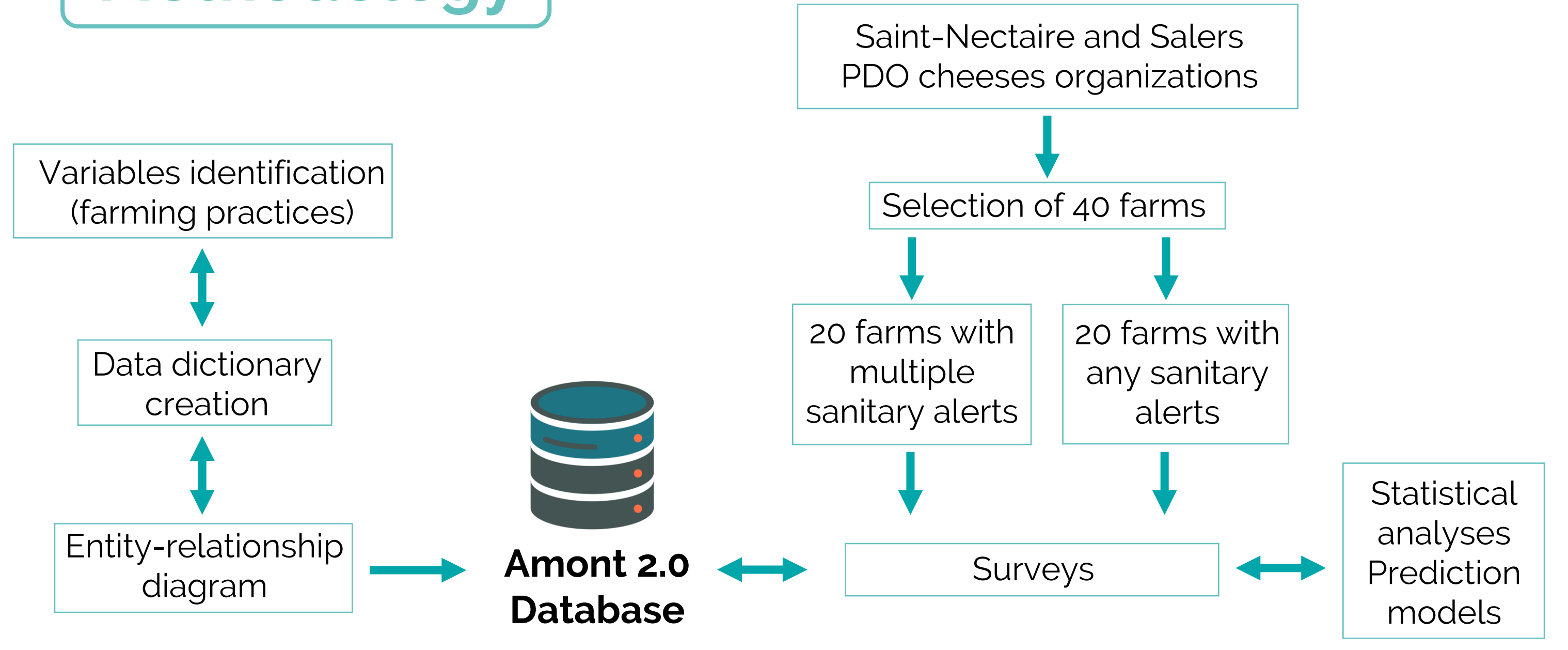


Introduction

In France over the last decade, 37% of listeriosis and 60% enterohaemorrhagic *E. coli* infections outbreaks have been linked to the consumption of raw milk cheeses [1]. In Massif central, 30% of farms producing Saint-Nectaire PDO cheese are affected by sanitary alerts per year due to *Listeria monocytogenes*. 14.3% of Salers PDO farms due to *Listeria monocytogenes* and *E. coli*. These alerts occur rarely, or recurrently (>2 times/year).

