

CURRICULUM VITAE

Pawan Singh Takhar

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EDUCATION:

2002 Ph.D., Purdue University, Food and Biological Engineering

1996 MEngg., Asian Institute of Technology, Thailand, Post Harvest and Food Pr. Engineering

1993 B.Tech. Punjab Agricultural University, India, Agricultural Engineering

PROFESSIONAL EXPERIENCE:

2009-Present	Associate Professor	Department of Animal and Food Sciences, and International Center for Food Industry Excellence, Texas Tech University, Lubbock, TX
2005-2009	Assistant Professor	Department of Animal and Food Sciences, and International Center for Food Industry Excellence, Texas Tech University, Lubbock, TX
2002-2005	Assistant Professor	Department of Food Science and Toxicology, University of Idaho, Moscow, ID
2002-2005	Adjunct Professor	Department of Chemical Engineering University of Idaho, Moscow, ID
2002-2005	Adjunct Professor	Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID
2001	Teaching Assistant	Math Course No. 692C, Purdue University, W. Lafayette, IN
1997-2001	Research Assistant	Department of Agricultural and Biological Engineering, Purdue University, W. Lafayette, IN

INTERNATIONAL EXPERIENCE:

1996-1997	Design Engineer	Research and Development section of Patkol Public Co. Ltd., Bangkok, Thailand
1995-1996	Research Assistant	Department of Agricultural and Food Engineering, Asian Institute of Technology, Thailand
1993-1995	Design Engineer	Pioneer Software Consultants, Ludhiana, India

MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES:

Professional:

1. American Association for Advancement of Science, 1999-Present
2. American Society of Agricultural and Biological Engineers, 1998-Present
3. American Institute of Chemical Engineers, 2001-Present

4. Institute of Food Technologists, 2001-Present
5. Member of IFT's Food Engineering Division, 2001-Present
6. Society for Industrial and Applied Mathematics, 2011-Present

Honorary:

1. Alpha Epsilon, Agricultural and Biological Engineering honor society, 1999 to Present
2. Gamma Sigma Delta, Agriculture honor society, 2004-Present

HONORS AND AWARDS:

1. Outstanding Student Award during Bachelor's degree, Punjab Agricultural University, India, 1993
2. ADB Japan Scholarship, 1995-96, AIT, Thailand
3. Outstanding Student Award during Master's degree, AIT, Thailand, 1996
4. Nominated by Food Science Department at University of Idaho for the College of Agriculture and Life Science's R.M. Wade Excellence in Teaching Award, University of Idaho, Spring 2005
5. Nominated for IFT-Food Engineering Division's Member-At-Large, Spring 2005
6. Nominated for Texas Tech's Alumni Excellence Award, Fall 2007.
7. Nominated for Texas Tech's Alumni Excellence Award, Summer 2008.
8. Nominated for Texas Tech's Outstanding Young Faculty Award, Summer 2009.

AREA OF EXPERTISE:

Transport processes in biopolymeric systems, rheology, transport in porous media, heat and mass transport in biological systems, image analysis of food microstructure, food process engineering.

GRANTS AND AWARDS:

Funded:

2010

1. **Takhar, P. S.** (2010). X-ray microtomography foods. Food Industry. 2010. ~\$35,000.
2. **Takhar, P. S.** (2010). Multiscale modeling of various drying processes. Food Industry. 2010 to 2012. \$105,705.
3. **Takhar, P. S.** (2010). Transport mechanisms and microstructural changes in foods during frying. Food Industry. Nov 2010 to Oct 2012. \$106,519.
4. Brashears, M., C. Alvarado, C. Brooks, **P. S. Takhar**, M. Miller, K. Pond, L. Thompson, D. Reed, J. Boyce and S. Harp (2010). Center for Food Industry Excellence. USDA-CSREES, \$800,000.

2009 and Earlier:

5. **Takhar, P. S.**, C. Alvarado, L. Thompson and H. G. (2009). Reducing Fat Uptake in a Coated Fried Food by Using Multiscale Hybrid Mixture Theory Based Predictive Modeling and Experimental Validation. USDA-AFRI, Feb 2009-Jan 2012, \$385,932.
6. **Takhar, P. S.**, G. Ganjyal and M. Hanna (2008). Multiscale Transport in Expanding Biopolymers During Extrusion: Modeling and Experimental Verification. National Science Foundation, Sept 2008-Aug 2011, \$300,000. (*proposal received highest ranking by the NSF-Thermal Transport Division*).

7. Brashears, M., C. Alvarado, C. Brooks, **P. S. Takhar**, M. Miller, K. Pond, L. Thompson, D. Reed, J. Boyce and S. Harp (2009). Center for Food Industry Excellence-Subaward Multiscale modeling of transport processes in biological systems. USDA-CSREES, ~\$1 million.
8. Brashears, M., C. Alvarado, C. Brooks, **P. S. Takhar**, M. Miller, K. Pond, L. Thompson, J. Boyce, M. Binkley and S. Harp (2008). Center for Food Industry Excellence. Subaward Multiscale modeling of transport processes in biological systems. USDA-CSREES, \$943,353.
9. Alvarado, C., M. Brashears and **P. S. Takhar** (2007). Control of *Listeria monocytogenes* on Contact and Non- Contact Surfaces by Electrostatic Spraying of Sanitizers. U.S. Poultry and Egg Association, \$36,000.
10. Sodhi, N. S. and **P. S. Takhar** (2006). NMR Imaging and Computer Simulations on Moisture Transport in Foods. BOYSCAST-India, ~\$28,000.
11. Brashears, M., C. Alvarado, J. Blanton, C. Brooks, **P. S. Takhar**, M. Miller, K. Pond, L. D. Thompson and Hoover (2006). Center for Food Industry Excellence. Subaward Multiscale modeling of transport processes in biological systems. USDA-CSREES, \$1.27 million.
12. **Takhar, P. S.** (2005). A multiscale approach towards prediction of stress-cracking in corn kernels. Oct-2005 to Sept 2008, USDA-NRICGP, Total funded \$223,000, funds spent at U of Idaho \$95,323, amount funded at Texas Tech \$127,67, (*proposal ranked among the top few proposals submitted to the NRI Food Quality Section and was funded on 1st submission*).
13. McDonald, A., K. Huber, **P. P. Singh**, E. Aston and B. He (2005). Murdock Foundation Grant for acquiring a twin-screw extruder. Murdock Foundation, Mar 2005 to Mar 2006, \$2,35000.
14. Huber, K. and **P. P. Singh** (2005). Enhanced Rheological Characterization of Starch-Based Materials using the Starch Pasting Cell. USDA-NRICGP, Sept 2004-Sept 2005, \$12,950.
15. **Singh, P. P.** and D. M. Smith (2004). Modeling of microbial kinetics in meats using fractional differential equations. UI Research Council, June 2004-June 2005, \$8926.70.
16. Clark, S., A. McCurdy, B. Swanson, J. R. Powers, D. Smith, G. Ü. Yüksel, K. Huber, **P. P. Singh**, R. G. Brown and B. Deuben (2004). Expanding the boundaries of critical thinking in food science at Washington State University and the University of Idaho. . Washington State University, 2004-2007, \$9,000.
17. **Singh, P. P.** (2003). Predicting textural changes in potatoes during drying. University of Idaho Research council, Jul 2003-Jul 2004, \$8590.
18. **Singh, P. P.** (2003). Travel grant for presenting a research paper at 2003 Annual Meeting of AIChE. NSF- EPSCoR, \$900.
19. **Singh, P. P.** (2003). Faculty startup augmentation grant. NSF-EPSCoR, Apr 2003-Dec 2003, \$10,000.
20. **Singh, P. P.** (2003). Texture analysis of Idaho potato varieties using dynamic mechanical thermal analyzer. Idaho Potato Commission, Jul 2003-Jun 2004, \$3000.
21. McDonald, A., K. Huber and **P. P. Singh** (2003). Equipment grant for the small laboratory molder. NSF-EPSCoR, Aug 2003, \$5500.

