SusSheP – Sustainable Sheep Production

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1ST SusAn COFUNDED Projects Seminar
23-24 November 2017, Bilboa (BC, ES)

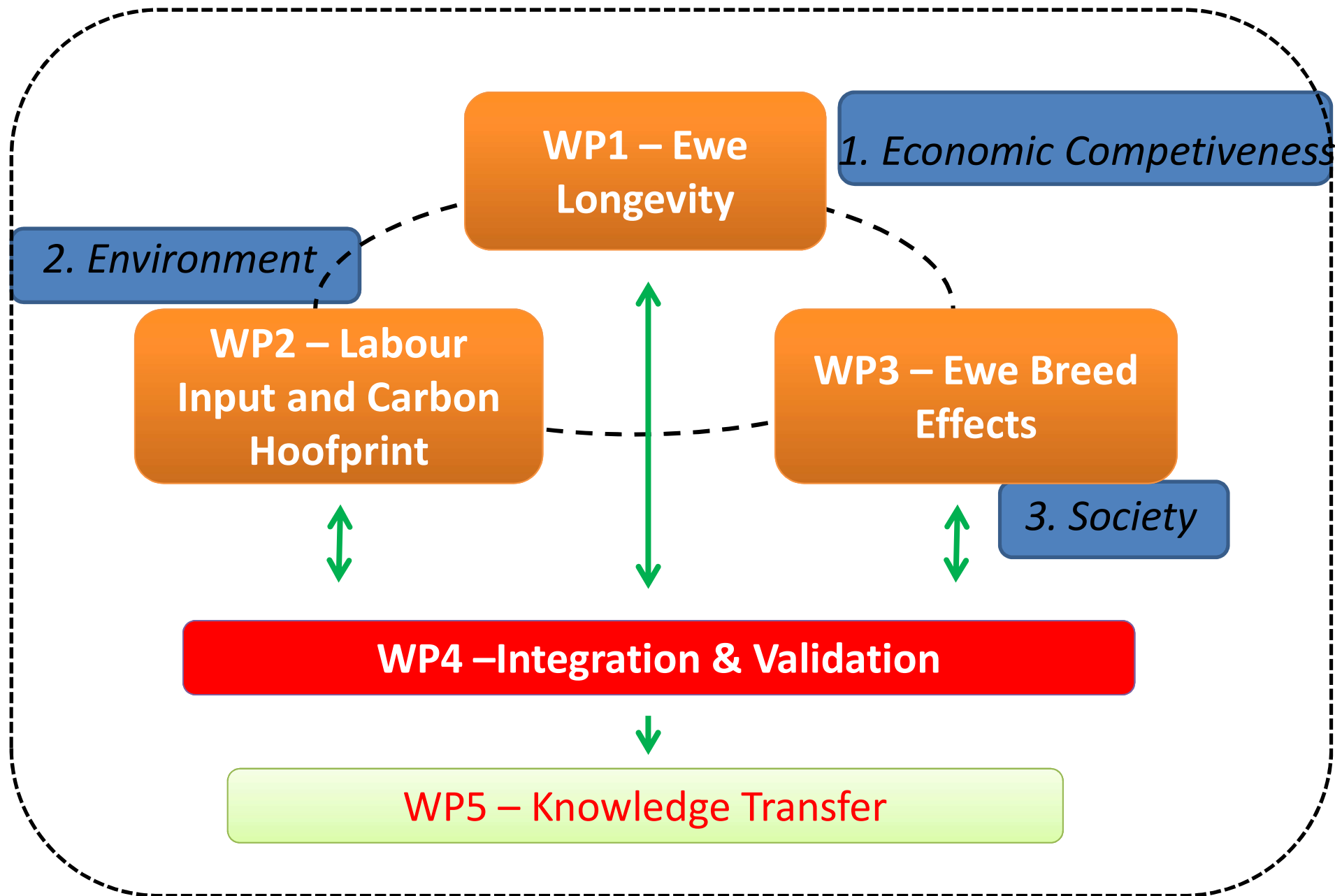**EUROPEAN RESEARCH AREA ON SUSTAINABLE ANIMAL PRODUCTION**

Challenge

1. Ewes have a relatively short productive life

2. Labour input & Environmental footprint

3. Limited artificial insemination

4. Low uptake of new technologies

Objectives of SusSheP

WP1 - Ewe Longevity

Help farmers **avoid** selecting breeding replacements with **poor life time expectancy**

