The sheep performances in a grassland-based system is improved when combined with beef cattle

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The specifications and the high price of feed in organic farming require implementing forage fattening. Based on the principles of agroecology, we hypothesized that the livestock farming system performance (animal productivity, environment and level of inputs) would be improved by associating beef cattle and sheep, allowing better valorisation of forages and parasitism control for the sheep. Three suckler farming systems (cattle (CAT), sheep (SH), mixed sheep-cattle (MIX)) were managed for 5 years into separate farmlets in INRAE Herbipole experimental farm, in order to test this hypothesis and the feasibility of producing beef and sheep-meat with only grass in a context of permanent grassland at 1000-1,300 m asl. In order to favour the production of finish grass-fed meat with young animals, we used crossbreeding between hardy breeds (Limousine ewes, Salers cows) and early maturing breeds (Suffolk rams, Angus bulls). Calving and lambing periods were adjusted to grass growth in order to optimize grazing. Young cattle were kept with their dam at pasture, weaned at 8-9 months in October, fattened indoors with hay and haylage-silage and slaughtered between 12 and 15 months. The results showed that MIX sheep took advantage of the association, with a lower use of concentrates and anthelmintics and a better lamb growth rate compared to SH enabling 100% of the lambs to be exclusively fattened on pasture. The complementarities in foraging behaviour and the lower parasitism level are underlying explanations. Despite a satisfactory degree of fatness, the carcass of young cattle were considered too light by the industry (230-280 kg), with poor price. The high need for conserved forages for beef fattening in winter, coupled with droughts, has generated additional costs through the purchase of hay. In the MIX system, the higher sheep performance and the lower concentrate input led to lower GHG emissions and energy use for sheep, compared to SH (-12.6% EqCO_2/kg LW and -16.9%MJ/kg LW); it also resulted in a 15% higher income per sheep livestock unit, in MIX vs SH.