

## Sushil K. Singh, Ph.D.

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### Employment History

- 05/2018 – ..... **Assistant Professor.** Department of Food Process Engineering, NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA, Odisha, India.
- 04/2018 – 05/2018 **Research Assistant.** Department of Dairy & Food Science, SOUTH DAKOTA STATE UNIVERSITY, Brookings, South Dakota, USA.
- 01/2017 – 03/2018 **Food Engineering Technologist.** Department of Dairy & Food Science, SOUTH DAKOTA STATE UNIVERSITY, Brookings, South Dakota, USA.
- 08/2015 – 01/2017 **Process & Product Development Associate.** VETS PLUS, INC., Menomonie, Wisconsin, USA.
- 09/2011 – 12/2011 **Senior Research Fellow.** Department of Post Harvest Process & Food Engineering, G.B. PANT UNIVERSITY OF AGRICULTURE & TECHNOLOGY, Pantnagar, Uttarakhand, India.

### Education

- 01/2012 – 05/2016 **Ph.D., South Dakota State University, Brookings, USA** in Agricultural, Biosystems & Mechanical Engineering.  
Specialization: *Food Process Engineering.*
- 07/2009 – 06/2011 **M.Tech., Indian Institute of Technology Kharagpur, India** in Agricultural & Food Engineering.  
Specialization: *Post Harvest Engineering.*
- 07/2005 – 06/2009 **B.Tech., G.B. Pant University of Agriculture & Technology, Pantnagar, India** in Agricultural Engineering.

### Grants

- “Development of a method to identify different varieties of areca nut (whole and broken) and value addition of its particles through extrusion process” (2023). **M/S Dharampal Satyapal Ltd. (DS Group)**, NOIDA, U.P. – Ongoing  
**Principal Consultant:** Dr. Sushil K. Singh
- “Development of Low Cost All-in-One Millet Processing Machine” (2020). **Department of Science & Technology (DST)**, Government of India – Completed  
**Co-Principal Investigator:** Dr. Sushil K. Singh

## Grants (continued)

- “Encapsulation of Bioactive Compound through Extrusion Process to Develop Ready-to-Eat Functional Snacks” (2019). **Science and Engineering Research Board (SERB)**, Department of Science and Technology, Government of India – Completed  
**Principal Investigator:** Dr. Sushil K. Singh
  
- “Texture and Rheology of Food Materials” (2023). **VRITIKA - Science and Engineering Research Board (SERB)**, Department of Science and Technology, Government of India – Completed  
**Principal Co-ordinator:** Dr. Sushil K. Singh
  
- “Extrusion of Plant-Based Food” (2023). **VRITIKA - Science and Engineering Research Board (SERB)**, Department of Science and Technology, Government of India – Ongoing  
**Principal Co-ordinator:** Dr. Sushil K. Singh

## Courses Taught

- Theory** ■ Transfer Processes in Food Engineering  
 Food Process Modeling and Simulation  
 Dairy Process Engineering  
 Experimental Design and Statistical Methods  
 Horticultural Product Processing
- Labs** ■ Advanced Food Engineering Laboratory  
 Experimental Design and Statistical Methods Laboratory

## Mentoring & Supervision Experience

### ■ As a Supervisor:

Status	Ph.D. Students	M.Tech. Students	B.Tech. Students
Ongoing	03	02	02
Completed	01	03	07





### ■ As a Co-Supervisor:

Status	Ph.D. Students	M.Tech. Students	B.Tech. Students
Ongoing	02	–	–
Completed	–	–	–



## Technical Skills

- Equipment handled** ■ Membrane Filtration Units (MF, UF, NF & RO), Evaporator, Heat Exchangers, Spray Dryer, Homogenizer, Centrifugal Separator, Hydrodynamic Cavitator, Single & Twin-Screw Extruder.
- Instrument handled** ■ Texture Analyzer, Rheometer.
- Computer skills** ■ MS Office, Design-Expert® v11, ANSYS® Workbench 15.0, SolidWorks and SPSS.