22. Huber, K., A. McDonald and **P. P. Singh** (2003). Simultaneous microstructural and calorimetric characterization of food and biomaterials using thermal microscopy. USDA-NRICGP, Sept 2003 to Dec 2003, \$25,000 (*proposal ranked among the top few proposals submitted to the NRI Food Quality Section*).
23. **Singh, P. P.** (2002). Effect of drying conditions and chemical composition of pasta (semolina) on stress crack development. University of Idaho Research Council, Jul 2002-Jul 2003, \$8997.
24. **Singh, P. P.** (2002). Instrumentation grant. NSF-EPSCoR, Aug 2002-Dec 2002, \$4000.
25. **Singh, P. P.** (2002). Faculty startup augmentation grant. NSF-EPSCoR, Aug 2002-Dec 2002, \$32,000.
26. **Singh, P. P.** (2002). Texture analysis of Idaho potato varieties using dynamic mechanical thermal analyzer. Grant for providing research experience to undergraduate students, NSF-REU, Sept 2002-Dec 2002, \$2250.

List of gifts-in-kind and donations

2010

1. Food Engineering Enhancement Fund, Food Industry. 2010. \$5000

Grants Submitted But not Funded in 2010:

Loneregan, G. and a team of 43 Co-PDs. (2010). Comprehensive Systems-Based Approaches to Reduce Associated Illnesses: A Risk-Informed, Integrated Farm-To-Fork Initiative. USDA-CSREES. \$25 million (not funded).

PUBLICATIONS:

Book Chapters:

1. **Singh, P. P.** 2004. Thermal Design of Heat Exchangers. *In: Encyclopedia of Agricultural, Food, and Biological Engineering*. D. R. Heldman (eds.), Marcel Dekker, NY: 1-6 (*Invited*).

Refereed Publications:

2010

1. **Takhar, P. S.** (2010). Unsaturated fluid transport in swelling biopolymeric systems. *Transport in Porous Media* (Submitted).
2. **Takhar, P. S.** (2010). Hybrid Mixture Theory Based Moisture Transport and Stress Development in Corn Kernels During Drying: Coupled Fluid Transport and Stress Equations. *Journal of Food Engineering*. (Submitted)
3. **Takhar, P. S.,** D. E. Maier, O. Campanella and G. Chen (2010). Hybrid Mixture Theory Based Moisture Transport and Stress Development in Corn Kernels During Drying: Validation and Simulation Results. *Journal of Food Engineering*. (Submitted)
4. Hundal, J. and **P. S. Takhar** (2010). Experimental study on the effect of glass transition on moisture profiles and stress-crack formation during continuous and time-varying drying of maize kernels. *Biosystems Engineering* **106**(2): 156-165.

2009 and Earlier:

5. Maneerote, J., N. Athapol and **P. S. Takhar** (2009). Optimization of processing conditions to reduce oil uptake and enhance physico-chemical properties of deep fried rice crackers *LWT - Food Science and Technology* **42**(4): 805-812.
6. Hundal, J. and **P. S. Takhar** (2009). Dynamic viscoelastic properties and glass transition behavior of corn kernels. *International Journal of Food Properties* **12**(2): 295 - 307
7. Chen, G., D. E. Maier, O. H. Campanella and **P. S. Takhar** (2009). Modeling of Moisture Diffusivities for Components of Yellow-dent Corn Kernels. *Journal of Cereal Science* **50**: 82-90.
8. **Takhar, P. S.**, K. L. Head, K. M. Hendrix and D. M. Smith (2009). Predictive modeling of salmonella species Inactivation in ground pork and turkey during cooking. *International Journal of Food Engineering* **5**(11): 2:1-20.
9. **Takhar, P. S.** (2008). Role of glass-transition on fluid transport in porous food materials. *International Journal of Food Engineering* **4**(7): 5: 1-15.
10. Kaur, A., **P. S. Takhar**, D. M. Smith, J. Mann and M. Brashears (2008). Fractional Differential Equations Based Modeling of Microbial Survival and Growth Curves: Model Development and Experimental Validation. *Journal of Food Science* **73**(8): E403-E414.
11. Huang, Y., P. S. Takhar, J. Tang and B. G. Swanson (2008). Flow behaviors of high acyl gellan aqueous solutions as affected by temperature, and calcium and gellan concentrations. *International Journal of Food Engineering* **4**(5): 12: 11-19.
12. Xing, H., **P. S. Takhar**, G. Helms and B. He (2007). NMR imaging of continuous and intermittent drying of pasta. *Journal of Food Engineering* **78**: 61-68.
13. **Takhar, P. S.**, M. Kulkarni and K. Huber (2006). Dynamic viscoelastic properties of pasta as a function of temperature and water content. *Journal of Texture Studies (invited for publication in the special issue)* **37**: 696-710.
14. Nindo, C. I., J. Tang, J. R. Powers and **P. P. Singh** (2005). Viscosity of blueberry and red raspberry juices for processing applications. *Journal of Food Engineering* **69**: 343-350.
15. Nindo, C. I., J. Tang, J. R. Powers and **P. P. Singh** (2005). Rheological properties of blueberry puree for processing applications. *LWT - Food Science and Technology* **40**(2): 292-299.
16. **Singh, P. P.**, D. E. Maier, J. H. Cushman, K. Haghighi and C. Corvalan (2004). Effect of viscoelastic relaxation on moisture transport in foods. Part I: Solution of general transport equation. *Journal of Mathematical Biology* **49**(1): 1-19.
17. **Singh, P. P.**, D. E. Maier, J. H. Cushman and O. Campanella (2004). Effect of viscoelastic relaxation on moisture transport in foods. Part II: Sorption and drying of soybeans. *Journal of Mathematical Biology* **49**(1): 20-35.
18. Huang, Y., **P. P. Singh**, J. Tang and B. G. Swanson (2004). Gelling Temperatures of High Acyl Gellan as Affected by Mono- and Di- Valent Cations with Dynamic Rheological Analyses. *Carbohydrate Polymers* **56**: 27-33.
19. Cushman, J. H., **P. P. Singh** and L. S. Bennethum (2004). Toward Rational Design of Drug Delivery Substrates: II. Mixture Theory For Three-Scale Biocompatible Polymers and a Computational Example. *Multiscale Modeling and Simulation: A Society for Industrial and Applied Mathematics (SIAM) Interdisciplinary Journal* **2**(2): 335-357.

