Designing of steroid level indicator for milk and meat

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Abstract - **This paper describes the testing of steroid level with help of experimental tests of milk and meat products. Increasing level of steroid in milk and meat is major problem for causing serious diseases like breast cancer, prostate cancer, early puberties and many other long and short term diseases. In last decades researcher does not focused on making a device at low cost with more accuracy. This paper focuses on the devices, properties of milk and meat for experimental comparison. 'PH' test were done on products comparison was done of dry matter percentage and fiber diameter of animal muscle tissue with the help of ultrasonic wave. Modified injection tool was made with electronic gadgets to obtain higher accuracy. Through testing, it is possible to run in a realistic scene. This concept helps to generate interest as well as innovation in field of medical science while working towards a practical and obtainable solution to save lives.**

keywords - **ultrasonic waves, PH, steroid, injection**

Introduction

Increasing level of steroid was always given the highest importance in day to day life. Inappropriate amount of steroid may cause serious diseases. As the detection of steroid is too expensive as it involves processes like "MS-LC". So introducing this system in the field of medical science can be revolutionary in detection of steroid level as it is very cheap and its parts are easily available in market. As we know many dairy farms and industries in order to increase the productivity of milk and meat products, the animals/birds are inoculated with steroid which boosts the production of milk and development of meat. The same steroid enters the food chain and unknowingly is consumed by humans. These steroids cause serious diseases like breast cancer, prostate cancer, early puberties, obesity, male infertility and many other long and short term diseases. So, our goal is to develop a device which could detect if the MRL (Maximum Residue Limit) of steroids in animal muscle exceeds ADI (Acceptable Daily Intake) for humans. Which they can consume without any hesitation so there will not occur any early hormonal changes in human beings especially in children's, so they can live life diseases free. And to design an injection tool to insert a steroid which would measure the amount of steroid added and which would also inform the right amount of steroid that can be added depending upon the animal weight or milk quantity to ensure that wrong amount is not added. This would lower the amount of steroids which are inoculated to the birds and animals. This research is mainly divided into two parts Material selection and experimentation. At last experimental results are used for detection of steroid

METHODOLGY

This system includes an ultrasonic wave emitter provided inside the machine which produces and emits ultrasound waves to the sample placed in front of sensor. An ultrasonic receiver is also placed with the emitter which receives the reflected waves from the sample. The reflected wave gives the dry matter percentage and fiber diameter of animal muscle tissues. And with the help of ultrasound waves the natural values and embed it with software that would compare output values and natural values via Arduino microcontroller and detect the steroid content. And the other idea is to carry out quantitative and qualitative analysis of milk and compare it to the ADI (Acceptable Daily intake) amounts of milk constituents with the help of sensors and implement it with a software which would also display if the milk of the animal sample under test was inoculated with excessive amount of steroid or not. We also have designed an injection which will tell us how much amount of steroid should be injected in animal. This process lowers the amount of steroid which was given to animals/birds, with minimum human interference.

Principal component of steroid level indicator:

Sr no.	Technology	Stack
1	Display	LCD 16×2
2	PH detection	PH sensor
3	Ultrasonic sensor	HS RO4
4	Pressure sensor	BMP 180
5	Transmitter	Miniature ultrasonic treatment

ULTRASONIC SENSOR

Ultrasonic ranging and detecting devices make use of high-frequency sound waves to detect the presence of an obstacle or objects and to measure the range. This system either measures echo reflected of the sound waves from objects or detect the interruption of the sound beam as object pass between the transmitter and receiver.

Fig. 3.1

Display (LCD.16×2)

The term LCD stands for **liquid crystal display**. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. and its Operating Voltage is 4.7V to 5.3V

Fig. 3.2

PROCESSOR (ARDUINO UNO)

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button

Fig. 3.3

PH sensor:

Campbell Scientific pH sensors measure the level of pH in sample solutions by measuring the activity of the hydrogen ions in the solutions. This activity is compared to pure water (a neutral solution) using a pH scale of 0 to 14 to determine the acidity or alkalinity of the sample solutions

Fig. 3.4

Pressure sensor (BMP 180):

They are all designed to measure Barometric Pressure or Atmospheric pressure. BMP180 is a high precision sensor designed for consumer applications. Barometric Pressure is nothing but weight of air applied on everything. The air has weight and wherever there is air its pressure is felt.
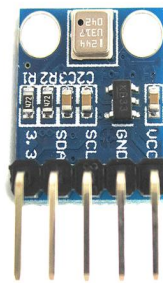

Fig. 3.5

Effect of hormone injection and thyroidectomy on average fiber diameter (Micron) and dry matter percentage of muscle tissue:

Group	ESTRADIOL Muscle		TESTOSTERONE Muscle		CONTROL Muscle	
	Fiber diameter average	Dry Matter %	Fiber diameter average	Dry Matter %	Fiber diameter average	Dry Matter %
All animal	55.2^1	26.1	51.7	25.2	49.4	26.0
Animals with thyroids	55.8	25.6	52.7	25.0	51.1	26.2
Thyroidectomized animal	59.1^3	26.6	50.7	25.5	47.7	25.8
All ewes	55.0	26.0	52.7	25.3	48.8	26.6
Ewes with thyroids	53.3	26.1	55.5	25.7	50.5	26.8
Thyroidectomized ewes	57.2^2	25.8	49.9	24.9	47.1	26.5
Wethers	55.5^2	26.2	50.6	25.2	49.9	25.3
Wethers with thyroids	50.4	25.2	49.8	26.1	51.5	25.6
Thyroidectomized wethers	60.5^4	27.2	51.4	24.1	48.3	25.0

