

Dr. Qin Xu

Department of Food Science, 745 Agriculture Mall Drive
Purdue University, West Lafayette, IN 47907-2009, USA
Tel: (765) 494-4183
E-mail: xuq@purdue.edu

Education

Ph.D. 1996, Food Chemistry, Purdue University
M.S. 1991, Food Chemistry, Purdue University
B.S. equivalent: 1988, Food Science, Purdue University
Associate Degree: 1986, Biology, Beijing Teachers College, China

Professional Experience

2013-present: Research Assistant Professor. Dept. of Food Science, Purdue Univ.

Main research area is on biomass conversion and utilization of agriculture materials. Studying the value-added co-products such as starch, protein and fiber from corn processing through novel processing technologies that are environmental friendly and economically feasible as well as the obtained products and byproducts are food grade and biodegradable. Understanding the functionality and application of cellulose and lignin from biomass materials. In addition, using ultrasound-assisted extraction of phenolic from food processing by-products and agriculture waste (such as potato peels, walnut shells/husks, etc.), studying the optimization of extraction conditions, characterization of phenolic extracts and their antioxidant capacities.

2010-2012: Research Scientist. Department of Food Science, Purdue University.

Developing a new processing concept and unique technology to process cellulosic and other grain materials, (such as cornstalk, walnut shell, corn, etc.) prior to enzyme hydrolysis for production of cellulosic ethanol.

2007-2009: Research Scientist. Department of Food Science, Purdue University.

Determine the efficacy of ClO₂ gas in inactivating different target microorganisms (mold, yeast, and bacteria) for high acid and low acid foods and optimize treatment conditions. Determine the efficacy of chlorine dioxide (ClO₂) gas for eliminating *Listeria monocytogenes* and *Pseudomonas putida* biofilm (a potential surrogate for *Listeria* biofilm) on food-contact surfaces (stainless and Teflon) as well as *Listeria innocua* in air (i.e. aerosol).

1997-2006: Research Scientist. Department of Food Science, Purdue University

Develop new processing concepts using high temperature and high shear in a twin-screw continuous processor. It includes production of microfibril from wood pulp, conversion of chitin to chitosan and water-soluble chitosan, and increase the efficiency of grains utilization for milling and fermentation. Derivatization of carboxyl methyl chitin (CMC) using chemical methods. Coating soluble chitin to polypropylene fabrics. Production of cellulose film and fiber using zinc chloride as a solvent. Simultaneous heating and maceration of fruits and vegetables using a continuous processor.

1996-2000: Manager of quality and R&D in Resources Industry, Lafayette, Indiana
Statistic quality control for processing, receiving, and shipment. Technical support for customer services.

1996-1998: Postdoctoral associate. Department of Food Science, Purdue University
Research on industrial applications of cellulose: develop cellulose based thermoplastic products, and develop methods to make foamed cellulose sheet that can improve water distribution properties.

1989-1996: Research assistant. Department of Food Science, Purdue University
Determined the structures of zinc-cellulose complexes and the dynamics of complex formation between zinc ion and cellulose. Developed novel methods to produce cellulose fiber and film from zinc-cellulose complex. Developed cellulose powder as a food additive that eliminates chalky mouth-feel and as a carrier for pharmaceutical applications.

1984-1986: Instructor. Biochemistry, Beijing Grain/Cereal College, China

Activities and Honors

- Advisor to Undergraduate research project, 3rd place of poster competition in 2016.
- Co-advisor to Soybean team, first place in 2012.
- Co-advisor to Soybean team, second place in 2011.
- Honor student, Food Science Department, Purdue University, 1988.
- Ranked as an excellence teacher by students, Beijing Grain and Cereal College, 1985.
- Honor student in Beijing Grain and Cereal College, 1982.