20. Cushman, J. H., L. S. Bennethum and **P. P. Singh** (2004). Toward Rational Design of Drug Delivery Substrates: I. Mixture Theory For Two-Scale Biocompatible Polymers. *Multiscale Modeling and Simulation: A Society for Industrial and Applied Mathematics (SIAM) Interdisciplinary Journal* **2**(2): 302-334.
21. **Singh, P. P.** and V. K. Jindal (2003). Pressure Drop Estimation in Tube Flow of Non-Newtonian Fluid Foods by Neural Networks. *Journal of Food Process Engineering* **26**(1): 49-65.
22. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2003). Three scale thermomechanical theory for swelling biopolymeric systems. *Chemical Engineering Science* **58**: 4017-4035.
23. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2003). Multiscale fluid transport theory for swelling biopolymers. *Chemical Engineering Science* **58**(11): 2409-2419.
24. **Singh, P. P.**, J. H. Cushman, L. S. Bennethum and D. E. Maier (2003). Thermomechanics of swelling biopolymeric systems. *Transport in Porous Media* **53**(1): 1-24.
25. **Singh, P. P.**, D. E. Maier and O. Campanella (2001). Effect of temperature and moisture on dynamic viscoelastic properties of soybeans. *Transactions of the ASAE* **44**(6): 1713-1719.
26. **Singh, P. P.** and D. E. Maier (2001). Transient Heat Conduction and Hotspot Development Prediction in a Flaking Roll with Revolving Heat Flux and Convection Boundary Conditions. *Journal of American Oil Chemists Society* **78**(8): 787-792.
27. **Singh, P. P.**, D. E. Maier, M. R. Okos, E. Cattanach and K. P. Trumble (1999). Effect of physical properties and operating parameters on soybean flaking. *Journal of American Oil Chemists Society* **76**(8): 981-987.

Conference Publications/Proceedings

2011

1. Yalamanchili, T., P. S. Takhar and C. Alvarado (2011). Creep compliance of chicken nuggets at different frying temperatures. 2011 International Poultry Expo, Jan 24-26, Atlanta, GA.
2. Yalamanchili, T., P. S. Takhar and C. Alvarado (2011). Texture of chicken nuggets with methylcellulose added as a pre-dust coating. 2011 International Poultry Expo, Jan 24-26, Atlanta, GA.

2010

3. **Takhar, P. S.** (2010). Applications of hybrid mixture theory for studying transport mechanisms in food materials. Conference paper for the 2010 InterPore Conference. Texas A&M University, Mar 14-17, College Station, TX. (*Invited*).
4. **Takhar, P. S.** and J. Maneerote (2010). Solving Two-scale Transport Laws During Frying of Foods Using Comsol Multiphysics. Conference paper for Comsol 2010 Conference, Boston, MA. Oct 7-9.
5. **Takhar, P. S.** and S. Dit-u-dompo (2010). Stress Crack Formation During Drying of Corn Kernels. Proceedings of 2010 Inverse Problems Symposium, July 6 to 8, Michigan State University, Lansing, MI. (*Invited*).
6. Lalam, S., **P. S. Takhar**, C. Alvarado and L. Thompson (2010). Pressure measurement and fluid transport imaging during deep fat frying of chicken nuggets. Institute of Food Technologists (IFT) Annual International Meeting, July 18-20, Chicago, IL.

2009 and Earlier

7. **Takhar, P. S.** and J. Maneerote (2009). Multiscale Modeling of Unsaturated Transport During Frying of Foods. Proceedings of the 37th North American Thermal Analysis Society Conference, Sept 20-23, Lubbock, TX, (invited).
8. **Takhar, P. S.** and S. Zhang (2009). Drying of Corn Kernels: From Experimental Images to Multiscale Multiphysics Modeling. Conference Paper for the Annual COMSOL Conference, Oct 7-9, Boston, MA (*Invited*).
9. Guibing, C., O. Campanella, D. E. Maier and **P. S. Takhar** (2007). Modeling of moisture diffusivities for components of yellow–dent corn kernels. Conference Paper for the Annual International Meeting of American Society of Agricultural and Biological Engineers, Jun 17-20, Minneapolis, MN. Paper No. 076264.
10. Hundal, J. and **P. S. Takhar** (2007). Multiscale Drying and Stress-Crack Formation in Corn Kernels. Proceedings of the Annual International Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No 92485.
11. Kaur, A. and **P. S. Takhar** (2007). Fractional Differential Equations Based Modeling Of Microbial Destruction In Meats. Proceedings of the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No. 92534.
12. Maneerote, J., A. Noomhorm and **P. S. Takhar** (2007). Optimizing Composition and Frying Parameters of Rice Crackers to Improve Physico-Chemical Properties and Reduce Oil Uptake. Proceedings of the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No. 92418.
13. Hundal, J. and **P. S. Takhar** (2006). Challenges and Remedies in Measuring Dynamic Viscoelastic Properties of Corn Kernels. Proceedings of the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France. Paper No. 602.
14. Kaur, A., **P. S. Takhar** and D. M. Smith (2006). A Novel Mathematical Approach For Prediction of Microbial Destruction During Cooking of Meat Products. Proceedings of the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France. Paper No. 1172.
15. **Takhar, P. S.** (2006). A porous media approach for coupling the moisture transport processes with viscoelastic changes in foods. Proceedings of the 3rd International Conference on Innovations in Food and Bioprocess Technologies, Dec 2006, Asian Institute of Technology, Bangkok, Thailand, (*invited*).
16. **Takhar, P. S.** (2006). Predicting quality changes during drying of foods: NMR imaging and computer simulations. Proceedings of the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France, Paper No. 556.
17. **Takhar, P. S.** (2006). Transport in the Vicinity of Glass-Transition, Published in online repository of NC-1023 multistate project <http://www.biotransport.net/NC136/glasstrans.pdf>, pp 1-6, (*Invited*).
18. **Takhar, P. S.** and M. Kulkarni (2005). Computer Simulations on Multiscale Fluid Transport in Foods. Conference Paper for the Annual International Meeting of American Society of Agricultural and Biological Engineers, July 17-20, Tampa, FL. Paper No. 056114.
19. **Singh, P. P.** and M. Kulkarni (2004). Role of Glass Transition on Moisture Transport and Stress Crack Initiation in Foods. Proceedings of the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 23-25, Baker City, OR.

20. **Singh, P. P.**, H. Xing and G. Helms (2004). NMR Imaging of Moisture Transport During Drying of Pasta. Proceedings of the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 23-25, Baker City, OR.
21. Cushman, J. H. and **P. P. Singh** (2003). Swelling Biopolymers and Other Viscoelastic Media: Theory and Numerics. Proceedings of Seventh SIAM Conference on Mathematical and Computational Issues in the Geosciences, March 17-20, Austin, TX.
22. **Singh, P. P.** and M. Kulkarni (2003). A Strategy to Minimize Cracking of Pasta During Sorption: Experiments and Computations. Proceedings of the Eighth Conference of Food Engineers (CoFE) held as part of the Annual Meeting of American Institute of Chemical Engineers, Nov 16-21, San Francisco, CA.
23. **Singh, P. P.** and K. Polar (2003). Experimental Challenges and Remedies in Determination of Dynamic Viscoelastic Properties of Potatoes. Proceedings of the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 25-27, Clarkston, WA. Paper No. PNW-03-101.
24. Xing, H. and **P. P. Singh** (2003). NMR Imaging of Moisture Profiles and Stress-Cracks in Pasta During Drying. Proceedings of the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 25-27, Clarkston, WA. Paper No. PNW-03-102.
25. **Singh, P. P.** and J. H. Cushman (2002). Continuum Thermodynamics Based Multiscale Fluid and Species Transport Theory For Biopolymeric Materials. Proceedings of the Annual Meeting of American Institute of Chemical Engineers, Nov 3-8, Indianapolis, IN.
26. **Singh, P. P.** and J. H. Cushman (2001). Controlled Release of Drugs From Swelling Biopolymers. Proceedings of the Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences, June 11-14, Boulder, CO.
27. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2001). Hybrid mixture theory approach to phase and species transport in swelling biopolymeric systems. Conference Paper for the Annual International Meeting of American Society of Agricultural and Biological Engineers, Jul 30-Aug 1, Sacramento, CA. Paper No 01-3022.
28. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2001). Modeling of Liquid Transport In Biological Materials Using Hybrid Mixture Theory. Proceedings of the Seventh Conference of Food Engineers (CoFE) held as part of the Annual meeting of American Institute of Chemical Engineers, Nov 4-9, Reno, NV.
29. **Singh, P. P.**, D. E. Maier, M. Okos, E. Cattnach and K. Trumble (1998). The Effect of Physical Properties and Operating Parameters on Soybean Flaking. Conference Paper for the Annual International Meeting of American Society of Agricultural and Biological Engineers, Jul 12-15, Orlando, FL. Paper No. 98-6008.
30. Yan, Y., **P. P. Singh**, D. E. Maier and R. Stroshine (1998). Thermal and Physical Properties of Soybean Bars. Conference paper for the Annual International Meeting of American Society of Agricultural Engineers, Jul 12-15, Orlando, FL, Paper No. 98-6007.
31. **Singh, P. P.** and V. K. Jindal (1997). Pressure Drop Estimation in Tube Flow of Non-Newtonian Fluid Foods by Neural Networks. Conference Paper for the Annual International Meeting of American Society of Agricultural and Biological Engineers, Aug 10-14, Minneapolis, MN. Paper No. 97-6009.

