



# Sm@RT: Identifying sheep and goats farmers' technological needs and potential solutions

Morgan-Davies, C.; Depuille, L.; Gautier, J.M., McLaren, A., Keady, T.W.J., McClearn, B., Grøva, L.; Piirsalu, P.; Giovanetti, V.; Halachmi, I.; Bar-Shamai, A., Klein, R., Kenyon, F., Llach-Martinez, I.

[claire.morgan-davies@sruc.ac.uk](mailto:claire.morgan-davies@sruc.ac.uk)

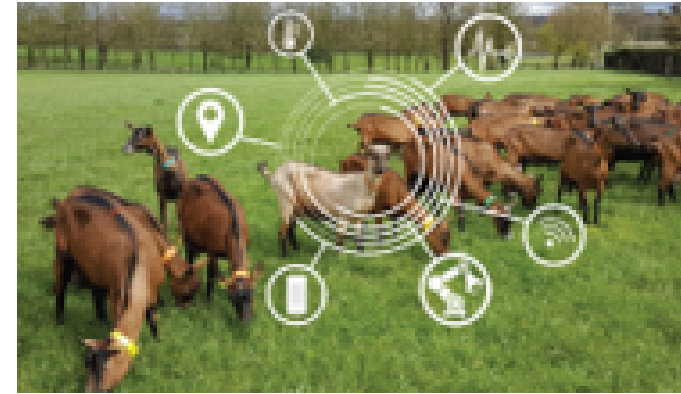


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 101000471

*Leading the way in Agriculture and Rural Research, Education and Consulting*

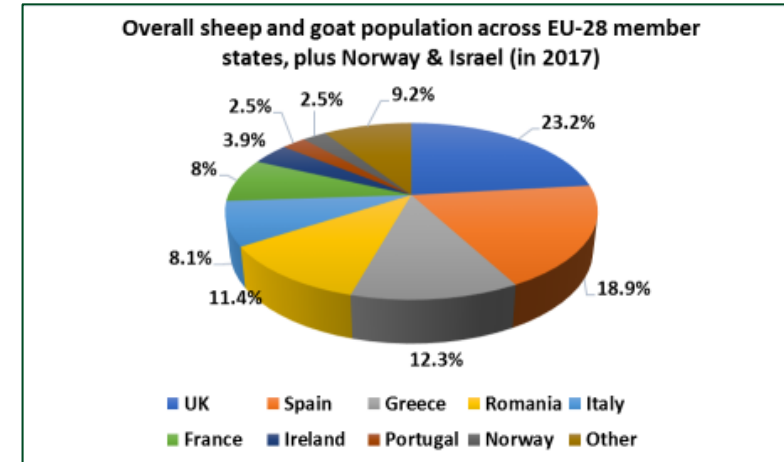
# Outline

1. Context
2. Project
3. Identifying needs
4. Proposing solutions
5. Conclusions



# 1. Context

- Sheep & Goats in Europe
- Challenging environment
- Varied production systems
- Important societal, environmental and cultural roles
- Labour issues
- Technology & innovation uptake is slow
- PLF & DT can provide production efficiency



