



Assoc. Prof. Dr. Tantawan Pirak

Faculty of Agro-Industry, Kasetsart University, Thailand

Qualifications:

- 2000 B.Sc. (Hons) Public Health (Food and Nutrition), Mahidol University, Thailand
- 2007 Ph.D. Food Technology, Chulalongkorn University, Thailand.

Current and Recent Positions:

- 2007-2012 Kasetsart University, Lecturer
- 2012-present Kasetsart University, Lecturer/Assistant Professor
- 2021-present Technical and Private Advisor for private company (part-time)

Research Interests:

- Meat, and poultry product development
- Functional food product development, esp. meat and poultry based products
- Meat protein and its interaction with hydrocolloids and other natural extracts.
- Applications of chitosan and other hydrocolloids (natural and modified form) as functional ingredients in meat and poultry products.
- Bioactive peptides, functional peptides and protein hydrolysates derived from meat and poultry (meat and by-products) and their applications as functional ingredients in food, especially meat products - BCG
- Interactions of chitosan and other hydrocolloids or natural extracts in food and meat products, and its antioxidant and antimicrobial activity
- Protein-polysaccharide interaction and complexation

Recent Funding:

- 2023 University Reinventing Programme from MAHESRI-OPS for KU on In vitro digestion of Thai herbs
- 2023 ITAP-KU Research grant in Developing of functional drink from Thai herbs
- 2023 Accelerator Bootcamp under KU-TAC and FI at KU
- 2022-2023 Research grant from National Research Council of Thailand and KU (Fundamental Fund) on In vitro digestion of cannabis leaves
- 2022-2023 Research grant from Thai OPS (Innovative Driven Entrepreneur, IDE grant) on Functional ingredient development for utilization in functional foods and drinks
- 2021-2022 Newton fund Institutional Links Research Grant in collaborations with Prof. Stephen Robert Euston, Heriot-Watt University, Edinburgh, Scotland funded by Thai OPS and British Council on Valorization of Thai seafood by-products (Thai-PI)
- 2021-2022 Research grant from ITAP and Private company on Development of high protein snack from Gourami fish meat (PI)
- 2019-2021 Research grant from ITAP and Private company on Development of value added products from Siamese crocodile by-products (PI)
- 2019-2021 Research grant from ITAP and Private company on Development of durian snack (PI)

- 2019-2020** SFC GCRF Network grant Technical, economic and environmental assessment of a biorefinery approach to valorising Thai seafood processing industry by-products: Bio-Valor- Seafood (Co-PI, partner country)
- 2019-2020** Research Grant from Thailand Food Innopolis on Development of high protein cube from chicken protein hydrolysate (PI)
- 2019-2020** Research Grant from Thailand Food Innopolis Development of high antioxidant shot drink (PI)
- 2019-2020** Research grant from ITAP and Private company on Development of low sugar syrup
- 2018-2019** Research grant from STI-RDC and Private company on Development of premium fish ball from seabass fish by-products
- 2018-2019** Research Grant from Thailand Food Innopolis on Development of low fat-high iron and fibre sausage
- 2017** Talent Mobility Research Grant from MUA, STI and Private company In development of high protein snack from surimi by-product
- 2015-2016** Private company funded project on flavoured peptides from chicken meat
- 2009-2010** Research grant from Thailand Research Fund for Young researcher scholarship on Development of allicin ingredients from garlic
- 2014-present** Ph.D. Scholarship from Thailand Research Fund and co-funding with Thailand Industry (RRI-TRF Ph.D.)
- 2014 Ph.D. Scholarship from Thailand Research Fund and Private company: In collaboration with Prof. Shai Barbut, University of Guelph, Canada: Application of non-thermal processing with hurdle techniques and formulation development for shelf-life extension, quality enhancement and nutritive value retention of prototype sausage product
 - 2015 Ph.D. Scholarship from Thailand Research Fund and Private company: In collaboration with Prof. Witoon Prinyawiwatkul, Louisiana State University, USA The Utilization of By Product from Dried Squid to Produce Functional - Flavored Peptide Ingredient in Nutritional Snack
 - 2016 Ph.D. Scholarship from Thailand Research Fund and Private company: In collaboration with Prof. Stephen R. Euston, Heriot-Watt University, UK Production of peptides and functional ingredients from by-products of chicken slaughterhouse (offal and bones) for supplementing in chicken meatball products concomitantly with the development of intelligent packaging of antimicrobial films from shrimp shells chitosan
 - 2018 Ph.D. Scholarship from Thailand Research Fund and Private company: In collaboration with Prof. Peter Wilde, Quadram Institute Bioscience, UK Development of White Mug wort and ground coffee spent extracts with anti-inflammatory and anticancer activities in vitro and simulated gut model for using as functional ingredient in functional drinks for elderly
 - 2021 Ph.D. Scholarship from National Research Council of Thailand and Private company: In collaboration with Prof. Peter Wilde, Quadram Institute Bioscience, UK Development of Coffee extract from organic cold brew coffee spent grounds and its utilization in functional products

