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Original Article

SEROPOSITIVITY OF EQUINE RHINOPNEUMONITIS IN KAZAKHSTAN

Abeuov Kh.B.[1]*, Burashev Y.D.[1], Rystaeva R.A.[1], Omarova Z.D.[1], Tulendibaev A.B.[1], Aubakir N.A.[1], Ermekbai T.T.[1], Argimbayeva T.U.[1], Alibekova D.A.[1], Abduraimov Y.O.[2], Rsalyev A.S.[2]

[1]LLP « Research Institute for Biological Safety Problems «. village Gvardeysky, Kordai district, Zhambyl region, Kazakhstan, 080409

[2]JSC «National Holding «QazBioPharm.

Korgalzhinskoe highway, 13/5, Astana, Kazakhstan, 010000

**Автор корреспонденции: Kh.abeuov@biosafety.kz*

ABSTRACT

This research focused on monitoring the seroprevalence of equine rhinopneumonitis in Kazakhstan. While PCR analysis of the collected samples did not detect the virus, serological testing confirmed the presence of antibodies to equine herpesvirus (EHV) in multiple regions.

Serological examination identified antibodies to EHV serotype 1 in several areas, including Akmola, Abay, East Kazakhstan, Jambyl, Almaty, and Jetisu regions. The seroprevalence of this virus varied, reaching between 66.6% and 100% in Akmola, Abay, East Kazakhstan, and Almaty, whereas in Jetisu and Jambyl, it remained at 50% or below.

ELISA testing further revealed that antibodies to EHV serotype 4 were present across nearly all regions, with the exception of Ulytau, Kostanay, and Pavlodar. Compared to EHV-1, EHV-4 exhibited a higher seroprevalence in most parts of Kazakhstan.

Regions such as Akmola, Abay, East Kazakhstan, Almaty, Jetisu, West Kazakhstan, Aktobe, Kyzylorda, Jambyl, and Karaganda demonstrated a 100% seroprevalence. In contrast, Atyrau, North Kazakhstan, Mangystau, Ulytau, and Kostanay regions showed little to no detectable antibodies.

Keywords: monitoring, equine rhinopneumonitis, equine herpesvirus, serotypes, seroprevalence.

INTRODUCTION

Equine rhinopneumonitis (ERP) is a contagious viral disease affecting horses, primarily characterized by inflammation of the respiratory tract mucosa, conjunctivitis, and, in pregnant mares, abortions occurring predominantly in the second half of gestation. This infection poses a significant economic burden on equine farms. The disease is caused by two subtypes of equine herpesvirus, which are endemic in countries where horse breeding is an integral part of agriculture or cultural heritage [1, 2].

The virus spreads through aerosol transmission from the respiratory secretions of infected animals. Additionally, placental fluids and aborted tissues from infected mares contain high concentrations of the virus, serving as key sources of infection.

Despite the widespread use of vaccines, equine herpesvirus (EHV) infections persist, leading to substantial global financial losses each year. Young horses, particularly those under three years of age, often experience ERP as an acute respiratory illness with high fever, which spreads rapidly within herds.

After entering the body, the virus replicates within the epithelial cells of the respiratory mucosa. Clinical symptoms typically appear between 2 to 8 days post-exposure and include fever, nasal discharge, lethargy, and reduced appetite. The severity of the disease depends on factors such as age and immune status, which can be influenced by vaccination history or previous exposure. Compared to EHV-4, infections caused by EHV-1 are more frequently associated with severe fever and complications [3, 4].

Even in young horses, EHV-1/4 infections often manifest in subclinical forms. Although uncomplicated cases of ERP rarely result in mortality and most horses recover within one to two weeks, the infection frequently disrupts equestrian training, racing, and competitions.

Long-term immunity following infection is short-lived, with recovered horses becoming susceptible to reinfection within a few months. While subsequent infections are often milder or asymptomatic, they still pose risks, including repeated abortions or neurological disorders. Similar to other herpesviruses, EHV-1/4 establish latency in infected animals, allowing the virus to persist for extended periods. Under stress or during pregnancy, latent infections may reactivate, increasing the risk of disease transmission.

The most concerning clinical outcomes of ERP for horse breeding, racing, and recreational riding are the reproductive and neurological complications associated with EHV-1 infection [5]. Equine herpesvirus myeloencephalopathy, the neurological form of the disease, remains rare but severe. A specific mutation in the ORF30 gene, which encodes DNA polymerase, has been linked to an increased risk of neurological disease. However, even virus strains lacking this mutation can sometimes cause paralysis [6, 7].

