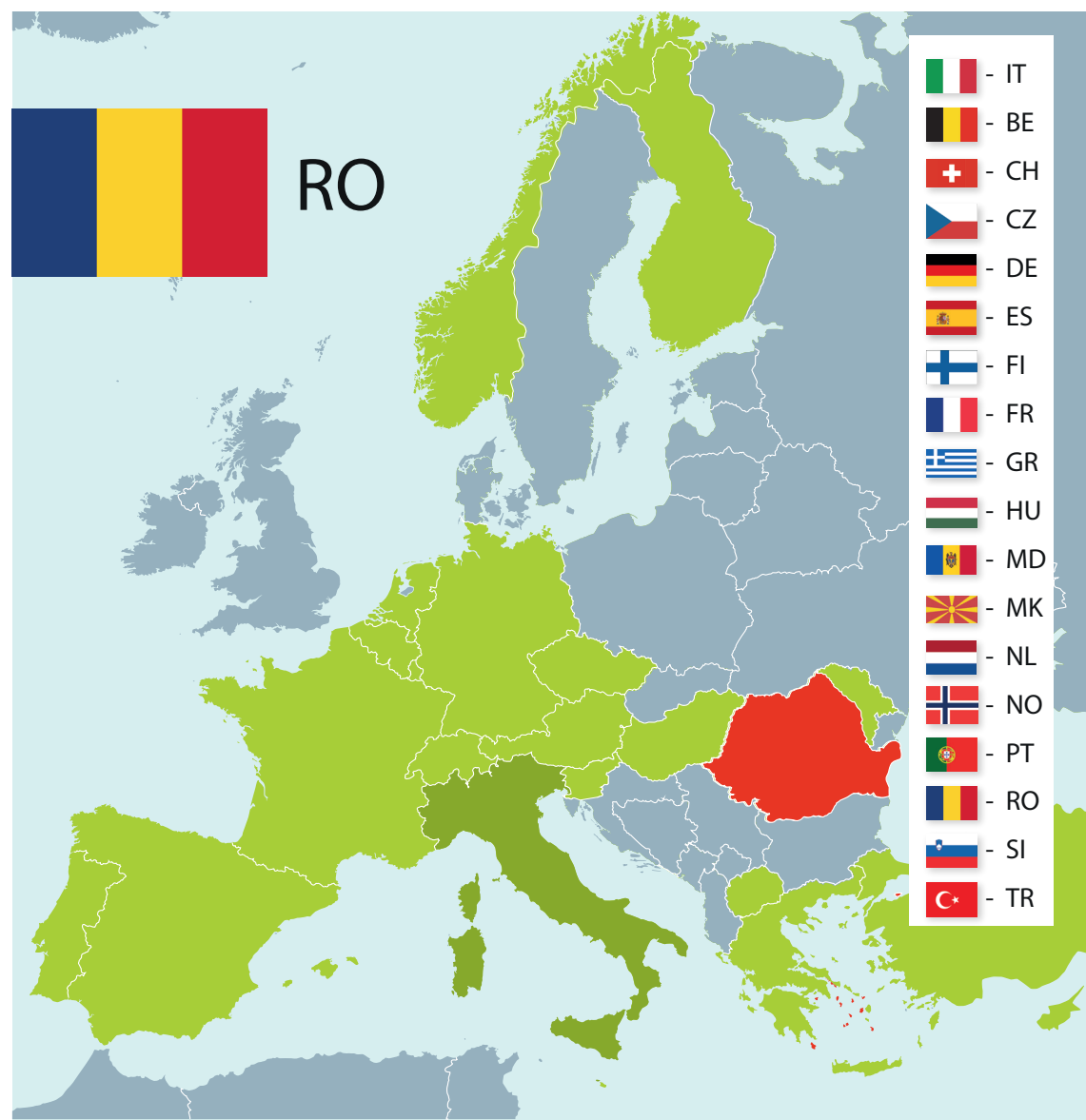


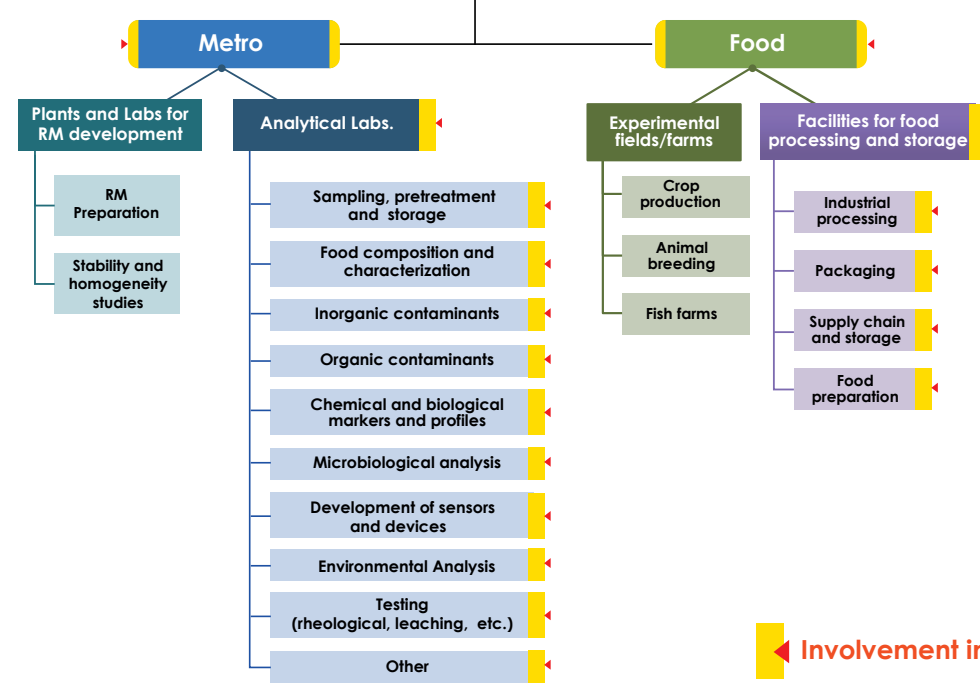


The Romanian Node of METROFOOD-RI

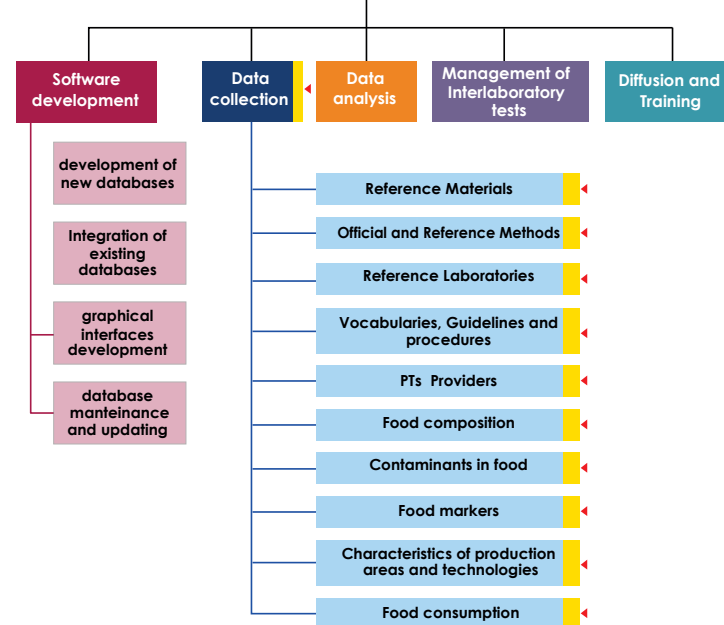


INFRASTRUCTURE FOR PROMOTING METROLOGY IN FOOD AND NUTRITION

Physical-RI



e-RI



Involvement in the Infrastructure

To enhance quality and reliability of measurement results

To make available and share data, information and metrological tools

To enhance scientific excellence in the field of food quality & safety

To strengthen scientific knowledge, promoting scientific cooperation and integration



Pre-existing value:
• 6.625 k€, out of which 20% (1.325 k€) put at Metrofood's disposal

Involved researchers:
• 64 units (5.5 FTE)

Research Areas:

- Sampling sample preparation and storage, Food composition and characterization, Inorganic contaminants, Organic contaminants, Chemical and biological markers and profiles, Microbiological analysis, Allergen testing, Analysis related to food contact materials, Rheology testing, Microbiological analysis of potable water, shelf life determination, sanitation evaluation etc., PCA analysis (e-nose)

MINISTERIAL SUPPORT

The Ministry of Research and Innovation.

METROFOOD-RI has been officially quoted in the Roadmap in Romania (pages 39 and 19).

