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IS-FOOD
Research Institute on Innovation & Sustainable Development in Food Chain

Research Institute for

INNOVATION & SUSTAINABLE DEVELOPMENT IN FOOD CHAIN

IS- FOOD

(Contact: M Jose Beriain mjberiain@unavarra.es)

Visit : IATI Institute (Highway to Technology and Innovation Institute
26/04/2017

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Institutos de investigación

Some Regional data: Land area of excellent agricultural and food-processing products

15 Quality labels, (DOP, PIG, integrated production)

- ✓ Between the primary and transformation sectors they add up to **8% of Navarra's GVA**. GVA has increased approximately 11% in the period 2008-2014, above the average of other sectors.
- ✓ Both sectors have a similar level of employment, adding between them some 24,000 jobs (**9.1%**).
- ✓ High level of the professionalism, specialization and commitment to the territorial balance of Navarre. Co-existance of cooperatives, self employment and multinational agrofood industries.
- ✓ The transformation sector stands out in Navarra's total exports: **more than 10% of the region's export volume**. There has been a growth of about 80% in exports between 2008 and 2014 (above the average growth of Navarre's exports).

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IS-FOOD focuses its activity :

Produce, innovate and promote: safe, sustainable and healthy **FOOD**

The Institute supports the production and innovation in the food chain , combining the demand for food with the challenges of a society , focusing on the food chain as a whole, from production of raw materials to the consumer , including all intermediate links

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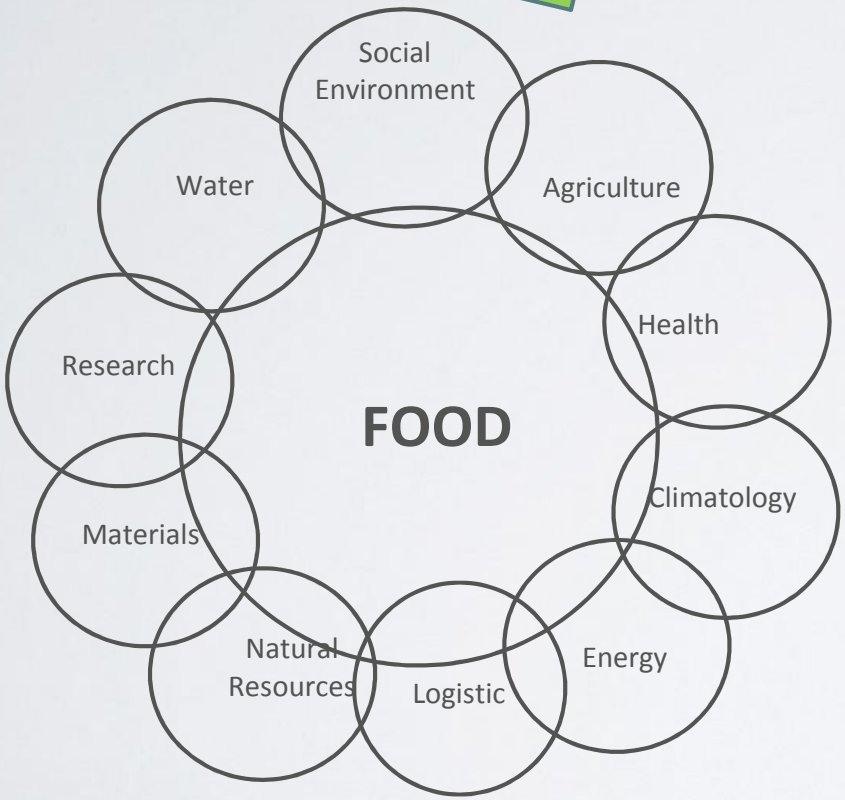
40 Researches / 10 scientific fields



- Sustainable Management and Use of **Soils**
- **Hydrology** and Structural Analysis
- **Ecology** and **Environment**
- Technology, Control y **Food Safety**
- Laboratory of Biology, Physiology and **Animal** Nutrition
- Animal Production and **Meat Quality and Technology**
- **Agro-Mechatronics**
- Advances in **Oenology**
- **Food Quality** and **Sensory Analysis**
- Analysis of Food and Agriculture **Markets**

