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So, the cultivation of channel catfish in polyculture with carp is economically profitable, since it allows you to make a profit of UAH 85,072 and provides a profitability level of 35%.

Conclusions. 1. For the implementation of the developed project of growing 17 thousand pieces of commodity catfish on 8 hectares of pond must have 41483 pcs. larvae, 26964 pcs. this year, 20223 pcs. one-year-old. In order to provide the farm with larvae in the planned year it is planned to have 2 broodstock.

2. Taking into account the fact that catfish was planned to be grown in polyculture, the required number of carp larvae is 78,304 pieces, this year -50,898 pieces, annuals - 38,174 pieces. Thus the exit of commodity biennials will make 32448 pieces.

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Svechkova

СПОСОБИ ВИЗНЧЕННЯ ТРИХІНЕЛЬОЗУ У ПРОДУКТАХ ТВАРИННОГО ПОХОДЖЕННЯ

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METHODS OF DETERMINATION OF TRICHINELOSIS IN ANIMAL ORIGIN

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Анотація

Трихінельоз - небезпечне зоонозне захворювання, яке спричиняють личинки і статевозрілі нематоди з роду *Thrichinella* виду *Thrichinella spiralis* (має найбільше значення, капсульний вид), *thrichinella pseudospiralis*, *thrichinella rariar* і (безкапсульні види). Вид *T. spiralis* має підвиди: *T spiralis spiralis*, *T spiralis britovi*, *Tspiralis nativa*, *T. spiralis murrelli*, *T. spiralis nelsoni* (капсульні).

Збудник - дуже дрібні волосоподібні нематоди, самці 1,4-1,6 мм завдовжки і 0,04 мм завтовшки, самки - відповідно 3,5-4,4 і 0,06 мм, живородні.

Хворіють на трихінельоз свійські та дикі свині, коні, ведмеді, борсуки, нутрії собаки, коти, вовки, лисиці, гризуни (щури, миші), морські ссавці (білуги, моржі, тюлені) - всього більше 100 видів ссавців, деякі види птахів, земноводних (жаби, крокодили), м'ясоїдні комахи, ракоподібні, риби, а також люди.

Шляхи зараження. М'ясоїдні і люди заражаються трихінельозом через споживання зараженого личинками м'яса. Такі несприйнятливі тварини, як *ракоподібні, риби, м'ясоїдні комахи* поглинають, інвазійні личинки трихінел чи живородних самок виділяють їх у зовнішнє середовище і вже потім вони можуть потрапляти до шлунку свого звичайного господаря продовжувати еволюційний цикл (явище форезії). *Коні* можуть заражатися через корми, в які додають борошно тваринного походження (що може бути інвазо-ване); в разі спотвореного апетиту при порушенні обміну речовин, поїдання трупів щурів, м'ясоїдних комах, трави.

Abstract

Trichinellosis is a dangerous disease caused by larvae and mature nematodes of the genus *Thrichinella* of the species *Thrichinella spiralis* (the most important is the capsular species), *thrichinella pseudospiralis*, *thrichinella rariar* and (non-capsular species). *T. spiralis* has subspecies: *T. spiralis spiralis*, *T. spiralis britovi*, *T spiralis nativa*, *T. spiralis murrelli*, *T. spiralis nelsoni* (capsular).

The causative agent is very small hairy nematodes, males 1,4-1,6 mm long and 0,04 mm thick, females -respectively 3,5-4,4 and 0,06 mm, viable.

Diseases of trichinosis are domestic and wild pigs, horses, bears, badgers, dog nutrium dogs, cats, wolves, foxes, rodents (rats, mice), marine mammals (beluga, walrus, tulle) - more than 100 species of mammals, some species birds, amphibians (frog, crocodiles), carnivorous insects, crustaceans, fish, as well as people.

Ways of infection. Meatballs and people are infected with trichinosis due to the consumption of infected meat larvae. Such susceptible animals as crustaceans, fish, carnivorous insects absorb, invasive larvae of *trichinella* or viviparous females isolate them into the external medium, and then they can fall into the stomach of their ordinary host to continue the

evolutionary cycle (the phenomenon of fororism). Horses can become infected through feeds, which are fed with flour of animal breeding (which can be invasive); in the case of disturbed appetite in case of violation of metabolism, eating corpses of rats, carnivorous insects, herbs contaminated by the remains of diseased animals or isolates of carnivorous insects.

