Comparative veterinary and sanitary assessment of wild animal meat in the middle Urals

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Abstract. Wild meat has long been part of the hunter’s diet. The Urals belongs to the ecologically unsafe regions of Russia, dysfunctional for invasive zooanthroponotic diseases. The annual hunting season is a potentially dangerous event due to the possibility of infection of the hunters themselves and their family members with zooanthroponoses spreading along the food chain. In this regard, the purpose of this study was to assess the intensity of commercial wild animals meat invasion by the express diagnostics using a compessarium and histological examination of veterinary and sanitary evaluation of meat. It was important to identify the highest degree of invasion of animals types. The article presents a comparative comprehensive veterinary and sanitary assessment of the meat of wild carnivorous and omnivorous animals from the Ural region. The grade of wild animals invasion large degree was revealed not only by intestinal forms of parasites, but also by the larval form of trichinosis. At the same time, was determined a high degree of invasion by trichinella. In case of minor invasion or its absence, wild animal meat should be allowed to be eaten by humans or in animal feed only after prolonged heat treatment, as they are one of the links in the spread of parasitic diseases.

1 Introduction

Conducting a veterinary and sanitary assessment of wild animals meat is an objective necessity. This is due to the fact that many wild animals and birds are natural reservoirs of not only zoonotic diseases, but also of various zooanthroponoses origins. Rabies is the most common and poses the greatest danger to humans, but it is not the only disease threatening the population of many countries over the world. For example, rabies is incurable and fatal. Invasive zooanthroponoses are not all and not always fatal, but they cause significant damage to human health. One of these diseases is trichinosis. Infection occurs not only when eating infected meat, it can occur through contact in the food chain: when scavengers eat the wild animals corpses, then eating infected remains of corpses by mouse-like rodents, and later mouse-like rodents can become prey, when hunting and eating infected rodents by domestic cats and dogs. In addition, many omnivores are also over-infected through the food chain. Transportation of wild animal meat products over long distances contributes to

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a significant expansion of the geography of this disease spread. One of the important factors in the spread of this zoonanthroponous disease are procurement points and storages of fur raw materials working with skins having a meat cut. At these enterprises, the skins of infected commercial animals come into contact with mouse-like rodents, which damage raw materials and become a focus of this disease widespread. Also, these mouse-like rodents, as an object of hunting for domestic cats and dogs, can also become a source of infection for people who are not even hunting [1-4], but who come into contact with domestic cats and dogs that eat infected rodents.

All these factors served the spread of helminths in the external environment and have allowed trichinosis to spread worldwide. Now there is practically no country in the world in which trichinosis would not be registered in representatives of wild fauna and, accordingly, in humans. According to the scientific literature, trichinosis is common among omnivores and carnivores, with the exception of herbivores, but they can become an intermediate link in the spread and movement of the pathogen to new territories, as well as with scavenger birds that do not become infected with trichinosis [5-7].

The Middle Urals belongs to one of the ecologically disadvantaged regions of Russia in terms of trichinosis. In recent years, the number of cases of people seeking medical help who have been officially diagnosed with trichinosis has increased. All the patients ate wild boar meat. These facts draw attention to this problem and actualize the careful veterinary and sanitary examination of wild commercial animals meat, which is a food product. In addition, it requires a thorough veterinary and sanitary assessment of the meat of all wild animals in order to block the pathways of transmission of the pathogen.

In connection with the above, the purpose of the study was to provide a comparative veterinary and sanitary assessment of the Middle Urals wild animals meat quality to identify parasitic diseases in them.

To achieve the purpose of the study, the following tasks were set:
- to conduct macroscopic veterinary and sanitary studies of carcasses of commercial animals harvested by hunters in the forests of the Sverdlovsk region;
- to perform trichinelloscopy and histological examination of the muscles of wild animals;
- to give a veterinary and sanitary conclusion on the possibility of using carcasses of wild animals.