Different studies showed that it is today crucial to take a systemic approach to the microbial diversity of raw milk, from the grassland, through the farming practices and the cheesemaking process, right up to the consumption of the cheese [2]. **Consolidated data over years in an adapted database are needed to predict the links between farming practices and sanitary risks in a context of and agricultural practices' evolutions related to the climate change.**

Methodology

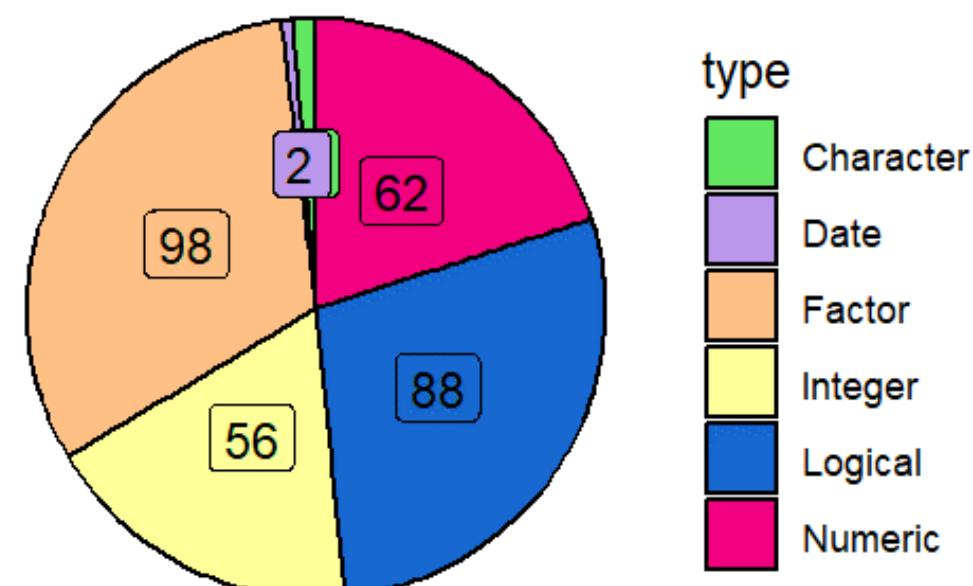


Results

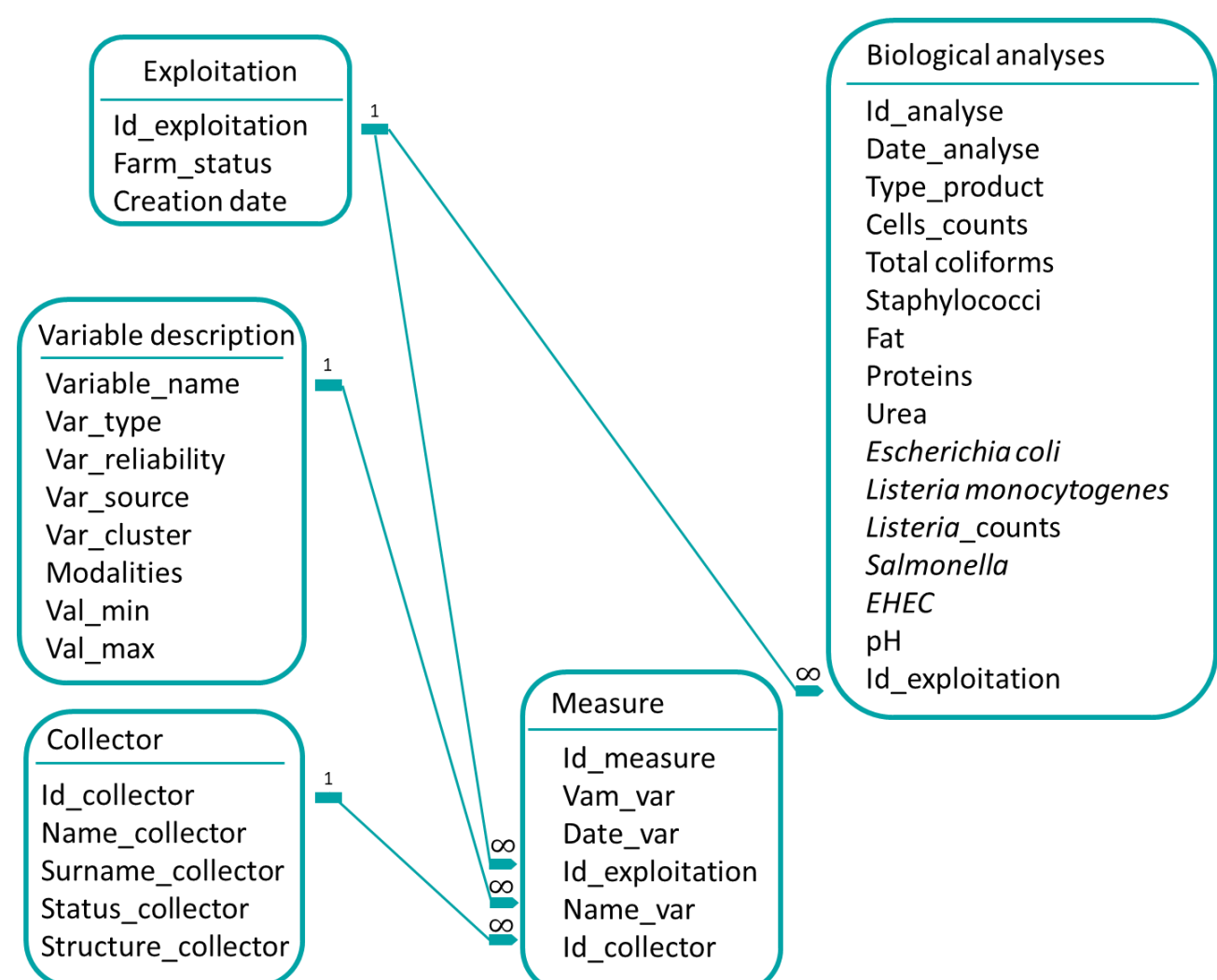
Identification of 310 variables of interest to describe farming practices, grouped into 10 categories

