TechCare – Integrating innovative TECHnology along the value Chain to improve small ruminant welfARE

Morgan-Davies, C*., Gautier, J.M., Halachmi, I., González-García, E., Grøva, L., Molle, G., Kenyon, F., Dwyer, C., Caja, G., Rosati, A., Sossidou, E., Lagriffoul, G.

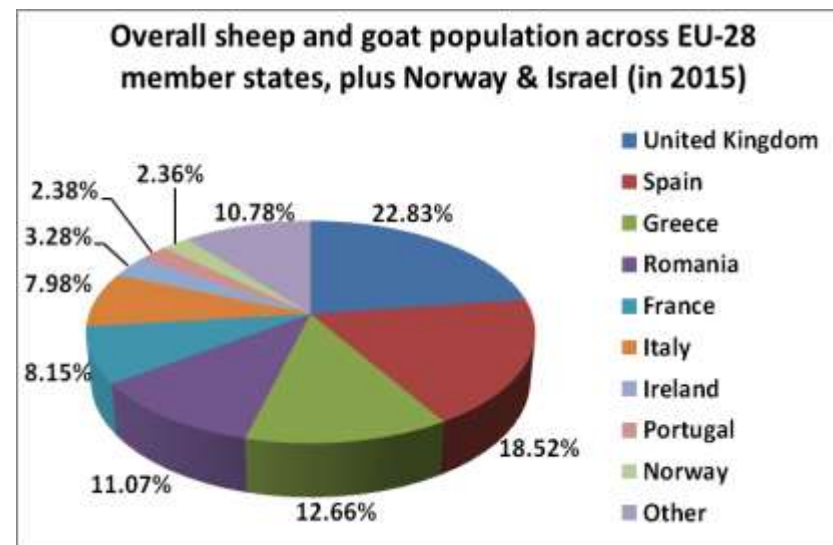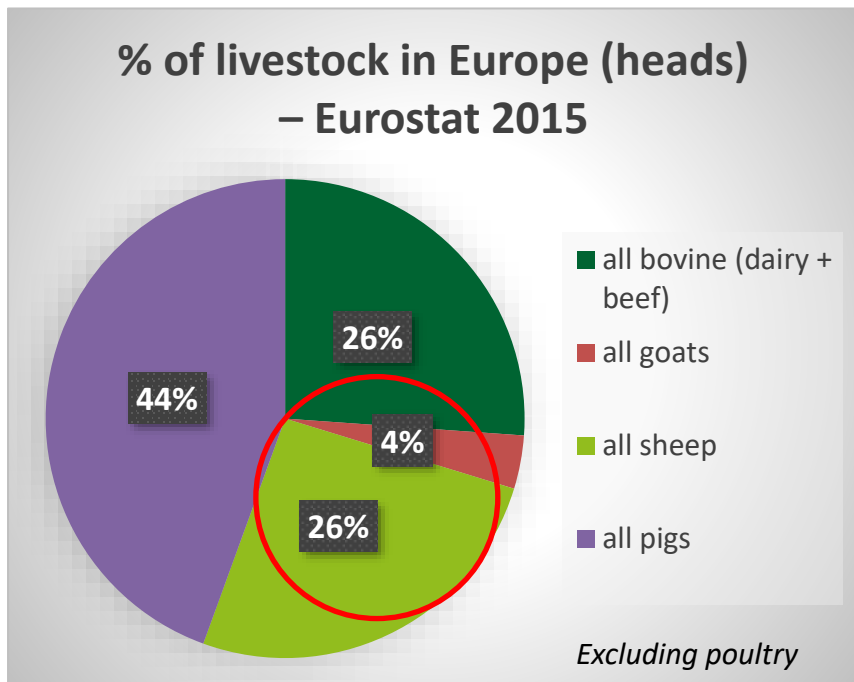* claire.morgan-davies@sruc.ac.uk