Master Degree Scholarship from Thailand Research Fund and co-funding with Thailand Industry (TRF-MAG)

- 2009 Master Degree Scholarship from Thailand Research Fund and Nuevotec Co.Ltd. in Development of functional snack for dogs
- 2012 Obtained 2 Master Degree Scholarships from Thailand Research Fund and Private company
 1. Antihypertensive peptides derived from chicken breast meat (co-funding with Betagro Co.Ltd.)
 2. Development of healthy snack from squid byproducts (co-funding with T Thai Co.Ltd.)

Research grant from Kasetsart University Research and Development Institute

- 2008: Application of chitooligosaccharides as natural preservative in pork meat balls
- 2009: Application of chitooligosaccharide and transglutaminase in ready to cook chicken patty produced with mechanically deboned chicken meat (MDCM)
- 2010: Effects of utilization of chitosan-ginger extract mixture as antioxidant and antimicrobial in minced beef
- 2014 Effect of utilization of mucilage from Hoary basil seed as fiber and fat replacer in low fat Chinese pork sausage: A concomitant study with antimicrobial and antioxidant properties of Hoary basil leaf extracts

Research grant from Graduate School of Kasetsart University

- 2008: Development of healthy Chinese pork sausage
- 2010 Obtained 2 grants:
 1. Development of low fat beef salami with plant oil
 2. Development of functional fish ball enriched with beta- carotene in plant oil
- 2011: Extraction of Anthocyanin form Thai herb and its utilisation as nitrite substitutes in Thailand fermented pork (Nham)
- 2013: Extraction of Beta-carotene and Lutein from Gac fruits for using as functional ingredient in meat products