Variables were identified in a participative research consortium (PDO organizations and researchers) to seek exhaustiveness in identification.

Categories	Numbers of variables
Farm description	32
Animals	18
Feeding	45
Working force	64
Housing	28
Water	9
Pastures	13
Milking	66
Cheese-making	26
Cheese quality	9



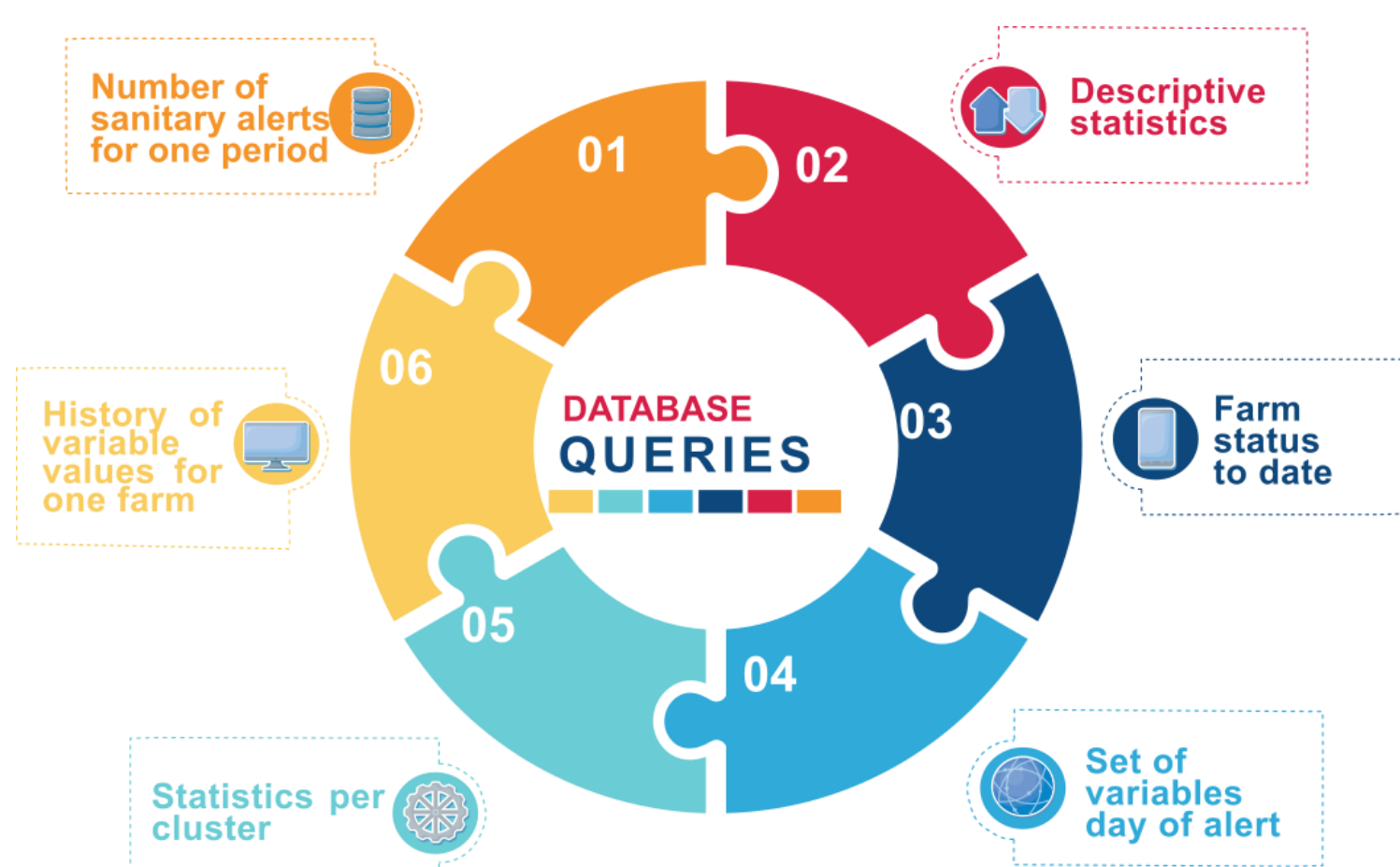
Database structure



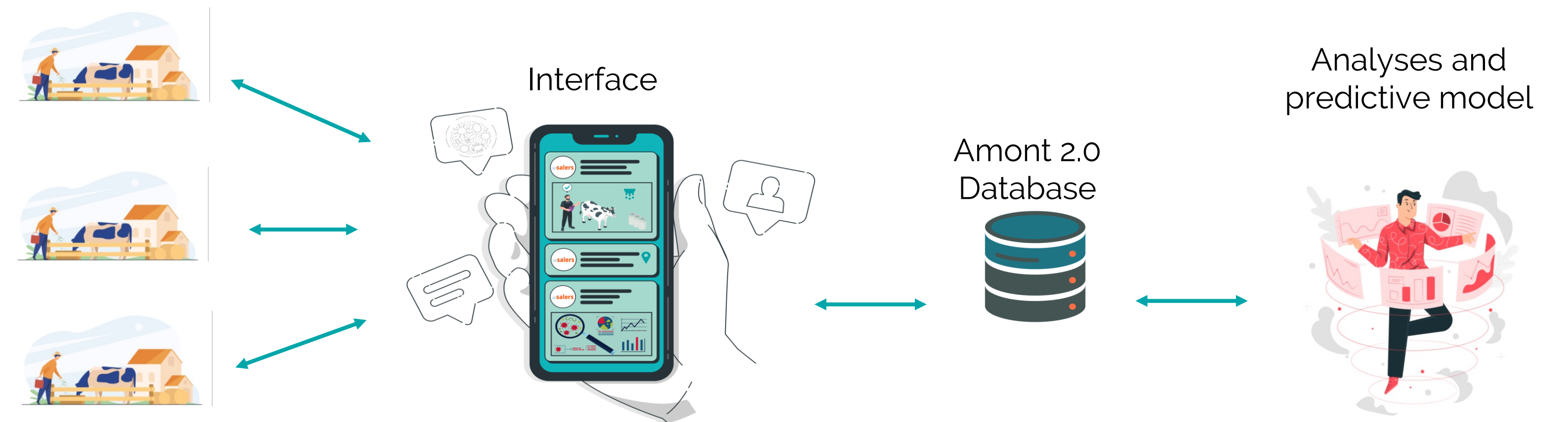
This data model permits to track changes in different variables over time. Each variable is linked with a date, an exploitation and a collector. This structure allows surveys to be reconciled with missing data or with "partial surveys".

Multiple database queries

Several database queries were written for different questions: statistics by category, by variable, by farm, etc. Other requests will be written according to the needs and questions of partners.

