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Grassland production systems: combining animal species and crossbreeding

Salamix: an inter-disciplinary experiment et the system level

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Context

❖ **French suckler farming systems: alarming observations!**
  ✓ Decrease of the factors’ productivity (land, intermediate consumptions, capital)
  ✓ Decrease of the use of the animals and plants resources
  ✓ Very few (or none) animals are fattened with a 100% grass diet
  ✓ Fattening diets (lambs and cattle) → grain (like monogastrics!)
  ✓ No wealth created by suckler farms

❖ **But:**
  ✓ French organic beef an lamb sector: positive dynamic needing animals
  ✓ Due to the concentrates’ prices, 70% of the bovine males from organic certified suckler cattle farms are sold as store animals on the conventional market!
  ✓ Lambs in mountain areas are fattened indoor with grain
  ✓ Grass-based systems have a positive image and real environmental and social advantages
Livestock farming project

Objective

 ✓ Lamb and beef production **with grass** in a low-input, self-sufficient and sustainable production systems
 ✓ Grass-based systems with a maximization of the use of grassland, and a minimum inputs’ use → added-value creation
 ✓ Set up sustainable production systems in the agro-ecological framework

Questions

 ✓ **Combining animal species** (sheep and cattle) → agro-ecological advantages?
 ✓ **Cross-breeding** → better use of resources?

System experiment (Herbipôle, Laqueuille, Massif Central)

 ✓ **Mountain** area, 1100 to 1400m asl., **100% permanent grassland**
 ✓ **Organic Farming** systems
 ✓ **3 systems**: sheep, beef, sheep+beef. Same UAA (40ha), LSU (30) and average annual stocking rate (0.75 LSU/ha) per system
Better use of forages?
✓ diversity of species and categories → animals’ complementarity
✓ Positive interaction on forage intake and use: better use of the nutritive value of forages, reduction of wastages

Better individual performances and per surface unit?
✓ Better system efficiency (less inputs per unit produced)

Better parasites control?
✓ Natural biological regulations: dilution, perturbations of cycles

Better environmental performances?
✓ Lower consumption of chemical inputs → lower fossil energy consumption and GHG emissions, biodiversity preservation

Work load?
✓ More complexity to manage
Crossbreeding

- Hardy, prolific breed dam x early-maturing breed sire
  - Herd productivity
  - Conformation of progeny
  - Castration of all males (lamb and calves)
  - Sale at slaughter of younger animals (beef)
  - Better use off grass

Cows: Salers

Bull: Angus

Ewes: Limousine

Ram: Suffolk
3 livestock farming systems

- **Specialized sheep farming system (30 LSU, 40ha)**
  - 164 ewes Limousines + 4 rams Suffolk + 2 rams Limousin
    - 20% replacement, 33 ewe lambs Limousine per year
  - 1 lambing period per year: 15 March → 20 April
    - Lambs over 1 month old at turnout to grass
  - Weaning from mid July
  - Sale of 1st lambs at weaning, finishing lambs on grass regrowth

- **Specialized beef farming system (30 LSU, 40 ha)**
  - 22 cows Salers + 1 bull Angus
    - 10% replacement, 2 heifers Salers (2 years old) purchased per year
  - Cow-calf-fattener system. 100% animals sold to slaughter
    - Males castrated at 3-4 weeks
  - Calving period: 15 January → 15 March
  - Weaning on October
  - Sale of young males and females (12 to 18 months old, 250-300 kg carcass), finishing with grass, hay and concentrates only if necessary

- **Mixed sheep-beef farming system (30 LSU, 40 ha)**
  - 66 ewes Limousines + 2 rams Suffolk + 1 ram Limousin → 12 LSU (40%)
  - 13 cows Salers + 1 bull Angus → 18 LSU (60%)
  - Same herd management than for specialized systems
Measures and evaluations

- Animal performances: weighing, body condition scoring
- Grass monitoring: available grass, forages harvest
  - Sward height (before and after grazing)
  - Weighing of harvest, hay analyses
- Parasitism, animal health
  - Infestation monitoring: faecal examination, post-mortem
  - Targeted treatments
- Biodiversity: indicators and dynamic
  - Botanic compositions, insects
  - Mapping of agro-ecological components
- Carcass and meat quality
  - Experimental slaughterhouse and specific analysis
- Techno-economic performances at the system level
  - Comparison with commercial farms results
- Carbon footprint and fossil energy consumption
- Labour organization and labour conditions
Experiment setting up and 1\textsuperscript{st} observations

- **Winter and spring 2015**
  - Herds, animals batching (ages, index, ...)
  - Allocation of the land parcels (hay, grazed, altitude, agronomic value, ...)
  - Fences

- **2015: system experiment setting up, first year**
  - Turnout to grass late (21 May)
  - Cows serviced by Salers bulls, Angus bulls purchased in summer
  - 0 concentrates during the grazing period
  - Good animal performances (average daily gain, weaning weight)
  - Suckling animals growth (lambs and calves): mixed > specialized
  - Lambs from the mixed system: 100% grass finished, 0 concentrates
  - Lambs from the specialized system: 11% finished indoor with concentrates
  - Salers baby beef fattening: hay + concentrates $\rightarrow$ ADG 1200g, sold at 300 kg carcass
  - Techno-economic performances: financial period 1\textsuperscript{st} May $\rightarrow$ 30 April, in progress

- **2016: first year of the conversion to organic farming**
  - Good numerical productivity (sheep and cattle)
  - Angus bulls serviced all the cows (echography in fall)
  - Early turnout to grass (13 to 25 April),
  - Rotational grazing well conducted $\rightarrow$ good grass quality $\rightarrow$ good animal performances
Comments and perspectives

- 3 systems breaking with the local practices
- A inter-disciplinary platform
  - Researchers from different disciplines working together on the same subject
- A steering group involving stakeholders
  - Researchers from several disciplines and higher education
  - Technical institutes (livestock institute, organic farming institute)
  - Local extension and development structures
  - Veterinary
  - Marketing co-operative of organic animals and meat
- A long term experiment