Kazakhstan is officially considered free of equine rhinopneumonitis, as no cases have been reported in the past decade. However, like equine influenza, EHV reemerges periodically, and declining herd immunity could lead to widespread outbreaks and substantial economic losses. Our previous studies confirmed the circulation of EHV-1 and EHV-4 among horses in the Jambyl region [8]. Additionally, during the same research period, antibodies to EHV-1 (50%) and EHV-4 (70%) were detected in horses from Kostanay, North Kazakhstan, Jambyl, and South Kazakhstan regions.

A review of existing literature reveals a lack of comprehensive studies on the presence of herpesviruses in Kazakh-

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stan's horse populations. Given this knowledge gap, conducting systematic monitoring for ERP is essential for early detection and prevention, ensuring the stability of the country's equine industry.

MATERIALS AND METHODS

Procedure for Sample Collection from Horses

Blood samples for serological analysis were obtained from the jugular vein in the upper third of the neck using vacuum tubes. The collection site was disinfected with an antiseptic solution, such as ethanol or a 3% carbolic acid solution, prior to sampling. Each horse had 7–10 mL of blood drawn for subsequent serological testing.

After collection, the blood was left at a temperature of 30–35°C for approximately one hour to allow clotting. It was then transferred to a cool environment for further settling. After 10–12 hours, the separated serum was transferred into sterile tubes for further examination.

Sample Collection and Preparation

Nasal and Nasopharyngeal Swabs:

Sterile swabs were used to collect samples for DNA extraction, followed by PCR-based virus detection. After sample collection, the swab was placed into 3 mL of a virus transport medium, such as phosphate-buffered saline (PBS) or serum-free minimal essential medium (MEM) supplemented with antibiotics.

To preserve viral infectivity, the transport medium was enriched with 0.1% (w/v) bovine serum albumin, fetal calf serum, or gelatin. If immediate processing was not possible, the samples were stored at -70°C to maintain viral integrity.

Blood Samples

To isolate the virus from leukocytes, 20 mL of blood was aseptically collected into tubes containing an anticoagulant such as citrate, heparin, or ethylenediaminetetraacetic acid (EDTA). EDTA was preferred for PCR analysis.

Samples were transported to the laboratory under refrigeration using cold packs but were not frozen [9].

Polymerase Chain Reaction (PCR) for Virus Detection

PCR is currently the primary method for diagnosing EHV-1 and EHV-4 in various biological materials, including clinical specimens, paraffin-embedded archival tissues, and cell cultures [10, 11].

A variety of type-specific primers have been designed to distinguish between EHV-1 and EHV-4. The correlation between PCR and virus isolation methods for diagnosing these infections is notably high [12].

PCR offers rapid and highly sensitive detection, independent of the presence of viable virus in a sample. This technique is particularly valuable when analyzing tissue from aborted fetuses, placental samples, and nasopharyngeal swabs from foals [13].

The method is especially critical during outbreak situations involving abortion, respiratory disease, or neurological symptoms, as rapid virus identification enables timely implementation of containment measures. In cases where neurological symptoms are observed, PCR analysis is performed on brain and spinal cord tissues as well as peripheral blood mononuclear cells (PBMCs) [14].

To differentiate between EHV-1 and EHV-4, this study utilized the nested PCR method, which is applicable for a wide range of clinical and pathological samples, including nasal secretions, blood leukocytes, nervous system tissues, and embryonic material. The protocol was adapted from Borchers & Slater (1993) [10].

However, due to the increased risk of cross-contamination in laboratory environments, single-step PCR methods are generally preferred for detecting EHV-1 and EHV-4 because of their sensitivity and speed [11].

Additionally, specialized PCR protocols were employed to identify EHV-1 strains carrying the neuropathogenic ORF30 marker. These protocols utilized either PCR-restriction enzyme analysis or real-time quantitative PCR [15].

Epidemiological typing techniques based on ORF68 gene analysis were also refined to differentiate virus strains [16].

PCR Application in This Study

In this study, real-time PCR (quantitative PCR) was utilized, as it is widely recognized for its speed and sensitivity in detecting viral DNA.

The PCR analysis was conducted using a 96-well plate, ensuring compatibility with automated nucleic acid extraction systems. The multiplex assay targeted virus-specific DNA sequences of EHV-1 and EHV-4 from various sample types, including tissue, nasal swabs, and respiratory washes.

The amplification targets for each virus were selected from conserved, type-specific genomic regions—glycoprotein B (gB) for EHV-1 and ORF17 (encoding UL43) for EHV-4. Differentiation between EHV-1 and EHV-4 was achieved using type-specific dual-labeled probes.

To investigate herpesvirus circulation and antibody prevalence in horse populations across Kazakhstan, a total of 1,365 samples were collected and submitted to the Scientific Research Institute for Biological Safety Problems (SRIBSP). All samples underwent PCR analysis to detect positive cases and assess EHV-1 and EHV-4 seroprevalence.

