French sheep-for-meat production: state of the art and perspectives for sustainable farming systems.

Sneessens I.1, 2, 3, Brunschwig G.2, 1, Benoit M.1, 2

1: INRA, UMR1213, F-63122 Saint-Genès-Champanelle
2: Clermont University, VetAgro Sup, UMR1213, BP 10448, F-63000 Clermont-Ferrand
3: French Environment and Energy Management Agency (ADEME), 20 avenue du Grésillé - BP 90406 F-49004 Angers Cedex 01

Referee of ADEME: Trevisiol A. - Service of Agriculture and Forest
Introduction – Analysis & Diagnostic – Design – Conclusion & Perspectives

Over the last 30 years, French sheep-for meat production by 50%

Nowadays, self-sufficiency of 50 %

Remaining production systems are
  ▪ still below international competitivness
  ▪ threatened by future economic and climatic contexts
  ▪ Pointed out for some of their environmental impacts

To maintain French Sheep-for-meat production systems, it’s clearly needed to identify what systems can face actual and future challenges
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

- Evolution analysis of French sheep-for-meat production systems in plainland areas
- Identification of drivers & Expected evolutions
- Defining objectives for sustainable farming systems

Montmorrillon
Evolution of farming systems – Drivers - Objectives

EXTENSIVE GRAZING SYSTEMS

:System with low labour and inputs needs

(Spring Lambings)

(JEAN, 1986)
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – Drivers - Objectives

- **Extensive grazing systems**
- DIVERSIFICATION WITH CROPS

= influence of **Western Migrants**

==> The competitiveness of local specialized production systems is questioned.

(JEAN, 1986)
Evolution of farming systems – Drivers - Objectives

The Green Revolution led to specialized intensive systems, mainly through:
- Mechanization
- Low input prices
More liberal CAP led to:

- a rise in imports of sheep meat: 20 → 50 % of national self-sufficiency
- A decrease of domestic prices of 40% (Benoit and al., 1991)
- Specialized intensive sheep systems are no longer competitive
Evolution of farming systems – Drivers - Objectives

- Extensive grazing systems
- Specialized intensive systems
- Diversification with cultures
- Diversification or Discontinuation

Autumn Lambings

Spring + Autumn Lambings
**Introduction – Analysis & Diagnostic – Design – Conclusion & Perspectives**

**Evolution of farming systems – Drivers - Objectives**

- **1930s**: Extensive grazing systems
- **1950s**: Specialized intensive systems
- **1970s**: Diversification with cultures
- **1980s**: Diversification or Discontinuation
- **1990s**: Cooperatives

**Accelerated Systems: 3 lambs/ewe over 2 years**

![Graph showing the timeline and systems evolution](chart.png)
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – Drivers - Objectives

- Extensive grazing systems
- Specialized intensive systems
- Diversification with cultures
- Diversification or Discontinuation
- Autumn Lambings

**Profitability** largely affected by **European reforms*** and **domestic factors**

- CAP Reform 1992*
- Compensatory Sheep Premium*
- Territorial contracts
- « Plan Barnier »

DIVERSIFICATION (CASH CROPS) OR DISCONTINUATION
Other characteristics of evolution (1987 – 2010)

- Total Agricultural Area: + 66%  (90 → 150 ha)
- Number of ewes: + 42%  (480 → 680 ewes )
- Labour productivity: + 35%  equLU/worker

( sample of 12-25 farms , INRA network)
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – **Drivers** - Objectives

**DRIVERS**
- Economic
- Political & Institution.
- Spatial
- Social

Adoption / Evolution / Discontinuation
Of
Sheep-for-meat Production System
**SCALE ECONOMIES:**
cost advantages that enterprises obtain due to a higher size of production, 
*because* cost per unit of output decreased as fixed costs are spread out over more units of output.

**SCOPE ECONOMIES:**
cost advantages that enterprises obtain due to the production of two or more inputs simultaneously.

⇒ *Determine the best production set for a given economic context*
Labour income is lower in sheep farming systems

Constant Euros 2012

(Agreste, RICA)
Case of French Sheep-for-meat production:
Profitability mainly determined by:
- High numerical productivity
- Low consumption of concentrates

Increasing of input prices expected
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – **Drivers** - Objectives

- **ECONOMIC**
- **POLITICAL & INSTIT.**
- **SPATIAL**
- **SOCIAL**

- CAP reforms
- Domestic factors
- Local governances (cooperatives, ...)

---

**CAP reforms**
**Domestic factors**
**Local governances (cooperatives, ...)**
Subsidies per worker are higher than income

Constant Euros

Subsidies per worker are higher than income (INRA Network)
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – **Drivers** - Objectives

- CAP reforms
- Domestic factors
- Local governances (cooperatives, ...)
  - Uncertainty about future European financial supports
  - New environmental policies (GHG, biodiversity, ...)?
  - New forms of governances?
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – **Drivers** - Objectives

- **ECONOMIC**
- **POLITICAL & INSTIT.**
- **SPATIAL**
- **SOCIAL**

Pedoclimatic conditions
Access to factors of production

⇒ **Main evolution expected: climatic hazards**
Introduction – **Analysis & Diagnostic** – Design – Conclusion & Perspectives

Evolution of farming systems – **Drivers** - Objectives

Constant efforts to **simplify** and **alleviate** labour work
Evolution of farming systems – Drivers - Objectives

**PROFITABILITY**
High and constant in presence of
- Climatic and economic hazards
- Higher input prices on the long term

**ENVIRONMENTAL FRIENDLY**
- Lower GHG emissions, Mj consumption
  - Higher biodiversity
  - Lower pollutions

**VIVABILITY**
AGROECOLOGY >>> CROP-LIVESTOCK INTEGRATION

High autonomy through integration:
- Transfer of organic fertilizers
- Transfer of feeds (crops or subproducts)
- Rotational patterns

More resilient through diversification

More environmental friendly

BUT complexity of management (is it a way to enhance rural cohesion?)

PROFITABILITY

ENVIRONMENTAL FRIENDLY

VIVABILITY

+ +

+ +

- (?)
PROFITABILITY

ENVIRONMENTAL FRIENDLY
- Lower GHG emissions, Lower MJ Consumption
- Biodiversity, Lower Pollution

VIVABILITY

HIGH NUMERICAL PRODUCTIVITY
Reproduction Rythm, Zootechnic Characteristics

BUT
- Complexity of management
- Needs well-adapted races
- Needs use of concentrates

[Diagram showing relationships and impacts such as positive (+) and negative (−) effects between the categories.]
GHG Emissions decrease with higher numerical productivity

(INRA Network, 1180 farms -24 years)
HIGH NUMERICAL PRODUCTIVITY
Reproduction Rythmn
Zootechnic Characteristics

BUT
- Complexity of management
- Needs well-adapted races
- Needs use of concentrates

PROFITABILITY

ENVIRONMENTAL FRIENDLY
- Lower GHG emissions, Lower MJ Consumption
- Biodiversity, Lower Pollution

VIVABILITY

+ + +

(?)
Preservation of sheep-for-meat production systems is questioned in plainland areas.

This production can be seen as a tool to enhance sustainability of crop farming systems

BUT

• Crop Livestock Integration ➔ Need for a better understanding

• Sustainability ➔ Which compromise between objectives?
Thanks to our financial supports, the French National Institute for Agricultural Research (INRA-Phase/SAE2) and the French Environment and Energy Management Agency (ADEME).