

CURRICULUM VITAE

University of Idaho

NAME: Ming-Hsun Cheng

DATE: 07/10/2022

RANK OR TITLE: Assistant Professor

DEPARTMENT: Natural Resources and Society

OFFICE LOCATION AND CAMPUS ZIP:

Center for Advanced Energy Studies (CAES)
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Idaho Falls Campus, 83401

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DATE OF FIRST EMPLOYMENT AT UI: 08/14/2022

DATE OF TENURE: Untenured

DATE OF PRESENT RANK OR TITLE: 2022

EDUCATION BEYOND HIGH SCHOOL:

Degrees:

- 2013-2017** **Ph.D.:** Agricultural and Biosystems Engineering, Iowa State University, Ames, Iowa
Advisor: Dr. Kurt Rosentrater
Dissertation: Sustainability Analysis of Soybean Refinery: Soybean Oil Extraction Process.
- 2008-2010** **M.S.:** Forestry and Resource Conservation, National Taiwan University, Taipei, Taiwan
Advisor: Dr. Chun-Han Ko
Thesis: The Fatty Acids Composition and The Efficiency of Enzymatic Transesterification of Different Plant Oils.
- 2004-2008** **B.S.:** Forest Products Science, National Chiayi University, Chiayi, Taiwan

Certificates and Licenses:

- Hazard Analysis and Critical Control Point (HACCP) Training

EXPERIENCE:

- 2022 to date Assistant Professor, Department of Natural Resources and Society, University of Idaho, Idaho Falls ID
- 2018-2022 Postdoc Research Associate, Center for Advanced Bioenergy and Bioproducts Innovation (CABBI), University of Illinois at Urbana-Champaign, Urbana IL
- 2017-2018 Postdoc Research Associate, Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign, Urbana IL
- 2013-2017 Graduate Research Assistant, Department of Agricultural and Biosystems Engineering, Iowa State University, Ames IA
- 2015-2016 Teaching Assistant, Department of Agricultural and Biosystems Engineering, Iowa State University, Ames IA
- 2011-2013 Research Assistant, Department of Forestry and Resource Conservation, National Taiwan University, Taipei Taiwan
- 2010-2011 Substitute Military Service, Kaohsiung City Environmental Protection Bureau, Kaohsiung Taiwan
- 2007 Wood Processing Intern, Alishan National Scenic Area/National Chiayi University, Chiayi Taiwan

TEACHING ACCOMPLISHMENTS: (Academic and Extension teaching)

Areas of Specialization: Renewable material processing, grain processing, biorefinery systems, process simulations, and sustainability analyses

Courses Taught:*University of Idaho*

ENVS 501 Graduate Seminar: Environmental Science (Fall 2022)
 NRS 508 Foundations of Natural Resources and Society (Fall 2022)
 ENVS 484 History of Energy (Spring 2023)
 NRS 501 Graduate Seminar: Natural Resources and Society (Spring 2023)

University of Illinois at Urbana-Champaign

ABE 488 Bioprocessing Biomass for Fuel (co-taught, 2020, 2021)

Iowa State University

ABE 469 Grain Processing and Handling (teaching assistant, 2015)
 ABE 480 Engineering Analysis for Biological Systems (teaching assistant, 2016)

Students Advised:*University of Idaho*

Graduate Students:

Kundan Kumar (2023-Current, Integrated biorefinery design, ENVS PhD program)
 Tyler Carlisle (2023-Current, Biofuel production, ENVS MS program)

University of Illinois at Urbana-Champaign

Graduate Students:

Zhaoqin Wang (2018-2019, techno-economic analysis of biomass pretreatment research project)
 Yuyao Jia (2019-2022, cellulosic ethanol production research)

Courses Developed:*University of Idaho*

ENVS 484 History of Energy
 ENVS 501 Environment Science Graduate Seminar
 NRS 501 Natural Resources and Society Graduate Seminar
 NRS 508 Foundations of Natural Resources and Society

University of Illinois at Urbana-Champaign

ABE 488 Bioprocessing Biomass for Fuel

- Process simulations for techno-economic analysis
- Enzymatic activity lab

Iowa State University

ABE 469 Grain Processing and Handling

- Fermentation lab

Workshops:

- Corn dry grind technology workshop, Urbana IL, 2019, 2020, 2022
- Biomass deconstruction pilot-scale demonstration, Urbana IL, 2022

Invited Lectures:*University of Illinois at Urbana-Champaign*

ABE 141 ABE Principles: Biological (2020)

Grand View University, Des Moines, IA
PHSC 201 Contemporary Issues in Science (2021)

Iowa State University
BRT 516 International Biorenewable Law and Policy (2016)

SCHOLARSHIP ACCOMPLISHMENTS: (Including scholarship of teaching and learning, artistic creativity, discovery, and application/integration)

Publications, Exhibitions, Performances, Recitals:

Peer Reviewed/Evaluated: (i.e. journals, articles, proceedings, abstracts, etc.)

