

**Heekwon Ahn**  
**Curriculum Vitae**

Mailing Address: Dept. of Animal Biosystems Science  
Chungnam National University  
99 Daehak-ro, Yuseong-gu, Daejeon 305-764, S. Korea  
E-mail) [hkahn@cnu.ac.kr](mailto:hkahn@cnu.ac.kr), [ahn.heekwon@gmail.com](mailto:ahn.heekwon@gmail.com)  
☎ +82-42-821-5785



**EDUCATION:**

**Ph.D Seoul National University, February 2003**

**Dept. of Agricultural Biotechnology (Ph.D. in Agriculture)**

Dissertation Topic: Development of a Piggery Slurry Treatment System Combining  
Autothermal Thermophilic Aerobic Digestion and Simplified Biofilter

Major: Agricultural Biotechnology, emphasis in Bioengineering for Livestock Production

**M.Sc. Seoul National University, February 1999**

**Dept. of Animal Science and Technology (Master of Science in Agriculture)**

Thesis Topic: Estimation of Thermal Energy Generated Through Composting of Poultry Manure  
in an Enclosed Reactor

Major: Animal Science and Technology, emphasis in Bioengineering for Livestock Production

**B.Sc. Kangwon National University, August 1996**

**Dept. of Feed Science and Technology (Bachelor of Science in Agriculture)**

Thesis Topic: How Feed Processing Affects Nutrient Utilization of Finishing Swine and Layer  
Diets

Major: Feed Science and Technology

## **RESEARCH EXPERIENCE:**

**Associate professor:** Dept. of Animal Biosystems Science, Chungnam National University, South Korea, February 2012 – Present.

**Research Scientist:** Animal Environment Division, National Institute of Animal Science (NIAS), Rural Development Administration (RDA), South Korea, December 2010 –February 2012.

- ◆ Development of a biosecurity emergency animal carcass disposal system  
*(Principal Investigator, 2011-2012, in USD \$340,000)*
- ◆ Development of low cost biogas production system utilizing livestock manure  
*(Principal Investigator, 2010-2013, in USD \$230,000)*
- ◆ Development of environmentally friendly livestock mortality disposal system using anaerobic digestion *(International cooperative research project: Iowa State University, Principal Investigator, 2011-2012, in USD \$100,000)*
- ◆ Evaluation of carcass decomposition rate and leachate production from buried cattle mortalities *(Principal Investigator, 2011, in USD \$195,000)*
- ◆ Evaluation of the influence of animal waste treatment system types on viral pathogen inactivation *(Principal Investigator, 2011-2013, in USD \$145,000)*

**Research Biologist (GS rank 12):** Environmental Management and Byproduct Utilization Laboratory. United States Dept of Agriculture (USDA) - Agricultural Research Service (ARS)-Animal and Natural Resources Institute (ANRI), March 2008 – November 2010.

- ◆ Conversion of agricultural products/byproducts to energy.
- ◆ Biogas production from switch grass – animal manure mixtures using dry anaerobic digestion.
- ◆ Evaluation of farm-scale dairy manure anaerobic digestion system performance.
- ◆ Development of simple management practices to reduce greenhouse gas emissions from composting operations

**Assistant Scientist II:** Dept of Agricultural and Biosystems Engineering. Iowa State University, USA, October 2006 – February 2008.

- ◆ On-site Composting for Bio-containment & Safe Disposal of Infectious Animal Carcasses and Manure in the Event of a Bio-terrorism Attack. (Sponsor: Canada Research & Technology Initiative)
- ◆ Bio-Fuel Production from Bio-Dried Animal Manure to Improve Iowa Livestock Production Economy (Sponsor–Iowa Biotechnology Byproducts Consortium)

**Post Doctoral Research Associate:** Dept of Agricultural and Biosystems Engineering. Iowa State University, USA, March 2003 – September 2006.

- ◆ On-site Composting for Bio-containment & Safe Disposal of Infectious Animal Carcasses and Manure in the Event of a Bio-terrorism Attack. (Sponsor–Canada Research and Technology Initiative)
- ◆ Bio-Fuel Production from Bio-Dried Animal Manure to Improve Iowa Livestock Production Economy (Sponsor–Iowa Biotechnology Byproducts Consortium)
- ◆ Environmental impact and biosecurity of composting for emergency disposal of livestock mortalities. (Sponsor–Iowa Department of Natural Resources and the U.S. Department of Agriculture)
- ◆ Developing and implementing a composting/vegetative filter strip demonstration site at the ISU dairy teaching farm (Sponsor - Iowa Department of Natural Resources)

**Visiting scientist:** Dept of Agricultural and Biosystems Engineering. Iowa State University, USA, June 2001 – September 2001.