Membership in academic and professional activity

- American Chemical Society (2017-Present)
- Institute of Food Technologists (1996-Present)

Research grants

1. Staring research fund, \$20,000, School of agriculture, Purdue University, 2013-2015.
2. Biomass conversion and utilization gift fund, \$70,000, 2013-2014
3. Biomass conversion and utilization gift fund, \$70,000, 2014-2015
4. Biomass conversion and utilization gift fund, \$70,000, 2015-2016
5. ISDA specialty crop block grant, total amount: \$88,754.00, to Dr. Xu: \$3,600, Jan.2016-Dec.2017
6. Martin undergraduate research fund, \$500, Full 2015- Spring 2016
7. Co-Lab with Prof. Han in Mechanical Engineering Technology, summer salary (~\$10,000), and chemical supplies (~\$800), Summer 2016
8. Biomass conversion and utilization gift fund, \$70,000, 2016-2017
9. 2017 MASI (Molecular Agriculture Summer Institute) undergraduate program (\$3,200 from Dept. of Food Science and School of Agriculture), Summer 2017
10. Co-Lab with Prof. Han in Mechanical Engineering Technology, summer salary (~\$10,000), and chemical supplies as needed (so far spending ~\$500), Summer 2017
11. Biomass conversion and utilization gift fund, \$70,000, 2017-2018

12. USAID Scholarship fully support a MS student for two years (2016-2018)
13. MASI (Molecular Agriculture Summer Institute) undergraduate program (\$3,200 from Dept. of Food Science and School of Agriculture), Summer 2018
- 14. Martin undergraduate research fund, \$500, Full 2018- Spring 2019**
- 15. John & Emma Tse Gift Fund for currently research, \$30,000, 2018-2020**
- 16. Biomass conversion and utilization gift fund, \$70,000, 2018-2019**

Undergraduate students research guidance

- 1. Stan Tu, Effect of temperature and shears on the quality of tomato product, 2019-2020**
- 2. Donald Molina, Effect of cold break with shears on the quality of tomato product, 2019**
3. Matthew Jacob Uhlmansiek, Characterization of tomato product processed at cold break with shear 2018
4. Wenyi Fu, Ultrasound assisted extraction of phenolic from food processing by-products and their antioxidant activities, Full 2017-Full 2018
5. Liuyue Guo, Ultrasound assisted extraction of phenolic from potato peels and its antioxidant activity (MASI summer internship, 2017)
6. Yanting Wang, Ultrasound assisted extraction of phenolic from walnut shell, 2016-2017 (MASI summer internship, 2016)
7. Chumin Zhang, Determination of physical properties of tomato products processed by a twin-screw continues processor, 2016-2017
8. Helen Games, Antimicrobial activities of phenolic extracts from walnut shells, 2016-2017
9. Wenwen Zhou, Extraction of phenolic from walnut shells, spring 2017
10. Yudi Weng, Antioxidant activity of phenolic extracts, Jan. 2016-spring 2017
11. Qianyin Ye, Antioxidant activities of corn glutelin, 2014-May, 2015.
12. Zifan Wan, Starch digestibility of processed corn, 2014-Dec. 2015.
13. Chen Chen, Making packaging materials from cornstalk, 2014-2016. (DURI)
14. Karina Desiree, Separation of corn glutelin from processed corn, 2014- April, 2016.
15. Katelyn Rosswurm, Making cellulose fiber and film from cellulose, 2014-2016. (DURI)
16. Hong Jian, Analysis glucose content from cornstalk after enzyme hydrolysis, 2012-2013.
17. Jinjing Wang, Analysis glucose from corn starch, 2010-2011.
18. Jimmy Ngadimin, Inactive microorganism by chloride dioxide gas treatment on stain steel surface, 2008-2009.
19. Paul Klockow, Inactive microorganism by chloride dioxide gas treatment on stain steel surface, 2007-2008.

Graduate students and visiting scholars research guidance

- 1. Maya Fitriyanti, Synergistic effect of low power ultrasonication on antimicrobial activity of Cecropin P1 against *Escherichia coli* 07: H 157. (PhD student under Dr. Narsimhan, I have supervised her thesis in part of ultrasonic operation, set up and design her system, etc.). Jan.-July, 2019**
2. Irma Andyatni, MS student (Major Professor), Tomato processing, Aug, 2016-May, 2018

3. Dr. Shusheng Wang, Ultrasound-assisted extraction of phenolics from walnut shells and potato peels. College of life sciences, Jilin Agricultural University, Changchun, China March, 2017- 2018
4. Reza Karimi, Visiting PhD student from Iran. Extraction and functionality of the dietary fiber processed from barley bran, Nov. 2016 – March, 2017
5. Pu Wang, post graduate student, Data analysis of extraction of phenolics from walnut shells, August, 2016-March, 2017
6. Dr. Na Tian, visiting scholar from China, Extraction and characterization of carotenoid of corn oil extracted from a processed corn kernel, March, 2015-March, 2016
7. Yu Peng, visiting MS student from China, Starch digestibility and functionality of processed corn by a twin-screw continue processor, Dec.2015- Sept.2016
8. Dr. Zuming Li, Characterization and fractionation of antioxidant peptides by enzymatic hydrolysis from corn glutelin produced by a continue processor, Jan. 2014-June, 2014