Ключові слова: трихінельоз, тваринницька продукція, лабораторна діагностика.

Keywords: trichinelosis, livestock products, laboratory diagnostics.

Actuality of theme. The life cycle of *Trichinella* occurs in the body of one host. The sexually mature helminth parasitizes in the intestines of humans and animals, and the larval stage - striated muscles. Humans and animals become infected through meat containing invasive parasite larvae. There is a very low probability of human infection through infested fruits and various plants, as well as through the consumption of poultry meat. After digestion of meat in the stomach, the larvae are retained in the duodenum and after 36 hours become mature. Males fertilize females and die. Females are screwed with their main end into the mucous membrane due to hooks and secretion of proteolytic enzymes. Females in 6-7 days give birth to 1500 to 10000 live larvae within 30-45 days, and then die. The larvae have the same hooks and pierce the mucous membrane as adults. Then the larvae through the lymphatic vessels of the intestine, thoracic lymphatic duct enter the right ventricle of the heart. Then, after a short pulmonary stage, in 10 hours they reach the left ventricle of the heart, through which they enter the great circle of blood circulation and spread to all organs and tissues of the body. However, only those that will be localized in the transversely striated muscles will be able to develop, others - die. Larvae can also cross the placental barrier and infect embryos. The most popular sites of *Trichinella* are the muscles of the legs of the diaphragm, tongue, esophagus, intercostal, masticatory, sublingual, laryn-geal muscles, neck, ears (in case of significant invasion), eyes, pectoral muscles, flexors, extensors. 16-17 days after consumption of muscle parasites, *Trichinella* reaches the invasive stage, being in the muscles, have an S-shape. On day 30-35, they twist into a spiral (3.5 turns), a single-layer capsule is formed around the larvae, and after three months the capsule begins to calcify. After 15-16 months, the process of calcification of the capsules of larvae ends. Encapsulated *Trichinella* larvae are lemon-shaped or oval in shape. Capsule length - 0.5-0.7 mm, width - 0.2-0.3 mm. *Trichinella* larvae do not form capsules, they move freely between muscle fibers. The viability of muscle trichinae persists in animals for many years, and in humans - up to 25 years. When *Trichinella* is localized in a muscle cell, they cause differentiation of the muscle fiber and the cell where the parasite is located to function as a placenta and provide nutrition to the parasite. In corpses, muscle larvae persist for up to 300 days. Therefore it is impossible to leave unburned corpses. Cooking meat can disinfect larvae only when the temperature in the muscle thickness reaches 80 ° C for 10 minutes. At a temperature of -12 ° C *Trichinella* remain viable for 2 months, at -15 20 ° C - 20 days and at -30 ° C - 12

In humans, the characteristic clinical signs of the disease usually appear 3-4 weeks after infection: fever, severe toxicosis, muscle pain, swelling in the eyes, lower jaw, rash, when consuming significantly infested meat, severe disorders of the gastrointestinal tract. If 1 g of raw material contains about 2 thousand *Trichinella*, a person usually suffers from a fatal outcome that occurs in a few days. In animals, in particular in pigs, no clinical signs of the disease are observed.

Methods of lifelong diagnosis of trichinosis. The Vinnytsia RDL of the State Service of Ukraine for Food

days. Ordinary smoking of sausages and hams does not affect the viability of larvae [1,2,3,4,14,1].

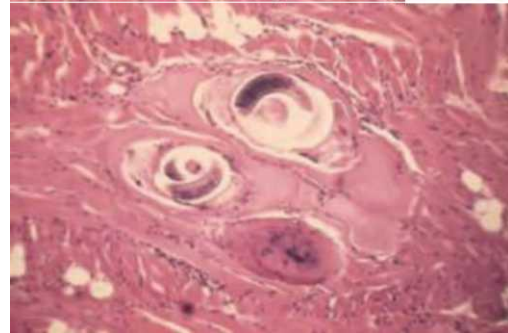


Fig. 1. The larva of the causative agent of trichinosis in muscle tissue.