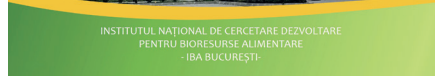
PARTNERS



Institutul National de Cercetare-Dezvoltare pentru Bioreurse Alimentare – IBA Bucuresti / National Research & Development Institute for Food Bioreources – IBA Bucharest

The National Research&Development Institute for Food Bioreources – IBA Bucharest is a public research organisation, in coordination with the Ministry of Research and Innovation, conducting food and nutritional research, product and technology development but also food S&T services for food industry. IBA holds ISO17025 accreditation for assessing Quality and safety of foodstuffs and functions as a national reference laboratory on several food safety and quality issues (e.g. GMOs, annual wheat crop quality, cereals quality so on) and as a notification body on others (e.g. food supplements). IBA plays an important role in developing national food policies, as it provides the Ministry of Agriculture and Rural Development (MADR) and the National Sanitary Veterinary and Food Safety Authority (ANSVSA) with expert advice. IBA has developed into an industry-oriented research organisation, accessing both public funding, via grant competitions, and private funding, through industry funded product/technology development projects. IBA has invested significantly in research infrastructure during the last five years, accessing nearly 10 M€ of European funds, via the SAPARD and SOC IEC programmes.

IBA has been participating in different national and European projects (over 100 in the last 10 years). At European level IBA was involved in projects within different EU programmes such as: FP5, FP6, FP7 and H2020, Leonardo da Vinci, Erasmus +, Socrates/Erasmus, Health Programme, SEE Transnational Programme, Eureka, Bilerals and ERA NET.



www.bioreurse.ro

Physical Facilities

Human Nutrition Lab is carrying out research activities in order to: design concepts, scientific and technological solutions to achieve healthy food for the prevention of consumers against Non-Communicable Diseases; develop performant methods for detection and quantification of biologically active compounds (fat and water-soluble vitamins, carotenoids, anthocyanins etc.) from food products and for analysis of total phenolic compounds and antioxidant capacity. Main equipment: HPLC-DAD; HPLC-Hybrid Ion Trap-Orbitrap MS; UV-Vis Spectrometer; Rotary evaporator; Nitrogen evaporator; Water purification system for HPLC-ELGA etc.

The main activity of **Food Chemistry and Colloidal Biochemistry Labs** is based on food quality: food composition with respect to energy, amounts and types of carbohydrates (sugars, starch and dietary fiber), proteins and amino acids, lipids and fatty acids, vitamins; chemical changes by lipid oxidation process; the control of colloidal stability during thermal processing; rheological measurements in food products; analysis of starch properties (gelatinization, retrogradation, damage); thermal transitions in food products; enzymatic methods in food characterization; protein and starch digestibility; rheological properties of dough; influence of additives (enzymes, gluten, starch) over flour quality; raw material diversification for bakery industry; shelf-life of food products. Main equipment: rheometer HAAKE MARS; DSC; Mixolab.

Food Packaging Lab is performing research activity in the field of food contact materials and food safety (contaminants). Overall migration and specific migration from food contact materials (plastic, paper/board, ceramic, glass, metal) into food simulants according to national and European legislation, heavy metals in food contact materials, heavy metals and minerals in food products, mechanical and barrier properties of flexible food packaging films are the main analyses conducted by the laboratory staff. Consultancy and professional training in food packaging are also provided. Main equipment: GF-AA5, HR-CS-AA5, ICP-MS, Instron Dual

Analytical Labs

column mechanical testing system, Manometric gas permeation analyzer, Water vapor permeation analyzer, Ion-chromatography system, Microwave digestion system.

The main activities of **Chromatography Lab** are: development, validation and accreditation of chromatographic methods such as fatty acids in foods, cis / trans isomers of methyl esters of oleic, linoleic and linolenic acids from chips and French fries, acrylamide from cereals and potato based products; experimental studies on the influence of some factors (raw material, recipe, technological process etc.) on the formation of acrylamide from bread, biscuits and other similar products; analysis of the composition of essential oils. Main equipment: GC-MS, GC-MS/MS, HRGC/HRMS, SPE, Hydrolysis unit.

Nuclear Magnetic Resonance Lab has the main research activity: development of specific procedures for fingerprinting of plant volatile oils by NMR and IR spectroscopy; development of specific procedures for determination of the lipid profile of vegetable and animal fats from food products, determination of the major compounds in volatile oils from medicinal and aromatic plants, determination of major compounds in wine by 1H-NMR spectroscopy. Main equipment: 400 MHz NMR Spectrometer (Bruker).