Conference Abstracts/Presentations

2011

1. Yalamanchili, T., **P. S. Takhar** and C. Alvarado (2011). Creep compliance of chicken nuggets at different frying temperatures. 2011 International Poultry Expo, Jan 24-26, Atlanta, GA.
2. Yalamanchili, T., **P. S. Takhar** and C. Alvarado (2011). Texture of chicken nuggets with methylcellulose added as a pre-dust coating. 2011 International Poultry Expo, Jan 24-26, Atlanta, GA.

2010

3. **Takhar, P. S.** (2010). Applications of hybrid mixture theory for studying transport mechanisms in food materials. Conference paper for the 2010 InterPore Conference. Texas A&M University, Mar 14-17, College Station, TX. (*Invited*).
4. **Takhar, P. S.** and J. Maneerote (2010). Solving Two-scale Transport Laws During Frying of Foods Using Comsol Multiphysics. Comsol 2010 Conference, Boston, MA. Oct 7-9.
5. **Takhar, P. S.** and S. Dit-u-dompo (2010). Stress Crack Formation During Drying of Corn Kernels. 2010 Inverse Problems Symposium, July 6 to 8, Michigan State University, Lansing, MI.
6. Lalam, S., **P. S. Takhar**, C. Alvarado and L. Thompson (2010). Pressure measurement and fluid transport imaging during deep fat frying of chicken nuggets. Institute of Food Technologists (IFT) Annual International Meeting, July 18-20, Chicago, IL.

2009 and Earlier

7. Kusuma, S., **P. S. Takhar**, C. Alvarado and L. Thompson (2009). Reduction of fat uptake in chicken nuggets using methylcellulose food gum during deep fat frying, Presented at IFT Annual International Meeting, Anaheim, CA, June 6-10, 2009.
8. Maneerote, J. and **P. S. Takhar** (2009). Simulation of heat and mass transfer during deep fat frying of rice crackers using two-scale hybrid mixture theory, Presented at IFT Annual International Meeting, Anaheim, CA, June 6-10, 2009.
9. **Takhar, P. S.** (2009). The Effect of Glass Transition on Darcian and non-Darcian Modes of Fluid Transport and Stress-Crack Formation in Biopolymers. The 37th North American Thermal Analysis Society Conference, Sept 20-23, Lubbock, TX.
10. **Takhar, P. S.** (2009). USDA-NRI Funding: A Young Investigator's Perspective, Presented at IFT Annual International Meeting, Anaheim, CA, June 6-10, 2009 (*Invited*).
11. **Takhar, P. S.**, C. Alvarado and L. Thompson (2009). Multiscale modeling of transport processes during frying, Presented at USDA-AFRI Project Director's Meeting held as part of the IFT Annual International Meeting, Anaheim, CA, June 6-10, 2009 (*Invited*).
12. **Takhar, P. S.** and J. Maneerote (2009). Two-Scale Modeling of Unsaturated Transport Mechanisms During Frying of Foods. Conference of Food Engineers (COFE), Apr 5-8, Columbus, OH.
13. **Takhar, P. S.** and S. Zhang (2009). Drying of Corn Kernels: From Experimental Images to Multiscale Multiphysics Modeling. Presented at the Annual COMSOL Conference, Oct 7-9, Boston, MA (*Invited*).

14. Hundal, J. and **P. S. Takhar** (2008). Role of glass transition on stress crack formation and moisture loss during continuous and time varying drying of corn kernels. Presented at the IFT Annual International Meeting, 28 June - 1 July, New Orleans, LA. Paper No. 008-43 (poster presentation, *invited*).
15. Kusuma, S., **P. S. Takhar**, C. Alvarado and L. D. Thompson (2008). Effect of methylcellulose coating on moisture loss, fat uptake and sensory attributes of fried chicken nuggets. Presented at the IFT Annual International Meeting, 28 June - 1 July, New Orleans, LA. Paper No. 132-12.
16. Maneerote, J., A. Noomhorm and **P. S. Takhar** (2008). The effect of fish powder and frying conditions on reducing oil uptake in fried rice crackers. . Presented at the IFT Annual International Meeting, 28 June - 1 July, New Orleans, LA. Paper No. 008-22.
17. **Takhar, P. S.** and J. Hundal (2008). Role of glass transition on stress crack formation and moisture loss during continuous and time varying drying of corn kernels. Presented at the IFT Annual International Meeting, 28 June - 1 July, New Orleans, LA. Paper No. 090-02 (oral presentation, *invited*).
18. **Takhar, P. S.**, A. Kaur and D. M. Smith (2008). Fractional differential equations-based approach for predicting nonlinear microbial survival curves. Presented at the IFT Annual International Meeting, 28 June - 1 July, New Orleans, LA. Paper No. 207-02.
19. **Takhar, P. S.** and J. Maneerote (2008). Two-scale hybrid mixture theory based modeling of unsaturated transport during frying of foods. Presented at the 14th World Congress of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Shanghai, China, Oct 19-23, 2008.
20. Guibing, C., O. Campanella, D. E. Maier and **P. S. Takhar** (2007). Modeling of moisture diffusivities for components of yellow–dent corn kernels. Presented at the 2007 Annual Meeting of American Society of Agricultural and Biological Engineers, Jun 17-20, Minneapolis, MN. Paper No. 076264.
21. Hundal, J. and **P. S. Takhar** (2007). Multiscale Drying and Stress-Crack Formation in Corn Kernels. Presented at the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No 92485.
22. Kaur, A. and **P. S. Takhar** (2007). Fractional Differential Equations Based Modeling Of Microbial Destruction In Meats. Presented at the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No. 92534.
23. Maneerote, J., A. Noomhorm and **P. S. Takhar** (2007). Optimizing Composition and Frying Parameters of Rice Crackers to Improve Physico-Chemical Properties and Reduce Oil Uptake. Presented at the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Nov 3-9, Salt Lake City, UT. Paper No. 92418.
24. **Takhar, P. S.** (2007). Multiscale modeling of transport processes in biopolymers, Published in online abstracts. Honored Participant in FACE faculty presentations organized by Teaching Learning and Technology Center, Apr 2007, Texas Tech University, Lubbock, TX.
25. Hundal, J. and **P. S. Takhar** (2006). Challenges and Remedies in Measuring Dynamic Viscoelastic Properties of Corn Kernels. Presented at the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France. Paper No. 602.

