SMART HEALTH MONITORING COLLAR FOR LIVESTOCK

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ABSTRACT: India is the world's largest Milk producer, accounting for around 17 percent of the global milk production. Dairy Farming employs millions of people directly while providing quality Milk and Meat. By monitoring and understanding the Dairy animal individual and herd behavior, farmers can potentially identify the onset of illness, lameness or other undesirable health conditions.

The objective of the project is to build low-cost, low power consumption wireless sensor platform for Cattle Health monitoring system. With the development of sensor technology, MEMS, wireless communications and the wide application of wireless Sensor, Wireless Sensor Networks has been paid great attention in various industrial fields. Cattle monitoring system using wireless network will be of helpful to the pastoralists, farmers and ranchers to monitor their cattle

The proposed architecture will try to extend health care from traditional veterinary hospital setting to Wireless Sensor Network based remotely health monitoring and diagnosis system for animal. By using this system, we would get information and symptoms of the possible illness and disease of the animal on runtime. As the size of the seasons is tiny there is minimal patient (animal) interaction. Since monitoring is done in the live space the animals travel less often, which is safer and more convenient. The system will allow farmers in remote Using smart sensors attached to the Dairy animals, milking equipment, and feeding points. We can monitor milk while milking, Detect illness, Monitor movement of Dairy animals and detect right period for insemination place to consult doctors. It will also allows doctors in remote and rural areas to consult with specialists in urban area if need be. Thus an overall improvement in the betterment of healthcare can be provided, which further will generate increase in annual yield of products and improve the quality of life of rural area of state of Tamil Nadu,[2].

KEY WORDS: wireless sensor network, Temperature sensor ,pressure sensor ,cattle health monitoring ,RF transmitter and receiver.

1.INTRODUCTION

Agriculture is the main source of income in rural areas of India. Animals like cow, buffalo, sheep, goat etc play a significant role in lives of rural India. They are used as a source of income. Hence animal husbandry becomes a major concern. The continued production of quality Milk and beef requires new and improved methods for long term monitoring of animal health. Additional benefits can be realized from this class of technology, such as the ability to identify the presence of disease early and thereby prevent its spread .
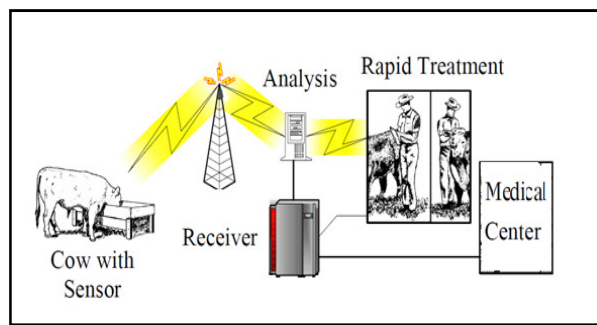
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2.EXISTING APPROACH

Existing approaches to achieving animal monitoring ranging from using a store and forward mechanism to employing GPS based techniques.Success rate of GPS is only 85%,so this is yet low for practical applications.These approach only provide sporadic information.

3.PROPOSED METHODOLOGY

In this Project we propose a health monitoring and reporting system that uses Wireless Sensor Networks (WSN) architecture. Using this architecture we intend to monitor the health and environmental scenario of animals located in rural area of the State of Tamil Nadu. To make sure that we get accurate and regular details of the animal, we need to
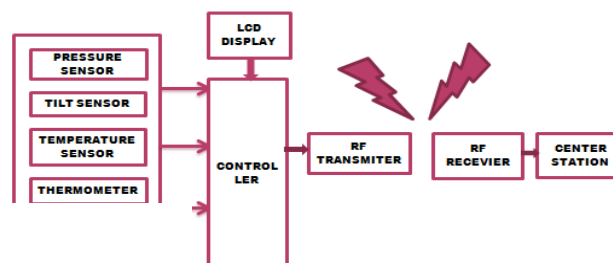
monitor various physical aspects like heart rates, heart rhythm, body temperature, animal identification and animal location along with the animal we also intend to monitor the place where the animals are kept. This monitoring will make sure that the animal always stays in a healthy environment.

