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THE ROLE OF THE "RIFIZOSTREP" PREPARATION IN THE PREVENTION OF BOVINE TUBERCULOSIS VETERINARY RESEARCH INSTITUTE TUBERCULOSIS LABORATORY

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Annotation: In order to determine the effectiveness of the drug *"Rifizostrep"* in the treatment of tuberculosis, a series of experiments were conducted. As a result, on March 18, 2024, in the presence of the commission members, four calves in Group 1 were infected with *M. bovis-149*, and three calves each in Groups 2 and 3 were infected with the *M. tuberculosis* strain. After infection, Groups 1 and 2 received subcutaneous injections of the *Rifizostrep* preparation in the neck area once every 10 days according to the Methodological Guidelines. Group 3 served as the control group; after infection with *M. tuberculosis-7880*, no treatment was administered.
As a result, when tuberculin testing was performed on the animals infected with *M. bovis-149* and *M. tuberculosis-7880* and treated with *Rifizostrep* (Groups 1 and 2), negative reactions were observed. In contrast, in the control group (Group 3), infected with *M. tuberculosis-7880* but not treated with antibiotics, positive tuberculin reactions were recorded.
Keywords: cattle, Rifizostrep, preparation, strain, negative, positive, antibiotic, tuberculin testing, livestock, bacteria.

Relevance of the topic: Bovine tuberculosis (bTB) is one of the diseases listed by the World Organisation for Animal Health (WOAH) and must be compulsorily reported when detected in farms [1].

Tuberculosis in cattle poses a serious threat to livestock production worldwide, leading to significant economic losses and public health concerns. Globally, more than 50 million cattle are infected with tuberculosis (bTB), resulting in an estimated annual economic loss of around 3 billion USD to livestock industries by 2025 [2].

Materials and Methods: Research was conducted in the Tuberculosis Laboratory of the Veterinary Research Institute (VITI) to determine the specific activity of the newly developed *"Rifizostrep"* preparation against tuberculosis pathogens. To test its antimicrobial effect against tuberculous mycobacteria, experiments were carried out on 10 calves kept in the laboratory vivarium.

According to the VITI Director's Order No. 9-i/ch dated February 28, 2024, a commission consisting of nine members was established [3,4]. In the presence of the commission members, experiments were conducted to evaluate the chemoprophylactic effectiveness of *Rifizostrep* on

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10 calves. The animals were divided into three groups: Group 1 (4 calves) was infected with *M. bovis-149*, while Groups 2 and 3 (3 calves each) were infected with *M. tuberculosis* strains to study the antibiotic's effect.

Research results: On March 18, 2024, under the supervision of the commission members, four calves in Group 1 were infected with *M. bovis-149*, and three calves each in Groups 2 and 3 were infected with *M. tuberculosis* strains. After infection, Groups 1 and 2 received subcutaneous injections of *Rifizostrep* in the neck region once every 10 days according to the Methodological Guidelines. After six injections at 10-day intervals, the preparation was further administered once every 20 days. Group 3 served as a control group and did not receive the drug after infection.

During the experiment, all calves were tested monthly using PPD tuberculin. The study lasted for six months after infection. Upon completion, calves from all three groups (infected with *M. bovis-149* and *M. tuberculosis-7880*) were slaughtered for further pathoanatomical and bacteriological examinations.

Using PPD tuberculin produced by the VITI Tuberculosis Laboratory, tuberculin testing was carried out once in April, May, June, July, August, and September 2024. The tuberculin diagnostic reagent was injected intradermally into the left side of the calves using a BI-7 injector. The reaction was measured 72 hours later with a spring caliper.

Table 1.

Experimental scheme for testing the "Rifizostrep" preparation

№	Animal species	**Group**	Number of animals	Name of infected strain	Infection dose	Drug dose	**Name of preparation and route of administration**	Result + –
1	Calves, experimental	1	4	*M.bovis*-149	0,03 mg/kg	100 kg/5 ml.	Rifizostrep, Parenteral	-
2	Calves, experimental	2	3	*M.tuberculosis 7880*	0,03 mg/kg	100 kg/5 ml.	Rifizostrep, Parenteral	-
3	Calves, control	3	3	*M.tuberculosis 7880*	0,03 mg/kg	-	Control, without treatment	+

Note:*"+" – tuberculosis detected; "–" – tuberculosis not detected.*

Using PPD tuberculin produced by the VITI Tuberculosis Laboratory, tuberculin testing was conducted once in April, May, June, July, August, and September 2024 on the experimental calves. The tuberculin diagnostic reagent was injected intradermally into the left side of the calves using a BI-7 injector. The reaction results were measured 72 hours after tuberculin administration with a spring caliper.

For infecting the experimental animals, *M. bovis-149* and *M. tuberculosis-7880* strains were first cultured in Löwenstein–Jensen nutrient medium in test tubes for 16–20 days in a thermostat at +36.5°C. The suspension for infection was prepared under biosafety box

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conditions. From the colonies grown on the nutrient medium, a suspension was prepared in 0.9% physiological saline solution under box conditions and used for infection.
Experimental and control calves were infected subcutaneously in the neck area, slightly in front of the prescapular lymph node, at a dose of 0.03 mg/kg. The control group was infected with the *M. tuberculosis-7880* strain but was not treated with the preparation.
Taking into account the incubation period of mycobacterial development in the organism, 24 days after infection, the preparation was administered subcutaneously once every 10 days for 60 days. The study lasted for 9 months. After the experimental period ended, all calves from both the experimental and control groups were slaughtered for mandatory postmortem (pathoanatomical) examination. The duration of bacteriological examination of pathological samples was 3 months.

Conclusions

1. It was determined that during the commission-based experiment conducted on 10 calves in the Tuberculosis Laboratory, the *Rifizostrep* preparation showed high effectiveness against tuberculosis pathogens.
2. In Group 1, consisting of 4 experimental calves infected with the *M. bovis-149* strain, administration of *Rifizostrep* at a dose of 5 ml per 100 kg body weight resulted in a negative tuberculin reaction after 6 months.
3. In Group 2, consisting of 3 experimental calves infected with the *M. tuberculosis-7880* strain, administration of *Rifizostrep* at a dose of 5 ml per 100 kg body weight also resulted in a negative tuberculin reaction after 6 months.
4. In Group 3, the control group consisting of 3 calves infected with the *M. tuberculosis-7880* strain and not treated with the preparation, a positive tuberculin reaction was recorded.

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