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Research Focus : Food chain

Innovation + SUSTAINABLE DEVELOPMENT

Sustainable Production & Quality

Agrofood Innovation

Consumer

Circular Economy values present in each area

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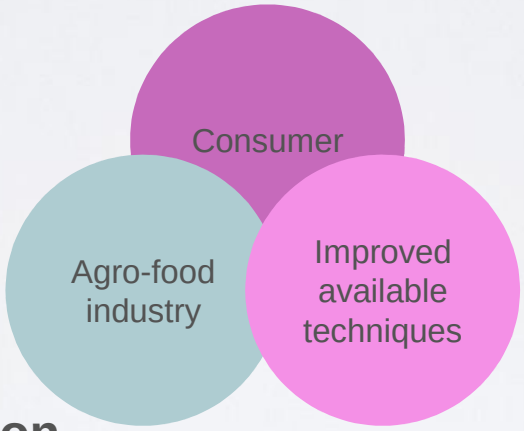
Our **main** basis are:

Consumer in 21st century

✓ Studing of level of **acceptance of new foods**

✓ Combination of **sensory and commercial analysis** in foods

✓ Influence of psychology (**emotions**) in food consumption



Agro-food innovation

✓ Development of foods with **healthy properties**

✓ **Shelf live improvements**

✓ **Edible toppings**

✓ Teledetection and **water-erosive** models

✓ **Nutrigenomic**

Sustainable production and food quality

✓ Valorization of products and **waste products (Bioproducts** and Sustainability).

✓ Sustainable management **land, water y vegetable resources**

✓ **Evaluation of Environment Impact**

✓ **Food safety and traceability**

✓ Prediction and determination of food **quality**

ISFOOD in Campus Iberus: NUTRIBERUS

The global aim of the Consortia is to establish the “Fingerprint” of the more representative mono-varietal virgin olive oils produced in the Ebro’s Valley area of Spain

Thank you!

IS-FOOD
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Pamplona - Navarra
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More details about us...

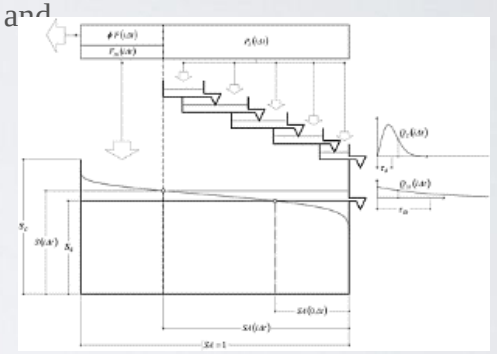
Lines of research:

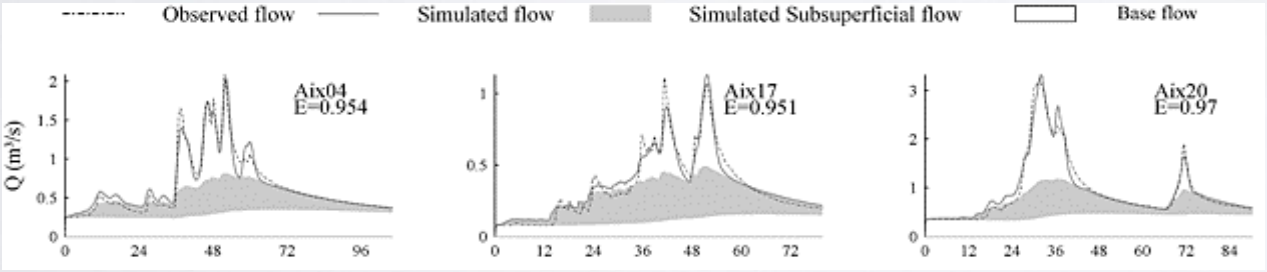
- ✓ Sustainable production and food quality
- ✓ Agro-food innovation
- ✓ Consumer and the Circular Economy