DNA extraction was performed using specialized reagent kits or automated robotic systems. The PCR amplification process utilized Taq DNA Polymerase from Invitrogen.Primer Sequences for Classical (Nested) PCR (EHV-1, EHV-4):

Primers for EHV-1

For the first stage of PCR	
EHV-1 gB1 FW	5'-TCTACCCCTACGACTCCTTC-3'
EHV-1 gB2 RV	5'-GCTTTCTTTTCCTGCTTTTC -3'
For the second stage of PCR	

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EHV-1 gB3 FW	5’-CTTTAGCGGTGATGTGGAAT-3’
EHV-1 gB4 RV	5’-CCTTTGTTGTTATGGGGTAT-3’
Primers for EHV-4	
For the first stage of PCR	
EHV-4 gB1 FW	5’-TCTATTGAGTTTGCTATGCT-3’
EHV-4 gB2 RV	5’-TCCTGGTTGTTATTGGGTAT-3’

Primers and probes for real-time PCR:

GHL 1 Forward: GGG-GTT-CTT-AAT-TGC-ATT-CAG-ACC

GHL 1 Reverse: GTA-GGT-GCG-GTT-AGA-TCT-CAC-AAG

GHL 4 Forward: TAG-CAA-ACA-CCC-ACT-AAT-AAT-AGC-AAG

GHL 4 Reverse: GCT-CAA-ATC-TCT-TTA-TTT-TAT-GTC-ATA-TGC

Probe for gB (GHL 1): {FAM}TCT-CCA-ACG-AAC-TCG-CCA-GGC-TGT-ACC{BHQ1}

Probe for ORF17 (GHL 4): {JOE}CGG-AAC-AGG-AAC-TCA-CTT-CAG-AGC-CAGC{BHQ1}

Composition of the reaction mixture for Nested PCR (per 1 sample)

10x buffer	5
dNTP 10m M	1
F primer	5
R primer	5
Taq polymerase 5 U/ µL	0,5
H2O	31,5
DNA	2

The thermal cycling parameters of classical PCR

For the first stage of PCR		
95°C	3 min	1 cycle
95°C	40 sec	35 cycles
60°C	50 sec	
72°C	90 sec	
72°C	5 min	1 cycle
For the second stage of PCR		
95°C	3 min	1 cycle
95°C	30 sec	35 cycles
60°C	40 sec	
72°C	60 sec	
72°C	5 min	1 cycle

Electrophoresis

In the course of PCR, a 1% agarose gel in 1X TAE buffer, supplemented with bromophenol blue, was used in the electrophoresis chamber at a voltage of 90 V for 30 minutes. The results were captured using a gel documentation system.

Standard Real-Time PCR

For the quantitative measurement of viral DNA levels, a standard DNA curve was utilized, which included at least four standards with known concentrations of target DNA from EHV-1 and EHV-4. To preserve the DNA in solution, all standards were diluted in polyinosinic-polycytidylic acid (poly I/C) at a concentration of 1 ng/ml. These were stored at -20°C and not exposed to repeated freeze-thaw cycles.

Testing Procedure

Given the high sensitivity of PCR-based tests, all potential sources of nucleic acid contamination were eliminated. All reagents and equipment used were PCR-grade, ensuring they were free from nucleic acids, nucleases, or other enzymes that could interfere with the process. Reactions were prepared using appropriate PCR master mix kits, and data collection was carried out in a real-time amplifier, following optimized settings for the specific device.

The amount of viral DNA in each sample was quantified by comparing it with known DNA standards. Each test also included positive and negative control samples: water as the no-template control, buffer that had undergone the sample extraction process (negative control), and viral DNA from EHV-1 and EHV-4 (positive control). To maintain consistent analysis quality, the threshold cycle (Ct) values were recorded and routinely monitored for each PCR run, using a known standard with a low copy number, such as 100 copies.

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Serological Tests

EHV-1 and EHV-4 are widespread globally, and their seroprevalence is generally high. However, paired serum testing remains a reliable method for diagnosing EHV in horses. A positive diagnosis is based on detecting a substantial (fourfold or more) increase in antibody titers in paired serum samples, one taken during the acute phase and the other during the convalescent phase of the disease. Serum samples collected on the same day are typically not conclusive.

The first serum sample (acute phase) is collected as soon as clinical symptoms appear, with the second sample (convalescent phase) taken 2-4 weeks later. In cases where mares have aborted or horses have a neurological form of EHV-1, the maximum antibody titers against EHV-1 may be present in the initial sample without a significant rise in subsequent samples. In such cases, paired serum samples from clinically healthy animals in the same stable provide valuable retrospective diagnostic data for EHV in that environment.

If EHV-1 antibodies are found in the heart or umbilical blood, or other fluids from aborted horse fetuses, it can be of diagnostic value, particularly in cases of abortion where the fetus is negative for the virus. Therefore, PCR testing was used to detect EHV-1/4 nucleic acids in these tissues.

