Intelligent Systems
Livestock

Sarvin Farm

About Sarvin Farm

Sarvin farm, a knowledge-based complex, works in the area of intelligent management of dairy farms using the internet of things and analysis of data gathered through intelligent sensors.
Sarvin Farm is a corporation business among the following entities: Mohsenian Agro-industrial Co, Soha Agreen Tech Co, and Sarvin technology Co.
Smart cattle is a joint product of Sarvin Farm and the U.S based Context Company.

Instagram> agreentech
Telegram> sohaagreentechco

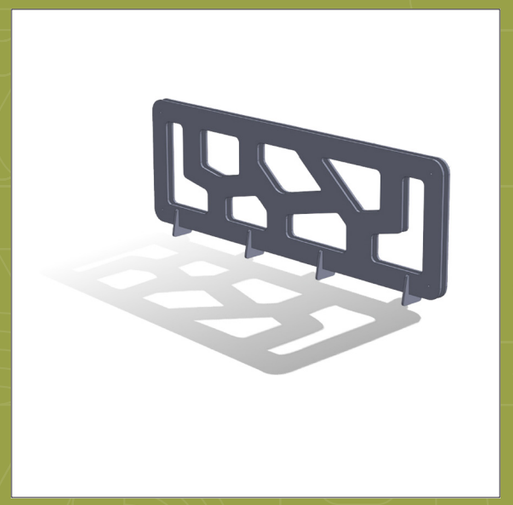
Animal RFID identification tags

Animal absence and presence detecting system

This system is based on international standard RFID1501178415 that attaches as a single earring to a cow's ear that can be read by a manual (baton) or
statice (gate) tracking system.
The baton manual system connects to specific information software and allows animal ID to be reached and recorded anywhere on the farm. The gate system can be easily installed in movement tracks like milking parlors, weighing systems, and lots.

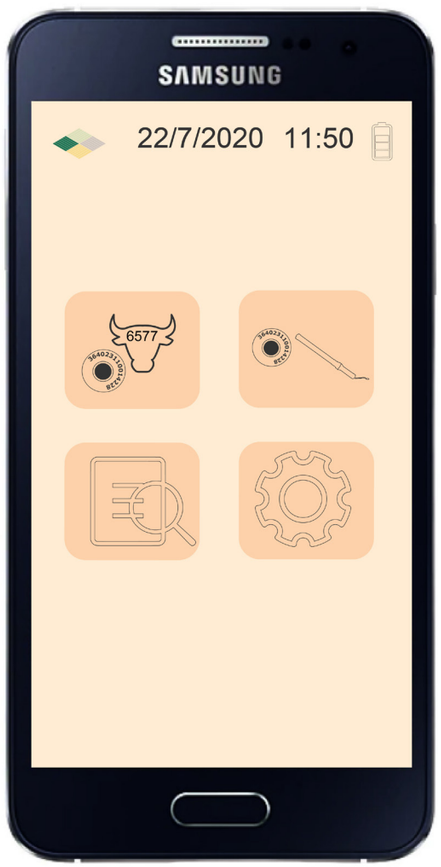
The most important features of the tags are

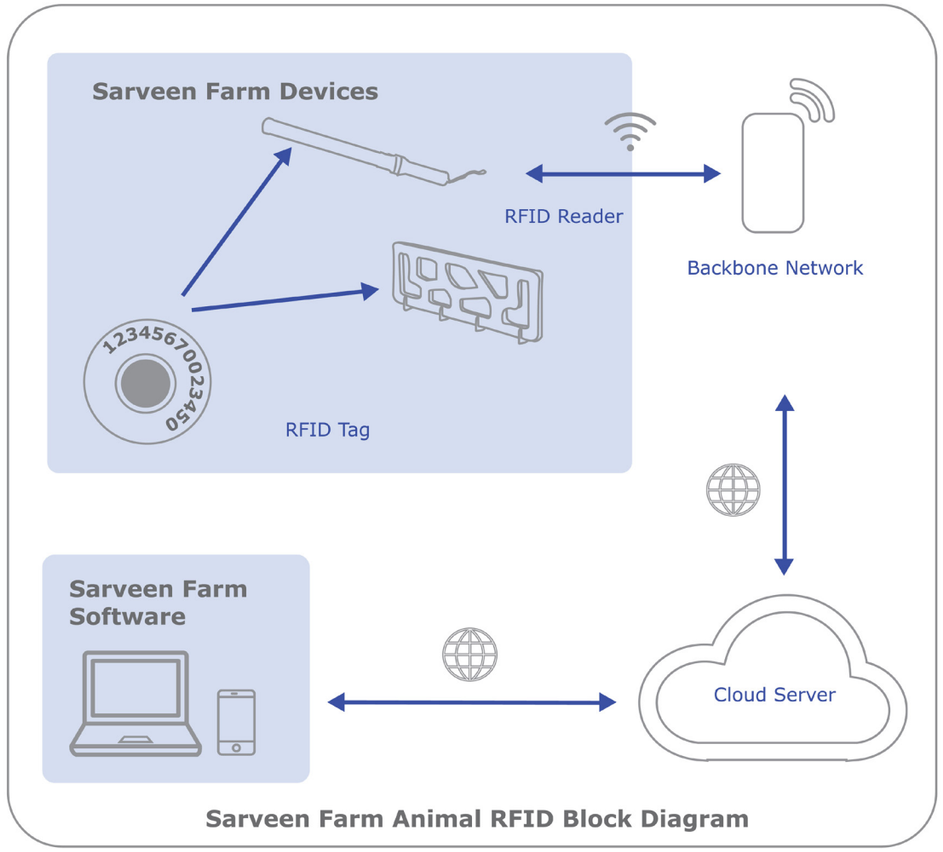
> Animal detection and identification (presence and absence)
> Integrable with various systems such
as milking, weighing, and traffic control
> Works independently or in coordination with farm management software
> Specific mobile application



