

Науковий вісник Львівського національного університету ветеринарної медицини та біотехнологій імені С.З. Гжицького

Scientific Messenger of Lviv National University
of Veterinary Medicine and Biotechnologies

ISSN 2518–7554 print
ISSN 2518–1327 online

doi: 10.15421/nvlvet8351
<http://nvlvet.com.ua/>

UDC 636.09:616.98:579.62

Etiological structure of bacteriosis of animals in the Dnipropetrovsk region for 2014–2016

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Article info

Received 30.01.2018
Received in revised form
28.02.2018
Accepted 05.03.2018

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Glebenyuk, V.V., Borovik, I.V., Kuchuk, T.V., & Litvinenko, O.O. (2018). Etiological structure of bacteriosis of animals in the Dnipropetrovsk region for 2014–2016. Scientific Messenger of Lviv National University of Veterinary Medicine and Biotechnologies. 20(83), 260–263. doi: 10.15421/nvlvet8351

The epizootic situation with regard to some infectious diseases in the Dnipropetrovsk region remains as complicated and strained. Timely and accurate diagnosis determines the effectiveness of the realized preventive measures of infectious diseases and establishes the peculiarities and changes of the epizootic situation in certain areas. The laboratory examinations, including the bacteriological method, have the crucial importance for the correct assessment of prevention and antiepidemic measures. Objective of this review: was to determine the etiological structure of infectious diseases in the Dnipropetrovsk region for 2014–2016, based on the results of bacteriological examinations. As the material for the examinations were the data of the veterinary reports of the State district veterinary medicine laboratories of the Dnipropetrovsk region and the results of our own examinations conducted on the basis of the Dnipropetrovsk Regional State Laboratory of the Veterinary Medicine (DRSLVM). As of 2014 year, in the Dnipropetrovsk region, the livestock capita in all categories of farms was: horned cattle – 130.527, small cattle – 44.739, pigs – 520.801, horses – 1.781, poultries – 15.342,087, including chickens – 14.816.157, waterfowl – 525.930. During 2014–2016 by means of laboratories of veterinary medicine in the Dnipropetrovsk region have been conducted 18.474 examinations on the infectious diseases of the animals. 142 positive results were received in total. According to the results of the bacteriological examinations in the Dnipropetrovsk region, for the years 2014–2016 were registered diplococcosis, malignant edema, pasteurellosis, colibacteriosis, salmonellosis, pullorosis, staphylococcosis, streptococcosis and swine erysipelas, poultry pseudomonosis, aeromonosis of fish, parafoul brood (caused by *Bacillus paraalvei*) and proteose of bees. 4.472 examinations were conducted on colibacteriosis and 78 positive results were obtained. 21 cultures were obtained from the pigs, from poultries – 44 cultures, from embryos – 6 cultures, from small cattle – 3 cultures, from fur animals – 2 cultures, from dogs – 2 cultures. Cultures of *Escherichia coli*, isolated from pigs are represented by the serological variants: O139, O26, O9, O78, O1, O8 and atypical variants, and from poultries – O115, O119, O78, O15, O86, K88 AB and atypical variants. For salmonella, 7.578 examinations were conducted and 16 positive results were obtained. Among the diseases of bees, laboratory tests have been recorded parafoul brood and proteose of bees. Conclusion: causative agents of 13 infectious animal diseases have been identified in the Dnipropetrovsk region by means of bacteriological investigations. Most commonly isolated pathogens of intestinal infections (colibacteriosis and salmonellosis).

Key words: Dnipropetrovsk region, bacteriosis, animals, colibacteriosis, salmonellosis, bacteriological examinations.