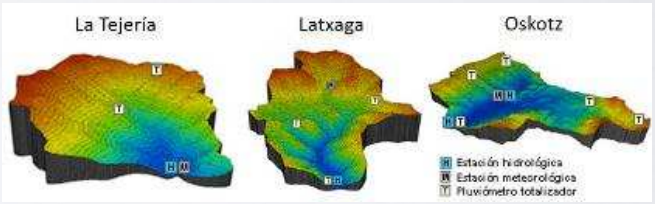
HYDROLOGY

RESEARCH LINES:

- Analysis and modelling of water, sediment and solutes generation and transport in agrarian basins towards a productive and sustainable activity
- Analysis and development of new hydrological models: *Geomorphological Unit Hydrographs* (GUH) and *the Reservoir Rainfall–Runoff Geomorphological Model (*R^3GeM)
- Precipitation analysis and synthetic rainfall generation
- Rainfall and hydrological study of rivers
- Sustainable Urban Drainage Systems
- Soil erosion



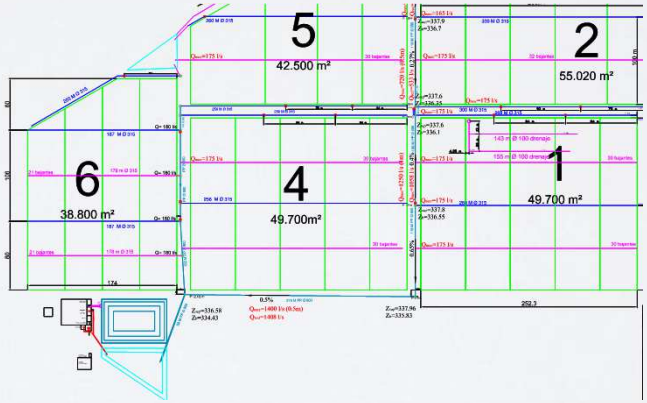




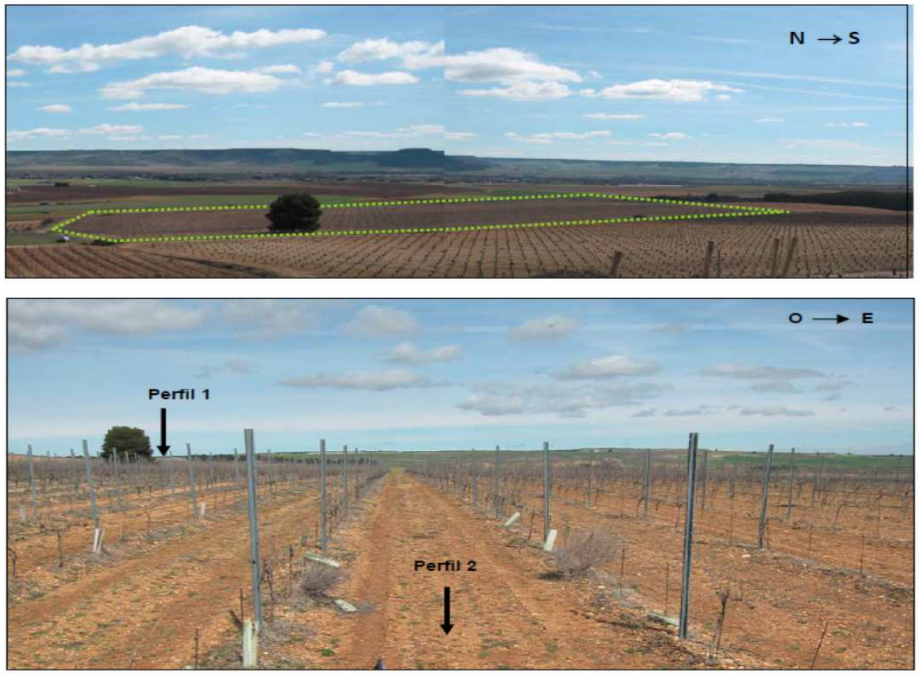
IRRIGATION

RESEARCH LINES:

