

Minliang Yang, Ph.D.

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PROFESSIONAL EXPERIENCE

Assistant Professor, Food Sustainability Jan 2023 - Current

Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, NC, USA

Associate Faculty Sep 2023 - Current

Department of Biological and Agricultural Engineering, North Carolina State University, NC, USA

Affiliate Mar 2023 - Current

Lawrence Berkeley National Laboratory, CA, USA

Postdoctoral Scholar Jul 2018 – Jan 2023

- Lawrence Berkeley National Laboratory
Biological Systems and Engineering Division / Energy Analysis and Environmental Impacts Division
- Joint BioEnergy Institute (JBEI)
Life cycle, Economics, and Agronomy Division (LEAD)

RESEARCH INTERESTS

- Sustainability assessment of agri-food systems
- Technoeconomic analysis (TEA) for economic feasibility of novel foods
- Life-cycle assessment (LCA) for environmental impacts of agri-food systems

EDUCATION

Ph.D. in Agricultural and Biosystems Engineering

Iowa State University, Ames, IA, USA Aug 2018

M.S. in Agricultural and Biosystems Engineering

Minor in Statistics

Iowa State University, Ames, IA, USA Dec 2014

B.S. in Food Science and Technology / Grain Engineering

Henan University of Technology, Zhengzhou, Henan Province, China Jul 2012

PUBLICATIONS

Google scholar: https://scholar.google.com/citations?hl=en&user=356YvYgAAAAJ&view_op=list_works

1. **Yang, M.**, Liu, D., Baral, N., Lin, C., Gladden, Simmons, B. A., J., Eudes, A., Scown, C. D. 2022. Comparing *in planta* accumulation with microbial routes to set targets for a cost-competitive bioeconomy. *Proc. Natl. Acad. Sci. U. S. A.* 119 (30), 1-10.
DOI: 10.1073/pnas.2122309119

Last update: 05/30/2024

2. Barnum, C., Paviani, B., Couture, G., Masarweh, C., Chen, Y., Huang, Yu-Ping, Mills, D., Lebrilla, C., Barile, D., **Yang, M.**, Shih, P. 2023. Plant-based production of diverse human milk oligosaccharides. *Nature Food*. (Accepted for publication: May 13th, 2024)
3. Wang, Y., Baral, N., **Yang, M.**, Scown, C. D. 2023. Co-processing agricultural residues and wet organic waste can produce lower-cost carbon-negative fuels and bioplastics. *Environ. Sci. Technol.* 57, 7, 2958-2969. DOI: 10.1021/acs.est.2c06674
4. Huntington, T., Baral, N., **Yang, M.**, Sundstrom, E., Scown, C.D. 2023. Machine learning for surrogate process models of bioproduction pathways. *Bioresour. Technol.* 370, 128528. DOI: 10.1016/j.biortech.2022.128528
5. Liu, P., **Yang, M.**,* Hermanowicz, S. W., Huang, Y*. 2022. Efficacy associated cost analysis on copper-based nanopesticides for tomato disease control. *ACS Agric. Sci. Technol.* 2(4), 796-804. DOI: 10.1021/acsagscitech.2c00098
*co-corresponding author
6. Achinivu, E. C., Cabrera, M., Umar, A., **Yang, M.**, Baral, N., Scown, C. D., Simmons, B. A., Gladden, J. 2022. In situ synthesis of protic ionic liquid for biomass pretreatment. *ACS Sustainable Chemistry and Engineering.* 10(37), 12090-12098. DOI: 10.1021/acssuschemeng.2c01211
7. Tian, Y., **Yang, M.**, Lin, C-Y., Park, J-H., Wu, C-Y., Kakumanu, R., De Ben, C. M., Dalton, J., V, K. M., Shih, P.M., Baidoo, E. E. K., Temple, S., Putnam, D. H., Scheller, H. V., Scown, C. D., Eudes, A. 2022. Expression of dehydroshikimate dehydratase in sorghum improves biomass yields, accumulation of protocatechuate, and biorefinery economics. *ACS Sustain. Chem. Eng.* DOI: 10.1021/acssuschemeng.2c01160
8. **Yang, M.**, Dahlberg, J., Baral, N., Daniel, P., Scown, C. D., 2021. Identifying forage sorghum ideotype used in biorefineries from techno-economic perspective. *ACS Sustain. Chem. Eng.* 9(23), 7873-7881. DOI: 10.1021/acssuschemeng.1c01706
9. **Yang, M.**, Rosentrater, K. A. 2021. Cradle to gate life cycle assessment of structural bio-adhesives derived from glycerol. *Int. J. Life Cycle Assess.* DOI: 10.1007/s11367-020-01733-9
10. Scown, C. D., Baral, N., **Yang, M.**, Nova, N., Huntington, T. 2021. Technoeconomic analysis of biofuels and bioproducts. *Curr. Opin. Biotechnol.* 67, 58-64. DOI: 10.1016/j.copbio.2021.01.002
11. Baral, N., **Yang, M.**, Harvey, B. G., Simmons, B. A., Mukhopadhyay, A., Lee, T. S., Scown, C. D. 2021. Production cost and carbon footprint of biomass-derived dimethylcyclooctane as a high performance jet fuel blendstock. *ACS Sustain. Chem. Eng.* DOI: 10.1021/acssuschemeng.1c03772
12. **Yang, M.**, Baral, N., Simmons, B. A., Mortimer, J. C., Shih, P. M., Scown, C. D. 2020. Accumulation of high-value bioproducts *in planta* can improve the economics of advanced biofuels. *Proc. Natl. Acad. Sci. U. S. A.* 117(14), 8639-8648. DOI:10.1073/pnas.2000053117

