

NATIONAL UNIVERSITY OF PHARMACY
DEPARTMENT OF PATHOLOGICAL PHYSIOLOGY

HYGIENE IN PHARMACY AND ECOLOGY

«HYGIENIC ASSESSMENT OF HUMAN NUTRITION»

Kharkiv, 2017/18

Plan of lecture

1. Nutritional status, assessment methods.
2. Types of food, rational nutrition.
3. Dietary and therapeutic and preventive nutrition.
4. Degrees of food quality.
5. Food poisoning.

The quastions of Independent work

- Basic methods of studying nutrition.
Sanitary examination of food products,
stages, food poisoning.

Suggested Reading

Basic

- Hygiene in Pharmacy. Manual for foreign students of higher schools / O. S. Kalyuzhnaya, O. P. Strilets, L. S. Strelnikov et al. – 2nd Edition, supplemented and revised. – Kharkiv: NUPh, 2013. – 224 p.
- Bardov V. G. Hygiene and Ecology/ Editer by V. G. Bardov. – Vinnytsya : Nova Knyha Publishers, 2009. – 687 p.

Auxiliary

- Kjellstrom Y. Basic environmental health / Y. Kjellstrom, K. Guidotti. – Oxford. – 2001. – 546 p.
- General Hygiene and environmental health / Zaporozhan V. M., Bazhora Yu. I., Vitenko I. S. et al. – Odessa, 2005. – 300 p.

Information resources, including the Internet

- Library of NPhaU: <http://lib.nuph.edu.ua>
- Specialized medical and biological portals of the Internet.



OUR FOOD SUBSTANCES SHOULD BE OUR MEDICINE AND OUR MEDICINE SHOULD BE OUR FOOD SUBSTANCES.

Hippocrates



«The sense of our life is enjoying and contributing to it, not mere consumption of food»

Socrates

«Breakfast is overrated».

Ilya Ilf and Yevgeny Petrov

HYGIENE OF NUTRITION – the science that studies the effect of food, nutrition of human's health ,working on the fundamentals of a balanced diet

All nutrients are divided into:

PROTEINS

FATS

CARBOHYDRATES

VITAMINS

MINERALS

PROTEINS

**Nonessential
amino acid
synthesized in the
organism.**



**Essential amino acid
not synthesized in the
body.**

DAILY NEED- 80 – 120 G.

55 % Should constitute animal protein

FATS

Animal fats:

Lard, butter, sour cream

Consists of saturated fatty acids



Vegetable fats:

Vegetable oils, nuts

**FREE
polyunsaturated
fatty acids**

DAILY NEED - 90-160 g.

Vegetable fats must be at least 30% of the total amount of fats

CARBOHYDRATES

Digestible carbohydrates:

**Glucose, fructose, sucrose,
polysaccharides - starch**

Indigestible carbohydrates:

Cellulose, pectin

DAILY NEED- 350-600 g.



5%



VITAMINS

Fat-soluble vitamins - Retinol (A), calciferol (D), tocopherol (E), phylloquinone (K).



Water-soluble vitamins - ascorbic acid (C), thiamine (B1), riboflavin (B2), pyridoxine (B6), nicotinic acid, TIOFLAVONOIDY (P) CYANOCOBALAMIN (B12), folic acid, pantothenic acid.



Vitamin-like substances- choline, lipoic acid, orotic acid, Pangamic acid, vitamin U.



MINERALS

SODIUM

CALCIUM

PHOSPHORUS

MAGNESIUM



Na, K, Ca, Mg, P, I, Zn

FUNCTIONS OF FOOD

1. ENERGY



2. PLASTIC



3. BIOREGULATORY



FUNCTIONS OF FOOD



4. REGULATORY DIETARY-BREAD'S FIBER



5. IMMUNOREGULATORY (iron, zinc, iodine)



FUNCTIONS OF FOOD

NaCl



6. REHABILITATION

7. SIGNAL-MOTIVATIONAL (Spices)



BIOLOGICAL EFFECTS OF FOOD AND KINDS OF NUTRITION

SPECIFIC ACTIONS
(optimizing)

Balanced diet

PHARMACOLOGICAL ACTION
(replacement)

Dietary (medical) nutrition

PROTECTIVE ACTION
(treat)

Preventive nutrition

Balanced diet

This is a complete in quantity and quality food, which is for normal growth, development of the organism, disability, longevity



Principles of balanced diet

- 1. Quantitative high-grade**
- 2. Qualitative high-grade**
- 3. Rational regime**
- 4. Safe in epidemiological sense**
- 5. Cleanliness**

1. Quantitative wholesome of food

Daily diet consuming energy expenditure

Energy needs depends on age, occupation, living conditions, climate.

