

Design, develop and validate innovative sustainable bio-based ingredients using biotechnology approaches + links with digital technologies and tools

- **Fermentation-based production of functional food ingredients and additives using by-products from the food industry** (e.g., precision-fermented flavor and aroma compounds, precision fermentation using fermentable bases derived from by-products of the food industry, bioactives and nutraceuticals, etc.).
- **New bioactive food ingredients for mental health** (GABA, dopamine, serotonin, neurosteroids, and neuroimmune modulators) derived from *in situ* microbial fermentation and *ex situ* precision fermentation.
- **Integration of digital technologies** - including hybrid mechanistic-AI models, Physics-Informed Neural Networks (PINNs), AI-driven process optimisation and digital twins - **to enable reliable bioprocess modelling, scenario prediction and efficient scale-up.**

Consumer perception & acceptance, and cooperation with industry

- **Consumer research and perception analysis** of bio-based innovations - combining surveys, sensory studies and focus groups - to evaluate consumer understanding of sustainability claims, perceived benefits and risks, and the factors that drive market acceptance of new bio-based products.
- Organize **co-creation workshops, focus groups and surveys** engaging consumers, producers, and policy actors to co-design bio-based solutions.
- Mobilize CNTA's **industrial network of associated companies** to test and validate new bio-based products.
- Support **communication** to enhance public trust and accelerate market uptake.

We're CNTA

NATIONAL CENTER FOR FOOD
TECHNOLOGY AND SAFETY.



Team especie CNTA

- +250 Professionals
- +500 Associated companies
- Governing board

Institutional and associated companies



**6 working
centers:**
San Adrián,
Alesón, Calahorra, Logroño, Madrid, Pamplona

Facilities and equipment

- 14 Labs
- 12 Pilot plants for food processes
- 3 Platforms for advanced characterization :
Metabolomics, cell culture and C. elegans

*Cutting-edge
knowledge and
technology.*



CNTA in 2025

Research

Reports

Consumer studies

Analytical services

Consulting

Training

Events

47

Knowledge uptake
projects

172

Contractual R&D
projects

97

Training
actions

88.961

Technological services
reports for companies

480
Associates

+

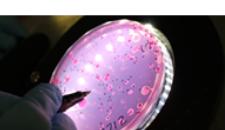
813
Clients

=

1293

**Companies
trust CNTA**

Our R&D capabilities

	<h3>Circular food ingredients</h3> <p>New upcycled ingredients Isolation of bioactive compounds Encapsulation Sustainable proteins</p>
	<h3>Food product development</h3> <p>Smart formulations Clean label Novel foods Alternative proteins Extrusion & texturization Sensory evaluation</p>
	<h3>Innovative preservation strategies</h3> <p>Thermal & non-thermal treatments (UV, plasma, HPP, etc.) Antimicrobials & biopreservatives Chlorine alternatives</p>
	<h3>Food biotechnology & fermentation</h3> <p>Strain collection Microbiome characterisation Pre/pro/postbiotics Process optimisation Precision & biomass fermentation</p>
	<h3>Sustainable food processes & packaging</h3> <p>Active coatings Food contact product validation Biomass stabilisation & conditioning Post-harvest solutions</p>
	<h3>Digital & AI tools</h3> <p>Artificial vision (NIR, Spectral tech) Data science & AI Process modelling & simulation Process efficiency & quality</p>
	<h3>Advanced food characterisation & 'omics'</h3> <p>Ingredient & product functional evaluation (<i>in vitro</i> & <i>in vivo</i> platforms, e.g. <i>C. elegans</i>) Metabolomics</p>
	<h3>Consumer studies & acceptance</h3> <p>EU-wide surveys, in-depth interviews & focus groups Market strategy SSH Online platform (>5k consumers)</p>

Our pilot equipment



Formulator | Autoclave | UHT lane and aseptic packaging | Microwave treatment. | Cold plasma

- Post-harvest treatments and operations
- Ready-to-eat products and cooked meals
- Manufactured meat and dairy products
- Fluid bed coater/dryer for encapsulation
- Active and smart packaging, ecodesign



Controlled atm. storage & drying rooms | Packaging and thermoforming eq.

- High-Pressure processing unit (HPP)
- Extrusion technologies (dry & HME extrusion)
- Fermentation processes (solid, liquid, precision) – from 50 ml up to 150 L bioreactors
- Sidestream valorisation (stabilisation, extraction, purification)



Dry/HME/cooking extrusion: 4x pilot extruders

- In vitro* digestibility platform
- HPLC and metabolomics platform
- ISO-compliant tasting rooms (sensory booths)
- Laboratories and whiterooms



Ultrasounds | Sidestream valorisation | 150L bioreactor



Extensive EU R&D funding expertise





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