Recent publications

1. Chongsrimisirakhol, O. and Pirak, T. 2023. Polyphenol Release and Antioxidant Activity of the Encapsulated Antioxidant Crude Extract from Cold Brew Spent Coffee Grounds under Simulated Food Processes and an In Vitro Static Gastrointestinal Model. *Foods*. 12(5): 1000.
2. Udomwasinakun, N., Saha., S., Mulet-Cabero, A., Wilde, P.T. and Pirak, T. 2023. Assessment of Polyphenols Bioaccessibility, Stability, and Antioxidant Activity of White Mugwort (*Artemisia lactiflora* Wall.) during Static In Vitro Gastrointestinal Digestion. 12(5): 949.
3. Pramualkijja, T., Pirak, T., and Euston, S.R. 2022. Functional Properties of Egg White Protein and Whey Protein in the Presence of Bioactive Chicken Trachea Hydrolysate and Sodium Chloride. *Sustainability*. 14(24): 16782.
4. Udomwasinakun, N., Pirak, T., and Chanput, W.P. 2022. Identification of polyphenols in white mugwort (*Artemisia lactiflora* Wall.) ethanolic extracts and their anti-inflammatory and anti- adipogenic activity potential. *Food Bioscience*. 47: 101761.
5. Chongsrimisirakhol, O. and Pirak, T. 2022. Total polyphenol content and antioxidant properties of cold brew coffee extracts as affected by ultrasound treatment and their application in low fat pork sausage. *International Journal of Food Properties*. 25(1): 813-826.
6. Sukkhown, P., Pirak, T., Jangchud, K. and Prinyawiwatkul, W. 2021. Novel peptides from dried squid head by-products obtained from snack process. *International Journal of Food Science and Technology*. 56(11): 5506-5517.
7. Pramualkijja, T., Pirak, T. and Euston, S.R. 2021. Valorization of chicken slaughterhouse by-products: Production and properties of chicken trachea hydrolysates using commercial proteases. *International Journal of Food Properties*. 24(1): 1642-1657.
8. Boonviset, S. and Pirak, T. 2020. Physicochemical and sensory characteristics of reduced fat-low sugar Chinese pork sausage as produced by chitooligosaccharide using commercial pectinase hydrolysis. *International Journal of Food Properties*. 23(1): 22-33.
9. Inmanee, P., Kamonpatana, P., Ratphitagsanti, W., and Pirak, T. 2020. Effect of thermosonication and microwave heating for post pasteurization on chemical, physical, and sensory characteristics of prototype sausage. *Agriculture and Natural Resources*. 54(1): 39-47.
10. Inmanee, P., Kamonpatana, P., and Pirak, T. 2020. Ohmic heating effects on *Listeria monocytogenes* inactivation, and chemical, physical, and sensory characteristic alterations for vacuum packaged sausage during post pasteurization. *LWT-Food Science and Technology*. 108: 183-189.
11. Natnoi, S., and Pirak, T. 2019. Effect of ultrasonic-assisted extraction on the properties, antioxidant and inflammatory activities of carotenoids from gac (*Momordica cochinchinensis*) fruit pericarp. *Cogent Food and Agriculture*. 5: 1696512.
12. Sukkhown, P., Pirak, T., Chonpracha, P., Ardoin, R., and Prinyawiwatkul, W. 2019. Seafood Flavor perception, liking, emotion, and purchase intent of coated peanuts as affected by

coating color and hydrolyzed squid peptide powder. *Journal of Food Science*. 84(6): 1570-1576.

13. Nguyen, B. M. N., and Pirak, T. 2019. Physicochemical properties and antioxidant activities of white dragon fruit peel pectin extracted with conventional and ultrasound-assisted extraction. *Cogent Food and Agriculture*. 5: 16333076.
14. Saengphol, E., and Pirak, T. 2019. Effect of Thai hoary basil (*Ocimum canum* Sims.) seed mucilage on fat reduction and quality characteristics of the chicken salt soluble protein gel and low-fat meat products. *Agriculture and Natural Resources*. 53(5): 487-499.
15. Balamurugan, S., P. Inmanee, J. De Souza, P. Strange, T. Pirak and S. Barbut. 2018. Effects of high pressure processing and hot water pasteurization of cooked sausages on inactivation of inoculated *Listeria monocytogenes*, natural populations of lactic acid bacteria, *Pseudomonas* spp. and coliforms and their recovery during storage at 4 and 10°C. *Journal of Food Protection*. 81(8): 1245-1251.
16. Saengphol, E., and Pirak, T. 2018. Hoary basil seed mucilage as fat replacer and its effect on quality characteristics of chicken meat model. *Agriculture and Natural Resources*. 52: 382-387.
17. Sukkhown, P., Jangchud, K., Lorjaroenphon, Y. and Pirak, T. 2017. Flavored-Functional Protein Hydrolysates from Enzymatic Hydrolysis of Dried Squid By-Products: Effect of Drying Method. *Food Hydrocolloids*. 76: 103-112.
18. Pramualkijja, T., Pirak, T., and Kerdsup, P. 2016. Effect of salt, rice bran oil and malva nut gum on chemical, physical and physico-chemical properties of beef salt - Soluble protein and its application in low fat salami. *Food Hydrocolloids*. 53: 303-310.
19. Sueprasarn, J., Reabroy, S. and Pirak, T. 2016. Antioxidant properties of Karanda (*Carissa carandas* Linn.) extracts and its application in Thai traditional fermented pork sausage (Nham). *International Food Research Journal*. 24(4): 1667-1675 (August 2017).
20. Pirak, T., Jangchud, A. and Jantawat, P. 2012. Characterization of Physical, Chemical, and Antimicrobial Properties of Allicin-Chitosan Complexes. *International Journal of Food Science and Technology*. 47: 1339-1347.
21. Kachanechai, T., Jantawat, P., and Pichyangkura, R. 2008. The influence of chitosan on physico-chemical properties of chicken salt-soluble protein gel. *Food Hydrocolloids*. 22(1): 74- 83.