All adult population of working age (18 - 59 years) divided into 4 groups of labor intensity.

Criterion for inclusion in the intensive labor:

PHYSICAL ACTIVITY RATIO – The ratio of total energy costs for all types of DAY OF ABILITY TO LIVE to the value of basal metabolism.

INTENSITY GROUPS OF LABOR

1ST GROUP- Mental work - very easy manual labor

CFA= 1,4.





2ND GROUP Easy work with a small manual labor

(Pharmacists, drivers, shoemakers, nurses)

CFA =1,6.

3RD GROUP- LABOUR MODERATE
(Machinists, engineers)

CFA = 1.9



4TH - Rough labor

(Builders, Metallurgy)

CFA = 2.3 (for men) and 2.2 (for women).



2. The usefulness of the qualitative composition of food

The daily ration contains proteins, fats, carbohydrates, vitamins, minerals, flavors.

Correlation between proteins, fats, carbohydrates (in grams) during mental work:

P: F: C = 1: 1: 4.



Daily ration of high-calorie

Proteins - 12%

Fat - 25%

Carbohydrates - 63%

Daily food

1. DAIRY PRODUCTS



2. VEGETABLES, FRUIT



3. MEAT, FISH



4. BAKERY PRODUCTS, CEREALS



5. OILS



6. SWEETS



3.Rational diet

The number of take of food:

For adults - 3-4 times, for children - 5-6 times

Distribution of daily ration:

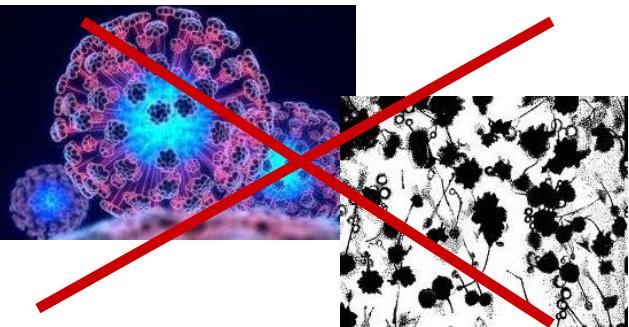
| | Breakfast | Lunch | Afternoon snack | Dinner |
|--------------------------|------------------|---------------|----------------------------|---------------|
| 3-meals a day | 30% | 45% | - | 25% |
| 4-meal a day | 25% | 35-40% | 10-15% | 25% |