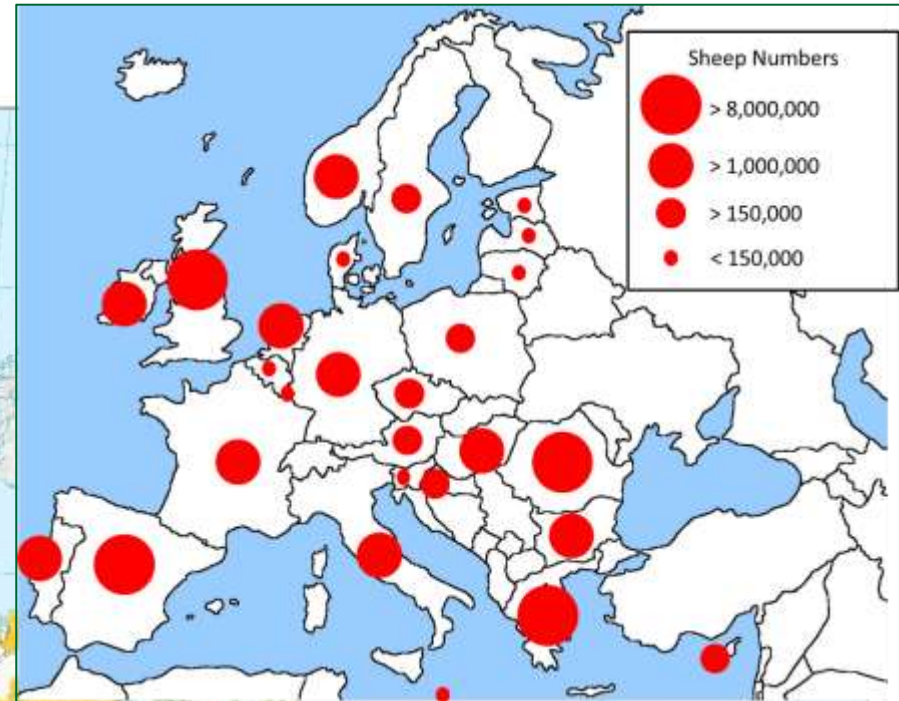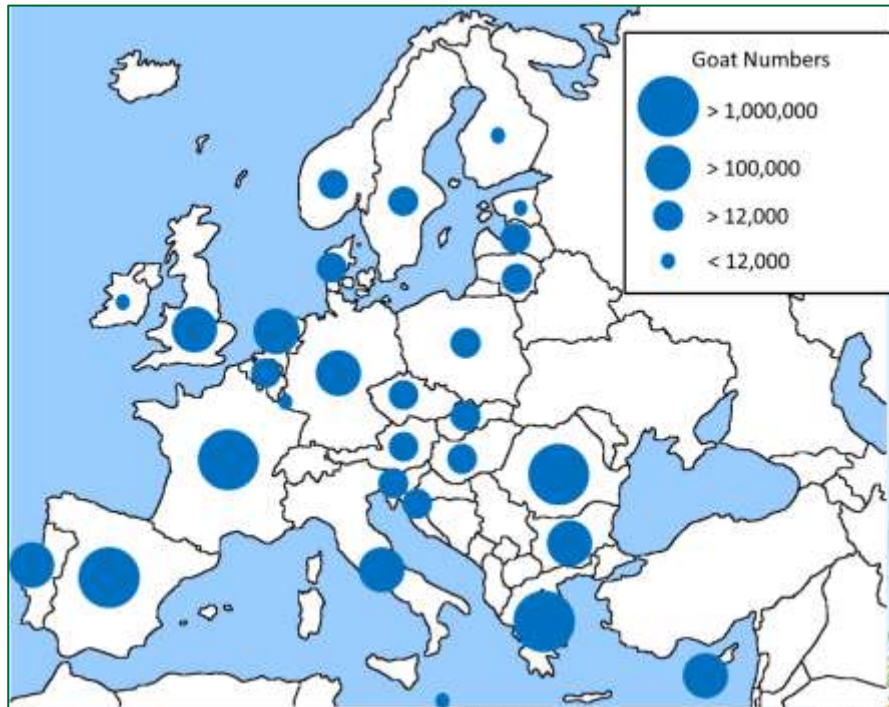*Leading the way in Agriculture and Rural Research, Education and Consulting*

Outline

1. Background
2. Project presentation
3. Consortium
4. Activities
5. The future?

Small Ruminant Systems

% of livestock in Europe (heads) – Eurostat 2015

- all bovine (dairy + beef)
- all goats
- all sheep
- all pigs

44%
26%
26%
4%

Excluding poultry

Overall sheep and goat population across EU-28 member states, plus Norway & Israel (in 2015)

- United Kingdom
- Spain
- Greece
- Romania
- France
- Italy
- Ireland
- Portugal
- Norway
- Other

22.83%
18.52%
12.66%
11.07%
8.15%
7.98%
3.28%
2.38%
2.36%
10.78%

In Europe – challenging areas

In Europe – Envtal importance

Estimated High Nature Value (HNV) farmland presence in Europe, 2012 update

- HNV farmland
- No data
- Outside coverage

Data sources:
Corine 2006, Natura 2000
IBAs: BirdLife International
PBAs: De Vlinderstichting (NL)

National biodiversity data
(UK, CZ, LT, SE, ES)

National HNV contributions
(HR, SR, CH)