National Journal

1. Pirak., T. 2012. Chitosan: Alternative Choice of Antimicrobial agent and Antioxidant in Meats and Meat Products. (In Thai). *Food Journal*. 42(1): 24-29.

International Conference Proceeding:

1. Kachanechai, T., Jantawat, P. and Pichyangkura, R. The preparation of chitosan and its interaction with chicken salt-soluble proteins: the model for using as cold-set binder in restructured meat products. Paper presented at The 8th International Hydrocolloids Conference, June 18-22, 2006, Norwegian University of Science and Technology, NTNU, Trondheim, Norway.
2. Kachanechai, T., Jantawat, P. and Pichyangkura, R. Application of Chitosan and Chicken Protein Hydrolysate as Cold-Set Binders in Raw Restructured Chicken Meat. Paper presented at The 9th International Hydrocolloids Conference, June 16-19, 2008, Rasa Sensota Hotel, Sentosa, Singapore.
3. Pirak, T. Production of Chitosan-Allicin Complexes for Using as Antimicrobial Agent: Preparation Method, Properties and Microstructure. Paper presented at The 10th International Hydrocolloids Conference, June 20-24, 2010, SJTU, Shanghai, China.
4. Pirak, T., and Jangchud, A. The Modification of Structure, Texture and Sensory Properties of Pork Meat Batters: The Effect of Substitution of Pork fat with Mixed Plant Oil. Paper presented at Food Oral Processing-Physics, Physiology and Psychology of Eating, July 5-7, 2010, Weetwood Hall, Leeds, England.

