

ORAL VACCINATION OF WILDLIFE USING A VACCINE–RABISTAV

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Abstract. The paper reviews the development and use of RABISTAV PB-97 vaccine, highlights wildlife rabies control programs using the vaccine in Azerbaijan. For the first time in Azerbaijan, vaccination measures are conducted with the RABISTAV vaccine using helicopters and experts from relevant institutions by scattering decoy bait in 48 rural and forested areas in Shamakhi, Aghsu, Ismayilli, Gabala and Oguz regions of Azerbaijan, where carnivorous wild animals reside.

Keywords: rabies, wild life, oral vaccine, RABISTAV.

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1. Introduction

Natural and climatic conditions in Azerbaijan are mysterious, and the country is endemic to many diseases, including anthrax, brucellosis, and rabies, which occur with varying frequencies each year. Azerbaijan's geographical location makes it impossible to ignore the fact that it is usually surrounded by two mountain ranges (the Greater and Lesser Caucasus mountains) and dense forests. There is a rich fauna and a wide variety of wild animals in such a geographical area. In urban areas, stray dogs are the main source of rabies, but in mountainous and foothill areas, wild animals are the primary source.

While taking into account general factors, the geographical location of Azerbaijan, uncontrolled animal populations under occupation (during 1992-2020) and the rabies situation in neighbouring states should be considered when assessing the risk of rabies.

In 2016, 247,947 dogs and cats were vaccinated against rabies, 248,652 in 2017, 244,896 in 2018, 251,181 in 2019, and 217,944 in 2020, 207,032 in 2021, but stray dog populations in the country continue to pose a major risk of spreading rabies due to inadequate control and an unknown census (Chart 1). The 1,900 stray dogs and cats were vaccinated in 2018, and 377 in 2019 accordingly. The vaccination of stray animals did not take place in 2020, but 170 stray animals was vaccinated in 2021.

In the neighbouring countries - Turkey, Russia, Iran and Georgia - rabies disease is also endemic and occurs with different frequencies in almost the entire territory (Fig. 1). This means that the uncontrolled migration of animals due to weather conditions, hunger and other environmental factors in the areas near the border creates favourable conditions for the spread of rabies.

As a result of the risk analysis conducted taking into account all the above, decoy baits containing rabies vaccine were distributed among wild animals for the first time in 2023 in order to limit the spread of rabies throughout the country. The Rabistav vaccine

used for this purpose, was selected by the experts of the Food Safety Agency of the Republic of Azerbaijan.

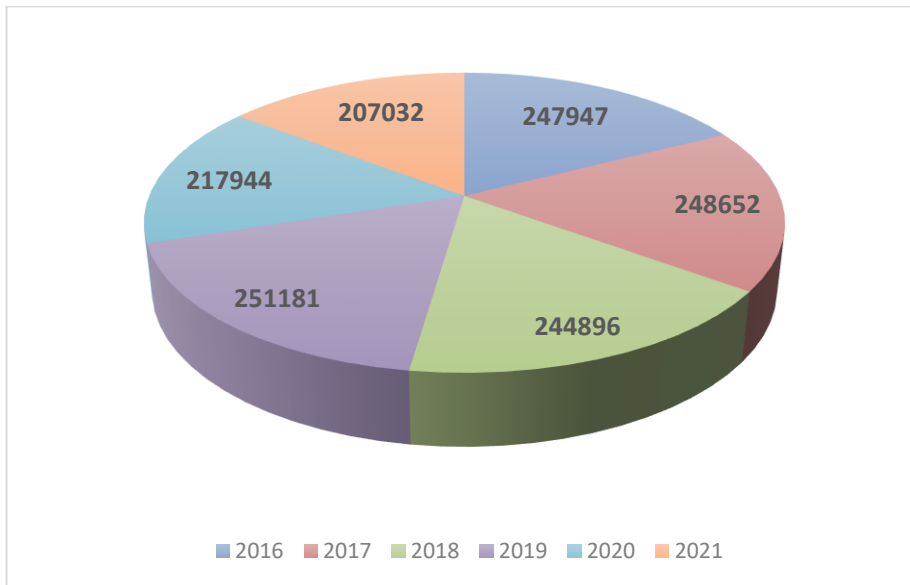


Chart 1. Dog and cats vaccination amount (2016-2021)

