Self-sufficiency for animal feed: a multi-level framework to promote agroecological farming systems
Vincent Thenard, Anais Charmeau, Pierre Triboulet, Guillaume Martin

To cite this version:
Vincent Thenard, Anais Charmeau, Pierre Triboulet, Guillaume Martin. Self-sufficiency for animal feed: a multi-level framework to promote agroecological farming systems. 67. Annual Meeting of the European Association for Animal Production (EAAP), Aug 2016, Belfast, Ireland. hal-01961390

HAL Id: hal-01961390
https://hal.science/hal-01961390
Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
SELF-SUFFICIENCY FOR ANIMAL FEED: A MULTI-LEVEL FRAMEWORK TO PROMOTE AGROECOLOGICAL FARMING SYSTEMS

Vincent Thénard, Anaïs Charmeau, Pierre Triboulet, Guillaume Martin
INRA-UMR1248 AGIR, F-31326 Castanet Tolosan, France,
Once upon a time trucks travelling across frontier
One 's upon a time lories travelling across frontier

We want hay, straw, ammonium nitrate, and soya for Roquefort production

We could be self-sufficient for feeding !!!
Main points for this presentation

- A conceptual framework and indicators to assess feed sufficiency
- Choice of sample farms & methods
- Using framework at farm level to define feed self-sufficiency
- Examples and Challenge at territory and supply chain level
Issue and objective of the study

- Self-sufficiency as a driver of agroecological transition.
- Most farmers combine livestock with forage and crop production to increase self-sufficiency for animal feeding.
- Few farms can develop local exchanges to use local resources.

To build framework characterizing self-sufficiency for animal feeding at farm level in order to discuss the issue of this feed self-sufficiency at different levels: farm, local farmer’s group, territory or supply-chain.
How to scheme the feed sufficiency at farm level using stock and flow approach:

→ Explaining different feed inflow and outflow used by animals.
→ Calculating the production impacts at farm level.

What is the relevance of these flows at territory level?

→ Flows approach can be used at territory level by aggregating data.
→ Exchanges between farmers at local level can foster feed sufficiency.
→ Supply chain actors must take into account needs for self-sufficiency for animal feeding.
Conceptual framework

1. Grassland
   - Sown Pastures
2. Leaching
3. N$_2$
   - Fodder Crops:
     - Maize
   - Lucerne
4. Cereals selling
5. Feed Supply
6. Sale/exchange: straw/manure
7. Milk & Meat
8. Fertilisation
   - Grazing
   - Forages
   - Concentrates

Mineralisation:

- Supply organic fertiliser
- Effluents animaux

Herd

- Grazing
- Forages
- Concentrates
Methodology: Sample Farms and studies

Analysis at farm level

**Agriculture census (Agreste, 2010) in Aveyron department:** Dairy cow, suckling cow and Dairy sheep farms represent 70% of the farms.

Collect data from:
- 20 farms Dairy and suckling cows (Dumas 2015)
- 21 farms Dairy sheep (Di Bartolomeo 2014, Galtier 2015)

Stock & Flow Modelling and indicators assessment

Territory Level

Aggregation of the farms at the agricultural region “Segala” 2 199 EA (Grimaldi 2013)

Analysis of exchange and agreement between farmers in two local regions (Mélac 2014, Péquignot 2015)

Stock & Flow Modelling at local region without performances analysis

Territory and Supply Chain Level

Interviews of stakeholders at farmers ‘groups and supply chain level

EAAP 2016
67th Annual Meeting
Belfast UK
29 Aug - 2 Sept
Indicators to assess feed sufficiency

**Feed Sufficiency**
- **Forage Sufficiency Indicator** → based on ratio forage production / consumption
- **Energy Sufficiency Indicator** → based on energy part of forage and concentrates
- **Protein Sufficiency Indicator** → based on protein part of forage and concentrates

**Farm Features**
- Crops & Forage crops area
- Rangeland per LU
- Stocking rate
- Animal Productivity

**Production Impacts**
- **Nitrogen Environmental Impact** → based on nitrogen losses (kg Nitrogen lost by ha of AA)
- **Food Productivity Impact** → based on protein production (kg protein produced by kg Nitrogen input)
Feed sufficiency at farm level

