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(54) Title: TELEMETRIC DATA LOGGER FOR RUMINANTS WITH ELECTROLYSIS BASED POWERING AND SENSING

(57) Abstract: This invention is about the telemetric data logger, which is applied on both the major fatling and dairy ruminants; long lasting due to its self-charging capability inside the ruminant stomachs; and also including the RFID, thermometer, electrolysis, 3D accelerometer and wireless communication parts. This invention especially is about the telemetric data logger, including the electrolysis that overdo pH measurement, and so the system is self-charging without any necessity of calibration due to the electrolysis method.

TELEMETRIC DATA LOGGER FOR RUMINANTS WITH ELECTROLYSIS BASED POWERING AND SENSING

TECHNICAL FIELD

This invention is about the telemetric data logger, which is applied on both the major fatling and dairy ruminants; long lasting due to its self-charging capability inside the ruminant stomachs; and also including the RFID, thermometer, electrolysis, 3D accelerometer and wireless communication parts.

This invention especially is about the telemetric data logger, including the electrolysis that overdo pH measurement, and so the system is self-charging without any necessity of calibration due to the electrolysis method.

THE PREVIOUS TECHNIQUE

Being in line with the milk ruminants is important for the health, hygiene and yield criteria of the ruminants. The animal care effort is getting important more and more everyday, especially in the farms and fields with large population. One of the tracing systems is telemetric data loggers also. Telemetric data loggers collect the data right from the stomach of animals and measures the important parameters such as acidity level and body temperature of the ruminants; and so the ruminants are ensured to swallow specified form and weighing transmitter (BOLUS). Ruminants have four stomachs and the transmitter is positioned in the first one, which is called the rumen, because of its porous structure. Treatments are being run if necessary, based on the fever or pH disorder data coming from ruminants via these transmitters. However this method collects incoherent data especially for pH measurements because of the pH meters can not be calibrated in every 6 months, and after a while these measurements fall on deaf ears so. Besides, this development is required due to the transmitters are short-lived and do export so scanty of the data.

To sum up, the requirement of an initiative data logger system due to solve problems of the existing technique as said above and the inefficacy of existing solutions did force this development to be done already in the technical field.

PURPOSE OF THE INVENTION

The invention solves the entire problems, mentioned above, simultaneously. The invention, being talked about, generally is a telemetric data logger, which causes the energy generation changes connected to pH level in rumen via electrolysis method and so avoids from the requirement for pH meter calibration, and includes the electrolysis that causes the system to be self-charging, thanks to the electrolysis method.

An aim of the invention is to be the telemetric data logger, which includes thermometer, electrolysis tips, 3D accelerometer and RFID on the transmitter, causes the ruminants to less frequently swallow the transmitters that to be positioned in stomach due to its long lasting and self-charging battery that conduce toward long term data collecting.

Other aim of the invention is to detect the fever and possible infections of ruminants via the thermometer and help the treatment decision if necessary, and to detect the possible illnesses based on the changes that might happen on the frequency of ruminants' water drinking habits.

Another aim of the invention is to measure via electrolysis tips the conduction capability caused by the acidity changes inside rumen, and monitoring the change course of rumen pH levels according to current changes during electrolysis. The circuit in the device continuously measures the electrical generation by electrolysis, and logs the trend. Additionally the generated energy will also be used for charging the internal battery of the device for running the processer and the sensors as well as transmitting the collected data to external reader(s) with the desired frequencies (data transmission at every 15 mins or 30 mins or 1 hour etc.).

Another purpose of the invention is to detect the possible abomasums displacements and rumen disorders via measuring the rumen spasm frequency via 3D accelerometer.

Another aim of the invention is to deliver the power that is produced during the electrolysis method to the transmitter. The battery is connected to the electrolysis tips (electrodes) and so the system lasts longer due to the self-charging.

In the direction of mentioned purposes, the invention is telemetric data logger that brings innovation for the current structuring existing problems, applied on both the major fatling and dairy ruminants; long lasting due to its self-charging capability inside the ruminant stomachs; the electrolysis method causes the acidity levels course, and so the system is self-charging without any necessity of calibration due to the electrolysis method.

This invention, being talked about, as is stands with its basic system, is going to be preferred product in the industry. So it will succeed commercially.

DETAILED DESCRIPTION OF THE INVENTION

The invention includes the telemetric data logger, electrolysis that measures electrolysis capacity in the stomach and to charge the battery also follow the acidity trend in rumen, accelerometer that measures the stomach spasm frequencies, thermometer that measures the heat of gastric juice, electrical conductivity in rumen and the wireless communication circuits in order to transfer the collected data to the reader(s).

The most important element of telemetric data logger, subject to the invention, is the element of electrolysis. It is possible to monitor acidity course of rumen by electrolysis method. Electrolysis method lets us to monitor the rumen acidity course of ruminants'. The device that the ruminant swallowed, acts as a battery due to the gastric acid and the steam that battery produces will be chased telemetrically. The electrolysis increases –or the pH level decreases- (acidity increases), the change inside rumen is monitored in compliance with the previous course of average electrical current production. Although the pH increases (acidity decreases) also the electrolysis decreases, get a diagnosis upon how the rumen works in compliance with the healthy electrolysis course of that ruminant. So the need for pH measurement is no longer an issue as well as the calibration. The data that has been

collected from the ruminant, which has turned into a biological battery, is send by radio frequencies; the energy that devices needs to broadcast and collect data is coming from the electrical current, which was produced by electrolysis out of self-charging.

Telemetric data logger measures the rumen activity by 3D accelerometer inside the device. Besides, the frequency of the rumen's physical activity (the frequency of ingestant transfers though the next stomach) and the reflex of rumination is measured frequently and this frequency is transferred as a data in order to monitor the health of rumen's activity.

The thermometer on the device does measure the ruminant's body temperature, and so the frequency of water drinking is monitored and so that keeps any unusual situation on these changes can be followed.

CLAIMS

1) The invention is telemetric data logger, applied on both the major fatling and dairy ruminants, long lasting due to its self-charging capability inside the ruminant stomachs **and the invention's properties are;**
   - It is characterized with containing the electrolysis that cause the system to self-charge by electrolysis itself, and enables to set the rumen acidity course according the changes in current production out of the acidity, without any need for pH measurement.

2) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with the informing structure that tells about the rumen activity out of comparing the electrolysis increase and decreases with the healthy activity of the ruminant's rumen.

3) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with the accelerometer that measures the physical activity of rumen (the frequency of ingestant transfer through the next stomach), reflex of rumination and transfers those data.

4) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with the transduction of kinetic energy out of gastric contractions into the electric energy.

5) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with the thermometer that measures the heat of ruminant.

6) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with measuring the electrical conductivity of the rumen solution.

7) It is telemetric data logger, which includes electrolysis that compliances with the Claim-1 **and its properties are** characterized with the data transfer via radio frequencies about the ruminants.

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A01K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/239616 A1 (HAFEZI HOOMAN [US] ET AL) 23 September 2010 (2010-09-23) paragraphs [0039] - [0040], [0070]; figures 1-2 paragraph [0075]	1-7
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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