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Unlocking the potential of Highland cattle: woody plant consumption and feeding preferences in encroached pastures in the Alps

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Since the 1950s, European mountain open areas have experienced significant woody encroachment due to agro-pastoral abandonment, posing critical challenges for extensive farming systems. Robust breeds like Highland cattle offer nowadays a promising solution due to their low maintenance needs, grazing adaptability, and agility on rough terrain. However, their foraging behavior in such environments remains understudied. This research examined the diet composition and feeding preferences of Highland cattle across four diverse woody-encroached pastures in the Western Alps. According to 11286 direct observations, cattle showed a major consumption (15-46%) of woody plants (more than 30 tree and shrub species), pointing out their potential as valuable forage resources. Jacob's Selectivity Index highlighted clear preferences for certain woody species, such as Celtis australis, Frangula alnus, and Rhamnus alpinus, while others like Corylus avellana, Prunus spinosa, and Sorbus aria were avoided. Remarkably, the relationship between species consumption and their abundance in the environment varied based on preference index, with preferred species consumed even at low abundance and avoided ones consumed mainly at high abundance. The noteworthy consumption of woody plants by Highland cattle, coupled with their resistance to cold weather and low demand for veterinary assistance, suggests their suitability for managing woody-encroached mountain pastures. Harnessing the potential of Highland cattle in marginal mountain areas holds promise for sustainable land use practices in the view of targeted silvo-pastoral systems in the Alps.

Assessing the agroecological management of grassland-based farming systems in mountain area through indicators

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In mountain area, traditional grassland-based farming systems provide different ecosystem services and a part of them can be considered as agroecological production systems. Several indicators can be used to assess the extent to which these production systems are agroecological. However, currently there is a lack of consensus among experts as to which indicators and tools should be used. The aim of this project is to test indicators at farm level to assess the extent to which a farming system is in agroecology. Thus, we collected quantitative and qualitative data in 10 farms involving ruminants in the Regional Park Livradois-Forez (France), including social and economic data to eventually propose an agroecological multicriteria approach. The surveyed farms have an average utilized agricultural area (UAA) of 62.70±28.67 ha and are composed by at least 80% of grasslands. Preliminary results suggest that economic data are the hardest to collect and are not always considered as the most important from farmers. On the other hand, the agroecological management of grassland-based farms highlighted a percentage of 93.35±5.66 of on-farm self-sufficiency. Nevertheless, farmers' perception is to have a gap of knowledge when it comes to grasslands management, and that they are adapting to social and environmental challenges. These results will contribute to the study of the reliability of the collected indicators and will increase the understanding of the agroecological level of a certain grassland-based farming system. Delving into this approach can drive the transition to an increasingly agroecological management through reliable and easy-to-gather indicators.