



Task 4.2 Innovation case study report

Feed self-sufficiency, a challenge for the sustainability of sheep and goat farms

iSAGE Training Course and Workshop

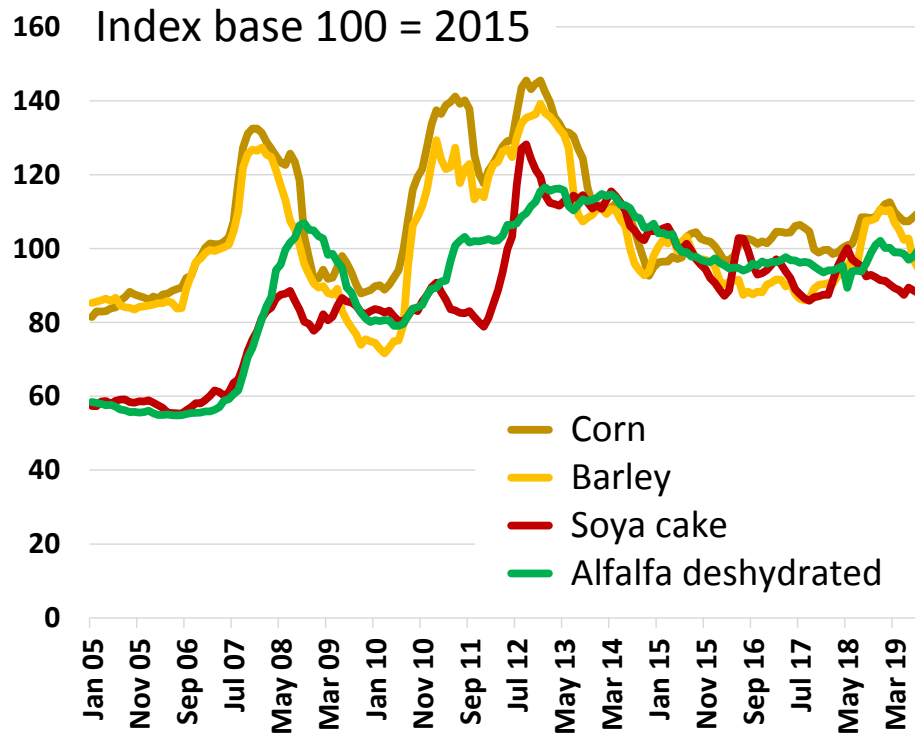
Zaragoza, Spain, from 10 to 13 December 2019

Emmanuel Morin, Vincent Bellet,
Nicole Bossis, Barbara Fança

Institut de l'Élevage - France

In sheep and goat sector, feed purchases \approx 50 to 60% of operational costs

Evolution of feed prices



Economic results of farms are highly dependant on the evolution of feed prices...

French Livestock Institute from INSEE and AGRESTE

AUTOSYSEL and AUTELO : 2 thematic networks about feed self-sufficiency



Project funded by CNE
45 sheep and goat farms



Project funded by the French
Ministry of Agriculture (CasDAR)
13 dairy sheep farms



Sustainability assessment done
for 4 of these farms [WP1]

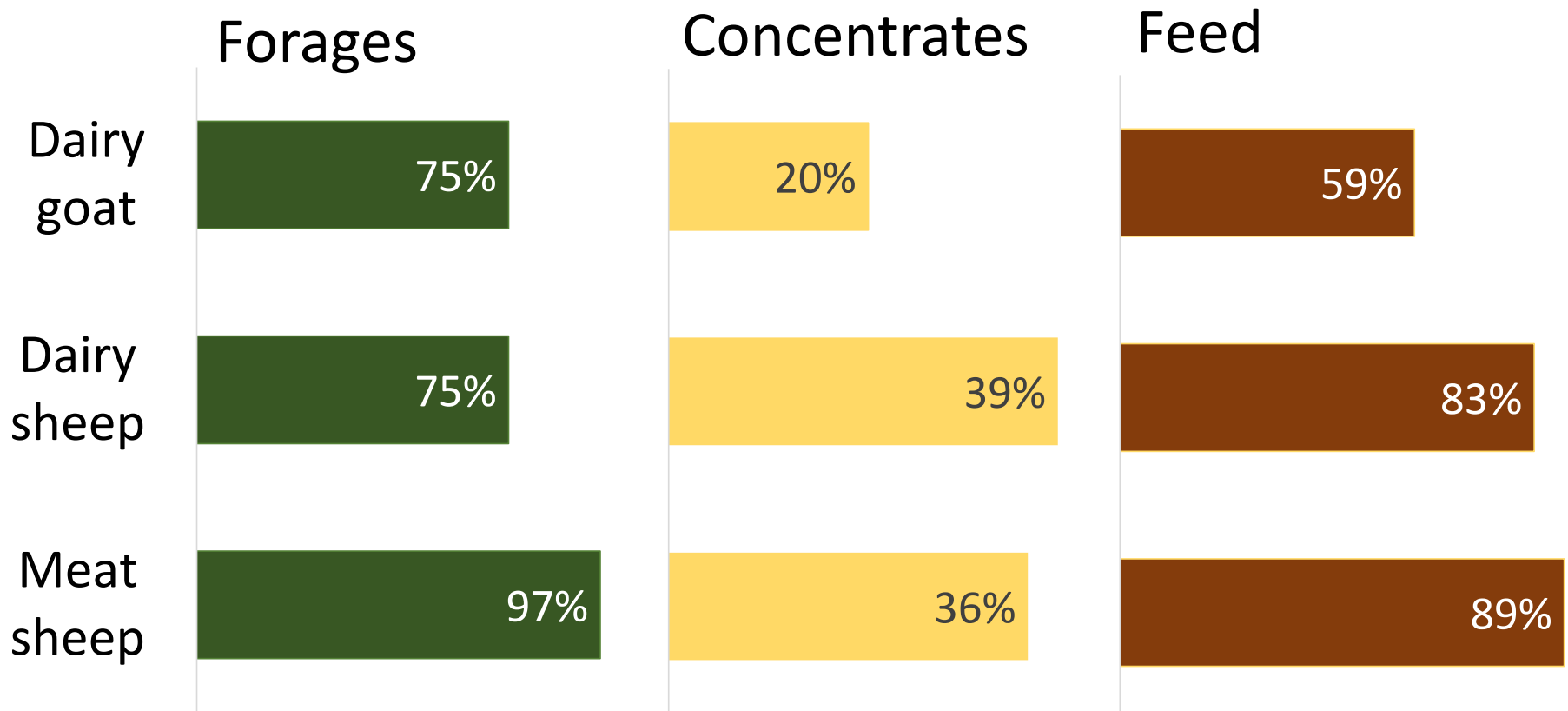
How to evaluate feed self-sufficiency ?