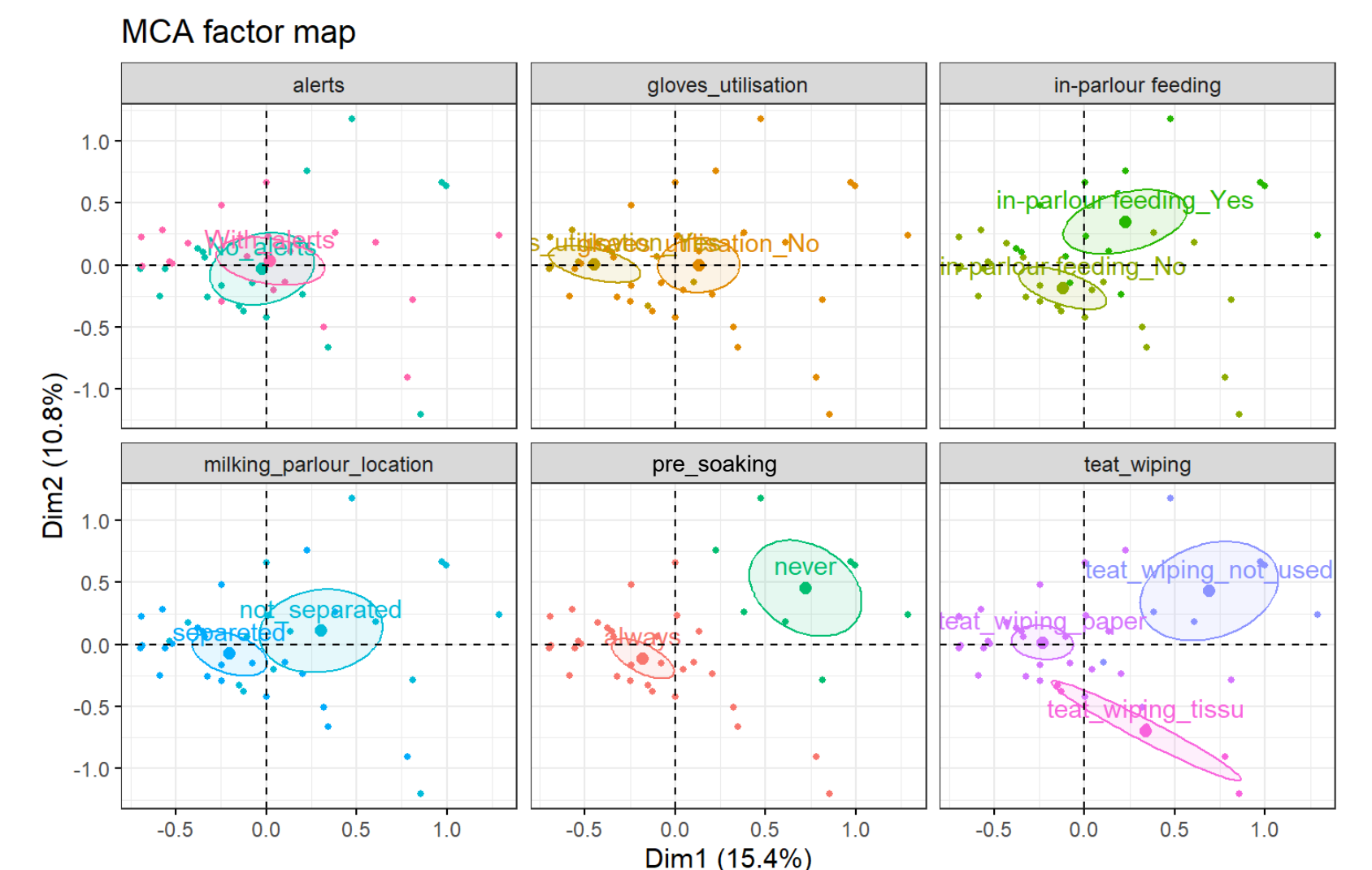