Safety and Consumer Protection conducts the method of enzyme-linked immunosorbent assay (the most promising). This method is based on the indication in the serum of specific antibodies. ELISA has a high sensitivity and detects the level of invasion - 1 larva per 100 g of muscle for 2-3 weeks after infection of the animal. With the help of compressor trichinoscopy, such carcasses are detected only by chance. Therefore, more than 20% of carcasses of pigs with low intensity of invasion can be sold after trichinoscopy without restrictions. Lifelong diagnosis of trichinosis in pigs, horses, wild boars and carnivores according to the "Instruction on diagnosis, prevention and elimination of animal trichinosis" (2007) is carried out by detecting antitrichinelosis antibodies in serum samples by ELISA. If positive ELISA results are obtained, a repeat study is performed in 3-4 weeks. In case of repeated positive ELISA result, the animal is registered, the data on it are sent quarterly to the veterinary department in the area. After slaughter of such an animal, diagnostic tests for trichinosis are performed by the method of artificial digestion of muscle samples. Vinnytsia RDL of the State Service of Ukraine for Food Safety and Consumer Protection by ELISA conducts annual monitoring studies of pigs, horses, wild boars and carnivores, as well as studies of all livestock in disadvantaged areas. In the laboratory, the diagnosis of trichinosis is considered to be established by obtaining positive results of laboratory tests by detecting larvae of *Trichinella* by digestion of muscle samples in artificial gastric juice and compressor trichinoscopy. Serum, blood plasma and intermuscular fluid are selected for enzyme-linked immunosorbent assay in accordance with the guidelines for the use of diagnostic kits [5,6,7,8,14]. Double gel diffusion method. Annular precipitation reaction. Allergy tests. Indirect immunofluorescence reaction. Complement binding reaction. Biopsy. Postmortem diagnosis is the main and reliable method of detecting trichinosis.

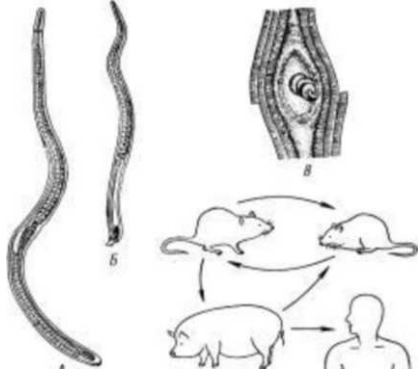


Fig. 2. *Trichinella* (*Trichinella spiralis*; A - female; B - male; C - encapsulated in the muscle fiber larva; D - the main route of circulation of trichinosis in nature.

Procedure and methods of research of meat and meat products for trichinosis. The Vinnytsia RDL of the State Service of Ukraine for Food Safety and Consumer Protection tests for trichinosis are conducted in accordance with the "Rules of pre-slaughter veterinary inspection of animals and veterinary examination of meat and meat products" (2002) and "Instructions for diagnosis, prevention and elimination of animal trichinosis" (2007). Every carcass of pork, nutria, carcasses of horses and wild animals (wild boars, bears, badgers, etc.) slaughtered at slaughterhouses, meat processing plants, slaughterhouses, farms, slaughter, hunting, etc. must be subject to veterinary treatment. sanitary examination with mandatory trichinostomy using a microscope (trichinoscope) or digestion of muscle samples in artificial gastric juice. In the study of samples at slaughterhouses and meat processing plants, as well as horse carcasses, the priority is the method of digestion of muscles in artificial gastric juice [14].

The pathogen is bisexual. Males are 1.2-1.6 mm long

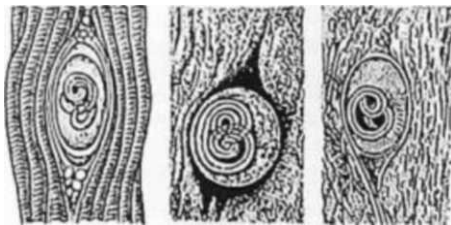


Fig. 3. Encapsulated larvae of *Trichinella* in muscles: a - pigs, b - foxes, c - a bear.

and 0.04 mm wide. Female dimensions: length from 1.5-1.8 mm to 4.4 mm, width - 0.06 mm. Their body is round, filamentous, slightly narrowed in front. At the front end is the mouth, which leads to the oral capsule, equipped with a stylet. Pathogens parasitize in the lower parts of the small intestine of humans or animals (intestinal *Trichinella*). The development of intestinal *Trichinella* occurs in the host's body after eating the meat of an animal infested with *Trichinella* larvae (muscle *Trichinella*). After the meat is digested in the stomach and the capsules containing the larvae are dissolved, the latter enter the small intestine. In a day they turn into males and females. Fertilized females with the help of the main stylet are attached to the intestinal mucosa and reach sexual maturity in a day. Females are viviparous. 80-90 hours after infection with human or animal trichinosis, females give birth to larvae, which enter first the

