

# Dr. Md. Wadud Ahmed

Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh

Mobile : +880 1724000216

Email : wahmed@sau.edu.bd ;wahmed.sau014@gmail.com

Google Scholar

Linkedin

Personal Website

## PROFESSIONAL SUMMARY

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PhD in Agricultural and Biological Engineering (University of Illinois Urbana-Champaign). Experienced academic with a demonstrated history of teaching and research in food and biological engineering. Research interests include hyperspectral imaging, NIR spectroscopy, machine learning, drying, and food safety.

## WORK EXPERIENCE

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- **Sher-e-Bangla Agricultural University** Dhaka, Bangladesh  
*Associate Professor, Department of Agricultural Engineering*  
Oct 2023 - Current
  - **Sher-e-Bangla Agricultural University** Dhaka, Bangladesh  
*Assistant Professor, Department of Agricultural Engineering*  
Oct 2016 - Oct 2023
  - **Sher-e-Bangla Agricultural University** Dhaka, Bangladesh  
*Lecturer, Department of Agricultural Engineering*  
Oct 2014 - Oct 2016
- Courses Taken:* Food Technology(50 students per semester), Agricultural Mechanization (500 students per semester)  
*National Funding Acquired:* 2 ; *Students Supervision:* 2 masters students

## EDUCATION

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- **University of Illinois Urbana-Champaign** Champaign, IL, United States  
*PhD in Agricultural and Biological Engineering;GPA: 3.85 / 4.00*  
*Advisor: Dr. Mohammed Kamruzzaman*  
*Thesis: Application of Spectral Techniques and Machine Learning for Fertility, Mortality, Sex, and Structural Evaluation of Eggs*  
*Relevant Courses: Engineering Measurement Systems, Food Processing Engineering, Food Safety for Global Food Security*  
Aug 2022 - May 2025
- **KU Leuven** Ghent, Belgium  
*European Master of Food Science, Technology and Business*  
*Thesis: Production of natural anticaking agent and suitability testing for flow regulation of whole milk powder*  
*Professional Module: Residence time distribution and kinetics of insolubility for skim milk powder during spray drying*  
2017 - 2019
- **Bangladesh Agricultural University** Mymensingh, Bangladesh  
*MS in Food Engineering;CGPA: 3.90 / 4.00*  
*Thesis: Analysis of Sorption Behaviors of Selected Commercial Flours using Different Models*  
2013 - May 2014
- **Bangladesh Agricultural University** Mymensingh, Bangladesh  
*B.Sc in Food Engineering;CGPA: 3.71 / 4.00 2nd Merit Position*  
*Thesis: Kinetics of Mechanical and Osmotic Dehydration of Eggplant*  
2009 - 2012

## RESEARCH EXPERIENCE

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- **University of Illinois Urbana-Champaign** Champaign, IL, United States  
*Graduate Research Assistant*  
Aug 2022 - May 2025
  - **Non-destructive evaluation of Eggs using Hyperspectral Imaging and NIR spectroscopy:** I extensively researched pre-incubation detection of fertility, embryo mortality, sex, and structural evaluation of eggs using optical sensing, machine learning and, explainable AI.
  - **High-throughput composition analysis of biomass:** My experiments demonstrated that NIR spectroscopy is sufficiently good for fast and accurate prediction of biomass composition to advance the biofuel industry.
- **Sher-e-Bangla Agricultural University** Dhaka, Bangladesh  
*Pre-doctoral Faculty*  
2014 - 2022
  - **Food Engineering and Food Safety:** Before my PhD I conducted various research on drying and moisture absorption kinetics, spray drying and food safety.
- **KU Leuven** Ghent, Belgium  
*Erasmus Mundus Scholar*  
2017 - 2019
  - **Spray Drying and Powder Technology:** My research focused on kinetics of insolubility for skim milk powder in spray drying and development of natural anti-caking agent to improve the flow ability of whole milk powder.