The difference between RFID tags and intelligent gadgets

RFID is only a tag to identify animal information, but complete gadgets are intelligent systems that allow for positioning, estrus detecting, and health monitoring. These gadgets are highly efficient and can be a proper replacement for humans to increase the farm's total efficiency.





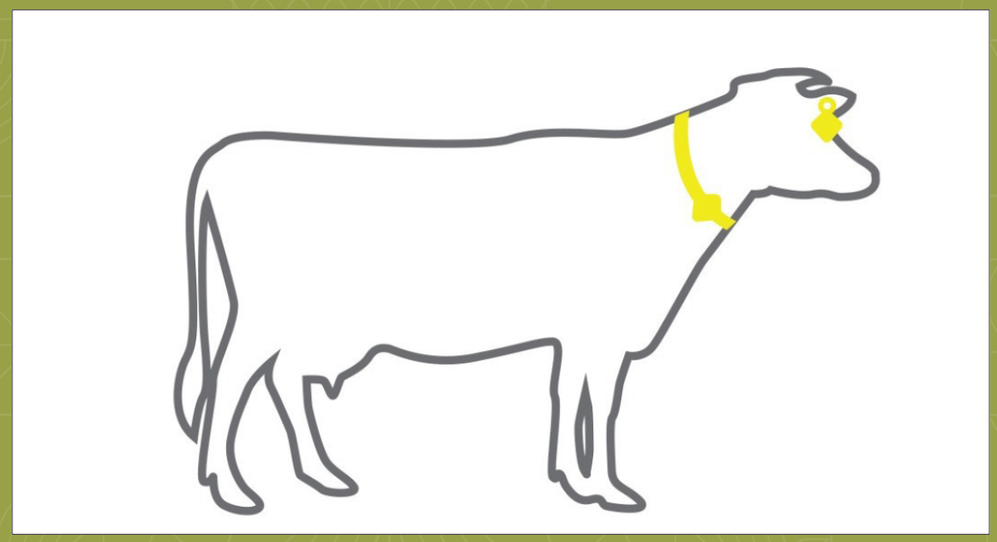
Sarveen Farm Animal RFID Block Diagram

Sarvin Farm intelligent gadgets

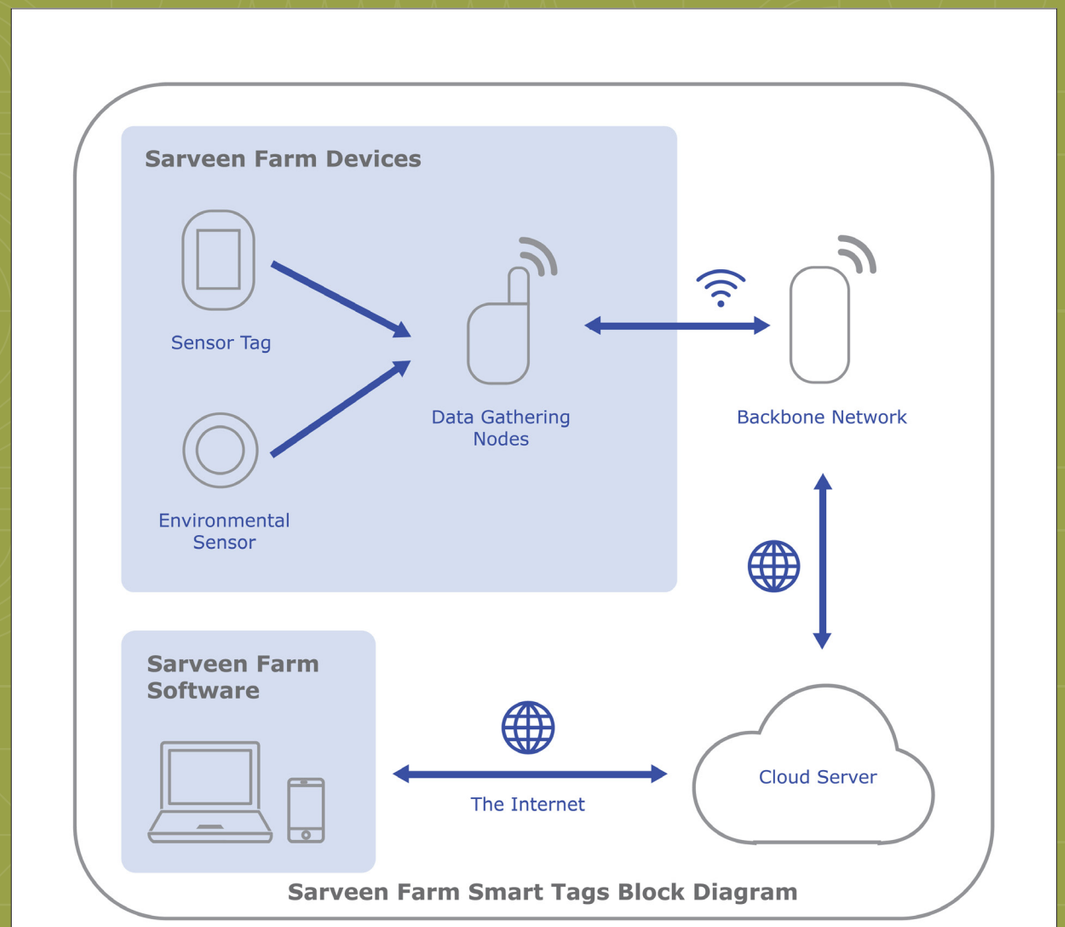
These fully wearable intelligent gadgets for dairy cows are in the form of earrings or necklaces that intelligently record animal location and behavior (positioning, estrus-detecting, animal health) and not only analyze the feed and animal health but also improve the management and economy of the herd. These gadgets are useable in different tending systems (lot or free-stall).

Advantages and applicability of the intelligent gadgets

1. Monitoring animal health through awareness of changes in its behavioral patterns.
2. Cattle welfare evaluation
3. Animal time budget management
4. Early detection of diseases and possible prevention
5. Evaluation and management of reproduction, production, and performance of the herd
6. Estrus detection and alarming for proper insemination time
7. Animal positioning
8. Quick location of a specific animal
9. Animal grouping management
10. Facilitating warehouse handling
11. Record and report of THI (Environment temperature and humidity index)
12. User-friendly software interface



To be economic, dairy cows should spend most of their time resting, eating, or ruminating.
The rumination movement decrease 12-14 hours before clinical symptoms of the disease appear. For example, the effects of insufficient laying include damage to hooves, an increase in lameness, disruption in rumination, and FCR reduction that translate into a financial loss for the dairy farm. The early detection of the disease allows quick treatment and prevention of economic loss due to lesser milk production.
Also, cows afflicted by metritis in the post-parturition period have been shown to have less feed intake and rumination one week before parturition and rest lesser compared to other cows. So, using this system, it is possible to detect the changes in the early stages and treat them better.
Cows that have lesser rumination and resting time during their close-up period are susceptible to metabolic disorders such as subclinical ketosis after calving.
This leads to a reduction in milk production, abomasum displacement, increasing the number of inseminations led to conception, metritis, and retained placenta. All these can be prevented or treated using intelligent gadgets.



Sarveen Farm Smart Tags Block Diagram

Force Plate
Intelligent weighing and body score evaluating system (on-motion)

This system comprises two parts (shown in the picture)

