CURRICULUM VITAE

NAME: Dr. Pawan Singh Takhar **DATE:** Apr 21, 2008
Previous Name: Pawan P. Singh
PRESENT RANK OR TITLE: Assistant Professor of Food Engineering
DEPARTMENT: Department of Animal and Food Sciences,
International Center For Food Industry Excellence
Texas Tech University, Lubbock, TX, 79409
OFFICE LOCATION: Rm 203, Animal and Food Sciences, Indiana Ave & Main St.
Lubbock, TX 79409
OFFICE PHONE: (806) 742-2805 ext 258. **FAX:** (806) 742-4003
WEB: http://www.afs.ttu.edu/home/ptakhar/default.html
E-mail: pawan.takhar@ttu.edu

PROFESSIONAL APPOINTMENTS:

Oct 2005-Present	Assistant Professor	Department of Animal and Food Sciences; and International Center for Food Industry Excellence, Texas Tech University, Lubbock, TX
Jan 2002-Oct 2005	Assistant Professor	Department of Food Science and Toxicology, University of Idaho, Moscow, ID
Apr 2002-Oct 2005	Adjunct Professor	Department of Chemical Engineering University of Idaho, Moscow, ID
Apr 2002-Oct 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
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

EDUCATION BEYOND HIGH SCHOOL:

Ph.D., Purdue University, West Lafayette, IN, Dec 2001, Food Process Engineering
MEngg., Asian Institute of Technology, Klong Luang, Thailand, 1996, Post Harvest and Food Pr. Engg.
B.Tech., Punjab Agricultural University, Ludhiana, India, 1993, Agricultural Engineering

RESEARCH INTERESTS BEING ACTIVELY PURSUED

Value-Added Processing of Foods; Design of Transport Processes, Prediction of Fracture Formation in Foods During Processing, Storage and Shipping; Using Multiscale Porous Media Approach to Study Fluid and Ion Transport in Food and Animal Tissues; NMR Imaging of Moisture Transport; Rheological Characterization of Food and Animal Products; Modeling of Microbial Kinetics in Animal Products (Ground Beef, Turkey Products, Ground Pork); Stochastic Modeling; Thermal Processing of Foods; Design of Starch-Foams; Computational Fluid Dynamics Based Design of Smokehouses For Improving Quality of Meat and Fish Products.

GRADUATE ADVISORS

Co-Major Advisors for Doctoral Degree

- Dr. Dirk E. Maier, Professor, Department of Agricultural and Biological Engineering, Purdue University
- Dr. John H. Cushman, Professor, Center for Applied Mathematics, Purdue University

HONORS AND AWARDS

-Nominated for Texas Tech's Alumni Excellence Award, Fall 2007
-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
-Nominated for IFT-Food Engineering Division's Member-At-Large, Spring 2005
-Alpha Epsilon Agricultural Engineering honorary society, 1999 to Present
-Outstanding Student Award during Master's degree, AIT, Thailand, 1996
-ADB Japan Scholarship, 1995-96, AIT, Thailand
-Outstanding Student Award during Bachelor's degree, Punjab Agricultural University, India, 1993

TEACHING ACCOMPLISHMENTS:

Areas of Specialization:

Food Process Engineering, Transport in Porous Media, Heat and Mass Transfer, Thermodynamics, Food Rheology, Applied Mathematics

Courses Developed and Taught:

At Texas Tech:

FDT 3305/5307-005, Principles of Food Engineering, developed for teaching at Texas Tech University in Spring 2007
FDT 5307 Rheological Properties of Food Materials, a graduate course on food rheology, developed and taught at Texas Tech in Summer II, 2006
ANSC 5100 Graduate Seminar, Developed and taught at Texas Tech Fall 2007

At University of Idaho:

FST 504, 1 cr, Physical Properties of Food Materials, graduate module, developed lecture materials, student handouts and overhead projector slides, Taught in Spring 2004
FST 303, 3 cr, Food Processing, developed the lecture materials, multimedia presentations, course assignments, designed lab sessions, prepared lab handouts, and developed and maintained the course website, Teaching every Fall for the last three years
FST 590, 1cr, Food Science Research Seminar, taught course and maintained course mailing list, Teaching every Spring for the last three years
FST 499, FST 502, BAE 502 Directed study courses offered to 4 students on topics of food rheology and modeling of food processes, Fall 2003 to Present

Teaching in Non-credit Classes, Workshops, Seminars, Invited Lectures, Lab Trainings etc.:

-Presented invited motivational lecture on "Careers in food engineering" in freshman class BAE 142, Engineering for Living Systems. Department of Biosystems Engineering, University of Idaho, Presenting for the last two years, Fall 2003, Fall 2004
-Presented invited lecture on the role of glass-transition on non-Fickian drying kinetics of foods in FST 470/570, Advanced Food Technology, Spring 2003
-Presented crash course on "Introduction to Food Engineering" to the Departmental Quiz Bowl Team, Feb, 2003
-Presented two invited lectures on food rheology in FSHN511, Food Carbohydrates and Lipids, Washington State University, Fall 2002
-Presented invited lecture on transport mechanisms in foods, Department of Biosystems Engineering, Washington State University, Spring 2002
-Presented invited lecture on role of glass transition on fluid transport in biopolymers, Department of Chemical Engineering, University of Idaho, Spring 2002

-Presented motivational lecture on "Pursuing Food Science major" to high school students visiting UI, Fall 2002
-Organized a workshop on food rheology. Presentations made by industrial experts, Summer 2002
-Presented guest lecture on "Viscoelastic modeling of polymeric systems using continuum mixture theories" in Mathematical Food Rheology (Teacher: Dr. Osvaldo Campanella). Department of Agricultural and Biological Engineering Purdue University, Fall 2000.
-Developed a Food Rheology Laboratory housing equipment worth over $300,000 (AR 2000 Rheometer, DMA Q800, Modulated DSC and Programmable Conditioning Chamber) in the Department of Food Science and Toxicology, Provided training to numerous students for using these equipment. Spring 2002 to Present

Students Advised:

Graduate Students:

Advised As Major Professor

- Jirawan Maneerote, Ph.D. student in Food Engineering at Asian Institute of Technology, Thailand. Co-Major Professor of student. Currently hosting the student as research scholar at Texas Tech to conduct research on modeling of oil uptake in fried rice crackers and develop a healthy food snack.
-Srivikorn Ditudompo, Ph.D. student in Food Science, Mar 2008 to Present
- Saicharan Kusuma, M.S. Student in Food Science, Thesis Title "Modeling of transport processes during frying of breaded chicken nuggets", Aug 2006-Present
-Jyoti Hundal, Ph.D. student in Food Science, Thesis Title: "*A Multiscale Approach Towards Prediction of Stress-Cracking in Corn Kernels*" Jan 2005-Present
-Apneet Kaur, M.S. student in Food Science, Thesis Title: "*Fractional Differential Equations Based Modeling of Microbial Destruction in Meat Products*", Aug 2004 to Present
-Huajing Xing, M.S. in Chemical Engineering, Thesis Title: "*Using NMR Imaging to Investigate the Role of Glass Transition on Moisture Transport in Foods*", Aug 2002-Aug 2004, (Graduated)
-Manish Kulkarni, M.S. student in Food Science, Thesis Title: "*Stress-Crack Initiation in Pasta During Continuous and Intermittent Sorption*", Aug 2002-Apr 2005 (Graduated)

Advised as Graduate Committee Member

-Andrea Dow, advising the student as a committee member providing guidance on technical aspects of using Electro Static Spray System for microbial destruction Continuing to serve on committee of M. Gurajala, M.S. student at U of Idaho.
-Advising Charles Broz , M.S. student in Human Sciences to perform mathematical modeling of heat transfer in fast food restaurants' packages, 2007-Present.
-Advising Justin Tedford to study heat transfer in steak samples, 2007-Present.
-Ron Johnson, Ph.D. in Food Science, Spring 2004-Oct 2005
-Seung Yong Lim, Ph.D. in Food Science, Washington State University, Fall 2003-Oct 2005
-Arvinder Singh, M.S. in Agricultural Engineering, Spring 2004-Dec 2005
-Jeremy Higley, M.S. in Food Science, Spring 2004-Sept 2005
-Murali Mohan Gurajala, M.S. in Food Science, Jan 2002-Present

Guided approx 50% of students' graduate research on mathematical modeling of microbial destruction in meat products

-Kari Head, M.S. in Food Science, Jan 2002-Present
Guided approx 50% of students' graduate research on mathematical modeling of microbial destruction in meat products

-Jeremy L. Freeman, M.S. in Mechanical Engineering, Aug 2002-Dec 2003, (Graduated)

-Tri Widodo, M.S. in Chemical Engineering, Jan 2002-May 2002, (Graduated)

-Ganga R. Ega, M.S. In Chemical Engineering, Aug 2003-Summer 2004, (Graduated)

Undergraduate Students:

-Karina Polar, Senior in Department of Food Science and Toxicology. Advised the student to conduct research on determination of dynamic viscoelastic properties of Idaho potato varieties under NSF-REU project. Fall 2002 to Fall 2004

-Ruth de La Fuente Sanz, Exchange Student from Spain, Food Science and Toxicology. Fall 2003 to Spring 2003

-Adriano Sun, Senior in Agricultural engineering with Food Science Minor, Fall 2003 to Fall 2004

-Jaime Yanez, advised the student as teaching assistant in FST303 Food Processing, Fall 2003

-Oriana Obiri, Senior in Chemical Engineering. Hosted the student as a summer intern in my lab. Summer 2003

-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", Fall 2003-Fall 2004.