**Research Assistant:** Dept of Agricultural Biotechnology. Seoul National University. Seoul, Korea, 1999- February, 2003.

- ◆ Leadership responsibility for research “Development of selective piggery slurry treatment systems and operational strategies for different scales of pig farms”
- ◆ A preliminary study on optimum treatment for composting of piggery slurry
- ◆ Suggestions for improvement of the rural environment in Wangoong handicapped human settlement
- ◆ Remediation to properly treat livestock manure in Saemangeum watershed

**Research Assistant:** Dept of Animal Sci & Tech. Seoul National University. Seoul, Korea, August, 1996-February, 1999.

- ◆ responsibility for research “Development of a practical on-site livestock wastewater treatment system for small-scale pig producers”
- ◆ Impact of livestock wastes on the water quality of Paldang reservoir (1).
- ◆ Impact of livestock wastes on the water quality of Paldang reservoir (2).

## **TEACHING EXPERIENCE:**

### **Lecturer:**

- ◆ Chungnam National University. March, 2012- Present
- ◆ Korea National Open University. March, 2001- June, 2001.
- ◆ Seoul National University. March, 2002- August, 2002.
- ◆ Korea National Open University. September, 2002- December, 2002.

## **RESEARCH PUBLICATION:**

### **ARTICLES IN REFEREED JOURNALS**

S. Sadaka, **H.K. Ahn**. 2012. Evaluation of a biodrying process for beef, swine, and poultry manures mixed separately with corn stover. *Applied Engineering in Agriculture*. 28(2):457-463.

D.F. Webber, S.K. Mickelson, T.L. Richard, **H.K. Ahn**. 2011. Livestock manure windrow composting runoff and infiltration characteristics from laboratory rainfall simulations. *Compost Science & Utilization*. 19(1): 6-14.

**H.K. Ahn**, M.S. Huda, M.C. Smith, W. Mulbry, W.F. Schmidt, J.B. Reeves III. 2011. Biodegradability of injection molded bioplastic pots containing polylactic acid and poultry feather fiber. *Bioresource Technology* 102: 4930-4933.

**H.K. Ahn**, W.W. Water, J.W. White, S.L. Kondrad. 2011. Pile mixing increases greenhouse gas emissions during composting of dairy manure. *Bioresource Technology* 102: 2904-2909.

N. Akdeniz, J.A. Koziel, T.D. Glanville, **H.K. Ahn**, B.P. Crawford. 2011. Air sampling methods for VOCs related to field-scale biosecure swine mortality composting. *Bioresource Technology* 102:3599-3602.

**H.K. Ahn**, M.C. Smith, S.L. Kondrad, J.W. White. 2010. Evaluation of biogas production potential by dry anaerobic digestion of switchgrass-animal manure mixtures. *Applied Biochemistry and Biotechnology* 160:965-975.

N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville, B.P. Crawford. 2010. Field scale evaluation of volatile organic compound production inside biosecure swine mortality composts. *Waste Management* 30:1981-1988.