## 2. Sm@RT – The project

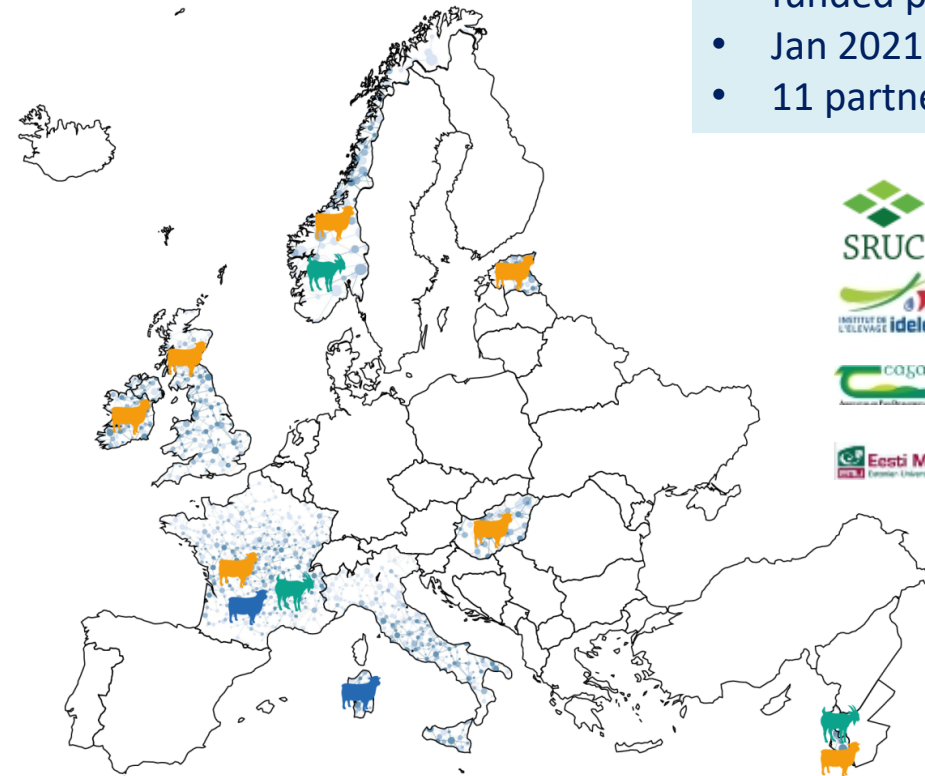


# Small Ruminant Technology – PLF and Digital technologies for small ruminants

### Objectives :

- To create a European **network** around the **use of PLF and digital technologies** in small ruminants
- To encourage **knowledge exchange**, new technologies **adoption** and **communication** between farmers and stakeholders of the small ruminant sectors

- EU Thematic Network funded project
- Jan 2021 to Sept 2024
- 11 partners, 8 countries



Carte réalisée avec Cartes & Données - © Articque



# Work thematic

PLF innovations and uses  
(farmers' needs)

Knowledge on technology use and  
data management

Multi-actor approach



3 levels of networking

## Digifarm

1 per country &  
production

- Experimental or demonstration farm with PLF/DT
- Perfect place for exchange, demonstration and knowledge transfer.

## Innovative farmers

3 per country and production type

- Commercial farms involved in the project, with some technologies, for peer-to-peer exchanges

Interested farmers



# The approach

## Step 1

- **1a:** Identification of farmers needs
- **1b:** Inventory of corresponding PLF/digital technologies

## Step 2

- Selection of PLF/digital technologies suitable to the different contexts and countries
- Identification of methods and channels for knowledge transfer

## Step 3

- Farmers and practitioners' barriers, testimonies and description of PLF/digital technologies adapted to local contexts

## Step 4

- Assessment of farmers acceptance of the different PLF and digital technologies from the sessions, visits, and farm demo on Innovative Farms and Digifarms.

## Step 5

- Definition of a European dissemination and uptake strategy for PLF and digital technologies in small ruminants systems



# 3. Identifying farmers' needs






- Series of workshops in 8 countries (Sept-Oct 2021)
- Common approach
- *What are your technological needs regarding:*
  1. Grazing/Feeding
  2. Health & welfare
  3. Reproduction
  4. Flock/herd management
  5. Fattening/Milking



### 3. Identifying farmers' needs



Topics			
Feeding/Grazing	<i>Forage quality</i>	<i>Fencing</i>	<i>Pasture monitoring</i>
Health/Welfare	<i>Early detection of health issues</i>	<i>Early detection of diseases</i>	<i>Early diagnosis of mastitis</i>
Reproduction	<i>Optimisation of AI</i>	<i>Animal selection</i>	<i>Early pregnancy diagnosis</i>
Flock/Herd management	<i>Batch management</i>	<i>Lack of support for using the tools</i>	<i>Group/batch formation</i>
Fattening/Milking	<i>Lack of references on milking tools</i>	<i>Lamb weighing</i>	<i>Milking machine maintenance</i>



