

NEW PERSPECTIVES IN TORTILLA PRODUCTION: ALTERNATIVE INGREDIENTS

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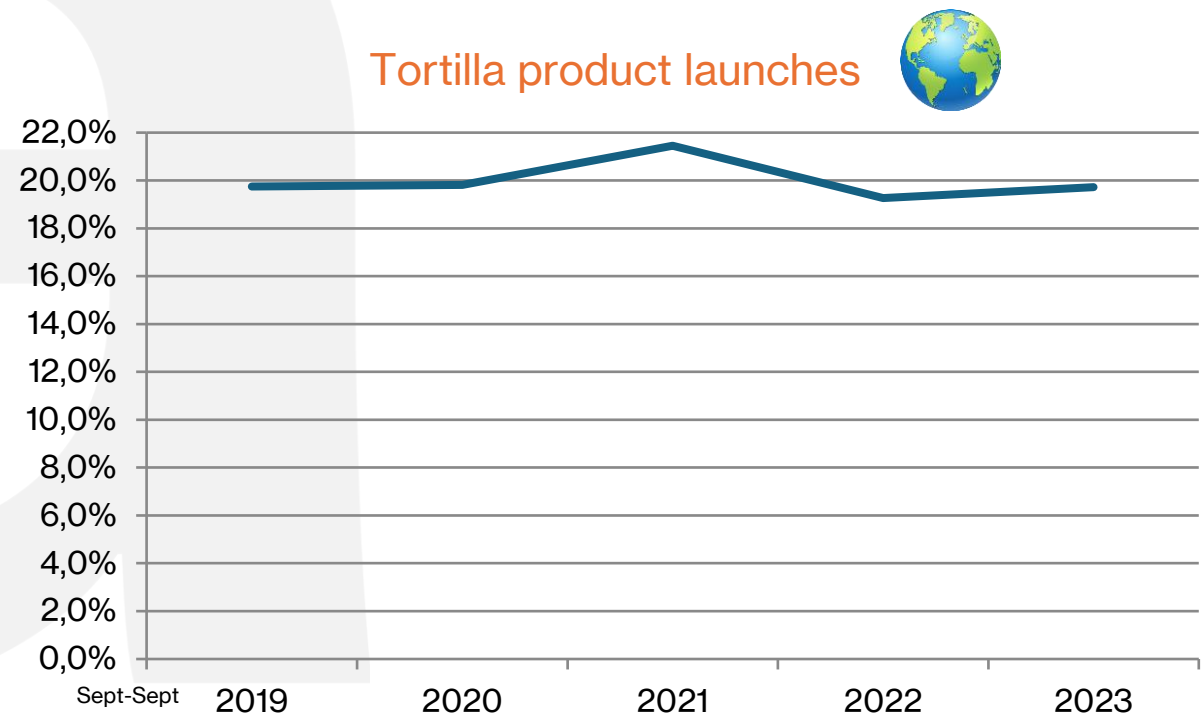
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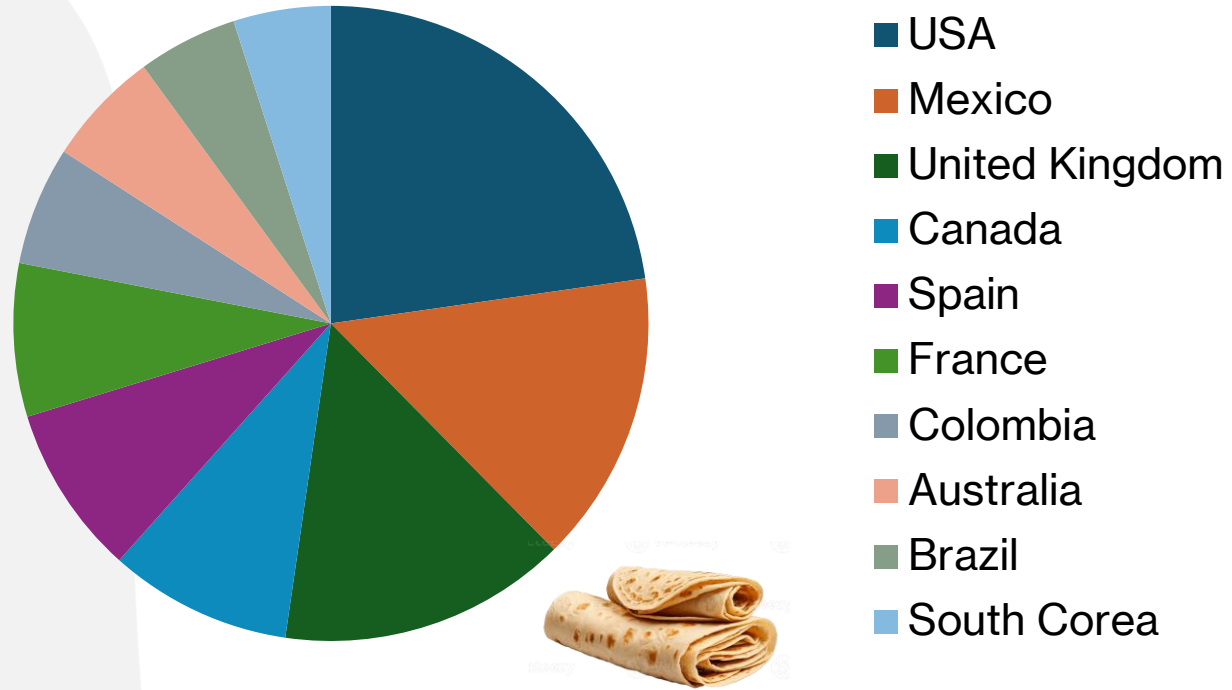
1. Tortilla Market insights