lymphatic and then the blood vessels, which are distributed throughout the body. They penetrate various organs, but their further development takes place in the striated muscles. By releasing hyalu-ronidase, the larvae enter the sarcolemma of the muscle fibers. After 18-20 days in the muscles, they grow to 0.8-1 mm, twist spirally and become invasive. After 3540 days, a capsule forms around the muscle trichinae due to the reaction of the surrounding tissue. The capsule wall consists of a thin connective tissue and transparent hyaline layers. The average size of capsules in humans is 0.6x0.2 mm. After 14-18 months. capsule calcification begins, which lasts up to 2 years. In the capsules, muscle trichinae remain viable for many years. Intestinal trichinae live much less - from 10 to 56 days in animals and 45-56 days in humans. During life, one female in the body of different animals gives birth to 200 to 2000 larvae, in the human body - an average of 1500. There are different infestations of *Trichinella* larvae in different muscle groups. In humans, muscular trichinae most often affect the legs of the diaphragm, intercostal, laryngeal, masticatory and abdominal muscles, tongue. When animals and humans eat meat affected by *Trichinella* larvae, the latter are released from the capsules and attached to the small intestinal mucosa of the new host, which undergoes the specified biological cycle of *Trichinella* development. The human or animal body is both a final (development of mature individuals in the intestines) and an intermediate host (development of the larval stage in the muscles). V.A. Bri-tov (1971) first established the existence of different species of *Trichinella*. In addition to *Tr. spiralis* Owen, he identified two other species of *Trichinella*: *Tr. native* Britov et Boev (1972) and *Tr. nelsoni* Britov et Boev (1972). *Tr. spiralis* circulates mainly in synanthropic foci and is common in all countries except Australia. *Tr. nativa* distributed among predators in Europe, Asia and North America. *Tr. nelsoni* was isolated in South America from hyenas and found in wild mammals in Tajikistan, Turkmenistan, and southern Ukraine. In 1972, L.B. Garkavi singled out a new species of *Trichinella* from the raccoon in Dagestan - *Tr. pseudospiralis* Garkavi. Larvae *Tr. pseudospiralis* are not encapsulated in the muscles. *Tr. spiralis*, *Tr. nativa* and *Tr. nelsoni* do not differ in size, *Tr. pseudospiralis* is much smaller than the previous ones (JB Sokolova, BS Shaikelov, 1976). All species have a common origin. Probably their original form is *Tr. pseudospiralis*. All four species of *Trichinella* develop cross-immunity.

Research of fresh meat. In the conditions of the above-mentioned laboratory for carrying out a trichi-nostomy take two samples of cross-striated muscles on 80 g each of legs of a diaphragm on a place of their transition to sinews. In the absence of diaphragm legs in pig carcasses, samples are taken from the muscular costal part of the diaphragm, tongue, muscles of the larynx, esophagus, intercostal, cervical, masticatory muscles in the same amount [14]. From the carcasses of wild boars - the legs of the diaphragm; from carcasses of bears - legs of a diaphragm, parts of masticatory or intercostal muscles; from carcasses of other omnivores and carnivores - samples of calf and other muscles; from horse carcasses - muscles of the root of the tongue, diaphragm, forging muscles, intercostal and shoulder-scapular part. In the case of examination of carcasses divided into cuts or pieces, samples must be taken from each cut (piece) separately. From each muscle sample make 24 slices the size of an oatmeal (a total of 48 slices). They are cut from each sample with curved scissors along the muscle fibers. In this case, the scissors must be kept

concave to the meat so that the slices fall on the convex side, where they are easy to apply to the compressor glass. The slices are laid out in the cells of the lower plates of the two compressors across their length and crushed between the plates so that the newspaper text can be read through them [14]. In the study of 48 sections from one carcass, the average load per specialist is 6-7 carcasses per hour. 120 sections are made from the carcasses of horses, as well as from the carcasses of other animals in unfavorable points, which are examined in five compressors. Sections are examined at low magnification (8x10) using appropriate instruments for trichinostomy. The research begins with the extreme section, slowly moving the compressor perpendicular to its length (along the course of the muscle fibers) in such a way that in each field of view all the fibers are visible. *Trichinella* larvae are located inside the transversely striated muscle fibers in the form of curls in a capsule of lemon-shaped or oval shape. Capsule length - 0.5-0.7 mm, width - 0.2-0.3 mm. Inside the capsule contains one, rarely 2-3 spirally larvae [9,10,11,14].