-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", Fall 2003- Spring 2004. (students graduated in Spring 2004).

-Serving as faculty advisor of UI's Indian Students Association. Spring 2002-Present

Post Doctoral Fellows:

-Advised Yiqun Huang, Post-Doctoral Fellow, Department of Biosystems Engineering (Major Advisor Juming Tang), Washington State University to conduct research on determination of dynamic viscoelastic properties of gellan gel as a function of ion concentration. Hosted the Post-Doc in my lab, Jan 2003-Jul 2004

-Advised Caleb Nindo, Post-Doctoral Fellow, Department of Biosystems Engineering (Major Advisor: Juming Tang), Washington State University to conduct research on determination of flow properties of fruit juices. Hosted the Post-Doc in my lab, Jan 2003-Present

SCHOLARSHIP ACCOMPLISHMENTS:

Publications, Exhibitions, Performances, Recitals:

Peer-Reviewed/Evaluated: (journal articles, book chapters etc.)

1. **Takhar, P.S.**, Kulkarni, M. and Huber, K., (2006), Dynamic viscoelastic properties of pasta as a function of temperature and water content, Journal of Texture Studies, **37**: 696-710 (invited for publication in the special issue of JTS).

2. Nindo, C.I., J. Tang, J.R. Powers, and **Takhar, P.S.** (2007) Rheological properties of blueberry puree for processing applications. J. Food Science & Technology (LWT), 40 (2): 292-299.
3. Xing, H., **Takhar, P.S**., Helms, G. and He, B. (2007), "NMR imaging of continuous and intermittent drying of pasta. Journal of Food Engineering, 78: 61–68.
4. **Singh, P. P**., Maier, D. E., Cushman, J. H., Haghighi, K. and Corvalan, C. (2004a). "Effect of viscoelastic relaxation on moisture transport in foods. Part I: Solution of general transport equation." Journal of Mathematical Biology 49(1): 1-19.
5. **Singh, P. P.,** Maier, D. E., Cushman, J. H. and Campanella, O. (2004b). "Effect of viscoelastic relaxation on moisture transport in foods. Part II: Sorption and drying of soybeans." Journal of Mathematical Biology 49(1): 20-35.
6. Huang, Y., **Singh, P. P**., Tang, J. and Swanson, B. G. (2004). "Gelling Temperatures of High Acyl Gellan as Affected by Mono- and Di-Valent Cations with Dynamic Rheological Analysis." Carbohydrate Polymers 56: 27-33.
7. Nindo, C. I., Tang, J., Powers, J. R. and **Singh, P. P**. (2005). "Viscosity of blueberry and raspberry juices for processing applications." Journal of Food Engineering **69:** 343-350
8. Cushman, J. H., Bennethum, L. S. and **Singh, P. P.** (2004a). "Toward Rational Design of Drug Delivery Substrates: I. Mixture Theory For Two-Scale Biocompatible Polymers." Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal 2(2): 302-334.
9. Cushman, J. H., **Singh, P. P**. and Bennethum, L. S. (2004b). "Toward Rational Design of Drug Delivery Substrates: II. Mixture Theory For Three-Scale Biocompatible Polymers and a Computational Example." Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal 2(2): 335-357.
10. **Singh, P. P.** (2004). "Thermal Design of Heat Exchangers." Encyclopedia of Agricultural, Food, and Biological Engineering. Ed: D. R. Heldman, Marcel Dekker, NY. *(Invited Book Chapter*)
11. **Singh, P. P.,** Cushman, J. H., Bennethum, L. S. & Maier, D. E. (2003). Thermomechanics of swelling biopolymeric systems. Transport in Porous Media, 53(1): 1-24.
12. **Singh, P. P.,** Cushman, J. H. & Maier, D. E. (2003). Multiscale fluid transport theory for swelling biopolymers. Chemical Engineering Science, 58(11): 2409-2419.
13. **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 .
14. **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.
15. **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.
16. **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.
17. **Singh, P.P**., D.E. Maier, M. Okos, E. Cattanach and K. Trumble (1999). Effect of Physical Properties and Operating Parameters on Soybean Flaking, Journal of American Oil Chemists Society, 76(8): 981-987.
18. Hundal, J. and **Takhar, P.S.**, (2007), Dynamic viscoelastic properties and glass transition behavior of corn kernels, Submitted to International Journal of Food Properties (**In Press**).
19. Kaur, A., **Takhar, P.S.**, Smith, D., (2007), Fractional Differential Equations Based Modeling and Prediction of Microbial Survival Curves – Model Development and Parametric Analysis, Journal of Food Science (**Accepted**).
20. Kaur, A., **Takhar, P.S.**, Smith, D., Brashears, M. and Mann, J., (2007), Fractional Differential Equations Based Modeling and Prediction of Microbial Survival Curves – Model Development and Parametric Analysis, Journal of Food Science (**Accepted**).
21. Huang, Y., **Takhar, P.S.,** Tang, J. and Swanson, B.G. (2007), Flow Behaviors of High Acyl Gellan Aqueous Solutions as Affected by Temperature, Calcium and Gellan Concentrations, Submitted to International Journal of Food Engineering (**In Review**).