Feed self-sufficiency = % of feed produced on farm (P) compared to what is consumed by the flock (C)

$$S = P / C$$

- ▶ **Forage self-sufficiency** = $1 - (\text{quantity of purchased forages} / \text{quantity of consumed forages})$
- ▶ **Concentrates self-sufficiency** = $1 - (\text{quantity of purchased concentrates} / \text{quantity of consumed concentrates})$
- ▶ **Feed self-sufficiency** = $1 - [(\text{quantity of purchased forages} + \text{quantity of purchased concentrates}) / (\text{quantity of consumed forages} + \text{quantity of consumed concentrates})]$

Feed self-sufficiency for French sheep and goat farms



French Livestock Institute from INOSYS Réseaux d'élevage

Some examples of levers used by farmers to improve feed self-sufficiency

- ▶ **adapt stocking rate of the main fodder area** by increasing farm area or reducing the number of ewes or goats,
- ▶ **improve the quality of harvested forages**, using silage, haylage or barn-dried hay,
- ▶ **develop grazing** if possible, in order to reduce the amount of forage distributed,
- ▶ **use pastoral lands** by installing fences or employing a shepherd,
- ▶ **adapt concentrate distributions to the animals needs** by doing feed batches or using an automatic feeder,
- ▶ **modify the cropping plan** to produce cereals or protein crops, or to improve the quality of harvested forages by developing, for example, legumes crops (alfalfa, clover...).

The farmers studied in iSAGE project often combine several levers to improve feed self-sufficiency of their farm



Meat sheep farm

- ↘ Stocking rate
- ↗ Cereal crops
- ↗ Alfalfa crops



Dairy goat farm

- ↗ Lupin crops
- ↗ Soya crops



Dairy sheep farms

- Rotational grazing practices
 - ↗ forages quality (in-barn drying)
- Adapt concentrates to animal needs (automatic feeder)

Feed self-sufficiency contributes to improve the various components of farm sustainability

Farm
business
resilience

- + ↘ operational costs and ↗ gross margin especially when feed prices are high
- Can ↗ fixed costs: machinery costs for cereal crops, automatic feeder...

Energie and
carbon,
fertiliser
management

- + ↘ carbon footprint: transportation of feed across the Atlantic ocean
 - ↘ nitrogen fertilizer and ↗ agricultural systems diversity : alfalfa, lupin in crop rotation
 - ↘ farm equipment and fuel consumption: grazing
- ↗ greenhouse gases: replacement of grasslands by crops

Feed self-sufficiency contributes to improve the various components of farm sustainability

Animal
welfare /
health

- + Access to pasture
Adapt feeding strategy to individual needs and to improve body conditions of young ewes: automatic feeder

Food
security

- + ↘ GMO feed and ↗ local feed
respect of quality label rules

Social

- ↗ workload

Future potential of the innovation...

- ▶ Feed self-sufficiency **is an important issue for the farmers** interviewed within the holistic sustainability assessment.
- ▶ **Different technical levers can be used** to improve feed self-sufficiency of farms.
- ▶ Most often, **farmers combine several levers** in the same time.
- ▶ Most of these levers have **positive effects on farms sustainability**... but some of them can have negative effects on a sustainability part.
- ▶ So it is important **to adapt the possible solutions** to farming systems and **to assist farmers in their implementation**.
- ▶ In France, this work is done by the **technical organisations** that advise the sheep and goat farmers.