- Kundan Kumar, Ling Ding, H. Zhao, ***Ming-Hsun. Cheng**. 2023. Waste-to energy pipeline through consolidated fermentation-microbial fuel cell (MFC) system. *Processes*. 11 (8), 2451. <https://doi.org/10.3390/pr11082451>
- **Ming-Hsun Cheng**, Shuchi Singh, Aidan Clennon, Bruce Dien, Vijay Singh, 2023. Production of designer xylose-acetic acid enriched hydrolysate from bioenergy sorghum, oilcane, and energycane bagasse. *Bioresour. Technol.* doi.org/10.1016/j.biortech.2023.129104
- **Ming-Hsun Cheng**, Shraddha Maitra, Aidan Clennon, Bruce Dien, Vijay Singh, 2022. The effect of sequential hydrothermal-mechanical refining pretreatment on biomass structure changes and cellulosic sugar recoveries. *Biomass Convers. Biorefin.* doi.org/10.1007/s13399-022-03359-3
- Ye-Gi Lee, Chanwoo Kim, Nurzhan Kuanyshev, Nam Kyu Kang, Zia Fatma, Zong-Yen Wu, **Ming-Hsun Cheng**, Vijay Singh, Yasuo Yoshikuni, Huimin Zhao, Yong-Su Jin, 2022. Cas9-based metabolic engineering of *Issatchenkia orientalis* for enhanced utilization of cellulosic hydrolysates. *J. Agric. Food Chem.* 70, 12085-12094.
- **Ming-Hsun Cheng**, Bruce S. Dien, Yong-Su Jin, Jonghyeok Shin, Patricia J. Slininger, Nasib Qureshi, Vijay Singh, 2021. Conversion of high-solids hydrothermally pretreated bioenergy sorghum to lipids and ethanol using yeast cultures. *ACS Sustainable Chem.Eng.* 9, 8515-8525.
- Mothi B. Viswanathan, **Ming-Hsun Cheng**, Tom Clemente, Ismail Dweikat, Vijay Singh, 2021. Economics perspective on coproducing ethanol and biodiesel from industrial hemp. *J. Cleaner Prod.* 299, 126875.
- **Ming-Hsun Cheng**, Haider J. Kadhum, Ganti S. Murthy, Bruce S. Dien, Vijay Singh. 2020. High solids loading biorefinery for the production of cellulosic sugars from bioenergy sorghum. *Bioresour. Technol.* 318, 124051.
- Mothi Bharath Viswanathan, Kiyoul Park, **Ming-Hsun Cheng**, Edgar B. Cahoon, Ismail Dweikat, Tom Clemente, Vijay Singh. 2020. Variability in structural carbohydrates, lipid composition, and cellulosic sugar production from industrial hemp varieties. *Ind. Crops Prod.* 157, 112906.
- **Ming-Hsun Cheng**, Liang Sun, Yong-Su Jin, Bruce Dien, Vijay Singh. 2020. Production of xylose enriched hydrolysate from bioenergy sorghum and its conversion to β -carotene using an engineered *Saccharomyces cerevisiae*. *Bioresour. Technol.* 308, 123275.
- **Ming-Hsun Cheng**, Zhaoqin Wang, Bruce S. Dien, Patricia J.W. Slininger, D.K. Lee, Vijay Singh. 2019. Economic analysis of cellulosic ethanol production from sugarcane bagasse using sequential deacetylation, hot water and disk refining pretreatment. *Processes*. 7, 642
- **Ming-Hsun Cheng**, Bruce S. Dien, D.K. Lee, Vijay Singh. 2019. Sugar production from bioenergy sorghum by using pilot scale continuous hydrothermal pretreatment combined with disk refining. *Bioresour. Technol.* 289, 121663.
- Bruce S. Dien, William F. Anderson, **Ming-Hsun Cheng**, Joseph E. Knoll, Marshall Lamb, Patricia J. O'Bryan, Vijay Singh, Ronald B Sorensen, Timothy C. Strickland, Patricia J. Slininger. 2020. Field productivities of napier grass for production of sugars and ethanol. *ACS Sustainable Chem. Eng.* 8, 2052-2060.
- **Ming-Hsun Cheng**, Bruce D. Dien, Vijay Singh. 2019. Economics of plant oil recovery: a review. *Biocatalysis Agric. Biotechnol.* 18, 101056.
- **Ming-Hsun Cheng**, Haibo Huang, Bruce S. Dien, Vijay Singh. 2019. The costs of sugar production from different feedstocks and processing technologies. *Biofpr.* 13, 729-739.
- **Ming-Hsun Cheng**, Kurt A. Rosentarter, Jasreen Sekhon, Tony Wang, Stephanie Jung, Lawrence A. Johnson. 2019. Economic feasibility of soybean oil production by enzyme-assisted aqueous extraction processing. *Food Bioprocess Tech.* 12, 539-550.
- **Ming-Hsun Cheng**, Kurt A. Rosentrater. 2019. Techno-economic analysis of extruding-expelling of soybeans to produce oil and meal. *Agriculture.* 9, 87. DOI:10.3390/agriculture9050087.

