# REAL-TIME MONITORING OF DISEASE PREVALENCE, INCIDENCE AND ASSOCIATED ANTIBIOTIC USE ON COMMERCIAL FARMS

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"SCIENCE MEETS PRACTICE TO REDUCE THE NEED FOR ANTIMICROBIALS IN ANIMALS"

## Introduction:

New technologies applied to animal health production facilitate the development of new applications for data collection, processing, and analysis. Within the strategy to promote the sustainability of the pig sector is the control and reduction in the use of antibiotics. In order to achieve an effective reduction, it is necessary to have a detailed understanding of the precise administration of antibiotics on the farm.

A monitoring system has been developed to monitor the health status and the use of antibiotics on commercial farms, and in consequence, improving efficiency and reducing healthcare costs of swine production.

## 2-Materials and Methods:

- A web app to perform data entry.
- The caregiver registers all incidences observed (medication and mortality).
- A database is set containing all the drugs used in the farm.
- 3 Commercial farms in Segovia (Spain).
  - 50 nursery batches → 19,362 piglets.
- Parameters recorded: number of animals treated; dose per animal; target disease of the treatment.
- Parameters calculated by the system:
  - Animal daily doses (**ADD**): dose per animal and day calculated by means of recommended dosages and estimated live weights.
  - Used daily doses (**UDD**): dose per animal and day prescribed by the veterinarian.
  - **UDD/ADD ratio** → indicated if there is a gap between the recommended and the actual doses applied.
    - UDD/ADD ratio ≥ 1 → **Overdosing**
    - UDD/ADD ratio < 1 → **Underdosing**

## Results:

The main causes of mortality were due to respiratory and enteric diseases (40.8% and 23.3%, respectively) (Fig. 1).

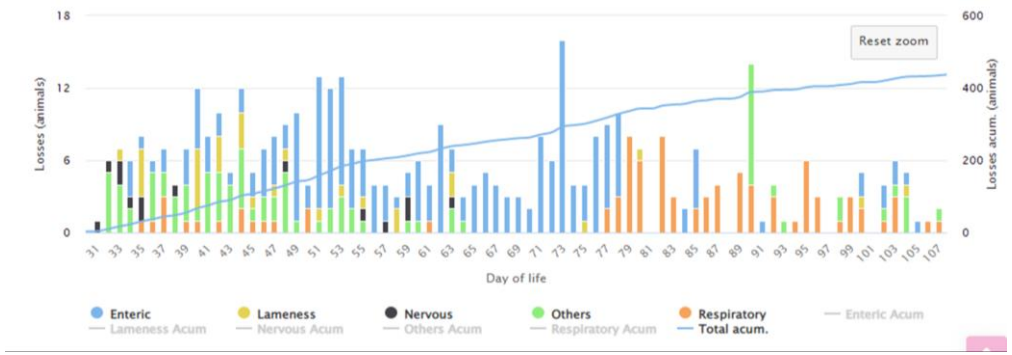


**Fig. 1. Over time distribution of mortality causes.**

The use of treatments showed that 58.8% of medication were oriented to treat respiratory pathologies, while 33.9% were used to treat enteric diseases (Fig. 2).
Amoxicillin showed a UDD/ADD ratio ≥ 1.3, indicating that it was overdosed, while tiamulin and doxycycline (< 0.9) were underdosed (Fig. 3).

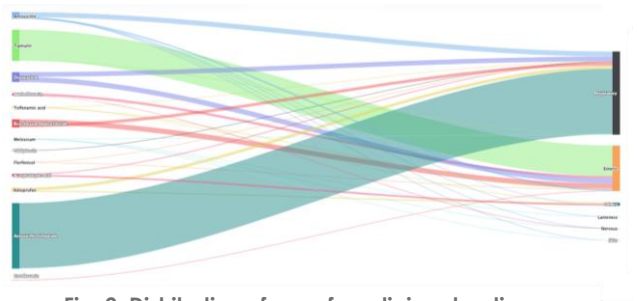

**Fig. 2. Distribution of use of medicines by disease.**

| Active ingredient | Dosage ratio | Situation |
|---|---|---|
| Amoxicillin | 1.3 | Overdosed |
| Tildipirosin | 1.0 | Correct |
| Tolfenamic acid | 1.1 | Correct |
| Tiamulin | 0.8 | Underdosed |
| Doxycycline | 0.7 | Underdosed |

**Fig. 3. Dosage ratio by medicine.**

## Conclusions and Implications:

The use of a real-time platform can solidly support the decision-making process about health control and medicines use without physical presence on the farm. The user can know the incidence and prevalence of the pathologies present in the farm and its distribution over time, as well as the information about the convenience of using a specific medicine or active ingredient and withdrawal periods warning.