## Awards and Achievements

- 2011  **ICAR International Fellowship 2011-12** – Indian Council of Agricultural Research, New Delhi, India.
- 2010  **Deutscher Akademischer Austausch Dienst (DAAD) Fellowship** – Bonn, Germany.
- 2009  **GATE Fellowship** – IIT Kharagpur, India.
- 2005  **National Talent Scholarship** – Indian Council of Agricultural Research, New Delhi, India

## Professional Involvement

- Judge**  2017 Clean Tech Competition, USA  
2018 Research Scholar's Week, NIT Rourkela, India
- Reviewer**  Journal of Food Process Engineering  
Journal of the Science of Food and Agriculture  
Journal of Food Processing and Preservation  
Journal of Food Science & Technology  
Animal Feed Science and Technology  
Journal of Food Processing and Technology  
Ultrasonics Sonochemistry  
Food Science & Nutrition  
Process Biochemistry  
Journal of Food Research  
IFT'16, IFT'17 & IFT'20 Technical Research Presentations and Scientific & Applied Sessions.

## Professional Memberships

-  Institute of Food Technologists (IFT)
-  American Society of Agricultural & Biological Engineers (ASABE)
-  Association of Food Scientists & Technologists, India (AFSTI) - Life Member
-  Indian Society of Agricultural Engineers (ISAE) - Life Member
-  Institution of Engineers (India) - Life Member

## Research Publications

### Journal Articles

- 1 Dash, D. R., **Singh, S. K.** & Singha, P. (2024). Viscoelastic behavior, gelation properties and structural characterization of deccan hemp seed (*Hibiscus cannabinus*) protein: Influence of protein and ionic concentrations, pH, and temperature. *International Journal of Biological Macromolecules*, 130120. doi:10.1016/j.ijbiomac.2024.130120
- 2 Goyal, R., Singha, P. & **Singh, S. K.** (2024). Spectroscopic food adulteration detection using machine learning: Current challenges and future prospects. *Trends in Food Science & Technology*, 104377. doi:10.1016/j.tifs.2024.104377

- 3 Pavani, M., Singha, P., Rajamanickam, D. T. & **Singh, S. K.** (2024). Impact of extrusion processing on bioactive compound enriched plant-based extrudates: A comprehensive study and optimization using RSM and ANN-GA. *Future Foods*, 9, 100286. doi:10.1016/j.fufo.2023.100286
- 4 Pavani, M., Singha, P. & **Singh, S. K.** (2024). Effect of pH and Biopolymer Ratio on Phase Behavior, Rheology and Structural Characteristics of Pea Protein Isolate-Locust Bean Gum Coacervates. *JSFA Reports*. doi:10.1002/jsf2.187
- 5 Rostamabadi, H., Nowacka, M., Kumar, Y., Xu, S., Colussi, R., **Singh, S. K.**, ... Falsafi, S. R. (2024). Green modification techniques: Sustainable approaches to induce novel physico-chemical and technofunctional attributes in legume starches. *Trends in Food Science & Technology*, 104389. doi:10.1016/j.tifs.2024.104389
- 6 Asaithambi, N., Singha, P. & **Singh, S. K.** (2023a). Influence of hydrodynamic cavitation on functional, nutritional, and structural characteristics of egg-white protein hydrolysates. *Food Hydrocolloids for Health*, 4, 100153. doi:10.1016/j.fhfh.2023.100153
- 7 Asaithambi, N., Singha, P. & **Singh, S. K.** (2023b). Recent application of protein hydrolysates in food texture modification. *Critical Reviews in Food Science and Nutrition*, 63(30), 10412–10443. doi:10.1080/10408398.2022.2081665
- 8 Pavani, M., Singha, P., Rajamanickam, D. T. & **Singh, S. K.** (2023). Application of fuzzy logic techniques for sensory evaluation of plant-based extrudates fortified with bioactive compounds. *Exploration of Foods and Foodomics*, 1, 272–287. doi:10.37349/eff.2023.00021
- 9 Rostamabadi, H., Nowacka, M., Colussi, R., Frasson, S. F., Demirkesen, I., **Singh, S. K.**, ... Falsafi, S. R. (2023). Impact of emerging non-thermal processing treatments on major food macromolecules: Starch, protein, and lipid. *Trends in Food Science & Technology*, 141, 104208. doi:10.1016/j.tifs.2023.104208
- 10 Shekhar, S., Prakash, P., Shekhar, S., **Singh, S. K.** & Prasad, K. (2023). Ultrasound-assisted green synthesis of silver nanoparticles from *Allium sativum*, its characterization, antimicrobial capabilities and thermo-plasmonic studies. *Journal of Physics: Conference Series*, 2663, 012020. doi:10.1088/1742-6596/2663/1/012020
- 11 Shekhar, S., Prakash, P., Singha, P., Prasad, K. & **Singh, S. K.** (2023). Modeling and optimization of ultrasound-assisted extraction of bioactive compounds from *Allium sativum* leaves using response surface methodology and artificial neural network coupled with genetic algorithm. *Foods*, 12(9), 1925. doi:10.3390/foods12091925
- 12 Asaithambi, N., Singha, P. & **Singh, S. K.** (2022a). Comparison of the effect of different desugarization techniques on the functionality of egg white protein hydrolysates. *Applied Food Research*, 2(2), 100152. doi:10.1016/j.afres.2022.100152
- 13 Asaithambi, N., Singha, P. & **Singh, S. K.** (2022b). Comparison of the effect of hydrodynamic and acoustic cavitations on functional, rheological and structural properties of egg white proteins. *Innovative Food Science & Emerging Technologies*, 82, 103166. doi:10.1016/j.ifset.2022.103166
- 14 Barbhuiya, R. I., Singha, P., Asaithambi, N. & **Singh, S. K.** (2022). Ultrasound-assisted rapid biological synthesis and characterization of silver nanoparticles using pomelo peel waste. *Food Chemistry*. 385, 132602. doi:10.1016/j.foodchem.2022.132602
- 15 Dash, D. R., **Singh, S. K.** & Singha, P. (2022). Recent advances on the impact of novel non-thermal technologies on structure and functionality of plant proteins: A comprehensive review. *Critical Reviews in Food Science and Nutrition*. doi:10.1080/10408398.2022.2130161