Етіологічна структура бактеріозів тварин у Дніпропетровській області за 2014–2016 роки

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Епізоотична ситуація щодо деяких інфекційних хвороб на Дніпропетровщині залишається складною і напруженою. Своєчасна й точна діагностика визначає ефективність реалізованих заходів профілактики інфекційних хвороб та встановлює особливості і зміни епізоотичної ситуації на певних територіях. Лабораторні дослідження, в тому числі бактеріологічний метод, мають вирішальне значення для правильної оцінки профілактичних і протиепізоотичних заходів. Метою нашої роботи було визначити за результатами бактеріологічних досліджень етіологічну структуру інфекційних хвороб у Дніпропетровській області за 2014–2016 роки. Матеріалом для досліджень були дані ветеринарної звітності державних районних лабораторій ветеринарної медицини Дніпропетровської області та результати власних досліджень, проведені на базі Дніпропетровської регіональної державної лабораторії ветеринарної медицини (ДРДЛВМ). Станом на 2014 рік у Дніпропетровській області поголів'я тварин по всіх категоріях господарств становило: великої рогатої худоби – 130527, дрібної рогатої худоби – 44739, свиней – 520801, коней – 1781, птахів – 15342087, у тому числі курей – 14816157, водоплавної – 525930. Упродовж 2014–2016 рр. лабораторіями ветеринарної медицини у Дніпропетровській області було проведено 18474 дослідження на інфекційні захворювання тварин. Всього було отримано 142 позитивні результати. За результатами бактеріологічних досліджень у Дніпропетровській області за 2014–2016 рр. було зареєстровано диплококоз, зложісний набряк, пастерельоз, колибактеріоз, сальмонельоз, пулороз, стафілококоз, стрептококоз та бешису свиней, псевдомоноз птиці, аеромоноз риб, паразитиць та протез бджіл. На колибактеріоз проведено 4472 дослідження і одержано 78 позитивних результатів. Від свиней отримано 21 культуру, від птиці – 44 культури, від ембріонів – 6 культур, від дрібної рогатої худоби – 3 культури, від хутрових звірів – 2 культури, від собак – 2 культури. Культури *Escherichia coli*, виділені від свиней представлені серологічними варіантами: O139, O26, O9, O78, O1, O8 та нетипованими, а від птиці – O115, O119, O78, O15, O86, K88 АБ та нетипованими. На сальмонельоз проведено 7578 досліджень і отримано 16 позитивних результатів. Серед хвороб бджіл лабораторними дослідженнями було зареєстровано паразитиць та протез бджіл. Висновки: у Дніпропетровській області бактеріологічними дослідженнями виділено збудників 13 інфекційних хвороб тварин. Найчастіше виділялися збудники кишкових інфекцій (колибактеріозу та сальмонельозу).

Ключові слова: Дніпропетровська область бактеріоз, тварини, колибактеріоз, сальмонельоз, бактеріологічні дослідження.

Introduction

The modern path of development of the Ukraine causes appearance of complex requirements and tasks in the field of animal husbandry, directed on the provision of the population with high-quality agricultural production in accordance with international standards of quality and security. Such production of animal origin should not contain pathogenic microorganisms and can only be obtained from healthy animals (Khomenko et al., 1995).

The epizootic situation with regard to some infectious diseases in the Dnipropetrovsk region remains as complicated and strained (Tkachenko et al., 2007; Ukhovskij et al., 2014; Bila et al., 2014; Hlebenjuk, 2014; Hlebenjuk and Telizhenko, 2015; Borovyk, 2016). Timely and accurate diagnosis determines the effectiveness of the realized preventive measures of infectious diseases and establishes the peculiarities and changes of the epizootic situation in certain areas (Konopatkin et al., 1984; Yarchuk et al., 2002).

The laboratory examinations, including the bacteriological method, have the crucial importance for the correct assessment of prevention and antiepidemic measures (Vasylieva, 2016; Ushkalov, 2017).

Objective of this review: was to determine the etiological structure of infectious diseases in the Dnipropetrovsk region for 2014–2016, based on the results of bacteriological examinations.

Materials and methods

As the material for the examinations were the data of the veterinary reports of the State district veterinary medicine laboratories of the Dnipropetrovsk region and the results of our own examinations conducted on the basis of the Dnipropetrovsk Regional State Laboratory of the Veterinary Medicine (DRSLVM).

Results and discussion

As of 2014 year, in the Dnipropetrovsk region, the live-stock capita in all categories of farms was: horned cattle – 130.527, small cattle – 44.739, pigs – 520.801, horses – 1.781, poultries – 15.342.087, including chickens – 14.816.157, waterfowl – 525.930.

