

**Valorisation of atypical land in cattle production systems in search of self-sufficiency**

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The challenge of feeding nearly 10 billion people by 2050 in a context of climate change and increasing scarcity of natural resources requires rethinking of agricultural systems and the resources they use. Livestock are questioned on the competition for food, land use and their capacity to contribute to the nutrient cycle. This study is based on four cattle breeding systems (two dairy, two suckling) that are not representative of the dominant systems of the Western Europe such as (i) they use minimal inputs (mineral fertilization, concentrates), (ii) they rely on atypical land use providing atypical resources: woody formations, spontaneous vegetation in marshes - reed, duckweed, azolla, grasslands abandoned by conventional livestock. This study aims to understand the different uses of these resources and to quantify, from a metabolic approach of nitrogen flows, their contribution to agroecological and feed performances.

Our results show that the self-sufficiency of these systems is mainly based on the use of renewable resources. Although atypical resources represent a small part of the circulating biomass, they contribute significantly to the self-sufficiency of these systems via (i) animal feeding or nitrogen supplementation during periods of deficit in the production of "conventional" fodder, particularly during summer droughts, (ii) the supply of winter stocks and (iii) the production of biomass for animal bedding, particularly when the land is not well adapted to cereal crops. In addition their composition in antioxidants and micronutrients potentially gives them a role in terms of animal health and tolerance to heat stress. Finally, these resources can offer flexibility of management to systems because they can be used for two purposes: feed or bedding. However, the valorization of these atypical lands requires harvesting practices that respect the life cycle of the resources generated to ensure their renewal but also the habitats that they provide for many wildlife species.