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DEPARTMENT OF GENERAL HYGIENE
AND PHYSICAL CULTURE

Kusova A.R., Tsilidas E.G.

HYGIENIC EXAMINATION HIGH QUALITY OF FOODSTUFF ANIMAL ORIGIN

Methodical recommendations to a practical training
for teachers and students of the II course of medical faculty

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Kusova A.R., Tsilidas E.G.

Hygienic examination high quality of foodstuff animal origin: methodical recommendations to a practical training about hygiene for students

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This training manual contains material that reflects modern hygienic ideas about the most important factor in the human environment - nutrition. The data on the types and functions of nutrition, basic hygienic requirements for the preparation of a food ration are presented. The information on regulated and unregulated human energy expenditure, the main components of a balanced diet, and the principles of constructing a diet is given. Methods for studying the actual nutrition of the population are described.

The manual contains situational tasks, test tasks, a list of the main and recommended additional literature that facilitate the assimilation of the material.

Methodical recommendations "Hygienic examination high quality of foodstuff animal origin", prepared in the discipline "Hygiene" in accordance with the Federal State Educational Standard of Higher Professional Education for students studying in the specialty General Medicine (05.31.01).

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Reviewers:

Kalagova R.V. - Doctor of Chemistry, Associate Professor, Head of the Department of Physics and Chemistry of the FSBEI of HE NOSMA of the Ministry of Health of Russia.

Tuaeva I.Sh. - Candidate of Medical Sciences. Associate Professor of the Department of Hygiene of the PMF with the course FPAE of the FSBEI of HE NOSMA of the Ministry of Health of Russia.

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Problem of sanitary and hygienic examination is determination of nutrition value of a product and its harmlessness for health of the person.

"Nutrition value" is all completeness of properties of foodstuff, including providing the person with this product of the physiological needs for the main feedstuffs and energy.

"The biological value" - degree of compliance of amino-acid composition of food protein to requirements of an organism.

Requirements to nutrition value are applied in relation to the following groups of raw materials and animal products: meat, meat products, bird and eggs, milk and dairy products, fish, fish and other products of the sea, fatty products.

When conducting sanitary examination define organoleptic properties of a product, compliance to his hygienic indicators, deviations in his chemical composition, the nature of bacterial pollution, his role in possible transmission of infection and in developing of food poisonings, find out storage conditions. Problems of sanitary examination include also establishment of conditions of realization of foodstuff, a possibility of his processing or need of destruction.

Sanitary and hygienic expertize is carried out as planned work of SES and over and above the plan (in the presence of special epidemiological indications) and also in an arbitration scheme.

Planned sanitary and hygienic expertize is carried out as precautionary and current sanitary inspection, quality control of products on organoleptic, physical and chemical, bacteriological indicators is exercised. Sampling of foodstuff and products at the enterprises of food industries, objects of trade, public catering is for this purpose made for a laboratory research.

Work on sanitary and hygienic examination includes:

1. Control of quality of perishable goods (milk, boiled sausages, culinary, etc.).

2. Control of release of new products, new materials and equipment.

3. Control of the content of residual amounts of pesticides, salts of heavy metals, antibiotics, harmful impurity, nutritional supplements.

4. Control of quality of ready food in child care facilities, educational institutions, catering departments medical, treatment and prevention facilities, catering establishments.

Unplanned sanitary expertize is carried out according to epidemiological indications in disputable cases in an arbitration scheme, at the request of the public, investigating authorities.

On quality foodstuff divides into the following categories:

a) good-quality;

b) substandard (the expressed unsatisfactory organoleptic indicators constituting health hazard or having);

c) conditional and good foodstuff (can become suitable in food after application of the corresponding processing). Such products don't meet some hygienic requirements, but don't constitute health hazard of the person.

Falsification of products - a fake or partial replacement of a natural product (meat, milk, honey, etc.) to others - cheaper, less nutritious at which the quality or naturalness of this product worsens addition of substance, alien, worst on quality, or removal of important (main) elements (or components).

Types of counterfeits (impurity):

1. Deliberate impurity: consist of sand, a marble crumb, a stone, clay, pounded chalk, the water added to milk, the harmful dyes and mineral oils added to edible oils.

2. Collateral impurity: consist of the remains of pesticides, a dung of lizards, rodents and larvae in food.

3. The pollution containing metals: arsenic of pesticides, lead from water, mercury, etc. belong to it.

Products substitutes - replacing what - or other product with which it has some general properties, but has no his qualities (for example barley coffee, soy meat, powdered milk, egg powder, etc.).

"Nutrition value" is all completeness of properties of foodstuff, including providing the person with this product of the physiological needs for the main feedstuffs and energy.