22. Kari, H., **Takhar, P.S.** and Smith, D.M. (2007), Predictive Modeling of *Salmonella* Species Inactivation in Ground Pork and Turkey During Cooking, Submitted to Journal of Food Protection, (**In Review**).

Presentations and Other Creative Activities:

Maintained website for the course FDSC3305 Principles of Food Engineering, FDSC 3305/5307, 2007. All lecture material were posted online.

Professional Meeting Papers, Conference Proceedings, Workshops, Showings, Recitals:

1. Maneerote, J., Noomhorm, A. and **Takhar, P.S.**, Optimizing Composition and Frying Parameters of Rice Crackers to Improve Physico-Chemical Properties and Reduce Oil Uptake, Published in The Proceedings of the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Salt Lake City, UT, Nov 3-9, Paper No. 92418.
2. Hundal, J. and **Takhar, P.S**., Multiscale Drying and Stress-Crack Formation in Corn Kernels, Published in The Proceedings of the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Salt Lake City, UT, Nov 3-9, Paper No., Paper No 92485.
3. Kaur, A. and **Takhar, P.S.**, Fractional Differential Equations Based Modeling Of Microbial Destruction In Meats, Published in The Proceedings of the 2007 Annual Meeting of American Institute of Chemical Engineers (AIChE), Salt Lake City, UT, Nov 3-9, Paper No. 92534.
4. Guibing, C., Campanella, O., Maier, D.E. and **Takhar, P.S.,** Modeling of moisture diffusivities for components of yellow–dent corn kernels, Published in the Proceedings of 2007 Annual Meeting of American Society of Agricultural and Biological Engineers (ASABE), Minneapolis, MN, Jun 17-20, Paper No. 076264.
5. **Takhar, P.S.** Honored Participant in FACE, faculty presentations organized by TLTC, Texas Tech. Contributed the article "Multiscale modeling of transport processes in biopolymers". Apr 2007.
6. Maneerote, J., Noomhorm, A. and **Takhar, P.S.**, 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, 2007.
7. **Takhar, P.S.,** Presented a paper entitled "Multiscale hybrid mixture theory based modeling of transport processes in biological systems" at the Texas Tech University's High Performance Computing Center's meeting, Spring, 2007.
8. **Takhar, P.S.,** 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, Asian Institute of Technology, Thailand, Dec 2006 (invited).
9. **Takhar, P.S.**, 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), Nantes, France, Sept 17-21, 2006, Paper No. 556.
10. Hundal, J. and **Takhar, P.S.**, 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), Nantes, France, Sept 17-21, 2006, Paper No. 602.
11. Kaur, A., **Takhar, P.S.** and Smith, D.M., 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), Nantes, France, Sept 17-21, 2006, Paper No. 1172.
12. **Takhar, P.S.**, (2006), Transport in the Vicinity of Glass-Transition, Published in online repository of NC-1023 multistate project at www.biotransport.net/NC136/, (6 pages).
13. **Takhar, P.S.** and Kulkarni, M. (2005), Computer Simulations on Multiscale Fluid Transport in

Foods, ASAE Paper No. 056114, Presented at ASAE International Meeting, Tampa, FL in July 2005.

