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| **Food Manufacturing and Logistics** |
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| **Research background:**Based on agricultural products, food industry is fundamental to a country with increasing importance, which ensures the continuous increase ofagricultural production, the improvement on the quality of life, and the promotion of rural industries. Food manufacturing is the key to "healthy China". Since the "11th Five-year Plan", China has formulated and implemented a special program for agricultural products processing, and a batch of major agricultural product processing projects have been successively implemented in various places. Food science covers the entire industrial chain, including field cultivation, harvesting, post-harvest logistics, processing and utilization, food nutrition and digestion, etc., which has obvious cross-trait. Food-related disciplines of Zhejiang University,including horticulture, food and pharmacy, weregraded “A” by the Ministry of Education, occupying the leading position in China. Thus solidfoundation is laidfor the implementation of interdisciplinary researches. The implementation of this project will support the development of agricultural products processing and logistics, combine the strength of related discipline, apply for national major projects of science and technology in agricultural areas, build up platform of food manufacturing, logistics technology and product development, and help establish ZJU’sdominant position in this field.  |
| **Main research topics and progress:****1. New technology of processing and utilization of agricultural products and water &energy saving technology**The Alliance focuses on the applied fundamental research of food resources development, qualityimprovement and food security, and the deep-processing technology and industrialization of technology integration for primary agricultural products. We identify, separate and purifyfunctional components with special physiological and pharmacological activity in agricultural products, and study their processing by-products, as well as the evaluation and mechanism of biological activity, the structural modification and modification of unstable functional components for the development of new generation of health care functional factors and functional foods.In this aspect, we have developed a series of products includingprocessing technology of the full utilization of fruits and vegetables, water-saving technologies, key technologies and equipment for central kitchen food manufacturing, key technologies and equipment for food sterilization, and traditional food mechanization and intelligent production equipment. And we have obtained national, provincial and ministerial awards and published several high-level papers.**2. Technologiesand logistics systems for the post-harvest quality maintenance of characteristic agricultural products**The Alliance exploresthe biochemical and biological laws inquality change of agricultural products,investigate the law of action of genetic traits, biotic and abiotic environment factorson the quality of agricultural products, and accordingly build the intervention theories and logistics system for the quality maintenanceof agricultural products. We developmono- or multifunctional green package materialswith humidity-controlling, dew preventing, antibiotic, ethylene absorbingand thermal insulating effects for food fresh-keeping.We developtime-temperature indicators as shelf-life monitors for fresh foods products in the low-temperature logistics systems. We work onintelligent packaging technologies based on RFID and GPS technologies, and develop intelligent packaging equipment accordingly. |
| **Member and college:**YE Xingqian,College of Biosystems Engineering and Food ScienceSUN Chongde, College of Agriculture and BiotechnologyCHEN Kunsong, College of Agriculture and BiotechnologyYIN Jianwei, College of Computer Science and TechnologyLIU Donghong,College of Biosystems Engineering and Food ScienceCHEN Shiguo,College of Biosystems Engineering and Food ScienceCHEN Jianchun,College of Biosystems Engineering and Food ScienceYIN Xueren, College of Agriculture and BiotechnologyWU Di, College of Agriculture and BiotechnologyZHU Changjin, College of Agriculture and BiotechnologyDENG Shuiguang, College of Computer Science and TechnologyWU Dan,College of Biosystems Engineering and Food ScienceYAN Xuemei,College of Biosystems Engineering and Food Science |
| **Representative achievements:**Funding:The national key research program: 3 projects, 6 subjects. The National Natural Science Foundation: 1 Key project, 1 Outstanding youth fund, 5 General programs. Publications:more than 50 articles, including 1 PNAS article, 7 articles with an IF ＞ 51 ESI high-cited paper and Hot Paper2 National Science Prizes, 2 provincial and ministerialPrizesTalents:2 talents (XU Changjie and LIU Donghong) in science and technology of the million people planning Program1 winner (YIN Xueren) of the Outstanding Youth Fund of NSFC1 foreign member of the Chinese Academy of Engineering.**The list of National Key Research Projects:**Research on fresh edible agricultural products logistics environment suitability and quality control mechanism: 65 million RMB.Research and development on new technology and equipment processing of food engineering and intelligent:34 million RMB.Processing technology and equipment research and development modelof fruits and vegetables origin commercialization:27.61 millionRMB.Representative publication [1] Zhangbo, Giovannoni James, Klee Harry\*. Chilling induced tomato flavor loss is associated with altered volatile synthesis and transient changes in DNA methylation. PNAS 2016, 113, 12580-12585. (IF=9.423)[2] Jianle Chen，Huan Cheng，Dan Wu，Robert J. Linhardt，Zijian Zhi，Lufeng Yan，Shiguo Chen，Xingqian Ye\*，Green recovery of pectic polysaccharides from citrus canning processing water，Journal of Cleaner Production，2017, 144：459-469. （IF=6.207）[3] Yin Xueren, Xie Xiulan, Xia Xiaojian, Yu Jingquan, Ferguson IB, Giovannoni James J, Chen Kunsong\*. Involvement of an ethylene response factor in chlorophyll degradation during citrus fruit degreening. The Plant Journal 2016, 86: 403-412. (IF=6.468)[４] Jinhu Tian, Jianle Chen, Feiyan Lv, Shiguo Chen\*, Jianchu Chen, Donghong Liu, Xingqian Ye\*. Domestic cooking methods affect the phytochemical composition and antioxidant activity of purple-fleshed potatoes. Food Chemistry , 2016,197: 1264-1270. (IF=4.052, hot-cited paper) |