

Integrated Environment Management System in dairy barns to improve the welfare and productivity of the COWS

Riferimenti

Tipo di progetto

Gruppo Operativo

Acronimo

GALA

Tematica

Benessere animale

Information

Time frame

2019 - 2022

Durata

36 months

Partners (no.)

5

Regione

Lombardia

Comparto

Zootecnia - bovini/bufalini

Localizzazione

ITC4A - Cremona

ITC4C - Milano

Costo totale

€632.825,33

Fonte di finanziamento principale

Programma di sviluppo rurale

Programma di sviluppo rurale

2014IT06RDRP007: Italy - Rural Development

Programme (Regional) - Lombardia

Parole chiave

Animal husbandry and welfare

Climate and climate change

Farming/forestry competitiveness and diversification

Sito web

<https://costruzionirurali.unimi.it/GALA/>

Project status

completed



Objectives

The project aims to create a management system for the housing environment in the dairy farm by integrating the various information (microclimatic, non-climatic, behavioral, production, food, management) in order to provide: elements for the automatic control of some devices, signaling to the breeder of anomalous situations or requiring his intervention, monitoring of environmental parameters inside the barn, indications for a better management and to improve environmental conditions.

Activities

The project will develop a system for the collection of numerous parameters from the farm through automatic recording systems and adequate software for processing of the data collected.

The activity plan provides for the development, construction and installation of a prototype of an integrated management system for the environment in the dairy barns.

The technology to be developed is a system of continuous monitoring of the environmental parameters and of the behavior of the cows and of direct and indirect control of the barn environment, in order to create an environment suitable for life, production and the reproduction of cows reared in the facility, also mitigating the internal climate.

Context

The rearing of the dairy cow has greatly evolved in recent years with the acquisition of new knowledge and the development of innovative technologies, with particular attention to animal welfare and comfort. The ability to keep dairy farms competitive in the international milk and raw materials market is largely due to the ability to achieve high standards of

efficiency and quality in the various stages of the production process that takes place in the barn.

A factor limiting the efficiency of the production process in the barn concerns animal welfare which is related to the state of health of the animals themselves and influences the quantity and quality of their productions. Breeders often do not have adequate tools to evaluate the adequacy of the structures and management of the barn in an objective way and to identify the critical points and interventions that can improve the situation in an integrated way. These limits require not only a widespread and intense information, dissemination and training activity, but also the availability of innovative systems able to provide precise indications and, when possible, directly control the conditions of the environment inside the stable.

Therefore, monitoring the living environment and the health state of cows is gaining attention for several reasons. First, these parameters show promising correlation with the cows' milk productivity, which is a primary economic driver for livestock raising. Then, there are raising ethical concerns about the environmental and life conditions of livestock animals. Finally, there is the possibility to build models to enable a better understanding of several pathologies.

Partenariato

Role	Azienda	Address	Telephone	E-mail
Leader	Università degli Studi di Milano - Dipartimento di Scienze Agrarie e Ambientali	Via Giovanni Celoria, 2 20133 Milano MI Italy	02 503111	sportello.ricerca@unimi.it
Partner	CEKFARM S.S. AGRICOLA	Cascina Concordia n° 1 26010 Camisano CR Italy		
Partner	SOCIETA' AGRICOLA EREDI MERIGO ANGELO DI MERIGO GIAN LUIGI E C. S.S.	Via Molino 32A 26010 Casalsetto Vaprio CR Italy		
Partner	SOCIETA' AGRICOLA BERTICELLI LUIGI S.S.	Cascina Vidoretto 26019 Vailate CR Italy		

Sistema di Gestione integrata dell'Ambiente nelle stalle da LATte per migliorare il benessere e la produttività delle bovine

3/4

<https://www.innovarurale.it/pei-agri/gruppi-operativi/bancadati-go-pei/sistema-di-gestione-integrata-dellambiente-nelle-stalle>

Role	Azienda	Address	Telephone	E-mail
Partner	Associazione Regionale Allevatori della Lombardia (ARAL)	Via Kennedy, 30 26013 Crema CR Italy	0373 89701	info@aral.lom.it

Pratiche abstract

Description

The technology to be developed is a system of continuous monitoring of the environmental parameters and of the behavior of the cows and of direct and indirect control of the stable environment, in order to create an environment suitable for the life, production and reproduction of the cows. cows raised in the structure also mitigating the internal climate.

The integrated system involves the use of different sensors that allow to detect:

- the temperature, humidity and air speed in different points of the barn
- the quality of the air in the farm by detecting the following parameters: ammonia (NH3), hydrogen sulphide (H2S), carbon dioxide (CO2), methane (CH4), noise
- monitoring the behavior of the cows, automatically detecting the time spent in the various activities (standing, feeding, resting) by means of accelerometers and presence sensors in the different areas of the barn
- monitoring of the presence of insects in the stable (photo of traps and image analysis)
- monitoring of water consumption and water temperature in drinkers
- monitoring of the functioning of manure removal systems

The sensors send the data to a centralized storage and processing system of the collected data in order to provide useful information for the management of the barn.

Description

The integration of the various information obtained from the sensors positioned in the barn and on the animals will be carried out by implementing specific methods of analysis and evaluation of the data transmitted wirelessly by the sensors to the control units which in turn will communicate with a central system through a radio connection and subsequently will be sent to a Cloud archive.

The data that will be collected automatically can be divided into three main categories:

- information relating to the monitoring of the relaying area (microclimate, presence of insects, temperature and drinking water consumption, air quality, etc.)
- information on the behavior and condition of the cows;
- information on the position of the cows in the barn

The software that will be developed will use the data to transform them into useful information for the management of the stable and directly usable by the farmer.

Link utili

Titolo/Descrizione	Url	Tipologia
pagina web del progetto	https://costruzionirurali.unimi.it/GALA	Link ad altri siti che ospitano informazioni del progetto

Sistema di Gestione integrata dell'Ambiente nelle stalle da LATte per migliorare il benessere e la produttività delle bovine

4/4

<https://www.innovarurale.it/pei-agri/gruppi-operativi/bancadati-go-pei/sistema-di-gestione-integrata-dellambiente-nelle-stalle>

Titolo/Descrizione	Url	Tipologia
Video del progetto	https://www.youtube.com/watch?v=9lXhH2zip_0&t=2s	Link ad altri siti che ospitano informazioni del progetto
filmato accelerometri	https://www.youtube.com/watch?v=7k-9KUkG698&t=2s	Link ad altri siti che ospitano informazioni del progetto
Brochure informativa del progetto	http://costruzionirurali.unimi.it/wp-content/uploads/Pieghevole_GALA.pdf	Materiali utili
Scheda tecnica del sistema integrato	http://costruzionirurali.unimi.it/wp-content/uploads/scheda-tecnica-GALA.pdf	Materiali utili
Pubblicazione scientifica sugli indicatori per il benessere animale	https://doi.org/10.3390/ani10081430	Materiali utili
Pubblicazione scientifica sullo sviluppo degli accelerometri	https://doi.org/10.3390/ani12111447	Materiali utili
Installazione dei prototipi nelle tre aziende	http://costruzionirurali.unimi.it/wp-content/uploads/descrizione-dei-prototipi-...	Materiali utili
Report del progetto GALA	http://costruzionirurali.unimi.it/wp-content/uploads/Report-progetto-GALA-web.p...	Materiali utili