# Sustainability Challenges and Solutions addressed by BovINE in 2020/21

## Introduction

Damiana Maiz

# NETWORK MANAGERS

**9 Network Managers** responsible for the creation and development of local networks, as well as organising the national level events held in autumn of each year, in:

Belgium, Estonia, France, Germany, Ireland, Italy, Poland, Portugal & Spain

# THEMATIC WORKING GROUPS

# GOOD PRACTICES AND RESEARCH INNOVATIONS

- **Good practices** – those practices which are currently being implemented on farm and are already addressing the needs identified

- **Research innovations** – solutions to the needs identified from research but not yet put into practice.

Based on the priority topics selected under each theme:

✓ At least 72 Good Practices are collected per year by the NMs

✓ At least 60 Research Innovations are collected per year by the TWGs.

**Get registered in the BovINE Knowledge Hub to check the GPs and RIs!**

# 2021 PRIORITY TOPICS

| BovINE Theme | Priority Topic Titles |
|---|---|
| **Socio-economic Resilience** | Initiatives to improve the image of and promote the sustainable consumption of beef |
| | Economically efficient housing systems for beef cattle |
| **Animal Health & Welfare** | Simple labour-saving tools to measure and communicate high animal welfare standards on beef farms. |
| | Management, housing, and environmental factors which affect animal welfare in rearing and finishing units |
| **Environmental Sustainability** | Environmental sustainability reward schemes for beef farmers |
| | Carbon sequestration on beef farms |
| **Production Efficiency & Meat Quality** | Impact of animal feeding and stress on meat quality |
| | Optimizing the number of calves per cow per year in suckler beef herds |

# Portuguese Good Practice
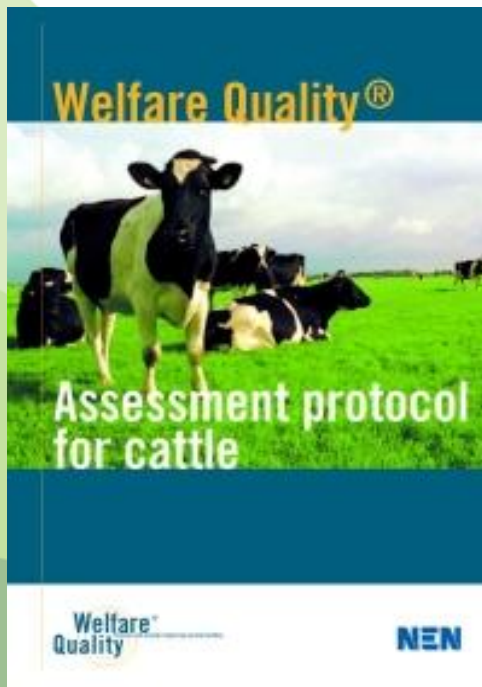


Presented by Mr. José Pais

# Welfare Quality®
# Assessment Protocol for Cattle

**Scientific based tools to assess animal welfare applied to fattening cattle farms with intensive housing systems**

- Initiatives to improve beef image and to break with the current trend of consumption decline

- Simple labour-saving tools to measure & communicate high animal welfare standards on beef farms

http://www.welfarequalitynetwork.net/en-us/home/

Socioeconomic Resilience

Animal Health & Welfare

# Welfare Quality® Assessment Protocol for Cattle

http://www.welfarequalitynetwork.net/media/1088/cattle_protocol_without_veal_calves.pdf

| Welfare principles | Welfare criteria | |
|---|---|---|
| Good feeding | 1 | Absence of prolonged hunger |
| | 2 | Absence of prolonged thirst |
| Good housing | 3 | Comfort around resting |
| | 4 | Thermal comfort |
| | 5 | Ease of movement |
| Good health | 6 | Absence of injuries |
| | 7 | Absence of disease |
| | 8 | Absence of pain induced by management procedures |
| Appropriate behaviour | 9 | Expression of social behaviours |
| | 10 | Expression of other behaviours |
| | 11 | Good human-animal relationship |
| | 12 | Positive emotional state |



- **Consumers expect beef production to be done with respect for animal welfare.**

- **Farms with a high standard of animal welfare can apply to use the WQ certification on the label of their products.**

# Spanish Good Practice



Presented by Mr. Daniel San Julián

# Development of a protocol on animal protection and welfare in INTIA

### Thematic area/priority need:

Animal health and welfare/ Simple tools to measure animal welfare standards on beef farms.

### Description:

INTIA has developed its own protocol, INTIA Animal Welfare, where the parameters and methodology for the assessment of animal welfare, specially designed for the type of predominant farms in Navarra (small and medium farms in a semi-extensive system), will be collected. It is proposed as a complement to the requirements for farms under a DOP (Registered Designation of Origin) or IGP (Protected Geographical Indication) or PI (Integrated Production), where part of the Animal Welfare requirements are included in their specifications.

### Most important outcome/benefit:

It responds to the growing demand from distributors and end-consumers. The existing protocols on the market do not fit the semi-extensive production systems. They are all designed for large feedlots. The one developed at INTIA is not only simple but also complete, providing the consumer with information on how the animals are reared. In addition, it is intended to have little impact on production costs.