Publications

1. **Wang, S., Fu, W., Han, H., Rakita, M., Han, Q., and Xu, Q. 2019. Optimizaiton of ultrasound-assisted extraction of phenolic compounds from walnut shells and characterization of their antioxidant activities. Journal of Food and Nutrition Research (Accepted)**
2. **Karimi, R., Azizi, M. H., and Xu, Q. 2019. Effect of different enzymatic extractions on molecular weight distribution, rheological and microstructural properties of barley bran β -glucan. International journal of biological macromolecules 126 (2019) 298-309**
3. Xu, Q., Adyatni, I., and Reuhs, B. 2018. Effect of processing methods on the quality of tomato products. *Food and Nutrition Science*, 9, 86-98
4. Han, H., Wang, S., Rakita, M., Wang, Y., Han, Q., and **Xu, Q.** 2018. Effect of ultrasound-assisted extraction of phenolic compounds on the characteristic of walnut shells. *Food and Nutrition Science*, 9, 1034-1045
5. Karimi, R., Azizi, M., **Xu, Q.**, Sahari, M., and Hamidi, Z. 2018 Enzymatic removal of starch and protein during extraction of dietary fiber from barley bran. *Journal of Cereal Science*, Volume 83, Pages 259-265 (>90% data was generated by Reza Karimi at Purdue and manuscript writing mainly under my supervision)
6. **Xu, Q.**, Chen, C., Rosswurm, K., Yao, T., and Janaswamy, S. 2016. A facile route to prepare cellulose-baxed films. *Carbohydrate Polymers* 149, 274-281
7. Trinetta, V., Vaid, R., **Xu, Q.** Linton, R., Morgan, M. 2012. Inactivation of *Listeria monocytogenes* on ready-to-eat food processing equipment by chlorine dioxide gas. *Food Control*, 26, 357-362.
8. Moussa, M., **Xu, Q.**, Chen, L.F., Campanella, O., Hamaker. B. 2011. High-quality instant sorghum porridge flours for the West African market using continuous processor cooking. *International Journal of Food Science & Technology*, 46, 2344-2350.
9. **Xu, Q.**, Hamaker, B., Chen L.F. 2002. Isolation of corn protein by agglomeration under high shear and elevated temperature. Final report, Indiana Value Added Program.
10. **Xu, Q.** Chen L.F. 1999. UV spectrum and structure of zinc-cellulose complexes in zinc chloride solution. *Journal of Applied Polymer Science*, 71, 1441-1446.
11. Cao, N.J., **Xu, Q.**, and Chen, L.F. 1996. Enzymatic hydrolysis of corn starch after extraction of corn oil with ethanol. *Applied Biochemistry and Biotechnology*, 57/58, 39-47.

12. Cao, N.J., **Xu, Q.**, Chen, L.F. 1995. Acid hydrolysis of cellulose in zinc chloride solution. *Applied Biochemistry and Biotechnology*, 51/52, 21-28.
13. Cao, N.J., **Xu, Q.**, Gong, C.S., Chen, L.F. 1994. Cellulose hydrolysis using zinc chloride as a solvent and catalyst. *Applied Biochemistry and Biotechnology*, 45/46: 515-520.
14. **Xu, Q.** Chen L.F. 1994. Characterization of cellulose film prepared from zinc-cellulose complexes. *Biomass and Bioenergy*, 6, 415-417.

