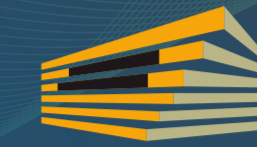# OT-37

CowBiosensor | Biosensor for collecting and processing kinematic data from livestock animals

TYPE OF R+D RESULT

New technology
New product
New service
New knowledge or skill

COMMERCIAL MATURITY LEVEL

Model or conceptual idea
Proof of concept (design)
Validated in a controlled environment
Validated in a real environment
Successfully implanted

PROTECTION LEVEL

Non- applicable
Patent
Software
Know - how
Utility model

Name of the patent
SENSOR DEVICE AND ASSOCIATED METHOD FOR COLLECTING AND PROCESSING KINEMATIC DATA OF A TERRESTRIAL ANIMAL

File number
P202100027
Filing date
17/02/2021
Patent grant status
Request
Places where the patent is granted

Description of the solution. Problem solved

Livestock sector plays an important role in the economy of many places due to the production and exportation of food. Also, livestock activity, especially centred into shepherding, has a positive impact on environment since it helps to control toxins and woody plants from the fields.
Because of this, it is needed to use means and tools that would control and assurance the animal welfare in livestock holdings.
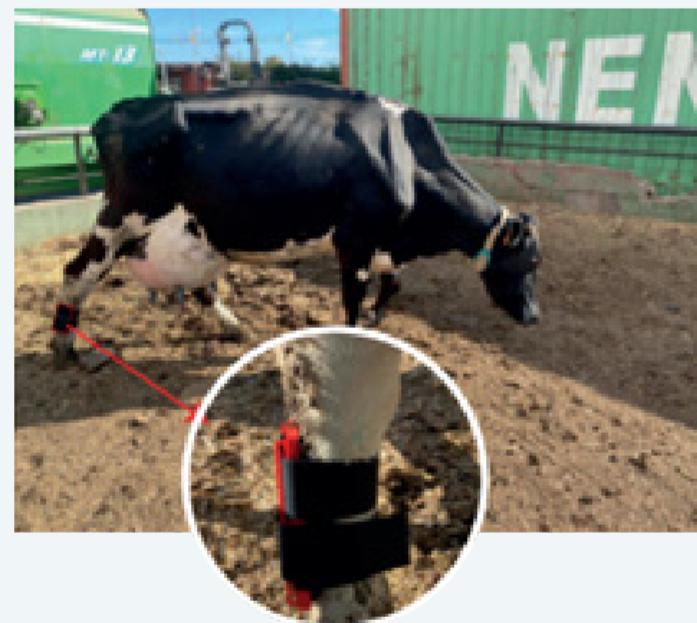

Figure: Detail of the biosensor set in hind leg of a cow with mobility problems.

The proposed solution (patent protected, P_202100027) is made by a sensor device and a method for collecting and processing kinematic data from animals that study their locomotion state and, thus, their health. This device consists of:

- **A movement sensor or biosensor:** that collects kinematic data for a determined period of time. This is a non-invasive sensor.

- **Processing means or transducer :** that transforms the signal obtained from the movement into a quantifiable measure and, thus, it can be compared allowing the animal's health state.

- **Memory element :** that stores the output signal in a data file. This way the signal is registered for further checking and comparisons.

By these means, the device makes a model that provides information about possible deficiencies in the locomotion activity of the animal, that means detecting distorted and/or amorphous motor patterns. This way, possible diseases related to locomotive system can be predicted.

So, the system measures and quantifies the neuromotor state of each asymptomatic animal in such a way that it can be compared to those showing any locomotive or other type symptoms. This device provides objective metrics about possible pathologies in typical locomotive activity of animals. Thus, if these metrics exceed reference margins, medical professional assessment of the animal is recommended.

It must be noted that the movement sensor is configured to be set in the wither heights or in a leg of the animal using a fastening mechanism as a harness, a strap or belt and some adhesive element.

Fields of commercial application

- Livestock sector.
- Health sector.

Market opportunity

In 2020, despite Covid-19 crisis, the Spanish animal health market increased its turnover compared to 2019, reaching to €1,718 million. Furthermore, according to Veterindustria, in 2020 the Spanish pig and beef sector amounted €378 and €236 million respectively. These data illustrate the importance and growth of the sector, even in an economy crisis situation.
Therefore, livestock industry would benefit from any solution leading to animal welfare and allowing to detect diseases in early stages, which makes easier to keep the animals' physical conditions.

Competitive advantage

- As aforementioned, this is a non-invasive solution that can be set in the wither height or one of the legs of the animal using a harness, strap, belt or an adhesive element.

- Analysing the locomotive state of the animal is easier, since it has a memory element that stores and registers all the information collected by the biosensor.

- This solution allows to detect abnormalities in asymptomatic animals' kinetics in early stages when pathologies or clinical signs have not appeared yet, especially those ones that directly affect the movement, such as limps. This would avoid the animals suffering, improving, thus, animal welfare. In addition, this solution helps to prevent pathologies and, therefore, treatment costs are reduced.

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