

## **Hee Seong Kim, M.Sc.**

Ph.D. Graduate student

Grain Science and Industry, Kansas State University

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### **CURRENT POSITION**

2020.8-present Ph.D. graduate student, Grain Science and Industry (Petfood processing and nutrition), Kansas State University, 001 Waters Hall, Manhattan, KS, 66506, USA.

Employer: Prof. Greg Aldrich

- To evaluate efficacy of whole soybeans utilization in extruded dog diets analyzing ingredients, processing, digestibility, *in vitro* fermentation, canine palatability, and sensory characteristics.
- Cumulative GPA: 4.0

### **ACADEMIC DEGREES**

2015.3-2017.2 M.Sc. Agricultural Biotechnology (Animal Nutrition and Biochemistry), Seoul National University, Seoul, South Korea.

**Thesis: “Effect of cats’ grooming behavior on apparent digestibility in domestic cats”.**

Advisor: Prof. Yoo Yong Kim.

2010.3–2015.2 B.Sc. Biological Science, Sookmyung Women’s University, Seoul, South Korea.

### **POSITIONS AND EMPLOYMENT**

2020.8-present Graduate research assistant, Grain Science and Industry (Petfood processing and nutrition), Kansas State University, 001 Waters Hall, Manhattan, KS, 66506, USA.

Employer: Prof. Greg Aldrich

- Research projects using dogs and cats to evaluate the efficacy of processed pet diets utilization analyzing ingredients, processing, digestibility, palatability, sensory characteristics, and shelf life.

2019.9-2020.7 Research Associate, Department of Animal Science, South Dakota State University, Brookings, SD, 57007, USA.

Employer: Prof. Tofuko A. Woyengo.

- Research projects using pigs and chickens to evaluate the efficacy of feed utilization analyzing ingredients, diets, gut tissues, digesta and fecal samples.
- Conduct an array of analyses including nutrient profile, gut permeability, gut histomorphology, immunology

and microbial analyses.

2019.3-2019.6 Research Associate, Department of Animal Science, South Dakota State University, Brookings, SD, 57007, USA.

Employer: Prof. Tofuko A. Woyengo.

- Research projects using pigs and chickens to evaluate the efficacy of feed utilization analyzing ingredients, diets, gut tissues, digesta and fecal samples.
- Conduct an array of analyses including nutrient profile, gut permeability, gut histomorphology, immunology and microbial analyses.

2017.1-2018.5 Procurement & Nutritionist (nutrition coordinate), Quality & Product Development Team, Harim Pet Food, Seoul, South Korea.

- Design of extruded dry dog foods and cat foods.
- Design of oven baked dry dog foods.
- Coordinating the collaboration work with a nutritional consulting company overseas.
- Sourced new ingredients.
- Conducting feeding trials before launching the new products.
- Establishment of the standard for quality control of products and ingredients.

2015.3-2017.2 Research assistant, Department of Agricultural Biotechnology, Seoul National University, Seoul, South Korea.

2013.10-2014.3 Internship, Department of Neuroscience, Brain Science Institute, Korea Institute of Science and Technology, Seoul, South Korea.

## **PUBLICATIONS IN PEER-REVIEWED JOURNALS**

### **Peer-reviewed articles:**

- 1) Lee, J. W., Wang, S., Seefeldt, T., Donkor, A., Logue, B. A., **Kim, H. S.**, Hong, J., & Woyengo, T. A. (2022). Porcine in vitro fermentation characteristics of canola co-products in neutral and acidic fermentation medium pH. *Animal Feed Science and Technology*, 284, 115188. DOI: 10.1016/j.anifeedsci.2021.115188
- 2) **Kim, H. S.**, Boss, C., Lee, J. W., Patterson, R., & Woyengo, T. A. (2021). Chemical composition and porcine in vitro disappearance of heat-pretreated and multi-enzyme-supplemented soybean hulls. *Animal Feed Science and Technology*, 277, 114951. DOI: 10.1016/j.anifeedsci.2021.114951
- 3) Hong, J., **Kim, H. S.**, Do, S., Kim, H. J., Kim, S. W., Jang, S. K., & Kim, Y. Y. (2021). Effects of lysine cell mass supplementation as a substitute for L-Lysine·HCl on growth performance, diarrhea Incidence, and blood profiles in weaning pigs. *Animals*, 11(7), 2092. DOI: 10.3390/ani11072092
- 4) **Kim, Hee S.**, Jin S. Hong, Chang W. Park, Kyung H. Cho, and Yoo Y. Kim. "Effects of coat length and faecal hair removal on measured nutrient digestibility in cats." *Journal of feline medicine and surgery* 21, no. 4 (2019):