Over the last 5 years Tortilla product launches have remained stable over time, with a slight peak observed in 2021. Currently, a growth trend can be observed.



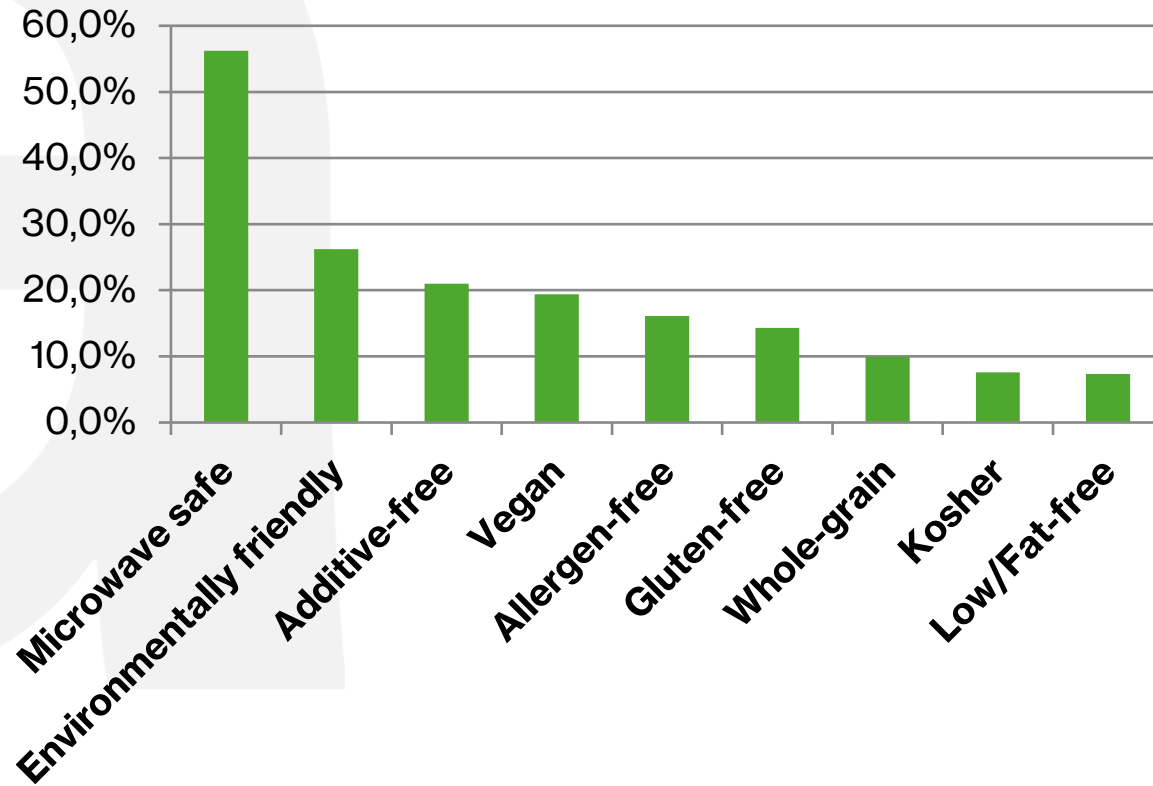
1. Tortilla Market insights

Top 10 countries with the strongest representation in the Tortilla Market

