

## Introduction

Precision Livestock Farming (PLF) involves all technologies that have the aim to **improve the productivity of the farm**. Veterinarians must be its assessors and will find in it plenty of tools to improve on their work. This is a collaborative field of veterinarians, engineers and data scientist.

## Bases of PLF

### Data acquisition

#### Sensors:

- Thermal sensors
- Cameras
- Nosebands
- Loadcells
- Accelerometers
- Pedometers
- Microphones
- Intraruminal bolus

### Data analysis

**Machine Learning (ML)**, being the principal analysis technology used, is the combination of data science and artificial intelligence, here applied on animal health (AH).

AH

Artificial Intelligence

Data science

ML

### Action

The actions are based in the insights of the analysis. Veterinarians are the ones that should **assess the actions** and decisions that the workers will come to term.

## Practical use examples

### USE-CASES OF PLF

Body weight, breed-agnostic predictions
Hyperketonemia detection and management
Mastitis detection
Assessing affective states
Management of grazing cows
Dairy farm management
Respiratory problems
Early detection of infections
Lameness detection
Oestrus detection
Heat strain detection
Enhancing the nutrition value of red meat
Tail biting detection
Poultry farm management
Keel bone damage

## Interview to a sales manager of robots



- Only **simple** technology is the one applied.
- Only **mastitis** is directly diagnosed.
- The improvements are more of **management**.

## Future predictions

- The market is expected to grow considerably from USD 3.1 billion in 2020 to USD **4.8 billion in 2025** (Neethirajan and Kemp 2021).
- The next pass forward should be an **integration of all technologies** that are useful for the farm.
- The latest pathway that is expected to be implemented is the **digital twin technology**. One way to describe it as there is two animals, the physical and the virtual, with the virtual one is possible to predict all future developments.



## Conclusions

- The base of PLF is to gather all the possible data and make inferences of it to take the best actions possible.
- Nowadays not all the technologies have been integrated, there is still time for a holistic management.
- The growth projection of this sector is really positive and will create new jobs opportunities for the ones updated.