- Studies of soils' aptitude for irrigation
- Evaluation of crops' water requirements and irrigation programming
- Use of soil moisture sensors and telemetry to improve irrigation management



Sustainable management **land, water y vegetable resources**



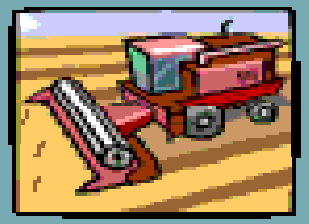
Los perfiles estudiados se han desarrollado sobre los depósitos de la terraza, del nivel T_5, y se trata por tanto de depósitos aluviales de cantos de cuarzo, cuarcitas y algunos de calizas.

2013-2015: Estudio morfológico y analítico de suelos destinados al cultivo de la vid y evaluación de sus propiedades agronómicas en la finca Miraflores. Viñedos Barón de Ley, SL.

Sustainable management **land, water y vegetable resources**

2013-2016: *Estudio de los beneficios medioambientales de la prácticas de agricultura regenerativa: demostración de una alternativa de gestión sostenible de los suelos agroganaderos, a través de indicadores de la calidad del suelo*. Con Ayto. de Orduña y Asociación Bedarbide.

GESTIÓN SOSTENIBLE DE RECURSOS AGROFORESTALES



Flujos de nutrientes en agricultura:

Optimización de la fertilización en regadío (Bardenas)

Quemas controladas y herbivorismo*:*
Gestión de ecosistemas: Desbroces biológicos, gestión pastoral y uso del fuego controlado

Flujos de nutrientes en silvicultura:

Límites de extracción sostenible en pinares pirenaicos

Productividad en silvicultura:

Estimación de biomasa generada en pinares pirenaicos

Conservación de biodiversidad en silvicultura:

Cambios en estructura y composición de pinares pirenaicos

Gestión sostenible

DESARROLLO Y METABOLISMO DEL TEJIDO GRASO

RESERVAS CORPORALES (¡tejido graso!)

(almacenamiento/movilización)

Sistemas de Producción

(eficientes, sostenibles)

-metabolismo/desarrollo (TG)
-métodos de estimación (EC)

vacuno

ovino

porcino

Calidad canal/carne

-Engrasamiento
-Conformación.

MEJORA GENÉTICA DE CARACTERES DE INTERÉS ECONÓMICO

SELECCIÓN ANIMAL

EVALUACIÓN GENÉTICA

Ovino de leche

Ej. Assaf

ESQUEMAS DE MEJORA

Ej. Alpacas

CONSERVACIÓN Razas
VARIABILIDAD GENÉTICA

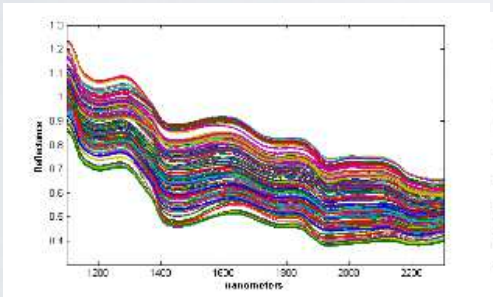
Ej. Latxa

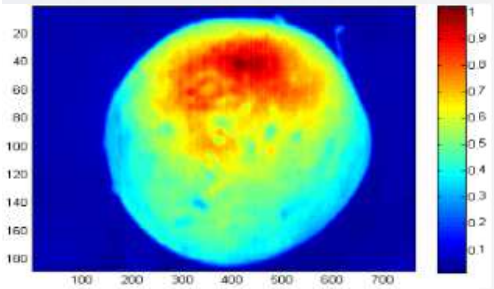
Ej. Betizu

PREDICTION AND DETERMINATION OF FOOD QUALITY

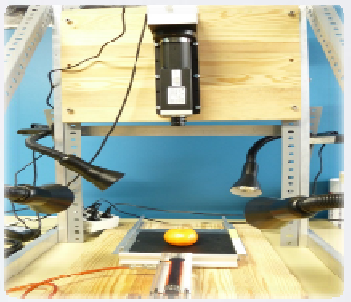
Near Infrared Spectroscopy for quality control