- 16 Pavani, M., Singha, P., Dash, D. R., Asaithambi, N. & **Singh, S. K.** (2022). Novel encapsulation approaches for phytosterols and their importance in food products: A review. *Journal of Food Process Engineering*, 45(8), e14041. doi:10.1111/jfpe.14041
- 17 Pavani, M., Singha, P. & **Singh, S. K.** (2022). Development of phytosterol enriched functional edible oils: Study of physical, chemical, thermal and structural properties. *Journal of Scientific & Industrial Research*. 81(5), 549–560. doi:10.56042/jsir.v81i05.59585
- 18 Asaithambi, N., Pandiselvam, R., Prasath, V. A., **Singh, S. K.**, Gul, K. & Kothakota, A. (2021). Application of cold plasma and ozone technology for decontamination of *Escherichia coli* in foods-a review. *Food Control*. 130, 108338. doi:10.1016/j.foodcont.2021.108338
- 19 Asaithambi, N., **Singh, S. K.** & Singha, P. (2021). Current status of non-thermal processing of probiotic foods: A review. *Journal of Food Engineering*. 303, 110567. doi:10.1016/j.jfoodeng.2021.110567
- 20 Barbhuiya, R. I., Singha, P. & **Singh, S. K.** (2021). A comprehensive review on impact of non-thermal processing on the structural changes of food components. *Food Research International*. 149, 110647. doi:10.1016/j.foodres.2021.110647
- 21 Nath, D., Barbhuiya, R. I., **Singh, S. K.** & Dwivedi, M. (2021). Rheological properties of Indian coffee plum (*Flacourtia Jangomas*) pulp in steady and dynamic shear at different temperatures. *International Journal of Fruit Science*. 21(1), 95–105. doi:10.1080/15538362.2020.1859042
- 22 Pradhan, D., Hoque, M., **Singh, S. K.** & Dwivedi, M. (2021). Application of D-Optimal Mixture Design and Artificial Neural Network in Optimizing the Composition of Flours for Preparation of Gluten-Free Bread: Optimization of ingredient for preparation of gluten free bread. *Journal of Microbiology, Biotechnology and Food Sciences*. e3294. doi:10.15414/jmbfs.3294
- 23 Barbhuiya, R. I., Nath, D., **Singh, S. K.** & Dwivedi, M. (2020). Mass Modeling of Indian Coffee Plum (*Flacourtia Jangomas*) Fruit with its Physicochemical Properties. *International Journal of Fruit Science*. 20(sup3), S1110–S1133. doi:10.1080/15538362.2020.1775161
- 24 Asaithambi, N., Singha, P., Dwivedi, M. & **Singh, S. K.** (2019). Hydrodynamic cavitation and its application in food and beverage industry: A review. *Journal of Food Process Engineering*. 42(5), e13144. doi:10.1111/jfpe.13144
- 25 Jerome, R. E., **Singh, S. K.** & Dwivedi, M. (2019). Process analytical technology for bakery industry: A review. *Journal of Food Process Engineering*. 42(5), e13143. doi:10.1111/jfpe.13143
- 26 Rifna, E. J., **Singh, S. K.**, Chakraborty, S. & Dwivedi, M. (2019). Effect of thermal and non-thermal techniques for microbial safety in food powder: Recent advances. *Food Research International*. 126. doi:10.1016/j.foodres.2019.108654
- 27 **Singh, S. K.**, Singha, P. & Muthukumarappan, K. (2019a). Modeling and optimizing the effect of extrusion processing parameters on nutritional properties of soy white flakes- based extrudates using response surface methodology. *Animal Feed Science and Technology*. 254. doi:10.1016/j.anifeedsci.2019.06.001
- 28 Singha, P., **Singh, S. K.** & Muthukumarappan, K. (2019). Textural and structural characterization of extrudates from apple pomace, defatted soy flour and corn grits. *Journal of Food Process Engineering*. 42(4), e13046. doi:10.1111/jfpe.13046
- 29 Singha, P., **Singh, S. K.**, Muthukumarappan, K. & Krishnan, P. (2018a). Physicochemical and nutritional properties of extrudates from food grade distiller's dried grains, garbanzo flour and corn grits. *Food Science & Nutrition*, 6(7), 1914–1926. doi:10.1002/fsn3.769