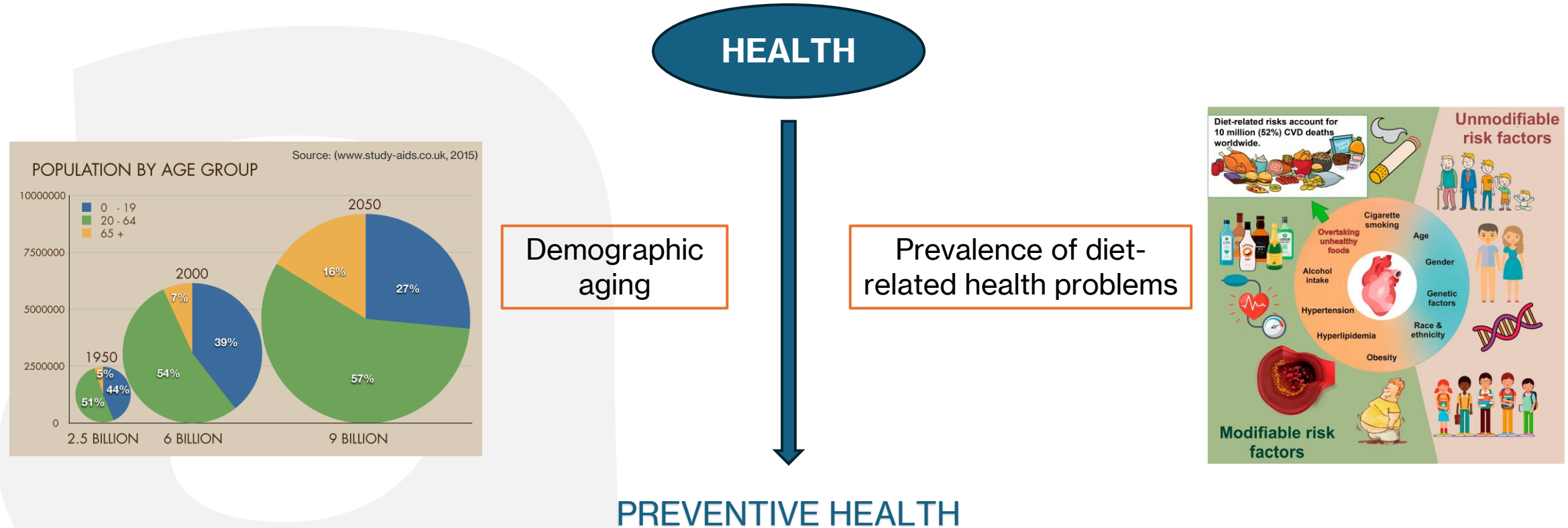


1. Tortilla Market insights

Main claims of Tortilla products launched between 2019 and 2024.



2. Alternative ingredients: Current trends



There is a need for consumers to adopt eating patterns that support their health in the longer term.