Use of GIS Software

For mapping purposes, ArcGIS, an open-source GIS program, was used. Sampling locations were converted into latitude and longitude coordinates using the «Geocode Addresses» tool in ArcGIS. If only approximate locations were available, the centroid coordinates of the administrative districts were used.

The dataset was saved as an XLS file, containing latitude and longitude coordinates as well as additional data (e.g., type of biological material, number of animals tested). This Excel file was then imported into ArcGIS as a point layer. A consistent coordinate reference system (CRS), specifically WGS 84 (EPSG:4326), was applied across all layers to ensure compatibility and consistency.

To visually represent the data, color coding was used to indicate the number of confirmed cases. Base maps from NextGIS Data were incorporated to provide context. Legends and scale bars were added for clarity. The maps were exported at high resolution for use in reporting and publication.

RESULTS

The main objective was to collect biological samples (including swabs, serum, whole blood, and parenchymal organs, if clinical signs of a potential disease were present or visible) from livestock across three rural districts in each region. Additionally, epidemiological data were gathered, including clinical symptoms of potential diseases and historical information from horse owners [19, 20].

As part of the monitoring study, a sampling plan was developed in advance. This plan outlined the sampling locations and the number of samples to be collected (as shown in Table 1). Table 1. Sampling plan for the Republic of Kazakhstan in 2024

Table 1. Sampling plan for the Republic of Kazakhstan in 2024

Regions	Num of districts	Districts, district centers	**Rural district**	Num of samples from horses	Num of samples
1	2	3	4	5	**6**
Almaty	5/10	Balkhash, Bakanas	3/15	15	75,00
		Zhambyl	3/24	15	
		Uyghur, Chundzha	3/14	15	
		Enbekshikazakh	3/26	15	
		Talgar	3/11	15	
Akmola	10/20	Atbasar, Atbasar	3/14	15	150,00
		Bulandy, Maikinsk	3/12	15	
		Burabay, Shchuchinsk	3/11	15	
		Ereymentau, Ereymentau	3/14	15	
		Korgalzhyn, Korgalzhyn	3/5	15	
		Birjansal	3/15	15	
		Sandyktaus	3/14	15	
		Akkol	3/11	15	
		Astrakhan	3/12	15	
		Esil	3/15	15	
Abay	5/10	Borodulikha	3/10	15	75,00
		Zharminsk	3/18	15	
		Urjar	3/16	15	
		Ayagos	3/23	15	
		Makanchinsky	3/11	15	

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Aktobe	6/12	Kobdinsky	3/16	15	90,00
		Irgizsky	3/7	15	
		Khamtausky	3/15	15	
		Kargalinsky	3/8	15	
		Mugalzharsky	3/15	15	
		Shalkarsky	3/13	15	
Atyrau	4/8	Zhylyoisky, Kulsary	3/7	15	60,00
		Isatay, Akkistau	3/7	15	
		Kurmangazinsky, Kurmangazy	3/19	15	
		Makatsky, Makat	3/3	15	
East Kazakhstan	4/9	Glubokovsky, Glubokoe	3/17	15	60,00
		Zaysansky, Zaysan	3/9	15	
		Katon-Karagaysky, Ulken-Naryn	3/13	15	
		Ulansky	3/16	15	
Jambyl	5/10	Sarysu	3/9	15	75,00
		Zhalinsky	3/14	15	
		Turar-Ryskulov	3/15	15	
		Shusky, Tole Bi	3/19	15	
		Kordaysky	3/19	15	
Jetisu	4/8	Aksusky, Zhansugurov	3/17	15	60,00
		Alakolsky, Usharal	3/22	15	
		Koksu	3/8	15	
		Panfilovsky, Zharkent	3/13	15	
West Kazakh-stan	6/12	Akzhaiksky, Chapayev	3/18	15	90,00
		Burlinsky, Aksai	3/15	15	
		Zhanibeksky,	3/9	15	
		Syrymsky, Zhimpity	3/12	15	
		Bokeyordinsky	3/7	15	
		Terektinsky	3/15	15	
Karaganda	4/7	Karkaralinsky	3/25	15	60,00
		Shetsky	3/25	15	
		Nuryinsky	3/25	15	
		Abaysky	3/14	15	
Kostanay	8/16	Amangeldinsky, Amangeldy	5/10	15	120,00
		Dzhangeldinsky, Turgay	6/12	15	
		Zhitikarsky, Zhitikara	7/15	15	
		Karabalyksky, Karabalyk	7/15	15	
		Mendykarinsky, Borovsky	6/13	15	
		Karasuy District	5/18	15	
		Naursum District	3/8	15	
		Beimbet Maiylin District	3/13	15	
Kyzylorda	3/7	Shielinsky	3/23	15	45,00
		Kazalinsky, Aiteke-Bi	3/21	15	
		Zhalagashsky	3/15	15	