The muscle fibers in which the *Trichinella* is located, as well as the adjacent tissues, lose their transverse striation. *Trichinella* larvae can be found in the muscle fibers, which have not yet been encapsulated and spirally folded. Such *Trichinella* is difficult to detect. You should pay attention to the tissue fluid that extends beyond the cut. It may contain non-encapsulated spindle-shaped larvae of *Trichinella*. At limy degeneration of capsules of a larva it is impossible to see. In this case, the sections are removed from the compressor, placed in a 5-10% solution of hydrochloric acid for 1-2 hours, or cups with sections are placed in a thermostat at a temperature of 37 °C for 20-30 minutes. Then add drops of glycerin or lactic acid. The shell of the capsule is illuminated and it shows the larvae of *Trichinella*. Clusters of *Trichinella* can be seen with the naked eye. Muscle fibers that contain *Trichinella*, as well as related fibers do not have lumbar stripes. With strong calcification of *Trichinella* and altered development of the capsule of the parasite can be seen with the naked eye on the cut surface of the meat in the form of small whitish grains with less gloss than the surface of the meat [14]. Vinnytsia RDL of the Civil Service of Ukraine for Food Safety and Consumer Protection regularly conducts research on trichinosis:

Pork offal (tongues, heads, legs, tails) in the absence of veterinary confirmation of their origin from carcasses subjected to trichinostomy, examine as follows: from 3% of packaging units take 10-15 recesses each and make a combined sample weighing at least 80 Imported pork (in carcasses, half-carcasses) is examined at least 10% of the batch of meat. Samples are taken from the remains of the legs of the diaphragm or intercostal muscles. The mass of the muscle sample from the carcass, half-carcass must be at least 1 g, the total mass of the sample for the study - at least 80 g Imported pork in blocks is examined in quantities of at least 1% of the batch of meat blocks. Samples are taken at 80 recesses (1 g each) from the unit, with a total weight of at least 80 g. Trichinostomy of frozen meat. *Trichinella* is difficult to detect in frozen meat, especially if the meat has been frozen slowly. The fluid from the capsule passes into the lumen between the muscle fibers, the contents of the capsule are completely or partially dehydrated, it falls. At a trichinostomy of the frozen pork cuts make 1,5-2 mm thick. To remove excess meat juice from the slice, the upper glass of the compressor is pressed with greater force. The sections

Slovak international scientific journal # 47, (2020) are crushed between the compressor plates, the upper glass is removed and one or two drops of 0.1% hydrochloric acid solution or methylene blue solution (0.5 cm³ of saturated alcoholic methylene blue solution per 10 cm³ of distilled water) are applied to each section. Muscle fibers after treatment with hydrochloric acid become transparent, grayish in color, against which the capsule takes the form of a silver rim. When processing sections with a solution of methylene blue, muscle fibers turn pale blue, adipose tissue becomes light pink. The capsule of *Trichinella* turns purple-pink or blue, and the larva does not color and becomes noticeable on trichi-nostomy. Sanitary assessment of slaughter products in trichinosis. If any of these methods detects at least one *Trichinella* larva (regardless of its viability), the carcass with slaughter products is destroyed by incineration. They are also subject to destruction if *Trichinella* fat, corned beef, smoked meat, smoked sausages, etc. are found in them. At the same time, in accordance with the current legislation, these products are seized and incinerated under the control of specialists of the state veterinary medicine. The burial of such products in cattle burial grounds is strictly prohibited. Animals that had lifelong positive results for trichinosis by ELISA after slaughter are tested for trichinosis by artificial digestion of muscle samples weighing at least 50 g. When the diagnosis is confirmed, the carcass of the animal is burned, with a negative result - sent for industrial processing [11,12,13,14].

