Co-grazing horses and cattle requires appropriate management to provide its expected benefits

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Context

- Incorporation of **diversity** into animal production systems is assumed to ↗ their multiperformance & resilience

  (Dumont et al. 2013, Martin et al. 2020)

- **Mixing different ruminant species in pastures**:
  ↗ vegetation use & nutritive value of herbage
  ↘ strongyle egg excretion by small ruminants (dilution effect)
  ↗ animal performances

  (d'Alexis et al. 2014, Marley et al. 2006, Sehested et al. 2004)

- **Few references** on the putative benefits of **horse-cattle association**, except with regards to their ability to preserve biodiversity in semi-natural habitats

  (Cornelissen & Vulink 2015, Ménard et al. 2002)

Context

- Opportunities for complementarity between horses & cattle:
  - ✓ horses graze **shorter** than cattle
  - ✓ cattle can use **dicotyledons** to a greater extent
  - ✓ high specificity of **gastro-intestinal nematodes** for each species

(Mandaluniz et a. 2011, Ménard et al. 2002)

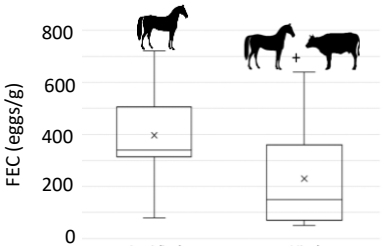
- Interviews & field surveys in **mixed saddle horse-beef cattle systems** *vs*. **specialized horse** systems :

↗ herbage use in mixed systems

Stocking rate (LU/ha)	0.93	1.20
Purchased fodder (tDM/LU/yr)	0.60	0.06
% area with mineral fertilization	25	4

(Dumont et al. 2020)

↘ egg excretion in horses grazing with cattle

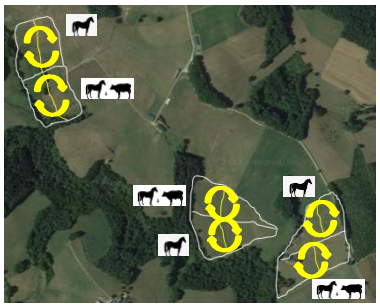


(Forteau et al. 2020)

lowlands of Massif central, France

This study: analysing the mechanisms of mixed horse-cattle grazing

- Experiment over three grazing seasons in a hill-range mesophile grassland (central France)
- **Co-grazing saddle horses-beef cattle** (LU horse/cattle = 1.0) **vs. horse grazing at the same stocking rate** (1.4LU/ha)



Animals in both treatments were **stocked alternately** on two subplots

- Measurements:

Diet selection (scan sampling; spring, summer, autumn)
Sward structure (entrance/exit of subplots) & **quality** (spring, summer, autumn)
FEC in horses (monthly), **larvae counts** in herbage (every two months)
Liveweight gains (start/end grazing season)
Social behaviour between species (focal sampling; monthly)

(Fleurance et al. 2022)

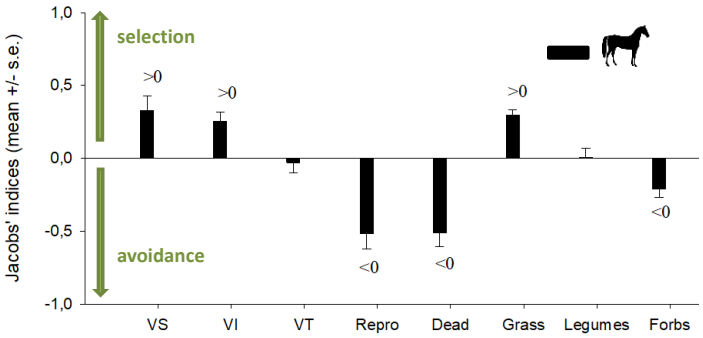
Horses quickly acclimated to heifers and exhibited typical patterns of diet selection

- Vigilant postures by horses towards cattle decreased to zero from the 2nd month
  Rare agonistic interactions

- **Horses, alone or with cattle**:

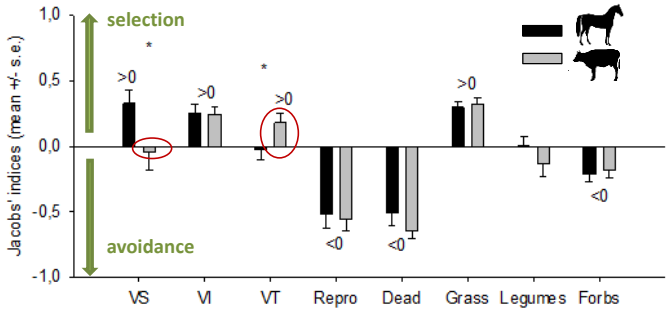
➢ **selected** vegetative short (VS, ≤ 4cm) & intermediate (VI, 5-8cm) patches & bites dominated by grasses
➢ used vegetative tall swards (VT, ≥ 9cm) and legumes **in proportion to their availability**
➢ **rejected** forbs and areas of reproductive swards & dead herbage where their faeces were concentrated

Consistent with Fleurance et al. (2016), Lamoot et al. (2005), Ménard et al. (2002)



Cattle used short swards more than expected

- Cattle selected VT swards & **used VS patches proportionally to their abundance**
  ≠ cattle excluded from lawns 1-4cm in less fertile grasslands grazed continuously by horses & cattle; e.g. López-López et al. 2019, Ménard et al. 2002)



A**lternate stocking** let short swards regrow (3.9cm) before animals entered the subplots again
High **selectivity** of Limousin breed (D'Hour et al. 1995)

- No differences between the two species for the other bite types

Mixed grazing did not homogenize sward structure nor dilute horse parasitism

- **Cattle**, by avoiding reproductive and dead herbage areas, **did not improve herbage quality**

CV sward surface height (%)	58.5 ± 1.7	60.1 ± 2.3	p = .324
CP (g/kgDM)	116.0 ± 4.8	113.7 ± 5.2	p = .147
NDF (g/kgDM)	594.4 ± 11.6	604.5 ± 13.6	p = .319
DM digestibility horses' diet (%)	57.5 ± 0.4	57.7 ± 0.4	p = .846

- Horse strongyle FEC and larvae counts/horse in herbage were similar between treatments. Cattle avoided grazing close to horse dungs (Jacobs' indice: -0.17, p=.006)

- Horse liveweight gains did not differ between treatments (378g/d on average)

Conclusion

- It is a core principle of any agroecological management to account for local conditions
  → mixed grazing **should not be considered as a « turn-key » solution.**
  Its **management** needs **to support the complementarity of horses and cattle dietary choices**

- For improving horses' performances:
  Grazing management should not provide accessible vegetative regrowths to cattle
  Use cattle breeds having low requirements and a high ability to feed on roughages