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Mangystau	4/7	Beyneusky, Beyneu	3/11	15	60,00
		Mangistau, Shetpe	3/12	15	
		Munailinsky, Mangistau	3/7	15	
		Tupkaragansky, Fort-Shevchenko	3/5	15	
Pavlodar	5/10	Irtyshsky, Irtyshsk	7/14	15	75,00
		Shcherbaktinsky, Shcherbakty	8/16	15	
		Bayanaulsky	5/13	15	
		Akkulsky	5/11	15	
		Zhelezinsky	5/13	15	
North Kazakhstan	7/13	Magzhan Zhumabaev, Bulayevo	3/18	15	105,00
		Mamlyutsky, Mamlyutka	3/11	15	
		Tayynshinsky, Tayynsha	3/19	15	
		Timiryazevsky	3/16	15	
		Ualikhanovsky	3/11	15	
		Zhambylsky	3/13	15	
		Gabit Musrepov	3/17	15	
Turkestan	7/13	Otyrarsky	3/14	15	105,00
		Shardarynsky	3/10	15	
		Kazgurt	3/13	15	
		Baydibeksky	3/11	15	
		Ordabasy	3/10	15	
		Tyulkubassky	3/13	15	
		Zhetisay	3/11	15	
		Shielinsky	7/14	15	
		Kazalinsky, Aiteke-Bi	7/15	15	
		Zhalagashsky		15	
Ulytau	4/5	Beyneusky, Beyneu		15	60,00
Total:				1365	**1365**

As outlined in the plan (Table 1), all samples were collected and sent to LLP « RIBSP» Additionally, several organizations from various regions participated in the monitoring process, including:

LLP «RIBSP» (Almaty, Zhetysu, Turkestan, Kyzylorda, Jambyl, and Karaganda regions)

LLP «OtarBioPharm» (Kostanay and Ulytau regions)

LLP «BioMedPreparate» (North Kazakhstan and Akmolinsk regions)

NAO «WKATU named after Zhangair Khan» (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions)

Shakarim University (Abay, East Kazakhstan, and Pavlodar regions)

A total of 1365 samples were collected during the monitoring study and delivered to LLP «RIBSP» for analysis. During the field visits, staff also gathered epidemiological information concerning the epizootic situation and veterinary interventions.

According to reports from the district veterinary inspections of the «Committee for Veterinary Control and Supervision» of the Ministry of Agriculture of the Republic of Kazakhstan, nearly all regions of the country carried out vaccinations against anthrax using the live liquid anthrax vaccine strain 55-VNIIVViM. Vaccinations were also conducted to some extent against rabies and lymphangitis.

In particular, the Karaganda region stands out, where lymphangitis and equine rhinopneumonia were reported in 2023. However, no animals exhibiting severe clinical signs of infectious diseases were observed during the current year.

PCR testing of the samples returned negative results across the board. However, serological testing revealed the presence of antibodies to EHV in several regions (as detailed in Table 2 and illustrated in Figures 1 and 2).

Table 2. Seroprevalence of herpesviruses among horses in Kazakhstan in 2024

Область	ГВЛ-1			ГВЛ-4		
	Количество исследованных животных	Количество положительных животных	Серопревалентность	Количество исследованных животных	Количество положительных животных	Серопревалентность
1	**2**	**3**	**4**	**5**	**6**	**7**

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Abay	26	6	23,07	26	26	100
Akmola	35	13	37,14	35	35	100
Aktobe	25	0	0	25	20	80
Алматиская	24	6	25	24	24	100
Atyrau	12	0	0	12	2	16,67
East Kazakhstan	20	3	15	20	15	75
Jambyl	25	1	4	25	22	88
Jetisu	25	0	0	25	25	100
West Kazakhstan	23	0	0	23	22	95,65
Karagandaская	20	0	0	20	20	100
Kyzylorda	26	0	0	26	26	100
Mangystau	10	0	0	10	0	0
North Kazakhstan	18	0	0	18	0	0
Turkestan	25	0	0	25	25	100
Total	314	29	9,23	314	262	83,43

