



Course Outline

Online International Training Course via Zoom Meeting

1. Course Title:

Sustainable Production Chain of Safety Fruits and Vegetables Commodity with Innovation and Drying Technology for Developing Country

2. Duration:

14 Days (June 1 – 14, 2022)

3. Background and Rational:

TICA: Thailand International Cooperation Agency

TICA is a national focal point for Thailand's international development cooperation. TICA was established in 2004 to realize Thailand's aspiration to be a contributor of development cooperation. Believing that global challenges are best addressed by international cooperation and global partnership, today we continue to strengthen our contribution to achieve global development agenda through various capacity-building and human resources development programmes. In response to the recent changes in the global landscape of development cooperation, especially through the concept of South-South and Triangular Cooperation, TICA continues to realign our focuses in order to deliver Thailand's commitment to be a relevant partner in global agendas including the 2030 Agenda for Sustainable Development.

Currently, consumer trend is focused on fruits and vegetables as healthy food not only for nutritional requirement but also as functional food and dietary purpose worldwide. The demand for consumption is abundantly increasing in the last ten years. Unfortunately, fruits and vegetable are spoiled at the high-level during production chain approximately 10 to 40% depended on different factors while lacking of food to consume for world population has been occurred in various regions of the world including African and others developing countries. Under-

grading fresh fruits and vegetables causes the low cost of these produces. Moreover, excessive production of these produces during seasonal production also causes the critical problem of the lower cost of the fresh agricultural commodity. Producers and farmers in developing countries face the upset of these situations and waiting for proper eradication or minimizing the wastage. The loss of fresh fruits and vegetable leads to economic loss and poverty initiation for developing countries. Since most fruits and vegetables are classified as highly and moderately perishable food. Prevention, reducing and minimizing these critical problems, innovation and preservation technologies can applied to solve the problems. Among various innovations and preservation technologies, drying technology is one of the attractive means for the achievement of fruits and vegetable as the dried commodity production, Since the advantages of drying technology are a simply process, long shelf life extension of the product, reduce weight and volume of fruits and vegetables, easy packaging and save cost for transportation. In addition, flavor aroma and nutrients are preserved and remained in finished product with a special drying including freeze drying technology. Also, the transferring of environment security, appropriate innovation and drying technology in the entire production chain of dried fruit production could be created not only adequate food, but also providing the value-added product, hence, opening a good chance and appropriate way of marketing via drying or water removal preservation for developing country as sufficiency economy and sustainable development. Safety concerning entire-production chain of dried fruit and vegetables will be cooperated in any point of safety risk in the chain and discussion. Practical analysis. quality and safety assurance system and implementation will be included. Direct experience and skill improving will be learned via study visiting both inside and outside Naresuan University. Both in lower and upper north regions of Thailand

Faculty of Agriculture, Natural Resources and environment of Naresuan University is one of the leading in agricultural study, research, and social services in food processing/ Agricultural Science Environment and Excellence Centers. Moreover, there are adequate expertise and academic staff in agricultural sciences and food science and technology to support this training program. Equipment for drying production and analytical are modern and adequate for learn and practical. Therefore, these facilities and staff can support this international training course for developing countries.

Organization/Institution

Faculty of Agriculture Natural Resources and Environment, Naresuan University

4. Objectives:

The program is designed to:

- Provide basic knowledge throughout the production chain of dried fruits and vegetables commodities
- Provide basic skill and understand methodology of quality and safety in laboratory
- Directly learning from expertise and manufacturer during academic visiting program
- Establishing the international net working in innovation and drying technology of fruits and vegetables

5. Course Contents:

The program consists of series of lecture online, practical session in vdo clip and project discussion.

5.1 Lecture Outline;

Intensive Lecture and Discussion

- GAP for plantation and primary production of fruit and vegetables
- Loss during harvesting and postharvest and control of fresh fruit and vegetables/transportation/ storage
- Physiology/Quality and safety attributes of raw materials
- Concept of drying technology/ general step for drying process
- Osmotic dehydration/ concentration and other water removal techniques
- Drying process with tray dryer/tunnel dryer/vacuum dryer
- Drying process with spray dryer and drum dryer
- Drying process with freeze dryer
- Methods and Equipment to determine physical, chemical, microbiological and Quality
- Sensory evaluation of finished product
- Packaging and labelling/shelf-life evaluation
- Good manufacturing practices (GMP) in drying process
- Concept of sanitary and safety of fruit processing plant and equipment design