5. Pirak, T. The Modification of Structure, Texture and Sensory Properties of Chicken Patties Substituted with Mechanically Deboned Chicken Meat as affected by Transglutaminase Enzyme and Chitooligosaccharide. Paper presented at The 2nd International Conference on Food Oral Processing-Physics, Physiology and Psychology of Eating (FOP 2012), July 1-5, 2012, The Palais des Congrès de Beaune, Beaune, France.
6. Boonviset, S. and T. Pirak. (2012) Effect of fat reduction and sucralose on quality characteristics and consumer acceptability of Chinese pork sausage. Oral presented at The 7th Taiwan-Thailand Bilateral Conference, October 18-19, National Ping Tung University, Taiwan
7. Pramualkijja, T. and Pirak. T. Effect of Malva Nut Gum and Sodium Chloride on Rheological Properties of Salt Soluble Protein Extracted from Beef. In Proceeding of The 14th Food Innovation Asia Conference 2012, June 14-15, 2012, BITEC Bangna, Bangkok, Thailand.
8. Pramualkijja, T., Pirak, T. and P. Kerdsup. (2014). Effect of Salt, Rice Bran Oil and Malva Nut Gum on Chemical, Physical and Physico-Chemical Properties of Beef Salt -Soluble Protein and Its Application in Low Fat Salami. The 12th International Hydrocolloids Conference. May 5-9, 2014. Taipei, Taiwan.
9. Sangpol, S. and T. Pirak. (2014) Sensory perception of chicken meat as effect of source, salt, pork back fat and Hoary Basil mucilage. The 3rd International Conference on Food Oral Processing (FOP 2014): Physics, physiology and psychology of eating. June, 29- July, 2, 2014, Hof van Wageningen, Wageningen, The Netherlands.
10. Jantad, S., Pirak, T and K. Jangchud. (2014). Inhibition of angiotensin i-converting enzyme from enzymatic hydrolysates of chicken meat. The 2nd International conference on food and applied bioscience. 6-7 February 2014, The empress hotel, Chiang Mai, Thailand.
11. Sukkhown, P. and T. Pirak. 2014. Development of Crispy Dried-Seasoned Roller Squid Product Developed from Surimi and Squid Trim. The 2nd International conference on food and applied bioscience. 6-7 February 2014, The empress hotel, Chiang Mai, Thailand.
12. Sangpol, S. and T. Pirak. (2014) Sensory perception of chicken meat as effect of source, salt, pork back fat and Hoary Basil mucilage. Proceeding of The 40th Congress on Science and Technology of Thailand (STT 40). 2-4 December, 2014. Pullman KhonKhan Raja Orchid Hotel, KhonKhan, Thailand
13. Thongpech, A. and T. Pirak. 2015. Effect of Pretreatment on Collagen Extraction from Yellow Stripe Travally (*Selaroides leptolepis*) By Product. Proceeding of The 17th Food Innovation Asia Conference 2015, June 18-19, 2015, BITEC Bangna, Bangkok, Thailand.
14. Inmanee, P., and Pirak, T. 2016. Effect of Thermosonication on Quality of Prototype Sausage. In Proceeding of The International Conference on Food and Applied Bioscience. February 4-5, 2016, The Empress Hotel, Cheang Mai, Thailand.
15. Sangphol, E. and Pirak, T. 2016. Thai Hoary Basil Seed Mucilage as Fat Replacer in the Model of Chicken Soluble Protein Gel and Low Fat Chinese Chicken Sausage. The 13th International Hydrocolloids Conference. Page 184. May 16-20, 2016 University of Guelph, Guelph, Ontario, Canada. (Poster presentation).
16. Sukkhown, P., Jangchud, K., Lorjaroenphon, Y. and Pirak, T. 2016. Flavored-Functional Protein Hydrolysates from Enzymatic Hydrolysis of Dried Squid By-Products: Effect of Drying Method. The

13th International Hydrocolloids conference. Page 83, May 16-20, 2016, University of Guelph, Guelph, Ontario, Canada. (Oral Presentation).

17. Vanisa, R. and T. Pirak. 2017. The Study of Antioxidant Activity of Crude Extract from Tangerine peel and Lime peel. 55th KU Annual Conference, January 31 –February 3, 2017, Kasetsart University, Bangkok, Thailand.
18. Bao, M.N.N. and Pirak, T. 2017. Identification of Chemical Properties of Organic and Non-Organic Virgin Coconut Oil. International Conference on Food Science and Nutrition (ICFSN 2017), October 25-26, 2017, The Pacific Sutera Hotel, Kota Kinabalu, Sabah, Malaysia. (Poster presentation).
19. Inmanee, P., T. Pirak, W. Ratphitaksanti and P. Kamonpatana. 2017. Effect of Microwave Pasteurization on Quality of Vacuum Packaged Sausage. The International Conference on Food Science and Nutrition 2017. 25-26 October 2017, The Pacific Sutera Hotel, Kota Kinabalu, Sabah, Malaysia. (Poster presentation).
20. Natnoi, S and Pirak, T. 2017. The effect of ultrasonic assisted extraction on carotenoid from pericarp Thai gac fruit (*Momordica Cochinchinensis*) and its antioxidants, inflammatory activities. International conference on food science and nutrition 2017 (ICFSN 2017). 25-26 October 2017, The Pacific Sutera Hotel, Kota Kinabalu, Sabah, Malaysia.
21. Natnoi, S and Pirak, T. (2018). Complex Coacervation of Casein and Chitosan incorporated with the ethanolic Thai Gac Fruit (*Momordica cochinchinensis*) extract. The 14th International Hydrocolloids conference, May 21-25, 2018, The Pullman Nanchang hotel, Nanchang, China (Poster Presentation).
22. Sukkhown, P., T. Pirak, K. Jangchud, Y. Lorjaroenphon and W. Prinyawiwatkul. 2018. Antihypertensive, Antioxidant and Functional Properties of Peptide from Dried Squid Head. The 14th International Hydrocolloids conference, May 21-25, 2018, Nanchang University, Nanchang, China (Oral Presentation).