Feed self-sufficiency for different livestock farming

Forage sufficiency | Energy sufficiency | Protein sufficiency

- 100% Dairy cow farm
- 90% Suckling cow farm
- 91% Dairy sheep farm

A large diversity in dairy farms, mainly for Energy and Protein
Feed sufficiency at regional scale

The averages of sample farms and all farms of the census in this small region are close.
Impacts for different stages of farm sufficiency

Three stages of farm sufficiency defined by PCA and clustering method

Farms very sufficient (forage Energy and Protein)

- Stocking rate and animal productivity low
- Weak Nitrogen Environmental Impact
- High Food Productivity Impact

Farms sufficient for forage, lack of Energy and no-sufficient in Protein

- Medium stocking rate and animal productivity
- Weak Nitrogen Environmental Impact
- Low Food Productivity Impact

No-sufficient farms

- Stocking rate and animal productivity high
- Strong Nitrogen Environmental Impact
- Low Food Productivity Impact

FPI  NEI
7.3a  12.4a
3.7b  18.5a
2.3b  87.9b
Improving agreements and exchanges at Territory level

- Local initiatives arise to develop exchange between farmers

**Stakes**
- Limiting prices hazard
- Local food network
- Crops with agronomic benefits

**Levers**
- Agronomic training
- Technical advises and monitoring
- Economic agreements
- Sustainable exchanges

**Limits**
- Web interface & design
- Price agreement
- Haulage and Storage services

A web-network for organic farming

Exchanges between crops farmers and livestock farmers: www.ecebio31.fr

After one year:
- 41 livestock farmers and 65 crops farmers
- 95 offers (mainly hay and « meteil »)
Local protein for animal fed: a challenge for supply chain level

- Agricultural cooperatives attempt to propose new services and products to the farmers

**Stakes**
- Increase the area limiting haulage
- Preserve the water catchment
- Add value to productive areas

**Levers**
- Alfalfa fields in irrigated areas
- Small units for the dehydration of Alfalfa
- Sufficient group of crops and livestock farmers

**Limits**
- 1st cutting management and use
- Availability of 800ha for Alfalfa within a radius of 20km
Outlook for regional level

- The actors of territory share an incentive for local production of forages and cereals. Debate is more complex for proteins.
- Technical weaknesses could be overcome.
- Logistic threats could limit the local initiative.
- Territorial sufficiency or local feed production can be improved by new cooperation between farmers and supply chain actors.
- Large types of resources can be used by farmers (knowledge, training, experiment, technical advises...).
Conclusions: a framework for farm sufficiency

- The different stages of self-sufficiency are linked to farm performances:
  - Intensifying production and animal productivity increase energy and protein requirements.
  - Farmers need to supply animal with purchased concentrates, limiting the self-sufficiency at farm level.

- Aggregation at the regional level shows similar results to self-sufficiency for animal feeding among the main part of the farms.
Three stages of farm sufficiency defined by PCA and clustering method
Echanges céréalières / éleveurs

Recherche

Pour effectuer une recherche, modifier votre compte et proposer de nouveaux produits, veuillez vous identifier avec votre email et votre mot de passe. Si vous n'avez pas de compte, remplissez la partie gauche du formulaire et cliquez sur "Je m'inscris".

Merci d'utiliser les informations saisies lors de votre notification à l'agence bio http://annuaire.agencebio.org/ si vous vous êtes notifié(e). Il est très important de bien renseigner votre adresse pour la géolocalisation de vos annonces.

Si vous avez un problème de mot de passe, vous pouvez essayer de le réinitialiser en saisissant votre adresse email dans l'encastré "Vous identifier" et en cliquant sur le bouton "Mot de passe oublié".

Inscription

- Nom de la structure:
- Titre:
- Nom:
- Prénom:
- Adresse:
- Code postal:
- Ville:
- Téléphone:
- Mobile:
- Email:
- Mot de passe (8 caractères min):
- Vous êtes en:  
  - Production animale
  - Production végétale
- Vous acceptez:  
  - Je me suis pas enfants
- CGU: J'ai lu et j'accepte les CGU
- Code (vous pouvez zoomer): TRJZV

Vous identifier

- Email:
- Mot de passe:
- Je me connecte
- Mot de passe oublié

Tutorial Site ECE