

HAEJIN KIM

Ph. D.
Swine Nutritionist
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105 Upchurch Hall
Department of Animal Sciences
Auburn University
Auburn, AL 36849

EDUCATION

- PhD** Oklahoma State University, Animal Nutrition July 2012
Dissertation: "Effects of distiller's dried grain with soluble (DDGS) on pig performance, nutrient excretion, and gaseous emissions of finishing pigs and gestating sows"
Advisor: Dr. Scott Carter
- MS** Dankook University, Nonruminant Nutrition February 2007
Thesis: "Effects of mud flat originated bacteria proteases supplementation on performance in monogastric animals"
Advisor: Dr. In-Ho Kim
- BS** Dankook University, Animal Science February 2005
Thesis: "Effects of MSM (Methyl Sulfonyl Methane) supplementation on growth performance and nutrient digestibility in growing pigs"
Advisor: Dr. In-Ho Kim

EMPLOYMENT HISTORY

- Research Associate IV** 2021 to Present
Supervisor: Dr. Leanne Dillard
Department of Animal Sciences, Auburn University
- Research Assistant IV** 2020 to 2021
Supervisor: Dr. Anne Wooldridge, DVM, MS, PhD, DACVIM
Department of Clinical Sciences, Auburn University
- Swine Nutrition Consultant as an Independent Contractor**
Research Scientist with Frust-McNess Company 2017 to 2020
Swine Nutrition R&D Scientist with Morningbio Inc. 2016 to 2017
- Post-Doctoral Associate** 2012 to 2016
Supervisor: Dr. Charles Maxwell
Department of Animal Science, University of Arkansas
- Research Associate** Sep. to Nov. 2012
Supervisor: Dr. Scott Carter
Department of Animal Science, Oklahoma State University

Graduate Research/Teaching Assistant

2008 to 2012

Advisor: Dr. Scott Carter

Department of Animal Science, Oklahoma State University

Graduate Research/Teaching Assistant

2005 to 2007

Advisor: Dr. In-Ho Kim

Department of Animal Resource and Science, Dankook University

RESEARCH EXPERIENCE

Auburn University, Auburn, AL

2020 to Present

Research Associate, Department of Animal Sciences

- In vitro digestibility and methane production of cover crops throughout the growing season
 - PI: Dr. Leanne Dillard
- Comprehensive ruminant digestive profile of four bermudagrass cultivars.
 - PI: Dr. W. Brandon Smith
- Alternatives to antibiotics for enhancing growth performance and gut health in newly weaned pigs.
 - PI: Dr. Marko Rudar

Research Assistant, Department of Clinical Sciences

- Pharmacokinetics of Misoprostol in horse: comparative study of oral and rectal administration.
 - PIs: Dr. Kara M. Lascola & Dr. Rachel Pfeifle
- Platelet-rich plasma (PRP) and platelet-poor plasma (PPP) harvest from horses for cell culture.
 - PI: Dr. Mariano Mora Pereira
- FGF21 gene expression in different tissue of horse.
 - PI: Dr. Anne Wooldridge
- Statistical data analysis of Leukemoid data in dogs.
 - PI: Dr. Megan Grobman
- Comparison of the crystalloid volume expansion effects between two bolus rates and evaluation of an ultrasound guided arterial catheter placement techniques in anesthetized cats.
 - PI: Dr. PenTing Liao

Swine Nutrition Consultant

2016 to 2020

Swine Nutrition R&D Scientist, Morningbio Inc, South Korea.

- Supported development of new feed additive products
 - Coated ZnO feed additive
 - Essential oil products as a natural growth promoter
 - Mineral based feed additive for sows

Swine Nutrition researcher, Frust-McNess Company, USA.