Socioeconomic Resilience

Animal Health & Welfare

| PRINCIPIO | Nº DE REQUISITOS | VALORACION/REQUISITO | | | PUNTUACIÓN MINIMA | TOTAL |
| --- | --- | --- | --- | --- | --- | --- |
| | | CONFORME | NO CONFORME | NO APLICA | | |
| 1. Buen alojamiento | 16 | 2 | -2 | 0 | ≥16 | 32 |
| 2. Buena alimentación | 5 | 4 | -4 | 0 | ≥12 | 20 |
| 3. Buena Salud | 10 | 4 | -4 | 0 | ≥16 | 40 |
| 4. Comportamiento apropiado. | 4 | 2 | -2 | 0 | ≥4 | 8 |
| TOTAL | 35 | | | | ≥48 | 100 |

| PUNTUACIÓN | CALIFICACIÓN | EN SOLICITUD | CON CERTIFICADO |
| --- | --- | --- | --- |
| 0 y < 48 y ningún Principio con Puntuación < P. Mínima. (*) | Explotación No Conforme | **No concesión del certificado:** pendiente de presentar acciones correctoras y evidencias de su implantación. | **Suspensión del certificado:** hasta presentar acciones correctoras y evidencias de su implantación. |
| ≥ 48 y < 60 | Explotación en proceso | | Presentar acciones correctoras y evidencias de su implantación en plazo de **3 meses**. **Si no se cumple, suspensión de la certificación** |
| ≥ 60 y 100 | EXPLOTACIONES CON CERTIFICADO IN T IA Bienestar Animal | | |
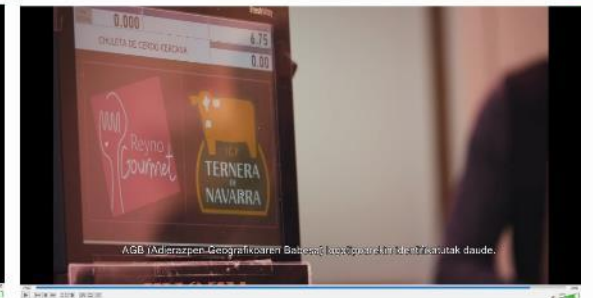
# French Good Practice



Presented by Ms. Marie Penn

# FRANCE CARBON AGRI ASSOCIATION (FCAA)

- Environmental Sustainability/ Environmental sustainability reward schemes for beef farmers

- FCAA is aims to involve and support farmers and their technical partners in their low-carbon initiatives and create the link with stakeholders who want to support financially, and in full transparency, projects innovative for the climate.

- With FCAA :
  - The breeder gains technically: he sets up an evaluation diagnosis on his farm (CAP2ER) and then new virtuous practices allowing the reduction of GHGs or increase carbon storage.
  - The breeder values the efforts made, economically: he then resells his carbon credits (around € 30 / tonne)
  - FCAA creates the link with stakeholders - communities, companies - who want to support financially, and in full transparency, projects innovative for the climate.
  - the breeder is assured of the system: Methods and tools certified by the Ministry of the Transition Ecological and Solidarity

# FCAA: Project monitoring in 5 steps

BREEDERS, LOW-CARBON AGRICULTURAL PROJECT LEADERS:



France **CARBON AGRI** Association

1 - EXPERTISE DU PROJET

2 - LABELLISATION BAS CARBONE

3 - RECHERCHE DE FINANCEURS

4 - AIDE À LA MISE EN ŒUVRE ET AU SUIVI DU PROJET

5 - RÉTRIBUTION FINANCIÈRE AUX AGRICULTEURS

LABEL BAS CARBONE

VENTE → CRÉDITS CARBONE ← ACHAT

CAP'2ER

ACTEUR(S) SOUTIEN(S) DE PROJET AGRICOLE BAS CARBONE
**PROJET DE COMPENSATION**

# German Good Practice



## Presented by Mr. Till Masthoff

# Installation of a calf clot for extra feeding and easier handling

- Socio-economic resilience: Efficient housing systems for beef cattle

- A calf clot was installed between two groups of suckler cows

- Can be entered only by calves up to 3 months

- Extra feeding, easier handling, treatment

- Early intake of concentrate

- Higher daily gain

- Healthier calves due to more energy

# Estonian Good Practice



## Presented by Ms. Airi Külvet

# Bale grazing for improving permanent pasture without plowing

- Additional biomass which is returned to the soil through trampling, resulting in increased carbon sequestration.
- Bale strips are also a valuable source of seeds for the pasture, so by spreading them you are increasing the seedbank of the pasture
- Additionally there is the animal health argument, by using strip bale grazing you can extend the season that animals are outdoors, which is beneficial for their health/ which resembles more their natural behaviour
- It can be seen as a labour saving tool, for a period - in Estonia- reasonable to do November-December.

- What we do:
- remove nets late late autumn, early winter
- but the bales in place before weather gets too wet or cold
- best reasults if we unroll the bales daily
- strip graze and move ahed, not to preassure area too much
- use the hay that has valuable seed to add

What we do not do:
- Not use it on natural pastures to awoid species we do not want





**Electric wire fencing is held by rods using the bales as support.**
*Photo: Manitoba Agriculture, Food and Rural Initiatives*

# Belgian Good Practice



## Presented by Mr. Dirk Audenaert

# Bloodsamples Se, vit E

GP Belgium:

- Production Efficiency:
  Optimizing the number of calves per cow per year

- Bloodsamples gives you more knowledge about the animal.

- (Belgian Bleu) cattle with lower values for Selenium and vit E are showing lower fertility.

Content of Selenium in bloodsamples. (Belgian Bleu)

|  | seleniumwaarden (microgram/liter) | | |
| --- | --- | --- | --- |
|  | < 50 slecht | 50-69 marginaal | 70-80 goed |
| **dierniveau** | | | |
| vaarzen (%) | 83,50 | 13,70 | 2,80 |
| koeien (%) | 84,20 | 14,00 | 1,90 |
| **bedrijfsniveau** | | | |
| vaarzen (%) | 90,70 | 9,30 | 0 |
| koeien (%) | 84,10 | 15,90 | 0 |

*Tabel 1 – Seleniumwaarden van vleesvee (bron: Veepeiler-rund 2009)*

# Bloodsamples Selenium and vit. E

- Less selenium : less immunity and less fertility

- Selenium and vit. E  are anti-oxydants

- The amount of Se of the mother has an effect on the Se of the calf.

- Measering the amount of Selenium in  serum of blood

- Target :
  - Dairy cattle : 50 microgram/liter serum
  - Beef cattle ( Belgian Blue) : 70 microgram /liter serum

- Less selenium in our soils for roughage (grass and maize)

- Farmers without concentrates or without a supplement of minerals.