Epidemiology. There are about 60 species of mammals, predators, omnivores, rodents, insectivores, pinnipeds, cetaceans, which are hosts of *Trichinella*. Among wild animals, trichinosis is common in all countries of the world, except Australia. Transmission of *Trichinella* from an infected animal to a healthy one occurs when eating meat infected with *Trichinella*. T

he most common trichinosis is among large predators (lion, tiger, wolf, fox, etc.) due to the fact that they eat weaker animals. Carnivores and omnivores, as well as some rodents and insectivores, are known to feed on carrion. There is a high incidence of trichinosis in the Arctic - polar bears, polar foxes, and marine mammals (seals, walruses, seals, etc.). In the CIS, the most common carriers of *Trichinella* are wolves (51%), jackals (36.5%), wild cats (36.2%), raccoon dogs (23.7%), and foxes (18.4%). Among humans, trichinosis is prevalent mainly in areas where there is a high infestation of *Trichinella* in pigs. The highest incidence of trichinosis is registered in North and South America (USA, Argentina, Mexico), in Europe (Spain, Poland, CIS). In Asia and Africa there are isolated cases of this disease in humans. Within the former USSR, trichinosis is predominantly focal. Belarus is unfavorable for trichinosis among pigs and humans; Vinnytsia, Khmelnytsky, Odessa regions of Ukraine; Krasnodar Territory, Ryazan, Bryansk regions of Russia, some areas of Lithuania. In other regions of the CIS there are isolated cases of trichinosis in pigs and the population. Humans become infected by eating pig meat that contains incised live *Trichinella* larvae; lard and products made from pork (bacon, loin, brisket, sausage, etc.), as well as meat from wild animals (bears, wild boars, etc.). The disease of trichinosis in humans is often group in nature. This is due to the consumption of insufficiently processed meat of pigs slaughtered at home without veterinary examination. Outbreaks of trichinosis are due to the widespread custom in rural areas to invite

relatives, neighbors, acquaintances to "freshness" - a dinner where the meat of slaughtered pigs is eaten. Outbreaks appear to be exacerbated in the CIS in recent years by outbreaks of trichinosis associated with the consumption of wild meat, mainly bears and wild boars. Circulation of *Trichinella* among animals is due to predation and eating the carcasses of dead animals. In disadvantaged settlements, it is maintained between domestic (pigs, cats, dogs) and synanthropic (rats, mice) animals by eating pig carcasses of rats, mice, cats, and the latter - pig slaughter waste. The high prevalence of trichinosis in pigs, domestic and synanthropic animals is observed in settlements where pigs are grazed, and pig slaughter waste is not disposed of in accordance with sanitary and veterinary requirements. In these areas, pigs eat the carcasses of domestic, synanthropic, and wild animals (foxes, martens, ferrets); domestic and synanthropic animals also consume pig slaughter waste. As a result, stable (stationary) synanthropic foci of trichinosis are formed, in which cases of trichinosis among pigs and outbreaks among the population systematically occur. In those settlements where pigs are kept in stalls, unfavorable conditions are created for their infection with *Trichinella*. Swine trichinosis is observed in isolated cases over a long period of time with intervals of several years (temporary synanthropic foci of trichinosis). In temporary foci, the circulation of *Trichinella* is maintained due to their introduction from the wild. Hunters bring the carcasses of wild animals to the village and after removing the skins from them do not destroy them. These corpses are eaten by domestic (cats, dogs) and synanthropic animals (rats, mice). Infection of pigs occurs when hunters feed them meat from slaughtered wild animals or when a pig eats the carcasses of rats or mice affected by trichinosis. The main reservoir of trichinosis in nature would be wild predators and omnivores, among which trichinosis is widespread. The most intensive cycle of *Trichinella* is carried out among predators. Synanthropic foci of trichinosis are formed due to their circulation among domestic animals (pigs, cats, dogs) and murine rodents (rats, mice).

Pathogenesis and pathomorphology. In the pathogenesis of trichinosis, the main role is played by allergic reactions of the organism, sensitized by the products of metabolism and decay of larvae and mature *Trichinella*. The first phase of specific sensitization of the body is characterized by the occurrence of general allergic manifestations: fever, edema, myalgia, skin rash, catarrhal phenomena, general neurological disorders. The second phase develops with intense infection and is characterized by manifestations of allergic systemic vasculitis and organ damage. The latter may be accompanied by high fever, severe muscle pain, rash. Nonspecific systemic vasculitis with perivascular infiltrates and thrombosis occur in the myocardium, brain, liver and other organs.