379-386. DOI: 10.1177/1098612X18783844

- 5) **Kim, Hee S.**, Jin S. Hong, Chang W. Park, Kyung H. Cho, and Yoo Y. Kim. "Evaluation of grooming behaviour and apparent digestibility method in cats." *Journal of feline medicine and surgery* 21, no. 4 (2019): 373-378. DOI: 10.1177/1098612X18783837
- 6) Yan, C. L., **H. S. Kim**, J. S. Hong, J. H. Lee, Y. G. Han, Y. H. Jin, S. W. Son, S. H. Ha, and Y. Y. Kim. "Effect of dietary sugar beet pulp supplementation on growth performance, nutrient digestibility, fecal microflora, blood profiles and diarrhea incidence in weaning pigs." *Journal of animal science and technology* 59, no. 1 (2017):18. DOI: 10.1186/s40781-017-0142-8

#### Abstracts:

- 1) **Kim, H. S.**, and C. G. Aldrich. (2022). Evaluation of whole soybeans as an ingredient in dog diets: Organic matter disappearance and production of short- and branched-chain fatty acids from whole soybeans and selected fiber sources used in pet foods by a canine in vitro fermentation model. ASAS-CSAS Annual meeting; Oklahoma City, OK. Accepted.
- 2) **Kim, H. S.**, L. Kilburn, C. G. Aldrich, H. Dogan, Y. Li, and S. Alavi. (2022). Internal versus external fat in extrusion of dry expanded dog kibbles containing soy – Impact on process stability and product uniformity. Institute of Food Technologists Annual Meeting; Chicago, IL. Accepted.
- 3) **Kim, H. S.**, G. Yang, K. Koppel, and C. G. Aldrich. (May 2022). Evaluation of whole soybeans as an ingredient in dog diets: Sensory analysis of extruded diets with graded levels of whole soybeans. Petfood Forum; Kansas City, MO.
- 4) **Kim, H. S.**, and C. G. Aldrich. (September 2021). Evaluation of whole soybeans as an ingredient in dog diets: extrusion and product parameters for extruded dog diets with graded levels of whole soybeans. Petfood Forum; Kansas City, MO.
- 5) **Kim, H.S.**, and C. G. Aldrich. (October 2021). PSV-B-21 Evaluation of whole soybeans as an ingredient in dog diets: Apparent total tract digestibility and stool quality of extruded diets with graded levels of dehulled whole soybeans by dogs. *Journal of Animal Science* 99, Supplement\_3: 337-337 DOI:10.1093/jas/skab235.619
- 6) **Kim, H.S.**, and C. G. Aldrich. (October 2021). PSV-B-22 Evaluation of whole soybeans as an ingredient in dog diets: Canine palatability of extruded diets with graded levels of dehulled whole soybeans. *Journal of Animal Science* 99, Supplement\_3: 336-337 DOI:10.1093/jas/skab235.618
- 7) **Kim, Hee S.**, Jin S. Hong, Chang W. Park, Kyung H. Cho, and Yoo Y. Kim. "Effects of coat length and faecal hair removal on measured nutrient digestibility in cats." *Journal of feline medicine and surgery* 21, no. 4 (2019): 379-386. DOI: 10.1177/1098612X18783844
- 8) **Kim, Hee S.**, Jin S. Hong, Chang W. Park, Kyung H. Cho, and Yoo Y. Kim. "Evaluation of grooming behaviour and apparent digestibility method in cats." *Journal of feline medicine and surgery* 21, no. 4 (2019): 373-378. DOI: 10.1177/1098612X18783837