13. **Yang, M.**, Baral, N., Anastasopoulou, A., Breunig, H. M., Scown, C. D. 2020. Cost and life-cycle greenhouse gas implications of integrating biogas upgrading and carbon capture technologies in cellulosic biorefineries. *Environ. Sci. Technol.* 54(50), 12180-12819. DOI: 10.1021/acs.est.0c02816
14. **Yang, M.**, Rosentrater, K. A., 2020. Economic feasibility analysis of traditional formaldehyde-based adhesives. *SN Appl. Sci.* 2(7), 1309. DOI: 10.1007/s42452-020-3108-2
15. **Yang, M.**, Rosentrater, K. A. 2020. Life cycle assessment of urea-formaldehyde adhesives and phenol-formaldehyde adhesives. *Environ. Process.* 7(2), 553-561. DOI:10.1007/s40710-020-00432-9
16. **Yang, M.**, Rosentrater, K. A. 2019. Life cycle assessment and techno-economic analysis of pressure sensitive bio-adhesive production. *Energies* 12(23), 4502. DOI: 10.3390/en12234502
17. **Yang, M.**, Rosentrater, K. A. 2019. Techno-economic analysis of the production process of structural bio-adhesive derived from glycerol. *J. Clean. Prod.* 228(10), 388-398. DOI: 10.1016/j.jclepro.2019.04.288
18. **Yang, M.**, Zhang, W., Rosentrater, K. A. 2017. Anhydrous ammonia pretreatment of corn stover and enzymatic hydrolysis of glucan from pretreated corn stover. *Fermentation*, 3(1), 9. DOI: 10.3390/fermentation3010009
19. **Yang, M.**, Rosentrater, K. A. 2017. Small scale low-moisture anhydrous ammonia (LMAA) pretreatment of corn stover. *Biomass Bioenergy* 97, 38-42. DOI: 10.1016/j.biombioe.2016.12.013
20. Cheng, M., **Yang, M.**, Wang, Y. 2016. American's energy future: an analysis of the proposed energy policy plans in presidential election. *Energies* 9(12),1000. DOI: 10.3390/en9121000
21. **Yang, M.**, Rosentrater, K. A. 2016. Comparison of sealing and open conditions for long term storage of corn stover using low-moisture anhydrous ammonia (LMAA) pretreatment method. *Ind. Crops Prod.* 91, 377-381. DOI: 10.1016/j.indcrop.2016.07.028
22. **Yang, M.**, Rosentrater, K. A. 2015. Techno-economic analysis (TEA) of low-moisture anhydrous ammonia (LMAA) pretreatment method for corn stover. *Ind. Crops Prod.* 76, 55-61. DOI: 10.1016/j.indcrop.2015.06.023

