the large amount of data remains a problem. So-called "alarm values" play an important role here. These must be determined and specified for each individual company. Using camera technology and AI (artificial intelligence) for animal observation, the expansion of digitalisation for early detection of possible caudophagy problems and optimised work completion is on the rise.

The largely manufacturer-specific approach to digitalisation is problematic in this context. Data networking via well-known cross-manufacturer solutions such as ISOagriNET will be a key task in the future in order to accelerate the benefits of digitalisation.

Farming technology for pigs

The further development of automated bedding systems is another trend at EuroTier 2024 due to the changed framework conditions in farming technology, particularly in Central and Northern Europe. The focus here is on bale presentation and the subsequent loosening and spreading of the bedding. The pre-storage of larger quantities of square or round bales with an automated technique for removing the twine has been in use for some time. Manufacturers achieve improved labour productivity with these innovations.

Detailed improvements can be seen in known distribution systems via pipe cable or pipe chain systems with a varying diameter of the delivery pipe. There are also new developments in dosing containers for better distribution of the bedding. Known systems that transport different quantities of bedding individually to specific positions are not necessarily gaining acceptance at present for cost reasons. Innovations are required here through the use of pneumatic valves together with corresponding distribution. With the help of an app-based control system, an appropriate amount of bedding can be individually conveyed to the desired position within the pen. Alternatively, bedding quantities are adjusted to requirements using a feed curve.

The further development of rail-bound systems familiar from cattle farming is also being used intensively for bedding technology in pig farming. The advantage of these systems is that the amount of bedding can be customised for each individual bay. For this purpose, markers are mounted on the track at a defined distance, which are detected by an inductive sensor. This allows the robot to know where it is on the track. Depending on the manufacturer, a different number of markers is possible. Starting from the parking station, an internal position counter records the number of markers passed. The control program also offers the option of linking a marker to a specific action. In addition to the actual spreading, for example, a lane change can also be programmed with an electric switch. Due to the different cubature compared to cattle farming, bedding robots with different sizes and loading capacities have been developed by the manufacturers for pig barns. These systems also save considerable labour time when introducing the bedding. In addition, an automatic, precisely metered bedding system reduces straw consumption by up to 30 %.

In the case of dragged-out runs of animal farming levels 3, 4 and 5, but also in the case of breeding sows, the overview and at the same time animal monitoring is more difficult. In the case of bedded runs that are cleaned out with a wheel loader or something similar, the animals must be locked away during the actual work process. The majority of door systems offered to

date do not have an automated locking mechanism. At EuroTier, further developments will be on show that are designed to save time and at the same time provide increased safety for barn staff. With the self-closing swing door, the direction of passage for one side is blocked by a pneumatic cylinder with a locking bolt. This means that when the directional barrier is active, the pigs should only be able to move from the outdoor area to the inside of the barn. The movement of animals from indoors in the direction of an outdoor run is to be prevented as far as possible. In order to significantly shorten the manure removal process, the manual labour involved in closing the pens is to be avoided. A timer can be used to activate the locking direction or release it again after removing the manure.

A retrofit system for fully automatic camera-based spraying of the tail area for fattening pigs will be exhibited as a further development. The denaturant, which comes from the human sector, is intended to prevent caudophagy problems through regular use and increase the chance of an intact curly tail.

Another development is concerned with reducing the ammonia content in the barn air. To improve the air quality in the barn, the barn climate is monitored by digital ammonia sensors. If the limit values for ammonia are exceeded, the manure is removed from the pen or barn via a moving floor or conveyor-belt system in order to minimise emissions accordingly.
Concrete slatted floors damaged by feed acid and/or simultaneous heavy use are a well-known issue. One exhibitor has developed a repair kit for replacing the concrete slits as a practical alternative. The repair kit is available in a version in which a cement coating is cast into 4-millimetre aluminium profiles. Alternatively, flat aluminium profiles are available that are bonded to a coating. The aluminium profile is available in many desired shapes and sizes. At the same time, it enables the slot width to be permanently guaranteed, which maximises the passage of manure and with it the dryness of the ground.

Automated condition monitoring and farming techniques for sows
The feed condition of the sows is an important factor for the economic success of a piglet producer. However, solely determining the weight of the sow is not very informative. The parallel measurement of back fat thickness using the known methods and measurement techniques is more effective. Alternatively, an assessment can be made using the Body Condition Score (BCS). This assessment is rather subjective, depending on the eye of the observer or the barn staff. Various manufacturers are offering further developed automated condition assessment systems at EuroTier. These systems are designed to enable condition-adapted feeding. These technologies are camera-based systems that are used in an electronic on-demand feeding station, a selection station or as a stand-alone device. The animal is recorded by the camera. The image(s) are then analysed to determine the animal's condition. The AI-supported analysis of the images is based on a base or ideal value calculated from many practice measurements.