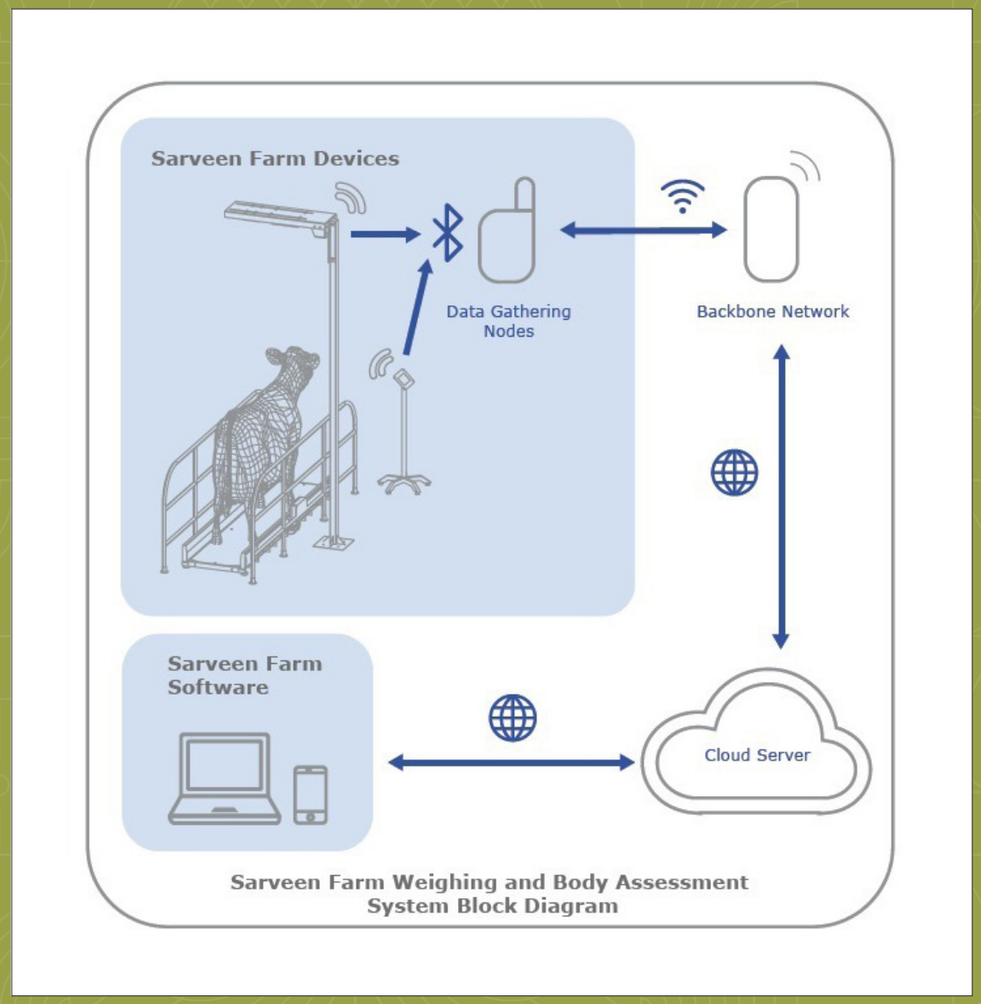
1- Intelligent weighing and motion analyzing plate that other than weighing animal while it is moving over, it can analyze stepping manner and evaluate animal limbs health and in case of lameness or other problems all required information will rely upon the farm manager.

2- Intelligent camera for evaluating body condition and locomotion score installed on a 3 m high pole and uses image processing technology. The combination of data gathered from load cells and images from the
camera are fed into special algorithms to calculate The body and locomotion score. This information is displayed on a screen next to the device.

If the animal does not have an Intelligent identification system, the person responsible for recording should record the information belonging to each animal manually. But using the intelligent identification system, the information will transfer to farm managers and veterinarians via the internet and special application.

The whole evaluation process takes place while the animal is on the move, Therefore installing it in a right place (e.g. after milking parlor) allows to
constantly monitor the body health condition of animals with high accuracy (<2%).

Data gathered from this evaluation allows for on-time treatment, providing welfare and management improvement.