14. Head, K.L., Hendrix, K.M., **Takhar, P.S**. and Smith, D.M. (2005), Predictive Modeling of *Salmonella* spp. Inactivation in Ground Turkey and Pork during Cooking, Presented at Annual IFT Meeting, New Orleans, LA in July 2005.
15. **Singh, P.P**. and Kulkarni, M., (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 2003, San Francisco, CA.
16. **Singh, P.P.,** Cushman, J.H. and Maier, D.E., (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 2001, Reno, NV.
17. Xing, H., **Singh, P. P**. and Helms, G., (2004) Using NMR imaging to investigate the role of glass transition on moisture profiles and crack initiation in foods. Presented at the Annual IFT Meeting held at Las Vegas, NV, Presentation No. 65-6.
18. Kulkarni, M. and **Singh, P.P**. (2004), Role of glass transition on stress crack initiation in foods during continuous and intermittent moisture transport processes. Presented at the Annual IFT Meeting held at Las Vegas, NV, Presentation No. 65-7.
19. Smith, D.M., Gurajala, M.M., **Singh, P.P**., and Hendrix, K.M. (2004) Predicting inactivation of Salmonella spp., Escherichia coli and Listeria monocytogenes in ground beef under nonisothermal cooking conditions. Presented at the Annual IFT Meeting held at Las Vegas, NV, Presentation No. 67E-21.
20. Huang, Y., **Singh, P.P**., Tang, J. and Swanson, B.G. (2004), Gelling temperatures of high acyl gellan as affected by monovalent and divalent cations. Presented at the Annual IFT Meeting held at Las Vegas, NV, Presentation No. 33A-21.
21. **Singh, P.P.,** Xing, H. and Helms, G. (2004), NMR Imaging of Moisture Transport During Drying of Pasta, *Presented at the Annual Pacific Northwest meeting of American Society of Agricultural Engineers* held at Baker City, OR, ASAE, 2950 Niles Rd., St. Joseph, Michigan 49085-9659.
22. **Singh, P.P**. and Kulkarni, M. (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* held at Baker City, OR, ASAE, 2950 Niles Rd., St. Joseph, Michigan 49085-9659.
23. **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
24. **Singh, P.P**. and Karina 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* held at Clarkston, WA, Paper No. PNW-03-101, ASAE, 2950 Niles Rd., St. Joseph, Michigan 49085-9659.
25. Xing, H. and **Singh, P.P.**, (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* held at Clarkston, WA, Paper No. PNW-03-102, ASAE, 2950 Niles Rd., St. Joseph, Michigan 49085-9659.
26. Cushman J.H. and **Singh, P.P.**, (2003). Swelling Biopolymers and Other Viscoelastic Media: Theory and Numerics. Presented at *Seventh SIAM Conference on Mathematical and Computational Issues in the Geosciences.* March 17-20, 2003, Austin, TX.
27. **Singh, P.P.** and Kulkarni, M. (2003). A Strategy to Minimize Cracking of Pasta During Sorption: Experiments and Computations, *Presented at the topical Conference of Food Engineers (CoFE) held during the annual meeting of AIChE, Nov 16-21*, San Francisco, CA.
28. **Singh, P.P.** (2003). Three-Scale Modeling and NMR Imaging of Moisture Profiles and Stress-Cracks in Foods During Drying, Presented during the annual meeting of USDA Sponsored NC-

136 multistate project October, 2003, Gainesville, FL.

29. **Singh, P.P.** (2002). Three-Scale Hybrid Mixture Theory Based Fluid and Species Transport in Biopolymers, Presented during the annual meeting of USDA Sponsored NC-136 multistate Project, Oct 2002, Columbus, OH.
30. **Singh, P.P.** and J.H. Cushman. (2002). Continuum Thermodynamics Based Multiscale Fluid and Species Transport Theory For Biopolymeric Materials. Presented at 2002 Annual Meeting of AIChE.
31. **Singh, P.P.**, Cushman, J.H. and Maier, D.E., (2001), Modeling of Liquid Transport In Biological Materials Using Hybrid Mixture Theory, Presented at the topical *Conference of Food Engineers (CoFE) held as part of the annual meeting of American Institute of Chemical Engineers*, Nov 2001, Reno, NV.
32. **Singh, P.P.,** Cushman, J.H. And Maier, D.E. (2001), Hybrid mixture theory approach to phase and species transport in swelling biopolymeric systems, Presented at the annual meeting of ASAE, Sacramento, CA, Jul-Aug 2001. ASAE Paper No 01-3022.
33. **Singh, P.P.** and J.H. Cushman. (2001). Controlled Release of Drugs From Swelling Biopolymers, P*resented at the Sixth SIAM Conference on Mathematical and Computational Issues in the Geosciences*, SIAM, 3600 University City Science Center, Philadelphia, Pennsylvania.
34. **Singh, P.P.**, D.E. Maier, M. Okos, E. Cattanach and K. Trumble. (1998). The Effect of Physical Properties and Operating Parameters on Soybean Flaking, *Presented at the 1998 Annual International Meeting of ASAE,* Paper No. 98-6008. ASAE, 2950 Niles Rd., St. Joseph, Michigan 49085-9659.
35. Yan Y., **Singh, P.P.**, Maier.D.E. and Stroshine, R. (1998). Thermal and Physical Properties of Soybean Bars, P*resented at the 1998 Annual International Meeting of ASAE,* Paper No. 98-6007, ASAE, St. Joseph, Michigan.
36. **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 1997Annual International Meeting of ASAE,* Paper No. 97-6009, ASAE, St. Joseph, Michigan.

