iSAGE
Innovation for Sustainable Sheep and Goat Production in Europe

Future challenges and innovative solutions for the sheep and goat sector

Alexandros Theodoridis

Assistant Professor, Laboratory of Animal Production Economics,

Aristotle University of Thessaloniki, Greece

WP 4 Leader

Challenges and Innovative solutions

- **Innovation** and **best practices**
- **Sustainability** and **efficiency**
- **Sheep and goat sector** is lagging other livestock sectors in **innovation**
- Slow adoption of innovation is a **key** challenge that the sector faces for its **sustainability**

iSAGE

- iSAGE dedicated considerable efforts on finding **innovative solutions** to **common challenges** of the sheep and goat sector across Europe

- This iSAGE initiative to identify innovations has been the **key issue** towards creating new knowledge, methods and/or techniques

iSAGE Objectives

- Design and **test innovations**
- Understand the **impact** of these innovative practices

  on farm level

  → **Sustainability** of the S & G farming
- **Drivers** and **constraints**
- **Strategies** for efficient implementation

Livestock farming **Innovation**?

- It is not just about technology, but…

*"The implementation of a **new** or significantly **improved product**, 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 world, new to a country, new to a farming system**"* (OECD)

- Innovations are **context dependent**

How?

- Prioritize future challenges
- Reveal best observed practices on farms
- Identify and test innovations to case study farms

Current and future challenges

- **Participatory multi-stakeholder approach**

- The idea was to **quantify the importance of current and future challenges** of sheep and goat industry in Europe

- Identify the **key stakeholders** that need to take **actions** to address these challenges

Current and future challenges

List of 30 challenges assessed (relevance, easiness, stakeholders)

TECHNICAL / SOCIAL

- Lack professionalization
- Slow adoption technology
- Poor Business management training
- Low Competitiveness
- Un-attractive for young farmers
- Fragmented sector / lack of integration /cooperation
- Female involvement
- Societal awareness of farmers role
- Researchers do not address relevant issues
- Parasites resistance

ENVIROMENTAL

- Climate change threats
- Low adaptation of high productive breeds to new environments
- Future environmental policy may limit intensification
- Conflicts with wildlife
- Land access
- Lack integration agriculture with livestock
- Breeding programs for local breeds

MARKET

- Volatility of commodity prices Uncertainty meat/milk prices
- Low consumers demand
- Low farm incomes
- No education on consuming local products
- Unfair trade/lack traceability
- Market control by few companies
- Low farm income, access to capital
- Lack society knowledge on sheep/goat farming

POLICY / FINANCIAL

- Dependency on CAP and other subsidies
- Future changes in CAP system
- Recognition and valuation of public services of livestock farming
- EU policy/measures launched with no scientific evidence

Current and future challenges

10 most important challenges

Challenge	Type of challenge	Stakeholder to address the challenge
Low consumer education about products	External threat	Government, cooperatives
Low promotion of local breeds	Internal weakness	farmers, cooperatives, academia
Low consumer knowledge in products	External threat	Government, cooperatives
Poor business management training	Internal weakness	Government, farmers, cooperatives
Researchers not addressing real problems	External threat	Academia
Unfair trade, lack of traceability	External threat	Government, cooperatives
Low professionalization	Internal weakness	Government, farmers, cooperatives
Slow adoption of innovations	Internal weakness	Government, farmers, cooperatives
Low adaptability of high producing breeds	Internal weakness	Academia
Poor recognition of public services	External threat	Government

Message

- Most of the challenges are **common** across species, type of product and intensification level
- The **geographical region** (Southern vs Central Europe) is one of the **main drivers** that determine the relevance of these challenges
- The **priority** should be focused on **education** at different levels (farmers, consumers, researchers and society)
- Government, farmers, association of producers and academia are expected to **work together** to help facing sector challenges
- EU should re-think about the **research priorities** in the small ruminant sector

Message

- The future of the sheep and goat sector lies on the adoption **of best practices, new technologies and innovations**

- Improve its **resilience and sustainability** and mitigate **dependence on public support**

Innovation case studies in iSAGE

Multiple innovation case studies that cover a range of key aspects affecting the performance of the sector, such as

- Breeding and genetics
- Animal health and welfare
- IT and individual data recording
- Feeding and reproduction systems
- Products and marketing
- Training

were implemented and provided information to better address the identified challenges in the sector

Impact

- On the **sustainability** of the sector through the promotion of **solutions** at farm and industry level

- On the **innovative capacity of the sector** as it provides farmers, industry and policy makers with best practice **guidelines** on how innovation should be implemented and under which conditions impact can be maximized

Under which conditions innovations are applicable?