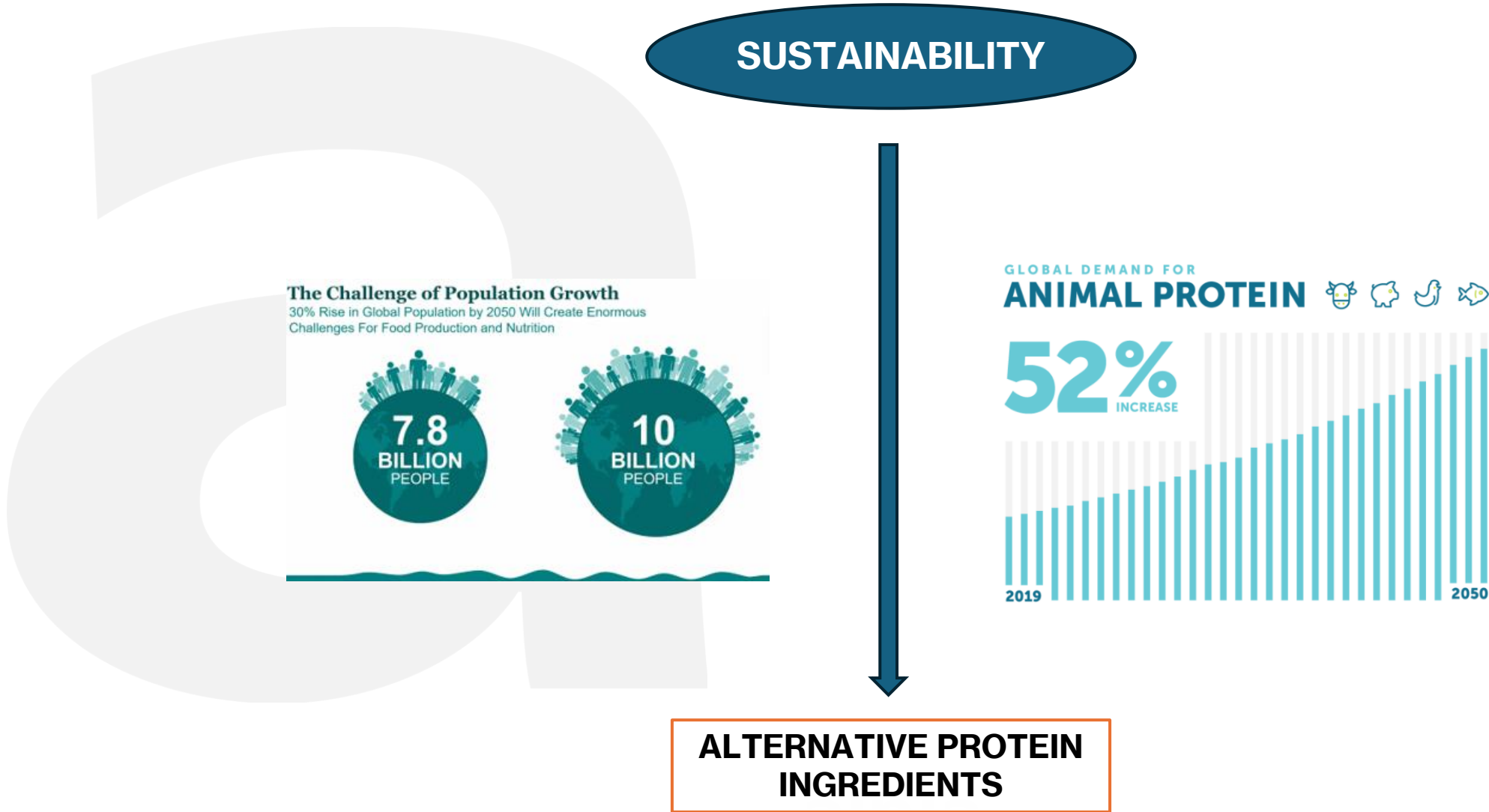
2. Alternative ingredients: Current trends

FOOD AS MEDICINE

- Represents the intersection of food and healthcare, where diet is used for the prevention and management of age- and lifestyle-related health conditions.



2. Alternative ingredients: Current trends



2. Alternative ingredients: Current trends

SUSTAINABLE AND GOOD TASTING INGREDIENTS

- Producers need to **diversify into more sustainable and environmentally friendly ingredients.**
- Sustainability alone cannot drive consumers to change their eating habits → Taste and Price also play a key role.