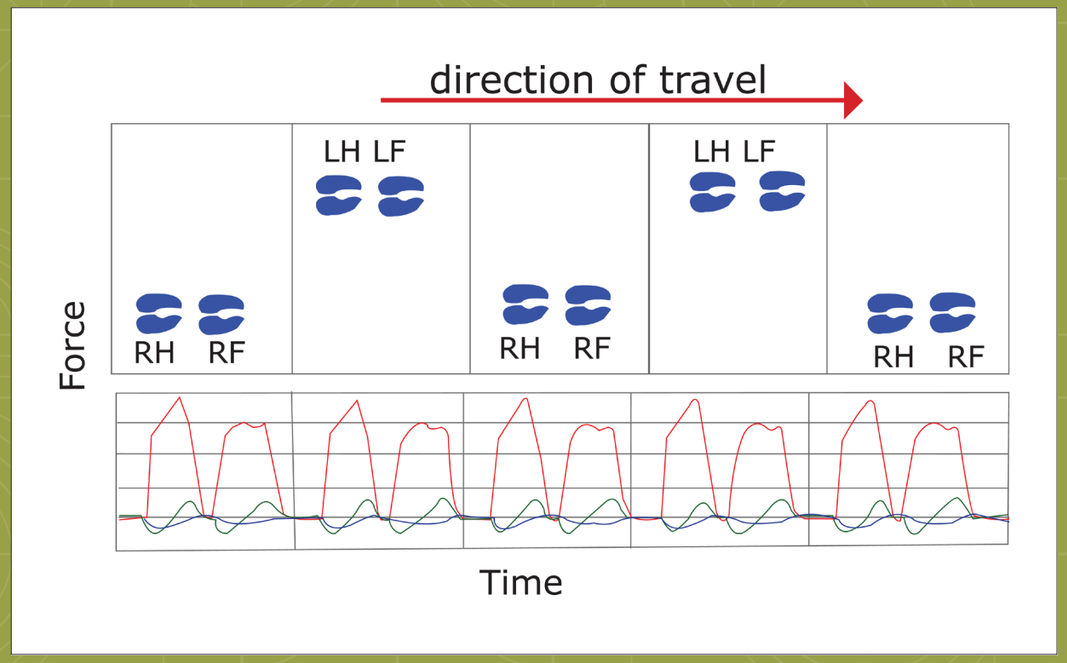


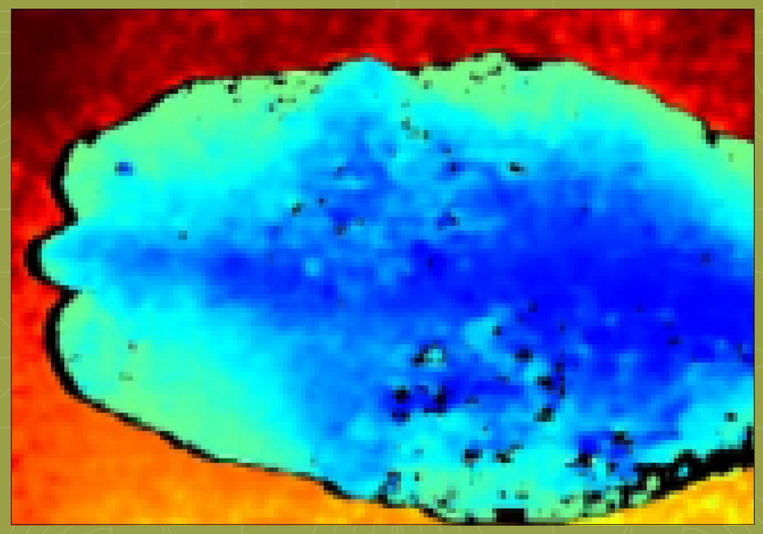
Technical features of the scoring system

> Body score nominal accuracy: average error less than 0.25 units
> Locomotion score nominal accuracy: average error less than 0.25 units
> Wireless connection of scoring system with standard BLE41
> Structure height: 3 m, Arm length: 1 m (can be installed on the wall)
> Dimensions of the camera box: 268×198×102 mm
> Thermal range: 0 to +50 C
> Electricity: Alternative 220+20 V
> Pole type: Concrete casting or electric welding to another structure

Functional characteristics of the Force Plate

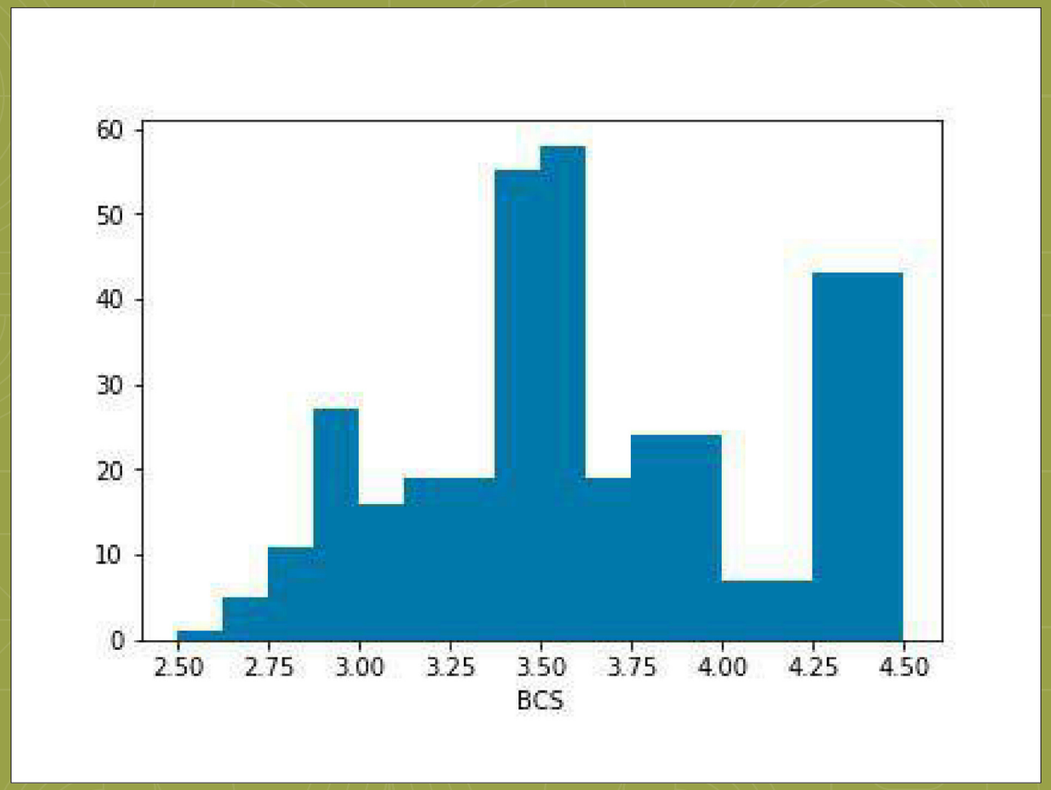
> Static and in-motion weighing capability
> Static and in-motion optical evaluation of body score
> Early detection of lameness
> Integrable with RFID animal identification system
> Wireless data transfer to the processing center
> Specific mobile application integrable with Sarvin Farm software