Cartography: Umweltbundesamt

Methodology: EEA & JRC 2007
adapted by: ETC-SIA 2012

© EuroGeographics for
administrative boundaries

Type of production

- Dairy vs meat vs wool + multi-purpose

Type of production

- Dairy vs meat vs wool + multi-purpose
- Intensive / semi-intensive / extensive

In Europe – social importance

- Landscape, traditions, cultural
- Social/Cultural
  - Employment – 1.5 million (7%)
  - High-quality traditional products
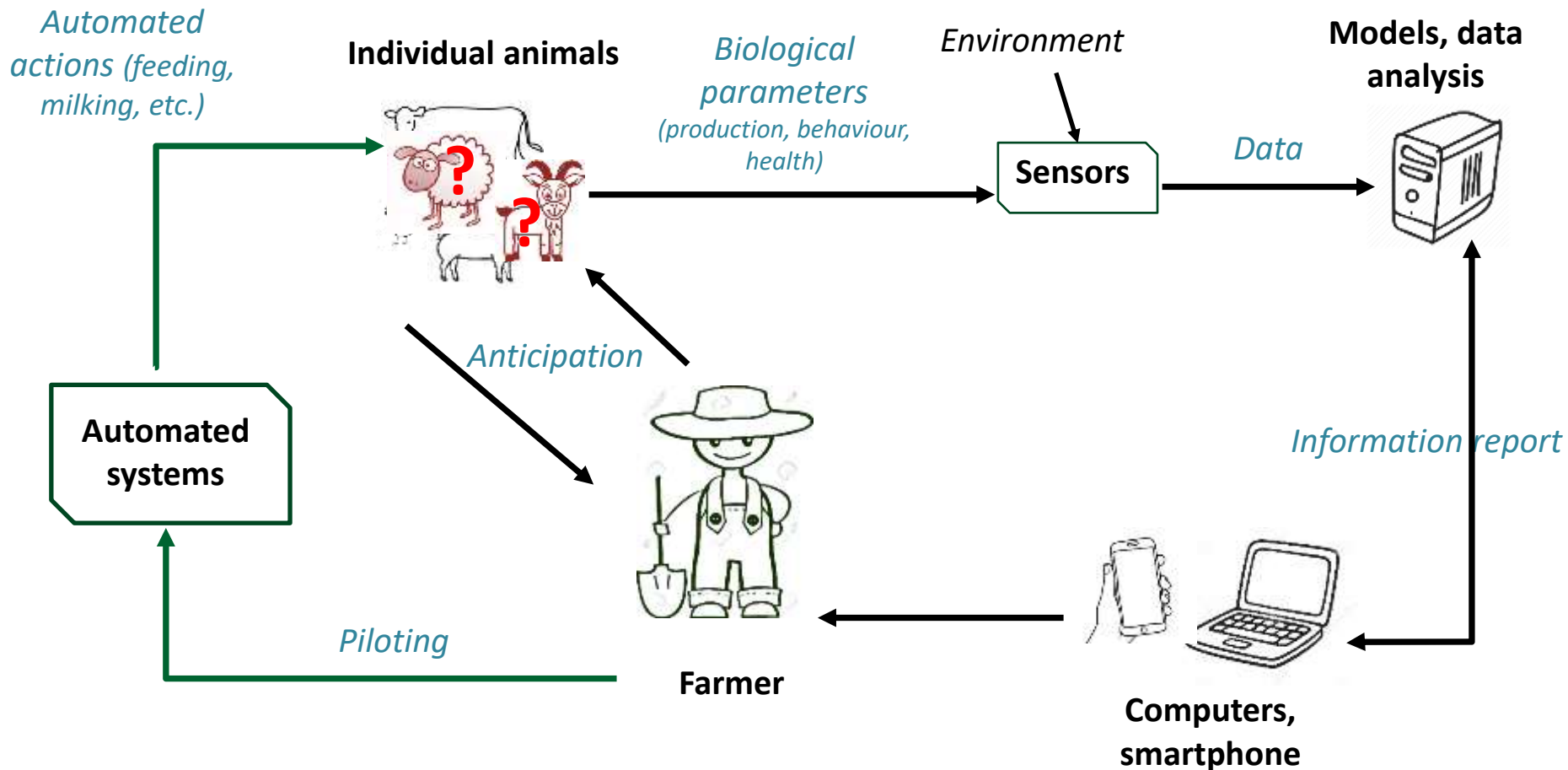- Public goods/ecosystem services

Challenges – esp. welfare

- Rangeland/remotely based
- Harsher environment/survival issues
- Lack of labour
- Lower productivity
- Welfare
  - Lack of supervision/observation
  - Lack of treatment
  - Variable feed supply/water supply
  - Predation
  - Long distance transport to abattoir/market
  - …

Precision Livestock Farming

Automated actions (feeding, milking, etc.)

Individual animals

Biological parameters (production, behaviour, health)

Environment

Models, data analysis

Sensors

Data

Automated systems

Anticipation

Information report

Piloting

Farmer

Computers, smartphone

*Adapted from Ingrand et al., 2018 (69th EAAP)*

PLF applications?

- Widely adopted in management of high-value animals and/or more industrialised farming systems
  - Pigs
  - Dairy cows
  - Beef cattle
  - Poultry

Milk production
Heat detection
Disease detection
Environmental quality
Etc.

11

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Milk production
Heat detection
Disease detection
Environmental quality
Etc.

