

14th CDTI - NEDO Joint Workshop
“Food Technology”
May 27, 2026 Bilbao (Spain)



INGREDALIA:
CIRCULAR HEALTH:
NATURAL, SCIENCE-BACKED
INGREDIENTS FROM VEGETABLE BY-
PRODUCTS

Dr. Miguel Angel Cubero Márquez, PhD
Technical CEO
INGREDALIA, S.L.



Profile of Organization / Company

Who We Are

Ingredalia

A Spanish biotech company based in Navarra, in the heart of Spain's leading vegetable-growing region.

We develop and manufacture natural, science-backed functional ingredients derived from vegetable by-products using our proprietary microencapsulation technology.



Add in the industry & research founders



Europe, Asia · U.S. expansion underway



Pilot & commercial-scale production

NAVARRA
Spain

Ebro Valley Barcelona
Madrid

NAV — Ebro Valley Vegetable Supply

Spain is the EU's largest broccoli exporter — securing traceable, cost-stable raw material supply.

ingredalia
Improving Naturally



Profile of Organization / Company

Mission & Vision



Our Mission

To transform underutilised vegetable by-products into high-performance, science-validated functional ingredients that deliver measurable health benefits - reducing food waste while creating sustainable value.



Our Vision

To become the global reference for circular, bioavailable phytonutrient ingredients – setting the standard for ingredients that are effective, transparent, and beneficial for people, producers, and the planet.



Science-First



Circular



Transparent



Collaborative





Products, services, technologies of the company



What We Do – Market Verticals

Sulforaphan™ Smart and our ingredient portfolio address four high-growth markets where bioavailability and clinical credibility are key purchase drivers.



Nutraceuticals & Supplements

Premium metabolic, detox, cognitive & longevity products. Clean-label, clinically substantiated.



Foods & Beverages

Proven functionality integrated into everyday formats: beverages, gummies, fortified dairy alternatives.



Animal Health & Nutrition

Resilience, healthy aging, and performance support for companion animals and livestock.



Cosmetics

Skin defense, anti-aging actives, and antioxidant support via topical and ingestible beauty formats.



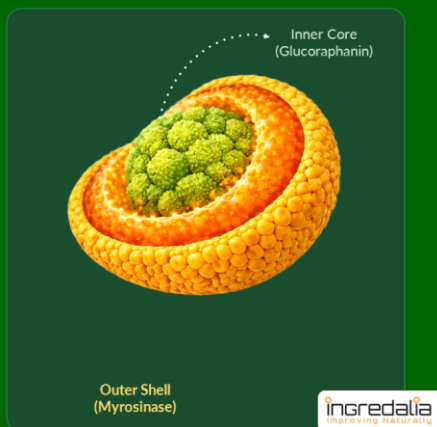
Products, services, technologies of the company

Product – Efficiency Advantage

Technology – Patented Microencapsulation

Bilayer Microcapsule Architecture

- Inner Core**
Natural concentrated broccoli extract (glucoraphanin) – the bioactive precursor
- Outer Shell**
Broccoli's own myrosinase enzyme, protected from stomach acid degradation
- Targeted Release**
Particle stable in stomach; disintegrates in intestine for site-specific activation
- Result**
Rapid local conversion to sulforaphane – maximising absorption efficiency



Why microencapsulation changes everything:

55%

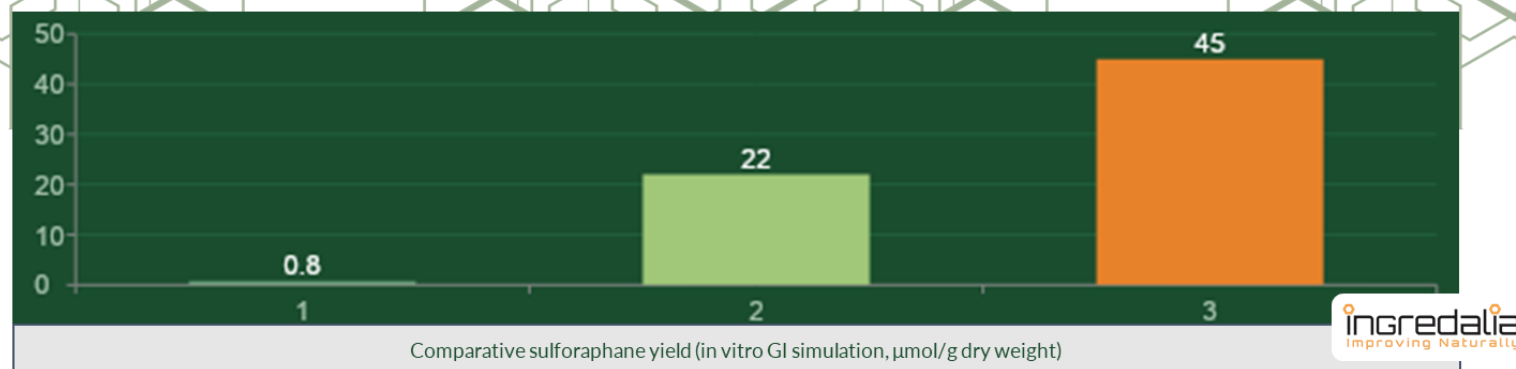
More sulforaphane vs. typical extracts

4000×

More efficient than eating raw broccoli

7×

Higher conversion (TGI simulation)





Products, services, technologies of the company

Technology – Competitive Advantages



Bioavailability by Design

Patented bilayer controls when and where bioactives activate – protecting through gastric transit, releasing at optimal site.



Clinically Meaningful Efficacy

High functional output at low doses. Demonstrated $\geq 7\times$ higher conversion vs. non-encapsulated in GI simulation.



Scalable & Cost-Effective

Produced from abundant vegetable side streams – reducing cost volatility while ensuring secure, traceable, scalable sourcing.



Format & Sensory-Ready

Works in capsules, gummies, liquids, and food matrices with minimal impact on taste, colour, or texture.

ingredalia
Improving Naturally



Main challenges and solutions in the project/case presented

Product – How it Works

Sulforaphane is the key active in Sulforaphan™ Smart - it is one of the most researched phytochemicals in food science, with over 3,000 peer-reviewed publications demonstrating its health benefits.



Metabolic Health

Supports glucose regulation and insulin sensitivity via NRF2 activation and AMPK pathway modulation.



Anti-Inflammatory Response

Activates Nrf2 antioxidant pathways, reducing oxidative stress and systemic inflammatory markers.



Neuroprotection

Supports cognitive function and healthy aging; shown to cross the blood-brain barrier in research models.



Detoxification Support

Enhances liver function and phase II enzyme activity, supporting endogenous detoxification capacity.

ingredalia
Improving Naturally



Main challenges and solutions in the project/case presented

Applications — Sectors & Product Types

Sulforaphan™ Smart integrates into a broad range of finished product formats across four key sectors, with full technical support from Ingredalia.



Nutraceuticals

- Capsules & tablets
- Softgels and sachets
- Gummies (taste-masked)



Food & Beverage

- Fortified beverages & juices
- Functional yogurts & dairy
- Protein & energy bars



Cosmetics

- Topical anti-aging serums
- Ingestible beauty supplements
- Skin brightening formulas



Animal Nutrition

- Pet supplement chews
- Livestock feed additives
- Veterinary nutraceuticals



Clinical Nutrition

- Paediatric health formats
- Medical foods & ONS
- Sports & metabolic recovery



Functional Honey

- Honey gel delivery format
- Natural confectionery formats

Ingredalia
Improving Naturally



Main challenges and solutions in the project/case presented

Clinical Data — Evidence Summary

Sulforaphan™ Smart is supported by a robust, multi-stage evidence base.

Human Trials

Ongoing RCT (Q1 2026): overweight/obesity & paediatric applications

Animal Studies

Rodent metabolic, liver, and neuroprotection models – all show statistically significant efficacy

In Vitro / Lab

GI simulation, Nrf2 assay, ORAC, stability – extensive characterisation completed

Literature Base

3,000+ peer-reviewed sulforaphane publications underpinning mechanistic rationale

Full scientific dossiers available to commercial partners upon NDA. Regulatory documentation available by market.

ingredalia
Improving Naturally



GOBIERNO DE ESPAÑA

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES





Ideas for a Japan – Spain collaboration

- ✓ Functional Ingredients for Healthy Aging
 - Co-development of natural bioactives ingredients targeting:
 - Healthy Aging
 - Beauty Aging
 - Metabollic wellness
 - Cognitive support
 - Combination of Japanese Biotech capabilities with Ingredalia's circular ingredient platform



Ideas for a Japan – Spain collaboration

- ✓ Circular bioeconomy and food sustainability
 - Joint valorization of vegetable side streams from Europe and Japan
 - Development of ingredients from agri-food by-products

- ✓ Science-backed nutraceuticals
 - Collaborative clinical and preclinical validation
 - Development of premium nutraceuticals and food products for Asian and European markets



Thank you for your attention

Contact information:

Dr. Miguel Angel Cubero Márquez, PhD / Manuel Rubio del Pueyo
Technical and Business Development CEOs
macubero@ingredalia.com / mrubio@ingredalia.com
+34 606 50 82 71 / +34 609 46 81 27