Technical features of the weighing system

> Detectable weights: 1-5 tons
> Accuracy: average error in static weighing is less than 5%
> Accuracy: average error in in-motion weighing is less than 2%
> Wireless connection of weighing system with standard BLE41
> The electronic box is resistant to moisture and dust IP65
> Plate: 250 cm long; 70 cm wide; 10 cm high; 85 Kg
> Railing: 270 cm long; 100 cm wide; 300 cm high
> Electronic weighing box: 24.5 × 16.5 × 6.6 cm
> Thermal range: -10 to +50 C
> Electricity: Alternative 220+20 V

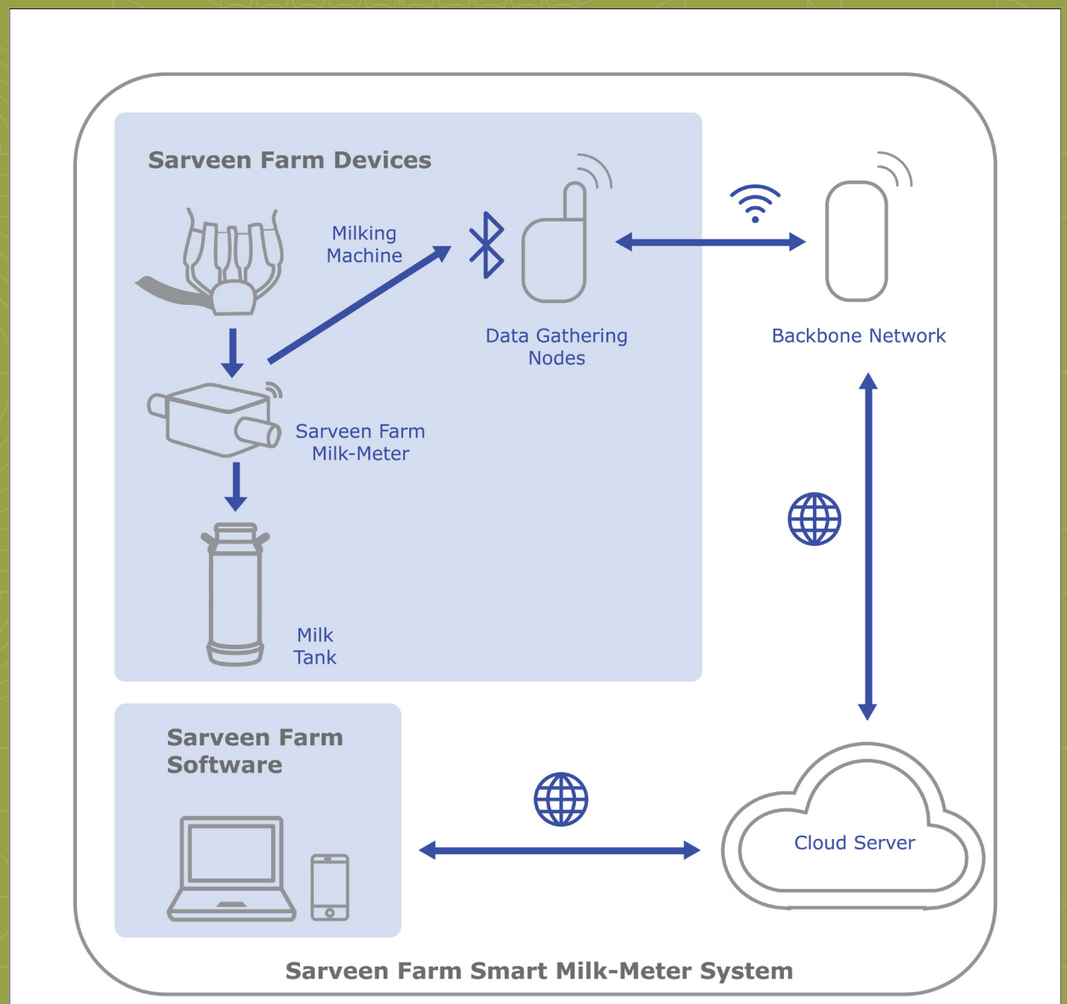


Milk meter

Milk measuring system that is positioned after claws that uses infrared waves to measure milk flow and wirelessly provides information to farm manager. It is possible to use RFID tags for identification.
This milk meter has no contact with milk and is easily washable. Because this system is completely digital, it has no mechanical or movable parts, therefore it does not require regular service. It can be installed on any milking system with minimum cost.

