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BIOSAFETY ASSESSMENT OF MEAT AND MEAT PRODUCTS IMPLEMENTED IN RETAIL OUTLETS

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Meat — carcass or part of the carcass obtained from slaughter, representing a set of tissues — muscle, connective (loose and dense), fat, and bone (or without it). Meat of animals and birds, meat products have high food and biological value. The importance of meat as a food product is determined primarily by the high content of high-grade protein. Meat is an important source of macro-and microelements (iron, potassium, phosphorus, etc.), B vitamins and extractives.

In the post-slaughter period, autolytic, microbial and chemical processes can occur in the meat, which lead to deterioration of the quality of meat or its spoilage. After slaughter of animal tissues, especially muscle and connective tissues, change, which affect its nutritional value and technological properties. On indices freshness distinguishes between meat fresh, questionable (doubtful) freshness and stale. Fresh meat is sold and used for industrial processing. Meat of questionable freshness is not accepted for sale in trade and public catering. According to the decision of the veterinary and sanitary service it can be sent for industrial processing. Stale meat is destroyed or disposed [1-5].

Meat is a very favorable environment for the development of many microorganisms. Meat can be infected as a result of violation of sanitary rules during slaughter, subsequent processing, transportation and storage. In case of violation of storage conditions meat and meat products are quickly exposed to microbial spoilage. Meat and meat products are often the cause of microbial food poisoning.

Fresh steamed meat is seeded slightly. In chilled meat, the number of microbes increases. When freezing meat is dying microflora of surface layers, but in the depths of this process is slow. It is known that many microorganisms, including *Salmonella*, remain viable in frozen meat.

Epidemiological danger of meat and meat products is associated with the possibility of transmission to humans from sick animals pathogens of zoonotic infections (anthrax, brucellosis, tuberculosis, foot and mouth disease, listeriosis and others), as well as salmonellosis. The danger is not only sick animals, but also animals-bacterial carriers. Infection of muscle tissue of the animal can occur with a decrease in the protective functions of the body of the animal as a result of exposure to adverse conditions.

In case of violation of the conditions of storage of meat may be different types of damage: sunburn, acidic fermentation, rotting, and molding. Meat of doubtful freshness, stale, with the expressed signs of damage is recognized unsuitable for food and is not allowed to be sold.

Thus, the quality and epidemiological safety of meat depend on many factors: animal health and conditions of its maintenance, transportation, technology of primary processing, as well as subsequent processes of refrigeration and storage [6,7].

The aim of our work was to assess the freshness and biosafety of meat and meat products.

To do this, we have selected samples of meat from two outlets. Samples were taken in the municipal market "Shapagat" and in the meat department of the supermarket "Magnum". Samples for examination were taken from deep layers of meat. Biosafety of the meat is measured when conducting sanitary-epidemiological expertise of the meat. To begin with, its organoleptic characteristics were evaluated: appearance, color, consistency, smell, condition of fat and bone marrow, quality of broth during cooking. The taste of the broth is investigated only with a full guarantee of safety.

To objectively assess the freshness of meat, methods are used to determine the amount of volatile fatty acids (VFA), less often, products of primary protein breakdown.

Bacterioscopic method allows evaluating the freshness of meat by the number of bacteria and the degree of decay of muscle tissue in smears – prints [7].

The results of veterinary and sanitary examination of meat showed no changes in the morphological structure of meat. The consistency of the muscles of the meat was elastic, dense, and formed by pressing the hole quickly returned to its original state. When the muscles were cut, there was a slight humidity (figure -1).

Figure 1 - Morphological structure of the studied meat

In general, in the organoleptic study of meat samples, the presence of pathology was not noted; all of the above signs characterized the meat as fresh and obtained from a healthy animal.

The results of physico-chemical and microbiological studies of meat samples are presented in table - 1.

Table 1 - Physico-chemical and microbiological indicators of quality of meat samples

Indicator	Samples from the municipal market "Shapagat"	Samples from the meat department of supermarket "Magnum"
Reaction with copper sulfate	–	–
Reaction with formalin	–	–
Reacttion with peroxidase	+	+
Quantity VFA, mg KOH/100 g	1,18±0,05	1,15±0,07
Quantity of microbic cells in one line of sight	3,13±0,07	3,11±0,08
pH meat, for each	6,40±0,12	6,02±0,11

The table -1 shows that in all groups of meat, subjected to reactions with copper sulfate and formalin gave a negative result, and during the reaction to the presence of peroxidase – positive,

indicating its freshness and that it was obtained from a healthy animal. The content of volatile fatty acids in the meat of all groups were in the normal range. There are single bacteria, there are no traces of muscle tissue decay (figure -2).
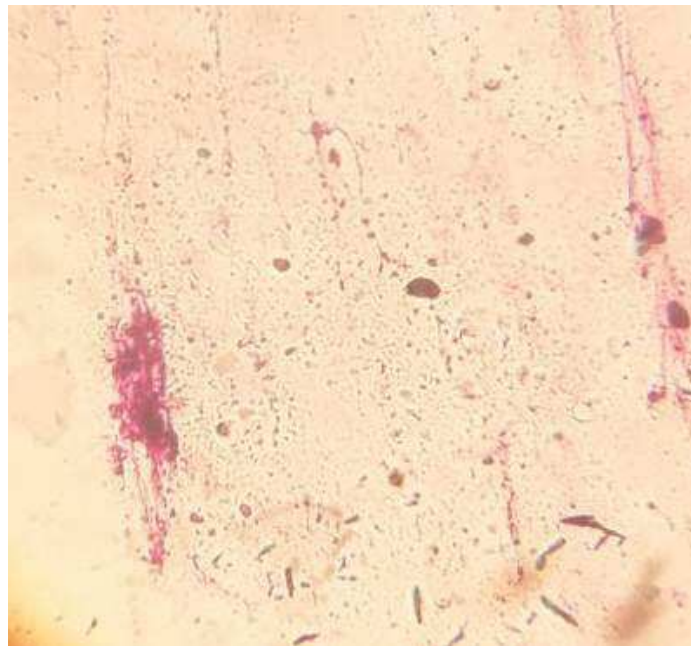

Figure 2 – Bacterioscopic analysis of meat

The results of the study of the acidity of meat for three days, characterized it as fresh and obtained from a healthy animal, as the decrease in the indicator met the requirements.

Thus, the results of the study of physico-chemical and microbiological studies of meat from the outlets of Nur - Sultan, showed that a significant difference in the indicators of Biosafety, which indicates the implementation of environmentally friendly meat products.

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