

Department of Food & Nutrition

Tel : +82 2 961 0260 | Fax : +82 2 961 0261 | E-mail : food@khu.ac.kr | URL : <http://www.che.khu.ac.kr/food>

Graduate study in the Department of Food and Nutrition at Kyung Hee University offers a strong academic program through a variety of courses and research activities in food science and nutrition. Many diverse research opportunities are available as a graduate student. The students have access to excellent research facilities including food safety, food analysis, food processing and packaging, food microbiology and immunology, molecular nutrition, human nutrition, and nutritional epidemiology laboratories. After graduation, students are prepared for scientific and technical careers in the industry, educational institutions, government agencies, and health care facilities.

| Degree Requirements |

- At least 24 course units are required for the master's degree and 36 course units for the doctoral degree in the graduate level of Food and Nutrition coursework.
- Students are required to pass the qualifying examination, defend their thesis or dissertation, and submit a hard copy of their thesis or dissertation for the degree.
- For the master's degree, the student must submit a research paper to an accredited journal of the National Research Foundation of Korea or the SCI(E) for publication. For a doctorate degree, the student must publish a research paper to a journal in the SCI(E).

| Courses |

Advanced Human Nutrition, Carbohydrate and Lipid Chemistry Metabolism, Techniques in Nutrition Research, Protein Foods, Advanced Food Preparation, Cereal Foods, Food Rheology, Food Safety, Special Topics in Food Chemistry, Food Service System Management, Special Topics in Food Processing and Preservation, Research in Food Preservation, Nutrition Education, Nutritional Epidemiology, Ecology of Nutrition, Food Quality Evaluation.

| Faculty |

- ___ Ja-Yong Chung, Ph.D. Tufts University, 2001, Professor, Molecular Nutrition, jchung@khu.ac.kr
- ___ Ki-Sun Yoon, Ph.D. University of Rhode Island, 1990, Professor, Food Safety and Quality, ksyoon@khu.ac.kr
- ___ Yunsook Lim, Ph.D. Ohio State University, 2003, Professor, Human Nutrition, [ylim@khu.ac.kr](mailto:yylim@khu.ac.kr)
- ___ Youjin Je, Sc.D. Harvard University, 2012, Professor, Nutritional Epidemiology, youjinje@khu.ac.kr
- ___ Yoon Hyuk Chang, Ph.D. Michigan State University, 2008, Professor, Food Analysis, yhchang@khu.ac.kr
- ___ Jun Tae Kim, Ph.D. Rutgers University, 2007, Professor, Food Processing and Packaging, jtkim92@khu.ac.kr

- ___ Yunju Jeong, Ph.D. Seoul National University, 2019, Food Microbiology and Disease Immunology, yjeong24@khu.ac.kr
- ___ Jong-Whan Rhim, Ph.D. North Carolina State University, 1988, Emeritus Professor, Food Packaging and Engineering, jwrhim@khu.ac.kr
- ___ Myung-Joo Han, Ph.D. University of Tennessee, 1989, Emeritus Professor, Food Fermentation, mjhan@khu.ac.kr
- ___ Soottawat Benjakul, Ph.D. Oregon State University(USA), 1997, Professor in Prince of Songkla University(Thailand) (Eminent Scholar), Food Science and Technology, soottawat.b@psu.ac.th
- ___ Giuseppe Valacchi, Ph.D. University of Siena(Italy), 2003, Professor in North Carolina State University(International Scholar), Cellular Physiology, gvalacc@ncsu.edu
- ___ Swarup Roy, Ph.D. University of Kalyani(India), 2016, Assistant Professor in Lovely Professional University(India) (Eminent Scholar), Food Technology Nutrition, swaruproj2013@gmail.com

| Laboratories |

FOOD SCIENCE

■ Food Safety and Quality Laboratory

Director : Ki-Sun Yoon(ksyoon@khu.ac.kr)

Our laboratory is engaged in basic and applied research to enhance the safety and quality of food. Current research focuses on microbial safety and quality of refrigerated and frozen foods. Long-term research projects include control of stressed and injured pathogens, development of predictive microbial model and its application in microbial risk assessment(MRA), development and validation of HACCP, and risk-based food safety education and management.

Ongoing Research Projects

- Hazard analysis and microbial risk assessment
- Application of risk ranking tool for food safety management
- Development and validation of a predictive model for food borne pathogens
- Development of HACCP and validation
- Control of stressed and injured pathogens on processed foods.
- Quality evaluation of minimally processed, fresh-cut produce, and extension of shelf life
- Control measures of pathogenic microorganisms to enhance the safety and quality of foods

■ Food Analysis and Ingredient Development Laboratory

Director : Yoon Hyuk Chang(yhchang@khu.ac.kr)

Our primary goal is to analyze the structural, rheological, and physicochemical properties of native and modified polysaccharides. In addition, our research activities include the development of microcapsule and hydrogel systems that can be applied in biological fields.