Treat the indicators characterizing nutrition value of products:

- Power value – amount of the energy which is formed in an organism at dissimilation of a product;

- Digestibility – compliance of the chemical composition of a product to the fermental systems of an organism;

- Comprehensibility – relative extent of use by an organism of the separate nutrients arriving with foodstuff;

- The Priyedayemost – the speed of development of a negative dynamic stereotype of the choice and consumption of this or that foodstuff.

"The biological value" - degree of compliance of aminokislovy composition of food protein to requirements of an organism. The quality of fatty components of foodstuff is defined by an indicator of the biological efficiency reflecting contents in them polynonsaturated fatty acids.

Hygienic examination of milk.

Milk on the biological and nutritious properties is one of the most valuable food for all groups of the population. It is of particular importance in food of children, elderly people, in dietary food.

The nutrition value of milk is defined by contents in number of protein, fat, vitamins, macro - and minerals and power value. Milk contains more than 90 components, 20 balanced amino acids, about 20 fatty acids, 25 various mineral substances (calcium, phosphorus, zinc, iron, copper), 12 vitamins (A, D, groups B, insignificant amount of vitamin C). Chemical composition of cow's milk: 88,6% - waters; 2,8% - proteins; 3,2% - fats; 4,7% - carbohydrates; 0,7% - ashes. The good comprehensibility and high power value (100 g of milk-65 of kcal) are peculiar to milk.

Sanitary and hygienic requirements to milk.

Milk has to meet for organoleptic, physical and chemical and microbiological indicators the requirements of the standard.

Milk shouldn't support strangers of mechanical impurity and the preserving substances.

Methods of a laboratory research of milk.

Sampling. For carrying out a laboratory research not less than 250 ml of milk undertake, the studied milk carefully mixes up. From the joint test after hashing take 0,5 dm3 for the analysis.

Organoleptic research of milk.

The color of milk is determined in a glass, on a white background. Whole cow's milk has a white color with a slightly yellow tint, removed or diluted with water - a bluish tint. Reddish color indicates an admixture of blood (udder disease) or associated with food (carrots, beets). Milk is poured into a conical flask, closed with a clean stopper, slightly heated in a water bath. Fresh milk has a peculiar milk smell. A sour smell indicates the process of souring milk. Foreign odors are observed in cases of improper storage of milk together with strongly smelling substances (soap, kerosene, turpentine, gasoline, naphthalene). There may be a smell of drugs.

The taste of benign milk is pleasant, slightly sweet. Sour taste indicates that the souring of milk. Bitter, salty, rancid, fish, soap and other flavors are observed when feeding animals with bad food, animal disease, lactation period, strong contamination of milk, impurities.

The consistency of milk should not be watery and viscous. Viscous consistency is associated with the development of bacteria that secrete mucus. In the first days after calving, milk has a thick and viscous consistency, yellowish color, unpleasant salty taste, specific smell (colostrum). Colostrum is not used in food, because it has a bad taste and a laxative effect. The consistency of milk is determined by eye in a glass vessel. With a mucous and viscous consistency, milk has a significant viscosity, stretches along the walls of the vessel.

Determination of specific weight (density). The normal proportion of milk is 1,028-1,034. The addition of water to the milk causes a decrease in specific weight, and the removal of cream increases it due to the removal of the light part – fat.

Determination of the proportion of milk produced by the hydrometer-lastdelimiter.

Determination of the fat content in milk – produced device butyrometer. According to the established norm, the fat content in milk should not be less than 3.2%. The amount of fat depends on the breed of cattle, feed, season, etc.

Determination of the dry residue is made by laboratory method.

The amount of fat-free substance is determined by subtracting the percentage of fat from the percentage of dry matter.

Evaluation of the freshness of milk is made by determining the acidity, coagulation tests in boiling and samples for reductase.

Determination of acidity. The acidity of the milk is determined by titration in degrees of Turner. Fresh milk has 16-19 degrees of acidity.

Reductase sample. Milk always contains a significant amount of microbes that release the enzyme reductase, which discolours some coloring substances.

Method. In a sterile tube, pour 10 ml of milk, 2-3 drops of 1% solution of methylene blue, stir, put in a thermostat: - 37-40°C). If discoloration of the solution does not occur within 5-7 hours, the milk is slightly seeded. When abundant contamination of milk microbes discoloration occurs from a few minutes to 1 hour.

Determination of impurities in milk. Impurities are added to the milk for the purpose of falsification. Most often added sodium bicarbonate and starch. Soda is added to the milk in order to keep it from souring. This is not allowed by sanitary legislation.

Hygienic examination of meat.

Animal meat is the main source of valuable proteins and fats. They provide the body with essential amino acids. The meat contains vitamins (a and b groups), mineral salts (potassium, phosphorus, sodium, iron). Internal organs (liver, kidneys, heart) are rich in b vitamins, vitamins "A", etc.