Development of models prediction of quality parameters in agrifood products through the application of NIR, MIR and SWIR technology combined with chemometric analyzes





Espectrofotómetro NIR



Cámara hiperespectral SWIR

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SENSORY ANALYSIS METHODS

33 vinos D.O. Navarra

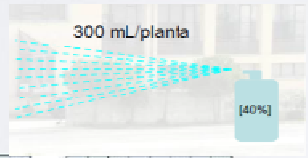
ecológicos

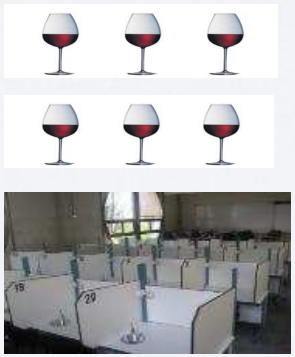
convencionales

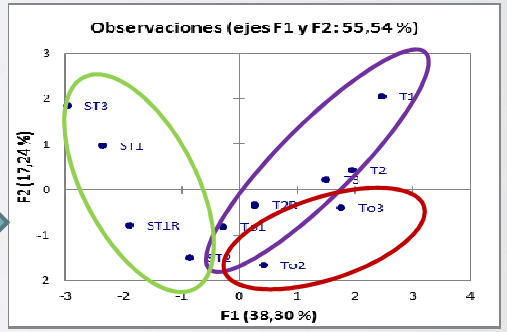
¿Preferencias?

4 24 20 6 11 2 18 3 19 17 29 7 13 25 31 10 22 27 1 8 28 5 30 26 9 14 15 23 12 21 16

Pulveriz







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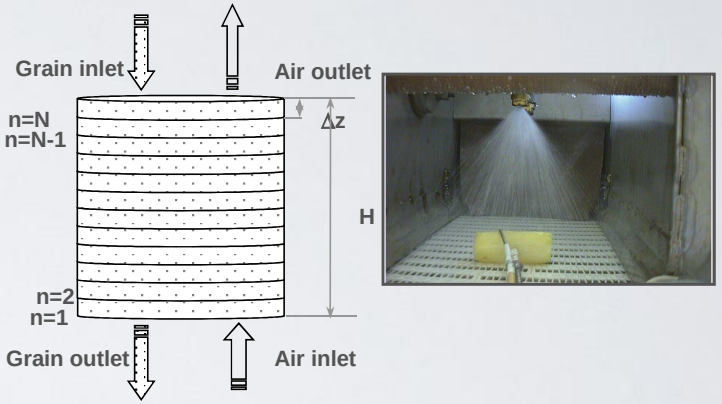
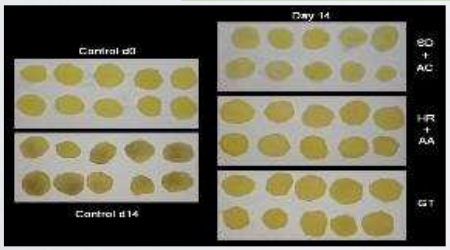
Institutos de investigación

- Water and energy management in food processing

  - **Vegetable water blancher optimization**
    - **Rice processing modelization**





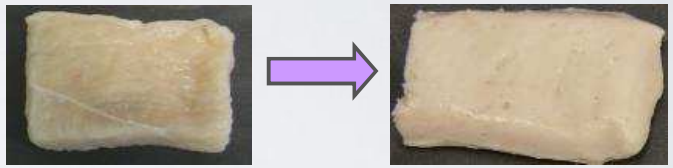
- Novel technologies for food processing

High pressure processing on rice and egg based dishes

- **Essential oils for potato storage**
- **Natural preservatives for vegetables**