- **Ming-Hsun Cheng**, Jasreen K. Sekhon, Kurt A. Rosentrater, Tong Wang, Stephanie Jung, Lawrence A. Johnson. 2018. Environmental impact assessment of soybean oil production: Extruding-expelling process, hexane extraction and aqueous extraction. *Food Bioprod. Proc.* 108, 58-68.
- Yu Wang, **Ming-Hsun Cheng**. 2018. Greenhouse gas emissions embedded in US-China fuel ethanol trade: a comparative well-to-wheel estimate. *J. Cleaner Prod.* 183, 653-661.
- Yu Wang, **Ming-Hsun Cheng**, Mark Mba Wright. 2018. Lifecycle energy consumption and greenhouse gas emissions from corncob ethanol in China. *Biofpr.* 12, 1037-1046.
- **Ming-Hsun Cheng**, Kurt A Rosentrater. 2017. Profitability analysis of soybean oil process. *Bioengineering.* 4, 83. DOI: 10.3390/bioengineering4040083.
- **Ming-Hsun Cheng**, Kurt A. Rosentrater. 2017. Economic feasibility analysis of soybean oil production by hexane extraction. *Ind. Crops Prod.* 108, 775-785.
- **Ming-Hsun Cheng**, Kurt A. Rosentrater. 2017. Fractionation of Distillers Dried Grains with Solubles (DDGS) by Combination of Sieving and Aspiration. *Food Bioprod. Proc.* 103, 76-85.
- **Ming-Hsun Cheng**, Minliang Yang, Yu Wang. 2016. American's energy future: An analysis of the proposed energy policy plans in presidential election. *Energies*, 9(12), 1000. DOI:10.3390/en9121000.
- Congmu Zhang, Kun Xie, **Ming-Hsun Cheng**, Kurt A. Rosentrater. 2015. Laboratory-scale fractionation of distillers dried grains with solubles (DDGS). *Agricu. Eng. Int.* 17, 293-299.
- Bing-Yuan Yang, **Ming-Hsun Cheng**, Chun-Han Ko, Ya-Nan Wang, Wen-Hua Chen, Wen-Song Hwang, Yuan-Po Yang, Hsin-Tai Chen, Fang-Chih Chang. 2014. Potential bioethanol production from Taiwanese chenopods (*Chenopodium formosanum*). *Energy*, 76: 59-65.
- Chun-Han Ko, Kai-Wun Yeh, Ya-Nan Wang, Chien-Hou Wu, Fang-Chih Chang, **Ming-Hsun Cheng**, Chia-Shin Liou. 2012. Impact of methanol addition strategy on enzymatic transesterification of Jatropha oil for biodiesel processing. *Energy*, 48,375-379.

Abstracts:

- K. Kumar, ***M.-H. Cheng**. 2023. Evaluation of Bioenergy Production from Advanced MFC-Fermentation Technology. AIChE annual meeting, Orlando, FL.
- K. Kumar, K.A. Das, **M.-H. Cheng**, S.A. Memon. 2023. Applications of Banana Peels Derived Bio-Adsorbent in NOM Removal from Surface Water. AIChE annual meeting, Orlando, FL.
- S. Maitra, **M.-H. Cheng**, H. Liu, D.V. Cao, B. Kannan, S.P. Long, J. Shanklin, F. Altpeter, V. Singh. 2023. Transgenic energycane as an alternative feedstock for biodiesel production: An industrially relevant study. AIChE annual meeting, Orlando, FL.
- **Ming-Hsun Cheng**, Vijay Singh, 2021. Methylcellulose synthesis and xylan recovery from corn pericarp fiber for meat analog applications. Food Innovation and Engineering Conference. Virtual Conference. 6-7 Dec. 2021
- **Ming-Hsun Cheng**, Anthony J. Studer, Vijay Singh. Sweet sorghum breeding to enhance sugar control and its perspective on ethanol production. AIChE Annual Meeting. Boston, MA. 7-11 Nov. 2021
- **Ming-Hsun Cheng**, Bruce S. Dien, Yong-Su Jin, Jonghyeok Shin, Patricia J. Slininger, Nasib Qureshi, Vijay Singh. Conversion of high-solids hydrothermally pretreated bioenergy sorghum to lipids and ethanol using yeast cultures. SIMB Annual Meeting. Austin, TX. 8-11 Aug. 2021
- **Ming-Hsun Cheng**, Bruce S. Dien, Yong-Su Jin, Jonghyeok Shin, Patricia J. Slininger, Nasib Qureshi, Vijay Singh. Biorefinery of lignocellulosic carbohydrates: productions of lipids and ethanol through engineered microbial conversion. ASABE International Annual Meeting. Virtual conference. 12-16 Jul. 2021
- **Ming-Hsun Cheng**, Sun Liang, Yong-Su Jin, Bruce S. Dien, Vijay Singh. β -carotene Production from Xylose Enriched Hydrolysate of Hydrothermally Pretreated Bioenergy Sorghum by Engineered *Saccharomyces cerevisiae* SR8B. AIChE International Annual Meeting. Virtual conference. 16-20 Nov. 2020
- **Ming-Hsun Cheng**, Haider Jawad Kadhum, Ganti S. Murthy, Vijay Singh. High solids loading processing for sugars production from bioenergy sorghum. ASABE International Annual Meeting. Virtual conference. 13-15 Jul. 2020
- **Ming-Hsun Cheng**, Bruce S. Dien, D.K. Lee, Vijay Singh. Sugar production from bioenergy sorghum by using pilot scale continuous hydrothermal pretreatment combined with disk refining. Abstract. Switchgrass V International Conference. Champaign, IL. 22-25 Jul. 2019
- **Ming-Hsun Cheng**, Bruce S. Dien, D.K. Lee, Vijay Singh. Improving sugar production from bioenergy sorghum by using continuous hydrothermal pretreatment combined with disk milling. 41st Symposium on Biotechnology for Fuels and Chemicals. Seattle, WA. 28 Apr.-1 May 2019

- **Ming-Hsun Cheng**, Bruce S. Dien, Vijay Singh. Economics of plant oil recovery: a review. Abstract. Genomic Sciences Program Annual Principal Investigator Meeting. Tysons, VA. 24-27 Feb. 2019
- **Ming-Hsun Cheng**, Bruce S. Dien, Vijay Singh. 2018. The costs of sugar production from different feedstocks. Abstract. Corn Utilization and Technology Conference. St. Louis, MO. 4-6 Jun. 2018
- **Ming-Hsun Cheng**, Weitao Zhang, Kurt Rosentrater, Jasreen J.K. Sekhon, Tong Wang. 2016. Technoeconomic analysis of integrated enzyme assisted aqueous extraction of soybean oil. ASABE International Annual Meeting. 2016. Orlando, FL. 17-20 Jul. 2016
- **Ming-Hsun Cheng**, Weitao Zhang, Kurt Rosentrater, Jasreen J.K. Sekhon, Tong Wang, Stéphanie Jung, Lawrence A. Johnson. 2016. Environmental impact analysis of soybean oil production from expelling, hexane extraction and enzyme assisted aqueous extraction. ASABE International Annual Meeting. Orlando, FL. 17-20 Jul. 2016
- **Ming-Hsun Cheng**, Xiong Cao, Minliang Yang, Kurt Rosentrater. 2016. Optimization of low moisture anhydrous ammonia pretreatment for corn stover enzymatic digestibility during hydrolysis process. ASABE International Annual Meeting. Orlando, FL. 17-20 Jul. 2016
- **Ming-Hsun Cheng**, Kurt Rosentrater. Techno-economic modeling of soybean oil extraction with hexane from 1980 to 2014. Abstract. ASABE International Annual Meeting. New Orleans, LA. 26-29 Jul. 2015
- **Ming-Hsun Cheng**, Kurt Rosentrater. Technoeconomic analysis of soybean oil expelling process from 1980 to 2014. ASABE International Annual Meeting. New Orleans, LA. 26-29 Jul. 2015
- **Ming-Hsun Cheng**, Kurt Rosentrater. Fractionation of distillers dried grains with solubles (DDGS) by combination of sieving and aspiration. ASABE International Annual Meeting. Montreal, Canada. 13-16 Jul. 2014
- **Ming-Hsun Cheng**, Samantha M. Riess, Kurt Rosentrater. The interaction of multiple factors for DDGS fractionation with sieving and aspiration process. Corn Utilization and Technology Conference. Louisville, KY. 1-3 Jun. 2014
- Chun-Han Ko, Kai-Wun Yeh, Ya-Nang Wang, Chien-Hou Wu, Fang-Chih Chang, **Ming-Hsun Cheng**, Chia-Shin Liou. Impact of alcohol adding strategy on enzymatic transesterification of jatropha oil for biodiesel processing. Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES). Dubrovnik, Croatia. 25-29 Sep. 2011
- Ya-Nang Wang, **Ming-Hsun Cheng**, Chun-Han Ko, Pei-Jen Lu, Jia-Ming Chern, Chien-Hou Wu, Fang-Chih Chang. Lipase catalyzed transesterification of tung and palm oil for biodiesel. World Renewable Energy Congress (WREC). Liköping, Sweden. 8-13 May. 2011