When the technology is used in a call-up station, the condition progression can be measured continuously. This enables (automatic) adjustments to be made to the feed curve of the pregnant sows at an early stage. However, the necessary interface between the measuring device and the call-up station must be defined. Comparable systems can also be used in conventional self-catching feeding bays. However, in most cases, it is necessary to change the corresponding feed quantities or curves manually. With a stand-alone station, an assessment can be carried out on the route between the various farming sections (breeding centre, sow holding pen, farrowing pen). This makes it easier to form homogeneous groups, especially in the holding pen at short feeding stalls or self-catching feeding pens.

Farrowing pen

Improvements and further developments to existing systems can be seen from both internationally active and regional exhibition companies. Due to the German requirements for the creation of a soft lying surface in the farrowing pen area, several exhibitors will be presenting further developments in the field of floor design. This is reflected in the further development of the grid design with a "sow mattress". This soft surface padding is designed to prevent shoulder injuries and provide improved surefootedness. Statements on the durability of these systems, some of which are already familiar, are not yet available.

In other systems, the nest-building material is initially provided on a predominantly closed lying area with a bedding of wood shavings or long straw. In order to utilise the bedding material for prolonged periods, a curvature of the outwardly rounded trough edge is intended to ensure that it remains securely in place. Even after nesting, a soft rubbery surface remains. A special mechanism makes it easier to remove the fibre-reinforced but non-deformable mat for cleaning. All approaches are designed to support the well-being of the sows and ensure a reduction in shoulder lesions.

Lowered piglet nests have been around for some time. However, there were problems with hygiene in the piglet nest in many systems. The approach was taken up again in a further development of existing grating systems. The partially perforated and lowered surface allows any liquids to run off to ensure a dry piglet nest. The piglet nest, which is fitted with underfloor heating, can provide the piglets with a hygienically optimised retreat thanks to its lowered shape, using bedding powder and, for example, wood shavings.

In order to minimise crushing losses, the temperature stability of the piglets is an important influencing factor. Especially in farrowing pens that are designed for free farrowing, the challenge is to guide the newborn piglets immediately into the warmed piglet nest. To this end, further developments will be presented at the trade fair that offer corresponding advantages thanks to a patented, simple curtain locking mechanism with a heat-conducting function. At the

same time, a multifunctional barrier board can be used to conduct the heat and block off the nest.

A number of further developments can be seen in the different housing systems in the farrowing barn. For example, there are logical and well thought-out evolutions for exercise or free-range pens in the farrowing area.

Due to changes in husbandry requirements as a result of the German Animal Welfare Livestock Ordinance, various manufacturers have continued to develop group housing systems for lactating sows. Modified door systems with a self-catching or locking function are intended to achieve increased work safety for necessary work inside the bay as well as possible time savings. The self-catching function is characterised by simple and intuitive operation via a computer or a compartment button. The aim is to make work in the barn safer and more labour-optimised.

Feeding technology

Dry feeders are becoming increasingly popular, especially for keeping uncropped animals, in order to ensure longer feed intake and therefore more intensive activity. Advanced distribution techniques are demonstrated in the dry feeding systems with a 1:1 animal/feeding area ratio. At the same time, sensors that have been further developed in the meantime (horizontally mounted long-trough sensors) can measure the feed quantities in the trough not only at specific points, but over a large area. The sensor system, which can also be retrofitted, is impervious to animal activity and moisture.

There have also been further developments in the familiar portion feeding systems for sows. Software changes have been made to ensure automated filling of the volume containers above the portion dispensers.

An efficient cleaning system with a water rinsing system has been developed for tilting troughs in the farrowing barn. This innovative approach is intended to simplify the removal of any food residues. However, if large amounts of food residues remain on the base of the grid, they must be removed in a further work step to prevent maggots and flies from forming.

Further developments in feeding systems for suckling piglets will be presented to ensure an improved hygiene status. Advancements have also been made with regard to feed trays in the farrowing barn. Water and feed should be offered separately in the transversely divided bowl, resulting in increased litter quality. With a further feeding system, larvae of the soldier fly can be offered to the piglets as an activity and reward, but also to promote nutrition.

Summary

As the world's leading trade fair for professional animal farming and livestock management, EuroTier 2024 offers many further developments and improvements to existing pig farming and feeding techniques. New, in some cases innovative developments, but also many small but well-designed details, including in accessories and equipment for successful production, make a visit to Hanover worthwhile.

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