National Conference Proceeding:

1. Kachanechai, T., Jantawat, P. and Pichyangkura, R. Chitosan as cold-set binder in raw restructured chicken meat: Preparation and its interaction in model system with chicken salt- soluble proteins. Paper presented at The fourth National Chitin-Chitosan Conference, October 5-6, 2006, Chulalongkorn University, Thailand.
2. Kachanechai, T., Jantawat, P. and Pichyangkura, R. 2007. Effects of Chitosan and Chicken Protein Hydrolysates on Cold-Set Gelation of Raw Restructured Chicken Meats. Poster presented at The 100 Years of Dr. Tab Neelanithi, July 1, 2007, Chulalongkorn University, Thailand.
3. Pirak, T., Jangchud, A. and Jantawat, P. 2009. Production of Chitosan-Allicin Complexes: Preparation Method and Effects of Drying Method. Paper presented at Thailand Research Fund (TRF) Annual Meeting, October 15-17, 2009, Holiday Inn Resort Regent Beach Cha-am, Petchaburi, Thailand.
4. Pirak, T., Jangchud, A. and Jantawat, P. 2010. Applications of Allicin-Chitosan Complex as Antimicrobial Agent in Low-Fat Pork Sausage and Its Effect on Product Quality and Shelf Life. Poster presented at Thailand Research Fund (TRF) Annual Meeting, October 14-16, 2010, Holiday Inn Resort Regent Beach Cha-am, Petchaburi, Thailand.
5. Boonviset, S., and Pirak, T. 2011. Production of Chitooligosaccharides from Shrimp Shells Using Commercial Enzyme (Cellulase and Pectinase) and Its Effect on Antimicrobial

Activity, pp. 348. In The Proceeding of the 49th Kasetsart University Annual Conference. 1-4 February 2011, Kasetsart University. Thailand.

6. Inmanee, P and T. Pirak. 2011. The Study of Antioxidant and Antimicrobial Properties of Chitosan with Various Molecular Weight, pp. 93. In Proceeding of the 22nd National Graduate Research Conference. 6-7 October 2011, Kasetsart University. Thailand.
7. Patnapanpong, C and T. Pirak. 2011. Product Concept Development of Semi-Moist Stick Dog Treat Product, pp. 108. In Proceeding of the 22nd National Graduate Research Conference. 6-7 October 2011, Kasetsart University. Thailand.
8. Patnapanpong, C and T. Pirak. 2012. The effect of washed mechanically deboned chicken meat and palability enhancer on quality characteristics of semi-moist dog treat. In Press. In Proceeding of the 38th Congress on Science and Technology of Thailand. 17-19 October 2012, The Empress Convention center, Chiang Mai, Thailand.
9. Maneepan, S., Pirak, T., Jangchud, K., and C. Charunuch. (2014) Development of dried canine food fortifying with probiotics and prebiotics. Oral presented at The 8th Thailand Taiwan Bilateral Conference and The 2nd UNTA Meeting On "Science Technology and Innovation for Sustainable Tropical Agriculture and Food" June 26 - 27, 2014, Rueang Khao Meeting Room, Faculty of Agriculture, Kasetsart University, Bangkok Campus Thailand.
10. Jantad, S., Pirak, T and K. Jangchud. (2014). Angiotensin converting enzyme inhibitory activities of dried protein hydrolysate powder produced from enzymatic hydrolysis of chicken meat. TRF-Master Research Congress VIII and RRI-MAG Congress I. 3-5 April 2014, The twin towers hotel, Bangkok, Thailand.
11. Sukkhown, P., T. Pirak, and P. Dhamvithee. 2014. Development of Crispy Dried-Seasoned Roll Squid Product from Surumi and Squid Trim. TRF-Master Research Congress VIII and RRI-MAG Congress I. Page 335, 3-5 April 2014, The Twin Tower Hotel, Bangkok, Thailand (Oral Presentation).