## **PRESENTATIONS**

- May. 4, 2022 Evaluation of whole soybeans as an ingredient in dog diets: Sensory Analysis of extruded diets with graded levels of whole soybeans. Poster presentation at 2022 Pet Food Forum, Kansas City, Missouri, USA.
- Sep. 23, 2021 Evaluation of whole soybeans as an ingredient in dog diets: extrusion and product parameters for extruded dog diets with graded levels of whole soybeans. Poster presentation at 2021 Pet Food Forum, Kansas City, Missouri, USA.
- July. 15, 2021 Evaluation of whole soybeans as an ingredient in dog diets: apparent total tract digestibility and stool quality of extruded diets with graded levels of whole soybeans by dogs. Poster presentation at 2021 ASAS-CSAS-SSASAS, Louisville, Kentucky, USA.
- July. 15, 2021 Evaluation of whole soybeans as an ingredient in dog diets: canine palatability of extruded diets with graded levels of whole soybeans. Poster presentation at 2021 ASAS-CSAS-SSASAS, Louisville, Kentucky, USA.
- Aug. 23, 2016 Effects of dietary supplementation of Lysine Cell Mass (LCM) as substitution for L-lysine-HCl on growth performance and blood profiles in weaning pigs. Poster presentation at 2016 Asian Australasian Animal Production Animal Science Congress, Fukuoka, Japan.

## **RESEARCH EXPERIENCE**

### **Research subjects involved:**

- Growth performance and gut integrity of nursery pigs fed diet with butyric acid and enzymatically hydrolyzed yeast product (sponsored by Canadian Bio-systems Inc., Canada, 2020).
- Effect of adaptation period on nutrient digestibility and blood profiles in cats fed dry feed and canned feed (sponsored by Daehan feed, South Korea, 2016).
- Effect of different levels of deboned chicken meat inclusion as a protein source on nutrient digestibility and blood profiles in cats fed dry feed. (sponsored by Daehan feed, South Korea, 2016).
- Effect of environmental housing conditions on nutrient digestibility and stress response in cats (sponsored by Daehan feed, South Korea, 2016).
- Effect of lysophospholipid supplementation to reduced energy, crude protein, and amino acid diets on growth performance, nutrient digestibility, and blood profiles in broiler chickens and laying hens (sponsored by Easybio, South Korea, 2015).

### **Animal research and management techniques:**

- Digestibility trial – total collection, index, and indirect methods (swine, poultry, feline, canine).
- Dog food production – formulation, extrusion, oven drying, fat coating, baking, retorting, canning.

- Animal behavioural observation – continuous quantitative behavioural observation of domestic cats.
- Feeding trial – growth performance of weaning pigs, growing-finishing pigs and broilers.
- Anatomy trial – sampling for organs, tissues, digesta, intestine (villi, crypt).
- *In vitro* trial – canine in vitro fermentation
- T-cannulation surgery in ileum of pigs.
- Blood collection via jugular veins from pigs.
- Ussing-chambers technique and gut histomorphology.

### **Laboratory technique and experience:**

- ELISA – analysis for immunoglobulin (IgG, IgA, IgM, TNF- $\alpha$  concentrations) in blood and milk.
- ELISA – analysis for D-mannitol and lactulose in urine samples.
- Gut histomorphology – villous height and crypt depth.
- DNA extraction from pigs' serum, digesta, fecal samples and measuring the concentration using Nanodrop.
- Real-time PCR – measuring microbiota in digesta, gut tissue and fecal samples.
- Bacterial cell counting– counting bacterial colony in digesta and fecal samples after cell culture.
- Determination of TiO<sub>2</sub> used as a dietary marker.
- Determination of ammonia concentration from fresh fecal samples.
- Proximate analysis – crude protein (Kjeldahl method, Elementar & Leco), ether extract (Gold Fisch, Soxhlet), hydrolyzed ether extract, ADF & NDF (Labconco), total dietary fiber, insoluble dietary fiber, soluble dietary fiber, total starch, gross energy, moisture, dry matter, crude ash, organic matter.
- Gas chromatography analysis – SCFA and BCFA from fresh fecal samples and *in vitro* fermentation residues.