26. Hundal, J. and **P. S. Takhar** (2006). Dynamic viscoelastic properties of corn kernels. Graduate Students' Annual Poster Competition, Organized by Teaching Learning and Technology Center, Apr 6, Texas Tech University, Lubbock, TX. Guided the student in poster preparation, (*won 3rd prize*).
27. Kaur, A., **P. S. Takhar** and D. M. Smith (2006). A Novel Mathematical Approach For Prediction of Microbial Destruction During Cooking of Meat Products. Presented at the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France. Paper No. 1172.
28. **Takhar, P. S.** (2006). A porous media approach for coupling the moisture transport processes with viscoelastic changes in foods. Presented at the 3rd International Conference on Innovations in Food and Bioprocess Technologies, Dec 2006, Asian Institute of Technology, Bangkok, Thailand, (*invited*).
29. **Takhar, P. S.** (2006). Predicting quality changes during drying of foods: NMR imaging and computer simulations. Presented at the 13th World Conference of Food Science and Technology, International Union of Food Science and Technology (IUFOST), Sept 17-21, Nantes, France, Paper No. 556.
30. Head, K. L., K. M. Hendrix, **P. S. Takhar** and D. M. Smith (2005). Predictive Modeling of Salmonella spp. Inactivation in Ground Turkey and Pork during Cooking. Presented at the IFT Annual International Meeting, July 15-20, New Orleans, LA.
31. **Takhar, P. S.** and M. Kulkarni (2005). Computer Simulations on Multiscale Fluid Transport in Foods. Presented at the Annual Meeting of American Society of Agricultural and Biological Engineers, July 17-20, Tampa, FL. Paper No. 056114.
32. Huang, Y., **P. P. Singh**, J. Tang and B. G. Swanson (2004). Gelling temperatures of high acyl gellan as affected by monovalent and divalent cations. Presented at the Institute of Food Technology (IFT)'s Annual International Meeting, July 12-16, Las Vegas, NV, Paper No. 33A-21.
33. Kulkarni, M. and **P. P. Singh** (2004). Role of glass transition on stress crack initiation in foods during continuous and intermittent moisture transport processes. Presented at the IFT Annual International Meeting, July 12-16, Las Vegas, NV. Paper No. 65-7.
34. **Singh, P. P.** and M. Kulkarni (2004). Role of Glass Transition on Moisture Transport and Stress Crack Initiation in Foods. Presented at the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 23-25, Baker City, OR.
35. **Singh, P. P.**, H. Xing and G. Helms (2004). NMR Imaging of Moisture Transport During Drying of Pasta. Presented at the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 23-25, Baker City, OR.
36. Smith, D. M., M. M. Gurajala, **P. P. Singh** and K. M. Hendrix (2004). Predicting inactivation of Salmonella spp., Escherichia coli and Listeria monocytogenes in ground beef under nonisothermal cooking conditions. Presented at the IFT Annual International Meeting, Las Vegas, NV. Paper No. 67E-21.
37. Xing, H., **P. P. Singh** and G. Helms (2004). Using NMR imaging to investigate the role of glass transition on moisture profiles and crack initiation in foods. Presented at the IFT Annual International Meeting, July 12-16, Las Vegas, NV. Paper No. 65-6.
38. Cushman, J. H. and **P. P. Singh** (2003). Swelling Biopolymers and Other Viscoelastic Media: Theory and Numerics. Presented at the Seventh SIAM Conference on

- Mathematical and Computational Issues in the Geosciences, March 17-20, Austin, TX.
39. **Singh, P. P.** and M. Kulkarni (2003). A Strategy to Minimize Cracking of Pasta During Sorption: Experiments and Computations. Presented at the Eighth Conference of Food Engineers (CoFE) held as part of the Annual Meeting of American Institute of Chemical Engineers, Nov 16-21, San Francisco, CA.
 40. **Singh, P. P.** and K. Polar (2003). Experimental Challenges and Remedies in Determination of Dynamic Viscoelastic Properties of Potatoes. Presented at the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 25-27, Clarkston, WA. Paper No. PNW-03-101.
 41. Xing, H. and **P. P. Singh** (2003). NMR Imaging of Moisture Profiles and Stress-Cracks in Pasta During Drying. Presented at the Annual Pacific Northwest Meeting of American Society of Agricultural Engineers, Sept 25-27, Clarkston, WA. Paper No. PNW-03-102.
 42. **Singh, P. P.** and J. H. Cushman (2002). Continuum Thermodynamics Based Multiscale Fluid and Species Transport Theory For Biopolymeric Materials. Presented at the Annual Meeting of American Institute of Chemical Engineers, Nov 3-8, Indianapolis, IN.
 43. **Singh, P. P.** and J. H. Cushman (2001). Controlled Release of Drugs From Swelling Biopolymers. Presented at the Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences, June 11-14, Boulder, CO.
 44. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2001). Hybrid mixture theory approach to phase and species transport in swelling biopolymeric systems. Presented at the Annual Meeting of American Society of Agricultural Engineers, Jul 30-Aug 1, Sacramento, CA. Paper No 01-3022.
 45. **Singh, P. P.**, J. H. Cushman and D. E. Maier (2001). Modeling of Liquid Transport In Biological Materials Using Hybrid Mixture Theory. Presented at the Seventh Conference of Food Engineers (CoFE) held as part of the Annual meeting of American Institute of Chemical Engineers, Nov 4-9, Reno, NV.
 46. **Singh, P. P.**, D. E. Maier, M. Okos, E. Cattanaach and K. Trumble (1998). The Effect of Physical Properties and Operating Parameters on Soybean Flaking. Presented at the 1998 Annual International Meeting of American Society of Agricultural Engineers, Jul 12-15, Orlando, FL. Paper No. 98-6008.
 47. Yan, Y., **P. P. Singh**, D. E. Maier and R. Stroshine (1998). Thermal and Physical Properties of Soybean Bars. Presented at the 1998 Annual International Meeting of American Society of Agricultural Engineers, Jul 12-15, Orlando, FL, Paper No. 98-6007.
 48. **Singh, P. P.** and V. K. Jindal (1997). Pressure Drop Estimation in Tube Flow of Non-Newtonian Fluid Foods by Neural Networks. Presented at the Annual International Meeting of American Society of Agricultural Engineers, Aug 10-14, Minneapolis, MN. Paper No. 97-6009.

Technical reports:

1. **Takhar, P. S.** (2009). NC-1023's Objectives C and D on Transport Mechanisms and Mathematical Modeling in Foods. Developed Texas Tech Station Annual Report and

- Participated in Proposal Writing Process of USDA Sponsored NC-1023 Multistate Project's Annual Meeting, Oct 4-6, NASA Johnson Space Center, Houston, TX.
2. **Takhar, P. S.** (2007). NC-1023's Objectives C and D on Modeling and Experimental Research on Moisture Transport in Foods. Published in Annual Report of USDA Sponsored NC-1023 Multistate Project's Annual Meeting, Sept 30-Oct 2, Penn State University, State College, PA.
 3. **Takhar, P. S.** (2006). NC-1023's Objectives C and D on Modeling and Experimental Research on Moisture Transport in Foods. Published in Annual Report of USDA Sponsored NC-1023 Multistate Project's Annual Meeting, Oct 8-10, Virginia Tech University, Blacksburg, VA.
 4. **Singh, P. P.** (2004). Presented Idaho Station Report on USDA Sponsored Project NC-136's Objectives C and D on Modeling and Experimental Research on Moisture Transport in Foods. Annual Meeting of NC-136. October 2004, University of California, Davis, CA.
 5. **Singh, P. P.** (2003). Three-Scale Modeling and NMR Imaging of Moisture Profiles and Stress-Cracks in Foods During Drying. Published in the Annual report of the USDA Sponsored NC-136 multistate project's Annual Meeting, October, 2003, Gainesville, FL.
 6. **Singh, P. P.** (2002). Three-Scale Hybrid Mixture Theory Based Fluid and Species Transport in Biopolymers. Published in the Annual Report of the USDA Sponsored NC-136 Multistate Project's Annual Meeting, Oct 2002, Columbus, OH.

