SPFG Project Tracking Form **Project Number: 2018-04**

Project Title	Optimization of vaccination treatment to eliminate Salmonella and Campylobacter contamination of poultry
Date submitted	June 5, 2018
Submitted by	Xiaonan Lu, Assistant Professor of Food Safety Engineering | Food Nutrition and Health Program
Summary	His previous project funded by IAFBC and SPFG was to reduce Salmonella and Campylobacter contamination of poultry. Specifically, they isolated lactobacillus strains from poultry and environment as well as design engineered lactobacillus vaccines along with some natural antimicrobials to feed chickens and reduce the loads of Campylobacter and Salmonella in chicken GI tract. By the end of this 2-YR project (December 2017), they identified that the synergistic treatment of the encapsulated lactobacillus and cinnamon oil could significantly reduce the colonization of both Campylobacter and Salmonella in chickens. The reduction level was about 100 times compared to the positive control group. However, this synergy treatment was unable to completely eliminate the colonized pathogens in chicken GI tract. They would like to optimize the synergistic treatment and eventually eliminate all the Campylobacter and Salmonella in chicken GI tract. They would like to apply to the Agri-Innovation Program and to continue to work on this research project to optimize the vaccine treatment. IAFBC is very interested about the proposed idea because: 1) the program only lasts for 6 months – IAFBC is expecting to fund some projects with a solid preliminary foundation, such as the extension of a previously funded IAFBC project; 2) the deliverable is clear and expected to be achievable; 3) has a significant impact on agri-food industry and business. His group will conduct the following experiments within 6-month time window 1) Introduce another natural antimicrobial compound (e.g. curcumin and diallyl trisulfide) to the current synergy treatment (encapsulated lactobacillus and cinnamon oil) to form a triple treatment. They expect this novel triple treatment will be more effective that can further reduce the load of Campylobacter and Salmonella in chicken GI tract. 2) We have constructed 2 more lactobacillus vaccines, both of which show good antimicrobial effect against Campylobacter and Salmonella in vitro. They will encapsulate these two vaccines separately and then mix with the aforementioned natural antimicrobial compounds (e.g. cinnamon oil, curcumin and diallyl trisulfide) and test the effect on the elimination of Campylobacter and Salmonella in chickens. Their goal is to identify the best synergistic treatment strategy that can completely eliminate the load of Campylobacter and Salmonella in chickens.