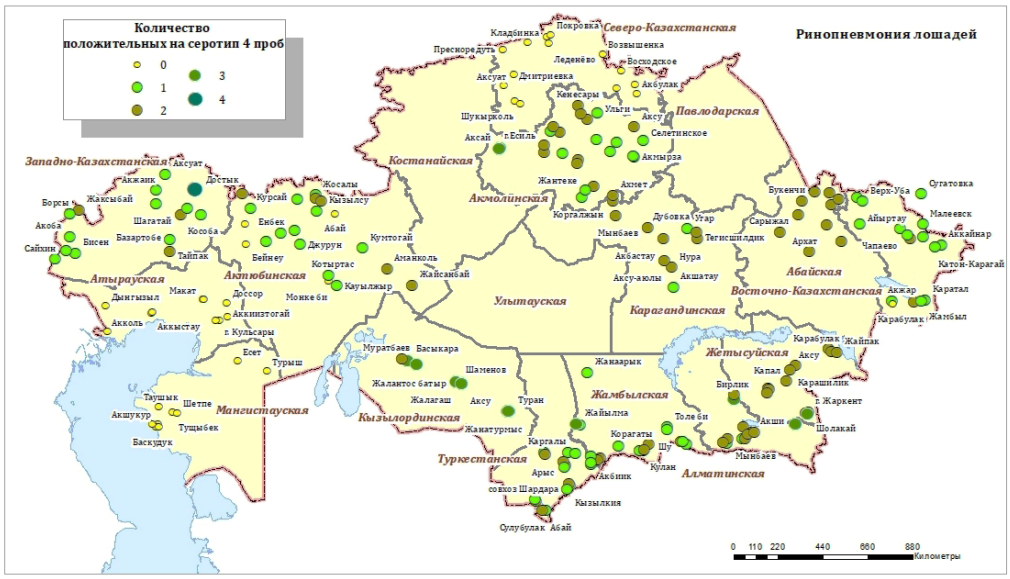

Figure 1. ELISA results for EHV-4 in Kazakhstan in 2024

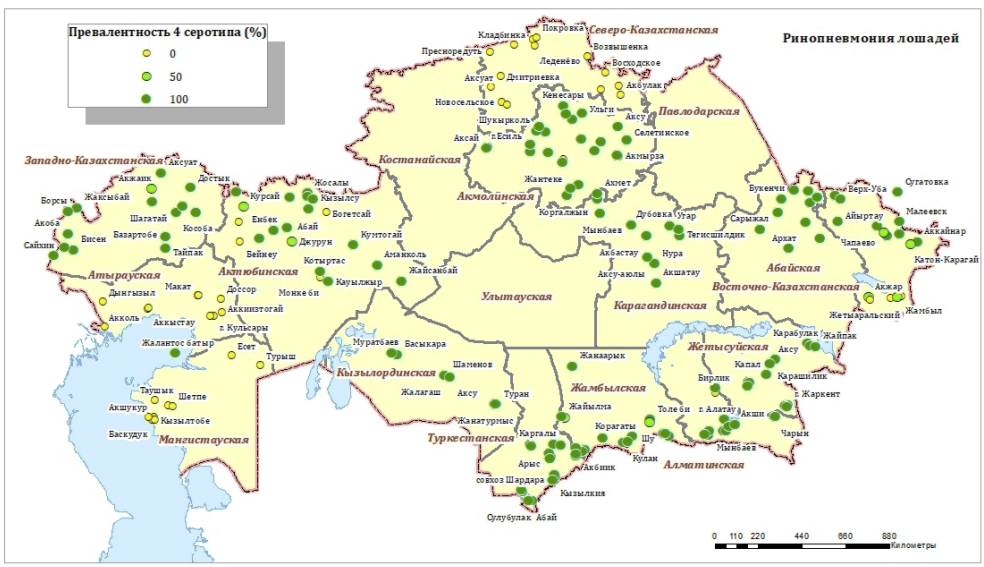

Figure 2. Seroprevalence of EHV-4 in Kazakhstan in 2024

As a result of the monitoring studies conducted, it was determined that in 11 out of the 14 regions surveyed, over 75% of the animals were seropositive for EHV-4. However, in the Atyrau region, the seroprevalence of EHV-4 was 16.67%.

The study revealed that antibodies to EHV-4 were not detected in animals from only the North Kazakhstan and Mangystau regions. The overall seroprevalence of EHV-4 in Kazakhstan was 83.43%, while the seroprevalence of EHV-1 was 9.23%.

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Figure 3. ELISA results for EHV-1 in horses in Kazakhstan in 2024