- The adoption and successful implementation of innovations requires the application of **specific measures and strategies**

- Overall, the main challenge of the S & G sector in Europe is the **socioeconomic and structural constrains** that prevent farmers' acceptance and uptake of innovations at farm level

- Therefore, any **research/extension service program** or action aiming at overcoming these constrains will most likely have greater impact on innovation uptake than investing in the development of new innovations

Socio-economic constraints

- Farmer's **reluctance to modify** farming practices
- **Lack of innovation culture** across farmer communities
- Limited farmer **skills and knowledge** in some areas
- Low farmer **investment capacity**
- The **ageing** of farmer populations
- Rural areas **depopulation** trends

Structural constraints at farm level

- Strong and long-term farmer's **collaboration** is required
- Recording and analysis of **farm data** is a key component of such collaboration
- The role of farmers' institutions and collective structures is decisive in regulating and managing such collaboration

Structural constraints at sector level

- **Balanced relationships** between value chain actors are required

- A **strong vertical value chain** integration in inter-branch organizations will facilitate the adoption of innovative practices in products development and marketing

- Marketing innovations should focus on increasing **society's awareness** concerning the **multifunctionality** of the S & G farming systems

iSAGE innovation case studies

- Extensive and semi-extensive farming systems appear to face the socio-economic constraints more than intensive systems
- This **imbalance** is also present among countries and regions
- Therefore, **innovation strategies** should be adjusted to countries, regions and farming systems specific features

Main messages from iSAGE experience

Breeding and genetics innovations

- The latest advances in molecular genetics and DNA analysis have boosted the development of **new tools in breeding programs**, among others the inclusion of **genomic information** in the breeding programs or the management of major genes

- Need of developing **selection indexes** which will combine **productional and functional traits**

Feeding innovations

- Feed self-sufficiency is at the center of farmers' concerns due to the **high costs** of purchased feed and **volatility of prices** that jeopardizes farms' sustainability
- Need for investigating the **optimal feeding strategy**
- On-farm feed production increases **environmental efficiency**

IT technologies and individual recording innovations

- **IT technologies** will be **fundamental** in the professionalization of the sector in the future
- The main field of application of these technologies is the recording of **individual animal data**, the analysis of which will support the **decision-making** process by the farmer
- IT technologies require **modern, large size farms with skilled workers** and investments on machinery and buildings

Products and Marketing innovations

- **Lack of innovation** in S & G products and in marketing strategies
- New packaging and cuts, development of **quality labels** and **traceability systems** and new marketing campaigns to make society aware of the environmental and social services of S & G farming systems are **key strategies**
- **Link products with extensive systems** that provide ecosystem services and **non-market benefits**
- Enhance **sustainability practices** by the producers and **guarantee** its correct implementation, **building trust** between the members of the association and with local stakeholders and consumers

Training innovations

- Farmers' training is the **key** **to improve sector's sustainability** and working towards this direction is essential
- **Initiatives to promote farmers interaction** with animal husbandry experts/vets in order to build trusted relationships, increase knowledge and improve expertise
- **Participatory farmer-group** training programs seems to be a strategy with high potential to develop a more **knowledgeable and competent farming workforce**

Requirements:

- *National organization with regional branches to oversee implementation*
- *Strong network of farms, businesses, organizations and key individuals*
- *Reliable funding source and stable network of industry contacts*

Conclusions

Sheep and goat farmers are continuously facing challenges that require **adaptation and innovation** to keep farms competitive.

- Sheep and goat farming is **labour-intensive**, and it requires specific skills
- Low farm **revenues** with inadequate producer prices and the presence of **unfair trading practices** along the supply chain jeopardize the survival of the farms
- High **production cost** increases farmers' vulnerability to income shocks, challenging market conditions and in general to volatile economic conditions
- Sheep and goat farmers are older than farmers in other sectors, sometime **reluctant to make changes** and young people are not interested in the business

Conclusions

A transition has emerged in the sector

- In order these farms to be fully **integrated into the liberalized market** a shift to more intensive patterns is in progress
- To maintain sector competitive **more innovation and technology** is required
- **iSAGE identified new innovations and best practices** to understand what the barriers to adoption are and how farms' innovation capacity can be improved
- However, innovations cannot be based on the old top–down model, but on **partnership and co-development** with all the actors and trans-disciplinary approaches have to be implemented

Thank you

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Best practices and Innovations

*Reveal what **leaders** in the S & G industry do…*

- ✓ Identify **best-practicing** producers and **benchmark** the performance of the rest against the top performing
- ✓ Describe the **structure** and the **profile** of “best farms”
- ✓ Reveal the **best observed** management and production **practices**

Best practices and efficiency

- ✓ **Efficiency Analysis to identify best farms**
- ✓ **Feedback on the practices used by these efficient farms**