4. Digestibility of food

Food must comply with enzymatic opportunities

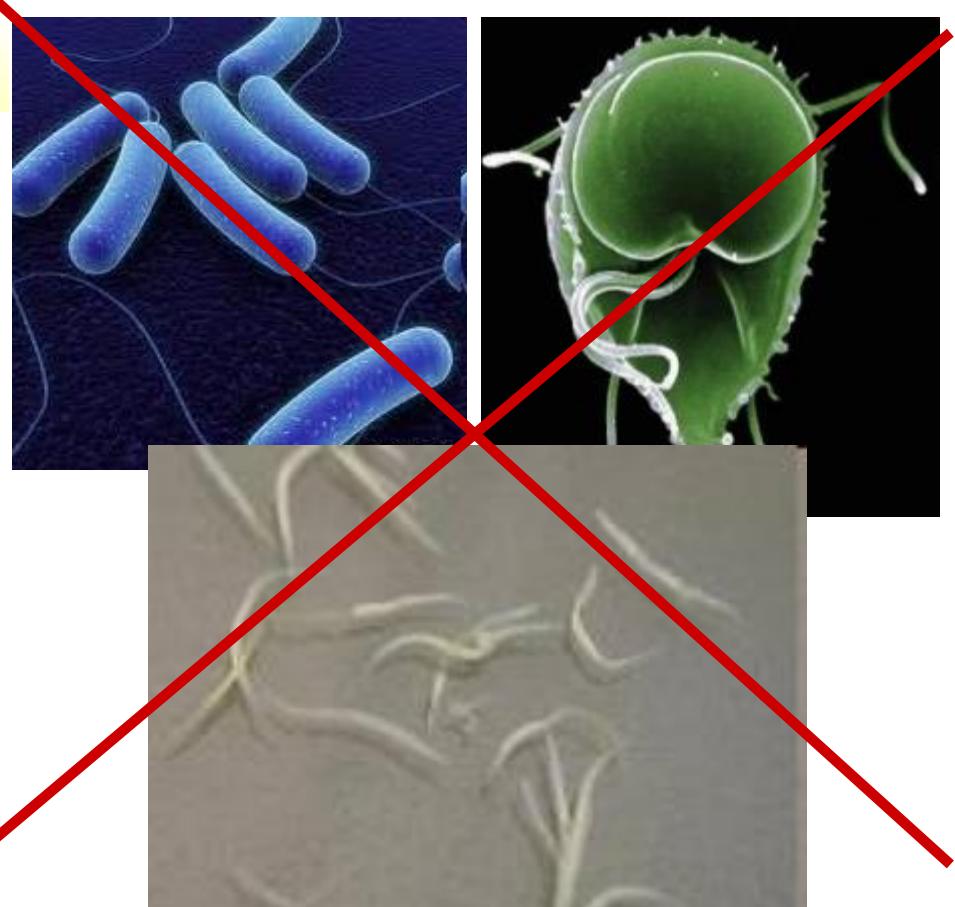


5. FOOD HARMLESSNESS



PRODUCTS TOXIC FREE

INFECTIOUS AGENTS



MEDICAL (dietary) NUTRITION

Based on sound nutrition, qualitative and quantitative changes in accordance with the disease

ACHIEVED exception of food substances, their special treatment.

USED BY:

Digestive diseases, metabolism, cardiovascular system, DS, liver, kidney



Diet № 1- peptic ulcer and 12 duodenal ulcer

Diet № 2 - chronic gastritis, acute gastro-enterocolitis

Diet № 3 - constipation

Diet № 4 - bowel disease with diarrhea

Diet № 5 - liver and biliary tract

Diet № 6 - Gout, kidney stones

Diet № 7 - acute and chronic nephritis

Diet № 8 - Obesity

Diet № 9 – Diabetes mellitus

Diet № 10 - Diseases of the CVS

Diet № 11 - Tuberculosis

Diet № 12 – nerves system disease

Diet № 13 - infectious diseases

Diet № 14 - nephrolithiasis with the discharge of calcium oxalate stones

Diet №15 - various diseases without diet

Preventive nutrition

Assigns for workers with occupational exposure to harmful physical or chemical factors.

Based on the principles of a balanced diet taking into account features exchange xenobiotics and the role of individual pieces of food, protective effect.

Components cover the deficit of biologically active substances improves the functional state affected organs and systems, neutralizes harmful substances to limit their accumulation, promotes their excretion from the body.

Used by:

Special diets,

Milk, dairy products,

vitamin preparations.

Nutritional status of the organism

The nutritional status of the organism - the physiological state of nutrition.

Classification of nutritional status (NS):

1st category.

OPTIMAL NS - the physiological state, the mass of the corresponding increase in age, sex, weight, work.



2ndCATEGORY

EXCESSIVE NS

(heredity,

overeating,

physical inactivity)



Obesity, 4-degree:

I - fat 15-20% exceeds the norm;

II - 30-49%;

III - 50-99%;

IV - 100% or more).



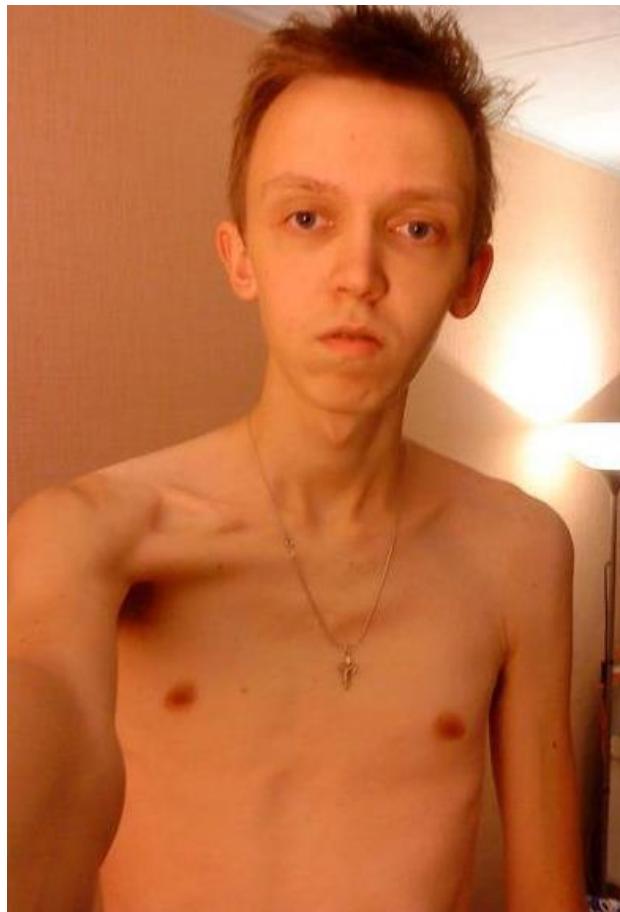
3rd category.