Shared responsibility

36%

of US consumers agree companies are responsible for improving sustainability, 34% individuals/consumers, and 27% governments

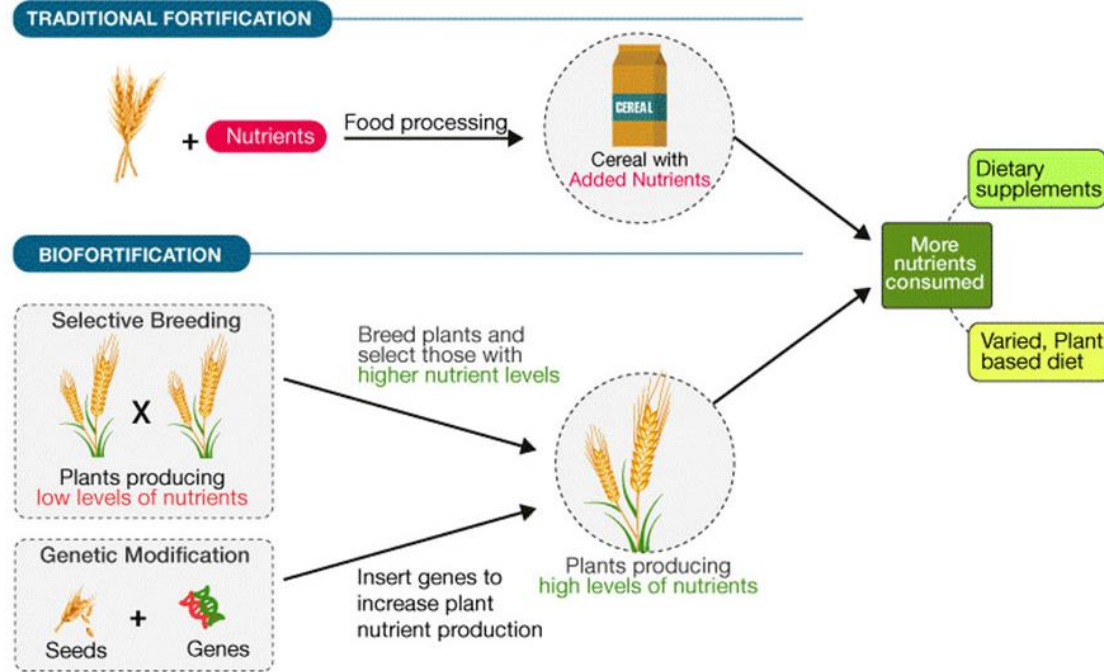
2. Alternative ingredients: Future trends

AI for the development of 'new' ingredients



2. Alternative ingredients: Future trends

Biofortification: Agricultural technology will deliver nutrients in 'novel' foods