Functional features of Sarvin Farm Milk meter

- **> Highly accurate in measuring flow rate and milk production**
- **> Small dimensions and easy installation**
- **> Compatible to use in different milking systems**
- **> No disturbance on pulsator and vacuum pump**
- **> No mechanical or movable parts and needless to service**
- **> No contact with milk and sensory parts**
- **> Wireless data transfer**



Intelligent gas exhalation measurement kiosk

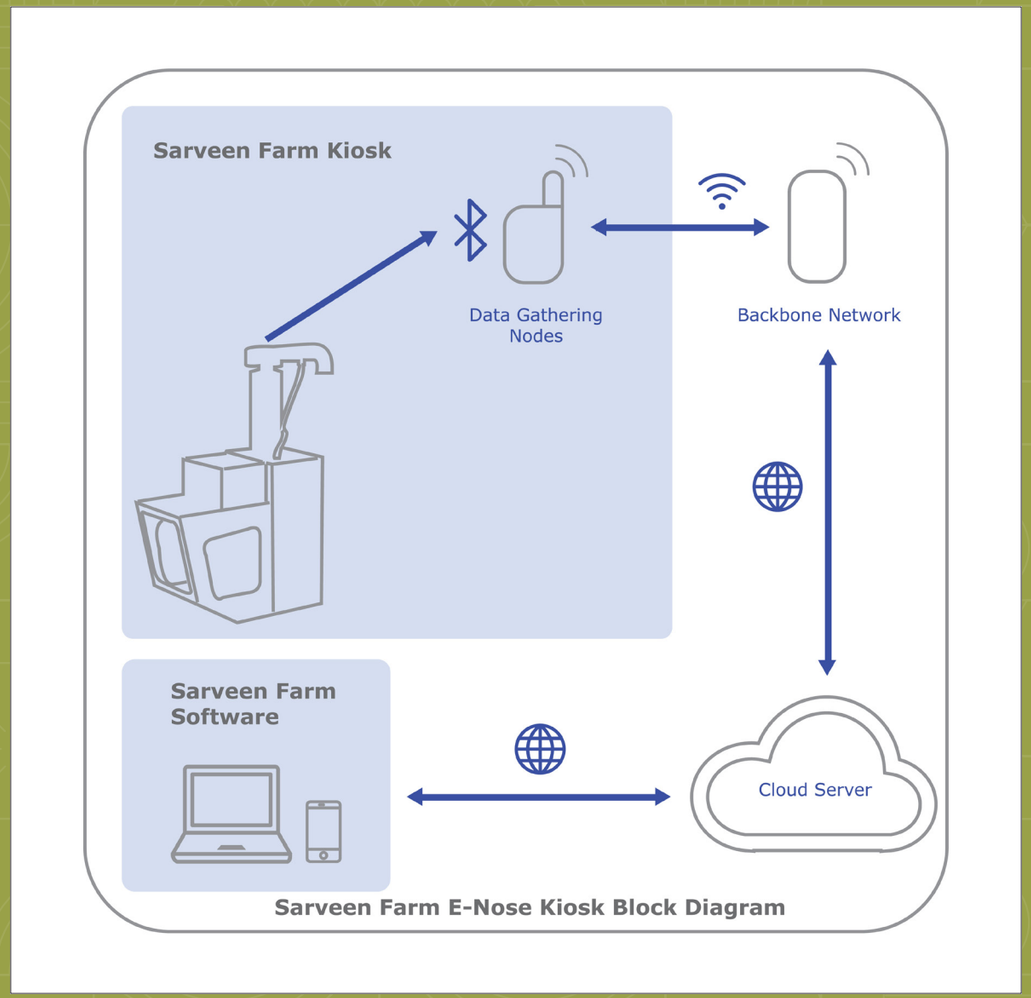
A device to measure four main exhaling gases with a special feed tank and a suction tube led to the detection and analyzing sensor. When the animal smells the feed and comes towards the kiosk, it will put its head inside the tank. After fifteen seconds the exhaled gases would be sucked into the tube, and the sensor instantly detects Methane, Aceton, Carbo dioxide, and Ammonia.