The meat belongs to the category of perishable goods that can easily be modified with the formation of toxic substances due to the decomposition of amino acids. It can be a factor in transmission of several diseases of animals and humans (anthrax, brucellosis, tuberculosis, actinomycosis, fines, etc.), to be the cause of food poisoning, caused by bacteria of the group of paratyphoid (Salmonella), Bacillus of botulinus etc. Therefore requires strict veterinary-sanitary and sanitary supervision of slaughter animals and meat.

Sampling. For the study taken from carcasses or parts of samples, one piece weighing not less than 200 g of the following places: against IV and V of the cervical vertebrae in the region of the scapula, thigh and thick parts of the muscles. Each sample is Packed in parchment or plastic food film, which indicates the name of the tissue or organ, the number of carcasses. Samples taken from one carcass are Packed in a paper bag and placed in a metal box, sealed and sealed. The samples shall be accompanied by a document indicating the date and place of sampling, type of livestock, carcass number, reason and purpose of the study. The document is signed by the sender.

The hygienic examination of meat is based mainly on the indicators of freshness. To do this, the determination of organoleptic characteristics, chemical research and microscopy.

Distinguish between benign meat (fresh), conditionally-good (questionable freshness) and stale. Conditionally suitable meat requires disinfection, special treatment.

Organoleptic study of meat.

Define appearance and color. At external examination, note the color of muscle tissue and fat on the surface of the fresh cut, the presence of surface slippage, moisture and stickiness of meat on the surface and on the cut. The degree of moisture is checked by applying a piece of filter paper to the cut surface. Fresh meat gives light moisture.

Determination of consistency. In the fresh cut hole from finger pressure equalized quickly, the meat questionable freshness — slow (1 minute).

Definition of smell. First, the smell of the surface layer is determined, then the smell of the cut surface is determined.

Determination of the state of fat. Examine the colour of the fat, the smell, the consistency with crushed bits of fat fingers.

Determination of the condition of tendons. Feeling establish their elasticity, density, condition of the joint surfaces.

Determining the status of the bone marrow. Attention is paid to the position of the bone marrow in the tubular bone, after which it is extracted, determine the color, elasticity and Shine on the fracture.

To recognize the initial signs of meat spoilage, it is recommended to do the following tests:

1. Heat the knife, cut the meat closer to the bones (the meat begins to deteriorate from the bones), then remove the knife and immediately smell. In the presence of damage to the meat from the surface of the knife will come an unpleasant smell of rot.

2. Lower the meat for a short time in boiling water and then smell; in the presence of damage, an unpleasant smell appears.

3. 30-50 g. boil meat in a small amount of water for 20-30 minutes in a closed pan. In the presence of damage, the broth is cloudy and has an unpleasant smell. Transparency is determined in the cylinder at 25 ml, pouring 20 ml of broth.

Chemical research

The reaction of free ammonia. When rotting meat, the released ammonia in the presence of hydrochloric acid forms a white cloud of ammonium chloride. Meat should be 1-2 cm above the level of the reagent. The resulting cloud of vapors of ammonium chloride indicates rotting meat.

Hydrogen sulfide sample. A small piece of the meat is placed in a beaker and closed glass sheet of thick paper, on the lower surface of which is applied 1-2 drops of alkaline solution of lead acetate. After 10-15 minutes, remove a sheet of paper. In the case of rotting meat, accompanied by the release of hydrogen sulfide, there is a brown (black) spot, as sulfur lead is formed.

Chemical studies also include the determination of ammonia by Nessler, reaction to peroxidase, reaction with copper sulfate, determination of volatile fatty acids, etc.

Bacteriological examination of meat. To determine the number of microorganisms make smears prints. In smears-prints of fresh meat bacteria are absent or in a single quantity there are cocci and sticks. There's no residual decomposed muscle tissue in sight. In the meat of questionable freshness found 20-30 cocci in the field of view and a few sticks, traces of tissue decay. In stale meat found a lot of microorganisms with a predominance of sticks, a large number of decayed tissues.

A study of meat for a Finn and Trichinella.

1. Lose meat with larvae of swine or bovine tapeworm is called cysticercosis (finnson). They are visible in the form of small white inclusions the size of a pin head to a pea. Finns differ from grains of fat in that they are crushed harder and with some crack. Finns are more common in the muscles of the heart, abdomen, masticatory and intercostal muscles. Upon detection of an area of 40 cm2 of the cut muscles more than 3 Finn carcass and offal is subjected to technical utilization. If found on the same area no more than 3 Finn meat is considered conditionally suitable and allowed to use after preliminary disinfection. In this case, the meat is boiled in pieces weighing no more than 2 kg and a thickness of 8 cm for 3 hours or cooking is carried out under a pressure of 1.5 ATM. - 1.5 hours. It is possible to neutralize pieces of meat up to 2,5 kg by salting for 20 days. When freezing, the meat is brought to a temperature of -10°C and kept for 10 days at t -12°C.