3. Recent launches of Tortillas in the market

FOOD-HEALTH AXIS



3. Recent launches of Tortillas in the market

SUSTAINABLE AND GOOD TASTING INGREDIENTS



3. Recent launches of Tortillas in the market

FORTIFIED TORTILLAS

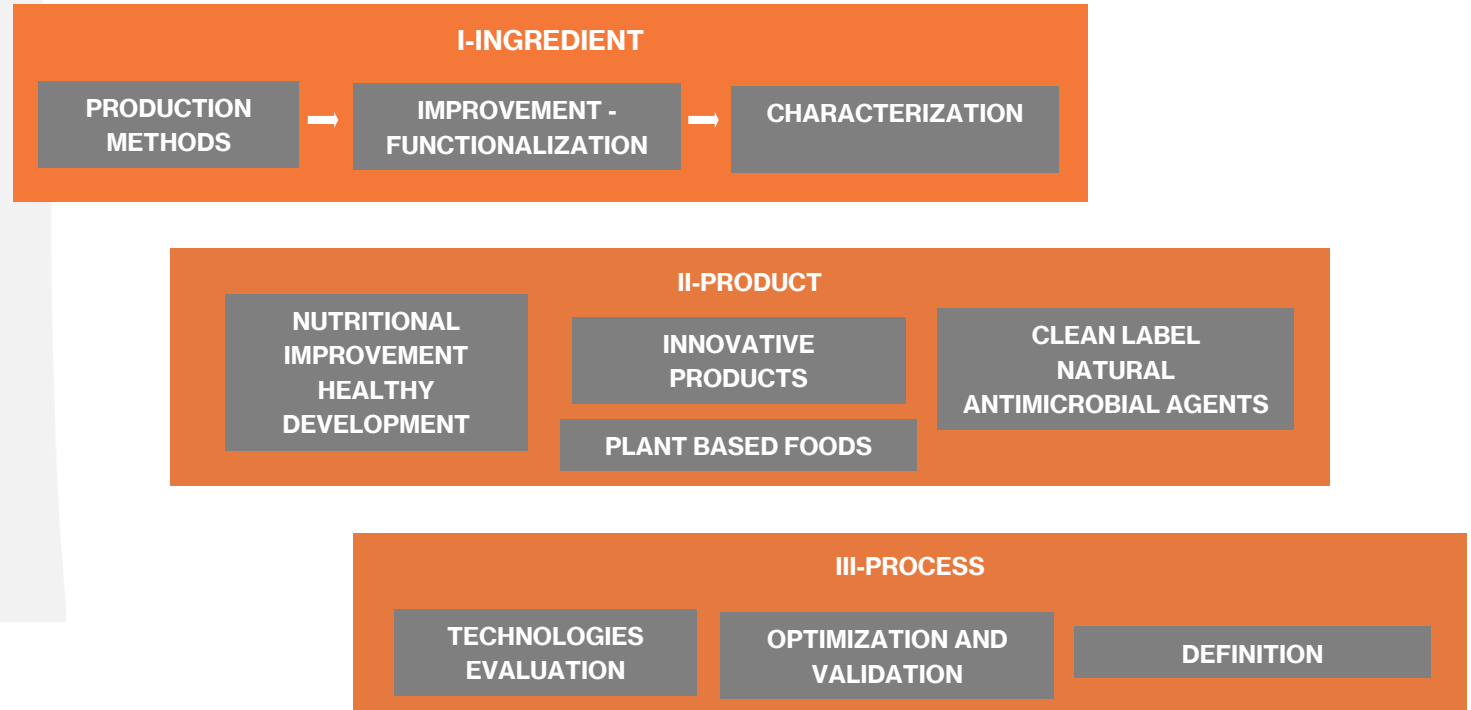


4. Research & Development & Innovation

AINIA'S CAPABILITIES



- ✓ Technologies for ingredient and product development
- ✓ Definition and improvement of industrial processes



4. Research & Development & Innovation

AINIA'S CAPABILITIES



WHAT WE CAN DO...

- ✓ Development of healthy products with **specific benefits**. **Functional validation** of new products and ingredients. Development and validation of ingredients and products for **specific groups or needs**. **Nutritional improvement**.
- ✓ Development of **new textures**.
- ✓ Evaluation of the incorporation of **novel ingredients**. **Matrix interaction**.
- ✓ Development of **convenience products** (ready-to-eat, microwave preparation, air-fryer, etc). New presentation formats and/or product line extension.
- ✓ Development of **clean label products**. Natural antimicrobials.
- ✓ Development of **plant-based products**: meat, fish, dairy analogues...

4. Research & Development & Innovation

AINIA'S CAPABILITIES



MICROBIAL SPOILAGE

Tortillas are mainly affected by the presence of moulds that emerge during the shelf life of the product.



- ✓ Identification and diagnosis of the occurrence of moulds during the product shelf life and application of **preventive measures**.
- ✓ Application of **natural /novel preservatives** to prevent mould spoilage
- ✓ Development of **kinetic models** to define the effect of factors combination (pH, aw, atmosphere, preservatives) to extend shelf life.
- ✓ Application of ad hoc solutions to **inactivate and/or monitor moulds** in the factory environment.