The monitoring has to be done on continuous basis and will not interfere with the movement of the animals. It will also make it convenient for the owner as well as health worker to keep track of physical as well as environmental concerns. In case of any eventualities like increase in body temperature, heart beats etc, a message informing the change can be generated instantly and sent to either the owner, health worker or doctor and thus timely action can be taken to improve the health of animal.

The system consists of heterogeneous wireless sensor devices capable of sensing and transferring data. The devices when combined will form a network. This network would be capable of collecting, aggregating, processing the data collected on occurrence of various events. Once the data is available, proper analysis of the data can be done and the healthcare provider (Veterinary Doctor) can be informed about the health status of the animals if required. The proposed architecture is as shown below.

As can be seen in the figure, the monitoring will be done by two types of sensors i.e. body sensors which will monitor the heart beat, body temperature, blood pressure etc; while the second type of sensors known as environmental sensors will monitor humidity, dust level, air pollution and other parameters. All these data are collected by sensors and transmitted to veterinary hospital using WSN. These data can be filtered using a graphical interface for generating required information regarding animal health. Animal owner can also send a query related to animal health via mobile interface to health worker or veterinary hospital, using same interface health worker will be able to send a reply. The animal health is being monitored on continuous basis, hence in case of problems, solution can be provided faster as compared to traditional methods

4.BLOCK DIAGRAM:

LM35 device does not required any external calibration .It provide typical accuracies over a full range of -55 to 150 degree Celsius

I.PRESSURE SENSOR

Pressure sensors are designed to measure in a dynamic mode for capturing very high speed changes in pressure.

II.TILT SENSOR

The tilt sensor is a component that can detect the tilting of an object.It is equivalent to the pushbutton activated through a different physical mechanism.It contains metallic balls inside that will communicate two pins of the device from on to off.

III.RF TRANSMITTER AND RECEIVER

RF transmitter receives have serial data and it transmits wirelessly through RF transceiver and its antenna connected at pin4.The frequency range varies from 30kHz to the 300 GHz. Transmission through RF is better than infrared because of many reasons,[3].

IV.LCD DISPLAY

        LCD display is a special thin flat panel that can get light go through it or block it.

        LCD screen are used in wide range of applications including computer monitors, televisions,instrument panels.

5.ADVANTAGES

- ❑ Implementation cost is cheap around 3000 to 5000.
- ❑ It is affordable for small farmers.
- ❑ Network setups can be done without fixed infrastructure.
- ❑ Low power consumption.
- ❑ Easily identify the location of cattle compare to using GSM.

6.OVERVIEW

The livestock can benefit tremendously from systems that continuously monitor cattle state-of-health, allowing the industry to maintain high Milk quality, react to the presence of disease, and predict its spread. We can improve the financial stability of the livestock   while becoming better prepared for epidemiological disasters, whether from natural or terrorist events. As demonstrated by the devastating impact of foot-and mouth and mad-cow disease on the Tamil Nadu farming, disease epidemiology needs much greater support at the local level. Economic benefits to producers will be significant: these systems will enable them to assess and treat animals sooner, optimizing Milk and Meat quality while preventing the spread of disease. Cattle monitoring system using wireless sensor network will be of helpful to the pastoralists, farmers and ranchers to monitor their cattle and using RF transcevier we can transmit the data to central station(near veterinary hospital).

7. SOCIAL RELEVANCE AND USEFULNESS OF THE PROJECT

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8. CONCLUSION

        A cattle health monitoring device having arduniouno was proposed to use for possible detection of cow's illness. Field test results indicate that the device that records data as well as wirelessly transmits this data to a central computer for analysis is a beneficial tool to determine when a cow begins its heat cycle. In particular, based on testing, proposed system can be utilized to identify the cow's speed of movement, and temperature. This device could be also used for alternative trending and observations to benefit the well-being of the cow for higher quantity and quality of milk production. As future work, a compact and low-maintenance cattle motion tracking device will be designed. This paper looks into the feasibility of using low-cost, low power consumption wireless sensor platform for animal monitoring system,[1].

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