Other publications:

1. **Singh, P.P.** 1992, Implications of reducing forest cover in India, Science Today India. pp 1 (popular press).
2. Developed the Maple based software package to derive single-scale continuum mechanics equations for elastic and viscous food and biomaterials. A free access to the package was provided online to academic and research community for non-commercial use. Available at:
<http://apps.depts.ttu.edu/afs/home/ptakhar/Research/ContMech/ContMech.html>

OTHER PRESENTATIONS/LECTURES:

1. **Takhar, P. S.** (2009). Finite Element Analysis of Microfluidics. Presented a guest lecture in Texas Tech Chemical Engineering graduate class entitled "Biomicrofluidics", Oct 20, 2009 (*Invited*).
2. **Takhar, P. S.** (2009). Multiscale modeling of transport processes in food and biological systems. Gave a presentation at the Post Harvest Technology Center, Punjab Agricultural University, India, Dec 2009.
3. **Takhar, P. S.** (2007). Multiscale hybrid mixture theory based modeling of transport processes in biological systems. Presented at the High Performance Computing Center's Spring Meeting, Spring 2007, Texas Tech University, Lubbock, TX, (*invited*).
4. Maneerote, J., A. Noomhorm and **P. S. Takhar** (2007). Optimizing Composition and Frying Parameters of Rice Crackers to Improve Physico-Chemical Properties and Reduce Oil Uptake. Poster Presented at the College of Agricultural Sciences and Natural Resources' Annual Faculty Retreat, Aug 22, Texas Tech University, Lubbock, TX.

5. Hundal, J. and **P. S. Takhar** (2006). Dynamic viscoelastic properties of corn kernels. Presented at the Graduate Students' Annual Poster Competition, Organized by Teaching Learning and Technology Center, Apr 6, Texas Tech University, Lubbock, TX. Guided the student in poster preparation, (*won 3rd prize*).
6. **Singh, P. P.** (2004). Presented invited motivational lecture on "Careers in food engineering". In Freshman Class BAE 142, Engineering for Living Systems, Fall 2004, Department of Biosystems Engineering, University of Idaho, Moscow, ID (*invited*).
7. **Singh, P. P.** (2003). Presented crash course on "Introduction to Food Engineering". To the Food Science College Bowl Team, February 2003, University of Idaho, Moscow, ID (*invited*).
8. **Singh, P. P.** (2003). Presented invited lecture on "Role of glass-transition on non-Fickian drying kinetics of foods". In FST 470/570, Advanced Food Technology, Spring 2003, Washington State University, Pullman, WA (*invited*).
9. **Singh, P. P.** (2003). Presented invited motivational lecture on "Careers in food engineering". In Freshman Class BAE 142, Engineering for Living Systems, Fall 2003, Department of Biosystems Engineering, University of Idaho, Moscow, ID (*invited*).
10. **Singh, P. P.** (2003). Three-Scale Modeling and NMR Imaging of Moisture Profiles and Stress-Cracks in Foods During Drying. Presented at the Annual Meeting of USDA Sponsored NC-136 multistate project October, 2003, Gainesville, FL.
11. **Singh, P. P.** (2002). Presented invited lecture on role of glass transition on fluid transport in biopolymers. Spring 2002, Department of Chemical Engineering, University of Idaho, Moscow, ID (*invited*).
12. **Singh, P. P.** (2002). Presented invited lecture on transport mechanisms in foods. Spring 2002, Department of Biosystems Engineering, Washington State University, Pullman, WA (*invited*).
13. **Singh, P. P.** (2002). Presented invited motivational lecture on "Pursuing Food Science major". Fall 2002, To high school students visiting UI campus, Organized by College of Agriculture and Life Sciences, University of Idaho, Moscow, ID (*invited*).
14. **Singh, P. P.** (2002). Presented two invited lectures on food rheology. In FSHN511, Food Carbohydrates and Lipids, Fall 2002, Washington State University, (*invited*).
15. **Singh, P. P.** (2002). Three-Scale Hybrid Mixture Theory Based Fluid and Species Transport in Biopolymers. Presented at the Annual Meeting of USDA Sponsored NC-136 Multistate Project, Oct 2002, Columbus, OH.
16. **Singh, P. P.** (2000). Viscoelastic modeling of polymeric systems using continuum mixture theories. Presented guest lecture in Mathematical Food Rheology Class, Instructor: Dr. Osvaldo Campanella, Department of Agricultural and Biological Engineering, Purdue University, Fall 2000 (*invited*).

GRADUATE STUDENT ADVISING

Current Students (4 Ph.D., 1 Masters)

As Major Advisor

Ph.D.

1. Srivikorn Dit-u-dompo. Anticipated completion date 2012.

Research area: Multiscale modeling and experimental validation of expansion of biopolymers during extrusion.

2. Jaspreet Sandhu. Anticipated completion date 2013.
Research area: Hybrid mixture theory based modeling and experimental validation of transport mechanisms during frying of foods.
3. Harkirat Bansal. Anticipated completion date 2013.
Research area: Multiscale modeling of microstructural changes in foods using combination of different drying methods.
4. Thrinadh Yalamanchili. Anticipated completion date 2013. Ph.D. Student at Texas A&M University, College Station, TX.
Research area: Microstructural and mechanical changes in coated foods during frying.
(Advising the student as co-advisor)

M.S.

1. Sravan Lalam. Anticipated completion date, Spring 2011.
Research area: Experimental study of microstructural changes, oil penetration and pressure development in coated chicken nuggets during frying.

As Committee Member

M.S.

1. Shail Shah, M.S. student in Plant and Soil Science, Anticipated completion date, Spring 2011.

Previous Students

As Major Advisor

Ph.D.

Jirawan Maneerote, Completed in 2009. Title of thesis: Transport Mechanisms and Optimum Frying Conditions for Rice Crackers

M.S.

1. Apneet Kaur, Completed in 2007. Title of thesis: A Fractional Differential Equations Based Approach for Modeling Microbial Survival Curves
2. Jyoti Hundal, Completed in 2007. Title of thesis: Determination of Viscoelastic Properties, Glass Transition Behavior and Drying Profiles of Corn as a Function of Temperature and Moisture Content
3. Saicharan Kusuma, Completed 2008, Title of thesis: Methylcellulose coating effects on moisture loss, fat uptake and sensory attributes of fried chicken nuggets
4. Manish Kulkarni, Completed in 2004. Title of thesis: Stress-Crack Initiation in Pasta During Continuous and Intermittent Sorption
5. Huajing Xing, Completed in 2005. Title of thesis: Using NMR Imaging to Investigate the Role of Glass Transition on Moisture Transport

As Committee Member

M.S.

At University of Idaho

- | | |
|----------------------|-------------------|
| 1. Kari Head | Completed in 2006 |
| 2. Jeremy Higley | Completed in 2005 |
| 3. Arvinder Singh | Completed in 2005 |
| 4. Tri Widodo | Completed in 2002 |
| 5. Jeremy L. Freeman | Completed in 2003 |
| 6. Ganga R. Ega | Completed in 2004 |

Ph.D.

At University of Idaho and Washington State University, respectively

1. Ron Johnson Completed in 2006
2. Seung Yong Lim Completed in 2006
3. M. Anantachar Anticipated completion date 2010 (at University of Agricultural Sciences, Dharwad, India)

M.S.