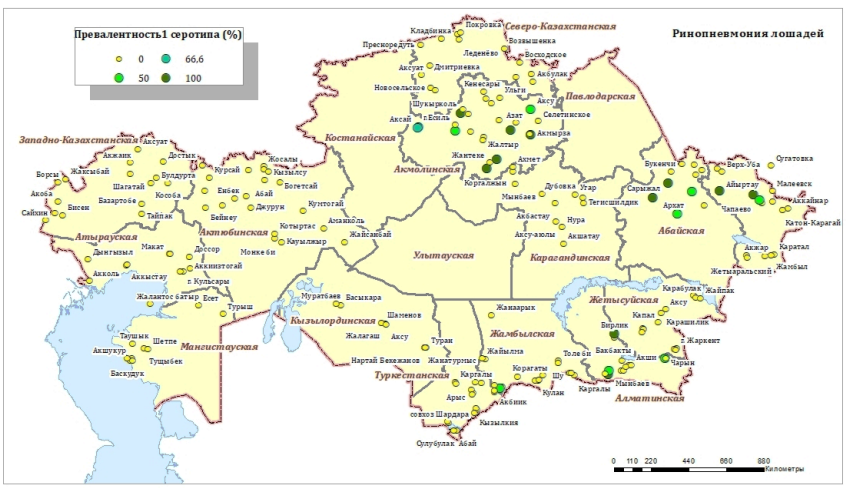

Figure 4 – Seroprevalence of EHV-1 in Kazakhstan in 2024

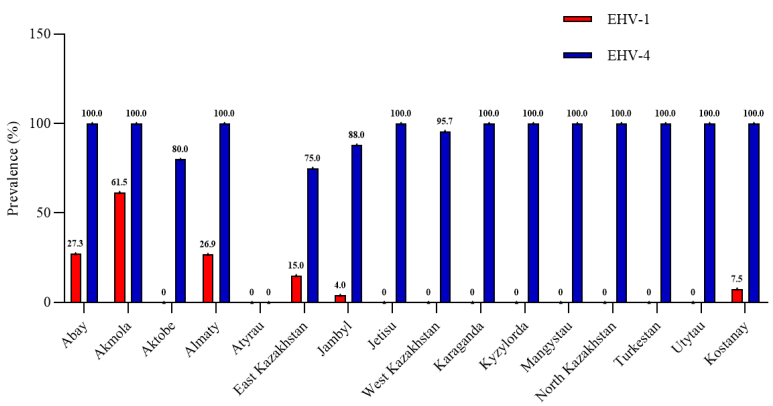

Figure 5 – Seroprevalence of EHV-1 and EHV-4 in Kazakhstan in 2024

Seropositive animals for EHV-1 were identified in the following regions: Abay (23.07%), Akmola (37.14%), Almaty (25%), East Kazakhstan (15%), and Jambyl (4%) regions (Table 2, Figures 3 and 4).

Figure 5 illustrates the widespread prevalence of EHV-4 across most regions of Kazakhstan. In five regions (Abay, Akmola, Almaty, East Kazakhstan, and Jambyl), the simultaneous circulation of both EHV-1 and EHV-4 serotypes has been observed.

The research conducted demonstrates that equine herpesviruses of serotypes 1 and 4 are actively circulating within the horse population in the Republic of Kazakhstan. It is crucial to carry out thorough inspections of equestrian farms where seropositive animals have been found to identify infected horses and isolate the pathogens. Such actions will help mitigate the risk of widespread transmission of this disease across horse populations in the country.

DISCUSSION

Although Kazakhstan is officially recognized as free from

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equine rhinopneumonitis, similar to equine influenza, EHV outbreaks still occur periodically. When immunity levels decline, these outbreaks can lead to significant epizootics, resulting in considerable economic damage.

The serological analysis revealed the presence of antibodies to EHV-1 in the Abay, Akmola, East Kazakhstan, Jambyl, Almaty, and Zhetysu regions. Seroprevalence rates in Akmola, East Kazakhstan, Almaty, and Abay ranged from 66.6% to 100%, while in Zhetysu and Jambyl regions, it was 50% or lower.

ELISA testing showed antibodies to EHV-4 in nearly all regions, except for Ulytau, Kostanay, and Pavlodar regions. Compared to EHV-1, the prevalence of EHV-4 was more widespread across Kazakhstan. Seroprevalence for EHV-4 reached 100% in Akmola, East Kazakhstan, Almaty, Zhetysu, West Kazakhstan, Aktobe, Kyzylorda, Jambyl, Karaganda, and Abay regions, while in Atyrau, North Kazakhstan, Mangystau, Kostanay, and Ulytau regions, antibodies were barely detectable.

CONCLUSION

Equine rhinopneumonitis, caused by the EHV-1 and EHV-4 serotypes, is highly prevalent among horses in Kazakhstan. The high seroprevalence, reaching up to 100%, indicates that EHV-4 has been circulating recently (2023–2024) and is still present. This situation highlights the need for the development and implementation of anti-epizootic measures, along with ongoing monitoring of the epizootic situation and pathogen typing, to ensure timely and effective control of this equine disease in Kazakhstan.