INVITED TALK & CONFERENCE PRESENTATIONS

Invited Talk

Industry Partners Advisory Council (IPAC) meeting, NC State, NC	Apr 2024
<ul style="list-style-type: none"> • Sustainability assessment of food systems 	
University of Idaho	Nov 2023
<ul style="list-style-type: none"> • LCA and TEA in food processing 	
KIETS Climate Leaders Program Fall Symposium, NC State, NC	Sep 2023
<ul style="list-style-type: none"> • <i>Ex-ante</i> LCA and cost analysis of non-thermal food technologies 	
Queens University, Charlotte, NC	Mar 2023

- Introduction of life-cycle assessment and technoeconomic analysis
CALS Emerging Research Showcase, NC State, NC Feb 2023
- Mitigating carbon emissions through value-added bioproducts
University of Idaho Nov 2022
- Life-cycle assessment and technoeconomic analysis of sustainable fuels and products
44th *Symposium on Biomaterials, Fuels and Chemicals*, New Orleans, LA May 2022
- Engineering bioenergy crops session: Comparing *in planta* accumulation with microbial routes to set targets for a cost-competitive bioeconomy
University of California, Berkeley, CA Feb 2021
- Separation Design and Economics of Bioprocess
Lawrence Livermore National Laboratory, Livermore, CA Nov 2020
- System Analysis Working Group: Life-cycle assessment and technoeconomic analysis of cellulosic biorefineries

Oral Presentations

- Yang, M.**, Liu, D., Baral, N., Lin, C., Gladden, Simmons, B. A., J., Eudes, A., Scown, C. D. 2022. Comparing *in planta* accumulation with microbial routes to set targets for a cost-competitive bioeconomy. *2023 ASABE annual international meeting: Circular Bioeconomy System (CBS) day, Omaha, NE, USA.*
- Yang, M.**, Baral, N., Simmons, B. A., Mortimer, J. C., Shih, P. M., Scown, C. D. 2020. Accumulation of high-value bioproducts *in planta* can improve the economics of advanced biofuels. *42nd Symposium on Biomaterials, Fuels & Chemicals. New Orleans, LA, USA.* (Cancelled due to COVID)
- Baral, N. R., **Yang, M.**, Scown, C. D. 2019. Lifecycle assessment of biologically derived medium-chain methyl ketones as a diesel blendstock. (Presenter) *LCA XIX, Tucson, AZ, USA.*
- Yang, M.**, Rosentrater, K. A. 2017. Techno-economic analysis (TEA) and life cycle assessment (LCA) of bio-adhesives derived from glycerol. *AAIC 29th Annual Meeting, Ames, IA, USA.*
- Yang, M.**, Rosentrater, K. A. 2017. Cradle to gate life cycle assessment of glycerol-based structural bio-adhesives. *2017 ASABE annual meeting, Spokane, WA, USA.*
- Yang, M.**, Rosentrater, K. A. 2017. Techno-Economic Analysis of glycerol-based structural bio-adhesives. *2017 ASABE annual meeting, Spokane, WA, USA.*
- Yang, M.**, Rosentrater, K. A. 2015. Comparison of sealing and open conditions for long term storage of corn stover using low-moisture anhydrous ammonia pretreatment method. *2015 ASABE annual meeting, New Orleans, LA, USA.*
- Yang, M.**, Rosentrater, K. A. 2014. Techno-economic analysis (TEA) of low-moisture anhydrous ammonia (LMAA) pretreatment method for corn stover. *2014 ASABE annual meeting, Quebec, Canada.*
- Yang, M.**, Rosentrater, K. A. 2014. Optimization of low-moisture anhydrous ammonia (LMAA) pretreatment of corn stover. *2014 ASABE annual meeting, Quebec, Canada.*

Zhang, W., **Yang, M.**, Rosentrater, K. A. 2013. Literature review: pretreatment methods of lignocellulosic biomass to ethanol. (Presenter) 2013 *ASABE annual meeting, Kansas City, MO, USA*.