### **HONORS AND AWARDS**

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| 2022 | Award – Majel M. MacMasters Memorial Achievement Award, Kansas State University, USA.                     |
| 2022 | Scholarship – K-State Alumni Association International Student Scholarship, Kansas State University, USA. |
| 2022 | Award – GSC Travel Award, Kansas State University, USA.   |
| 2022 | Grant – HEERF 3 grant, Kansas State University, USA.  |
| 2021 | Scholarship – Graduate student council scholarship, Kansas State University, USA.                         |
| 2021 | Grant – HEERF 2 grant, Kansas State University, USA.  |
| 2021 | Grant – Bluemont grant, Kansas State University, USA.   |
| 2016 | Scholarship – Brain Korea 21 Plus, National Research Foundation of Korea.                                 |
| 2015 | Scholarship – Brain Korea 21 Plus, National Research Foundation of Korea.                                 |
| 2015 | Award – Certificate of Honors Graduate, Sookmyung Women's University, South Korea.                        |

- 2014 Scholarship – Sookmyung Leader Group Scholarship.
- 2014 Scholarship – Honor student scholarship, Sookmyung Women's University, South Korea.
- 2014 Scholarship – Scholarship for study abroad program.
- 2013 Scholarship – Honor student scholarship, Sookmyung Women's University, South Korea.

**PROFESSIONAL ASSOCIATIONS AND ACTIVITIES**

- 2022.5 Attend Petfood Forum 2022, Kansas City, Missouri, USA.
- 2022.1 Assist Pet Food Formulation Short Course spring 2022, Manhattan, Kansas, USA.
- 2022-current Member, Institute of Food Technologists.
- 2021.9 Attend Petfood Forum 2021, Kansas City, Missouri, USA.
- 2021.9 Moderate Pet Food Essentials 2021, Kansas City, Missouri, USA.
- 2021.8 Assist IGP-KSU Pet Food Workshop 2021, Manhattan, Kansas, USA.
- 2021.7 Attend ASAS-CSAS annual meeting 2021, Louisville, Kentucky, USA.
- 2021.6 Assist Pet Food Formulation Short Course summer 2021, Manhattan, Kansas, USA.
- 2021.1 Attend Pet Food Formulation Short Course spring 2021, Manhattan, Kansas, USA.
- 2021-current Member, American Society of Animal Science.
- 2019.7 Attend ASAS-CSAS annual meeting 2019, Austin, Texas, USA.
- 2019.3 Attend ASAS-ADSA annual meeting 2019, Omaha, Nebraska, USA.
- 2018.3 Attend Petfood Forum Asia 2018, Bangkok, Thailand.
- 2017.8 Attend 33<sup>rd</sup> World Veterinary Congress, Incheon, South Korea.
- 2017.4 Attend Petfood Forum 2017, Kansas City, Missouri, USA.
- 2017.4 Attend Petfood Innovation workshop 2017, Kansas City, Missouri, USA.
- 2016.8 Attend AAAP Animal Science Congress 2016, Fukuoka, Japan.
- 2016.6 Attend annual congress of KSAST, Seoul, South Korea.
- 2015.8 Attend annual congress of KSAST, Seoul, South Korea.
- 2015-2017 Member, Korean Society of Animal Sciences and Technology.

**TRAINING RECORDS: CERTIFICATES**

- 2022.4 Record of Completion, KSU Hazard Communication Endcap, Kansas State University, Kansas, USA.
- 2022.3 Record of Completion, Family Educational Rights and Privacy Act (FERPA), Kansas State University, Kansas, USA.
- 2021.10 Certificate, Scientific contribution to the 13<sup>th</sup> Annual Grain Science Graduate Student Research Symposium, Grains Science Graduate Student Symposium, International Grains Program Institute, Manhattan, Kansas, USA.