**INSUFFICIENT NS - BODY WEIGHT lags behind the age, height
(malnutrition, toil).**



Category 4.

NS premorbid physical disabilities, defects in diet



5 category – MORBID NS

STARVATION 2 FORMS

**cachexia (marasmus),
kwashiorkor (swelling)**



STUDY OF NUTRITIONAL STATYS

Objective indicators:

1. Somatoscopic:

Examination of the body a person or group (standard-setting, hypo- hypersthenics, harmonious shapes, fatness (NORM, thinness, obesity), color of skin, mucous membranes, nails).

2. Somatometric:

Measurement of length, weight, of the bust, shoulders, waist, hips.

Measuring the thickness of skin (under the lower angle scapula, on the back side middle of the shoulder, on the side of the chest, abdomen).

INDEX Brock - normal body weight (BW) in kg corresponds to the growth (G) in centimeters minus 100 (105 or 110):

MALE:

GROWTH = 155-165 cm; BW = height - 100.

GROWTH 166-175; BW = height - 105.

Growth of more than 175 cm; BW = height - 110.

WOMEN IN ALL CASES OF BODY WEIGHT should be less 5%, than men.

Ketle index - BODY MASS INDEX

BMI = body mass, KG

GROWTH, M²

Normal values of BMI - 18.5 - 25 kg/m²

Inadequate (BMI) <18 kg/m²

Redundancy (BMI) of 25 - 30 kg/m²

Obesity (BMI) > 30 kg m²

QUALITY DEGREE OF FOOD

Benign product –used without restrictions.



Low quality product- the deviation from normal

QUALITY DEGREE OF FOOD

Low quality product- the deviation from normal



Degree of product quality

Conditional suitability of the product - causes a disturbance of the deviation, eliminates processing

Substandard product - causes of ill-health





Food poisoning and prevention



CLASSIFICATION OF FOOD POISONS

**Microbial
Non-microbial
Undetermined Etiology food poisons**



Bacterial

Relevant toxins: **Cl.botulinum, Stafilococcus spp.**



Symptoms of gastritis, diarrhea, dehydration

Food mycotoxicoses

CAUSES: toxins fungi Fusarium (bread).

CLINIC: septic sore throat.

CAUSES: toxins fungi Claviceps purpurea (bread)

CLINIC: ergotism

CAUSES: Aspergillus toxins (soybeans, peanuts) –

CLINIC: aflotoxicosis



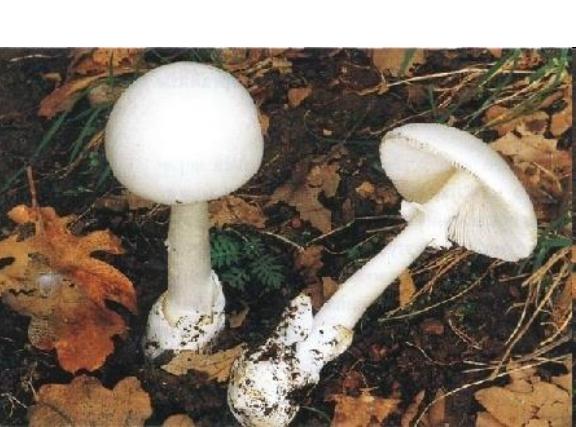
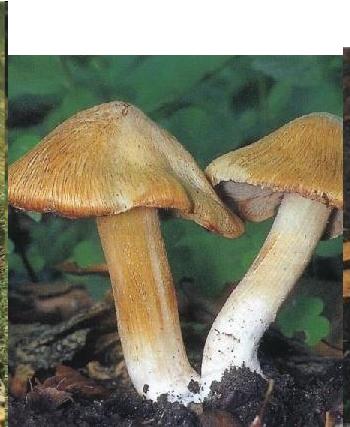
Not-microbial

Thermostable poisons:

- Cytotoxins
- Neurotoxins
- Intestinal toxins

Poisonous mushrooms

Clinic: abdominal pain, vomiting, diarrhea, coma, and death.



VEGETABLE PRODUCTS

- alkaloids
- organic acid
- glycosides (**Belladonna, lily of the valley**)
- amygdaline- hydrocyanic acid
(Apricot, peach, quince, cherry bones)



ANIMALS

Tetradotoxin (fish: tuna, mackerel, fugue)

Clinic: vomiting, diarrhea, coma, death



**THANKS FOR
ATTENTION!!!**