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Course 6: Bringing Innovation to Farms

# M3: Livestock Monitoring Systems

Co-funded by the European Union



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# Objectives and Learning Outcomes

This module explores the role of **automation in livestock farming**, focusing on how **smart monitoring systems enhance animal health, welfare, and productivity**. Learners will discover how automated feeding systems, wearable sensors, and environmental controls work together to optimise livestock management. By examining real-world applications, they will gain insight into the benefits of integrating technology for real-time health tracking, precision feeding, and efficient resource use. This module will provide a strong foundation for understanding how automation improves farm operations while ensuring sustainable and ethical livestock practices.

**Explore…**

…how automation enhances feeding and environmental control in livestock farming.

**Understand…**

…the role of wearable sensors in tracking animal well-being.

**Identify…**

…benefits and challenges of integrating smart livestock management systems.

# contents

This module provides an overview of how technology enhances livestock management through automated feeding, health monitoring, and environmental control. Explore the role of wearable sensors and smart systems in improving efficiency, animal welfare, and decision-making!






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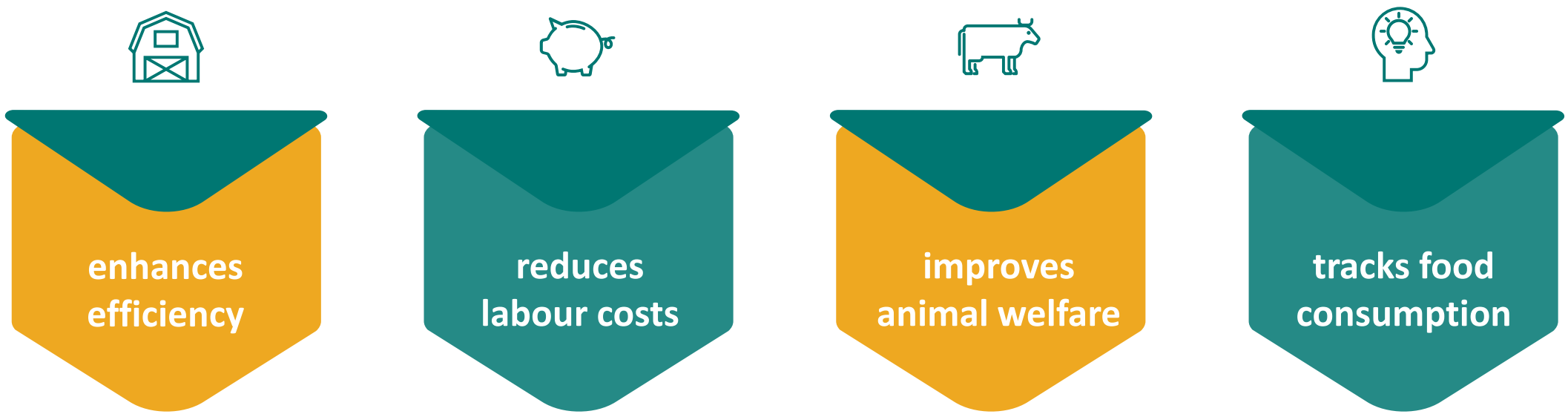
01

# AUTOMATING FEEDING, HEALTH MONITORING & ENVIRONMENT CONTROL

# Automating Feeding Processes

Automating livestock management through advanced technologies significantly:




Automated feeding systems ensure that animals receive the correct amount of food at optimal times, improving nutrition and growth rates while minimising waste. These systems can be programmed to distribute feed based on individual animal needs, reducing overfeeding and ensuring consistent dietary intake.

# Automated Health Monitoring

Health monitoring is another key component of automation in livestock management.

| In order to detect early signs of illness or distress Smart sensors and Internet of Things (IoT) devices can continuously track: | By analysing **real-time data**, farmers can intervene promptly in order to: | Automated health monitoring: |
|---|---|---|
| • vital signs,<br>• activity levels,<br>• behavioral patterns | • prevent the spread of disease<br>• reduce medical costs | • reduces the need for manual inspections<br>• allows to efficiently oversee well-being of hundreds animals simultaneously |

**For more information on lifestock management, be inspired by this podcast on latest advice, insights and technical updates for the sheep industry.**

# Environmental Benefits

Environmental control systems play a crucial role in maintaining optimal conditions for livestock. Automated ventilation, heating, and cooling systems adjust temperature and humidity levels based on real-time data, ensuring a **comfortable environment that promotes healthy growth**.

Sensors can detect harmful gases such as ammonia and hydrogen sulphide, activating ventilation systems to maintain air quality. These smart systems not only improve animal welfare but also contribute to higher productivity and sustainability by reducing resource wastage and improving farm efficiency.

