

# *Lecture 1. Introduction.*

**1. Characteristics of branch of storage and processing of plant production.**

**2. Main tasks of the course.**

**3. Fighting with losses in quality and weight of plant production.**

**4. Main tasks of storage branch.**

**5. Scientific and methodic bases of the course.**

**6. Role of Ukrainian scientist in building bases of quality, storage and processing technology of plant**

# Characteristics of branch of storage and processing plant production

**There are a lot of enterprises which store up, store and processing production of plant growing in Ukraine.**

**There are *enterprises of grain procurement, fruit-and-vegetable base and the enterprises on processing of technical crops.***

- **Storing** (storage of bread-grain and seed grain);
- **Selling** (store up, store and selling final products of processing (flour, groats, mi-xed fodders et al.);
- **Government reserve** (for sustained sto-rage).

**Store up, storage and processing of fruit-and-vegetable production are carried out with fruit and vegetable base and fruit processing plant. There are also association of growing and processing manufacturers in many areas.**

**Technical crops store up and processing factories of the state submission and the association, created on the basis of association of growing and processing manufacturers of technical crops.**

## 2. Main tasks of the course

**The first task** - studying questions of quality of plant products in a complex.

- **The second task**- studying of base theories and practice of storage of plant products.

**The third – training of specialists and managers of agriculture in the area of storage and processing technology of plant growing products.**

### *3. Fighting with losses in quality and weight of plant production*

*There are two types of losses of plant production during the storing:*

- losses of weight;
- losses of quality.

They are interdependent in most cases that are losses of weight are escorted by losses of quality and vice versa.

By nature losses can be **physical and biological**.

*Losses  
of  
weight*

**Biological**

**breathing**

**germination of grain**

**evolution of microorganisms**

**evolution of insects and ticks**

**self-heating**

**extermination of rodents**

**extermination of birds**

**Physical (*mechanical*)**

**injuries**

**sawing**

**spilling**

*Losses of  
quality*



## 4. Main tasks of storage branch

1. *To store up production of plant growing and seeds with the minimal losses of weight and without decrease in quality.*
2. *To raise quality of production of plant growing during storage, applying corresponding technological receptions and modes.*
3. *It is most profitable to organize storage of plant products.*

## ***5. Scientific and methodic bases of the course.***

**Effective storage of production of plant growing is based on the perfect knowledge of three equally important components:**

- 1. the object of storage (chemical structure, physiology), its physical properties and physical and physiological of its aggregate (seeds or potatoes amount, etc.), special features of inter-action with environment;**
- 2. factors that influence on processes which take place in the plant product during storage or processing;**
- 3. scientific principals that the foundation of storage of the certain type of plant products.**

- Principals of storage of plant growing products are established on the base of studying physiological, biochemical and microbiological processes which occur in certain conditions and regimes. These principles are classified by Nikitinsky. He has put in their basis four conditions which there can be a biological object (bios, anabiosis, cenoanabiosis, abiosis) .**

# Principals of storage of plant products according to Nikitinsky

<b>I. Bios</b>	<b>A. Eubios</b>	<i>Conservation and transpor-tation whole, alive organisms to time of processing.</i>	<i>Temporary storage of fru-its and vegetables, potato-es before its processing.</i>
	<b>B. Gemybios</b>	<i>Principal of partial bios. Storage in the fresh of fruits and vegetables.</i>	<i>Potato, roots, onions, grain mass of the raised humidity and the majority of fruits storage in a condition gemybios with reduction to the certain borders of temperature and contained oxygen in an atmosphere.</i>
<b>II. Ana-bi-osis</b>	<b>A. Thermoana-biosis.</b>	<i>Storage in cool or freeze con-ditions. Psychroanabiosis - reduction temperature to 0 °C. Cryoanabiosis -storage lower temperature 0 °C.</i>	<i>Storage of fresh fruits of vege-tables. Storage of the frozen fruits and vegetables.</i>
	<b>B. Xeroanabiosis</b>	<i>Storage as a result of full or partial dehydration</i>	<i>Raisin, dried apricots, dried fruit and vegetables.</i>
	<b>C. Osmoana-biosis</b>	<i>Change osmosis pressure in a product under action of salt or sugar.</i>	<i>Salt of 12-13 % - osmosis pressure 7 MPa, sugar - 65 % - 35 MPa.</i>
	<b>D. Acidoana-biosis</b>	<i>Changing of the acidity of product's environment as a result of insertion of acid</i>	<i>Artificial ensilage fodder. Manufacturing of food vege-table and fruit marinades.</i>
	<b>E. Narcoana-biosis</b>	<i>Using the anesthetization agent</i>	<i>Adding of chloroform, salts propionic, ant and acetic acids, carbon dioxide of the raised concentration in grain mass and storage of fruit and</i>

