Study program: Organic crop and livestock production

Type and level of study: Bachelor academic studies

Course Title: BASICS OF VEGETABLES PRESERVATION

Teachers: Dr. Ilić S. Zoran, Full professor

Status: Elective 6, semester VIII

ECTS: 7

Prerequisite: None

The goal of course

The main objective of the course Basics preservation of organic products is to familiarize students and acquire knowledge about the importance of quality fresh organic products, vegetables, fruits and flowers placed on the preservation, reduce losses, and slow their decline. For the development of quality production, storage and sales of organic fruits and vegetables is essential ongoing education of all participants in this integrated process, the development of scientific research and application of these results in practice.

The outcome of the subject

Training students in the preservation of the quality of organic vegetables and fruits in which a longer period of time allows the extension of the use of fresh vegetables and fruit as a basis for rational nutrition. It also means greater competitiveness in the market fresh products throughout the year, reducing the seasonality of production and sales. Economically, lower losses mean not only more storage, but also the ability to vegetables and fruits, in species where it is possible to put on the market when the price is high (winter, late spring). Processing, storage well means more complete utilization of capacity in the long term.

Through this course will connect the influence of many factors prior to harvest (choice of varieties, climate and agro-technical factors) and during the harvest (maturity, time and method of harvesting) on the quality and the possibility to reduce losses and preserve quality during storage of fresh products. Application of new biotechnology during the storage process gives a scholarly upgrade through doctoral studies for scientific research work in programs to preserve the quality during storage and all professions where necessary understanding and respect for determining kvalitetaa fresh products, monitoring the process of export or import of fresh vegetables and fruits, for work refrigerated, in the planning and procurement of technological equipment, and so on.

Syllabus

Theoretical study ntroduction: The specificity of the chemical composition of vegetables and fruits. Definitions, parameters and quality features. Biology maturation and changes during ripening. The influence of factors of production to the quality of products and processes storage. Codex health safety of agricultural products. Respect for the principles of GAP - Good Practices and Application GMP - Good Manufacturing Practices and applying the HACCP - Hazard Analysis and Critical Control Point system. Harvest, harvest timing and method of harvesting. Preparing vegetables for preservation. Cooling, sorting, packing. Physiology storage. Evaporation, respiration, ethylene production, photosynthesis, transpiration, growth and development, physiological degradation, physical and pathological lesions. Internal - biological factors-the nature and structure of the harvested products., The temperature of the products. Exterior - Environmental factors keeping. Temperature, relative humidity, light, air composition. Products incurred during storage. Pathology of storage, means of penetrating pathogens, infection, colonization, disease, and reduction control of diseases. Payment storage; Simple objects for storage, semi-controlled, controlled way of keeping controlled. Basic principles of the controlled cooling. Forced-air cooling Hydro-water cooling, liquid cooling ice with chopped ice. Vacuum cooling. Refrigeration drying.

Methods for the extension of the lifespan of fresh products. Is modified atmosphere packaging and related technologies Controlled atmosphere storage (CA), equilibrium modified atmosphere (EMA), vacuum packaging (VA), keeping the gas exchange, gas-exchange preservation (GEP).

Future trends in the process of storage. An improved method for controlling and monitoring temperature and relative humidity. During the storage of organic vegetables apply to commercial biopesticides based on microorganisms, then botanical or essential oils, natural polymers and mineral resources. In organic

protection during čuvalja fresh products are used and the natural substances, chitosan, terpenoid and essential oils, isocyanates, ethanol, phenolic components and the like.
Practical classes - Field practice: visit refrigerator and storage for vegetables and fruits

Literature

Kays Stanley J.: Postharvest physiology of perishable plant products. University of Georgia, Athens, 1996.
Kader, A.A. Postharvest technology of horticultural crops 3th ed. Universities California Agri. Nat. Resources, Oakland, Publ.3311, 2002
FAO, 2004: Improving the quality and safety of fresh fruits and vegetables: a practical approach. Prepared by : Maya Pineiro and Luz Berania Diaz Rios : United Nations Food and Agriculture Organization, Rome, Italy

Number of lectures: 6				Other Classes
Lectures: 3	Practices: 3	Other forms of teaching:	Student research work:	

Teaching methods: All the teaching process is carried out interactive and multimedia, including power point prezentacije. Sastvni part of the teaching presentations of seminar papers of students, then students work involved in processing different theme, lectures of experts from the country and inostranstava, which contributes to better understanding and perception the complexity of the case. The practical part of the training takes place through exercises in groups, watching and discussion of film material and consultations.

Score (maximum 100 points)

Pre-commitments	**Poens**	**The final exam**	Poens
Activity during lectures	5	Written exam	25
Practical classes	15	Oral examination	25
Colloquia	15		
Seminars	15		
Total	50		50