Clinic. The incubation period averages 10-25 days. In some cases, its duration is 5-8, in others - up to 35-45 days. With a very severe course of the disease, the incubation period can be reduced even to 1 day. In the case of infection with natural strains of *Trichinella* (for example, from bears), the incubation period is extended to 40-45 days. The most common clinical manifestations of trichinosis are fever, mainly of the remitting type, swelling of the eyelids and face, muscle pain and eosinophilia. The disease begins with a headache. Body

temperature rises to 38-39.5 ° C (depending on the severity of the disease). The duration of the febrile period is on average 2-3 weeks, sometimes up to 3 months. Swelling of the eyelids appears in the first days of the disease, followed by puffiness and conjunctivitis. In some patients there is swelling of the legs, arms, lower back, which lasts 5-8 days, sometimes up to 2-3 weeks. Muscle pain in most patients appears 1-3 days after the onset of the disease and later. It occurs in the eye, masticatory, calf muscles, as well as in the muscles of the lower back and shoulder girdle. In some patients, palpation of the biceps muscle can be found small painful seals (nodules), which are apparently formed due to the inflammatory reaction of muscle tissue and blood vessels to the penetration of larvae (MA Andreychin, 1983). Abdominal pain, nausea, vomiting occur in 20-25% of patients. Eosinophilia appears in the first days of the disease and reaches its maximum level in the 23rd week. There is a direct relationship between eosinophilia and the severity of clinical manifestations of the disease. The expressed forms of a disease are followed by increase in number of eosinophils in blood to 50-60% against leukocytosis (10-30 G / l.). In very severe forms of the disease there is a sharp decrease in the number of eosinophilic granulocytes. Maculopapular or hemorrhagic rashes appear on the skin and last for several days. At intensive infection with *Trichinella* the clinical course of the disease is complicated by the appearance of systemic allergic vasculitis and organ disorders. The most severe of these are myocarditis, pneumonia, and meningoencephalitis, which appear at 3-5 weeks. Occasionally after recovery in 2-3 days-2-3 weeks. there are relapses of the disease, which occur in a mild form.

Treatment. Specific treatment of patients with mild forms is not performed. Prescribe symptomatic drugs: antipyretics, analgesics, antihistamines, vitamins. Of the specific drugs, the most effective is ver-mox (mebendazole), mintagezole (thiabendazole) is also used. Indications for their appointment are high fever, edema, severe muscle pain, intense infection of the patient (finding in the meat consumed a large number of viable *Trichinella*), a short incubation period (up to 710 days). Vermox is prescribed in a daily dose of 300 mg in 3 doses after meals for 7-10 days, depending on the severity of the disease. The most effective treatment in the first 2-3 weeks. after infection, when the intestines contain female *Trichinella*. The use of ver-mox or thiabendazole during this period causes the death of intestinal *Trichinella* and prevents young *Trichinella* from entering the muscles and other tissues of the patient. Specific treatment causes the destruction of intestinal and muscular *Trichinella*, which is accompanied by increased clinical manifestations of the disease (fever, increased edema, myalgia, damage to internal organs). Therefore, in severe trichinosis, ver-mox is prescribed glucocorticoids - prednisolone at a dose of 30-40 mg, in very severe - up to 60-80 mg per day orally, dexamethasone - up to 6-10 mg. These doses of gluco-corticoids are prescribed for a week, then quickly reduced depending on the patient's response to their use. Glucocorticoids prevent the development of trichinosis myocarditis, pneumonia, meningoencephalitis. Prescribe potassium supplements (potassium orotate 0.5 g 3 times a day or 3-5% potassium chloride solution 30 ml 3-4 times a day), ascorbic acid, rutin. Of the antihistamines shown diphenhydramine, pipolfen, suprastin. In the absence of ver-mox, thiabendazole (mintagezole) can be prescribed in a daily dose of 25 mg per 1 kg of body weight for 5-10 days.

Thiabendazole is less active on muscle larvae than vermorin. Relapses can occur on their own or under the influence of desensitizing agents. Persons who have relapsed with trichinosis are under dispensary supervision for 1 year.

Prevention. An important measure is the obligatory destruction by hunters of the corpses of predators at the place of their shooting by burning or burying them in the ground to a depth of at least 1 m after pre-treatment with petroleum products. Mandatory stall keeping of pigs, their free movement on the territory of the settlement, in the forest is forbidden. Slaughterhouses and biothermal pits must be equipped in settlements to dispose of slaughter waste from farm animals and their carcasses; it is necessary to organize the capture and destruction of stray dogs and cats, deratization in places of slaughter and keeping of pigs, at food enterprises, warehouses of animal raw materials, markets. When slaughtering pigs, it is necessary to perform trichinosis of pig carcasses and destroy the infected ones (if there is even one *Trichinella* in the meat). When shooting wild boars, bears, badgers and other predators whose meat is eaten by the population, trichinosis should also be performed. Sanitary and educational work is carried out among hunters and groups of the population who eat meat that has not been sufficiently cooked.