Poster Presentations

Robert Wine, **Yang, M.*** 2024. Systematic review of the factors contributing to food loss and waste: a comparative analysis between developing and developed countries. *2024 IFT FIRST, Chicago, IL, USA*

Ajinkya Atkare, Robert Wine, **Yang, M.*** 2024. Assessing environmental impacts and economic feasibility of cultivated meat using LCA and TEA. *Sustainable Agri-Food Technology Summit (SAFTS), Raleigh, NC, USA*. (Received the 'People's Voice' poster award)

Yang, M.*, Wang, Q., Hill, T., Meer, M. S. 2023. Life-cycle assessment (LCA) and cost analysis among non-thermal food technologies. *2023 IFT-EFFoST International Nonthermal Processing workshop, Minneapolis, MN, USA*

Yang, M., Liu, D., Baral, N., Lin, C., Gladden, Simmons, B. A., J., Eudes, A., Scown, C. D. 2022. Comparing *in planta* and microbial production of bioproducts. *2022 DOE Genomic Sciences Program (GSP) Annual Principal Investigator (PI) meeting*.

Yang, M., Anastasopoulou, A., Baral, N., Breunig, H. M., Scown, C. D. 2020. Carbon footprint and economics of integrating biogas upgrading process and carbon capture technologies in cellulosic biorefineries. *2020 Genomic Sciences Program (GSP) Annual Principal Investigator (PI) meeting. Washington, DC, USA*.

Yang, M., Baral, N., Scown, C. D. 2019. Techno-economic analysis of different forage sorghum varieties in bioethanol production. *AIChE Bioenergy Sustainability Conference, Nashville, TX, USA*.

Yang, M., Rosentrater, K. A. 2016. Cradle to gate life cycle assessment of traditional adhesives used in wood sheet production. *2016 ASABE annual meeting, Orlando, FL, USA*.

Yang, M., Rosentrater, K. A. 2016. Techno-Economic Analysis of traditional adhesives used in wood sheet production. *2016 ASABE annual meeting, Orlando, FL, USA*.

Yang, M., Rosentrater, K. A. 2015. Environmental effects and economic analysis of adhesives: a review of life cycle assessment (LCA) and techno-economic analysis (TEA). *2015 ASABE annual meeting, New Orleans, LA, USA*.

TEACHING EXPERIENCE

Course developer & instructor, FS 591/495 (003) Introduction to Food Sustainability 2024
Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University

Teaching Assistant, AE 480/580 Engineering Analysis of Biological Systems 2017
Department of Agricultural and Biosystems Engineering, Iowa State University

GRANTS

- NC Animal Health and Nutrition Consortium. *Strategies to improve environmental sustainability in animal-source foods via nutrition-based life-cycle assessment (nLCA)*. Role: PI. 2024/01 – 2024/12.
- Center of Advanced Processing and Packaging Studies (CAPPS). *Comparative sustainability analysis of food waste utilization and valorization pathways towards circular economy*. Role: PI. 2024/08 – 2025/07.
- Alamance Foods. *Sustainability roadmap for the food industry – phase 1*. Role: PI. 2024/07 – 2024/09. (Pending)
- USDA National Institute of Food and Agriculture. *Integrating environment, economic, and societal metrics to assess the sustainability of plant-based foods in a holistic approach*. Role: PI. 2024/08 – 2026/07. (Pending)

HONORS AND AWARDS

- Outstanding Publication Award, Joint BioEnergy Institute (2022)
- Recognition of Excellence Award, Joint BioEnergy Institute (2022)
- Outstanding service award, Association of Overseas Chinese Agricultural & Food Engineers (2019)
- Graduate leadership award, Association of Overseas Chinese Agricultural & Food Engineers (2018)
- Outstanding service award, Association of Overseas Chinese Agricultural & Food Engineers (2017)
- Graduate leadership and service award, Association of Overseas Chinese Agricultural & Food Engineers (2015)
- The Honor Society of Agriculture, Gamma Sigma Delta (2015)
- 2nd place in Creativity Competition sponsored by Novozymes Investment Company (2011)
- Distinguished team of the 3rd Google Cup Chinese Students' Creativity Competition (2010)
- University scholarship in 2010 & 2011
- Excellent volunteer teacher in Baibang Village, Guizhou Province, China (2009)

MEDIA COVERAGE

Full list available upon request.

