ABSTRACT

Dissertation work of Abdiramanova Botagoz Akaydarkyzy for the degree of Doctor of Philosophy PhD on speciality 6D120100 - 'Veterinary Medicine' on the theme: 'Detection of the pathogen Trichophyton verrucosum with the help of the molecular genetic test system and immunoprophylaxis and treatment with a polyvalent inactivated vaccine'.

Relevance of the research topic. Bovine trichophytosis is more common in young cattle under 3 years of age and less common in cattle over 3 years of age. This is because currently there is no planned work on immunisation of cattle with trichophytosis vaccine. Trichophytosis infection is currently becoming an urgent problem, as trichophytosis is also transmitted to humans, so this disease is socially relevant. Currently, trichophytosis has been reported in cattle in 113 locations worldwide, covering 35-40% of the world's cattle. Trichophytosis-infected animals sharply reduce the quality of the obtained products (milk, meat and skin), while the growth of young animals is also delayed. Obtained during the study of the epizootic situation on trichophytosis of cattle: patent RK for utility model, 'Method of detection of *Trichophyton verrucosum* in pathological material'. For the first time in the field of veterinary medicine, pathological samples collected under production conditions were tested and detected for prompt detection of the dermatophyte *Trichophyton verrucosum* by PCR from pathological materials. Polyvalent inactivated vaccine against dermatomycosis of farm and carnivorous animals was first developed in 2018 and included in the veterinary register of the Republic of Kazakhstan.

Systematic prophylaxis and treatment of animals with this disease under production conditions with polyvalent inactivated vaccine against bovine trichophytosis against dermatomycoses of agricultural and meat animals was carried out.

Our modern research work contributes to improvement of epizootological (epidemiological) situation on dermatomycoses of cattle in the country, obtaining safe products of high sanitary quality (milk, beef and skin).

Today, due to the increasing number of cattle, the main task for livestock specialists is to give importance to the quality of young stock rather than its quantity.

Based on the above data, it can be understood that the problem of zooanthropophilic trichophytosis prevalence currently remains relevant not only in veterinary and medical, but also in social terms.

Accordingly, the study of the current clinical features and peculiarities of the epidemiology of zooanthroponous trichophytosis is the most important task of modern veterinary mycology. Knowledge of the peculiarities of this infection will improve the detailing, which, in turn, will allow timely initiation of prophylaxis and treatment to prevent neglected, neglected forms of dermatomycosis infection.

Purpose of the thesis research: Detection of *Trichophyton verrucosum* pathogen by molecular genetic testing system (PCR) and carrying out prophylactic and therapeutic work with polyvalent inactivated vaccine.

Objectives of the study.

1. study of epizootic situation of bovine trichophytosis in Almaty, Turkestan and Kyzylorda oblasts, collection of samples from diseased animals.

2. Allocation, cultivation and identification of field isolates of bovine trichophytosis.

3. Study of immunobiological (pathogenicity, virulence and immunogenicity) properties of isolated field isolates on laboratory animals.

4. Application of PCR method in detection of bovine trichophytosis.

5. Testing of prophylactic and therapeutic efficacy of polyvalent inactivated vaccine against dermatomycosis of agricultural and carnivorous animals in laboratory conditions (on rabbits).

6. Testing of prophylactic and therapeutic efficacy of polyvalent inactivated vaccine against dermatomycosis of farm and carnivorous animals in production conditions (on calves).

Research Methods.

According to the results of scientific research, 141 pathological samples from peasant farms in Almaty, Kyzylorda and Turkestan oblasts were sown in special nutrient medium Susloagar with isolation of field isolates of Trichophyceae. The isolated field isolates were identified using the definition of pathogenic, toxigenic and harmful to humans fungi by P.N.Kashkin, N.P.Golovina, L.G.Ivanova, D.Sutton and it was established that they belong to the species *Trichophyton verrucosum*. Having studied pathogenicity, virulence and immunogenicity of isolated isolates of *Trichophyton verrucosum*, it was found that the percentage of studied properties of trichophytosis was 60-70%, and the percentage of standard epizootological strain was 100%. Detection of trichophytosis by PCR in pathological samples, for the first time introduced in the field of veterinary medicine.

Main points (proven scientific hepotheses and other conclusions that are new knowledge).

The timely application of express-diagnostics of dermatophyte *Trichophyton verrucosum* in pathological material by PCR and planned introduction of polyvalent inactivated vaccine against trichophytosis of cattle in production conditions is actual for today.

Characterisation of the main findings of the research.

1. In each of the studied regions of the Republic of Kazakhstan the level of incidence of bovine trichophytosis was revealed.

2. At detection of cases of bovine trichophytosis a patent for useful model of the Republic of Kazakhstan for the method of detection of *Trichophyton verrucosum* in pathological material was obtained.

3. For the first time in the field of veterinary medicine the express-diagnosis

of dermatophyte *Trichophyton verrucosum* by PCR was carried out on pathological materials collected in production conditions.

4. The systematic prophylaxis and treatment of patients with trichophytosis of cattle in production conditions using polyvalent inactivated vaccine against dermatomycoses of farm and carnivorous animals was carried out.

Justification of the novelty and significance of the results obtained.

In each region of the Republic of Kazakhstan epizootic situation of trichophytosis among young cattle was revealed and prophylactic and therapeutic efficacy of the applied vaccine was specified.

In the course of studying the epizootic situation of trichophytosis in cattle a patent of the Republic of Kazakhstan was obtained: Method of specific detection of *Trichophyton verrucosum* in cattle. Utility model No. 8224 RK, 30 June 2023 was obtained.

For the first time in the field of veterinary medicine an express method of detection of dermatophyte *Trichophyton verrucosum* by PCR in pathological material was introduced.

Relevance to science development directions or government programmes.

Dissertation work in the Republic of Kazakhstan for 2018-2020 was carried out under the project «Development of practical technologies for castration, suppression of bulls' activity, sorting, culling of bulls on the fattening plateau», under the GMK programme of the Ministry of Education and Science of the Republic of Kazakhstan, BR06249373-20 (2018-2020) and in 2022-2024 under the project «Zhas-Falym».

A description of the doctoral student's contribution to each publication.

9 scientific papers have been published on the thesis topic, including: 3 articles published in the editions recommended by the Ministry of Higher Education and Science of the Republic of Kazakhstan, 1 article - in the publications on the basis of Scopus, 2 patents of the Republic of Kazakhstan for a useful model, 1 article - in the materials of the international conference, 1 practical proposal and 1 methodological instruction.

The scope and structure of the thesis work.

Materials of the dissertation contains from 116 pages of computer text, which includes: normative references, definitions, designations and abbreviations, introduction, literature review, independent research, analysis of research results, conclusion, practical recommendations, List of used literature, appendices.

The dissertation work is decorated with 16 tables, 7 figures. The number of used domestic and foreign literature 163.