2. The meat can be affected by the larvae of Trichinella.

Trichinella refers to roundworms, found mainly in pork meat. Two samples of meat from the diaphragm legs, intercostal or masticatory muscles are taken for the study, and 12 sections are examined from each sample. Consider Trichinella under a microscope. They are visible in the form of folded into a spiral or curved worms, surrounded by a capsule. For the study of meat on Trichinella often use a

special device compressor. If at least one Trichinella is found in 24 sections, the carcass and by-products are sent for technical disposal or destruction.

Drawing up of the report. The evaluation is given on a 25-point system.

Study of canned food.

Canned food are meat, fish, meat, vegetable, fruit, dairy. Food products in hermetically-sealed cans are divided into canned, pasteurized, sterilized and unsterilized (preserve). Preserve can be kept short and only in the cold. Canned food and preserves are available in tin or glass containers.

Sampling. For laboratory research, at least 10 pieces from the batch are selected. If the batch of canned food has banks with damages, the number of samples is doubled. Selected samples of canned food for research are accompanied by relevant documents.

Determination of the appearance of the container.

All canned goods must have a label or lithographed surface.

The impression can be given all in 2 lines on a cover or on a cover in 2 lines with production date, number of change and assortment number, and on a bottom with an index of system, number of the enterprise.

Reading the print of canned food:

Or 131088 131088 on the cover

1183A151 1183

on the bottom A151

Canned worked out October 13, 1988 1 the change with assortment number 183 enterprise meat industry No. 151.

During the examination of cans pay attention to their surface. Banks should be smooth, undeformed, not rusty. Pay attention to the configuration of cans. If the configuration is violated, it may be noted: bombing-swelling of the bottom or cover of the bath, melting after pressing it with your fingers; clapping-the bulge of the bottom or cover, which when pressed disappears at one end of the can and simultaneously occurs at the other end, accompanied by a characteristic slamming sound. Bombing can be physical, chemical or biological

Physical bloat — swelling of the cans in the result of the overflow of their product or because of the freezing of the contents of the cans. Swelling may also be observed immediately after sterilization (temporary or false bombing).

Chemical bombing is the swelling of the cans as a result of the accumulation of gas formed in the process of electrolytic dissociation during corrosion of the inner surface of the metal can.

Biological bombing is the swelling of cans due to the increase in pressure inside the cans as a result of the release of gaseous products of microorganisms.

Data of external examination, banks are entered into the Protocol analysis.

Determination of tightness is made by several methods, the simplest of which is the immersion of cans in warm water. Metal cans are placed in heated to a boil water in a row (the water temperature should not be below 85° C; a layer of water above the banks - not less than 25 — 30 mm). The appearance of a trickle of bubbles in any place of the Bank indicates its leaks.

Banks should be kept in hot water for 5-7 minutes in a vertical position at the bottom, and then on the lid.

Determination of the state of the inner surface of metal cans. Banks free from the contents, wash and wipe dry. Note: the presence and extent of dark spots (due to exposure of iron or the formation of sulfur and other compounds); the presence and extent of rust spots and other changes.

Organoleptic evaluation is carried out after obtaining satisfactory results of microbiological and chemical analysis. Canned food, which must be brought to culinary readiness, is prepared according to the method specified on the label. When assessing the smell, determine the aroma, the harmony of odors, establish the presence of foreign odors. In determining the color set different deviations from the color specific to this type of product. In assessing the consistency is determined by the density, stickiness, hardness of the product. The taste of the product should correspond to the type of canned food.

Physico-chemical studies. Preparation of samples: fruit, vegetable, meat and meat-vegetable products are ground, rubbed, mixed, removed bones, spices,

impurities; products containing animal fats are heated in a water bath or in a thermostat to melt fat; frozen products are pre-defrosted in a closed container. When carrying out physico-chemical research is carried out to determine acidity, dry matter, salt.

CONTROL QUESTION

1. What is the nutritional and biological value of food
2. What are the tasks of sanitary and hygienic examination of food products
3. How to carry out scheduled and unscheduled sanitary examination
4. How is the sampling for laboratory analysis in the examination of milk, meat, canned food
5. What methods determine the quality of food
6. What categories of food products are divided by quality
7. What is the nutritional value of milk
8. How to produce organoleptic milk research
9. How to determine the fat content in milk
10. What methods are used to determine the freshness of milk
11. What is the nutritional value of meat
12. What is the sanitary and epidemiological importance of meat
13. How is the quality of meat evaluated
14. To characterize the signs of fresh, conditionally-fit and stale meat.
15. How is the sanitary examination of canned food
16. What do the impressions on the can mean?
17. How to assess the tightness of canned food