BUT…. what about species where animals are considered to have a lower individual value or with less economic interest, or in extensive management systems?
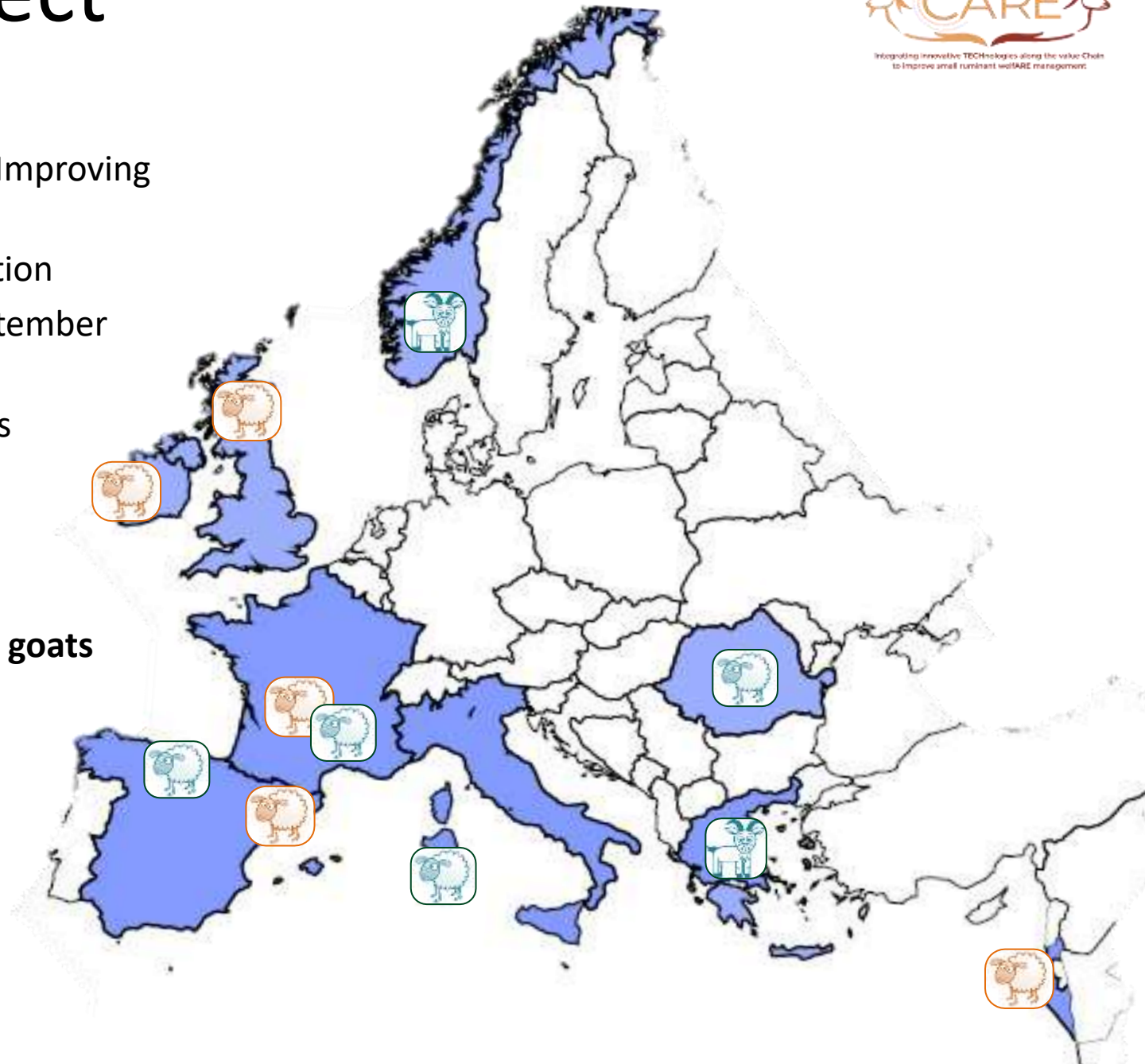
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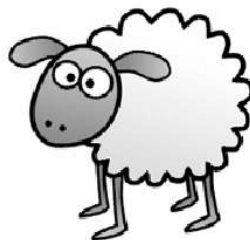
The project

- **Info:**
- H2020-SFS-2019-1, Improving animal welfare
- Type: Innovative Action
- Starting date: 1 September 2020
- Duration: 48 months