Conference and invited presentations

1. **Qin Xu, May, 2019. Plant-based protein ingredients market research and their functionality. Chenguang Biotech Group Co., Ltd, Hebei Province, China**
2. Qin Xu, June 8, 2018. Extraction of phenolic from food by-products and agriculture waste. Chenguang Biotech Group Co., Ltd, Hebei Province, China
3. Qin Xu, July 21, 2017. Biomass conversion and utilization: Cornstalk juice applications and processing quinoa by a twin-screw continue processor. Glojob Agricultural Science and Technology Co., Ltd. Qinghai Province, China
4. Qin Xu, March 7, 2017. Biomass conversion and utilization: Extraction of phenolic from food by-products and agriculture waste and/or non-useable materials. College of Food Science and Nutritional Engineering, China Agriculture University, Beijing, China
5. Han, H., Zhang, F., Wang, Y., Jensen, J., Rakita, M., Han, Q., Janaswamy, S., and Xu, Q., April 2. 2017. Optimization of phenolic extraction from walnut shells through ultrasound treatment. ACS 253th Annual conference, California
6. **Xu, Q.** June, 2015. Biomass conversion and utilization: Corn processing and utilization, College of Food Science and Engineering, Northwest A&F University, Yanglin Province, Xian, China
7. **Xu, Q.** 2014. Biomass conversion and utilization: Innovative ethanol production from corn seeds and cornstalks. BIT's 7th Annual Congress of Industrial Biotechnology, IBIO 2014, Dalian, China.
8. Vaid, R. **Xu, Q.**, Linton, R., Morgan, M. 2008. Efficacy of chlorine dioxide gas, aqueous chlorine dioxide and sodium hypochlorite treatment in eliminating *Listeria monocytogenes* Scott A biofilms present on meat processing equipment surface. IFT Annual Meeting, New Orleans, LA.
9. **Xu, Q.**, Klockow, P., Nelson, P., Morgan, M. 2007. Institute of Food Technologies (IFT) Annual meeting & Food Expo. Chlorine Dioxide Gas for Inactivation of Microorganisms on Surface of Processing Equipment.
10. **Xu, Q.**, Chen, L.F. 1991. Zinc chloride as a cellulose solvent for production of high tensile strength fiber. Cellulose 91, New Orleans, LA.
11. **Xu, Q.**, Chen, L.F. 1991. Characterization of cellulose film produced from zinc-cellulose complexes. Cellulose 91, New Orleans, LA.
12. **Xu, Q.**, Chen, L.F. 1997. UV spectrum and structure of zinc-cellulose complexes in zinc chloride. Fifteenth American Chemical Society Annual Meeting, California.
13. Shin, J. E., **Xu, Q.**, Chen. L.F. 2002, Deacetylation of chitin in a semi-solid system for production of water soluble chitosan. IFT Annual meeting, Anaheim, CA.

Patents and Disclosures

1. Xu, Q. and Janaswamy, S. 2016. Cellulose-based packaging films (Disclosed)

2. Chen, L-F, and **Xu, Q.**, 2012. Environmentally friendly and economically feasible process of manufacturing ethanol from corn and other starchy raw materials (Patented No. ZL 2007 1 0127839.1).
3. Chen, L-F, and **Xu, Q.**, 2010. Chen-Xu method for conversion of Cellulosic feed stock to ethanol (Disclosed).
4. Chen, L-F, **Xu, Q.**, and Ferruzzi, M. 2006. Production of edible oil containing high levels of carotenoids from grains and oil seeds (Disclosed).
5. Chen, L-F, **Xu, Q.**, and Hamaker, B. "Method for producing a material having an increased solubility in alcohol" June, 2004 (Pending)
6. Chen, L-F, **Xu, Q.**, and Hamaker, B. "Production of thermoplastic material from corn and thereon production of corn syrup" February, 2003 (Disclosed)
7. Chen L-F, **Xu, Q.** "Chitosan and methods of producing same" June, 2002 (Disclosed)
8. Chen, L-F, **Xu, Q.**, and Nelson, P. "Improvement of food qualities by simultaneous heating/cooling and maceration of fruit and vegetable using a continuous high shear processor" April 11, 2000 (Disclosed).
9. Chen, L-F, **Xu, Q.**, and Ni, J. "Regeneration of natural cellulose from cellulose solution" P-99005, 1999 (Patented).

Review paper and proposal

- 1) **External proposal review for Nebraska Center for Energy Sciences Research at the University of Nebraska-Lincoln. (2019)**
- 2) Journal of Food Quality (2017). Manuscript number: 2784146
- 3) Journal of Cereal Science (2016) Manuscript number: JCS16-294

Synergistic activity

- Pilot Plant Advisory Committee (2017- present)
- Departmental Social Committed (2013-2017)
- Diversity Action Team in Agriculture (2014-2016)