<u>Funded</u> Grants and Contracts:

USDA-CSREES

1. Brashears, M., Alvarado, C., Blanton, J., Brooks, C., **Takhar, P.S.**, Miller, M. , Pond, K., Thompson, L.D., Hoover, (2006), International Center for Food Industry Excellence, USDA-CSREES, $1.7 million.
2. **Singh, P.P.** A multiscale approach towards prediction of stress-cracking in corn kernels. USDA-NRICGP, Sept 2003 to Aug 2006, **$223000.** *(Proposal ranked among the top few proposals submitted to the Food Quality Section, Funded on 1st submission)*.
3. Huber, K. and **Singh P.P.**, Enhanced Rheological Characterization of Starch-Based Materials using the Starch Pasting Cell, USDA-NRICGP, Sept 2004-Sept 2005, **$12950**.
4. Huber K., McDonald, A. and **Singh, P.P.**, Simultaneous microstructural and calorimetric characterization of food and biomaterials using thermal microscopy, USDA-NRICGP, **$25000,** Sept 2003 to Dec 2003. *(Proposal ranked among the top few proposals submitted to the Food Quality Section).*

U.S. Poultry and Egg Association

1. Alvarado, C., Brashears, M., **Takhar, P.S.**, McKee J. (2006), Control of *Listeria monocytogenes* on Contact and Non- Contact Surfaces by Electrostatic Spraying of Sanitizers, US Poultry and Egg Association, $36000.

BOYSCAST-India

1. Sodhi, N.S. and **Takhar, P.S.** (2006), NMR Imaging and Computer Simulations on Moisture Transport in Foods, BOYSCAST-India, ~$28000.

Murdock Foundation

1. McDonald, A., Huber, K., **Singh, P.P.,** Aston, E. and He, B. Murdock Foundation Grant for acquiring a twin-screw extruder, **$235,000**, Mar 2005 to Mar 2006.

Idaho Potato Commission

2. **Singh, P.P.** Texture analysis of Idaho potato varieties using dynamic mechanical thermal analyzer. Idaho Potato Commission. Jul 2003-Jun 2004, $3000.

NSF-REU

3. **Singh, P.P.**, 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.

NSF-EPSCoR

4. **Singh, P.P.**, Faculty startup augmentation grant, NSF-EPSCoR, Apr 2003-Dec 2003, $10,000**.**
5. McDonald, A., Huber, K. and **Singh, P.P.**, Equipment grant for the small laboratory molder, NSF-EPSCoR, Aug 2003, $5500.
6. **Singh, P.P.**, Faculty startup augmentation grant, NSF-EPSCoR, Aug 2002-Dec 2002, $32000.
7. **Singh, P.P.**, Instrumentation grant, NSF-EPSCoR, Aug 2002-Dec 2002, $4000.
8. **Singh, P.P.,** Travel grant for presenting a research paper at 2003 Annual Meeting of AIChE. NSF- EPSCoR, $900.

UI Research Council

9. **Singh, P.P,** Smith, D.M., Modeling of microbial kinetics in meats using fractional differential equations, UI Research Council, $8926.7, June 2004-June 2005
10. **Singh, P.P.,** Predicting textural changes in potatoes during drying. University of Idaho Research council, Jul 2003-Jul 2004, $8590.
11. **Singh, P.P.**, Effect of drying conditions and chemical composition of pasta (semolina) on stress crack development. University of Idaho Research Council, Jul 2002-Jul 2003, $8997.

Washington State University Educational Grant

12. Clark, S., McCurdy, A., Swanson, B., Powers, J.R., **Smith, D., Yüksel, G.Ü., Huber, K.**, **Singh, P.P.**, Brown, R.G. and Deuben, B. 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.

Pending Grants

Developed and submitted the following proposals, which are currently pending:

1. **Takhar, P.S.**, Ganjyal, G. and Hanna, M. Multiscale Transport in Expanding Biopolymers During Extrusion: Modeling and Experimental Verification, National Science Foundation, 2007, $316,316
2. **Takhar, P.S.**, Brashears, M., Lyte, M., Holaday, S. and Karunasena, E., Environmental Stresses and Host Pathogen Interactions Affecting Permissivity of Spinach to Bacterial Infections, 2007, $399,432
3. Smith, P., HPCC Team, **Takhar, P.S.**, CI-TEAM Demonstration Project: Southern US Collaboration for Cyber infrastructure Enhancement and Educational Development (SUCCEED) Regional Training Program, Participated as senior collaborator of this multi-departmental team proposal, National Science Foundation, 2007, $249957, (**Pending**)

Proposal Written During Graduate Studies

I was successful in generating funding for my entire doctoral research by writing the major portions of the following proposals:

1. Viscoelastic properties of soybeans, Central Soya Co. Inc., $24001. My approximate contribution to the proposal: 90%. (PD, Maier, D.E.)
2. Prediction of thermomechanical stresses during drying, Central Soya Co. Inc. $25060. My approximate contribution to the proposal: 90%. (PD, Maier, D.E.)
3. Modeling of transport mechanisms and thermomechanical stresses during processing of foods, Midwest Advanced Food Manufacturing Alliance. $70347. My approximate contribution to the proposal: 60%. (PD, Campanella, O.)