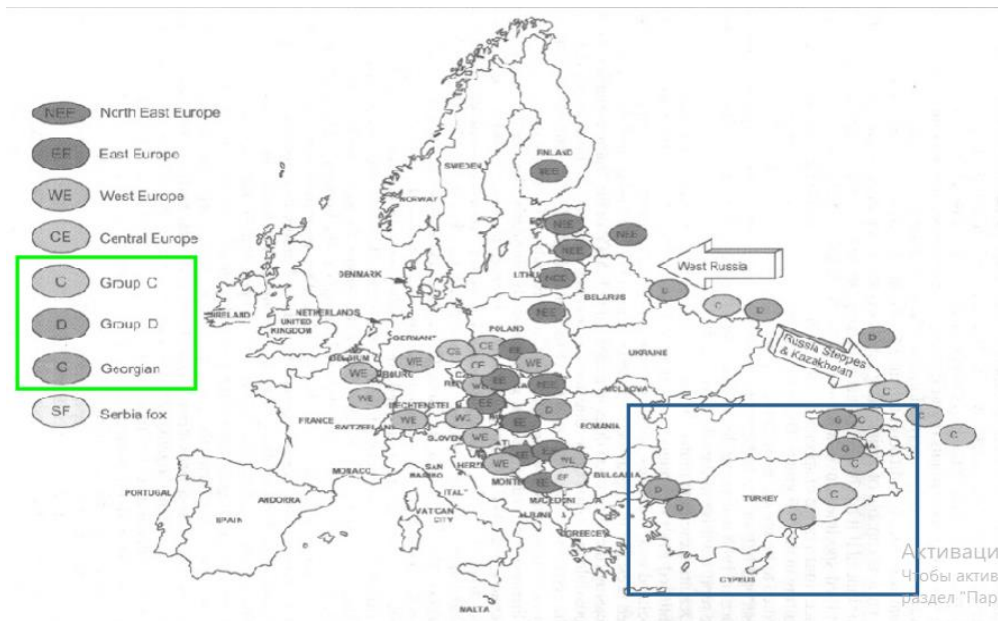


Figure 1. Distribution of rabies disease by groups

The Rabistav vaccine is intended for oral immunization of wild carnivorous animals against rabies in unfavorable and rabies-threatened territories. There are no contraindications to the vaccination of animals in the territories threatened by rabies. The vaccine is applied to threatened and disadvantaged territories due to rabies at the rate of 25-30 briquettes per 1 sqkm. Vaccination in rabies-threatened regions is carried out twice

a year: - the first time in the spring in the absence of snow and stable positive temperature (absence of night frosts) of 4-10°C (April-May); - the second time in autumn before the onset of frost (from the 3rd decade of September to the 3rd decade of November). Additional (third) vaccination is given at the end of June - beginning of July, at a temperature of no higher than 25°C, in the regions affected by rabies. A month after applying the vaccine, wild carnivorous animals (at least 4 heads from the territory of 100 km²) are shot on the territory, from which the lower jaw with teeth and blood are taken to evaluate the bait's edibility and the effectiveness of the vaccination. Collected samples (under the conditions of storage and transportation) are sent to veterinary laboratories, which conduct relevant research. Symptoms of rabies or other pathological signs of vaccine overdose are not established.

2. Material and methods

Before distributing decoy baits by helicopter in Azerbaijan, an oral vaccine was administered in the wild before the animals were vaccinated. In 2014, a small project was conducted in Azerbaijan's northwestern region bordering Georgia and in some parts near Baku to test the feasibility of oral vaccination against rabies. A manual distribution of inoculation feeds was carried out during this project. This measure had not been evaluated for effectiveness at that time. Due to this, wild animal vaccinations in 2023 are considered the first large-scale campaign.

During the event, the cargo was 18000 doses of decoy feed briquettes (23 boxes weighing 313 kg with a volume of 0.69m³). A dose of 25 (briquettes) is distributed every sqkm. 1 vaccine weighs between 25 and 30 grams.

A vaccination route covering Shamakhi, Agsu, Ismayilli, Gabala, Oguz, Sheki, Gakh, Zagatala and Balakan districts of Azerbaijan covered approximately 389 km depending on the relief structure. It was selected because of the high dynamics of rabies disease observed among animals over the years and the prevalence of animal bite complaints among people.

3. Results

Although it was the first time in the country, oral vaccination of wild animals by helicopter was very successful. Even if the instability of the weather conditions created certain difficulties along the flight route, the distribution of decoys to all the intended areas was fully implemented. Several nuances have been taken into account in determining the places where decoys will be thrown along the route initially in the form of a pilot project. Thus, the selected areas (Figure 2) were mainly border areas, and at the same time, they were chosen as areas where rabies cases are more common.

During this period, in addition, in 64 districts (cities) of our republic, vaccination was carried out by scattering 62,055 pieces of decoy bait among carnivorous wild animals and stray dogs.



Figure 2. Selected areas for vaccination (Departure and return route)

4. Discussion

Oral vaccination campaigns of wild animals should be carried out in parallel with measures to evaluate their effectiveness. In relation to oral vaccination campaigns of wild animals, public awareness measures should be carried out by competent authorities in order to prevent adverse events. Before initiating oral vaccination measures against rabies in wild animals, it is advisable to test the effectiveness of this method in a limited area. For this purpose, during the oral rabies vaccination method, aerial vehicles (helicopter and in some places by hand) were used to drop vaccine feed capsules into the areas where wild animals live.

In order to evaluate the effectiveness of the oral vaccination campaign, attention should be paid to:

- aerial distribution of vaccine fodder;
- selection the right time of the year for carry out of the vaccination;
- epidemiological surveillance of rabies in the entire country;

- monitoring of vaccination (collecting samples from wild animals in vaccinated areas and checking the absorption of vaccine feed and the level of immunity against rabies);
- maintaining the enhanced awareness programme among different social groups of citizens

Because oral vaccines are live vaccines released into the human environment, medical staff should be aware of the necessary treatment measures to be taken for people who have come into contact with the "vaccine feed".

At the end of the last works, it is planned to continue the oral vaccination campaign, which was initially carried out as a pilot project, across the country, and at the same time, with the aim of evaluating the effectiveness of vaccination, taking skull samples from wild animals and determining the antibiotic ring caused by eating the vaccine in their teeth is planned as a future measure.

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