- N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville, B.P. Crawford, D.R. Raman. 2010. Laboratory scale evaluation of VOC emissions as indication of swine carcass degradation inside biosecure composting units. *Bioresource Technology* 101:71-78.
- D.F. Webber, S.K. Mickelson, L.W. Wulf, T.L. Richard, **H.K. Ahn**. 2010. Hydrologic modeling of runoff from a livestock manure windrow composting site with a fly ash pad surface and vegetative filter strip buffers. *Journal of Soil and Water Conservation* 65:252-260.
- H.K. Ahn**, T.J. Sauer, T.L. Richard, T.D. Glanville. 2009. Determination of thermal properties of compost bulking materials. *Bioresource Technology* 100:3974-3981.
- T.D. Glanville, **H.K. Ahn**, T.L. Richard, J.D. Harmon. 2009. Soil contamination caused by emergency bio-reduction of catastrophic livestock mortalities. *Water Air and Soil Pollution* 198:285-295.
- N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville, B.P. Crawford, D.R. Raman. 2009. Air sampling and analysis method for volatile organic compounds (VOCs) related to field-scale mortality composting operations. *Journal of Agricultural and Food Chemistry* 57:5658-5664.
- D.F. Webber, S.K. Mickelson, T.L. Richard, **H.K. Ahn**. 2009. Effects of a livestock manure windrow composting site with a fly ash pad surface and vegetative filter strip buffers on sediment, nitrate, and phosphorus losses with runoff. *Journal of Soil and Water Conservation* 64:163-171.
- H.K. Ahn**, T.L. Richard, T.D. Glanville. 2008. Laboratory Determination of compost physical Parameters for modeling of airflow characteristics. *Waste Management* 28(3): 660-670.
- H.K. Ahn**, T.L. Richard, T.D. Glanville. 2008. Optimum moisture levels for biodegradation of mortality composting envelope materials. *Waste Management* 28(8): 1411-1416.
- H.K. Ahn**, T.L. Richard and H.L. Choi. 2007. Mass and Thermal Balance during Composting of a Poultry Manure - Wood Shavings Mixtures at Different Aeration Rates. *Process Biochemistry* 42(2): 215-223.
- D.Y. Choi, H.L. Choi, J.H. Kwag, J.H. Kim, H.C. Choi, D.J. Kwon, H.S. Kang, C.B. Yang, **H.K. Ahn**. 2007. Characteristics of Manure and Estimation of Nutrient and Pollutant of Holstein Dairy Cattle. *Korean Society of Anim. Sci. & Tech.* 49(1): 137-146.
- D.Y. Choi, J.H. Kwag, C.H. Park, K.H. Jeong, J.H. Kim, Y.H. Yoo, C.B. Yang, H.L. Choi, **H.K. Ahn**. 2007. Effect of feed intake and water consumption on milk yield and manure production in milking

cows. Journal of Livestock Housing and Environment. 13(1) 21-28.

**H.K. Ahn** and H.L. Choi. 2006. Piggery slurry composting using batch operating autothermal thermophilic aerobic digestion system. Asian-Australian Journal of Animal Sciences. 19:273-279.

H.L. Choi, Tom L. Richard and **H. K. Ahn**. 2001. Composting high moisture materials: biodrying poultry manure in a sequentially fed reactor. Compost Science & Utilization. 9(4): 303-311.

**H. K. Ahn** and H. L. Choi. 2001. Energy estimation of poultry manure biodegradation in an enclosed reactor. Korean Society of Anim. Sci. & Tech. 43(5): 763-776

**H. K. Ahn**, H. L. Choi, W. C. Jung, K. Y. Kim, J. K. Kim, I. H. Park and Y. C. Jung. 2001. Impact of livestock waste on the water quality of Paldang reservoir. Korean Society of Anim. Sci. & Tech. 43(4): 569-586

J.K. Kim, H. L. Choi, S. C. Hong and **H. K. Ahn**. 2001. The Reaction Characteristics and Application of Photocatalytic Reaction System for Non-biodegradable. Korean Society of Anim. Sci. & Tech. 43(3): 409-422

Y. B. Ahn, H. L. Choi and **H. K. Ahn**. 2000. Changes of the bacterial populations with the treatment process of pig slurry. Korean Society of Anim. Sci. & Tech. 42(3): 361-370.

H. L. Choi, J. I. Song and **H. K. Ahn**. 2000. Field survey of structural and environmental characteristics of pig houses in the southern provinces in Korea. Korea J. Livestock Housing and Environment. 6(1):1-14, 2000

H. L. Choi, J. I. Song and **H. K. Ahn**. 1999. Better housing for effective pig production. Asian-Australian Journal of Animal Sciences. 12(8): 1310-1315.

H. L. Choi, J. I. Song, H. T. Kim, **H. K. Ahn**, and S. Y. Koh. 1999. Field survey of structural and environmental characteristics of pig houses in the central provinces in Korea. Korea J. Livestock Housing and Environment. 5(1) 1-15.

## **RESEARCH PUBLICATIONS (NOT PEER-REVIEWED)**

**H.K. Ahn**, M.C. Smith, J.W. White, S.L. Kondrad. 2010. Influence of switchgrass maturity on dry anaerobic digestion performance. ASABE paper No 1009885. ASABE annual international meeting. Pittsburgh, PA. USA.