- Supplementation of Se (organic or anorganic) in concentrates or minerals.

# Italian Good Practice



Presented by Mr. Alessandro Mazzenga

# Precision feeding control

- Thematic area: Animal Health and Welfare

- Priority Topic: Ways of improving the Animal welfare of beef cattle in rearing and finishing units.

- Description of the GP:

*The use of portable NIRs instruments for the control of chemical and physical traits of TMR and feed in beef farms. The analysis could be directedly performed at the feeding alley using portable devices or they can be installed into the mixer wagon. These digital devices guarantee a precise and continuous monitoring of feed variability day by day and along the feeding alley. They allow the control of TMR homogeneity and bull sorting activity. Moreover, they could predict the chemical constituents of bulls' feces in order to calculate the digestibility of the main nutrients (DM, CP, NDF, starch).*

# learning/outcome/opportunity



€ a greater feed efficiency with low nutrient/feed losses, with a consequent reduction of feeding costs, greater feed conversion rate and animal welfare

reduced feed variability and control of feed intake and feces can lead to reduced risk of rumen acidosis and other feeding-related dysmetabolic diseases

✓ greater growth performance and feed conversion rate



CO² a reduction of nutrient losses, in particular of nitrogen and energy

Odds: cost of investiment

# Analysis of TMR homogeneity

BovINE
BEEF INNOVATION NETWORK EUROPE

Note:

Data: 2021-04-28
Azienda:
Nome della razione:
Tipo di razione: Unifeed vacche lattazione
Strumento: poliSPEC-NIR (SN: )
Analisi: 4 sectors / 4 samples

**homogeneity index**  76.1 /100   **particles lenght**  5.4 mm   **defribration index**  7.3 %

| Costituente | Indice per parametro | Media | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| S4 | 81.7 | 38.6% | = | = | = | = |
| S5 | 73.0 | 19.2% | = | = | = | = |
| Fondo | 60.3 | 19.9% | ↓ -2.1% | ↓ -3.9% | = | ↑ 5.1% |
| LMG | 86.2 | 5.4 mm | = | = | = | = |
| CP | 71.7 | 15.6% | = | = | = | = |
| NDF | 73.2 | 30.9% | = | = | = | = |
| starch | 76.7 | 29.7% | = | = | = | = |
| Sostanza secca | | 48.8% | 48.3 % | 48.7 % | 48.8 % | 49.6 % |
| LMG | | 5.4 mm | 5.4 mm | 5.5 mm | 5.3 mm | 5.2 mm |
| Indice di sfibratura | | 7.3% | 7.3 % | 6.8 % | 9.0 % | 6.0 % |

ITPhotonics

ITPhotonics Srl - www.itphotonics.com - www.polispec.com - info@itphotonics.com

# Irish Good Practice



## Presented by Mr. Kevin Kinsella

# Bord Bia Sustainable Beef and Lamb Assurance Scheme

- Thematic area – Socio economic resilence.

- Priority Topic – Initative to improve beef image.

- Description – Scheme to prove the sustainability and quality assurance credentials of Irish beef and lamb.
  - To demonstrate to customers that quality beef and lamb are produced sustainably under an accredited Scheme;
  - To provide a uniform mechanism for recording and monitoring: quality assurance criteria, and sustainability criteria for beef and sheep farms;
  - To set out the criteria for best practice in Irish beef and lamb farming, and
  - To provide an on-going means of demonstrating best practice at farmer level.

- Important learning/outcome/opportunity – how to develop and run a large scale QA scheme from farm to fork and meet changing customer requirements.

# Bord Bia Sustainable Beef and Lamb Assurance Scheme

**Origin Green IRELAND** — Ireland's food and drink sustainability programme

**BORD BIA QUALITY ASSURANCE ORIGIN-IRELAND**

**GRASS FED VERIFIED — BORD BIA IRISH FOOD BOARD**

## QA & Sustainability Standard Content

1. Overview and Retention of Records*
2. Producer Capability and Competence*
3. Identification and Traceability*
4. Animal Remedies*
5. Animal Feeds and Water*
6. Land Management*
7. Specified Management Tasks: Dairy, Beef, Sheep*
8. Animal Health and Welfare*
9. Biosecurity and Pest Control*
10. Housing*
11. Transport*
12. Environment*
13. Farm Health & Safety and Social Sustainability*
14. Dairy – General
15. Dairy
16. Milking Parlour
17. Milk Storage & Collection
18. Milking Equipment
19. General Hygiene
20. Chemicals, Pesticides and Herbicides*

https://www.youtube.com/watch?v=uhBrPhNdki8

# Environmental Sustainability Research Innovations

Presented by Mr. Josselin Andurand & Ms. Riet Desmet

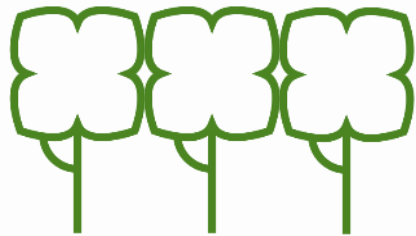# Hedgerows

Carbon sequestration

# Hedgerows
Carbon sequestration

## a type of Agroforestry

- Trees and permanent vegetation on croplands/grasslands
- Great potential for climate change mitigation
- Above- and belowground tree biomass and soil
- More C sequester potential (litterfall)

# Hedgerows

Carbon sequestration

- High SOC stocks in hedgerows
- OM from leaves, seeds, nuts, etc.
- Slow C decomposition
- SOC stock 81,7 Mg C ha-1

Less SOC

Litter falls straight down

Sandy soils low conc of org C and plant nutrients (here in study)

SOC stock 56,4 Mg C ha-1

In grass strips SOC stock 56,6 Mg C ha-1

Van Den Berge *et al*. 2021

# Hedgerows

Carbon sequestration

*Beneficial for agriculture*
Soil health
Crop productivity
Lower fertilizer need
Shelter