Sensory Evaluation Lab has the central role in fundamental research studies regarding the consumers preferences and acceptability for foods. The most common used tests are: descriptive tests and hedonic tests for evaluation of different food products. Main equipment: Sensory evaluation area (6 testing booths equipped with different lights, sink, PC and dedicated software Eye Question); Multisensor system for food quality control and food frauds detection (Prometheus); Texture analyzer for characterization of the texture of food products etc.

The main research activity of **Molecular Biology Lab** is consisting in studies for the identification and quantification of GMOs and microorganisms using molecular biology techniques; identification of

plant varieties and animal breeds; role of nutrients in modulating gene expression; identification and analysis of genetic markers. Main equipment: Real-Time PCR CorbettRotorGene6000, Real Time PCR System iQ5-BIO-RAD, Electrophoresis unit.

Microbiology-ELISA Lab is performing research activity in the field of: incidence of pathogenic microorganisms in food; determining the shelf-life of the food products; mycotoxins, allergens, antibiotics, vitamins in cereals, feed and food using the ELISA method; development and implementation of systems to reduce microbial contamination; sanitation and food hygiene tests for food processing units (technological flow, work equipment, packing materials, personnel). Main equipment: Autoclave, Microscope, Incubators with and without cooling, Refrigerator, Bacteriological laminar flow box, Ultra-centrifugal mill, MicroFoss rapid testing system, Semi-Automated Microbial identification system (Biolog).



PILOT PLANTS

Pilot Plant - Fruits and vegetables processing main equipment: Cutting machine, Colloidal mill, Cooking Kettle with stirrer, Cooking Kettle, Pulper refiner, Semi-automatic system for dosing and sealing containers, Dehydration system using DIC Technology (Instant controlled pressure drop), Electric dryer for fruits and vegetables dehydration, Steam generator, Refrigerators, Freezers, etc. Research activities are consisting in new canning, drying, so on technologies, optimisation of the old ones, designing of new fruits and vegetables foods with specific nutritional values for different consumer needs, so on. **Pilot Plant** - Cereals and Flours Processing main equipment: Electrical deck oven with two baking chambers and proofer, Electrical rotary oven with proofer, 2 electrical deck ovens, Spiral mixer MX 50, Dough divider, Manual dough divider and roller, 3 Dough mixers, Long and small pasta presses, Biscuit production machine-Janssen, Long shape machine for bakery, Pasta dryer, Laboratory mill, Bühler MLU 202 laboratory mill, Brabender mill, Stand-alone Extruder KE 19, Whole cereals mill. Besides the experiments within the research projects, the pilot plant has a small production for gluten free and phenylketonuria food products.

Pilot Plant - Meat Processing main equipment: Electric grinder, Bowl cutter, Vacuum filling machine, Semi-automatic clippers, Paddle mixer, Knife sterilizer, Raw – dehydrated installation, Tenderizer, Meat injector, Tumbler, Ice flake machine, Boiling smoking cell 1 frame, etc. Reformulation of new meat products through national research project was envisaged. A method of analysis of meat products texture was developed.



Electronic Facilities

- ▶ Data Base / Data Calculation
- ▶ Calculation / Data Processing
- ▶ Modeling / Data Integration
- ▶ E-learning platforms
- ▶ Other e-facilities

Software & Servers

ANALYTICAL CAPACITIES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
OTHER ANALYTICAL CAPACITIES	MATERIALS		AGROECOSYSTEM				NUTRITION		AUTHENTICITY TRACEABILITY				FOOD QUALITY				FOOD SAFETY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Ceramic materials and composites	Plastic materials	Air pollution	Wet & Dry depositions	Bio-availability studies	Soils and sediments characterization	Surfaces and groundwater quality characterization	Vitamins	Carbohydrates	Fatty acids	Proteins and amino-acids	Water	Minerals	Other	Genetic markers	Metabolic profiles	Elemental profiles	Rare Earth Elements	Sensor profiles	Trace elements	Non target analysis	Isotopes of heavy elements	Isotopes of light elements	Other	Microbiological analysis	Molecular	Autofluorescence	Biological analysis	Bioactive compounds	Physico-chemical analysis	Nutritional quality	Organoleptic properties	Other	Radiolabeling	Foodborne viruses and Phages	Pesticides	Phenols	Hydrocarbons	Biotransformation	Biosensors	Biogenic amines	Nanomaterials	Pathogenic micro-organisms	GMO	Food contact materials (migration)	Adaptogens	Other toxins (marine, freshwater, bacterial,...)	Mycotoxins	Veterinary drugs	VOCs	Pesticides	Chemical speciation	Trace elements																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