02

# WEARABLE SENSORS FOR TRACKING LIVESTOCK WELL-BEING

# Wearable Sensors For Lifestock Management

Wearable sensors have transformed livestock management by providing continuous health and behavioural monitoring. These devices, attached to animals via collars, ear tags, or leg bands, collect real-time data on movement, body temperature, heart rate, and feeding patterns.

By analysing this data, farmers can detect early signs of illness, stress, or injury, enabling timely intervention and reducing losses. Wearable sensors also play a crucial role in tracking reproductive cycles, helping optimise breeding programmes and improve fertility rates.

# Benefits of Wearable Sensors

### Real-Time Health Monitoring

Sensors track vital signs such as temperature and heart rate, helping detect diseases and health issues before they become severe.

### Behavioural Tracking

Movement sensors analyse feeding, resting, and social behaviours to identify signs of distress or abnormal patterns.

### Automated Alerts and Notifications

Farmers receive instant alerts when sensors detect unusual health or activity trends, allowing quick action to prevent problems.

### GPS Tracking and Security

Some sensors include GPS technology to track livestock location, prevent theft, and monitor grazing patterns.

Wearable sensors also contribute to reproductive cycle management and resource optimisation. By detecting heat cycles and pregnancy, these devices support more efficient breeding, leading to higher reproductive success rates. Additionally, insights from sensors improve pasture management, feed distribution, and environmental conditions, helping farmers enhance productivity while minimising waste.

# 03

# EXAMPLES OF INTEGRATED LIVESTOCK MANAGEMENT SYSTEMS

digitanimal

## Be inspired…

…by the power of Digitanimal's smart tracking technology, designed to give you total peace of mind over your livestock. With real-time location tracking, activity monitoring, and virtual fencing, you'll always know where your animals are and how they're doing—reducing losses and improving productivity effortlessly.

## Take control…

…of your farm with cutting-edge IoT technology and long-lasting battery life, ensuring seamless monitoring with minimal effort.

## Visit…

…Digitanimal's website today and discover how smart farming can transform the way you manage your livestock!

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# Be inspired…

CowMonitorApp

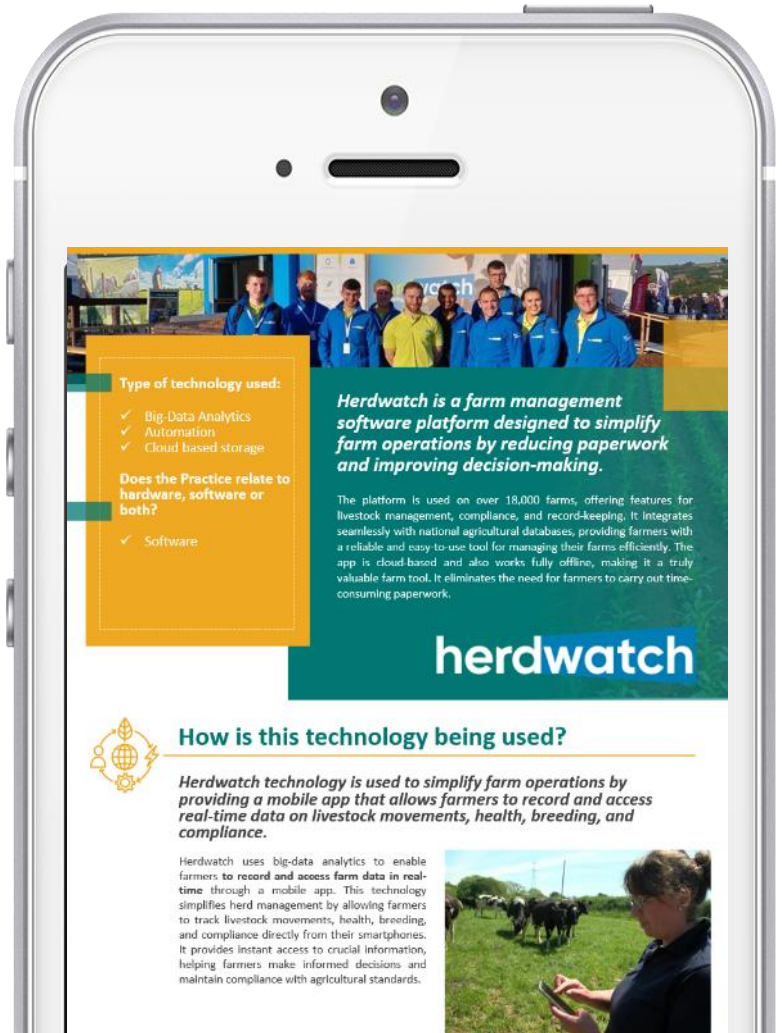
Dive into the world of **Agriculture 4.0** and learn more about the use of IoT on Polish dairy farms with the

**CowMonitor App!**


For more information, check out their website for fascinating insights into the technology:

https://www.cowmonitor.pl/

herdwatch




# Case Study…

**…Be inspired** by Herdwatch's innovative approach to digital farm management, helping farmers save time, reduce paperwork, and make smarter decisions for a more sustainable future.

