Data bases for prediction of meat production and quality in ruminants

We collected results from phenotyping and genotyping studies on muscle production and quality from ruminants. A database was built. We then designed predictive models of meat quality that could be incorporated into decision tools for production chains. Tables for the nutritional value of meat from ruminants were produced.

Sustainability of meat production systems in ruminants requires being able to monitor and control different production objectives such as feed efficiency and meat quality. Many experimental results have been obtained in our Research Unit and internationally. The present challenge is gathering and analysing all these results. The strategy applied is to develop data bases and modelling approaches to provide recommendations, predictions or indicators useful for developing or evaluating production systems.

The Amuvi team has a driving role in the development of databases dedicated to herbivorous animals. Several APP referenced databases have been developed through national and international collaboration and after defining variables in a common ontology (ATO, in progress within Phase Department). The BeefBif database gathers INRA experimental data from individual animals to predict growth of muscle and adipose tissues together with sensory and nutritional value of meat. The NutriFlux data warehouse gathers literature values in two databases, Flora (to predict nutrient fate in the animal) and W3Meat (to predict long-chain fatty acid composition of meat). Using these tools, tables of the nutritional value of meats (from beef, sheep and horse) were published with the Meat Information Center (CIV), focusing on the most commonly consumed meats. The contents of different fractions of lipids (with their fatty acids), proteins (with their amino acids), vitamins (B3, B6 and B12) and minerals (heme Fe, Zn, Se) were reported for nine meats and five offals. They served as a reference in the CIQUAL tables for use by actors in the meat industry and nutritionists in France.

These databases are regularly updated and their application scope has widened. Three PhD research projects are presently using them. One of these projects follows up from the CIQUAL tables, and aims at predicting the fatty acid content of beef, especially for the fatty acids of high nutritional interest using W3Meat. The second one aims at predicting meat tenderness from BeefBif and using the Australian MSA system as a reference. The last one aims at predicting the post-hepatic availability of nutrients to characterise the nutrient composition of dietary metabolisable energy. Eventually, all the models will be integrated into decision tools for production chains.


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