*Other benefical effects*
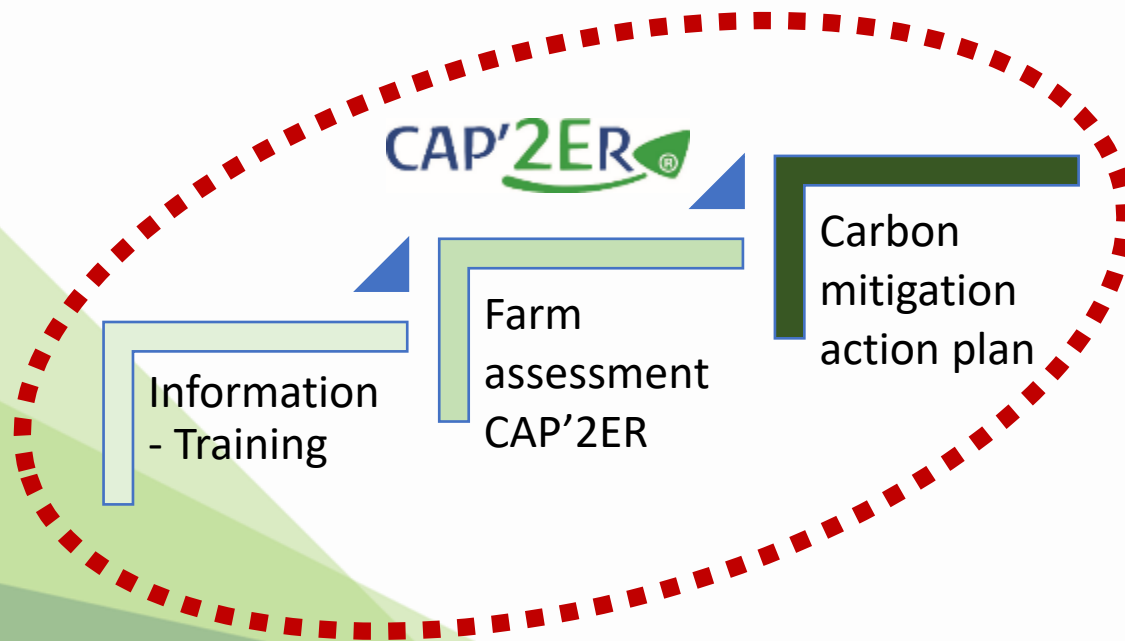Water holding capacity
Microclimate
Biodiversity
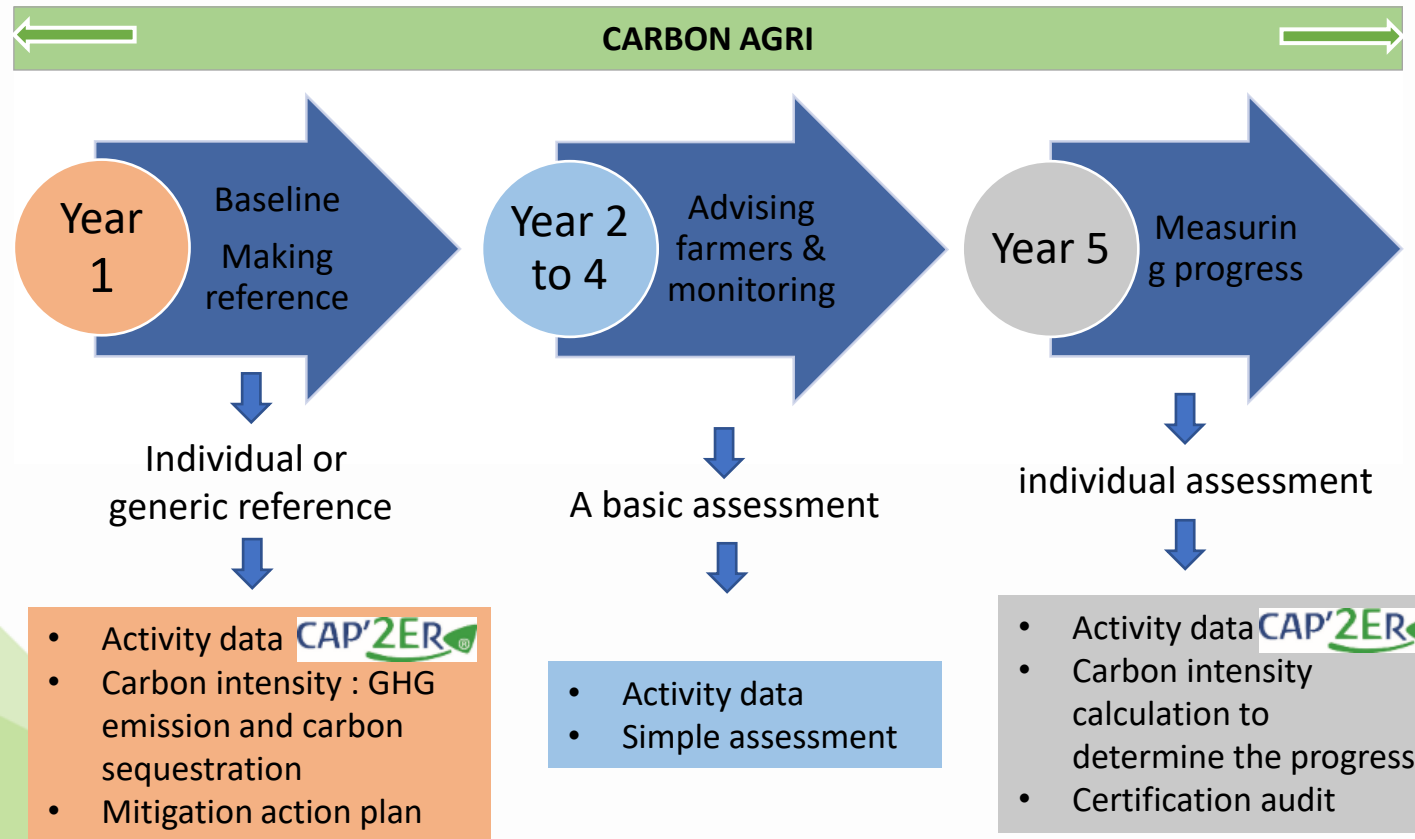Erosion

