



POST HARVEST OPERATIONS AND PROCESSING OF FRUITS, VEGETABLES, SPICES AND PLANTATION CROP PRODUCTS

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INTENDED AUDIENCE: Food Processing and Engineering, Food Technology, Agricultural Engineering, Biochemical Engineering, Post Harvest Technology, Chemical Engineering, Horticulture and related disciplines

INDUSTRY SUPPORT: Food industries such as Britannia Industries Ltd, Nestle, Hindustan Unilever Ltd, Patanjali, PepsiCo Frito Lay, General Mills, Glaxo, ITC, Parle, Coca Cola, Keventer Agro, Reliance Fresh, etc.

ABOUT THE COURSE:

Horticultural and plantation crops have always played an important role in Indian dietary. Globally, India is the second-largest producer of fruits and vegetables. However, only about 2-3% of the produce is processed and converted into value-added products. About 15 to 20 % of the produce, in some cases even more, is wasted due to improper cold storage infrastructures, transportation systems, lack of technical knowledge, skilled labour, and limited processing. It is necessary to develop skills and increase the technical knowledge base in the sector of novel post-harvest handling, processing, packaging, and storage technologies and infrastructure to improve availability and accessibility of the produces, improve the nutritional status of country, provide nutritional security, increase the agri-startups and improve nation's economy.

This online course is being offered to disseminate the knowledge on recent developments and innovations in different science and engineering domains of post-harvest management and processing of fruits, vegetables, spices, and plantation crop products. This course will develop trained human resource for the food industry and prepare them to face the newer challenges in the fast-expanding sector of horticultural & plantation crop products processing. Also, this course will provide ample materials to the students for the preparation of competitive examinations like GATE, NET, etc

ABOUT THE INSTRUCTOR:

Professor H N Mishra has over 35 years of experience in teaching and research. A Professor of Food Technology in the Agricultural and Food Engineering Department and former President of the Association of Food Scientists & Technologists (India), Dr. Mishra is the former Chairman of the Post Harvest Technology Centre, IIT Kharagpur. Professor Mishra teaches food science & technology, food product & process technology, non-thermal processing of food, industrial processing of foods & beverages, and food chemistry. His research interests include RTE Health foods & nutraceuticals, novel food product & process development, and extension of shelf life of perishable foods. Professor Mishra has published 581 research papers including 243 in peer-reviewed refereed journals & 338 in conference proceedings. He has written 4 books, 4 e-books, 7 edited volumes, 34 book chapters, 7 lecture compendium & laboratory manuals, 4 technology manuals, and has 14 Indian patents to his credit.

COURSE PLAN:

Week 1: Composition, nutritional and health value of fruits & vegetables, Indian spices and plantation crops.

Week 2: Post harvest losses and preventive measures; Post harvest operations; Handling & transportation; Supply chain management & storage; Quality assurance and control (QA/QC).

Week 3: Basics of processing and preservation of horticulture & plantation crop products; Processing by removal of water; Processing by addition of heat; Processing by removal of heat; Irradiation of fruits, vegetables and spices.

Week 4: Cleaning operations; Sorting and grading; Peeling, coring, slicing; Containers and packaging materials; Packaging methods and equipment.

Week 5: Minimal processing strategies; Hurdle technology concepts; Intermediate and high moisture fruit products; Cut fruits and vegetables.

Week 6: Juice extraction & clarification; Concentrates and pastes; Aseptic processing and packaging; RTS and RTD beverages; Quality and safety aspects.

Week 7: Drying techniques and equipment; Powders and premixes; RTE fruit products; Dehydrated and instant cooking vegetables.

Week 8: Tea and tea products; Coffee processing; Cocoa and chocolate technology; Vanilla essence and flavour; Coconut processing.

Week 9: Processing of spices; Spice powders; Spice pastes, sauces and gravies; Essential oil and oleoresins; Condiments technology.

Week 10: Fermentation technology; Fruit wines and ciders; Probiotic/Fermented vegetable products; Carbonated fruit juices, premixes; Quality assurance/quality control.

Week 11: Packaging methods and materials; Active/Intelligent packaging; Edible coatings & films; Modified atmosphere packaging; Controlled atmosphere storage.

Week 12: Green technologies and near zero waste processing; Extraction of bioactives and pigments from fruits and vegetables industrial waste; Valorisation of waste into value-added products; FSSAI regulations & FSMS guidelines for fruits, vegetables, spices and plantation crops; Course summary & summing up.