

Spotlight on Gi-Hyung Ryu

Cereals & Grains Association members each have their own story, and we want to highlight all of their amazing accomplishments. "Spotlights" is a series of individual and institutional member interviews capturing the unique stories of our many volunteers and their journeys with the Cereals & Grains Association.



Gi-Hyung Ryu
Kongju National University
Member for 30 years

Q: What is your current position and what type of work do you do?

A: Currently, I am working as the president of graduate schools at Kongju National University (KNU), Republic of Korea, and as a professor in the Department of Food Science and Technology, KNU. My expertise is mainly in food extrusion technology, food engineering, and cereal grain processing. Nowadays, I am focusing more on extrusion texturization of plant-based meat alternatives.

Q: When and how did you first decide you wanted to work in cereal and grain science?

A: During my M.S. study program in Korea, I started to study food extrusion under the influence of my academic advisor Prof. Cherl-Ho Lee. After that, I continued with a Ph.D. study program at Kansas State University in the United States. During that time, Prof. Charles Walker introduced me to a broader area of cereal science. Since finishing my Ph.D. degree and returning to Korea, I have continuously worked and conducted research in cereal and grain science for more than 30 years.

Q: How have you been involved with the Cereals & Grains Association? How has your involvement with the association enriched your career?

A: When I was a Ph.D. student at Kansas State University, I regularly gave research paper presentations at AACCC International meetings. Since then, I have become a member of the Cereals & Grains Association and interacted with other members. By joining the association, I was able to expand my technical knowledge of cereal and grain science by sharing experiences and developing networks with other participants.

Q: In 2020, Cereal Foods World (CFW) is focusing on the Global Food System (GFS). Please offer your perspective on how global societal and technology trends are affecting cereal science and the cereal grain industry overall? How will cereal scientists need to adapt to these global trends?

A: Today, our society is facing many environmental issues, such as CO₂ emissions, environmental pollution, land and water

resource degradation, human and animal disease outbreaks, etc. These are becoming the driving forces for us to discover more environmentally and ecologically safe technologies and food products. Because animal husbandry has a large energy footprint and negative impacts on the environment, plant-based products must be substituted for animal meat consumption. This is an urgent matter that needs the attention and efforts of cereal grain scientists.

Q: In this issue of CFW, we are exploring Meat Alternatives and Processing in the context of the GFS. Do you have any perspectives to offer on the challenges and opportunities associated with the global expansion of the food chain and the dynamic global food trade?

A: Plant-based meat alternatives have many advantages—they are environmentally friendly, have similar textural properties but are less expensive than animal meat products, and have a broader market, including vegans, vegetarians, and even nonvegetarians. Plant-based alternatives have been marketed in Western countries, and there are opportunities in the Asian market as well. In my opinion, the greatest challenges will be how to make the structure of meat alternatives as similar to animal meat products before or after cooking and to develop plant-based foods that match the taste and sensory qualities that consumers expect from meat products to draw their interest and enhance consumption as much as possible. If we can increase consumption of plant-based alternatives, we will be able to ensure global food security and reduce animal meat production.

Q: What's next for you?

A: In relation to the challenges described above, my next plan is first, by means of high-moisture extrusion, to develop plant-based meat alternatives that have textural, functional, and nutritional properties that are similar to animal meats. Then, studies will be needed to determine whether plant-based alternatives can compete with animal meats. I also plan to find better ways to promote the consumption of high-moisture meat analogs (HMMA) across diverse food cultures around the world and to substitute animal meats with HMMA in countries around the world. My most important plan is to educate people about high-moisture extrusion technology and plant-based HMMA globally.