# Carbon crediting

## Reward systems for the farmer

# Involving farmers in a national carbon action plan and rewarding with carbon Credit
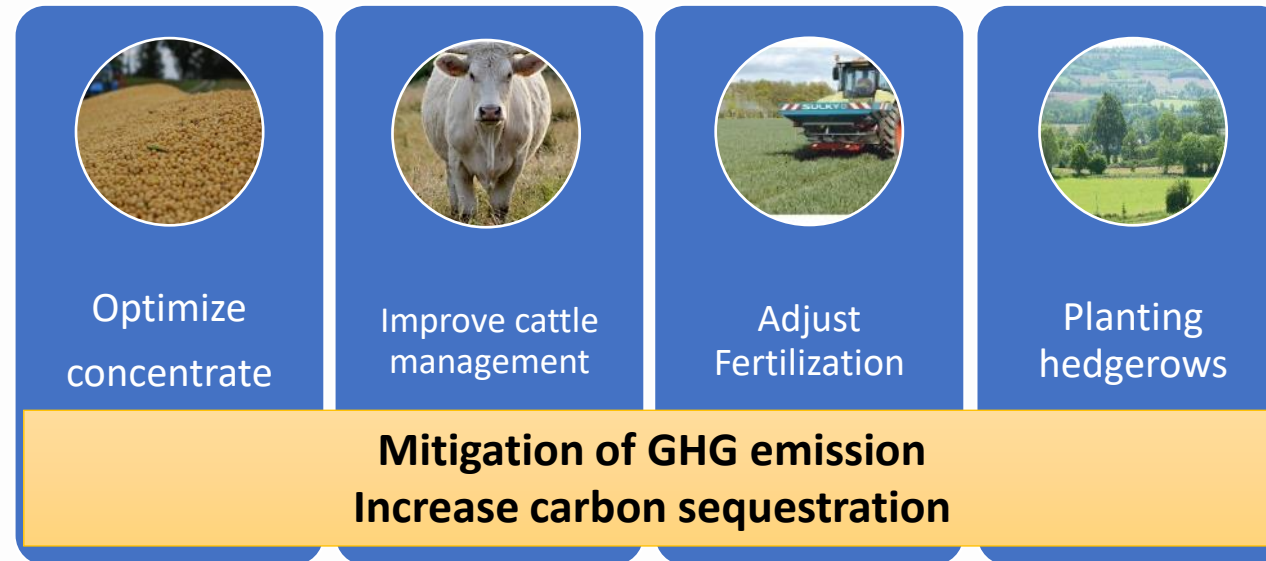
▶ **Several steps for involving cattle farmers**



Information - Training

Farm assessment CAP'2ER

Carbon mitigation action plan

# CAP'2ER for monitoring the progress



**CARBON AGRI**

**Year 1** — Baseline: Making reference

↓

Individual or generic reference

↓

- Activity data CAP'2ER®
- Carbon intensity : GHG emission and carbon sequestration
- Mitigation action plan

**Year 2 to 4** — Advising farmers & monitoring

↓

A basic assessment

↓

- Activity data
- Simple assessment

**Year 5** — Measuring progress

↓

individual assessment

↓

- Activity data CAP'2ER®
- Carbon intensity calculation to determine the progress
- Certification audit

# Example of mitigation potential and carbon credit on an average beef farm



| Optimize concentrate | Improve cattle management | Adjust Fertilization | Planting hedgerows |