Conclusion. According to the Instruction on Diagnosis, Prevention and Elimination of Trichinosis of Animals (2007), a settlement, locality, farm, farm, regardless of ownership and subordination, in which 1 or more cases of trichinosis have been registered during five years. Quarantine is introduced and a plan for the elimination of a trichinosis outbreak within a radius of 30 km is developed. Endemic zone for trichinosis is an area (district, region, country) where this invasion is constantly present, which is due to natural (resistance of the parasite in the environment, the presence of a significant number of species of susceptible animals, complex nutritional relationships between them etc.) and human factors (helping people to infect pigs, horses, fur animals by feeding them uncontaminated slaughterhouse waste). Meat and meat products coming to Ukraine from areas endemic for trichinosis are examined in the amount of not less than 10% of the batch volume by digestion of muscle samples in artificial gastric juice and compressor trichinosis. In areas unfavorable for trichinosis invasion at slaughterhouses of farms, meat processing plants, meat processing plants, shops for the production of meat food products, research on trichinosis is carried out by digestion of muscle samples in artificial gastric juice. An unfavorable point, farm, farm, area is

Slovak international scientific journal # 47, (2020) considered healthy if within three years no case of trichinosis is detected, as well as anti-Trichinosis antibodies in the sera of animals during ELISA monitoring studies. According to the Vinnytsia RDL of the State Service of Ukraine for Food Safety and Consumer Protection, our region and districts are considered safe for this disease.

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ВПЛИВ ХЕЛАТНИХ СПОЛУК МІКРОЕЛЕМЕНТІВ НА ОРГАНІЗМ СІЛЬСЬКОГОСПОДАРСЬКИХ ТВАРИН

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EFFECT OF CHELATE COMPOUNDS OF MICROELEMENTS ON THE ORGANISM OF AGRICULTURAL ANIMALS

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Анотація

Дослідження вчення „Про біогеохімічні провінції“ дало роз'яснення специфічних різниць тварин і рослинних організмів в різних зонах і областях земної поверхні, ґрунтів та вод, які характеризуються нестачею або надлишком деяких мікроелементів. Ця робота дала можливість зрозуміти ряд місцевих ендемічних захворювань людей і тварин та відіграла велику роль у боротьбі із захворюваннями.

Оптимальний вміст і співвідношення життєво необхідних мікроелементів в організмі сільськогосподарських тварин зумовлює нормальний перебіг обмінних процесів, добрий стан їх здоров'я і високу продуктивність.

Abstract

The study of the doctrine of "biogeochemical provinces" clarified the specific differences between animals and plant organisms in different areas and areas of the earth's surface, soils and waters, which are characterized by a lack or excess of some trace elements. This work provided an understanding of a number of local endemic human and animal diseases and played a major role in disease control.

The optimal content and ratio of vital trace elements in the body of farm animals determines the normal course of metabolic processes, good health and high productivity.

Ключові слова: раціони, сільськогосподарські тварини, мікроелементи, хелатні сполуки, метіонати.

Keywords: rations, farm animals, microelements.

Introduction. With a lack or excess of trace elements in the body there are diseases called trace elements. The most common hypomicroelementosis, which occurs due to a lack of essential trace elements in animals. Hypermicroelementosis as a consequence of an excess of microelements in an organism meets much less often. These diseases both in our country and abroad are still insufficiently studied, especially the issues of pathogenesis, clinical diagnosis and prevention and veterinary and sanitary quality of the products [1,2].

In the conditions of intensification of animal husbandry the role of high-grade feeding which provides display of genetic potential of productivity of animals, reception of high-quality production at decrease in expenses of forages especially grows. Complete feeding of animals is

based on knowledge of their needs for energy, nutrients and biologically active substances, among which an important place is occupied by minerals, in particular trace elements. They give structure and strength to the skeleton, act as a component of organic compounds, increase the activity of the enzyme system of the body. Minerals are also necessary for the synthesis of hormones. They also control the water balance in the body, determine the number of positively and negatively charged compounds and thus regulate the balance of the acidic environment, cause muscle contraction, the movement of nerve impulses. In addition, they are used by animals for digestion of food, affect the course of digestion, support the protective functions of the body and neutralize metabolic products [2,3].

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