IDEA FOR INJECTION

As the main purpose of designing this injection is to maintain the level of steroid which is injected to the animals. In most of the time steroids are injected manually till now. Previous method involves lot of human interference and high approximations and errors. So the idea is to prepare a perfect injection tool with pressure sensor, live injection volume states and adequate diameter of needle with minimum human interference and data of adequate amount of steroid injection so that MRL does not exceed ADI.it contain a led display which tells us amount of steroid injected. It also has a microcontroller which tells us the amount of level that should be injected. And the level of steroid level in the animal will remain low which will full fill our goal and need.
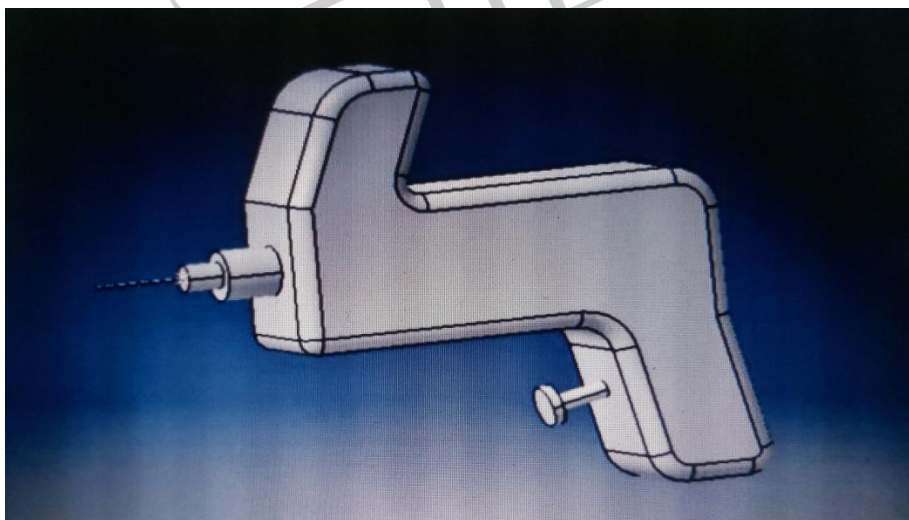

Fig. 4.0

ADVANTAGES:

1] An ultrasonic sensor is less cheap and less demanding than other type of sensors presently used.
2] As using ultrasonic sensors we can obtain dry matter percentage of meat which will tell us how many percentages of steroids are injected in meat.
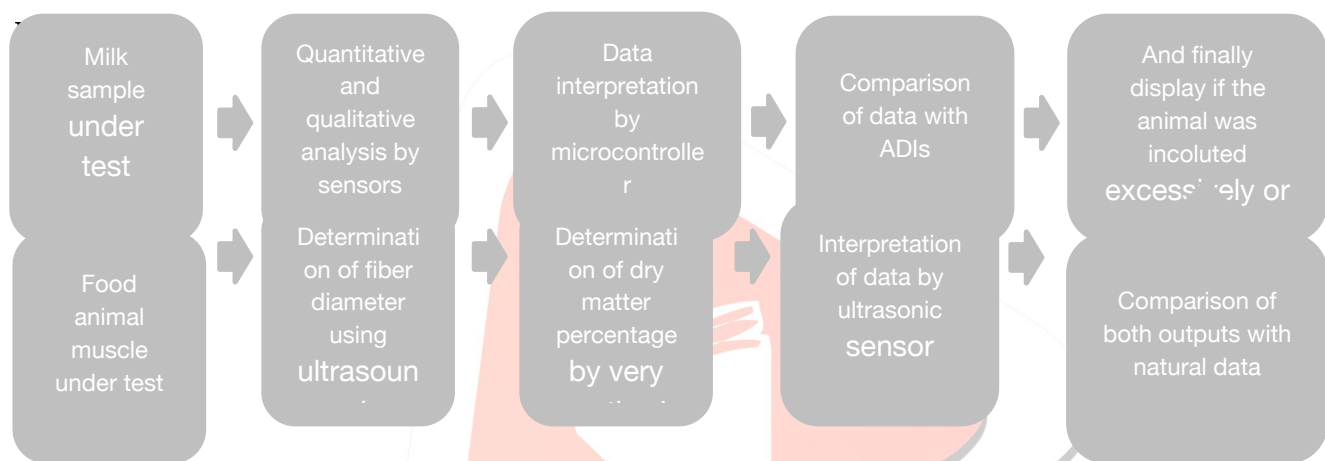
3] With the help of injection we can reduce the steroid level given to the animals.

4] By carry outing quantitative and qualitative analysis of milk using ph we can calculate steroid level.

Prototype of device for measuring steroid content in milk and meat:

Fig. 4.1

In this report the innovative idea of implementing this system is discussed and there by analysed its various parameters for regular realistic application. Steroid indicator is one of the smart options which can be implemented in various field of medical science. The previous research study clearly explains that ultrasonic sensor and microcontroller action plays vital role in every fields of science. Design of steroid indicators applications basically depend upon effectiveness of ultrasonic sensor and ph sensor. In present work various experiments were conducted to check the effect of various parameters such as diameter of fiber, dry matter percentage and ph of milk by placing sensor at right position. An ultrasonic sensor and ph sensor are cheaper and less demanding in hardware than other type of sensor presently used, such as the sensor based on computer vision or radar, is used to measure average fiber diameter, dry matter percentage and ph of milk. These quantities are used by the control system to calculate the steroid level present in the sample. This matter, coupled with the fact of lower cost of ultrasonic sensor and ph sensor compared with other kind of sensors could facilitate the application and mounting on the system in many low-end machines, helps to improve safety and it is reliable source at reduced cost. we have also considered a injection with minimum human interference it will help to lower the level of steroids given to the animals. Which tells us how many percentages of steroids should be given by displaying on LCD screen.

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