**Mitigation of GHG emission
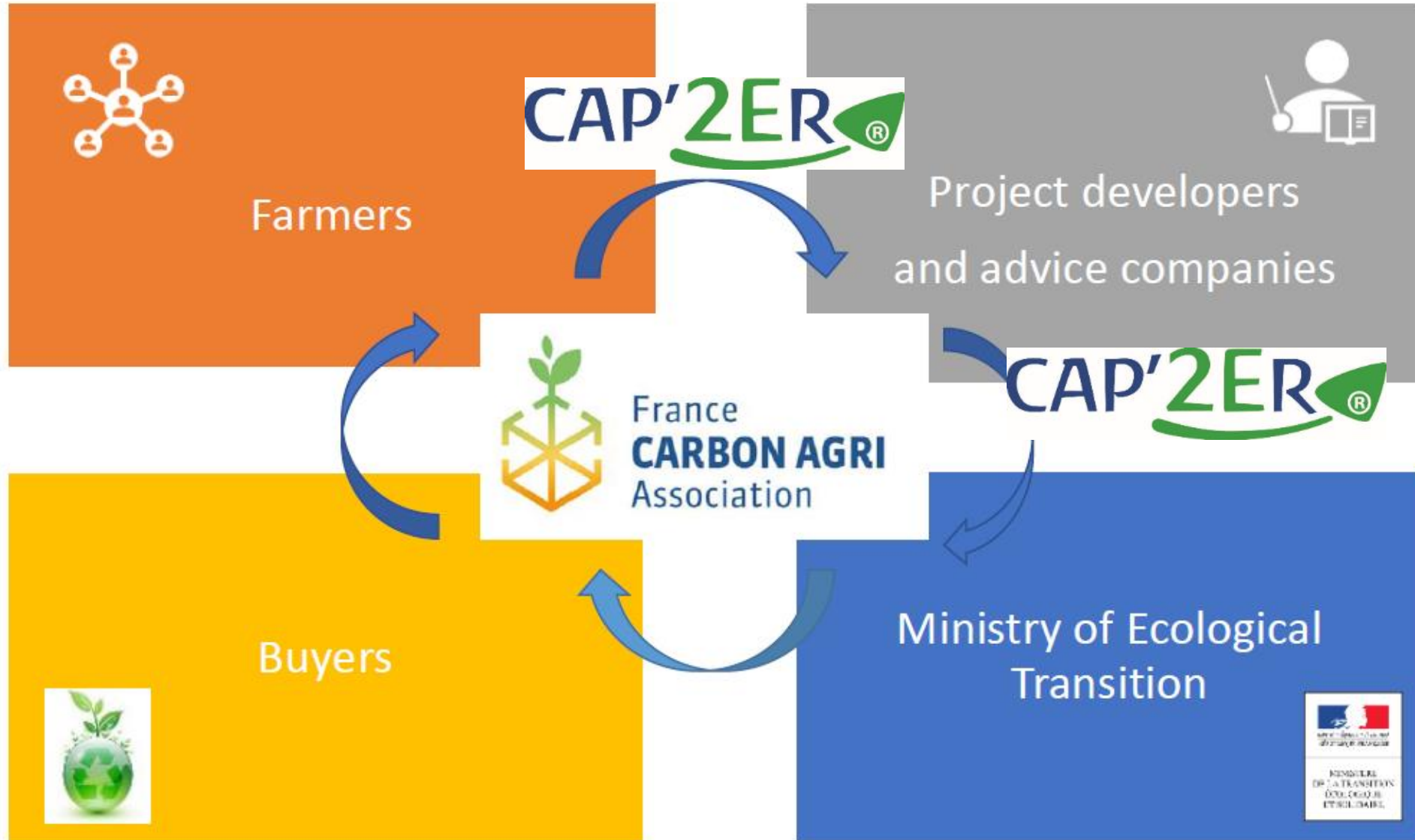Increase carbon sequestration**

**Decrease of carbon footprint by 12 %**

**On 5 years :
400 tons of CO2e for an average french beef farms = 10 000 €**

# Partnership of a carbon credit project

# Production Efficiency & Meat Quality Research Innovations



Presented by Ms. Kizkitza Insausti & Ms. Virginia Resconi

# Beef+: Beef circularity through vegetable by-product feeding strategies

**Thematic area**: Production Efficiency & Meat Quality (WP5)

**Topic 5.3**: Animal feeding and stress on meat quality

**Research Innovation**: Trasa, Univ. Pública de Navarra IS-FOOD Institute, PGI Ternera de Navarra (funded by the Gobierno de Navarra, Proyectos I+D 2020).

Vegetable by-products

Micro-silages

PGI beef

# The project, foresees different benefits, "from feed to food":

## FEEDING

- Use of local by-products
- Source of antioxidants of natural origin
- Characterization of fermentation, digestibility and nutritional value of the raw materials
- Formulation and validation of a complete ration

## ANIMAL

- Lower health issues, such as digestive disorders
- Less stress

## FARMER

- Higher productivity
- Economically viable

## QUALITY

- Better image of the production system
- Consumers demands on local products
- Circular economy
- High quality beef

**Link to a video** (in Spanish): https://www.youtube.com/watch?v=yVt2UMgaTeM&t=52s

**Contact person**: Kizkitza Insausti (kizkitza.insausti@unavarra.es)

# Estrus detection in suckler cows using automated on-farm tools

- **Thematic area:** Production Efficiency & Meat Quality

- **Topic 5.4:** Optimizing the number of calves per cow per year in suckler beef herds

- **Research innovation:** several devices developed by companies and/or research centres with different maturity level (some already commercialized)

*Heatime Pro collars*

*Heatwatch®*

MoocallHEAT

ixorigue

A

B

C
CX   FV   CV
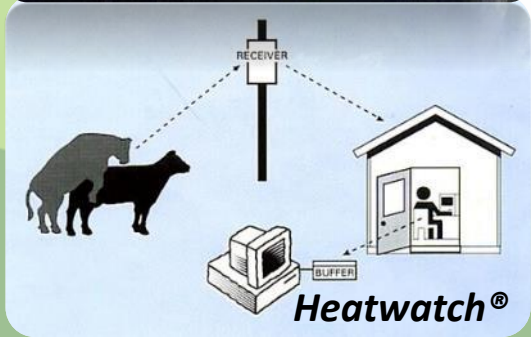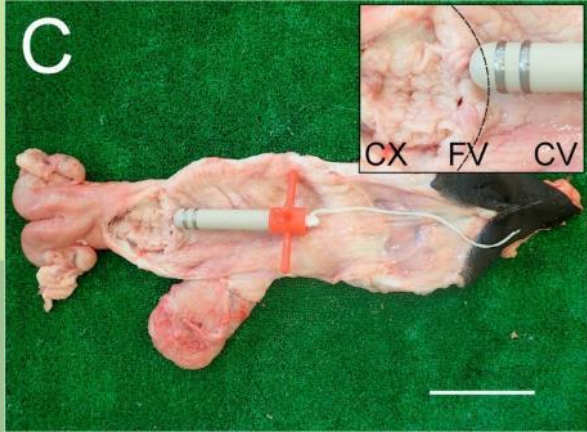
Higaki et al (2019)

**Detection of Cattle's Mounting Actions Using Camera**

This cow is in heat !

A pattern recognition-based system need **an image dataset** to learn!

3

Kawano 2021

**Link to a video**: https://www.youtube.com/watch?v=Gqj9_bZonSg

## Natural breeding

- Document **puberty**, **breeding** and **repeat breeding** of females.