1. **Ahmed, M. W.**, S. J. Hossainy, A. Khaliduzzaman, J. L. Emmert, and M. Kamruzzaman. Non-destructive optical sensing technologies for advancing the egg industry toward industry 4.0: A review. *Comprehensive Reviews in Food Science and Food Safety*, 22(6):4378–4403, 2023
2. **Ahmed, M. W.**, A. Sprigler, J. L. Emmert, R. N. Dilger, G. Chowdhary, and M. Kamruzzaman. Non-destructive detection of pre-incubated chicken egg fertility using hyperspectral imaging and machine learning. *Smart Agricultural Technology*, 10:100857, 2025
3. **Ahmed, M. W.**, A. Khaliduzzaman, J. L. Emmert, and M. Kamruzzaman. An overview of recent advancements in hyperspectral imaging in the egg and hatchery industry. *Computers and Electronics in Agriculture*, 230:109847, 2025
4. **Ahmed, M. W.**, A. Sprigler, J. L. Emmert, and M. Kamruzzaman. Non-destructive pre-incubation sex determination in chicken eggs using hyperspectral imaging and machine learning. *Food Control*, page 111233, 2025
5. **Ahmed, M. W.**, S. Alam, A. Khaliduzzaman, J. L. Emmert, and M. Kamruzzaman. Non-destructive measurement of eggshell strength using nir spectroscopy and explainable artificial intelligence. *Journal of the Science of Food and Agriculture*, 2025
6. **Ahmed, M. W.**, S. Alam, A. Khaliduzzaman, J. L. Emmert, and M. Kamruzzaman. Nondestructive prediction of eggshell thickness using nir spectroscopy and machine learning with explainable ai. *ACS Food Science & Technology*, 2025
7. **Ahmed, M. W.**, C. A. Esquerre, K. Eilts, D. P. Allen, S. M. McCoy, S. Varela, V. Singh, A. D. Leakey, and M. Kamruzzaman. Rapid and high-throughput determination of sorghum (sorghum bicolor) biomass composition using near infrared spectroscopy and chemometrics. *Biomass and Bioenergy*, 186:107276, 2024
8. **Ahmed, M. W.**, C. A. Esquerre, K. Eilts, D. P. Allen, S. M. McCoy, S. Varela, V. Singh, A. D. Leakey, and M. Kamruzzaman. Influence of particle size on nir spectroscopic characterization of sorghum biomass for the biofuel industry. *Results in Chemistry*, 13:102016, 2025
9. **Ahmed, M. W.**, F. Schulnies, and T. Kleinschmidt. Residence time distribution and kinetics of insolubility of skim milk powder during spray drying. *Food and Humanity*, 2:100211, 2024
10. **Ahmed, M. W.**, M. S. I. Khan, A. Parven, M. H. Rashid, and I. M. Meftaul. Vitamin-a enriched yogurt through fortification of pumpkin (cucurbita maxima): A potential alternative for preventing blindness in children. *Heliyon*, 9(4), 2023
11. **Ahmed, M. W.**, M. A. Haque, M. Mohibullah, M. S. I. Khan, M. A. Islam, M. H. T. Mondal, and R. Ahmmed. A review on active packaging for quality and safety of foods: Current trends, applications, prospects and challenges. *Food Packaging and Shelf Life*, 33:100913, 2022
12. **Ahmed, M. W.** and M. Kamruzzaman. Advancing food safety in bangladesh: Challenges and the promise of smart sensor technology. *Food Safety and Health*, 2025
13. M. T. Ahmed, **Ahmed, M. W.**, and M. Kamruzzaman. A systematic review of explainable artificial intelligence for spectroscopic agricultural quality assessment. *Computers and Electronics in Agriculture*, 235:110354, 2025
14. N. G. Schumer, **Ahmed, M. W.**, K. Rausch, V. Singh, and M. Kamruzzaman. Chemometric-based approach for economically motivated fraud detection in organic spices via nir spectroscopy. *Journal of Food Composition and Analysis*, 142:107538, 2025
15. M. C. Paul, **Ahmed, M. W.**, M. D. H. Prodhan, N. K. Dutta, M. T. Ahmed, M. M. Abdullah, M. A. Islam, and M. S. I. Khan. Pesticides in widely consumed vegetables in bangladesh and its health risk. *Food Additives & Contaminants: Part B*, 18(1):1–11, 2025
16. M. M. Islam, **Ahmed, M. W.**, M. H. Rabin, M. A. Razzaque, M. Hasan, M. Siddika, and S. S. Zamil. Status and health risk assessment of heavy metals in vegetables grown in industrial areas of bangladesh. *International Journal of Environmental Analytical Chemistry*, 104(17):5208–5226, 2024
17. M. T. Ahmed, **Ahmed, M. W.**, O. Monjur, J. L. Emmert, G. Chowdhary, and M. Kamruzzaman. Hyperspectral image reconstruction for predicting chick embryo mortality towards advancing egg and hatchery industry. *Smart Agricultural Technology*, 9:100533, 2024
18. D. H. Lee, **Ahmed, M. W.**, and M. Kamruzzaman. Nanoscale substance-integrated optical sensing platform for pesticide detection in perishable foods. *Current Opinion in Food Science*, page 101227, 2024