1. Improve recording of health traits

2. Establish genetic factors which contribute to longer living ewes

3. Characterise important early life factors affecting longevity phenotypically

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WP2 - Carbon/Labour Efficiency

To characterise **labour input** and **carbon hoofprint** of different sheep production systems (SPSs)

- 18 focus flocks:
  - With/without precision livestock farming (4 UK, 2 Ireland)
  - Prolific/non-prolific breeds (4 Ireland, 2 Norway)
  - With/without high genetic gain (4 UK, 2 France)

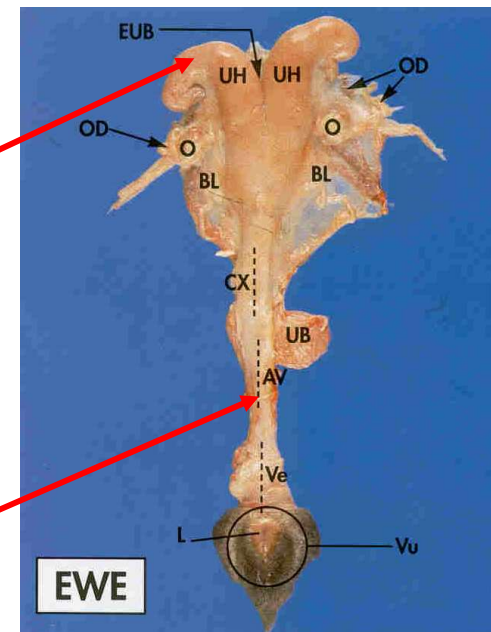SusSheP

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WP3 - Sheep AI; Ewe Breed Effects

Characterise the biology of the **cervix** and its secretions in **ewe breeds** know to differ in their fertility following cervical AI with frozen semen

Laparoscopic AI with frozen semen
>70% pregnancy rate

Cervical/Vaginal AI with frozen semen
<30% Pregnancy rate

Norway is the exception
Vaginal AI with frozen semen
>60% Pregnancy Rates

Ewe Breed Differences in Cervical Function

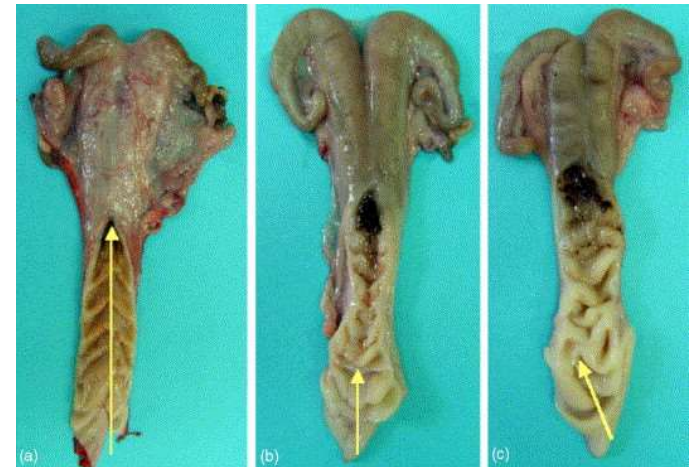|	High Fertility	Low Fertility
Ireland	Belclare	Suffolk
Norway	Norwegian White Sheep	Norwegian Fur Sheep
France	Romanov	Ile de France

- n = 30 ewes per breed
- Induced and Natural Oestrus
- Follicular & luteal phases
- X3 replicates

Mucus
- Volume/Viscosity
- Proteome/Glycome

Tissue
- Transcriptome

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WP4; Integration/Validation

1. **Ascertain farmers' views on alternative SPSs to improve productivity, efficiency and impacts on environment**

    - Precision livestock farming and prolific breeds
    - AI and maternal breeding indexes

2. **Integrate data from WP1-3 and complete a life cycle assessment of the differing SPSs**

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WP5; Knowledge Transfer

Disseminate as widely as possible

- Twitter/Facebook

- Webpage
  - https://www.sheep.ie/wp/?page_id=2387

- Farm Animal Breeders and Reproduction Technology Platform – FABRE-TP
  - http://www.fabretp.eu/susshep.html