## Artificial insemination

- **Optimal time** for insemination (higher pregnancy rate)

## Fixed-time artificial insemination

- When protocols are used, heat detection could be obviated
- Detection of heat can help **to reduce the GnRH treatment (and cost related)** used at the time of AI

## Conventional estrus detection

- Depends on the visual observation of behaviour, which is **time consuming** and needs **expertise**.
- **Difficult in large herds or extensive systems**
- Limited by **weather conditions**

# Animal Health & Welfare Research Innovations



Presented by Ms. Karin von Deylen & Mr. Frank-Dieter Zerbe

# Obsalim
## Feed check with cards

- Topic 4.3 Simple tools to measure animal welfare standards on beef farms

- Obsalim = Observations alimentaires = feeding observations

- Available as an **App** or as a paper version (**set of cards** (61 in case of cattle))

- **Identify problems with the ration by observing your cattle!**
  - Evaluate the <u>uniformity</u> of your herd (condition, cleanliness, vitality) → is further observation needed?
  - "check the cross of the hock" (dirty under a vertical line or behind a horizontal line)
    - → <u>Orientation</u>, where does the problem come from?
  - Evaluate <u>rumen stability</u> → by evaluation of the hair coat
  - Evaluate the <u>ration</u>: identify the various digestive symptoms, make totals by adding the values at the bottom of the card & get your diagnosis
    - To make a statement for the entire herd, at least two thirds of the animals must show the symptoms
    - Symptoms from at least three different anatomical locations are required to make a reliable statement (Coat, skin, urine, faeces, udder, claws, nose, eyes, withers, pHG zone)

- see www.obsalim.com, https://www.youtube.com/watch?v=st18Deiv_h0 (12:45), https://www.obsalim.com/medias/set-of-cards-for-cattles-guide.pdf
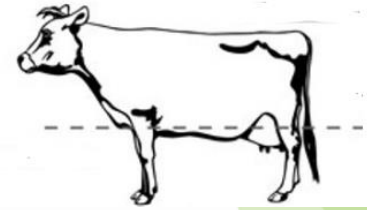
# Examples



## Kniekreuz

**60. Schmutzig unter dem Kniekreuz**

- 👁 Schmutzige Haut unter dem Kniekreuz horizontale Linie, Brust, Brustbein, Buggelenk, Flanke, Sprunggelenk, Fessel.

- ⚠ Künstliche Säuberung, Regen, übermässige Stroheinstreu.

Zeit bis zum Auftreten: 72 Stunden

| Ef | Eg | Sf | Sg | Ff | Fs | Ps |
|----|----|----|----|----|----|----|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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☰ **Obsalim®** Beobachtung

## Verhalten

### R VE Langsam

**Symptom**

- ⦿ Nicht vorhanden
- ◯ Anwesend



**Beschreibung**

Die Tiere bewegen sich sehr langsam. Die Tiere versammeln sich langsam im Wartebereich.

**Nicht zu wechseln mit**

Müdigkeit, Phosphormangel

**Koeffizienten**

| Energie | | nitrogen | | Fasern | | Pfannenstabilität |
|---------|----|----------|----|--------|----|------------------|
| Ef | -1 | Sf | -1 | Ff | 0 | 1 |
| Z.B | 1 | Sg | 0 | Fs | 0 | |

**Anpassungszeit** 1 Woche

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## Wiederkäuen

**43. Unter 75% der Kühe liegen**

- 👁 Zu Beginn des Nachmittags liegen weniger als 75% der Kühe und sind mit Wiederkäuen beschäftigt.

- ⚠ Übermässiges Angebot an sehr appetitlichen Futtermitteln, zu wenig Komfort, Stress, Aggressivität.

Zeit bis zum Auftreten: 24 Stunden

| Ef | Eg | Sf | Sg | Ff | Fs | Ps |
|----|----|----|----|----|----|----|
| 2 | 0 | -1 | -1 | 0 | 0 | -1 |

# Automatic Feed pushing
## for more productivity

- Topic 4.4 Ways of improving the Animal welfare of beef cattle in rearing & finishing units

- Positive effects are known from dairy, automatization is well advanced

- Fully automated feed pushing means pushing **continuously** even **at night** or **during work peaks**

- Advantages: higher **feed intake**, better **rumen health** (more even feed intake = less pH fluctuations), calmer animals / **less antagonistic behavior**

→ Different systems from various manufacturers are available

Picture source: joz.nl

Picture source: Suendermann-gmbh.de

Picture source: Kuh und Herde (Lely)