- Swine research data analysis
- Supported R&D and International Sale Team for overseas market development

University of Arkansas, Fayetteville, AR

2012 to 2016

Post-Doctoral Associate, Department of Animal Science

- Integrated Resource Management Tool to Mitigate the Carbon Footprint of Swine Production in the U.S. (USDA/AFRI)
 - Collaborations:
 - ▶ University of Arkansas
 - Drs. Thoma and Ulrich, Chemical Engineering
 - Drs. Matlock and Costello, Biological and Agricultural Engineering
 - Dr. Popp, Agricultural Economics and Agribusiness
 - ▶ Academic Partners: Purdue University and Virginia Tech
 - ▶ Industry Partners: Ajinomoto, Evonik, and ADM
- Effect of Rearing Environment on Development of the Immune System in Neonates: the Pig as a Model (Arkansas Bioscience Institute; ABI)
 - Collaborations:
 - ▶ University of Arkansas
 - Dr. Kegley, Animal Science
 - Dr. Erf, Poultry Science
 - ▶ Academic Partners: University of Memphis
 - Drs. Buddington and Van der Merwe
- Effect of feed-grade amino acids supplementation on cell-signaling pathway of muscle protein synthesis and degradation in nursery pigs (Western Blot technique)
- Effect of feed additive supplementation on gut development and intestinal physiology of early-weaned pigs (Microscopic approach and Western Blot technique)
- Industry collaborators
 - Feed-grade amino acid research:
Ajinomoto, ADM, Cargill, and Evonik
 - Fermented SBM research:
Hamlet protein
 - Enzyme research (Multi-carbohydrase and/or phytase):
AB Vista and DSM
 - Yeast product research:
AB Vista and Phileo Lesaffre
 - Antibiotic alternatives research:
Cargill and HuvePharma
 - Mineral research:
Ceresco Nutrition and MicroNutrients
 - Organic acid research:
Cargill and DSM
 - Yucca extract research:
DPI Global

Oklahoma State University, Stillwater, OK

2008 to 2012

Graduate Research Assistant/Research Associate, Department of Animal Science

- Effects of Inclusion of Corn Distillers Dried Grains with Solubles in the Diet of Finishing Pigs and Gestating Sows on Nutrient Excretion and Gaseous Emissions (National Pork Board; NPB)
 - Effect of 25% distillers dried grains with solubles on nutrient excretion and gaseous emissions during the finishing phase
 - Effects of distillers dried grains with soluble in the diet of gestating sows on nutrient excretion and gaseous emissions
 - Effects of increasing distillers dried grains with solubles on nutrient excretion and gaseous emissions during the finishing phase
- Effects of increasing levels of dietary turmeric on growth performance and immune response of nursery pigs
- Effects of ractopamine supplementation on growth performance, nutrient excretion, and gaseous emissions during the finishing phase
- Effects of EcoCare® Feed on the growth performance, nutrient excretion, mass balance of N & P, and gaseous emissions of finishing pigs

Dankook University, Cheonan, South Korea

2005 to 2007

Graduate Research Assistant, Department of Animal Resource and Science

- Effects of a variety of feed additives supplementation on animal performance and nutrient digestibility of non-ruminant animals.
- Nutritional research in Poultry and Swine
- Laboratory manager: Nutrient digestibility analysis (DM, Cr, N, Ca, P, and GE)

TEACHING EXPERIENCE

University of Arkansas, Fayetteville, AR

2015 to 2016

Post-Doctoral Associate, Department of Animal Science

- Taught several lectures in Principle of Animal Nutrition (ANSC 3143; Spring 2015 & 2016), an undergraduate course averaging 50 students per class, covering the following topics: Scientific approach to animal nutrition involving the mechanisms through which feed nutrients are utilized by farm animals
- Developed quizzes & exams and coordinated grading

Oklahoma State University, Stillwater, OK

2010 to 2011

Graduate Teaching Assistant, Department of Animal Science

- Supported Swine Nutrition (ANSI 4643; 2010), Applied Animal Nutrition (ANSI 3653; 2011), and Application of Biotechnology in Animal Science (ANSI 4843; 2011), undergraduate courses averaging 50 students per class
- Supported and setup labs for hands-on experiences of students
- Developed quizzes & exams and coordinated grading

Dankook University, Cheonan, South Korea

2005 to 2007

Graduate Teaching Assistant, Department of Animal Resource and Science

- Supported General Biology, Experiment of Biology, and Animal Nutrition and Experiment, undergraduate courses averaging 40 students per class
- Supported and setup labs for hands-on experiences of students

- Developed quizzes & exams coordinated grading

PUBLICATIONS

Journal Publications

Tsai, T. C., M. A. Sales, **H. J. Kim**, G. F. Erf, N. Vo, F. Carbonero, M. van der Merwe, E. B. Kegley, T. Buddington, X. F. Wang, C. V. Maxwell, and J. C. Zhao. 2018. Isolated rearing at lactation increases gut microbial diversity and post-weaning performance in pigs. *Front. Microbial.*, 29.