- Workshops

- Technical newsletters

- Scientific literature

- Farming press/events etc
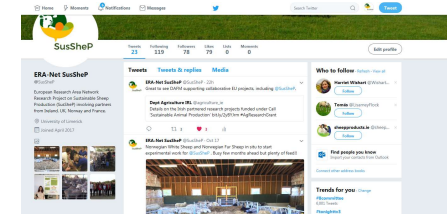
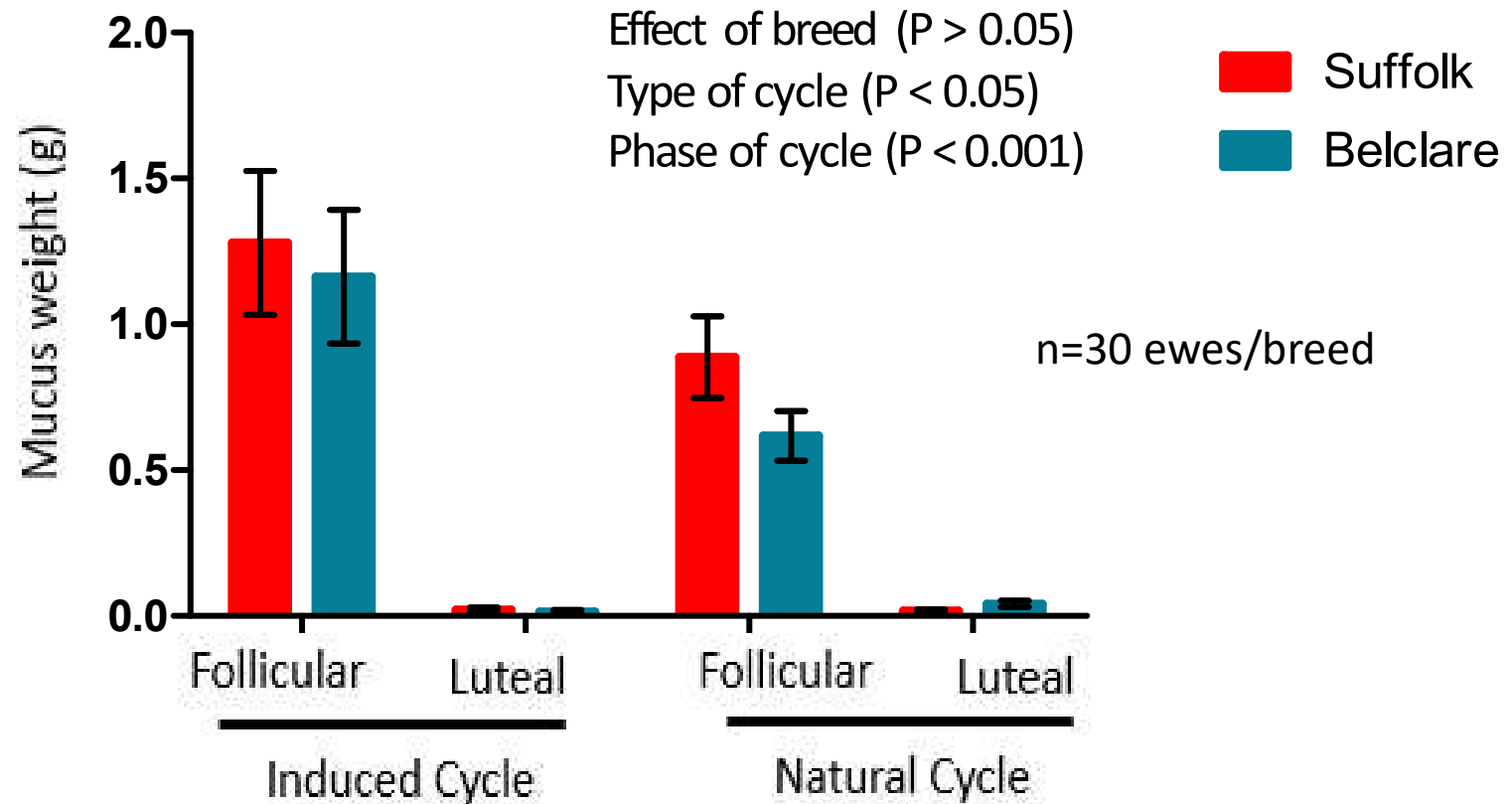# Consortium

Potential Impact

- Transnational collaboration

- Multi-disciplinary research
  - Linking researchers from different disciplines
    - Systems researchers
    - Geneticists
    - Biologists
    - Environmentalists

- Benefit beyond the lifetime of the project
  - Biobanking samples
  - National genetic evaluations