T.D. Glanville, **H.K. Ahn**, B.P. Crawford, J.A. Koziel, N. Akdeniz. 2009. Physical, chemical, and biological performance of a plastic-wrapped composting system for emergency disposal of disease-related swine mortalities. 3<sup>rd</sup> International symposium on management of animal carcasses, tissue and related byproducts. Davis, CA. USA.

**H.K. Ahn**, M.C. Smith, J.W. White, S.L. Kondrad. 2009. Biogas production during co-digestion of dairy manure and food waste mixtures. ASABE paper No 097423. ASABE annual international meeting. Reno, NV. USA.

T.D. Glanville, **H.K. Ahn**, B.P. Crawford, J.A. Koziel, N. Akdeniz. 2009. Composting for bio-containment & safe disposal of infectious swine carcasses. ASABE paper No 096342. ASABE annual international meeting. Reno, NV. USA.

**H.K. Ahn**, M.C. Smith. 2008. Biogas production potential from switch grass-animal manure mixture using dry anaerobic digestion. ASABE paper No 085157. ASABE annual international meeting. Providence. RI. USA.

**H.K. Ahn**, T.D. Glanville, S.J. Hoff, J.A. Koziel, B.P. Crawford, N. Akdeniz. 2008. Airflow measurement and moisture loss evaluation within passively aerated composting system. ASABE paper No 085152. ASABE annual international meeting. Providence. RI. USA.

T.D. Glanville, **H.K. Ahn**, , J.A. Koziel, N. Akdeniz, B.P. Crawford. 2008. Pathogen inactivation potential and carcass degradation in a bio-secure emergency livestock mortality composting system. ASABE paper No 084426. ASABE annual international meeting. Providence. RI. USA.

N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville, B.P. Crawford, N.Shah, P.C. Hermston, D.R. Raman, A.L. Pometto, S.M. Beattie. 2008. Characterization of VOC emissions from warm season swine mortality composting operations. ASABE paper No 085047. ASABE annual international meeting. Providence. RI. USA.

**H.K. Ahn**, T.D. Glanville, B.P. Crawford, J.A. Koziel, N. Akdeniz. 2007. Evaluation of the biodegradability of animal carcasses in passively aerated bio-secure composting system. ASABE paper No 074037. ASABE annual international meeting. Minneapolis. MN. USA.

S.S. Sadaka, **H.K. Ahn**, R.T. Burns, H.M. Hanna. 2007. Biofuel production from bio-dried animal manure. ASABE paper No 076151. ASABE annual international meeting. Minneapolis. MN. USA.

T.D. Glanville, **H.K. Ahn**, D. L. Reynolds, J.A. Koziel, S. Akinc, N. Akdeniz. 2007. Performance evaluation of a biosecure composting systems for emergency disposal of swine mortalities. ASABE paper No 074038. ASABE annual international meeting. Minneapolis. MN. USA.

N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville. 2007. Stability evaluation of simulated plant and animal composts utilizing respiration rates and VOC emissions. ASABE paper No 074155. ASABE annual international meeting. Minneapolis. MN. USA.

N. Akdeniz, J.A. Koziel, **H.K. Ahn**, T.D. Glanville. 2007. Qualitative characterization of volatile compound emissions during biological decomposition of plant materials with solid-phase microextraction and gas chromatography-mass spectrometry. ASABE paper No 074041. ASABE annual international meeting. Minneapolis. MN. USA.

T.D. Glanville, T.L. Richard, J.D. Harmon, D. L. Reynolds, **H.K. Ahn**, and S. Akinc. 2006. Composting livestock mortalities: Assessing the feasibility. *Biocycle*. 47(11) 42-48.

**H.K. Ahn**, T.J. Sauer, T.L. Richard, T.D. Glanville. 2006. Determination of thermal properties of compost bulking materials by using various methods. ASABE paper No. 064065. ASABE annual international meeting. Portland. OR. USA.

T.D. Glanville, **H.K. Ahn**, T.L. Richard, J.D. Harmon, D. L. Reynolds, and S. Akinc. 2006. Environmental impacts of emergency livestock mortality composting- Leachate release and soil contamination. ASABE paper No. 064049. ASABE annual international meeting. Portland. OR. USA.