- 30 **Singh, S. K.** & Muthukumarappan, K. (2017a). A viscosity model for soy white flakes- based aquafeed dough in a single screw extruder. *Journal of Food Process Engineering*, 40(2), e12357. doi:10.1111/jfpe.12357
- 31 **Singh, S. K.** & Muthukumarappan, K. (2017b). Rheological characterization and CFD simulation of soy white flakes based dough in a single screw extruder. *Journal of Food Process Engineering*, 40(2), e12368. doi:10.1111/jfpe.12368
- 32 **Singh, S. K.** & Muthukumarappan, K. (2016). Effect of feed moisture, extrusion temperature and screw speed on properties of soy white flakes based aquafeed: A response surface analysis. *Journal of the Science of Food and Agriculture*, 96(6), 2220–2229. doi:10.1002/jsfa.7339
- 33 **Singh, S. K.** & Muthukumarappan, K. (2014b). Effect of different extrusion processing parameters on physical properties of soy white flakes and high protein distillers dried grains-based extruded aquafeeds. *Journal of Food Research*, 3(6), 107–123. doi:10.5539/jfr.v3n6p107
- 34 **Singh, S. K.** & Muthukumarappan, K. (2014d). Single screw extrusion processing of soy white flakes based catla feed. *Journal of Food Research*, 4(1), 1–9. doi:10.5539/jfr.v4n1p1

### Books and Chapters

- 1 Barbhuiya, R. I., Singha, P. & **Singh, S. K.** (2023). Positive Displacement Pumps. In S. M. Jafari & N. Malekjani (Eds.), *Transporting Operations of Food Materials Within Food Factories: Unit Operations and Processing Equipment in the Food Industry* (pp. 201–217). doi:10.1016/B978-0-12-818585-8.00010-6
- 2 Barbhuiya, R. I., **Singh, S. K.** & Singha, P. (2022). Mangosteen Wastes: Chemistry, Processing, and Utilization. In K. Muzaffar, S. A. Sofi & S. A. Mir (Eds.), *Handbook of Fruit Wastes and By-Products* (pp. 113–124). doi:10.1201/9781003164463-8
- 3 Barbhuiya, R. I., Singha, P. & **Singh, S. K.** (2022). Pomelo Wastes: Chemistry, Processing, and Utilization. In K. Muzaffar, S. A. Sofi & S. A. Mir (Eds.), *Handbook of Fruit Wastes and By-Products* (pp. 19–38). doi:10.1201/9781003164463-2
- 4 **Singh, S. K.**, Rajpurohit, B. & Singha, P. (2021). Camelina (*Camelina sativa*) seed. In B. Tanwar & A. Goyal (Eds.), *Oilseeds: Health Attributes and Food Applications* (pp. 455–471). doi:10.1007/978-981-15-4194-0\_18