# 4. Proposing solutions



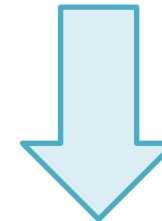
- All needs were collated from the 8 countries, by production type
- Needs were ranked by order of importance by farmers, for each of the 5 main themes



- *Grazing/feeding*
- *Health & Welfare*
- *Reproduction*
- *Flock management*
- *Fattening/Milking*

Proposed by all

> 50 solutions



Presented to stakeholders  
Voted on most relevant/favourite ones

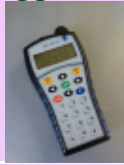


# Feeding/Grazing

<p>SmartFence/Virtual fence</p>	<p>EID weighcrate + autosorter</p>	<p>Grazing management app</p>	<p>Automated grass measurement</p>
<p>Pregnancy scanning</p>	<p>Ration/Feeding Software</p>	<p>Drone</p>	<p>Portable NIR</p>
<p>Milkmeter</p>	<p>Automatic feeder</p>	<p>Connected Fence</p>	<p>GPS collars</p>
<p>Postdried hay technology</p>	<p>HappyGrass</p>	<p>Drone with thermal camera</p>	<p>GPS collars with behaviour</p>

# Health/Welfare/Reproduction

EID hand-held wand/data loggers



Data recording system/  
Flock recording app



EID weigh crate and autosorter



FEC software  
(FecPak G2)



Pregnancy scanning



Parentage test



Worming  
/vaccinating  
gun



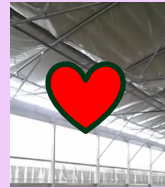
Sheep coneyor



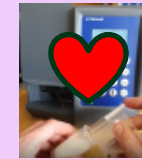
Happy Factor algorithm



Camera



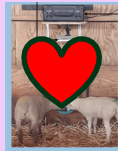
Somatic Cell  
counter



Weather/  
environmental station



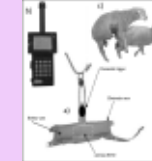
Water meter



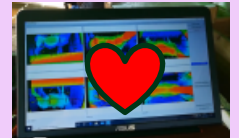
Automatic feeder



Alpha detector



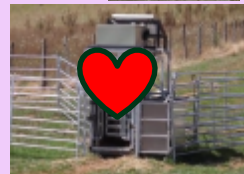
3D imaging



Ultra High  
Frequency



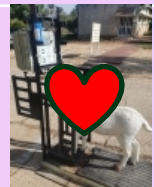
Walk Over Weigh



Environmental  
enrichment



EID-enabled  
water trough



GPS & proximity  
ear-tags



Guard dog &  
high tensile fence



Milk feeders for  
kids/lambs



GPS collars & behaviour information



## Flock/Herd monitoring

EID hand-held wand



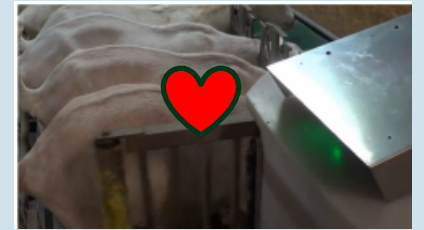
Worming/Vaccinating guns



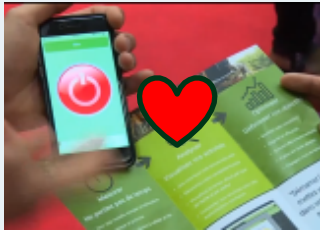
EID weigh crate and autosorter



Milking parlour with EID



Aptimiz



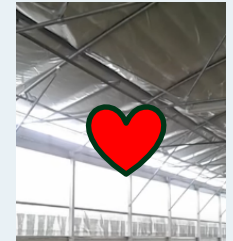
Environmental station + cooler



Automatic feeder



Camera



Milk meter



EID-enabled water trough



Data recording system







# Fattening/Milking

EID hand-held wand/data loggers



Walk Over Weigh





EID weigh crate and autosorter




FEC software



EID tags





Electronic weather station





Automated grass measures





Happy Factor algorithm






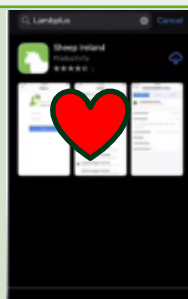
EID-enabled weighing trough





Flock recording app (SheepIreland)