### **III. Cenoana-b iosis**

**A.  
Acidoceno-anabi  
osis**

*Conservation by using acids which  
was produced by microorganisms*

**B.  
Alcoholce-noan  
abiosis**

*Conservation by using alcohol which  
was produced by microorganisms*

**A.  
Thermoste-ri-liza  
tion**

*Heating to the high temperature*

**B. Chemical  
ste-ri-lization**

*Insertion of antiseptics*

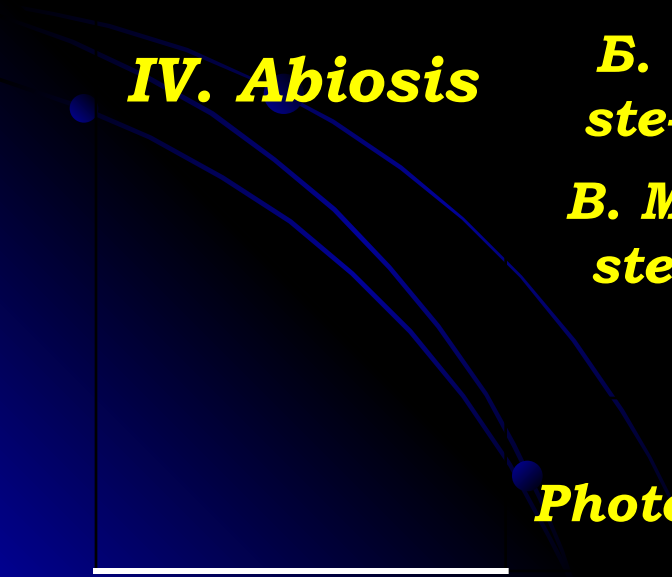
**B. Mechanical  
sterilization**

*Filtration on sterilization filters  
(ultrafiltration, microiltration)*

**Г.  
Photostereli-sati  
on**

*Using different rays (ultra-violet rays,  
heat rays and etc.)*

### **IV. Abiosis**



## *Role of Ukrainian scientist in building bases of quality, storage and processing technology of planting production*

- *The history of processing of grain total a millennium, about what confirm archeological excavations. So, 6-8 thousand years ago took place original storehouses for grain.*
- *For a feudal order peasants built special barns for storage of grain. For its grinding have begun to use millstone.*
- *The first attempts are to make greater reserve of grain in Ukraine to be done at the end of XV century . There are rye court yard, baker's shops in greater cities.*
- *By XVIII century - it is created Central state board - Provisions the order for supply of army with the foodstuffs.*
- *A.T.Bolotov has begun the edition of the first agricultural maga-zines.*
- *1765 - the Free economic society is founded (the project of the first elevator).*
- *XVIII century - a principle of a blow of grain for air with used bel-lows.*
- *In 1816 - «Rules for food armies» which established norms of humi-dity, cleanliness and a smell of grain. «Norms of natural losses were established at storage of grain».*

# Outstanding scientists

- ***P. Alecsandrov “Experience agricultural technology» (1853).***
- ***D.I. Mendeleyev has translated nine issue of “Technology” of Wagner (1862 - 1879).***
- ***V.P. Goriachkin - drying of grain.***
- ***Nikitinskiy (principles of storage of production of plant growing).***
- ***P.O. Kozmin “Flour-grinding manufacture”.***
- ***In 30th years of a question of improvement of quality, and processings of plant production research in the works K.A. Timiriazev, M.I. Vavilov, K.I. Debu, P.P. Lukyanenko.***
- ***The significant payment at revealing the reasons of losses of grain during storage have made O.I. Oparin, O.M. Bux, V.A. Kretovich, L.O. Trisvjats-ky.***
- ***The greater merit in development merchandising, biochemistry and tech-nology of storage of fruit and vegetable enter F.V. Tserevitinov, E. Shiro-kov, R. Tsiprush, P. Sokol, G. Djaneev et. al.***
- ***For last decades for development of a science works in M. Z. Xelemskogo, B.V. Lesuk, S.F. Polishchuk.***

**Thank you  
for attention**