19. M. V. da Silva Ferreira, **Ahmed, M. W.**, M. Oliveira, S. Sarang, S. Ramsay, X. Liu, A. Malvandi, Y. Lee, and M. Kamruzzaman. Ai-enabled optical sensing for smart and precision food drying: Techniques, applications and future directions. *Food Engineering Reviews*, pages 1–29, 2024
20. M. T. Ahmed, **Ahmed, M. W.**, and M. Kamruzzaman. Spectrochat: a windows executable graphical user interface for chemometrics analysis of spectroscopic data. *Software Impacts*, 21:100698, 2024
21. A. Hossain, **Ahmed, M. W.**, M. H. Rabin, A. Kaium, M. A. Razzaque, and S. S. Zamil. Heavy metal quantification in chicken meat and egg: An emerging food safety concern. *Journal of Food Composition and Analysis*, 126:105876, 2024

## PUBLICATIONS - CONFERENCE

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1. M. Khatun, **Ahmed, Md Wadud**, M. M. Hossain, P. Karmoker, and A. Iqbal. Utilization of banana peel flour in biscuit making as wheat flour substitute. *European Journal of Agriculture and Food Sciences*, 3(6):32–35, 2021
2. **Ahmed, M. W.**, A. Khaliduzzaman, J. L. Emmert, and M. Kamruzzaman. Non-destructive prediction of eggshell strength using ft-nir spectroscopy combined with pls regression. In *2024 ASABE Annual International Meeting*, page 1. American Society of Agricultural and Biological Engineers, 2024
3. **Ahmed, M. W.**, C. Esquerre, V. Singh, A. D. Leakey, and M. Kamruzzaman. Nir spectroscopy and chemometrics for detecting some selected components of lipid-producing sorghum biomass for biofuels. In *2023 ASABE Annual International Meeting*, page 1. American Society of Agricultural and Biological Engineers, 2023
4. O. Monjur, M.T Ahmed , **M. W. Ahmed** and M. Kamruzzaman. AgroNet: A Convolution-Attention fusion based hyperspectral image extractor for Agro-food quality measurement. **Accepted at CVPR 2025 Workshops**

## EDITORIAL EXPERIENCE

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Guest Editor Assistant, Foods (MDPI) – Special Issue: Recent Advances in Application of Food and Bioprocess Engineering for Food Safety and Quality. March 2024 - Current

## REVIEWING EXPERIENCE

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1. Food Control 2022-2025: 4 papers
2. Journal of Food Science and Technology 2022-2025: 10 papers
3. Journal of Food Composition and Analysis 2024: 1 paper

## AWARDS AND FELLOWSHIP

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1. Erasmus Mundus Scholarship for Joint master's degree, 2017
2. Nuffic OKP Scholarship for the professional degree, 2021
3. National Science & Technology Fellowship from Ministry of Science and Technology, Bangladesh, 2013

## SKILLS SUMMARY

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- **Programming Languages:** Python, Matlab
- **Tools:** MS Excel, SPSS
- **Management:** Assistant provost for a student hall of 1200 students
- **Languages:** English (B2), Bangla (Native)

## REFERENCES

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- **Mohammed Kamruzzaman** Champaign, IL USA  
Assistant Professor, Department of Agricultural and Biological Engineering  
University of Illinois at Urbana-Champaign, Illinois, USA  
Email: mkamruz1@illinois.edu
- **Jason Lee Emmert** Champaign, IL USA  
Professor, Department of Animal Sciences  
University of Illinois at Urbana-Champaign, Illinois, USA  
Email: jemmert@illinois.edu