1. Andrea Dow Completed in 2008
2. Charles Broz Completed in 2008
3. Ngan Nguyen Completed in 2009
4. Justin Tedford Completed in 2009

UNDERGRADUATE ADVISING:**At Texas Tech University**

1. Advised Jonathan Hartzendorf in pursuing engineering career in the food industry, 2006-2007
2. Megan Kowalczyk, advised the student to assist graduate student in conducting research on frying of foods 2008 (along with Drs. Alvarado and Thompson)
3. Maria Cazares, advised the student to assist graduate student in conducting research on frying of foods 2008 ((along with Drs. Alvarado and Thompson)

At University of Idaho

1. Karina Polar, Senior in Food Science and Toxicology. Advised the student to conduct research on determination of dynamic viscoelastic properties of Idaho potato varieties under NSF-REU project from 2002 to 2004
2. Ruth de La Fuente Sanz, Exchange Student from Spain, Food Science and Toxicology. 2003 to 2004
3. Adriano Sun, Senior in Agricultural engineering with Food Science Minor, 2003 to 2004
4. Jaime Yanez, advised the student as teaching assistant in FST303 Food Processing, 2003
5. Oriana Obiri, Senior in Chemical Engineering. Hosted the student as a summer intern in my lab, 2003
6. Advised Biological and Agricultural Engineering Department's team of two students (Adriano Sun, Grissa Mohamad) on senior design project, Project topic: "Experimental measurement of moisture profiles inside potatoes during drying", 2003-2004
7. Co-Advised Chemical Engineering Department's team of three students (Sarah Francisco, Katia Hristova and Oriana Obiri) on Senior Design Project, Project topic: "Trout Drying: A comparison of continuous and intermittent drying methods", 2003-2004

TEACHING RESPONSIBILITIES:

Teach undergraduate and graduate courses, and guide graduate students on coursework and research projects.

Courses Taught At Texas Tech University

1. FDT/FDSC 3305: Principles of Food Engineering (Undergraduate), Spring 2007, Spring 2010.
2. FDT 5307: Principles of Food Engineering (Graduate component of above course), Spring 2007, Spring 2010.
3. FDT 5307-005/FDSC 5304: Rheological properties of foods, taught in summer of 2006, 2007 and 2008 was not evaluated because TTU does not evaluate summer courses.
4. ANSC 5100: Graduate Seminar, taught in Fall 2007 and Spring 2008
5. FDSC 5311: Modeling of Transport Processes in Food and Biomaterials. Fall 2008, 2009, Fall 2010.

FIVE YEAR SUMMARY OF TEACHING EVALUATIONS At Texas Tech University (TTU mean score is out of 5)

Term/Class	Number of Students	Instructor Overall (Question #1) Mean	Availability (Question #2) Mean	Treated all Fairly (Question #4) Mean	Presented Clearly (Question #7) Mean
Spring 2006					
ANSC 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDT 5307	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDT 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-I 2006					
ANSC 7000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDT 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-II 2006					
FDT 5307	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
ANSC 5000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Fall 2006					
ANSC 5000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDT 6000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Spring 2007					
FDT 3305	11	4.40	4.20	4.50	4.40
FDT 5307	5	4.75	5.00	5.00	4.75
FDT 6000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-I 2007					
FDSC 5304	4	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-II 2007					

ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Fall 2007					
ANSC 5100	35	4.25	3.91	4.26	4.17
ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Spring 2008					
ANSC 5100	15	3.75	4.27	4.45	3.92
FDSC 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-I 2008					
FDSC 5304	3	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Term/Class	Number of Students	Instructor Overall (Question #1) Mean	Availability (Question #2) Mean	Treated all Fairly (Question #4) Mean	Presented Clearly (Question #7) Mean
Spring 2009					
FDSC 3305	16	4.45	3.77	3.90	3.71
Summer-I 2009					
FDSC 5304	5	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Spring 2010					
ANSC 7000	4	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 6000	3	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 5307	3	5	5	5	5
FDSC 3305	6	4.83	4.83	4.83	4.83
Summer-I 2010					
ANSC 7000	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Summer-II 2010					
FDSC 5307	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
Fall 2010					
FDSC 5307	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 6000	1	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 6001	2	Not evaluated	Not evaluated	Not evaluated	Not evaluated
FDSC 5311	6	4.83	4.83	4.83	4.67

At University of Idaho (UI mean scores are out of 4)

Semester	Course	Credit Hrs	No. of Responses/ Students Enrolled	Instructor Performance	Course Quality	Departmental Mean ¹	College Mean ¹
Fall 2004	FST 303	3	11/15	3.5	3.5	-	-
Spring 2004	FST 504	1	5/5	4.0	3.6	3.7, 3.6	3.5, 3.5
Spring 2004	FST 590	1	3/6	4.0	4.0	3.7, 3.6	3.5, 3.5
Fall 2003	FST 303	3	9/12	3.2	3.2	3.7, 3.7	3.5, 3.4
Spring 2003	FST 590	1	4/8	3.3	3.0	3.6, 3.6	3.5, 3.5
Fall 2002	FST303/ FST404ST	3	9/9	3.7	3.3	3.6, 3.6	3.6, 3.5

Other Teaching Responsibilities

1. Served as faculty advisor of University of Idaho's Indian Students Association, 2002-2005.
2. Advised Abhijit Nalawade, M.S. student in Food Science as Teaching Assistant for FDSC 3305, Fall 2006.
3. Developed a Food Rheology Laboratory housing equipment worth over \$230,000 (DMA Q800, Modulated DSC and Programmable Conditioning Chamber). Provided training to several graduate students for using these equipment. Spring 2006 to Present.

SERVICE TO PROFESSIONAL ORGANIZATIONS

National:

1. American Society of Agricultural and Biological Engineers, (member since 1998)
 - a. Ad-hoc reviewer of Transactions of ASABE
2. Institute of Food Technologists, (member since 2001)
 - a. Member of IFT's Food Engineering Division
 - b. Ad-hoc reviewer of Journal of Food Science
 - c. IFT Annual Meeting abstracts and student papers reviewer
 - d. Session moderator during IFT Annual Meeting
 - e. Contributor to IFT's Student Professional Development session
3. American Institute of Chemical Engineers, (member since 2001)
 - a. Ad-hoc reviewer of AIChE journal
4. American Association for Advancement of Science (member since 1999)

State:

1. Texas section of American Society of Agricultural and Biological Engineers (member since 2005)
2. Longhorn Section of Institute of Food Technologists (member since 2005).