Carter, S. D. and **H. J. Kim**. 2013. Technologies to reduce environmental impact of animal wastes associated with feeding for maximum productivity. *Animal Frontiers*. 3:42-47.

Kim, H. J., J. H. Cho, Y. J. Chen, J. S. Yoo, B. J. Min, and I. H. Kim. 2007. Effects of coastal mud-flat bacteria origin protease supplementation on laying performance, nutrient digestibility, and total protein concentration of serum in laying hens. *Korean J. Poult. Sci.* 34(1):9-14.

Kim, H. J., B. J. Min, J. H. Cho, Y. J. Chen, J. S. Yoo, J. S. Jang, Y. K. Lee, and I. H. Kim. 2006. Effects of mud flat bacteria origin protease supplementation on growth performance, amino acid digestibility, blood characteristics, meat quality, fecal VFA and NH₃-N concentration in finishing pigs. *J. Anim. Sci. & Technol. (Kor)* 48(1):49-58.

Kim, H. J., J. C. Park, Y. J. Chen, J. S. Yoo, S. J. Lee, I. C. Kim, Y. H. Kim, H. J. Jung, B. C. Park, and I. H. Kim. 2006. Effects of selenium and vitamin E supplementation on meat quality and shelf-life in finishing pigs. *Korean J. Food Sci. Ani. Resour.* 26(2): 197-203.

Kim, H. J., J. H. Cho, Y. J. Chen, J. S. Yoo, B. J. Min, B. C. Park, and I. H. Kim. 2006. Effects of mud flat bacteria origin protease supplementation on egg quality, nutrient digestibility, and total protein concentration of serum in laying hens. *Korean J. Poult. Sci.* 33(4):303-308.

Kim, H. J., J. S. Yoo, O. S. Kwon, B. J. Min, K. S. Shon, J. H. Cho, Y. J. Chen, and I. H. Kim. 2005. Effects of *Bacillus subtilis* supplementation on egg quality, blood characteristics and fecal NH₃-N in laying hens. *Korean J. Poultr. Sci.* 32(1):9-14.

Journal Papers in Progress

Kim, H. J., T. C. Tsai, E. B. Bass, and C. V. Maxwell. Effect of maximum replacing CP with feed-grade amino acids on growth performance of nursery pigs. *To be submitted to Journal of Animal Science*.

Kim, H. J., S. D. Carter, T. M. Walraven, M. R. Bible, and K. F. Coble. Effect of high inclusion of distillers dried grains with solubles on nutrient excretion and

gaseous emission of gestating sows. *To be submitted to Journal of Environmental Quality.*

Kim, H. J., S. D. Carter, T. M. Walraven, M. R. Bible, and K. F. Coble. Effects of dietary inclusion of distillers dried grains with solubles on gaseous emissions of pigs during the finishing phase. *To be submitted to Journal of Environmental Quality.*

Kim, H. J., S. D. Carter, T. M. Walraven, M. R. Bible, and K. F. Coble. Effects of dietary inclusion of distillers dried grains with solubles on nutrient excretion of pigs during the finishing phase. *To be submitted to Journal of Environmental Quality.*

PRESENTATIONS AND INVITED LECTURES

Oral Presentations

Kim, H. J., S. D. Carter, M. R. Bible, K. F. Coble, and T. M. Walraven. 2012. Effects of dietary distillers dried grains with solubles (DDGS) on growth performance and nutrient excretion of finishing pigs. ASAS Midwest Section Meeting, Des Moines, IA.