- Hazard analysis and critical control point (HACCP) in drying process/Other quality and safety assurance system
- Zero waste management
- Production planning/marketing survival/sufficiency economy and sustainable development in chain of dried fruit and vegetable commodity production and agri – business

The site visiting and demonstration:

- Pun Dee Military Project Somdej Phra Ekka Thotsarot Camp Phitsanulok Province
- Traditional and modernize solar technology for drying banana at Bangkratum, Phitsanulok

6. Participants Criteria:

Applicants must fulfill the following requirement:

- Be nominated by their respective government;
- Education: equivalent to a bachelor degree (B.Sc.) of university/technical college on food science, agricultural science, biotechnology, agricultural processing, agricultural product development, or have at least 5 years of related work experience;
- Language: proficiency in English (speaking, reading and writing)

7. Attendance and Evaluation

Participants who completed the online training will receive E-certificate base on:

- Real time Online Class (not less than 80%)
- Online class participation and discussion
- Online presentation and report
- Online evaluation

8. Venue:

This fourteen-day online course will be conducted during June 1 – 14, 2022 via Zoom Cloud Meetings from the Faculty of Agriculture Natural Resources and Environment, Naresuan University, Center of excellence in postharvest technology, Naresuan University, Phitsanulok Thailand.

9. Expected Results:

The expected outcomes are as follows: the participants will:

1. Gain basic knowledge throughout the production chain of dried fruits and vegetables commodities
2. Gain basic skill and understand methodology of quality and safety in laboratory
3. Gain directly learning from expertise and manufacturer during academic visiting program
4. Gain the international net working in innovation and drying technology of fruits and vegetables

10. Organization/ Institution:

▪ Implementing Agency;

- This training course will be conducted by Center of excellence in postharvest technology, department of agro-industry and faculty of Agriculture, Natural Resources and Environment, Naresuan University
- Course leader: Assist. Prof. Dr. Boonsong Saengon, (Ph. D. Food sciences and Technology) who has a life-long experience in Food sciences and Technology research on fruits and vegetables, both at the fundamental as well as applied levels. Quality safety and also drying, process of fruits and vegetables in the production chain and on technological developments and social services to improve quality and shelf life of fruits and vegetables are main activities. He also taught in “Advance food Microbiology, Food Microbiology, food safety and Food preservation techniques session” for Bachelor, Master and Ph. D degree level. He also served as thesis and dissertation supervisor for master degree and doctoral degree student concerning fruit and vegetables research.
- NU Staffs are Assist. Prof. Dr. Mayuree Krajayklang (Ph.D. in Post-harvest physiology), Assist. Prof. Dr. Peerasak Chaiprasrat (Ph. D in Post-Harvest) and other 1 staff in Agro-Industry Department

▪ Contact Person

- Assist. Prof. Dr. Boonsong Saengon,(Ph.D. Food sciences and technology) Faculty of Agriculture Natural Resources and Environment, Naresuan University, 99/9 Nakhonsawan-Phitsanulok Road, Amphur

Muang District, Phitsanulok, 65000, Thailand Tel. 055-963014, Fax. 055-963015 E-mail: Saengbn@nu.ac.th

11. Expenditure/Funding:

Thailand International Cooperation Agency (TICA)
Government Complex, Building B (South Zone), 8th Floor,
Chaengwattana Rd. Laksi District, Bangkok 10210 THAILAND
Website: <https://tica-thaigov.mfa.go.th/en/index>
Email: aitc@mfa.mail.go.th

Schedule for the Online Training Programme:

Sustainable production chain of safety fruits and vegetables commodity with
innovation and drying technology for developing country

June 1 – 14, 2022

Faculty of Agriculture Natural Resources and Environment, Naresuan University
Phitsanulok, Thailand

