A framework to analyse agricultural innovation systems applied to the sheep sector
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Agricultural innovation studies have evolved from the Innovations Diffusion model approach to the actual Agriculture Innovation Systems (AIS). AIS perspective considers all stakeholders and factors that affect the development and adoption of innovation. Innovation is not just technology but a comprehensive view of what production systems should look like in the future. Although the AIS concept draws a realistic view of the innovation process, it also highlights its complexity. To tackle this complexity researchers have developed several approaches to analyse and assess AIS inefficiencies, and to suggest improvements. We present a methodology to analyse livestock innovation system by disengaging its components and interactions, and identifying the drivers and constraints for an efficient development and dissemination of innovations. We adapt previous work into a methodology tuned up to the sheep sector. Central to this method is the assessment of the functions that AIS should fulfil: (1) guidance of the search; (2) knowledge development; (3) field experimentation; (4) knowledge diffusion; (5) resources mobilisation; and (6) innovation brokering. The methodology is based on a multi-stakeholder consultative process with the following consecutive steps: (1) ‘Sheep Innovation System definition’ in which the system boundaries (geographical area, species, innovation types) are defined and stakeholders are identified; (2) ‘Stakeholder and social network analysis’ which involves an analysis of stakeholder functions and areas of interest, and an indicator-based social network analysis; (3) ‘Assessment of AIS function performance’ which consists of a stakeholder consultative assessment of functions and identification of key enablers and disablers of the innovation system performance. Finally, we show how the methodology can be implemented in practice using the case of the sheep sector in Spain. The Spanish analysis highlighted the lack of a common vision across the sector stakeholders and the central role of breed associations in improving sector linkage and information flow among AIS stakeholders.

How an on-farm experimentation may improve attitudes and practices of dairy farmers
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Vaccination of dairy herds is often too late to be fully efficient. This paper reviews the impact of a full-scale experimentation of dairy cattle vaccination in French farms on farmers’ attitude and their practices regarding calves health. Before the experimentation (2017), one-on-one conversations were carried out with 36 farmers involved in the experimental design; 29 of them were interviewed at the end of the experiment (2018). Before the experimentation, farmers had a positive attitude towards vaccination. They associated it to prevention (77% of answers) to limit health issues (64%), to decrease time spent for sick animals (44%) or to save on treatments (11%). Though, vaccination of cows was mainly implemented when several calves already suffered from diarrhoea, and should then be qualified as a curative approach. Hence, cow vaccination was never cited as a mean to improve the quality of calves. The experimentation had a positive effect on the attitude of farmers towards the colostrum. 75% of them now consider that the colostrum is involved into the cow-calf immunity transfer. They now give more importance to the timing between the calving and the distribution of colostrum (72% of answers) and to the quantity taken by the calf (65%). They still consider as less important the quality of colostrum (50%), mainly because of the lack of references and/or practical solutions when quality is low. As a consequence, 41% farmers indicated that, after the experimentation, they changed their way to distribute the colostrum to better control the quantity which is really taken by the calf. A lower impact was observed on farmers’ attitude towards the vaccination of cows. Although 58% of farmers showed interest in the experimentation and 41% could observe positive impacts on calf health, only 44% of them declared that they would put it in practice, and only during winter as a risky period (curative measure). Growth of calves was not considered by farmers as a motivation to implement cow vaccination although we could measure positive effects, mainly because growth is rarely monitored by dairy farmers.
Session 73. Innovative farm systems to meet societal demand

Date: Friday 4 December 2020; 13.45 – 17.30
Chair: Siqueira

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Developing cross-boundaries based innovations to design diversified and integrated livestock systems
M.A. Magne, M. Duru and B. Dedieu

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Rapeseed-oil as ω3-rich natural sources for livestock feeding to obtain differentiated meat products
N. Mandaluniz, I. Olazaran, J. Arranz, E. Ugarte and R. Ruiz

Sustainability of extensive livestock production systems: the challenge of PA technologies
J. Serrano, S. Shahidian, E. Carreira, J. Marques Da Silva, A. Pereira and M. Carvalho

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Planning farm efficiency at territorial scale to improve environmental performance of dairy sheep
A.S. Atzori and A. Cannas

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Can collective brands push dairy farms to adopt innovative practices?
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Green Finance: a tool for assessing the environmental impacts of investments in livestock farming
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Horizontal arrangements, technologies and productive capacity of Brazilian dairy farmers

Comparison of organic and traditional lamb production systems by meta-analysis
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Life cycle assessment of the Iberian pig systems in the Spanish dehesa
C. Reyes-Palomo, E. Aguiera, M. Llorente, C. Diaz-Gaona, G. Moreno and V. Rodriguez-Estévez

A study of growth performance of Bordaleira de Entre Douro e Minho lambs breed
R. Catani, J. Cerqueira, J.P. Araújo and V.A.P. Cadavez
Book of Abstracts of the 71st Annual Meeting of the European Federation of Animal Science

Virtual Meeting
1-4 December 2020
Book of Abstracts of the 71st Annual Meeting of the European Federation of Animal Science

Virtual Meeting, 1st–4th December, 2020

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OASES
Online Academic Submission and Evaluation System
What is an innovation?

“The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations which can be new to the firm, new to the market and new to the world” (OECD)

• Depends on the system/situation analyzed
• Innovation refer to:
  • Products and equipment
  • Structure and organization
  • Method and ideas for practice changes
The Agricultural Innovation System

“A network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance” (The World Bank, 2006)

Goes beyond the creation of knowledge to…

… the factors affecting demand for and use of knowledge
AIS research approaches

1. Benchmark analysis
2. Social network analysis
3. Functions of innovation system approach
   a) guidance of the search: identification of problems, potential and direction of change
   b) knowledge development: research or learning by doing
   c) field experimentation,
   d) knowledge diffusion/transfer,
   e) resources mobilization; monetary and non monetary
   g) innovation brokering: networking, trust building
The Spanish Sheep Innovation System
1. System definition

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## 2. Stakeholder analysis

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2. Social Network analysis

- Indicator: n of common innovation project or activities

3. Functions performance: Guidance

- There is **not a clear common innovation strategy** at national level
- **Many forums** about priorities. **Do not materialize.**
- **Disconnection and segmentation** across stakeholder and regions…
  … and even among regional research institutions
- Farming stakeholder perceive a **lack of communication** between the agents that are supposed to guide the innovation
- Private sector respond to short term demand that can be monetarized
3. Functions performance: Knowledge development

- Well-developed human capital both at public and private sectors
- Public sector focus on highly vulnerable systems and aspects related to sustainability…
  … not always tackle farmer needs
- Private sector focus on innovations with market value…

3. Functions performance: Transfer and communication

- There is not an organized and structured extension strategy
- Many stakeholder involved, however farmers perceive…
  … that transfer in deficient, scarce and dispersed
- Digital revolution key to avoid isolation of many stakeholders
- New models such as Cooperative groups enhance communication between value chain actors
- Cooperatives and breeds associations are key
3. Functions performance: Funding

- Despite getting a larger share than other sectors…
  …stakeholders perceive a lack of funding
- Funding is too much focused on knowledge development…
  …and too little in implementation of innovations
- Bureaucracy for funding leave out individual farmers and small scale cooperatives and associations
- Limited private funding due to low economic return related to low farm profitability

Conclusions

- Innovations are rarely analyzed with a systemic approach
- The proposed methodology generates a comprehensive view that goes beyond…
  … the creation of knowledge and the adoption of technology
- Based on structured interviews easily applicable
- Rely on a solid selection of representative stakeholders
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THANK YOU!