**…Visit** Herdwatch to see how its easy-to-use mobile app is transforming farm operations with real-time data tracking and seamless compliance management.

**…Read more** in our Good Practice Compendium to explore how Herdwatch is revolutionizing agriculture with big-data analytics and farm-to-fork integration.

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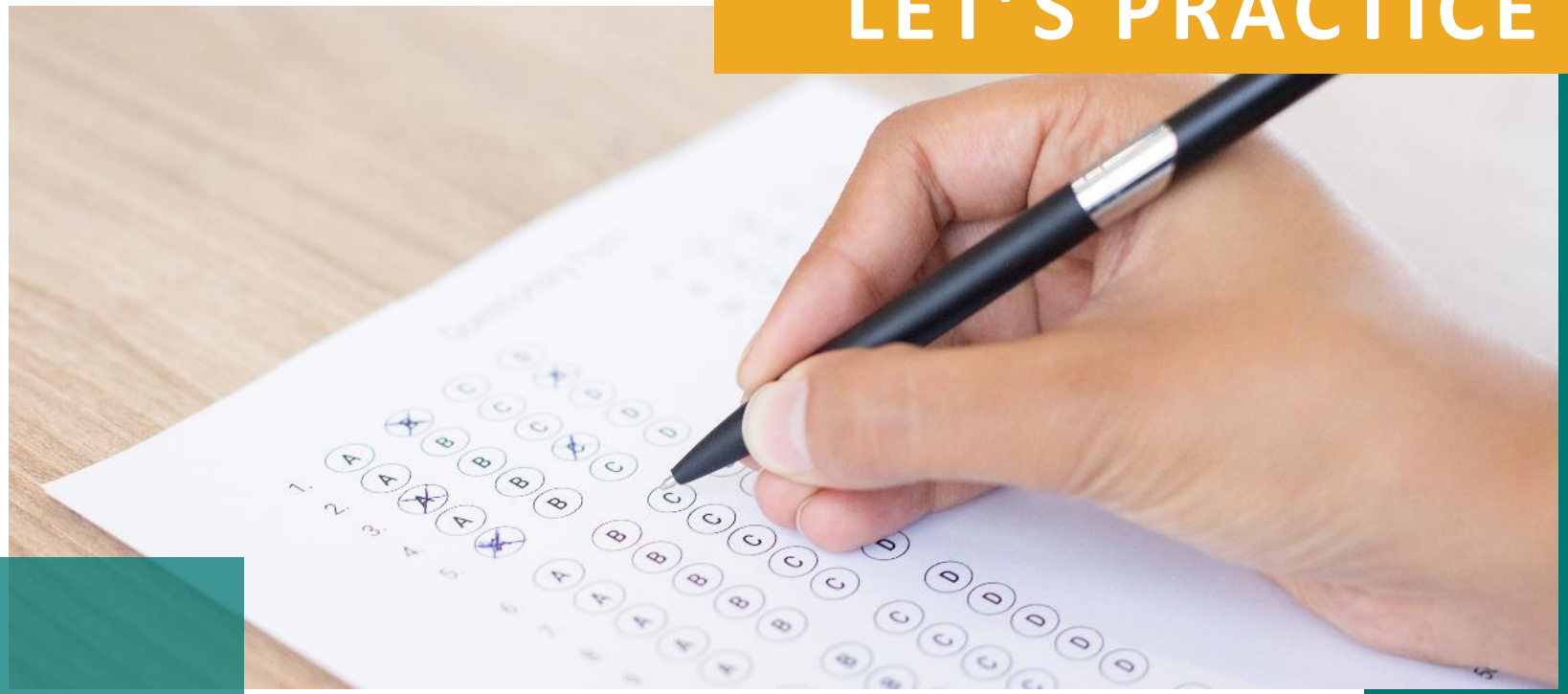
# 04

# LET’S PRACTICE



# Time for Self-Reflection

Imagine you are a livestock farmer using automation and wearable sensors to manage your animals. Below are two real-life scenarios. For each, decide how you would respond using the technology available. Discuss your choices with the group!

**Scenarios:**

**1. A cow's activity levels have suddenly dropped according to its wearable sensor.**

1. What action do you take?
2. How can automation help you respond quickly?

**2. Your environmental control system detects high ammonia levels in the barn.**

1. What changes should be made to improve air quality?
2. How does this impact animal health?

“SUSTAINABILITY IS NO LONGER ABOUT DOING LESS HARM. IT’S ABOUT DOING MORE GOOD.”

*– Jochen Zeitz*

# Bravo!

You finished the third module of **Course 6**! Keep going on this learning journey.

In the **next module** you will learn about **Field Automation and Real-Time Monitoring!**

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## Follow our journey

# www.smartskillsproject.eu

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