Peer Reviewed/Evaluated (currently scheduled or submitted):

- Ming-Hsun Cheng, Bruce Dien, Vijay Singh, 2022. Xylose and acetic acid recoveries from lignocellulosic biomass using sequential hydrothermal pretreatment and fed-batch enzymatic hydrolysis. (In process)

Invited Keynote Speech:

- Ming-Hsun Cheng. 2021. The perspective on cellulosic biorefinery for producing value-added bioproducts. International Conference on Industry-Academia Initiatives in Biotechnology and Chemistry (iCIABC21). Virtual Conference. 20-21 Dec. 2021

Patents: (provide title/description, patent number and date)

- Singh, V., **Cheng, M.-H.** 2020. High solids loading processing of cellulosic biomass for high yields of cellulosic sugar production. OTM Ref: 2019-214.

Grants and Contracts Awarded: (provide principal and co investigators, title, sponsor, funding dates, amount)

- **Cheng, M.-H.** 2023. Municipal solids waste (MSW) sampling and characterization to understand the characterization of variability in MSW streams. DE-FOA-0002423, Subcontract. (\$110,000 for 3 years)
- **Cheng, M.-H.** 2023. Agroforest and Agrofood Biorefineries Design for Bioenergy and Platform Chemicals Innovations. CAES Summer Visiting Faculty Program. (\$20,000)

Honors and Awards:

- CABBI Research Poster Contest, University of Illinois at Urbana-Champaign (2018)
- Research Excellent Award, Iowa State University (2017)

SERVICE:**Major Committee Assignments:**

- Graduate committee:
Harrison Appiah (2022-Current, ENV5 PhD Student)
Courage Alorbu (2023-Current, ENV5 PhD Student)

Professional and Scholarly Organizations

- RISE (research internship in sustainable bioenergy) program committee, CABBI University of Illinois at Urbana-Champaign (2020-2022)
- ΓΣΔ Honor Society of Agriculture (2014-Current)
- American Society of Agricultural and Biological Engineers (2013-Current)

Outreach Service: (Including popular press, interview articles, newspaper articles, workshops-seminars-tours organized, Extension impact statements)

- Guest editor for MDPI Processes special issue: Advances in Value-Added Products from Waste (2022-Current)
- US DOE SBIR/STTR program proposal reviewer (2020-Current)
- Member of reviewer pool of:
 - 1) Journal of Cleaner Production (2020-Current)
 - 2) American Society of Agricultural and Biological Engineering (2021-Current)
- Manuscript review:
 - 1) Biofuels, Bioproducts & Biorefining
 - 2) Journal of Cleaner Production
 - 3) Industrial Crops and Products
 - 4) American Society of Agricultural and Biological Engineering
 - 5) Journal of Advances in Microbiology
- Meet with potential ENV5 students
- Showcase ENV5 program and bioenergy conversion research at K-12 education event in Idaho Falls (2023)
 - 1) Career on Wheel (COW) day
 - 2) TriO Ignite STEM day

PROFESSIONAL DEVELOPMENT:**Teaching:**

- University of Idaho CETL Workshop: Transparency in Learning and Teaching (Fall 2022)
- University of Idaho CETL Workshop: Metacognition and Self-Regulated Learning (Fall 2022)
- University of Idaho CETL Workshop: Leadership Essentials, Part 1, Leading Self (Fall 2022)

Scholarship:

- University of Idaho Proposal Development Academy (Spring 2023)
- NSF Developing a Strategic Plan for Funding Your Research Workshop (Fall 2022)
- DOE Office of Science PIER Plan Webinar (Fall 2022)

Outreach:**Administration/Management:**