- Focus on **sheep and goats farming systems**
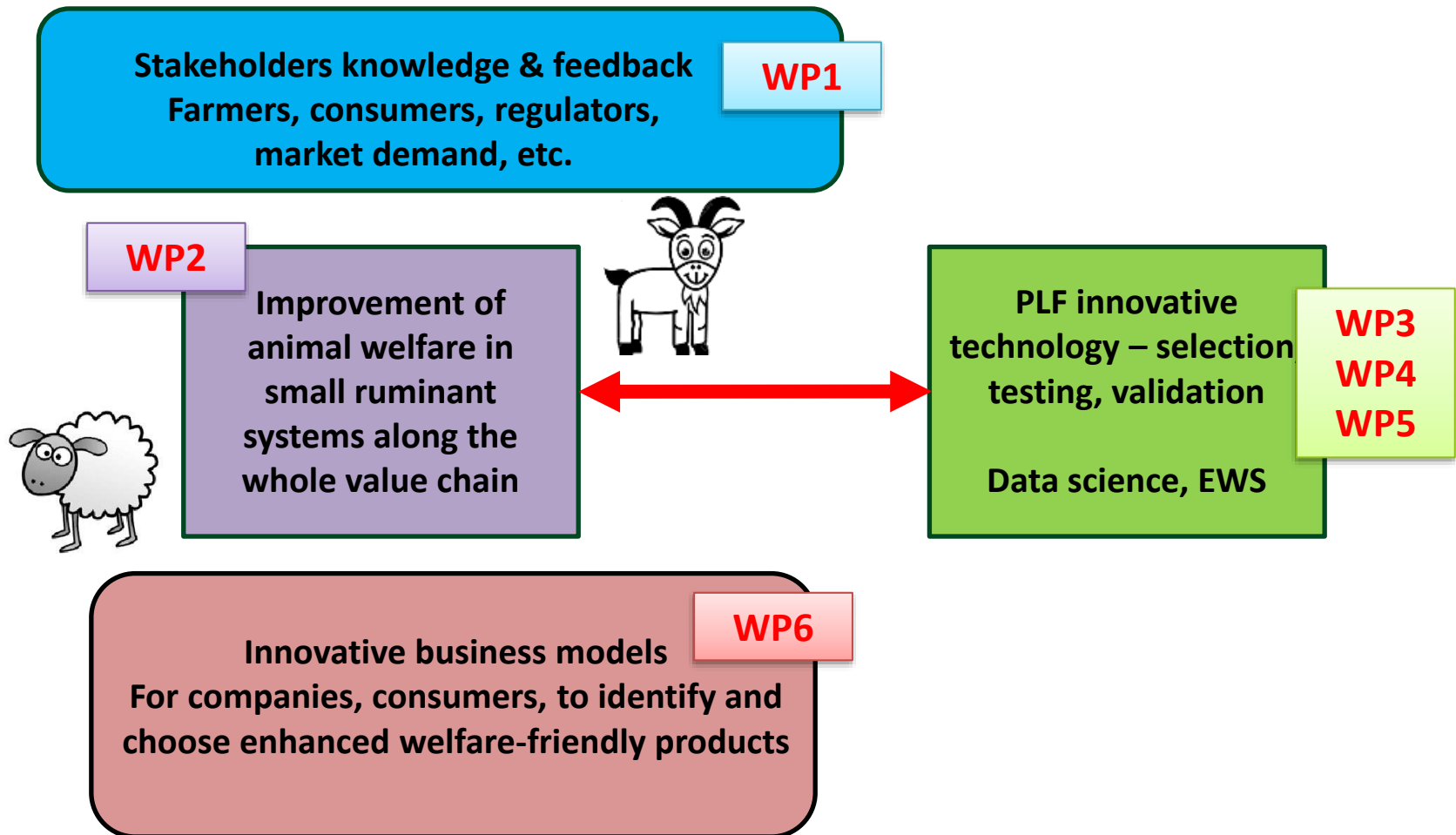
- **9 countries**
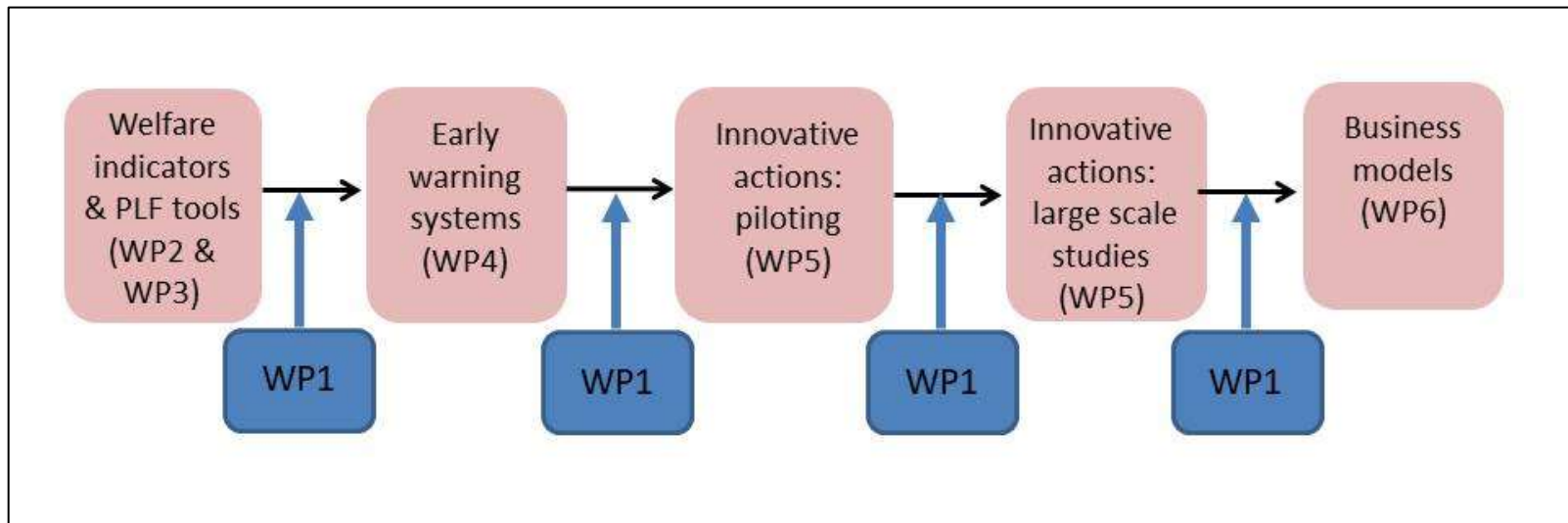- **19 partners**

Consortium

9 countries, 19 partners

1. **UK:** 3 partners: SRUC, MRI, *Breedr Ltd*
2. **France:** 5 partners: Idele, INRAe, *CNBL, Agdatahub, Page Up*
3. **Italy:** 3 partners: Agris, EAAP, *Abinsula*
4. **Spain:** 2 partners: UAB, *Oviaragon*
5. **Israel:** 2 partners: ARO, *Spark*
6. **Romania:** 1 partner: BUAS
7. **Ireland:** 1 partner: Teagasc
8. **Norway:** 1 partner: NIBIO
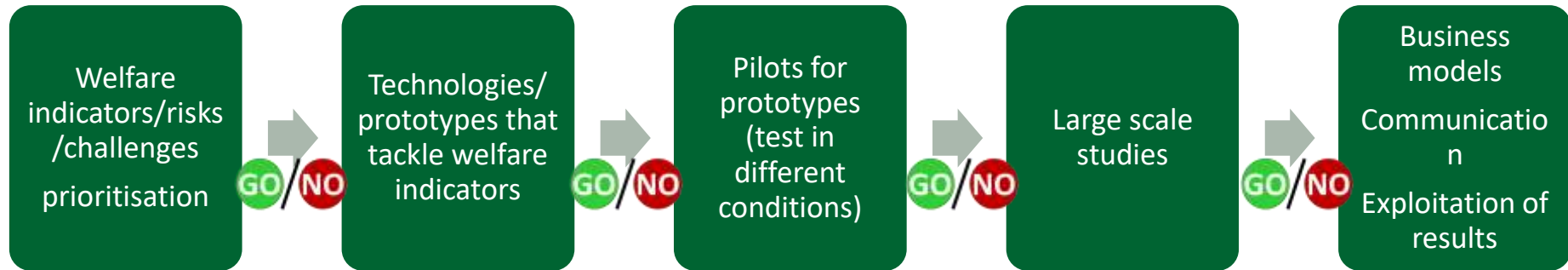9. **Greece:** 1 partner: HAO

The WPs

Stakeholders knowledge & feedback
Farmers, consumers, regulators, market demand, etc.