- 2021.10 Record of Completion, Hazardous Waste Awareness Refresher, Kansas State University, Kansas, USA.
- 2021.10 Record of Completion, Cybersecurity Awareness, Kansas State University, Kansas, USA.
- 2021.9 Certificate of Completion, IGP-KSU Pet food workshop, IGP Institute Kansas State University, Kansas, USA.
- 2021.5 Certificate of Professional Development, 2020-2021 Graduate Student Council Professional Development Program, Kansas State University, Kansas, USA.
- 2021.1 Record of Completion, Initial Hazardous Waste Aware, Kansas State University, Kansas, USA.
- 2021.1 Record of Completion, Non-discrimination Policy, Kansas State University, Kansas, USA.
- 2021.1 Certificate of Completion, Pet Food Formulation for Commercial Production, IGP Institute Kansas State University, Kansas, USA.
- 2020.11 Certificate of Completion, Basic Language Training in Chinese – Mandarin, Kansas State University, Kansas, USA.
- 2020.10 Record of Completion, Cybersecurity Awareness, Kansas State University, Kansas, USA.
- 2020.9 Certificate of Completion, Voices for Change – Consent, Get Inclusive, USA
- 2020.8 Certificate of Completion, Working with the IACUC, Collaborative Institutional Training Initiative (CITI) Program, USA.
- 2020.8 Certificate of Completion, Working with Dogs in Research Settings, Collaborative Institutional Training Initiative (CITI) Program, USA.
- 2020.8 Certificate of Completion, Working with Cats in Research Settings, Collaborative Institutional Training Initiative (CITI) Program, USA.
- 2020.8 Certificate of Completion, Responsible Conduct of Research (RCR), Collaborative Institutional Training Initiative (CITI) Program, USA.
- 2020.8 Record of Completion, Emergency and Fire Preparedness, Kansas State University, Kansas, USA.
- 2020.8 Record of Completion, Back Safety and Injury Prevention, Kansas State University, Kansas, USA.
- 2020.8 Record of Completion, Personal Protective Equipment, Kansas State University, Kansas, USA.
- 2020.8 Record of Completion, Hazard Communication, Kansas State University, Kansas, USA.
- 2020.8 Record of Completion, KSU-Initial Hazardous Waste Awareness Training, Kansas State University, Kansas, USA.

### **NON-ACADEMIC ACTIVITIES**

- 2022-current Secretary, Grain Science Graduate Student Organization (GSGSO), Kansas State University, Kansas, USA.
- 2021-2022 Social chair, Grain Science Graduate Student Organization (GSGSO), Kansas State University, Kansas, USA.

- 2021.4 Assistant, Happy National Pet Day event; live pet treats baking show, Kansas State University, Kansas, USA.
- 2020-2021 Club member, GSGSO, Kansas State University, Kansas, USA.
- 2020-2021 Club member, I-buddies, Kansas State University, Kansas, USA.

**VOLUNTEERING ACTIVITIES**

- 2014.3-2014.11 Sookmyung International Women’s association (SIWA) member, Assisted women with mental disabilities with basic activities such as bathing and feeding, Holt Ilsan Welfare Town, Ilsan, Gyeonggi-do, South Korea.
- 2014.6 SIWA dance & music class leader, Mujigae Camp (Volunteer-Run Korean Culture Camp for Korean adoptees), Introduced Korean adoptees to Korean cultures, Albany, New York, USA.
- 2014.7 SIWA dance & music class leader, Heart and Seoul Camp (Volunteer-Run Korean Culture Camp for Korean adoptees), Introduced Korean adoptees to Korean cultures, Rochester, New York, USA.
- 2013.7-2013.8 Camp mentor, Mentored Korean elementary students at Samsung Fire & Marine Insurance company English camp, Daejeon, South Korea.
- 2013.1 Team leader, Led 2013 Science Sharing Camp and taught elementary level science class, Pocheon Idong Elementary School, Pocheon, Gyeonggi-do, South Korea.
- 2011.9-2012.12 Volunteer, Assisted and escorted foreign patients, International Clinic, Samsung Seoul Hospital, Seoul, South Korea.
- Others Cleaned dog shelters, Made and delivered Kimchi for elderly living alone, Assisted ‘Forest-love campaign’ for youth, Counseled and mentored junior and senior high school students in Pocheon, South Korea, Volunteered for the swine department at SDSU, Volunteered for GSGSO at KSU.



## **REFERENCES**

### **Greg Aldrich, Ph.D.**

Research Associate Professor, Pet Food Program Coordinator  
Department of Grain Science and Industry, Kansas State University  
Waters 003, Manhattan, KS 66506  
[aldrich4@ksu.edu](mailto:aldrich4@ksu.edu)

### **George Collings, Ph.D.**

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Collings Nutrition Solutions  
1086 Pebble Beach Drive  
O'Fallon, Missouri 63366  
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### **Hak Rim (a.k.a. Harry) Lee, Ph.D.**

Senior Managing Director, MBD  
Harim Holdings., LTD  
Harim Group Corporate Office  
13F Harim Building, 130 Dosan-daero Gangnam-gu,  
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### **Yoo Yong Kim, Ph.D.**

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