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ҚАЗАҚСТАНДАҒЫ ЖЫЛҚЫНЫҢ РИНОПНЕВМОНИЯСЫНЫҢ СЕРОПРЕВАЛЕНТТІЛІГІ

Абеуов Х.Б.*[1], Бурашев Е.Д.[1], Рыстаева Р.А.[1], Омарова З.Д.[1], Тулендибаев А.Б.[1], Ермекбай Т.Т.[1], Әубәкір Н.А.[1], Аргимбаева Т.У.[1], Әлібекова Д.Ә.[1], Абдураимов Е.О.[2], Рсалиев А.С.[2]

[1]«Биологиялық қауіпсіздік проблемаларының ғылыми-зерттеу институты» ЖШС, Гвардейск құқ, Қордай ауданы Жамбыл облысы, Қазақстан, 080409
[2]«QazBioPharm» Ұлттық холдингі» АҚ
Қорғалжын тас жолы к-сі, 13/5, Астана қ., Қазақстан, 010000
**Kh.abeuov@biosafety.kz*

ТҮЙІН

Зерттеудің мақсаты Қазақстандағы жылқы ринопневмониясының серопревалентттілігін анықтау бойынша мониторингтік зерттеулер жүргізу болды. ПТР сынамаларын зерттеу кезінде барлық үлгілер теріс нәтиже көрсетті, бірақ серологиялық талдау бірқатар аймақтарда жылқының герпесвирусының (ЖГВ) антиденелерінің болуын көрсетті.

Серологиялық талдау нәтижелері бойынша Ақмола, Abay, Шығыс-Қазақстан, Жамбыл, Алматы және Жетісу облыстарында 1 ЖГВ серотипіне антиденелер табылды. Бұл вирусқа серопревалентттілік Ақмола, Abay, Шығыс-Қазақстан және Алматы облыстарында 66,6-100%, ал Жетісу және Жамбыл облыстарында – 50 % және одан аз.

ИФТ нәтижелері Ұлытау, Қостанай және Павлодар облыстарын қоспағанда, барлық дерлік облыстарда антиденелердің және 4 ЖГВ серотипінің болуын көрсетті. ЖГВ-1-мен салыстырғанда Қазақстанның барлық өңірлерінде ЖГВ-4-ке серопревалентттілік басым болды. Ақмола, Abay, Шығыс-Қазақстан, Алматы, Жетісу, Батыс-Қазақстан, Ақтөбе, Қызылорда, Жамбыл және Қарағанды облыстарында серопревалентттілік 100 % көрсетті, ал Атырау, Солтүстік-Қазақстан, Маңғыстау, Ұлытау және Қостанай облыстарында антиденелер іс жүзінде анықталмады.

Түйін сөздер: мониторинг, жылқының ринопневмониясы, жылқының герпесвирусы, серотиптер, серопревалентттілік.

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СЕРОПОЗИТИВНОСТЬ РИНОПНЕВМОНИИ ЛОШАДЕЙ В КАЗАХСТАНЕ

Абеуов Х.Б.*[1], Бурашев Е.Д.[1], Рыстаева Р.А.[1], Омарова З.Д.[1], Тулендибаев А.Б.[1], Ермекбай Т.Т.[1], Әубәкір Н.А.[1], Аргимбаева Т.У.[1], Әлібекова Д.Ә.[1], Абдураимов Е.О.[2], Рсалиев А.С.[2]

[1]ТОО «Научно-исследовательский институт биологической безопасности», АО «Национальный холдинг «QazBioPharm».
пгт. Гвардейский, Кордайский район, Жамбылская область, Казахстан, 080409
[2]АО «Национальный холдинг «QazBioPharm».
Ул. Коргалжинское шоссе, 13/5, Астана, Казахстан, 010000
**Kh.abeuov@biosafety.kz*

АБСТРАКТ

Целью исследований явилось проведение мониторинговых исследований по определению серопревалентности ринопневмонии лошадей в Казахстане. При исследовании проб методом ПЦР все образцы показали отрицательные результаты, однако серологический анализ показал наличие антител к герпесвирусу лошадей (ГВЛ) в ряде регионов страны.

По результатам серологического анализа были обнаружены антитела к серотипу ГВЛ-1 в Акмолинкой, Абай, Восточно-Казахстанской, Жамбылской, Алматинской и Жетысуской областях. Серопревалентность к этому вирусу в Акмолинской, Восточно-Казахстанской, Алматинской областях области Абай, варьирует в диапазоне 66,6-100 %, а в Жетысуской и Жамбылской областей – 50 % и менее.

Результаты ИФА показали наличие антител и к серотипу ГВЛ-4 практически во всех областях, за исключением области Улытау, Костанайской и Павлодарской областей. В сравнении с ГВЛ-1 серопревалентность к ГВЛ-4 преобладала практически во всех регионах Казахстана. Серопревалентность в Акмолинской, Восточно-Казахстанской, Алматинской, Жетысуской, Западно-Казахстанской, Актюбинской, Кызылординской, Жамбылской Карагандинской областях и области Абай, показала 100 %, а в Атырауской, Северо-Казахстанской, Мангыстауской, Костанайской областях и области Улытау антитела практически не выявлялись.

Ключевые слова: мониторинг, ринопневмония лошадей, герпесвирус лошадей, серотипы, серопревалентность.