### Conference Presentations

- 1 Dash, D. R., **Singh, S. K.** & Singha, P. (2023). Extraction and characterization of protein from novel plant-based sources. In *29th ICFoST, Indian Convention of Food Scientists and Technologists*, Thiruvananthapuram, Kerala, India, January 05-07.
- 2 Asaithambi, N., Singha, P. & **Singh, S. K.** (2022c). Effect of desugarization on functional, antioxidant properties and in-vitro digestion of egg-white protein hydrolysates. In *3rd International Conference on Bioprocess for Sustainable Environment & Energy (ICBSEE-2022)*, NIT Rourkela, India, June 20-24.
- 3 **Singh, S. K.** & Dwivedi, M. (2019). Development of online quality control of fermentation process during leaving of dough using FT-NIR and E-Nose. In *ASABE Annual International Meeting*, Boston, MA, USA, July 7-10.
- 4 **Singh, S. K.**, Singha, P. & Dwivedi, M. (2019). Evaluation of extrudates from sorghum -grape pomace blends by extrusion processing. In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.

- 5 **Singh, S. K.**, Singha, P. & Muthukumarappan, K. (2019b). Viscosity modeling of aquafeed dough in a single screw extruder. In *ASABE Annual International Meeting*, Boston, MA, USA, July 7-10.
- 6 Singha, P., **Singh, S. K.**, Muthukumarappan, K. & Krishnan, P. (2019). Textural properties and sensory study of garbanzo and corn-based extrudates containing food grade distiller's dried grains. In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 2-5.
- 7 **Singh, S. K.** & Singha, P. (2018). Role of extrusion processing conditions on the properties of soy and corn-based extruded products. In *4th NDSU Annual Conference on Food for Health*, Fargo, ND, USA, July 8-11.
- 8 Singha, P., **Singh, S. K.**, Muthukumarappan, K. & Krishnan, P. (2018b). Study on the properties of corn grits-based extruded snacks fortified with garbanzo and distiller's dried grains. In *4th NDSU Annual Conference on Food for Health*, Fargo, ND, USA, July 8-11.
- 9 **Singh, S. K.** & Muthukumarappan, K. (2015a). Computational fluid dynamic simulation of soy white flakes based extrudates. In *IFT Annual Meeting & Food Expo*, Chicago, IL, USA, July 11-14.
- 10 **Singh, S. K.** & Muthukumarappan, K. (2015b). Computational fluid dynamics simulation of the soy white flakes based aquafeed dough in a single screw extruder. In *ASABE North Central Intersectional Meeting*, Fargo, ND, USA, April 10-11.
- 11 **Singh, S. K.**, Emin, M. A., Srivastav, P. P. & Muthukumarappan, K. (2014). Dispersion of triglycerides into plasticized starch matrices via extrusion process. In *IFT Annual Meeting & Food Expo*, New Orleans, LA, USA, June 21-24.
- 12 **Singh, S. K.** & Muthukumarappan, K. (2014a). Effect of die nozzle dimensions on physical properties of high protein distillers dried grains and soy white flakes-based extruded aquafeeds. In *Conference of Food Engineering (CoFE)*, Omaha, NE, USA, April 7-9.
- 13 **Singh, S. K.** & Muthukumarappan, K. (2014c). Influence of soy white flakes content and extrusion process parameters on physical properties of aquafeed. In *ASABE/CSBE North Central Intersectional Meeting*, Brookings, SD, USA, March 28-29.
- 14 **Singh, S. K.** & Muthukumarappan, K. (2013). Single-screw extrusion processing of soy white flakes (SWF) and high protein distiller dried grains (HP-DDG). In *ASABE Annual International Meeting*, Kansas City, MO, USA, July 21-24.
- 15 **Singh, S. K.** & Muthukumarappan, K. (2012a). Extrusion Processing: Challenges and Opportunities. In *ASABE-CSBE Intersectional Meeting*, Fargo, ND, USA, March 30-31.
- 16 **Singh, S. K.** & Muthukumarappan, K. (2012b). Extrusion technology and its applications. In *Annual Meeting of Centre for Bioprocessing Research and Development*, Rapid City, SD, USA, March 8-9.