Fernando A. Mendoza

Senior Food Quality Expert | Food technologist | Project Manager

Professional Overview

Strong analytical professional and experience in food science and technology, food safety and quality evaluation of food materials, with a strong academic background developing instrumental, sensorial and sensing techniques for testing external and internal properties of raw, semi-processed and finished fresh produce. Specialized in food quality and processing, non-destructive sensing methodologies, data analysis and modelling for advanced food quality characterizations, end-use quality prediction, shelf-life and their relationships with physicochemical, safety, sensorial and nutritional properties.

Key Skills

- **Property characterization** and **quality assessment** of fruits and vegetables implementing **physicochemical, microbiological** and **sensorial** methods, as well as developing **quality standards** and **shelf-life prediction** models for validating and creating product news and claims.
- Extensive experience **designing, planning** and **executing** food tests for evaluating concepts, initiatives, food prototypes and new formulations. Physicochemical and sensorial indicators are used for characterizing the end-use properties of foods as well as the effects on consumer acceptance due to composition, processing and storage.
- Extensive experience **leading R&D teams, research projects** and optimizing **processing lines** at the food industry.
- Extensive experience implementing non-destructive **sensing methods** based on imaging colour, NIR spectroscopy and hyperspectral imaging for predicting **end-use quality** properties and assuring **food safety** and **freshness.**
- Experience and knowledge in **food safety** and **preservation, product development** and **verification,** and the development of **pre-requisites, product specifications** and **documentation** for assuring food safety and quality.
- Extensive experience working in **data analysis, machine learning, protocol development** and **technical documentation** for the quality assessment of foods and the optimization of food production lines.
- Experience working in the implementation and application of the **HACCP management system** for ensuring **manufacturing quality** and **food hygiene safety procedures** and **practices** at the food industry.

Professional Experience (since terminal degree)

SENIOR INNOVATION EXPERT – Food Science Area Competence Manager **Jul 2017 – Jun 2023**
Global Advance Development Food Preservation, AB Electrolux, Sweden.

- Led and guided the food science area within the AD Food Preservation. Led the functional compartments network of R&D resources sharing project information, test standards and Technical Road Maps content to internal stakeholders and board of directors.
- Developed the lab sources in the AD Food Laboratory and within the Global R&D organization.
- Conducted and designed experimental tests and data analysis to validate refrigerator prototypes, compartments, food packages and new marketing claims on food freshness and sensorial quality.
- Developed test protocols, quality indicators and standard quality charts for the freshness scoring of fruits, vegetables and meats, and implemented sensors for measuring the performance and impact of new cooling systems on food freshness and safety.
- Based on factorial experiments, objectively demonstrated the benefits of a *low intensity light module* for preserving the freshness and nutritional value of spinach leaves stored in crisper drawers for up to 13 days.

- Developed shelf-life prediction models for fruits, vegetables, meats, milk and orange juice stored in domestic refrigeration conditions with prediction errors lower than one day. All these procedures and tools are currently used to objectively create and validate marketing claims, reduce and calculate food waste; and moreover, to satisfy the consumer demands developing new systems and concepts for food preservation.

ASSOCIATE RESEARCHER **Feb 2014 – Jul 2017**

Department of Plant, Soil and Microbial Science, Michigan State University, USA

- Responsible of the project: *Prediction of end-use quality of bean seeds using optical sensing techniques*.
- Developed *Standard Sensory Quality Charts* for rating colour and appearance of canned black beans.
- Developed and implemented imaging colour, NIR spectroscopy and hyperspectral imaging methods and protocols for the fast phenotyping characterization and evaluation of physicochemical, sensorial and nutritional properties of dry bean genotypes before and after processing (storage/cooking/ canning).
- Developed robust machine learning models with accuracies higher than 83% for predicting from intact dry bean seeds the end-use quality of sensory rates (colour and appearance), texture (firmness), mineral concentration and cooking time.

RESEARCH AGRICULTURAL ENGINEER – ARS/USDA **Jun 2009 – Nov 2013**

Biosystems and Agricultural Engineering Department, Michigan State University, USA

- Responsible of the project: *Quality Evaluation of apple fruits using non-destructive optical sensors*.
- Developed and implemented Vis/NIR spectroscopy, hyperspectral imaging and multi-sensor data fusion techniques for predicting apple quality and maturity. Prediction models for three varieties of apples (using more than 3000 apples per variety) tested with independent set of samples showed predictions accuracies higher than 90%.
- Developed classification models for sorting apples by flesh firmness (firm/soft), sugar content (sweet/non-sweet) and the combination of both attributes based on VIS/NIR spectroscopy and spectral scattering measurements. Classification models tested with independent set of samples showed performances higher than 83% for sorting apples with premium firmness and sweetness.

PROJECT MANAGER / POSTDOCTORAL FELLOW RESEARCHER **Nov 2006 – Jun 2009**

Biosystems Engineering Department, University College Dublin – UCD, Ireland

- Responsible of the project: *Quality characterization and assessment of pork hams using machine vision*.
- Developed non-destructive imaging techniques for characterizing the quality of cooked hams prepared with different formulations.
- Developed quality indicators for evaluating the colour, overall appearance, surface topography, sensorial and mechanical properties of cooked hams due to composition and processing conditions.

AGRICULTURAL RESEARCHER **May 2005 – Oct 2006**

Laboratorium voor Naoogsttechnologie, K.U. Leuven, Belgium

- Developed a methodology for the quantitative pore network characterization and 3-D visualization of apple and pear tissue at micron resolution using X-ray computed tomography. The procedure was used and extended for modelling in 3-D the moisture and gas transport kinetics of these fruits during cold storage.

Education

Ph.D.	Science in Chemical Engineering and Bioprocess, *Pontifical Catholic University of Chile*, Chile
M.Sc.	Food Technology, Minor: Microbiology, *University of Santiago*, Chile
Eng.	Food Industry, *National Agrarian University – La Molina*, Lima, Peru
B.Sc.	Food Industry, *National Agrarian University – La Molina*, Lima, Peru

(Academic records and Degrees accredited by the Int. Education Research Foundation, Inc. / IERF #R0900492/abz)

Additional Information

- ISO 22000:2018. Food Safety Management System – Requirements for a food sagety management system applicable for any organization in the food chain (**2023**). *Udemy* online course, 60 Lectures, 5 total hours.
- Certification in Food Safety and HACCP. HACCP Training & Certification at Michigan State University. Department of Food Science and Human Nutrition. The International HACCP Alliance (**2015**).
- Authored 40 scientific research papers published in ISI journals and 4 book chapters in food quality and technology.
- Fluent in English and Spanish.
- Advanced knowledge of Microsoft Office, Teams, MATLAB software, statistical, experimental factorial design and data modelling packages.
- Outside of work I keep myself fit and active and regularly participate in outdoor activities including jogging in nature and soccer games. I am also an active member of the *Spanish Catholic Mission* in Stockholm and President of *the Legion of Mary* praesidium for Spanish speakers who serves on a voluntary basis through the Catholic Church (from **2017 until now**).
- Swedish citizen