4. Research & Development & Innovation

AINIA'S CAPABILITIES



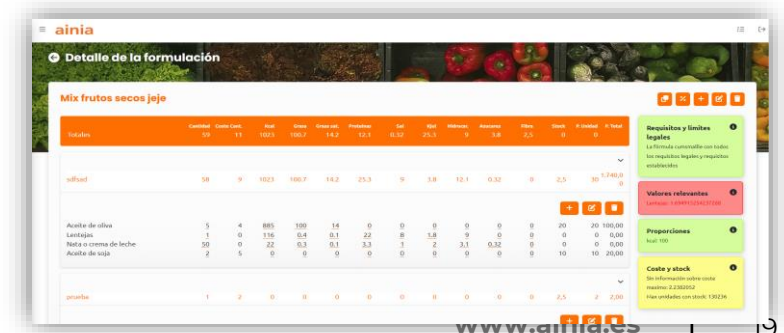
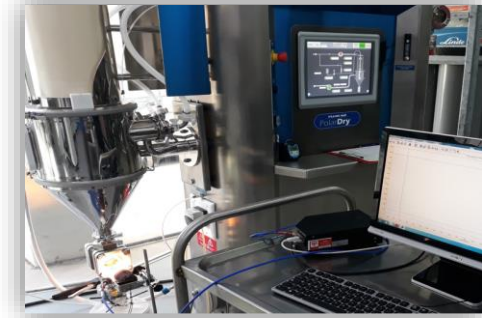
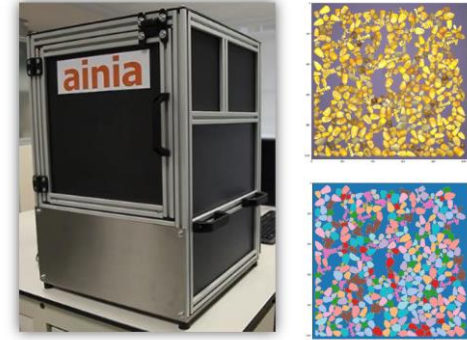
APPLICATION OF DIGITAL TECHNOLOGIES IN TORTILLAS PRODUCTION

- Quality control of **ingredients**
- **Process** optimization - Quality control in production
- Integrity control in the **packaged product**



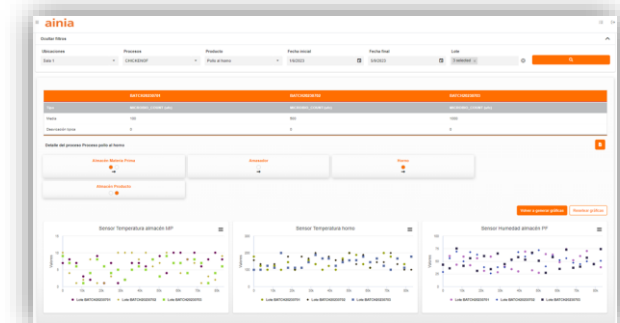
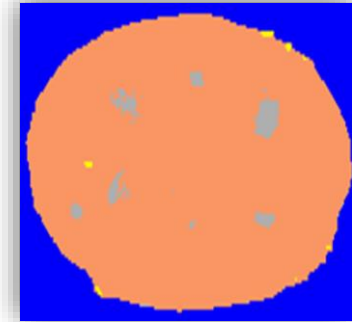
4. Research & Development & Innovation

- VISpector:** Automates quality control in ingredients using machine vision and AI. It is able to analyze very quickly the particle size, defects, amount of foreign matter, color, etc.
- NIRSpector:** Infrared spectroscopy solution able to analyze and characterize samples (protein, carbohydrate, fat, moisture) in real time and non-destructive way.
- NPD (New Product Development):** Software solution to streamline the processes associated with new product development, optimizing the steps from product ideation to validation before starting production on an industrial scale