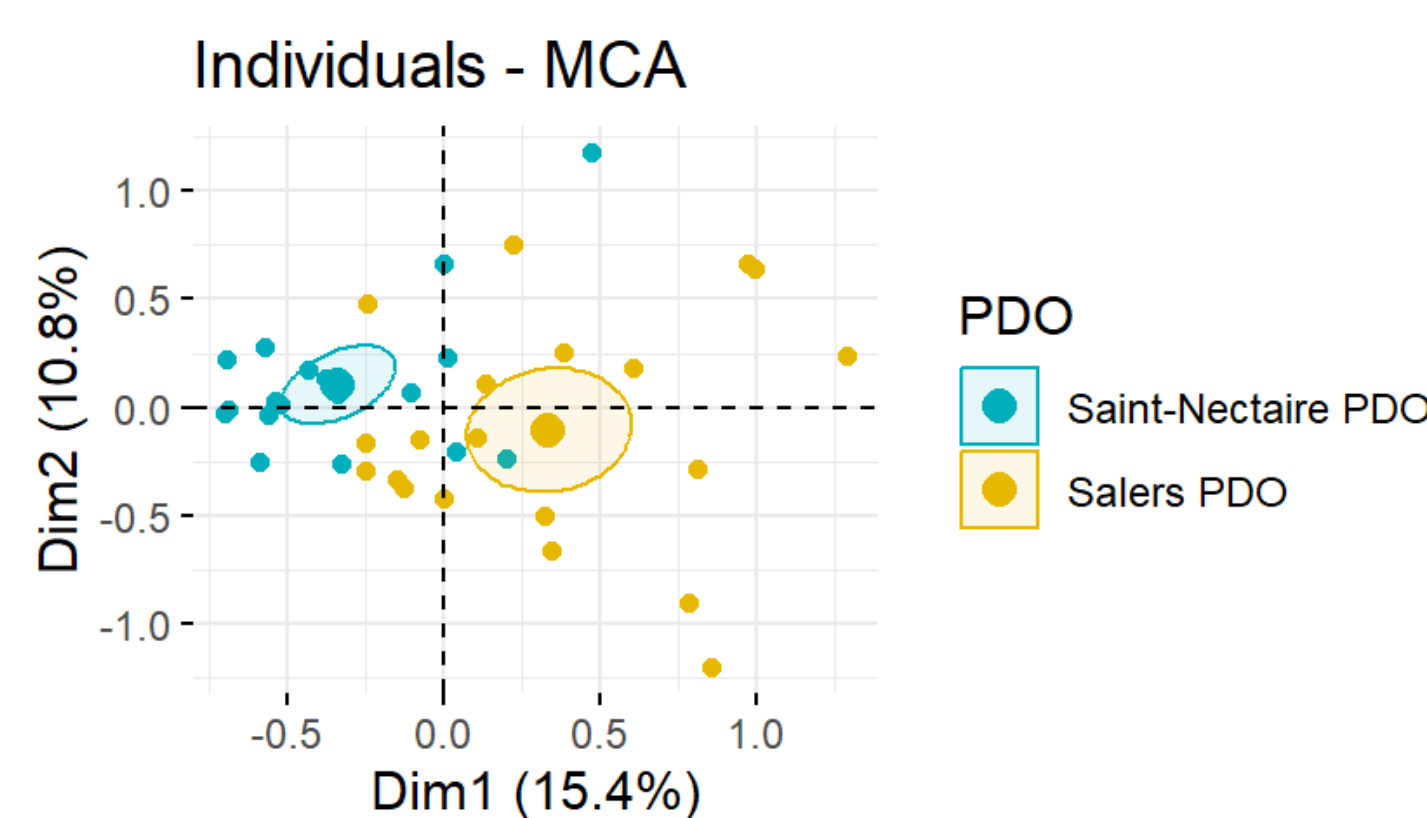