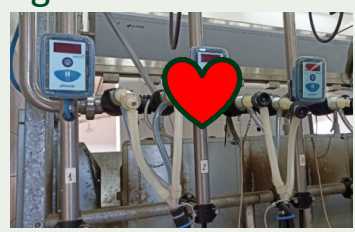
Milk tank weighing







Milk meter & milking management software





Somatic cell counter



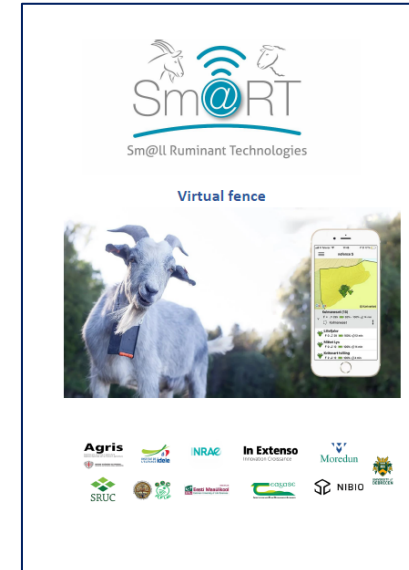




# 5. Conclusions



- Common needs between countries
- Many solutions already exist
- How to encourage farmers adopt the tools?
  - Series of guidelines on the preferred tools
  - Cost-benefits analysis on each tool
  - Videos/testimonies online
  - Training sessions & farm demo days



Sm@RT Digifarm testimony - UK -  
DNA tissue collection



Sm@rt Innovative farmer Tomas  
O'Toole (Ireland)

*demystify the use of technologies*

# Acknowledgments

**Agris**

Agència per la recerca en agricultura  
Agencia regional per a la recerca en agricultura



**INRAE**

**In Extenso**

Innovation Croissance

**Moredun**



UNIVERSITY OF  
DEBRECEN



**Eesti Maaülikool**  
Estonian University of Life Sciences



**NIBIO**



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 101000471



@H2020Smart



H2020-smart



h2020smart



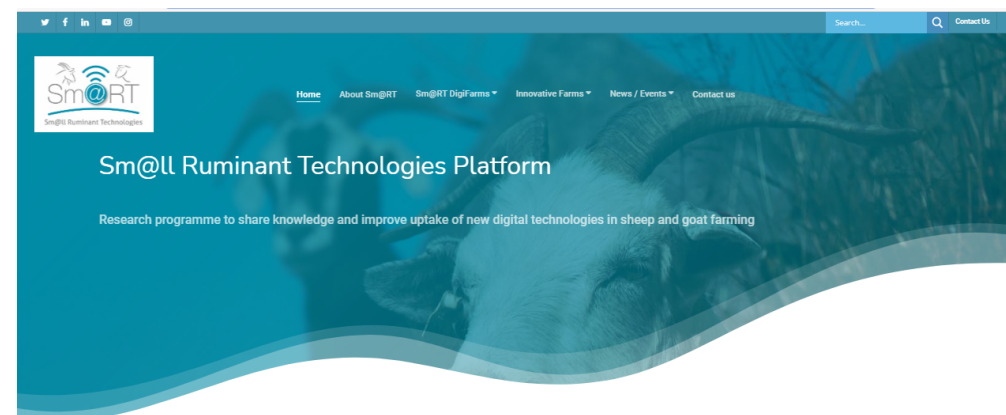
H2020-Sm@RT



H2020SmaRT



## www.smartplatform.network



The EU-funded Sm@RT (Sm@ll Ruminant Technologies) project brings together a network of researchers, farmers & advisors from across Europe who will improve awareness amongst those working in the farming industry of newly available PLF tools, demonstrating their potential and possible return of investment.