Kim, H. J., S. D. Carter, T. M. Walraven, M. R. Bible, and K. F. Coble. 2011. Effects of distillers dried grains with solubles in the diet of gestating sows on nutrient excretion. ASAS National Meeting, New Orleans, LA.

Kim, H. J., S. Carter, T. Walraven and M. Bible. 2011. Effects of increasing distillers dried grains with solubles on nutrient excretion during the finishing phase. ASAS Midwest Section Meeting, Des Moines, IA.

Poster Presentations

Tsai, T. C., **H. J. Kim,** X. Wang, J. J. Chewning, J. A. Apple, J. E. Thomson, and C. V. Maxwell. 2017. Effect of increasing standardized ileal digestible tryptophan:lysine ratio on growth performance of grower-finisher pigs. ASAS Midwest Section and ADSA[®] Midwest Branch Meeting, Omaha, NE.

Tsai, T. C., **H. J. Kim,** X. Wang, J. J. Chewning, J. A. Apple, J. R. Bergstrom, and C. V. Maxwell. 2017. Effects of supplementation with a protease, carbohydrates, and phytase in reduced-nutrient diets fed from weaning to market on growth performance, nutrients digestibility, intestinal morphology, and hematological characteristics. ASAS Midwest Section and ADSA[®] Midwest Branch Meeting, Omaha, NE.

H. J. Kim, T. C. Tsai, J. J. Chewning, J. K. Apple, K. J. Touchette, J. E. Thomson, J. Less, and C. V. Maxwell. 2016. Effects of aggressive feed-grade amino acid supplementation in reduced CP diets formulated on ME or NE basis on growth performance of nursery pigs. ASAS Midwest Section and ADSA[®] Midwest Branch Meeting, Des Moines, IA.

Bergstrom, J. R., T. C. Tsai, **H. J. Kim,** and C. V. Maxwell. 2016. Effects of supplementation with *Aspergillus oryzae* derived phytase (Ronozyme[®] HiPhos) and

fiber degrading enzymes (Victus® Swine Starter) on growth performance, intestinal morphology, leukocyte differential, and nutrient digestibility in nursery pigs. ASAS Midwest Section and ADSA® Midwest Branch Meeting, Des Moines, IA.

Tsai, T. C., **H. J. Kim**, M. A. Sales, X. Wang, G. F. Erf, E. B. Kegley, F. G. Carbonero, M. van der Merwe, R. K. Buddington, and C. V. Maxwell. 2016. Effect of topsoil exposure during lactation on subsequent performance and abundance of innate and adaptive immune cells in pigs. ASAS Midwest Section and ADSA® Midwest Branch Meeting, Des Moines, IA.

Tsai, T. C., **H. J. Kim**, M. A. Sales, X. Wang, G. F. Erf, E. B. Kegley, F. G. Carbonero, M. van der Merwe, R. K. Buddington, and C. V. Maxwell. 2016. Effect of rearing strategies during lactation on growth performance and the population of innate and adaptive immune cells in pigs from pre-weaning to market. ASAS Midwest Section and ADSA® Midwest Branch Meeting, Des Moines, IA.

Maxwell, C. V., Tsai, T. C., **H. J. Kim**, J. K. Apple, K. J. Touchette, and J. J. Chewning. 2016. Supplementation of feed grade essential and non-essential amino acids to control levels in pigs fed reduced crude protein (RCP) diets meeting the SID His:Lys ratio requirement maintained growth performance and carcass composition in growing/finishing swine. ASAS Midwest Section and ADSA® Midwest Branch Meeting, Des Moines, IA.

Apple, J. K., T. C. Tsai, **H. J. Kim**, M. Wang, B. P. Corbett, T. M. Johnson, and C. V. Maxwell. 2015. Intratesticular injection of zinc solution effectively castrates male pigs without affecting pork quality. ASAS National Meeting. Orlando, FL.