- French **extensive dairy** sheep farms (IDELE)
- Spanish **semi-intensive meat** sheep farms (OVIARAGON)
- French **intensive meat** sheep farms (IDELE)
- French **extensive meat** sheep farms (IDELE)
- UK **extensive meat** sheep farms (AHDB)

Efficiency analysis

- **Inefficiencies in the use of resources**

- **Potential for farms to increase their revenues if they adopt properly existing innovative technologies and best practices**

Efficiency analysis

Efficient farms

- rear **large flocks**,
- utilize **economies of scale**,
- depend on **home-grown feed**
- use **infrastructure** at full capacity,

  decreasing **fixed cost** per animal

Efficiency analysis

Efficient farms

- manage more rationally **human labor**,
- utilize **poor landscapes**,
- rear breeds lambing easily outdoors
- **sell** products **directly to consumers**

Which practices render these farms more efficient?

General Categories of Farm Practices	No of practices selected by the efficient farms
Feeding	134
Breeding	127
Gadgets and Applications	84
Product marketing	74
Reproduction	65
Information and training	62
Human resources organization	31
Health	22
Product processing	4

Which practices render these farms more efficient?

1. Electric identification systems
2. Certification / Branding of products
3. Use of elite flocks
4. System to choose best animals for replacement
5. Assisted reproduction techniques
6. Data collection / Data linked to animal ID for Decision Making
7. Increased forage / pasture quality
8. Access to abattoir feedback on carcass quality and health
9. Innovative grazing practices
10. Staff training courses / Software management programs

Innovation case studies

- ✓ 31 case studies
- ✓ Selection depended on:
  - Resources available
  - Organizational constraints
  - Main interest and expertise
  - Challenges considered critical for each case

Summary of case studies

8 "BROAD" innovation types	No of case studies
Breeding and genetics	6
Feeding	3
IT & individual recording technologies	6
Environment	4
Products and marketing	3
Reproduction	4
Training	2
Other	3
Total	**31**

Type	Innovation case study	Country
Breeding&genetics	1) Evaluation of reproductive performance of crossbreeds of Romanov and Turkish Native Breed	Turkey
	2) Potential, drivers and constraints of genomic selection in sheep and goat sector	Spain, France and Greece
	3) Analysis of farmers perception of the drivers and constrains for the uptake of a new selection index for ewe productivity	Finland
	4) Assessing parasitic resistance of UK local and newly introduced sheep breeds in organic/low input and conventional farms.	UnitedKingdom
	5) Assessment of ROA GENE effect on Rasa Aragonesa breed productivity	Spain
	6) A new longevity breeding goal for Lleyn sheep	UnitedKingdom
Feeding	7) Better utilisation of farm forage– reduce reliance on imported concentrates and forages on the farm	France
	8) Assessment of feeding alternatives in sheep and goat farms in Turkey	Turkey
	9) Grazing in arable rotations	UnitedKingdom
IT technologies and individual recording	10) Extension activities for individual recording	Greece
	11) Mobile flock managementof intensive sheep farm	Turkey
	12) Reproductive performance recording in intensive dairy goat farming	Turkey
	13) Assessment of Eskardillo: a platform based on individual data collection to improve decision making and management in dairy goat farms.	Spain
	14) Individual data collected from EID for several purposes	France
	15) Training and implementation of farm management application (AWIN)	Greece

Environment	16) Ecological knowledge transfer and sharing expertise from Transhumance	Turkey
	17) Carbon efficiency and footprint comparison for various farming systems	Turkey
	18) Small ruminant farmers' perception on climate change impact and assessment of adaptation innovations	Turkey
	19) Holistic Management and Farm Sustainability Assessment Tools	UnitedKingdom
Products and marketing	20) Participatory Guarantee System for Brogna sheep Association in Lessinia	Italy
	21) Functional food production from goat milk and lamb meat	Turkey
	22) Marketing innovations for transhumance dairy products	Greece
Reproduction	23) Testing of a new sheep and goat AI speculum	Spain, France and Greece
	24) Controlling reproduction in sheep and goats and developing easycare breeds	Turkey
	25) Testing assisted reproduction technologies in dairy goats and maternal sheep	Turkey
	26) Drivers and farmers perception on hormonal control uptake in extensive farms in Turkey	Turkey
Farmer training	27) AssesmentofAmbassador programme	UnitedKingdom
	28) Assessment of Flock Health Programme	UnitedKingdom
Others	29) Controlled weaning in organic goat rearing	Italy and Greece
	30) Managing Haemonchus burden in lambs using a copper oxide bolus	UnitedKingdom
	31) Portable milking machine in different farming systems	Turkey