Using the database to collect data from farms

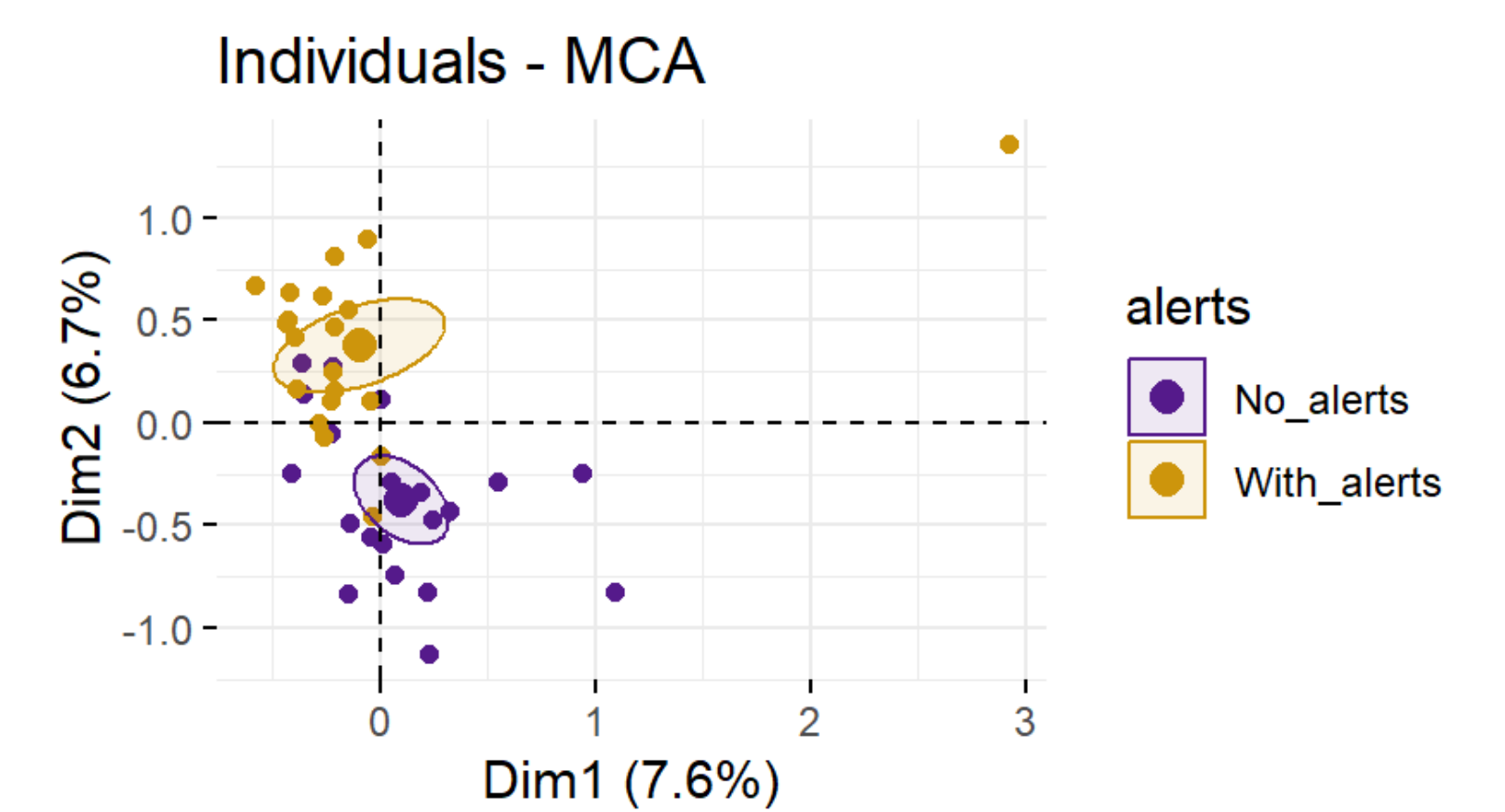
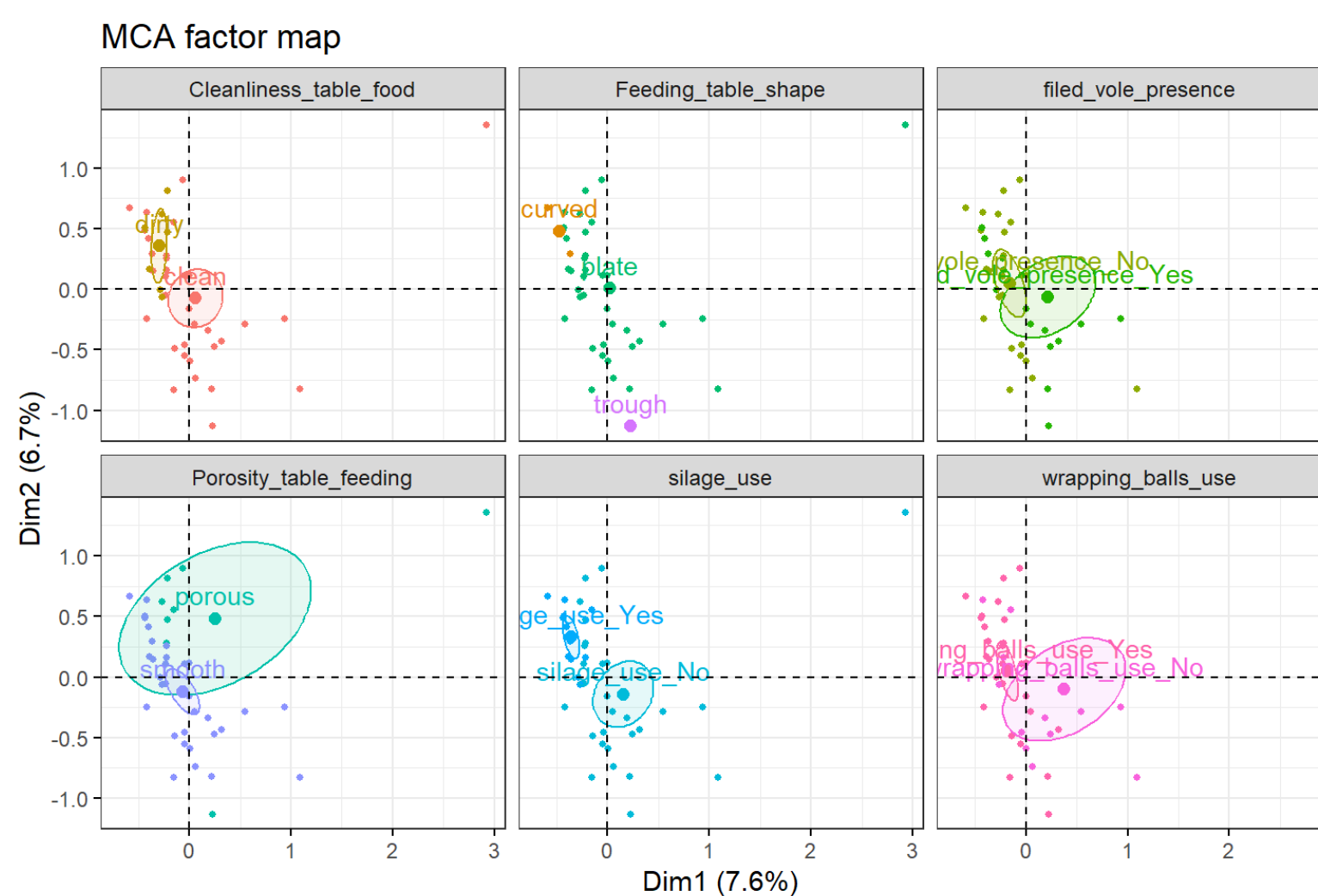