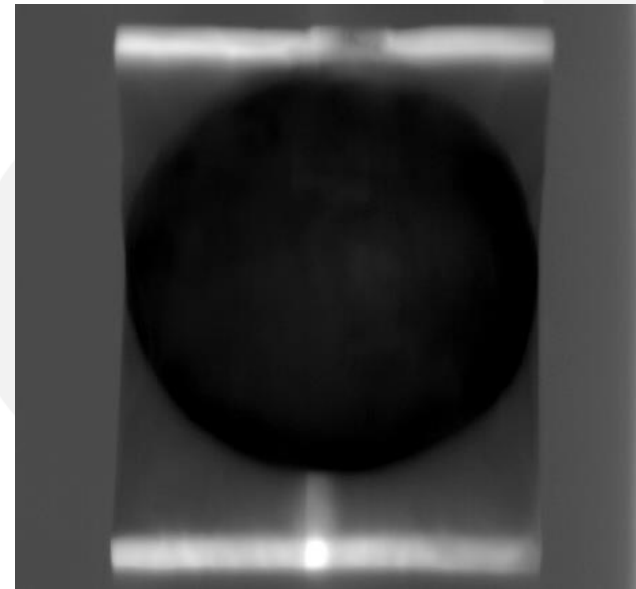
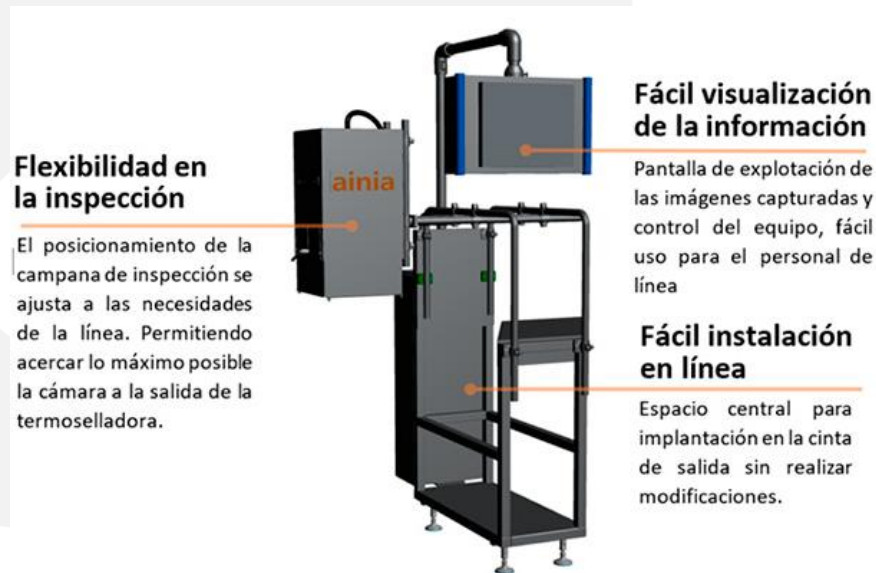
4. Research & Development & Innovation

- **CHEMinspector:** Solution for the measurement of chemical and physical properties of the products (tortillas) in real time using hyperspectral vision. Generates a chemical and physical map of each tortilla to ensure it meets quality specifications. In real time and non-destructive way.
- **Advanced Vision Digitalization:** Solution based on Artificial Vision and Deep Learning to analyze the shape, color, roughness and texture of the tortilla thanks to the use of color image sensors and 3D.
- **Digital Food Factory:** Agri-food software solution to collect and analyze through AI and Big Data techniques a large amount of data from different sources (ingredients, suppliers, manufacturing conditions, machine parameters, quality parameters, laboratory results, etc.) to predict quality, shelf life, risk of microbiological contamination, etc.



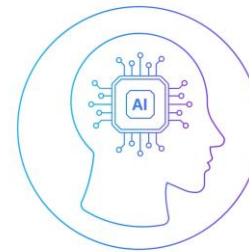
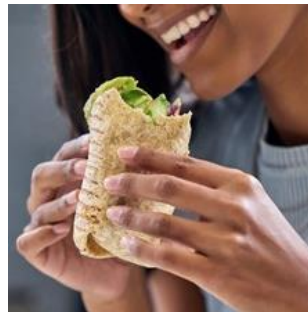
4. Research & Development & Innovation

- **TERMOseal:** Patented solution that uses thermography and artificial intelligence to identify imperfections in the weld seam of plastic containers, whether visible or not. This system allows to identify if there is any defect that allows the passage of air and the contamination of the product causing a reduction of its shelf life. This technology allows inspections of 100% of production to be carried out in real time.



5. Conclusions

- ❖ **The connection between what we eat and our health is becoming increasingly relevant.**
- ❖ **Focus on sustainable ingredients that taste good.**
- ❖ **Novel tech may revolutionize food production.**



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