1. 'NC State adds faculty position in food sustainability', NC State University CALS News, 2023
<https://cals.ncsu.edu/news/nc-state-adds-faculty-position-in-food-sustainability/>
2. 'Are copper-based nanopesticides for tomato crops worth it?' AZO NANO, 2022
<https://www.azonano.com/news.aspx?newsID=39448>
3. 'Making biofuels cheaper by putting plants to work', Renewable Energy Magazine, 2020.
<https://www.renewableenergymagazine.com/biofuels/making-biofuels-cheaper-by-putting-plants-to-20200407>
4. 'Berkeley lab researchers quantify how accumulation of high-value bioproducts in plants

improves economics of biofuels’, Green Car Congress, 2020.

<https://www.greencarcongress.com/2020/04/20200407-lbl.html>

5. ‘Researchers describe how biofuels can reach cost parity of petroleum fuels’, Phys.org, 2020.
<https://phys.org/news/2020-04-biofuels-parity-petroleum-fuels.html>
6. ‘Researchers assess the environmental impact of bio-based adhesives’, BioMarket Insights, 2020.
<https://biomarketinsights.com/researchers-assess-the-environmental-impact-of-bio-based-adhesives/>
7. ‘UC researchers discover amount of biofuel needed to match price with gasoline’, The Daily Californian, 2020.
<https://www.dailycal.org/2020/04/09/uc-researchers-discover-amount-of-biofuel-needed-to-match-price-with-gasoline/>
8. ‘Harnessing the power of plants for cheaper production of biofuels’, AZO CLEANTECH, 2020.
<https://www.azocleantech.com/news.aspx?newsID=27153>

LEADERSHIP EXPERIENCE

Co-organizer, Sustainable Agri-Food Technology Summit (SAFTS), Raleigh, NC 2024

Special Issue Guest Editor 2023

Research topic: Advance in Bioprocessing Design for Platform Chemicals and Biofuels Innovations, Frontiers in Industry Microbiology

Review Editor, Frontiers in Energy Research 2023 - Current

Events Subcommittee 2022

Early career employees resource group, Berkeley lab

Mentor

Biotech Partners 2021 high school bioinformatics/research summer internship 2021

- Project: Introduction of bioseparation process

Master student from ETH Zürich, Switzerland 2021 – 2022

- Project: County level estimation of fat, oil, and grease potential in the U.S.

Ph.D. candidate from Tsinghua University, China 2021 – 2022

- Project: Sustainability analysis of copper-based nanopesticides in tomato production

Associate Editor 2014 – 2019

Association of Overseas Chinese Agricultural, Biological and Food Engineers IMPACT newsletter

Treasure 2016 – 2017

Agricultural and Biosystems Engineering Graduate Organization, Iowa State University

Secretary 2015 – 2016

Agricultural and Biosystems Engineering Graduate Organization, Iowa State University

PEER REVIEW ACTIVITIES

Journal: ACS Sustainable Chemistry and Engineering; Agronomy; Biotechnology for Biofuels; Buildings; Data; Energies; Environmental Research Letter; Environmental Science & Technology; Frontiers in Energy Research Bioenergy and Biofuels; GCB Bioenergy; Green Chemistry; Journal of Cleaner Production; Journal of Environmental Management; Journal of Marine Science and

Engineering; Nature Communication; Processes; Resource, Conservation and Recycling; Sustainability; Sustainable Energy & Fuels; Toxics.

Proposal: USDA NIFA Agriculture and Food Research Initiative (AFRI) program; IFT 2024 technical abstract; 2025 AAAS Annual Meeting Scientific Session proposals.

PROFESSIONAL AFFILIATIONS

International Food Technology (IFT)

American Society of Agricultural and Biological Engineers (ASABE)

American Chemical Society (ACS)