2 Research material and methods

The raw carcasses of a lynx, a badger, three wolves and a bear obtained on the territory of a hunting farm in the Sverdlovsk region served as the material for the study. The research was conducted at the Faculty of Veterinary Medicine and Expertise of the Ural State Agrarian University. For the purpose of a comprehensive sanitary assessment, a pathoanatomical autopsy of wild animals killed by hunters was first performed. Macroscopic changes in muscles and internal organs were evaluated, samples were taken from the trunk muscles and diaphragm legs for histological and trichinelloscopic examination. A complete veterinary and sanitary examination of meat and bacteriological examination were carried out. The research was carried out according to generally accepted methods. The material for histological examination was fixed with an aqueous solution of neutral formalin of 10% concentration. Then dehydration was carried out through increasing concentration of alcohols, poured into paraffin and histological sections were prepared. The sections were stained with hematoxylin and eosin according to the generally accepted method. The photo fixation was carried out using a Levenhuk C-Series microscope camera.
3 Results and discussion

During the macroscopic examination - pathoanatomical autopsy of the lynx corpse, the following changes were revealed: general exhaustion without visible changes in internal organs.

Upon autopsy of the corpse of a badger, dystrophic changes in the liver, heart and kidneys were noted, with no visible changes in the muscles of the trunk.

Upon autopsy of all the corpses of wolves, were noted local skin lesions; muscle tissue without features; inflammatory changes in all animals in the lungs: two – croup, one – serous. All had catarrhal enteritis and one had coprostasis. Two have parasites in the intestinal cavity, tapeworms of the genus Alaria and Taenia. Internal organs: liver, spleen, pancreas, kidneys and heart – with pronounced signs of dystrophy.

During the autopsy of the bear's corpse, dystrophic changes were found in the muscles of the trunk and internal organs: liver, kidneys, pancreas and heart.

During the veterinary and sanitary assessment of meat, it was revealed:
- reaction with copper sulfate – doubtful;
- pH – 6.7;
- reaction to peroxidase – doubtful;
- trichinelloscopy – out of 24 sections of the trunk muscles, an average of 4 sections with trichinella larvae (Fig. 1, 3, 5, 7).
- bacteriological examination in a smear–stained muscle print - 50 microbial cells or more in the field of view of a microscope with a predominance of bacterial microflora. When typing microflora on special media, pathogenic strains of E. coli and salmonella, as well as single small colonies of staphylococcus, were identified.

Figures 2, 4, 6, 8 show histological studies of skeletal muscles for the detection of trichinosis.
According to the results of the study, a high degree of invasion by trichinosis can be noted, more than 100 capsules in 1 gram of muscle tissue. Comprehensive studies of comparative veterinary and sanitary assessment of wild animal meat in most cases revealed the defeat of invasive diseases. Bacterial contamination of meat also has a serious limitation in the use of meat from these animals. Macroscopic changes accompanied by pronounced dystrophic and atrophic changes were noted.

### 4 Conclusions

After analyzing the results obtained, the following conclusions can be drawn:

1. Macroscopic studies of carcasses of various species of wild commercial animals obtained in the hunting farm of the Sverdlovsk region showed that wild animals showed signs of pronounced exhaustion and dystrophy of both muscle tissue and internal organs.
2. A pathomorphological autopsy revealed a significant lesion of wild animals by tapeworms.
3. Trichinelloscopy of skeletal muscle tissue of hunting and commercial animals showed their significant infection with trichinosis.
4. To assess trichinella damage to meat of wild commercial animals, it is additionally possible to perform trichinelloscopy of skeletal muscles in the absence of a diaphragm, and also use this technique to determine the intensity of damage to muscle tissue.
5. A comprehensive veterinary and sanitary examination of meat of various types of wild animals revealed a high degree of damage by invasive diseases.
6. During the inspection of carcasses of wild animals, all modified internal organs must be completely disposed of, if trichinosis is detected, the meat must also be disposed of without access to pets. If it is impossible to carry out trichinelloscopy, wild animal meat...
should be allowed to be eaten by humans or in animal feed only after a prolonged heat treatment of at least 3 hours with a piece thickness of no more than 8 cm, since wild animals are one of the links in the spread of parasitic zooanthroponous diseases and, in particular, trichinosis.

References


