MOLECULAR-GENETIC ANALYSIS OF BOVINE HERPESVIRUS-5 (BOHV-5) IN THE MILK OF COWS IN FARMS OF VOLOGDA REGION

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INTRODUCTION

Respiratory diseases of calves are a group of diseases emerging by a wide range of infectious, genetic and sanitary factors. In recent years, herpesviruses have become increasingly important in infectious pathology of cattle. Among viral infections, herpesvirus takes one of the leading places due to the ubiquitous distribution among humans and animals, the variety of clinical manifestations, the chronic course, as well as various transmission routes.

In Russia, the specific weight of dairy farms is increasing. High milk productivity of cows is often accompanied by metabolic disorders and resistance reduction of animals which leads to the activation of various infectious agents, mainly mass respiratory diseases, which are one of the main causes of economic damage.

Vologda region is a large region in which dairy farming is rapidly developing. For several years, in some livestock farms of the region, the outbreaks of mass respiratory infection were recorded. According to the literature, the provision of newborn young animals with high-value nutrients and protective factors in the postnatal period of development belongs to the secret of the mammary glands. Therefore, we carried out the study of the secret of the udder of cows for the presence of viral infections.

The purpose of the research was to identify the causative agent of respiratory infections in the milk of cows of the livestock farms of the Vologda region.
MATERIALS AND METHODS

• The laboratory studies were conducted in the virology laboratory of FSC VIEV. Milk samples for the study were prepared as follows: test tubes with samples (10 ml each) were centrifuged at 2500 x g for 15 minutes. Sediment containing the largest number of cells was used in the study.

• PCR and RT-PCR were used to detect the viral genome in milk. DNA was extracted from biological material by a “DNA Extran” reagent kit (Syntol ZAO, Russia), according to the manufacturer’s recommendations. For the bovine herpesvirus identification we have used primers to the fragment of glycoprotein B gene.

• Local alignment of the studied nucleotide sequences was performed by BLAST (GenBank, INSDC). Multiple alignment and clustering pattern was determined by the neighbor-joining method with the “Bootstrap” values based on 1000 replicates.
RESULTS

• Clinical signs
In the livestock enterprises of the region where the studies were conducted respiratory diseases of both adult and young cattle are annually recorded. Experimental studies were carried out in livestock farms of Vologda region of dairy direction suspected to respiratory infections. Acute form of the disease with high temperature (41.5 °C), rapid breathing, severe cough, serous nasal discharges were observed in the beginning of disease manifestation. Subsequently, the nasal discharges became serous-purulent and breathing became difficult. Along with respiratory syndrome conjunctivitis was observed in many animals (cows and calves), accompanied by lacrimation and purulent exudate discharges. Simultaneously with the above mentioned clinical signs, vulvovaginitis, endometritis and mass abortions were also observed in cows. In all examined farms the herd reproduction occurs due to the young animals.

• Polymerase chain reaction
In the study of milk samples obtained from cows belonging to the farms of the Vologda region for the first time, the fragments of the bovine herpesvirus-5 (BoHV-5) gene were detected.
RESULTS

• Phylogenetic analysis

The phylogenetic analysis showed the similarity of the virus found in the milk of cows in farms in the Vologda region with the herpes virus of cattle type 5.

Figure 1. Dendrogram shows the phylogenetic relationship between the Vologda isolate and reference strains of bovine herpes virus (BoHV).
CONCLUSION

• Outbreaks of mass respiratory infections of both adult and young cattle in livestock farms of the region have been observed for several years.
• This was the reason for studying the secret of cow udders for the presence of viral infections.
• Thus BoHV-5 was detected for the first time in the milk of cows from livestock farms of the Vologda region as a result of molecular genetic analysis.