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DEVELOPING FOOD PROCESSING, SAFETY, QUALITY, AND SUPPLY SOLUTIONS FOR PRODUCTION OF HIGH QUALITY AND SAFE FOOD

NON-TECHNICAL SUMMARY: Food supplied from the farm goes through various stages along the supply chain before reaching the consumer, each of which significantly impacts product quality and safety, and the agricultural economy. Agriculture in the State of Washington is diverse, with a wide range of outputs including, fruits, vegetables, cereal grains, pulses, seafood, poultry, and other animal products. Washington leads the nation in production quantities or value for many of these items. Outputs are often marketed as raw (fresh) products, as well as in various processed (value-added) forms, across the nation and internationally. This provides numerous production, processing, safety and quality challenges along the supply chain.This project addresses complex technical challenges using a team of scientists, engineers, microbiologists, animal health experts, and economists. The experts will collaborate to address the challenges faced by the industry to enhance economic competitiveness in the areas of food processing, quality, safety, demand and supply.

OBJECTIVES: The major objectives of this project include:Food Processing: Develop strategies and technical solutions that enable value-addition to agricultural outputs.Food Safety: Develop technically and economically feasible interventions to assist the industry in bringing safe food to consumer.Food Quality: Optimize food quality and nutrition of agricultural outputs as they move from farm to consumer to enhance marketability, desirability, and competitiveness.Food Supply: Find innovative solutions to tackle technical and economical challenges of moving food from farm to consumer throughout the supply chain.

APPROACH: Food Processing (Tang, Sablani, Ganjyal, Barbosa, Edwards, Ross, Rasco)Development and pilot testing of microwave-assisted thermal sterilization and pasteurization systems for ready-to-eat meals (Tang, Sablani)Evaluation of high hydrostatic pressure, pulsed electric field, ultrasound and UV-C light technologies for pasteurization/sanitization of foods (Barbosa-Canovas, Sablani)Design, fabricate and evaluate high gas barrier multilayer polymeric films and trays for ready-to-eat meals (Sablani, Tang)Extrusion processing of pulses and other

grains (Ganjyal, Ross, Rasco)Direct steam injection processing (Ganjyal, Ross, Rasco)Food QualitySensory evaluation of processed foods using consumer and trained panels (Ross, Marsh, Gallardo, McCluskey , Love, Ganjyal, Tang, Sablani, Harbertson)Statistical analysis of food data (Marsh, McCluskey, Gallardo, Love, Ross, Tang, Sablani, Ganjyal)Physical and mechanical properties of foods (Ross, Ganjyal, Tang, Sablani, Barbosa)Willingness to pay studies for improved food quality (Gallardo)Food Safety (Marsh, Gallardo, Love, Ganjyal, Shah, Sischo, Call)Consumer surveys on food contaminants such as E. Coli (Marsh, Iles, Fortenbery, Gallardo, Love, McCluskey, Ganjyal)Pathogen testing on raw and processed food products and economic assessment (Marsh, Fortenbery,)Statistical analysis of food data (Marsh, Iles, Fortenbery, Gallardo, McCluskey, Love, Ross, Tang, Sablani, Ganjyal)Pathogen testing on raw and processed food products (Shah, Sischo)Pathogen surveillance (isolation, identification and characterization of food-borne pathogens) in food animals and poultry (Shah, Sischo)Antibiotic resistance surveillance in food animals and animal derived foods (Shah, Sischo, Call)Pathogen control (eg., development of probiotics, immunomodulators, antibodies and on farm management intervention strategies) in food animals and poultry (Shah, Sischo, Fox)Development of improved antimicrobial treatments to improve microbiological safety of poultry meat (Shah)Field sampling of soil and roots; laboratory, greenhouse and field assessment of crop nutrient availability, microbial activities, and plant growth. (Collins)Analysis of soil physical, nutrient and chemical, and biological parameters. (Collins, Owen)Food Supply (Marsh, Iles, Fortenbery, Gallardo)Focus groups and consumer surveys and experiments on food production and food security (Marsh, Iles, Fortenbery, Gallardo)Statistical analysis of domestic and international food and trade data (Marsh, Iles, Fortenbery, Gallardo)Life Cycle Cost Assessment of new technologies in the supply chain (Marsh, Fortenbery)Econometric analysis of food markets, demand, supply and trade, risk to identify short, intermediate, and long run effects (Marsh, Iles, Fortenbery, McCluskey, Gallardo)

KEYWORDS: Food; Food Quality; Food Safety; Food Supply; Food Processing