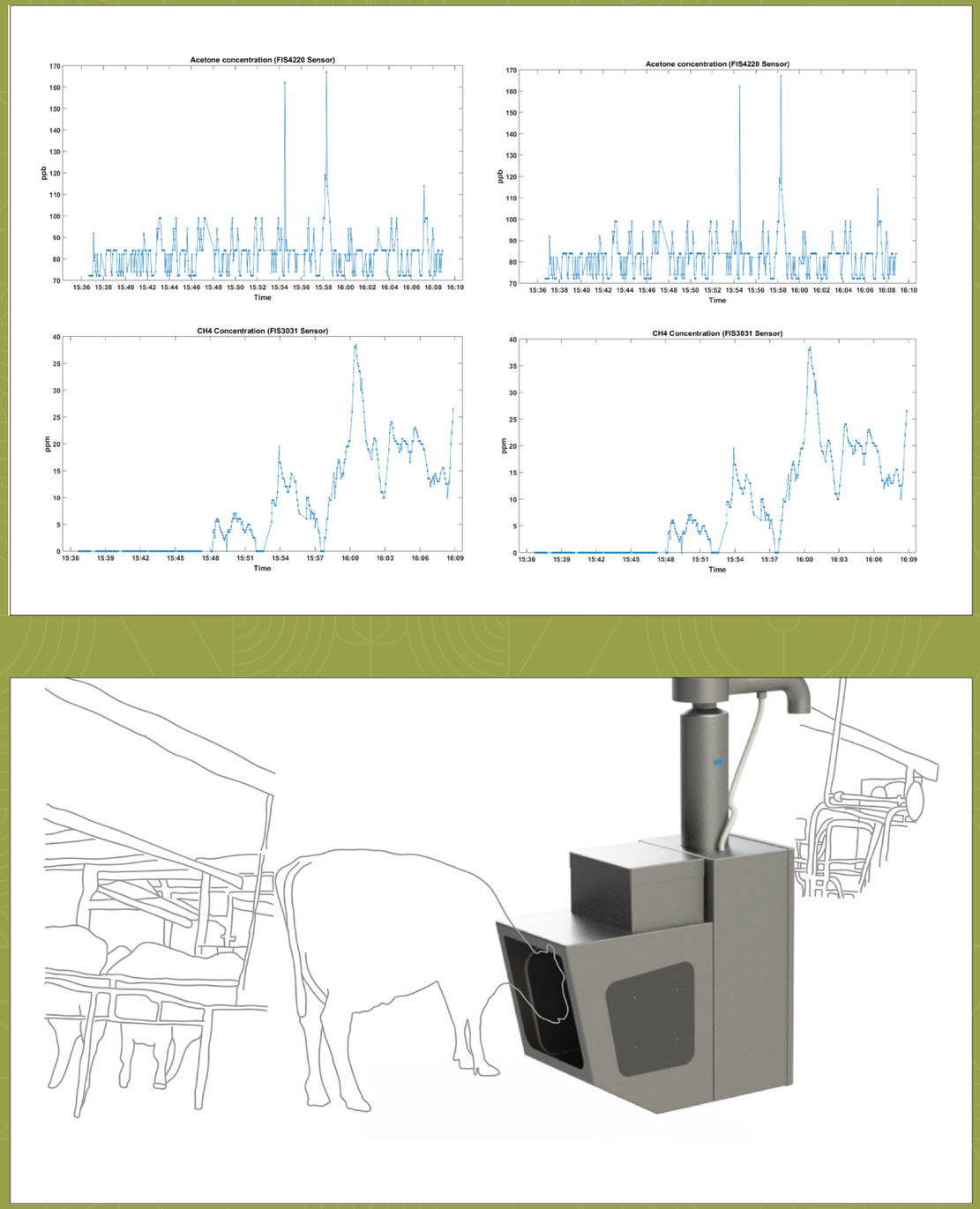
If the animal is equipped with an intelligent identification system, its information would be recorded and wirelessly transferred to the Sarvin Farm central server. All the information would also be provided to the farm managers and veterinarians through the mobile application.

Data from this system would then be used to formulate and evaluate diets and also to assess methane emission that is important in environmental pollution and energy dispersion of the animal.

The Sarvin farm intelligent software evaluates this data to detect early symptoms of disorders such as ketosis and acidosis and to issue warnings for quick action.

This system could be used individually or for a group of animals in a lot.





Functional features of exhaling gas kiosk

1. Early detection of ketosis and acidosis
2. Formulation and evaluation of animal diets
3. Measurement and management of exhaled methane and environmental pollution control
4. Wireless data transfer
5. Specific mobile application