Date/ Period /Topic	Time (Thailand time)	Content	Speaker	Note
Day 1 :				
June 1, 2022	12.00 – 13.00	Register through the google form program		
	13.00 – 13.30	Opening ceremony and speech	Prof. Dr. Kanchana Ngourungsi President of Naresuan University	
	13.30 – 14.00	Present for training program	Assist. Prof. Dr. Boonsong Sangon	
	14.00 – 15.00	Introduction to significance of fruit and vegetables	Assist. Prof. Dr. Peerasak Chaiprasart	
Day 2 :				
June 2, 2022	12.00 – 14.00	GAP for plantation and primary production of fruit and vegetables	Assist. Prof. Dr. Peerasak Chaiprasart	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	GAP for plantation and primary production of fruit and vegetables (continue)	Assist. Prof. Dr. Peerasak Chaiprasart	
Day 3 :				
June 3, 2022	12.00 – 14.00	Loss during harvesting and postharvest and control of fresh fruit and vegetables/transportation/ storage	Assist. Prof. Dr. Mayuree Krajayklang	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Loss during harvesting and postharvest and control of fresh fruit and vegetables/transportation/ storage (continue)	Assist. Prof. Dr. Mayuree Krajayklang	
Day 4 :				
June 4, 2022	12.00 – 14.00	Physiology/Quality and safety attributes of raw materials	Assist. Prof. Dr. Peerasak Chaiprasart	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Lab: Physiology/Quality and safety attributes of raw materials	Assist. Prof. Dr. Peerasak Chaiprasart	

Date/ Period /Topic	Time (Thailand time)	Content	Speaker	Note
Day 5 :				
June 5, 2022	13.00 – 16.00	Live broadcast Pun Dee Military Project Somdej Phra Ekka Thotsarot Camp Phitsanulok Province	Assist. Prof. Dr. Peerasak Chaiprasart	
Day 6 :				
June 6, 2022	12.00 – 14.00	Concept of drying technology/ general step for drying process	Assist. Prof. Dr. Boonsong Sangon	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Osmotic dehydration/ concentration and other water removal techniques	Asst. Prof. Dr. Orose Rugchati	
Day 7 :				
June 7, 2022	12.00 – 14.00	Drying process with tray dryer/tunnel dryer/vacuum dryer	Dr. Suwimol Jetawattana	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Drying process with spray dryer and drum dryer	Dr. Suwimol Jetawattana	
Day 8 :				
June 8, 2022	12.00 – 14.00	Drying process with freeze dryer	Asst. Prof. Dr. Khanitta Ruttarattanamongkol	
	14.00 – 14.15	Take a break		
	14.15 – 17.15	Live broadcast traditional and modernize solar technology for drying banana at Bangkratum, Phitsanulok	Assist. Prof. Dr. Boonsong Sangon	
Day 9 :				
June 9, 2022	12.00 – 14.00	Methods and Equipment to determine physical, chemical, microbiological and Quality	Assist. Prof. Dr. Boonsong Sangon	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Sensory evaluation of finished product	Assist. Prof. Dr. Riantong Singanusong	
Day 10 :				
June 10, 2022	12.00 – 14.00	Packaging and labelling/shelf-life evaluation	Dr. Nattha Pensupa	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	- Good manufacturing practices (GMP) in drying process - Concept of sanitary and safety of fruit processing plant and equipment design	Assist. Prof. Dr. Boonsong Sangon	
Day 11 :				

Date/ Period /Topic	Time (Thailand time)	Content	Speaker	Note
June 11, 2022	12.00 – 14.00	Hazard analysis and critical control point (HACCP) in drying process/Other quality and safety assurance system	Assist. Prof. Dr. Boonsong Sangon	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Hazard analysis and critical control point (HACCP) in drying process/Other quality and safety assurance system (continue)	Assist. Prof. Dr. Boonsong Sangon	
Day 12 :				
June 12, 2022	12.00 – 14.00	Zero waste management	Assoc. Prof. Dr. Dondej Tungtakanpoung	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Zero waste management (continue)	Assoc. Prof. Dr. Dondej Tungtakanpoung	
Day 13 :				
June 13, 2022	12.00 – 14.00	Production planning/marketing survival/sufficiency economy and sustainable development in chain of dried fruit and vegetable commodity production and agri - business	Assoc. Prof. Dr. Makasiri Chaowagul	
	14.00 – 14.15	Take a break		
	14.15 – 16.15	Production planning/marketing survival/sufficiency economy and sustainable development in chain of dried fruit and vegetable commodity production and agri-business (continue)	Assoc. Prof. Dr. Makasiri Chaowagul	
Day 14 :				
June 14, 2022	13.00 – 16.00	Closing ceremony at Faculty of Agriculture Natural Resources and Environment, Naresuan University Phitsanulok, Thailand	Assist. Prof. Dr. Boonsong Sangon (Staff) Representative of TICA	

*Schedule is subject to change as appropriate