Multistate Project Participation

1. **Singh, P.P.,** Participated in the Proposal rewrite process for USDA Sponsored-NC-136 project. 2004. Participated in NC-136's proposal rewrite process. Contributed to proposal sections on modeling of thermal and transport processes, and extrusion modeling.
2. **Singh, P.P.,** Improvement of thermal and alternative processes for foods, Idaho Station Representative in USDA-Sponsored NC-136 Multistate Project, Aug 2002-Present.
3. Smith, D.M. and **Singh, P.P.,** Enhancing Food Safety Through Control of Food-borne Disease Agents, Idaho Station Participant in USDA Sponsored S-295 Multistate Project. (Station representative D. Smith).

Hatch Projects

1. **Singh, P.P.**, Modeling of stress-cracking in foods and biomaterials using hybrid mixture theory and experimental verification, USDA-CSREES (Hatch project), Aug 2002-June 2007, $4000.
2. Smith, D.M., **Singh, P.P** . Verification of thermal processing adequacy in meat products, *USDA-CSREES (Hatch project),* Aug 2003-Jun2008, $4000.

SERVICE:

Major Committee Assignments: (National, State, District, County, University, College, Departmental and dates)

-USDA Sponsored Food Engineering Group NC1023's representative for Texas Tech University, 2006-Present

-USDA Sponsored NC-136, Idaho Station Representative, Multistate project to work on project's objectives A, C and D, October 2002-Oct 2005

-USDA Sponsored NC-136 project's ad-hoc committee on "Online compilation of food process engineering teaching and research tools", October 2002-Present

-USDA Sponsored S-295 Multistate project, Idaho Station Participant working on Mathematical Modeling of Microbial Destruction, Spring 2004-Present

-USDA task force to review proposals on allowable ingredients in organic farming (The National Organic standards Board). Managed by Virginia Tech's Center for Food and Nutrition Policy in Alexandria, Virginia, June-August 2002

-Cool-season crops review committee for USDA regional project proposals, April 2002

-USDA-CSREES, ad-hoc committee to review proposals submitted to the National Research Initiative (NRI) competitive grants program under the category Food Characterization/ Process/Product Development, Reviewed three proposals from 2002 to 2004.

University and College

College/Departmental Service

At Texas Tech

-Member of CASNR, Texas Tech University's International Activities Committee, 2006 to Present

-Member of Ag Awareness Committee, College of Agricultural Science and Natural Resources, Fall 2006.

-Serving as Department of Animal and Food Sciences' Network Support Coordinator..

-Guided the graduate student, Kusuma Saicharan for updating the departmental website according to the new CASNR format. The new website was launched in December 2006.

-Honored Participant in FACE, faculty presentations organized by TLTC, Texas Tech. Contributed the article "Multiscale modeling of transport processes in biopolymers".

At University of Idaho

-University of Idaho, Committee member of College of Agriculture and Life Sciences Student Awards. Participated in Committee's activities on selection of outstanding students for various awards. Spring 2004.

-Participated in Dr. Kerry Huber's Promotion and Tenure Committee, Department of Food Science and Toxicology, University of Idaho, Fall 2003

-Served on UI's Graduate Students Research Exhibition Award Committee, University of

Idaho, April 2003
-Chaired the Research Support Scientist & Scientific Aide Sr. Search Committee, Department of Food Science and Toxicology, University of Idaho, Jan 2003 to May 2003
-Participated in the departmental curriculum review activity to obtain the curriculum approval from IFT. Developed documentation for approval of the material covered in the course FST 303 Food Processing, Fall 2002

Membership of Professional and Scholarly Organizations

-American Institute of Chemical Engineers
-American Society of Agricultural Engineers
-Participant in Society's Manuscript Review Service
-American Association for Advancement of Science
-Institute of Food Technologists
-Member of IFT's Food Engineering Division
-Member of IFT's Intermountain Section
-Nominated for IFT-Food Engineering Division's Member-At-Large, Spring 2005

Scientific Meeting Moderation

-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.
-Moderator of Food Engineering divisions's technical session at Annual IFT Meeting, New Orleans, LA, July 2005

Manuscript and Proposal Review Service:

– Served as reviewer of two porous-media papers submitted to Journal of Food Engineering, Aug-Dec 2007
-Reviewed 1 proposal submitted to USDA-SBIR division, Feb 2007.
-Reviewed 14 papers submitted to IFT Food Engineering division for the student paper competition, Feb 2007
-Reviewed two proposals for USDA-NRICGP's Food Quality division as an ad-hoc reviewer, Spring 2005
-Reviewed 1 manuscript for Transactions of ASAE's Food Engineering Division, Nov 2004-Jan 2005
-Reviewed 1 manuscript submitted to Encyclopedia of Agricultural, Food and Biological Engineering, Nov 2004
-Reviewed one proposal submitted to USDA-NRICGP in the Division of Food Characterization/Process/Product Research, Spring, 2004
-Reviewed one proposal submitted to National Science Foundation's Office of International Science and Engineering, (OISE), Summer 2004
-Reviewed two proposals submitted to USDA-NRICGP in the Division of Food Characterization/Process/Product Research, Spring 2003
-Journal of Food Processing and Preservation. Reviewed one manuscript, Nov 2002.
-Journal of Food Science. Reviewed 3 manuscripts, Apr-Dec 2003.
-Transactions of the ASAE. Reviewed 2 manuscripts, Sept-Dec 2003.
-Food Science and Technology International. Reviewed one manuscript, Sept-Nov 2003.

Outreach Service:

-Collaborator of MGP Ingredients, KS for developing improved starch based products
Advised Japan Canners Association on sensor placement and data analysis for aseptic tanks and tubes carrying non-Newtonian fluid foods. Spring to Summer 2004.
-Advising 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-Present.
-Advising Medallion Foods, WA to minimize stress crack development in pasta during drying, storage and shipping, and conditioning of pasta under controlled conditions. Apr 2003-Present.
-Performed statistical analysis of data for West Farm Foods, Idaho to help the company calibrate their milk drying operation, April 2002.

PROFESSIONAL DEVELOPMENT:

Food Science Courses Taken at University of Idaho

To enhance my knowledge in Food Science, I have audited the following courses at University of Idaho:

a. MMBB 380, Introductory Biochemistry, (3 credits), Summer 2004
b. FST 504 (Special Topics), Carbohydrate Chemistry: Starch and Hydrocolloids (1 credit), Jan-Feb 2004
c. FST 504 (Special Topics), Protein Functionality, (1 credit), Mar 22-Apr 30, 2005.

Teaching

1. Obtained Maple Mathematical Software Online training. Introduction to Maple and Role of Maple in Engineering Design, Apr 2007. Utilized the software for teaching food engineering principles to FDSC 3305/5307 students.
2. Advising Workshop held by Office of the Vice Provost for Academic Affairs, University of Idaho, March 26, 2002
3. Teaching Workshop, UC Davis, California, September 2002
4. Attended three days intensive workshop on basics of teaching. Organized by Center of Instructional Excellence, Purdue University, Jan 2001
5. Attended workshop on role of humor in teaching, Organized by Center of Instructional Excellence, Purdue University, Feb 2001

Scholarship:

1. Attended workshop entitled "Writing Winning Grants" by David Morrison, Texas Tech University, Apr 11, 2008
2. Attended Comsol Multiphysics two day training to use the package for Finite Element simulation of food engineering transport problems. Houston, TX, Mar 2007.
3. Completed TTU-EEO Non-Discrimination training, Feb 27, 2007.
4. Attended NSF grants roundtable organized by Office of Research Services, Spring 2007.
5. Attended Office of Research Services' grant application training, Spring 2007.
6. Attending training entitled "How to deal with difficult people" organized by Employee Assistance Program, Texas Tech University, Oct 25, 2005.
7. Attended various online training sessions of Maple Symbolic Manipulations package, by Waterloo Maple, Summer 2007.
8. Attended several symposia on modeling in biological systems during Annual Meeting of Society of Mathematical Biology, Jul 2004, University of Michigan, Ann Arbor, MI
9. Attended symposia on nanotechnology and heat transfer during annual meeting of IFT, Las Vegas, NV, July 2004
10. Attended workshop on research and funding opportunities in nanotechnology applications in foods, held during 2003 annual meeting of American Institute of Chemical Engineering, San Francisco, CA, Nov 2003
11. BRIN (Biomedical Research Infrastructure Network) Grant Writing Workshop entitle "How to write award-winning NIH Grants" by S.W. Russel, Moscow, Idaho, August 12-13, 2002
12. USDA-CSREES Grant Writing Workshop Roseville, Minnesota, September 2002
13. SAS Workshop on statistical analysis, College of Agriculture, University of Idaho, April 25, 2002.
14. Attended workshop on pursuing an academic career, Organized by Center of Instructional Excellence, Purdue University, March 2001