Multivariate statistical analyses

First multivariate statistical analyses were conducted on the data of 40 PDO's farms. MCA was performed on milking category (🐄), showing a clear difference between the two PDO cheeses technologies, in terms of in-parlour feeding, pre-milking practices, gloves utilization and milking parlour location.



Results below showed MCA performed on feeding category (🌿), showing a difference between farms with and without sanitary alerts, whatever PDO. Factorial variables as the cleanliness and porosity of feeding table, the use of silage, wrapping contribute to the characterization of farms with sanitary alerts.



Conclusions and perspectives

Data structuring enabled work on single or numerous farming practices and their links with sanitary situations. First multivariate statistical analyses and surveys showed the importance of exhaustiveness in variables identification. Data will be collected each year on at minimum on 50 farms to complete the database. Collected data will aim at being used to build an explanatory model and a multi-criteria ranking in agricultural dairy systems to predict sanitary alerts or other questions of interest, and their evolution with climate change.

Bibliography

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2. Bouchon M, Martin B, Bord C, Ferlay A, Bloor JMG, Eugène M, et al. 2025. Adaptation strategies to manage summer forage shortages improve animal performance and better maintain milk and cheese quality in grass- versus corn-based dairy systems. Journal of Dairy Science <https://doi.org/10.3168/jds.2024-25730>

- 2 Laboratoire de Mathématiques Blaise Pascal, Les Cézeaux, 3 place Vasarely, 63178 Aubière, France
- 3 Pôle Fromager AOP Massif Central, Aurillac, France
- 4 Interprofession du Saint-Nectaire, Besse-et-Saint-Anastaise, France
- 5 Comité Interprofessionnel des Fromages, Aurillac, France