

Innovation for Sustainable Sheep and Goat Production in Europe

# Future challenges and innovative solutions for the sheep and goat sector

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#### **Challenges and Innovative solutions**

- Innovation and best practices
- Sustainability and efficiency
- Sheep and goat sector is <u>lagging</u> 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

#### 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

#### **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

#### **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



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# Impact

- On the sustainability of the sector through the promotion of <u>solutions</u> at farm and industry level
- On the innovative capacity of the sector as it provides farmers, industry and policy makers with best practice <u>guidelines</u> 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 <u>socioeconomic and structural constrains</u> 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 <u>farm level</u>**

- 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 <u>sector level</u>**

- 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

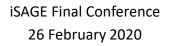




# **iSAGE innovation case studies**

- 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

#### <u>Requirements:</u>

- 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.

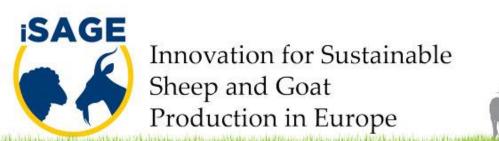
- Sheep and goat farming is **labour-intensive**, and it requires specific skills
- Low farm revenues with inadequate producer prices and the presence of unfair trading practices along the supply chain jeopardize the survival of the farms
- High production cost increases farmers' vulnerability to income 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



### **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



**iSAGE** Regional Meeting

12-14 January 2020



#### **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
GE Innovation for Sustainable ISAGE 16 May 2019	ARISTOT

Innovation for Sustainable Sheep and Goat Production in Europe iSAGE 16 May 2019 2<sup>nd</sup> Review of iSAGE



Туре	Innovation case study	Country
	1) Evaluation of reproductive performance of crossbreeds of Romanov and Turkish Native Breed	Turkey
S	2) Potential, drivers and constraints of genomic selection in sheep and goat sector	Spain, France and Greece
Breeding&genetics	3) Analysis of farmers perception of the drivers and constrains for the uptake of a new selection index for ewe productivity	Finland
ling&g	4) Assessing parasitic resistance of UK local and newly introduced sheep breeds in organic/low input and conventional farms.	UnitedKingdom
Breed	5) Assessment of ROA GENE effect on Rasa Aragonesa breed productivity	Spain
	6) A new longevity breeding goal for Lleyn sheep	UnitedKingdom
ng	7) Better utilisation of farm forage– reduce reliance on imported concentrates and forages on the farm	France
Feeding	8) Assessment of feeding alternatives in sheep and goat farms in Turkey	Turkey
Не	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	Spain
	improve decision making and management in dairy goat farms.	
IT and reco	14) Individual data collected from EID for several purposes	France
IT ar re	15) Training and implementation of farm management application (AWIN)	Greece

	16) Ecological knowledge transfer and sharing expertise from Transhumance	Turkey
Jent	17) Carbon efficiency and footprint comparison for various farming systems	Turkey
Environment	18) Small ruminant farmers' perception on climate change impact and assessment of adaptation innovations	Turkey
En	19) Holistic Management and Farm Sustainability Assessment Tools	UnitedKingdom
Products and marketin g	20) Participatory Guarantee System for Brogna sheep Association in Lessinia	Italy
	21) Functional food production from goat milk and lamb meat	Turkey
Prc anc ma	22) Marketing innovations for transhumance dairy products	
uo	23) Testing of a new sheep and goat AI speculum	Spain, France and Greece
ucti	24) Controlling reproduction in sheep and goats and developing easycare breeds	Turkey
libo'	25) Testing assisted reproduction technologies in dairy goats and maternal sheep	Turkey
Reproduction	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
Oť	31) Portable milking machine in different farming systems	Turkey