WP1

WP2

Improvement of animal welfare in small ruminant systems along the whole value chain

PLF innovative technology – selection, testing, validation

Data science, EWS

WP3
WP4
WP5

Innovative business models
For companies, consumers, to identify and choose enhanced welfare-friendly products

WP6

TechCare steps/activities (1)

TechCare steps (2)

Welfare indicators/risks /challenges prioritisation

→ GO/NO →

Technologies/ prototypes that tackle welfare indicators

→ GO/NO →

Pilots for prototypes (test in different conditions)

→ GO/NO →

Large scale studies

→ GO/NO →

Business models
Communication
Exploitation of results

GO/NO
- Stakeholders decision/validation

- Respect of TechCare criteria (*cheap, easy to widely disseminate in sheep/goat systems, reliable/ready for farmers' sector, ... to be defined*)

TechCare steps (3)
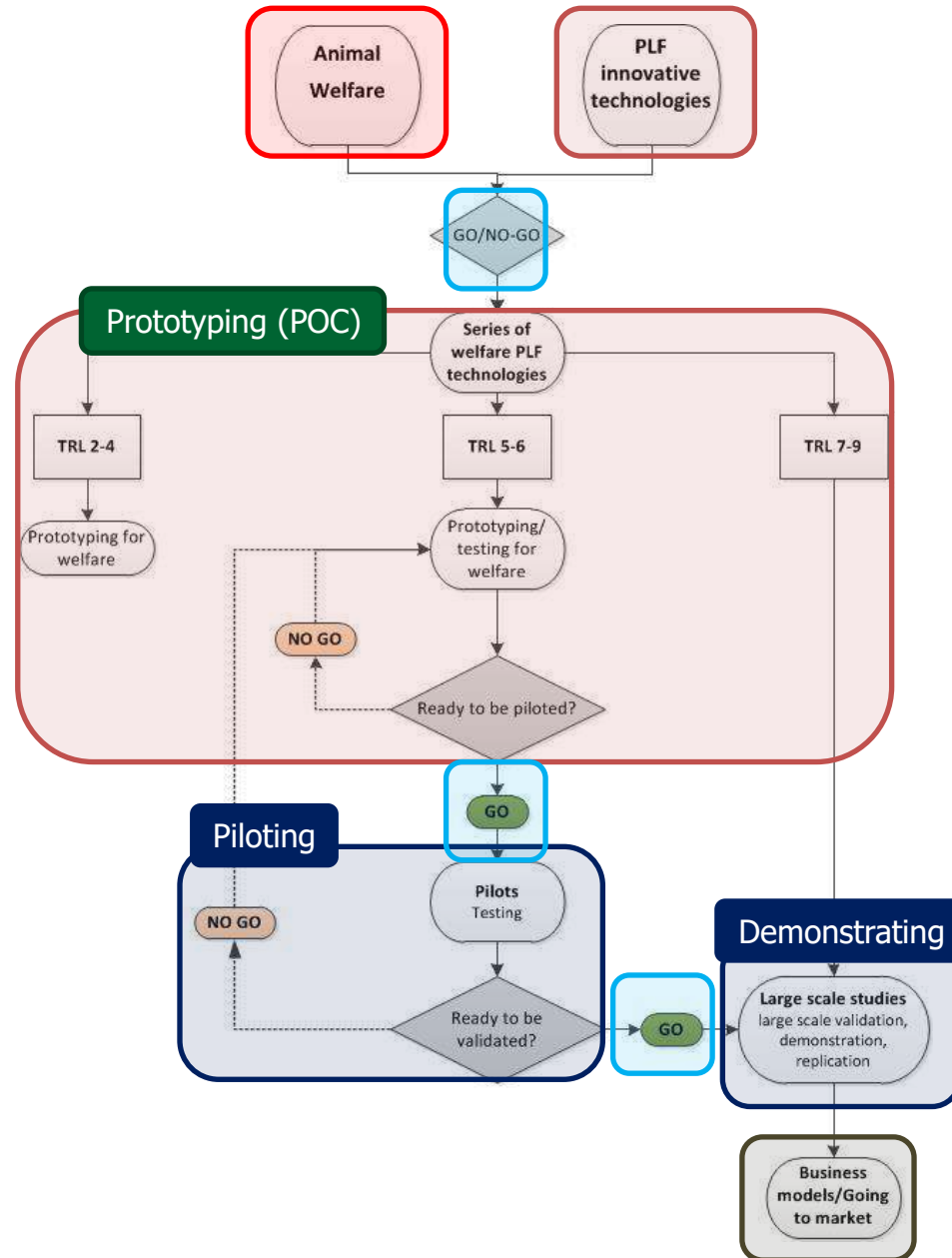
What is expected of a pilot?