**H.K. Ahn**, T.L. Richard, T.D. Glanville, J.D. Harmon, and D.L. Reynolds. 2005. Estimation of optimum moisture levels for biodegradation of compost bulking materials. ASAE paper No. 054089. ASAE Annual International Meeting. Tampa. FL. USA.

T.D. Glanville, **H.K. Ahn**, J.D. Harmon, T.L. Richard, D. L. Reynolds, and S. Akinc. 2005. Environmental Impacts & Bio-security of Composting for Emergency Disposal of Livestock Mortalities. ASAE paper No. 054094. ASAE Annual International Meeting. Tampa. FL. USA.

**H.K. Ahn**, T.L. Richard, T.D. Glanville, J.D. Harmon, and D.L. Reynolds. 2004. Laboratory determination of compost modeling parameters. ASAE paper No. 044060. ASAE/CSAE Annual



International Meeting. Ottawa, ON, Canada

T.D. Glanville, T.L. Richard, J.D. Harmon, D.L. Reynolds, **H.K. Ahn**, S. Akinc. 2004. Environmental Impact & Bio-security of Composting for Emergency Disposal of Livestock Mortalities -Year 2 Project Update. ASAE paper No. 044069. ASAE/CSAE Annual International Meeting. Ottawa, ON, Canada

## **CONFERENCE PRESENTATIONS, POSTERS AND ABSTRACTS**

**H.K. Ahn**. 2012. 2010 FMD outbreak in Korea-Government's response to this emergency and important lessons learned. 4<sup>th</sup> International Symposium. Managing Animal Mortalities, Products, By-Products and Associated Health Risk: Connecting Research, Regulations & Response. Dearborn, Michigan, USA. (***Invited Keynote Speaker***)

**H.K. Ahn**, J.H.Kim, J.H.Kwag, K.H.Jeong, S.H.Cho, Y.H.Yoo. 2011. Sustainable animal waste management and utilization in Korean livestock farms. Food and Fertilizer Technology Center 2011 International Seminar on "Sustainable resource management of livestock and poultry waste for Asian small-scale farmers". FFTC. Ho Chi Minh, Vietnam (***Invited Speaker***)

M.C. Smith, **H.K. Ahn**, J.W. White. 2009. Farm biogas production and water resource. American Chemical Society Abstracts. 238<sup>th</sup> National meeting of ACS. Washington, D.C. USA.

N. Akdeniz, J.A. Koziel, T.D. Glanville, **H.K. Ahn**, B.P. Crawford. 2009. Identification, evaluation and quantification of VOCs as bio-secure markers of swine carcass degradation. 3<sup>rd</sup> International symposium on management of animal carcasses, tissue and related byproducts. Davis, CA. USA.

**H.K. Ahn**. 2008. Trends in research and policy regarding sustainable livestock farming and biomass production in the U.S. International Symposium on Environmentally Friendly Livestock Farming. The Korean Society for Livestock Housing and Environment. Suwon. Korea (***Invited Speaker***)

**H.K. Ahn**, M.C. Smith. 2008. Cafeteria food waste pulp as digester substrate. The 8<sup>th</sup> annual BioCycle conference on renewable energy from organics recycling. Madison, WI. USA (***Invited Speaker***)

M.C. Smith, **H.K. Ahn**, J.W. White. 2008. Turning waste into energy: Biogas production on dairy farms. American Chemical Society Abstracts. 236<sup>th</sup> National meeting of ACS. Philadelphia, PA. USA.

N. Akdeniz, J.A. Koziel, **H.K. Ahn**, B.P. Crawford, T.D. Glanville. 2007. Qualitative characterization of volatile compound emissions during biological decomposition of plant and animal tissues using SPME-GC-MS. 2nd Annual Symposium ISU Institute for Food Safety and Security.

J. Guan, B.W. Brooks, J.L. Spencer, P. Kitching, T.A. McAllister, G.D. Inglis, F.J. Larney, X. Hao, T. Glanville, J.Kozile, D. Reynolds, **H.K. Ahn**, N. Akdeniz, K. Stanford. 2006. On-site composting for bio-containment and safe disposal of infectious animal carcasses and manure in the event of a bio-terrorism attack. CRTI Summer Symposium 2006. Quebec, Canada.

T.D. Glanville, D. L. Reynolds, S. Akinc, J.D. Harmon, T.L. Richard, & **H.K. Ahn**. 2006. Biosecurity of Composting Process for Emergency Disposal of Livestock Mortalities. "Safe and Secure Food for Public Health and National Security". Institute of Food Safety and Security (IFSS) symposium. Ames, Iowa, USA.

