

MEDIA INFORMATION

Leibniz Institute for Farm Animal Biology

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LEIBNIZ INSTITUTE
FOR FARM ANIMAL BIOLOGY

Leibniz scientists in Dummerstorf develop new system for the early detection of claw diseases

[Impact sound plate can detect the acoustic footprint of dairy cows.](#)

In cooperation with argus electronic GmbH Rostock, scientists from the Leibniz Institute for Farm Animal Biology Dummerstorf (FBN) are developing an early warning system that can detect the acoustic footprint of dairy cows and thus also the onset of signs of claw and limb disease..

Besides disturbed fertility and udder health diseases of the claws and limbs are the biggest problems in dairy farming. There is currently no tried and tested early diagnosis to detect diseases of the claws. However, healthy claws are a prerequisite for a good general condition of the animal.

The impact sound plate is patented and will be presented to the livestock industry for the first time next year at the world's leading trade fair for animal husbandry, the EuroTier in Hanover.

Wanted: Reliable warning system for larger herds

If there are impairments at the claws, the animal tries to relieve the pathological area and lames. This lameness can be seen on the impact sound plate in the acoustic gait pattern of the cow. The most common method to control claw health to date is visual lameness assessment by the farmer. This requires a trained eye and is time-consuming and therefore difficult to integrate into the daily routine. Automatic and reliable measurement methods are therefore of great interest to dairy farmers, especially as the consequences of lameness for animal health and economic performance are enormous. Breeding associations and companies estimate the cost of lameness at €150 per animal.

In 2018 there were a total of around 4.17 million dairy cows in Germany. The proportion of farms with 200 or more dairy cows is around 50 percent. An increase in the number of livestock per farm can also be expected in the future if milk production is to be profitable. "In view of these developments, we assume that the demand for reliable automatic animal monitoring systems will increase strongly not only in Germany, but also internationally," said Project Manager Dr. Peter-Christian Schön of the FBN Institute of Behavioural Physiology.

Sensors detect the different movement rhythm

The impact sound plate was developed after an idea of the staff member Kurt Wendland and with the help of the specialists of the Rostock based argus electronic GmbH. An acoustic recording is made via acceleration sensors and the mathematical evaluation of the individual impacts on the sound plate. Pathological occurrences are to be classified in this way. The complete acoustic gait patterns are digitized, modelled and stored in an animal-specific database. Healthy cows have a smooth gait pattern, sick animals move more irregularly. Changes in movement behaviour and impact shape should be used to detect lameness at an early stage and to report the corresponding animals to the farmer promptly in order to initiate steps for treatment. The impact sound plate can be integrated into a dairy cattle facility in such a way that the animals have to cross it every time they milk.

"We paid particular attention to the robustness and practicality of the system," emphasised Dr. Peter-Christian Schön. "The impact sound plate is one of the contributions with which we are advancing digitisation in livestock farming. It can easily be used in any playpen environment. We initially evaluate it for dairy cattle husbandry. Other types of husbandry and animal species are conceivable".

"Our company has focused primarily on device development and programming as part of the project," said Stefan Ibendorf, project manager responsible at argus electronic GmbH. The innovative core of the project clearly lies in the recording and processing of impact noises on a sound plate using suitable acoustic sensors," says the electronics engineer.

Acoustic measurement systems are used in almost all industrial sectors, only in agriculture rather rarely. "In two to three years, we want to jointly bring the new system to market maturity so that it can be introduced in addition to the existing herd management systems," announced Dr. Peter-Christian Schön. "Until then, we will use the time to gain experience with further practical assignments in stables and to optimize the software in a user-friendly way. We are convinced that animal owners will be able to significantly improve the animal health of dairy cows in the future by early detection of lameness with the Impact sound plate".

argus electronic GmbH Rostock

argus electronic GmbH was founded in 1994 as an engineering office in the Hanseatic city of Rostock. The company develops and produces hardware and software solutions as well as measurement and sensor technology in the fields of forest physical measurement technology, fuel cell technologies, dosing controls, especially for the agricultural sector, and automation solutions for industrial and laboratory requirements. The company with twelve employees is represented internationally with sales channels on all continents.

www.argus-electronic.de

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Photos FBN/Joachim Kloock: *A cow is walking in the FBN on its way to the milking parlour via the impact sound plate. The acoustic signals are recorded.*

Kurt Wendland can follow and evaluate the movement activities on the PC. (Screenshot: FBN)

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