Ongoing Research Projects

- Structural, rheological, and physicochemical properties of polysaccharides.
- Modification of polysaccharides to improve emulsifying, rheological, and antioxidant properties.
- Utilization of polysaccharides for thickening agent and coating material of microencapsulation.
- Development of food ingredients for prebiotic and anti-inflammatory activities using synbiotic micro-based hydrogel.

■ Food Processing and Packaging Laboratory

Director : Jun Tae Kim(jtkim92@khu.ac.kr)

Performing research on the development and application of active and intelligent food packaging materials including nanoparticles, carbon quantum dots, metal-organic frameworks, etc.

Ongoing Research Projects

- Development of high-barrier mono-material eco-friendly packaging(exhibiting high heat resistance and low-temperature heat-sealability) for microwave cooking
- Antiviral and antibacterial test of composites and identification of killing mechanism
- Study on improving the safety assessment model for food utensils, containers, and packaging that reflect changes in eating habits
- Study on improving the migration test method for large-capacity food utensils and containers
- Development of stimulus-responsive multifunctional carbon quantum dots and phosphorus quantum dots-based fluorescent probes for food safety and quality monitoring and use as intelligent packaging
- Operation of a safety evaluation system for recycling of food container
- Development of multifunctional biocomposites using agro-food wastes and application to extension of shelf life of fresh food

■ **Fermented Food and Quantity Food Laboratory**

Director : Yunju Jeong(yjeong)

Focus on fermented foods and human-derived microorganisms, integrate disease-associated immunological mechanisms with multi-omics analyses(microbiome, transcriptomics, single-cell sequencing, proteomics), apply in vitro, in vivo, and ex vivo assays, and discover novel strains to define their functions and mechanisms of action.

Ongoing Research Projects

- Discovery of microbial strains that reduce hyperuricemia
- Multi-omics analyses to investigate differences between older and younger individuals
- Metabolomic analysis of Bifidobacterium

NUTRITION

- Nutrition education programs
- Cultural aspects of food and nutrition

■ **Cellular and Molecular Nutrition Laboratory**

Director : Ja-Yong Chung(jchung@khu.ac.kr)

Our research focuses on elucidating the molecular mechanisms regulating the metabolism of essential minerals and understanding how the mineral homeostasis is altered under various conditions such as chronic alcohol exposure and obesity, etc. Genetic factors that influence the nutrient metabolism are also currently investigated in our laboratory.

Ongoing Research Projects

- The role of antioxidant nutrients and gene polymorphism in child atopic dermatitis
- Salt sensitivity and related gene polymorphisms in the development of hypertension
- Effects of retinoic acid and vitamin E on the ethanol-induced hepatocyte proliferation
- Influences of iron transporters on the lead-induced neurotoxicity in the central nervous system
- The role of the hepatic hormone hepcidin in the body's iron metabolism

■ **Human Nutrition and Metabolic Diseases Laboratory**

Director : Yunsook Lim(ylim@khu.ac.kr)

Research in the Human Nutrition and Metabolic Diseases Laboratory focuses on effects of antioxidants and anti-inflammatory nutrients on inflammatory responses and oxidative stress in aging related chronic diseases(obesity, diabetes, metabolic syndrome, muscle atrophy, demetia etc.) and their complications in humans and animals.

Ongoing Research Projects

- Effect of dietary phytochemicals on inflammation during cutaneous wound healing in obesity and diabetes.

- Effect of dietary antioxidants on the oxidative stress and inflammation response in diabetic complications
- Protective effects of natural products on muscle atrophy
- Preventive effects of natural products/phytochemicals on diabetic demetia

■ Nutritional Epidemiology Laboratory

Director : Youjin Je(youjinje@khu.ac.kr)

Our research primarily involves the investigation of dietary factors, using the epidemiologic approaches, in the prevention of chronic diseases. We focus on how food intake, anthropometric measures, and biological markers of dietary intake are related to cancer incidence and survivorship. Much of this work is based on large prospective cohort studies. In addition, we carry out a systematic review and meta-analysis of observational studies. Findings from the meta-analysis can provide scientific and quantitative evidence for conducting clinical intervention trials and/or developing dietary guidelines for chronic disease prevention among populations.

Ongoing Research Projects

- Coffee consumption and risks of chronic diseases including metabolic syndrome, diabetes, cardiovascular diseases and cancer
- Long-term dietary supplement use and total mortality, CVD-specific- and cancer-specific mortality
- Development of dietary-methyl score using plasma homocysteine levels
- Meta-analysis of epidemiological studies
- Analysis of KNHANES data to examine how diet and lifestyle determinants influence health among Koreans