- # New Product development

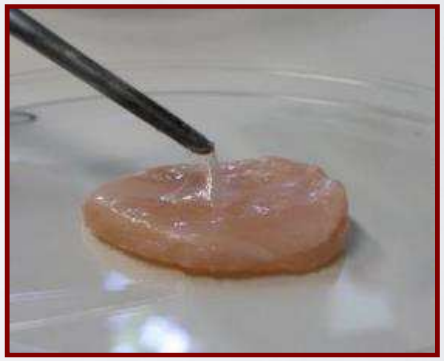
- **Reduced need of cold chain**
  - **Safer, increased shelf-life**
  - **High nutritional value**
  - **Meat, poultry, fish and vegetables**

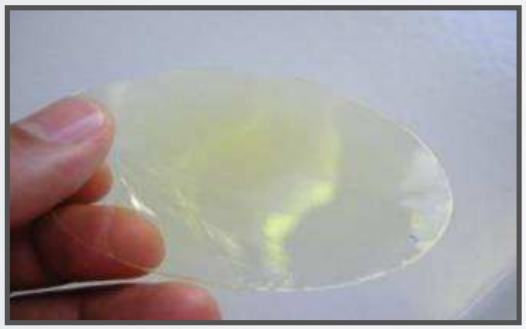


- # Minimally Processed Foods

- **Fresh-cut and sous-vide vegetables**
  - **Modified Atmosphere Packaging**
- **High pressure on minimally processed foods**

- Biofilms and coating for food applications
  - **Mass transfer barrier**
  - **Carrier of antimicrobial**
  - **Nanoparticles and cyclodextrines**
  - **On seeds, poultry, fish, dry food**





Valorization of products and **waste products**

Extracto de pepitas

Microencapsulación

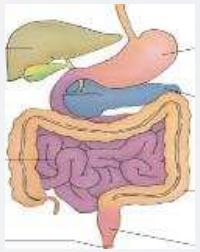
Microcápsulas

Alimentos funcionales

Resveratrol

Microencapsulación

Microcápsulas



Liberación en condiciones gástricas simuladas

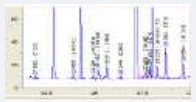
FOOD WITH HEALTHY PROPERTIES:

FROM INCLUSION N-3 AND CLA IN THE FATTENING DIET YOUNG BULLS TO BEEF

Farm

Fattening Diet

Linseed CLA



Animal

- Carcass
- metabolims study

Fatty acids

Consumers

Beef

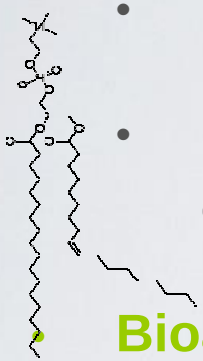
Beef patty

- Olive oil emulsified
- Grape seed extract

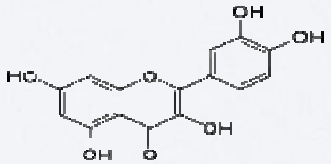
Consumer

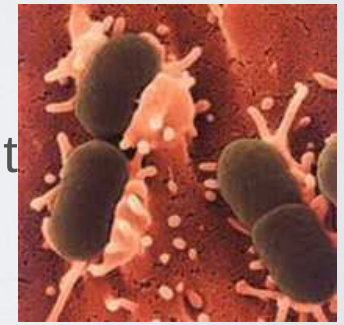
FOOD WITH HEALTHY PROPERTIES:

- **Probiotics**:
  - Intestinal beneficial effects of kefir-supplemented diet in rats
  - Microencapsulation of a probiotic and prebiotic in alginate-chitosan capsules improves survival in simulated gastro-intestinal conditions



- **Bioactive compounds:**
  - Effect of dietary quercetin and sphingomyelin on intestinal nutrient absorption and animal growth.





ANALYSIS OF FOOD AND AGRICULTURE **MARKETS**

- Agrood Food **Value Chain**
- Agroalimentario **Marketing**
- **Consumer Behavior** on food
- **Environmental economic** evaluation
- Economic evaluation of agri-environmental **intangibles**