Goals :
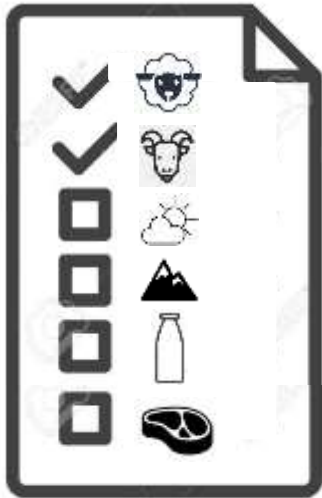
- Validate the robustness of the technology
  → Test in different environments:
  - Breeds/species
  - Climatic/environmental conditions
  - Topography
  - Production system

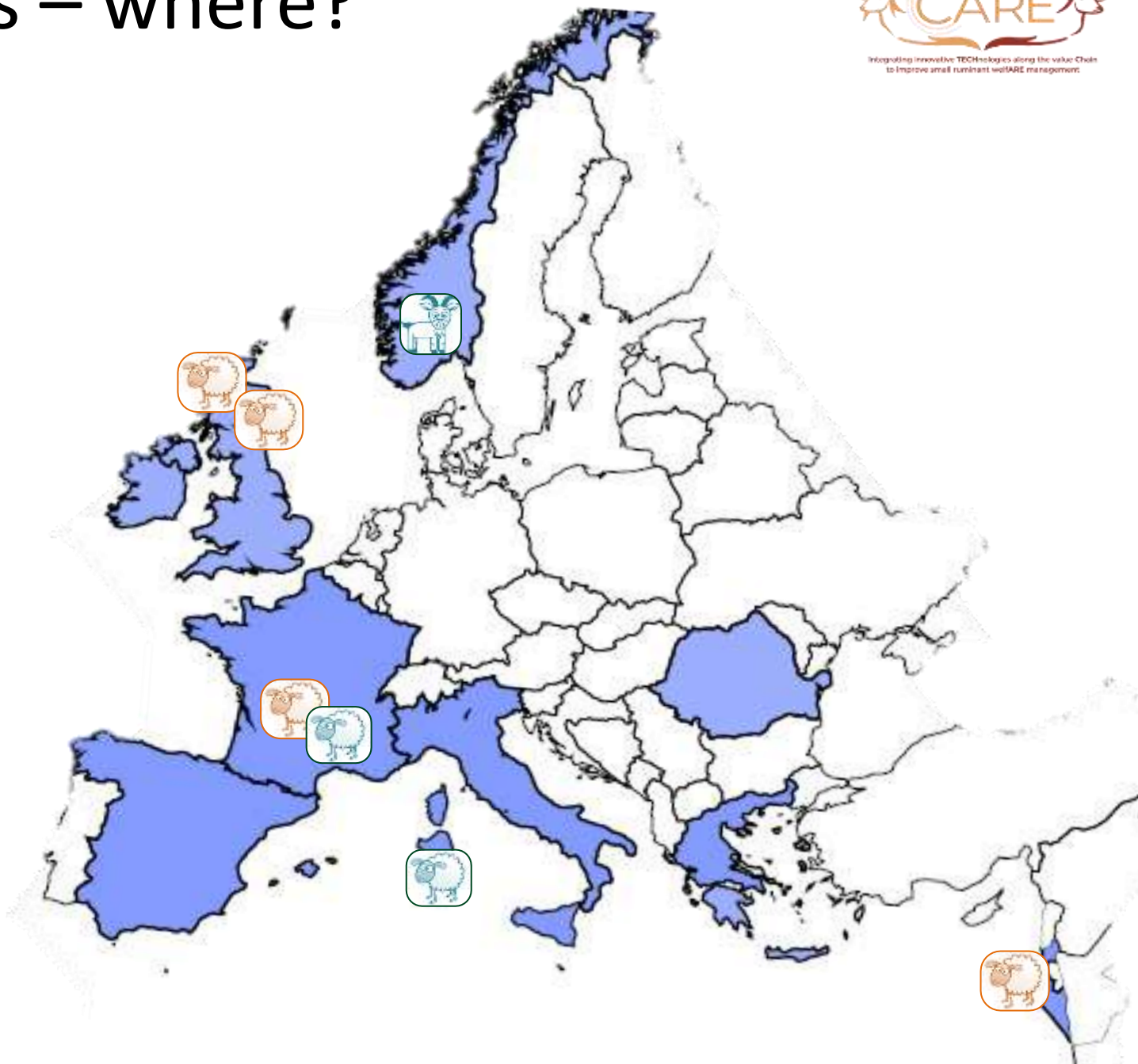- Fine-tune the application of the technologies to be used as an early warning system

Pilots – where?

7 Experimental farms

Transport

Abattoirs

# What is expected of a large scale test?

Goals :

- Validate the ease of use of the innovative technologies and indicators
- Define the limits/optimal conditions of use
- Collect communication materials (demonstration)

Focus on:

- Ease of use (by all actors),
- Workload and work organisation,
- Data flow, management and access by all actors,
- Link between animal welfare with other production parameters.
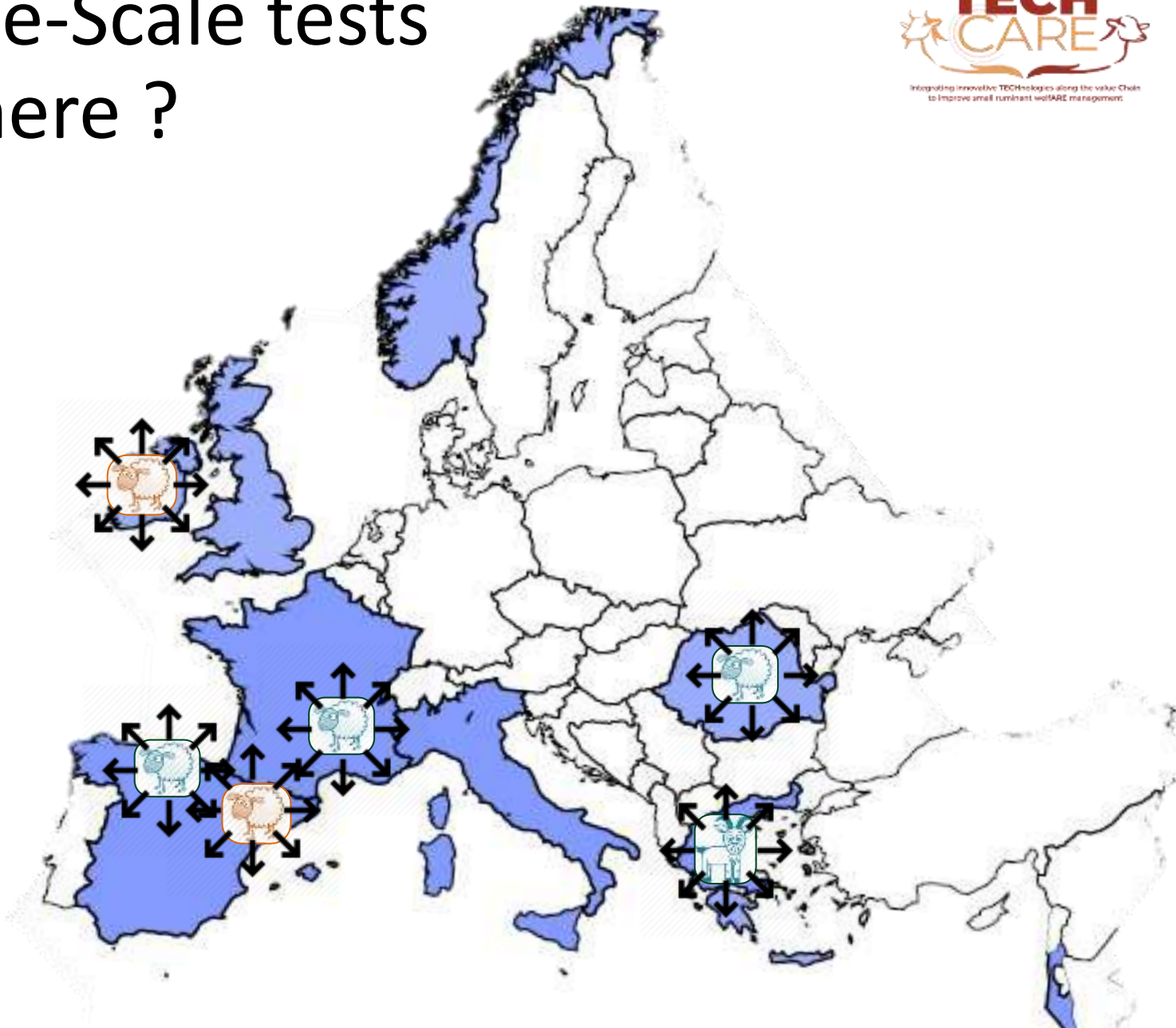- Determinate the cost/benefits
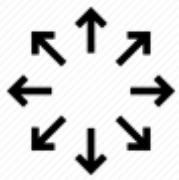
Large-Scale tests - where ?

6
demonstration
sites
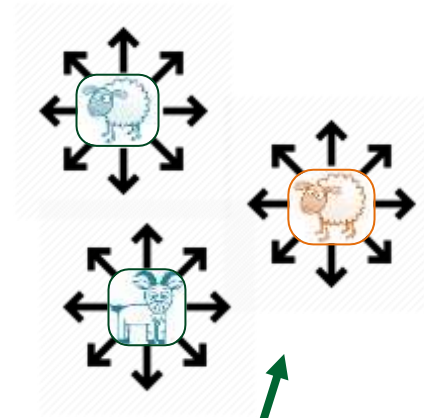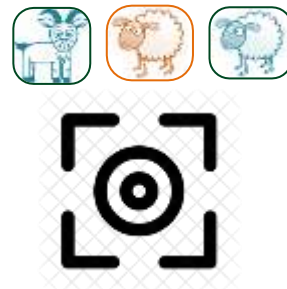100 to 120
farms

Transport

Abattoirs

Final product
Milk / Meat

Data & early warning systems

Welfare challenges/indicators

Inventory:
Data sources
Building blocks for data analysis

Development
Application (program code)
Verification of the EWS algorithms in semi-commercial & commercial sites

Application Programming Interface (API) for animal welfare issues identification and improvement of animal welfare management
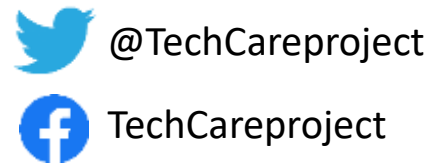
End products?

- EWS/technology/technology blueprints for farmers/value chain to manage welfare on small ruminant systems that are:
  - Acceptable to stakeholders
  - Affordable to farmers
  - Relevant

    'cheap and small'?

Acknowledgments

SRUC

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