Apple, J. K., C. V. Maxwell, T. C. Tsai, **H. J. Kim**, D. G. Cook, K. J. Touchette, J. E. Thomson, J. Less, and J. J. Chewning. 2015. Effect of feed-grade amino acid supplementation in reduced crude protein (RCP) diets formulated on a NE basis on performance and carcass characteristic of growing-finishing pigs. ASAS Midwest Section Meeting, Des Moines, IA.

Cook, D. G., J. K. Apple, C. V. Maxwell, A. N. Young, D. L. Galloway, **H. J. Kim**, and T. C. Tsai. 2015. Effects of amino acid supplementation of reduced crude protein (RCP) diets formulated on a NE basis on belly fatty acid deposition in swine. ASAS Midwest Section Meeting, Des Moines, IA.

Cook, D. G., J. K. Apple, C. V. Maxwell, A. N. Young, D. L. Galloway, **H. J. Kim**, and T. C. Tsai. 2015. Effects of amino acid supplementation of reduced crude protein (RCP) diets formulated on a NE basis on the fatty acid composition of the LM and jowl subcutaneous fat. ASAS Midwest Section Meeting, Des Moines, IA.

Kim, H. J., T. C. Tsai, J. R. Bergstrom, J. J. Chewning, J. K. Apple, and C. V. Maxwell. 2015. Effects of a multicomponent enzyme product in diets with and

without wheat middlings on the performance of nursery pigs during the first 23 d postweaning. ASAS Midwest Section Meeting, Des Moines, IA.

T. C. Tsai, **H. J. Kim**, J. L. Usry, J. Cohen, J. J. Chewning, J. K. Apple, and C. V. Maxwell. 2015. Effect of Zn sources and inclusion rate on growth performance and carcass composition in grower-finisher pigs. ASAS Midwest Section Meeting, Des Moines, IA.

T. C. Tsai, **H. J. Kim**, J. R. Bergstrom, J. J. Chewning, J. K. Apple, and C. V. Maxwell. 2015. Effects of increasing dietary levels of *Aspergillus oryzae*-derived phytase (Ronozyme) on the growth performance of nursery pigs fed an adequate phosphorous diet. ASAS Midwest Section Meeting, Des Moines, IA

T. C. Tsai, **H. J. Kim**, J. R. Bergstrom, J. J. Chewning, J. K. Apple, and C. V. Maxwell. 2014. Effects of the combination of 50 ppm L-carnitine and 200 ppb chromium from chromium picolinate on sow reproductive performance, progeny growth performance and carcass quality. ASAS Midwest Section Meeting, Des Moines, IA.

T. C. Tsai, **H. J. Kim**, J. R. Bergstrom, J. J. Chewning, J. K. Apple, and C. V. Maxwell. 2014. Effect of wheat middling and multiple enzyme products on growth performance and carcass characteristics in nursery and finisher pigs. ASAS Midwest Section Meeting, Des Moines, IA.

Tsai, T., **H. Kim**, G. Fitzner, J. K. Apple, J. J. Chewning, and C. V. Maxwell. 2013. Effect of diet complexity and an enzyme-treated soy protein plus yeast on performance in weanling pigs. ASAS National Meeting, Indianapolis, IN.

Carter, S. D., B. de Rodas, K. F. Coble, **H. J. Kim**, M. R. Bible, and G. Willis. 2013. Effects of healthy edge technology on sow and litter performance. ASAS National Meeting, Indianapolis, IN.

Bible, M. R., S. D. Carter, K. F. Coble, **H. J. Kim**, and T. M. Walraven. 2013. Effects of turmeric and curcumin addition to diets on growth performance and immune response of nursery pigs. ASAS National Meeting, Indianapolis, IN.

Coble, K. F., S. Carter, M. Pierdon, K. Haydon, **H. Kim**, and M. Bible. 2013. Effects of ractopamine HCl on the efficiency of feed and nutrient utilization of finishing pigs. ASAS Midwest Section Meeting, Des Moines, IA.

Kim, H. J., S. D. Carter, M. R. Bible, K. F. Coble, and T. M. Walraven. 2012. Effects of distillers dried grains with solubles on gaseous emissions of finishing pigs. ASAS Midwest Section Meeting, Des Moines, IA.