# Automatic Feed pushing
## for more productivity

# Socio-Economic Resilience Research Innovations



Socioeconomic Resilience

€

Presented by Mr. Jerzy Wierzbicki & Mr. Kees de Roest

# 3G - Management of beef eating quality in supply chain

**Thematic Area BovINE**

Production Efficiency & Meat Quality

Socio-Economic Resilience

**Priority Topic**

Animal feeding and stress on meat quality

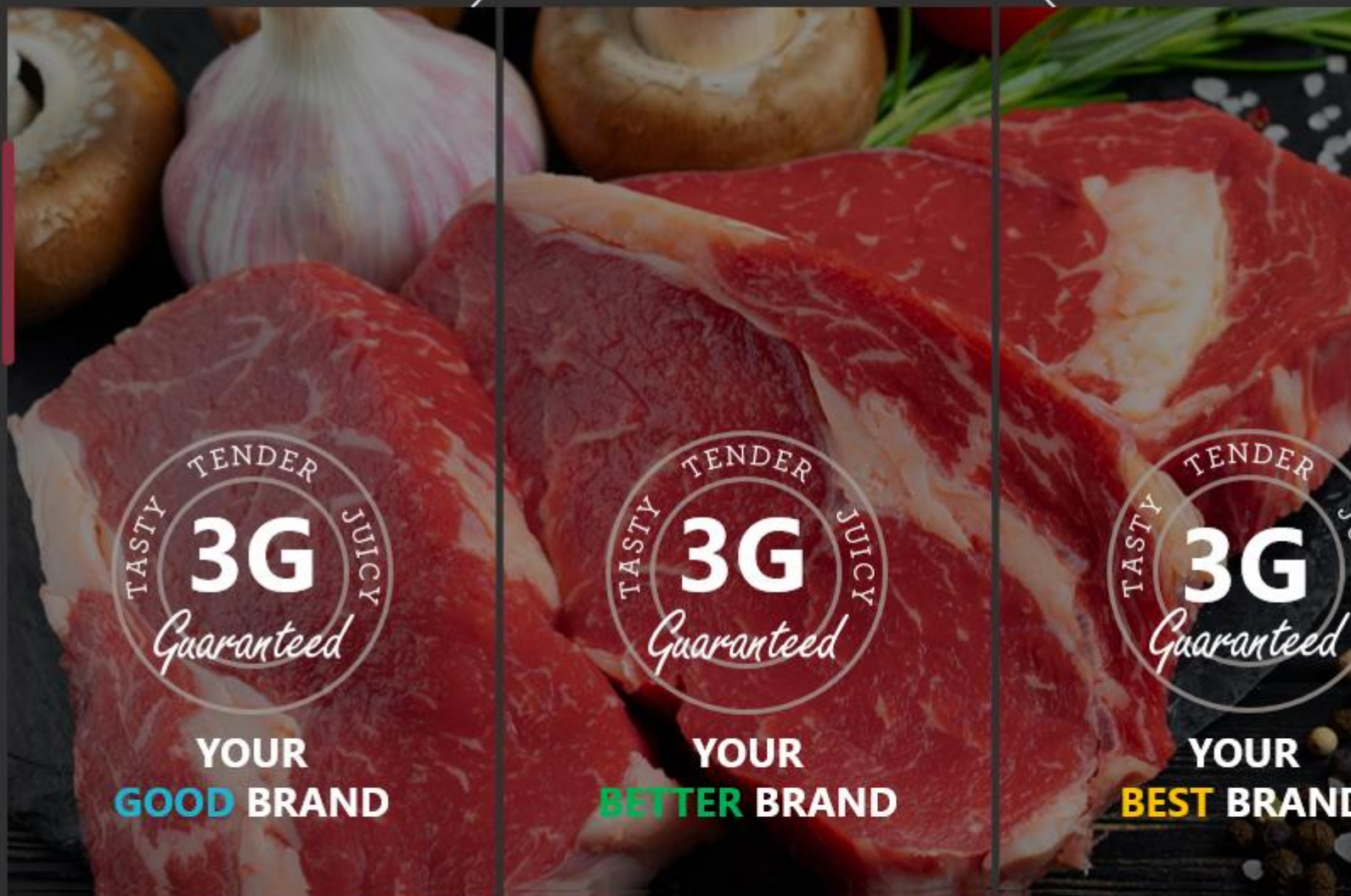Initiatives to improve beef image and to break the current trend of consumption decline

# 3G - Management of beef eating quality in supply chain

- The 3G model has been developed to help farmers and the beef industry satisfy the consumer

- The 3G model was developed in Poland in cooperation with Rod Polkinghorne who has over thirty years of experience in designing and implementing similar type grading systems in Australia (MSA) and New Zealand (Silver Fern)

- The slaughterhouse has a great tool to encourage farmers to produce carcasses that have a cuts with a higher eating quality value.

# 3G - Management of beef eating quality in supply chain

## Be Consumer Focused

- Base Eating Quality prediction modelling for grading & application on consumer sensory research conducted under UNECE protocols
- Collaborate to obtain the best possible prediction modelling through sharing of research datasets

## Have Strong Integrity

- Clear , detailed, documented & audited procedures
- Grader training & licensing to UNECE standards
- Documentation of grading standards and required measurement tools
- Provision for new measurement technology as science delivers

Make provision for combining Yield grade (EUROP) and Eating Quality (EQ) to deliver accurate carcase value

- Kg of Beef sold (EUROP) plus EQ (price per Kg)

# CARCASE ASSESSMENT TRAINING

- ✓ Training of eating quality Graders is available through the International Meat 3G Research Foundation (IMR3GF) - IMR3G.org

- ✓ The IMR3GF is licensed to provide the UNECE/ABCAS Carcase Chiller Assessment course for training of 3G Graders in UK and Europe

- ✓ Category Two (ABCAS) licence for research data collection

- ✓ Category One licence for commercial use



Carcase Assessment Standards & Training

Now provided through the IMR3G Foundation

INTERNATIONAL MEAT RESEARCH 3G FOUNDATION

# Operational Group : Autofeed
*Feeding automation for cattle farms in Lombardy (IT)*

**Partners:**

- CREA – Research Centre for Engineering and Agro-Food Processing

- CRPA – Studies and Research Foundation

- Five dairy and beef cattle farmers

**Objective:**

- Carrying out an evaluation of the conditions of the use of the Automatic Feeding Systems (AFS) and of partially automated systems for rationing and ration management operations in dairy and beef cattle farms in Lombardy

# Automatic feeding systems

- The AFS consists of one or more self-propelled electric wagons that manage the ration of the groups independently and at variable frequency

- A fully automated kitchen fills the wagons with the ration to be offered to animals

- The wagons operate 24 hours/day, and they can manage different rations that the various groups of animals (of different breed and age) require

- The system also monitors the animal performances and the herd's status and provides support in establishing animal health, body condition and growth performance.

# Activities of the operational group

- Analysis of the market, of the available AFS types, of the choosen installation solutions and of the opinion the breeders on AFS

- Definition of the housing models equipped with AFS and their comparison with others based on a conventional TMR (Total Mixed Ration) wagon

- Monitoring and analysis of the cattle farms already equipped with AFS to highlight the economic, production performance and animal welfare aspects

- Feasibility study in farms not equipped with AFS to define the technical and economic convenience. Comparison of before and after AFS installation.

# Examples of AFS for beef production

**Verona (Italy)**

**Mantua (Italy)**

A 4 m³ self-propelled, horizontal augers, electric driven, automatic wagon serves 960 beef cattle (all females in this farm for marketing strategies)

A couple of 2 m³ sycronized self-propelled, vertical auger, electric driven, automatic wagons serve 800 beef cattle of three different French breeds

The kitchen is based on an array of electric-driven containers and silos for the upload of different feeds

The kitchen is based on an electric-driven crane and silos for the upload of different feeds