- Foundation for future projects
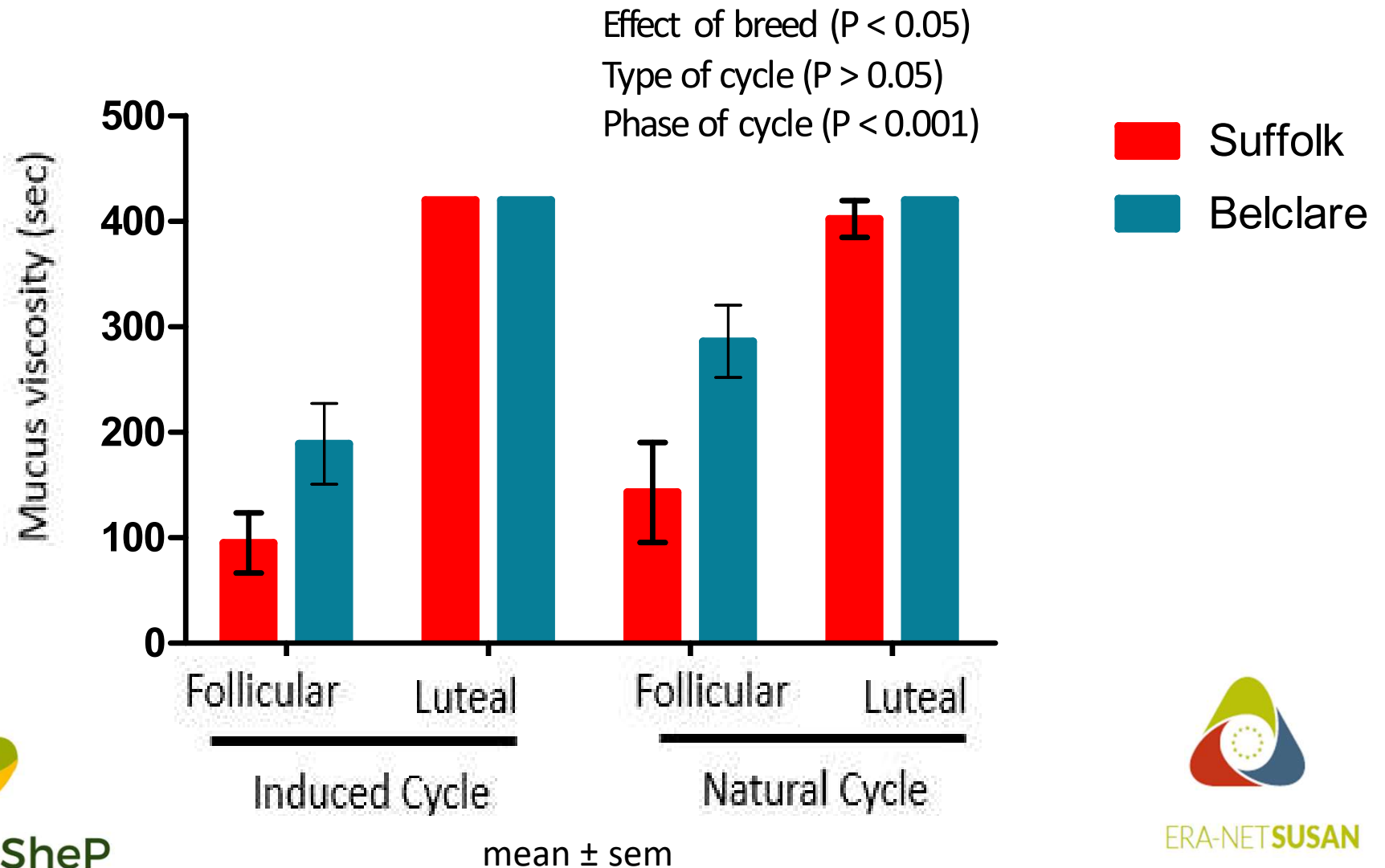
- Training of young researchers

Preliminary Results

Ewe Breed Effects; Mucus Weight

Effect of breed (P > 0.05)
Type of cycle (P < 0.05)
Phase of cycle (P < 0.001)

■ Suffolk
■ Belclare

n=30 ewes/breed

mean ± sem

Ewe Breed Effects; Mucus Viscosity

Stakeholders

- Scientific Community

- Farmers

- Animal breeding companies

- Environmentalists

- Policy Makers

- Funders
  - SusAN
  - National Agencies

Expectations

- Characterise factors influencing ewe longevity

- Identify most efficient labour and carbon SPSs

- Understand cervical factors influencing sperm transport

- Ascertain famers views on new technologies

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Kick off Meeting – 24th April 2017