Fernando, R., S. Hermansky, **H. J. Kim**, M. R. Bible, S. D. Carter, and U. DeSilva. 2012. Impact of diet on swine fecal microbiome. International Plant and Animal Genome Conference, San Diego, CA.

Bible, M. R., S. D. Carter, **H. J. Kim**, T. M. Walraven, C. Houchen, S. Anant, and R. Ramanujam. 2011. Effects of increasing levels of dietary turmeric on growth performance and immune response of nursery pigs. ASAS National Meeting, New Orleans, LA.

Walraven, T., S. Carter, J. Jarrett, M. Bible, and **H. J. Kim**. 2010. Effects of multiple dietary manipulations on the mass balance of N and P during the swine finishing phase. J. Anim. Sci. Vol. 88 (e-Suppl. 2): 1112.

Walraven, T., S. Carter, J. Jarrett, M. Bible, and **H. J. Kim**. 2009. Effects of combining multiple dietary manipulations on growth performance and nutrient excretion of finishing pigs. J. Anim. Sci. Vol. 87 (e-Suppl. 2): 560.

Kim, H. J., B. J. Min, J. H. Cho, Y. J. Chen, J. S. Yoo, and I. H. Kim. 2006. Effect of medicinal plants (*Atramentaria*, *Acanthopanax* and Garlic) by solvent extract methods on growth performance, nutrient digestibility and IGF-1 concentration in nursery pigs. VIIth AAAP Animal Science Congress, Busan, Korea.

Kim, H. J., J. C. Park, Y. J. Chen, J. S. Yoo, S. J. Lee, I. C. Kim, Y. H. Kim, H. J. Jung, and I. H. Kim, 2006. Effect of selenium and vitamin E supplementation on meat quality and storage stability in finishing pigs. VIIth AAAP Animal Science Congress, Busan, Korea.

Kim, H. J., B. J. Min, J. H. Cho, Y. J. Chen, J. S. Yoo, Q. Wang, and I. H. Kim. 2006. Effect of protease supplementation selected from mud flat microorganism on growth performance, nutrient digestibility, total protein and BUN concentration in broilers. Joint Annual Meeting, Minneapolis, MN.

Kim, H. J., B. J. Min, J. H. Cho, Y. J. Chen, J. S. Yoo, Q. Wang, and I. H. Kim. 2006. Effect of protease supplementation selected from mud flat microorganism on egg quality, nutrient digestibility and total protein concentration in laying hens. Joint Annual Meeting, Minneapolis, MN.

Kim, H. J., J. S. Yoo, O. S. Kwon, B. J. Min, K. S. Son, J. H. Cho, Y. J. Chen, and I. H. Kim. 2005. Influence of *Bacillus subtilis* supplementation on egg quality, blood characteristics and fecal NH₃-N in laying hens. Joint Annual Meeting, Cincinnati, Ohio.

Kim, H. J., B. J. Min, J. H. Cho, Y. J. Chen, J. S. Yoo, and I. H. Kim. 2005. Effect of *Perinereis aibuhitensis* originated protease supplementation on growth performance, amino acid digestibility, meat quality and VFA and NH₃-N concentration in finishing pigs. J. Anim. Sci. & Technol. Symposium, Chon Buk Univ., Korea.

Invited Lecture

“Swine Nutrition and Animal Science” in KSEA Arkansas Local (NWA) meeting
(Dec. 2014)

PROFESSIONAL AFFILIATIONS

American Society of Animal Science (ASAS)

A member of ASAS (2005-Present)

Korean-Americans Scientists and Engineers Association (KSEA)

A member of KSEA Alabama chapter (2019-Present)

A member of KSEA Arkansas chapter (2013-2016)

Golden Key International Honour Society

A member of Golden Key International Honour Society (2010-Present)

PROFESSIONAL SERVICE

Ad-Hoc Reviews for Animal Science Journals:

- Animal Science Journal
- Journal of Animal Science
- Journal of Animal Science and Technology
- Journal of Food Science
- Journal of Poultry Science
- The Revista Brasileira de Zootecnia