OTHER PROFESSIONAL SERVICE:

Panel Service

1. Served on USDA-AFRI Panel on Improving Food Quality and Value, July, 2009.

Manuscript and Proposal Review Service

1. Member of USDA task force for reviewing proposals on allowable ingredients in organic farming (The National Organic standards Board). June-August 2002
2. Cool-season crops review committee for USDA regional project proposals, April 2002
3. Food Science and Technology International. Reviewed one manuscript, Sept-Nov 2003
4. Transactions of the ASAE. Reviewed 2 manuscripts, Sept-Dec 2003.
5. Journal of Food Science. Reviewed 4 manuscripts, Apr-Dec 2003, Oct 2008.
6. Journal of Food Processing and Preservation. Reviewed one manuscript, Nov 2002.
7. Reviewed two proposals submitted to USDA-NRICGP in the Division of Food Characterization/Process/Product Research, Spring 2003
8. Reviewed one proposal submitted to National Science Foundation's Office of International Science and Engineering, (OISE), Summer 2004
9. Reviewed one proposal submitted to USDA-NRICGP in the Division of Food Characterization/Process/Product Research, Spring, 2004
10. Reviewed 1 manuscript submitted to Encyclopedia of Agricultural, Food and Biological Engineering, Nov 2004
11. Reviewed 1 manuscript for Transactions of ASAE's Food Engineering Division, Nov 2004- Jan 2005
12. Reviewed two proposals for USDA-NRICGP's Food Quality division as an ad-hoc reviewer, Spring 2005
13. Reviewed one proposal submitted to USDA-NRICGP's Food Safety division, Spring 2006
14. Reviewed 14 papers submitted to IFT Food Engineering division for the student paper competition, Feb 2007
15. Reviewed 1 proposal submitted to USDA-SBIR division, Feb 2007.
16. Served as reviewer of two papers submitted to Journal of Food Engineering, Aug-Dec 2007
17. Served as reviewer of four LWT-Food Science and Technology Journal. July 2008, Sept 2008, Dec 2008, Jan 2009.
18. Served as reviewer of Food and Bioproducts Processing Journal paper. July 2008
19. Reviewed three papers for Journal of Texture Studies, Jan 2008, Sept 2008, Oct 2008.
20. Reviewed 40 Abstracts and 5 full papers for IFT food engineering division's student paper competition. Jan-Mar 2009.

Session Chair

1. Chaired the Food Engineering division's technical session at Annual IFT Meeting, New Orleans, LA, July 2005

2. Chaired the food process modeling session at the 3rd International Conference on Innovations in Food and Bioprocess Technologies, Asian Institute of Technology, Thailand, Dec 2006.

SERVICE TO:

International Service

1. Served on faculty and scientist selection committee of National Agri Food Biotechnology Institute, Mohali, PB, India. 2010.
2. Served on mentoring committee of Dr. Jirawan Maneerote of Kasetsart University, Thailand, 2009 to Present.

UNIVERSITY:

At Texas Tech

1. Represented department on University Day, Mar 5, 2007.
2. Contributed to cyber infrastructure enhancement proposal as senior collaborator with HPCC to secure funding for enhancing Texas Tech's computing infrastructure, addressed to National Science Foundation, Summer 2007.
3. Regularly advised the University library on textbooks and journals of importance to food science field, 2002-Present.

At University of Idaho

4. Served on UI's Graduate Students Research Exhibition Award Committee, April 2003

COLLEGE:

At Texas Tech

1. Member of CASNR's International Activities Committee, 2006 to Present
2. Member of Ag Awareness Committee, College of Agricultural Science and Natural Resources, Fall 2006.

At University of Idaho

3. Member of College's student awards committee, Spring 2004.

DEPARTMENT:

At Texas Tech

1. Serving on mentoring committee of Jyotsana Sharma, Assistant Professor, Plant and Soil Sciences, Jan 2011 to Present.
2. Prepared documentation for approval of Ph.D. in Food Science program in collaboration with Dr. Leslie Thompson.
3. Serving as Department of Animal and Food Sciences' Network Support Coordinator, Jan 2007-Present.
4. Serving on Department of Animal and Food Sciences' graduate students admission committee, 2010-Present
5. Guided the graduate student, Saicharan Kusuma for developing the departmental website according to the new CASNR format and helped to maintain and update the website, Oct 2006-Jan 2007.

At University of Idaho

4. Member of department's promotion and tenure committee, Fall 2003

5. Chaired the departmental Research Support Scientist & Scientific Aide Sr. Search Committee, Spring 2003.
6. Participated in the departmental curriculum review activity to obtain the curriculum approval from IFT, Fall 2002

COMMUNITY:

1. Demonstrated the mechanical testing of extruded starch based products to 100 high school students as part of the NSF grant. April 2010.
2. Presented talks on Fox Television and Radio Shows in Spring 2006 and Fall 2007 to enhance the awareness of general public about food science and engineering research at Texas Tech and its benefit to the farming and general community.

INDUSTRY:

1. Advised Central Soya, Fort Wayne, IN for enhancing oil recovery from soybeans, optimizing cracking, conditioning and flaking operations, and enhancing packing density of soybean meal in railroad cars, 1997-2002.
2. Performed statistical analysis of data for West Farm Foods, Idaho to help the company calibrate their milk drying operation, April 2002.
3. Organized a workshop on food rheology. Presentations made by industrial experts for enhancing student learning, Summer 2002.
4. Advised Medallion Foods, WA to minimize stress crack development in pasta during drying, storage and shipping, and conditioning of pasta under controlled conditions. Apr 2003-2005.
5. Advised Purely Supreme Foods, Idaho on improving texture of processed potatoes, 2003-2004.
6. Advised Clear Spring Foods, Idaho to optimize the performance of smokehouses used for drying trout. Developed one grant proposal submitted to Northwest Aquaculture Initiative to optimize design of industrial smokehouse, Mar 2003-2007.
7. Advised Japan Canners Association on sensor placement and data analysis for aseptic tanks and tubes carrying non-Newtonian fluid foods. Spring to Summer 2004.
8. Conducted research on USDA-NRI funded stress-crack formation in corn kernels project and presented numerous talks and published four manuscripts for helping the industry to develop wholesome corn.
9. Currently working on three frying projects to help Kerry Ingredients, Wisconsin, U.S.A. to minimize oil uptake in chicken nuggets. The results of the project will benefit this company. Secured USDA-NRICGP grant to perform advanced multiscale modeling work on the problem.
10. Collaborator of MGP Ingredients, Kansas City, KS for developing improved starch based food, feed and biomedical products. Developed a proposal in collaboration with Dr. G. Ganjyal of MGP Ingredients that was successfully funded by NSF in 2008.
11. Developed high-nutrition rice crackers in collaboration with Dr. Athapol Noomhorm of Asian Institute of Technology, Thailand to benefit consumers in South-East Asian countries.

12. Advisor for engineers from Patkol Public Co., Thailand on using Computational Fluid Dynamics for engineering design of food processing machinery, Dec 2006-Present.
13. Invited by Maplesoft Inc., Waterloo, Canada to review the tensor analysis capabilities of its mathematical symbolic manipulation. Developed and maintained an online blog identifying strengths, limitations and wish-list for the package for use by the academic community. All the suggestions made incorporated into release 12 of Maple, 2007-Present.
14. Provided guidance to General Mills on role of glass transition in corn processing, July 2008.
15. Developed a workshop on Sensory and Texture of Foods in collaboration with Dr. Janice Boyce for teaching to local and regional food industry representatives in Spring 2009.
16. Advised Tyson Foods about reducing fat uptake in fried foods, Sept-Oct 2008.
17. Provided Consultation service to Microzap Inc., Lubbock TX and ITHACA, Brescia, Italy on design of microwave for heating foods. Nov 2008.

OTHER:

Multistate Project Participation

1. Idaho station representative for USDA Sponsored NC-136 multistate project on Improvement of Thermal and Alternative Processes for Foods. Participated in project objectives A, C and D, 2002-2005.
2. Contributed to rewrite of multistate collaboration proposal for the NC-136 project renewal, Contributed to proposal sections on modeling of thermal and transport processes, and extrusion modeling, 2002-2005.
3. USDA sponsored multistate project NC1023 Improvement of Thermal and Alternative Processes for Foods' representative for Texas Tech University, Participating in Objectives, A, C, D. 2006-Present.
4. Member of NC-1023 project's ad-hoc committee on "Online compilation of food process engineering teaching and research tools", October 2002-Present.
5. USDA Sponsored S-295 Multistate project on Food Safety, participant working on Mathematical Modeling of Microbial Destruction, Spring 2004-Present.