**H. K. Ahn**, T. L. Richard, S. K. Mickelson, & D. F. Webber. 2006. Nutrient Mass Balance of a Demonstration Windrow Composting Site. 6th Annual Water Monitoring Conference, Iowa State University, Ames, Iowa, USA.

D. F. Webber, S. K. Mickelson, T. L. Richard, & **H. K. Ahn**. 2006. Runoff Results from a Windrow Composting/Vegetative Filter Strip Demonstration Site. 6th Annual Water Monitoring Conference, Iowa State University, Ames, Iowa, USA.

T.D. Glanville, T.L. Richard, J.D. Harmon, **H.K. Ahn**, D.L. Reynolds, S. Akinc. 2005. Evaluation of Composting for Emergency Disposal of Cattle Mortalities in Iowa: Performance, Environmental Impacts, & Bio-security. Conference of Composting Mortalities and Slaughterhouse Residuals. Portland, ME, USA

D. L. Reynolds, S. Akinc, T. D. Glanville, J.D. Harmon, T.L. Richard, **H.K. Ahn**, S. Sadaka. 2004. Evaluation of Biosecurity of Large Scale Composting. Conference of Research Workers in Animal Diseases (CRWAD). Chicago, IL, USA

Webber, D.F., S.K. Mickelson, T.L. Richard, and **H.K.Ahn**. 2004. Developing and Implementing a Composting/Vegetative Filter Strip Demonstration Site at the ISU Dairy Teaching Farm. The Soil and Water Conservation Society Annual Meeting, Paul, MN. USA.

D. F. Webber, S. K. Mickelson, T. L. Richard, & **H. K. Ahn**. 2004. Developing and Implementing a Composting/Vegetative Filter Strip Demonstration Site at the ISU Dairy Teaching Farm. 4th Annual Water Monitoring Conference, Iowa State University, Ames, Iowa, USA.

**H. K. Ahn**, H. L. Choi, J. I. Song, W. C. Jung, K. Y. Kim, Y. C. Jung, C. H. Ryu, J. K. Cho, K. H. Kim. 2000. Impact of livestock manure on water quality of South Han river. Proc. of the 9th Annual Congress of Animal Sciences and Technology. Seoul, Korea.

**H. K. Ahn** and H. L. Choi. 1999. Estimation of thermal energy generated through composting of poultry manure in an enclosed reactor. Proc. of the 8th Annual Congress of Animal Sciences and Technology. Seoul, Korea.

## **SOCIETY MEMBERS & ACTIVITIES**

### **Members**

American Society of Agricultural and Biological Engineers (ASABE), member

ASABE Food Processing Waste Management & Utilization Committee Membership (2006-2007)

The Korean Society of Animal Sciences and Technology, member

The Korean Federation for Environmental Movement, member

### **Activities**

ASABE- FPE-707 Food and Organic Waste Management & Utilization Committee Officer:

**Chair (2008-2009), Vice-Chair (2007- 2008), Secretary (2006-2007)**

Organic Recovery & Biological Treatment (ORBIT) 2010 conference: **Scientific committee (Composting & Biogas production)**

The Journal of Livestock Housing and Environment: Editor- in-Chief (2012 – Present)

## **HONORS & AWARDS**

Best researcher award, 2011. National Institute of Animal Science, RDA, South Korea

Outstanding performance appraisal, 2010. USDA-ARS, Animal and Natural Resources Institute.

Outstanding performance appraisal, 2009. USDA-ARS, Animal and Natural Resources Institute.

Listed in Marquis Who's Who in Science and Engineering, 10<sup>th</sup> Anniversary Edition, 2008-2009.

Listed in Marquis Who's Who in Science and Engineering, 9<sup>th</sup> Edition, 2006-2007.

Post-Doctoral Scholarship (\$20,000), 2003. Korea Science and Engineering Foundation (KOSEF).

Aug. 1996. Cum Laude, Kangwon National University.

## **REFEREE FOR PEER-REVIEWED JOURNALS**

Journal of Environmental Quality

Waste Management.

Transactions of the ASABE (American Society of Agricultural and Biological Engineers).

Canadian Biosystems Engineering.

International Journal of Environmental Research and Public Health