During 2014–2016 by means of laboratories of veterinary medicine in the Dnipropetrovsk region have been conducted 18.474 examinations on the infectious diseases of the animals (Fig.). 142 positive results were received in total.

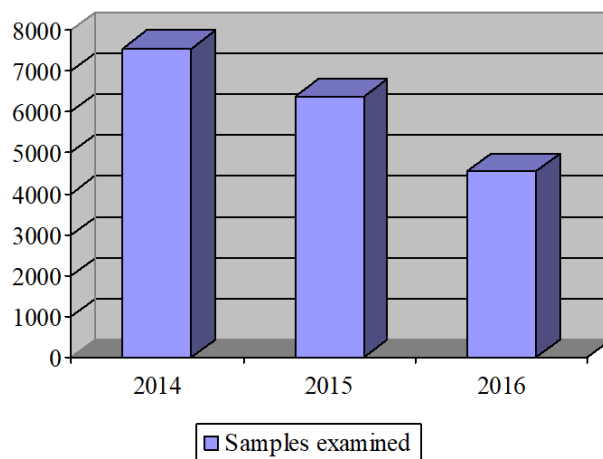


Fig. Number of the bacteriological examinations on bacteriosis of the animals in the Dnipropetrovsk region for 2014–2016 (data, received from DRSLVM)

According to the results of the bacteriological examinations in the Dnipropetrovsk region, for the years 2014–2016 were registered diplococcosis, malignant edema, pasteurellosis, colibacteriosis, salmonellosis, pullorosis, staphylococcosis, streptococcosis and swine erysipelas, poultry pseudomonosis, aeromonosis of fish, parafoul brood (caused by *Bacillus paraalvei*) and proteose of bees.

As can be seen from the table, 71 samples were examined on swine erysipelas, including 5 samples from wild fauna. The positive result was found in 5 animals from Kryvorizkyi and Petrykivskyi districts.

From the 745 examinations on pasteurellosis, the diagnosis was confirmed in 3 animals (2 rabbits from the city of Dnipro and 1 lamb from Pavlogradskyi district).

4.472 examinations were conducted on colibacteriosis and 78 positive results were obtained. 21 cultures were obtained from the pigs (Novomoskovs'kij, Sinel'nikivs'kij, Magdaliniivs'kij, Dniprovskyi, Petrykivskyi and Pyatyhatskyi districts), from poultries – 44 cultures (Novomoskovs'kij, Sinel'nikivs'kij, Krivoriz'kij, Tomakivs'kij, Dniprovskyi, Petrykivskyi and Pyatyhatskyi districts), from embryos – 6 cultures (Petrykivskyi district), from small cattle – 3 cultures (Magdaliniivs'kij and Dniprovskyi districts), from fur animals – 2 cultures, from dogs – 2 cultures.

Cultures of *Escherichia coli*, isolated from pigs are represented by the serological variants: O139, O26, O9, O78, O1, O8 and atypical variants, and from poultries – O115, O119, O78, O15, O86, K88 AB and atypical variants.

For salmonella, 7,578 examinations were conducted and 16 positive results were obtained (Table). From pigs received 2 cultures (Krivoriz'kij and Petrikivs'kij districts), from horned cattle – 1 culture (Magdaliniivs'kij district), from coypu furs – 2 cultures (Verchedniprovs'kij district), from poultries – 12 cultures (Magdaliniivs'kij, Krivoriz'kij, Sinel'nikivs'kij and Pyatyhatskyi districts).

Table

Frequency of isolation of bacterial pathogens of animals in Dnipropetrovsk region for 2014–2016

Name of disease	Samples examined	Cultures isolated
colibacteriosis	4472	78
salmonellosis	7578	16
pullorosis	213	9
swine erysipelas	71	5
pasteurellosis	745	3
staphylococcosis	18	12
swine streptococcosis	27	4
poultry pseudomonosis	73	6
diplococcosis	1	1
malignant edema	1	1
aeromonosis of fish	360	5
parafoul brood	2	1
proteose of bees	1	1
rest	4912	0

Causative agent of pullorosis were isolated in 9 cases (Magdaliniivs'kij and Pyatyhatskyi districts).

By means of bacteriological examinations were determined the etiological significance of 12 staphylococcal cultures in the occurrence of inflammatory processes (vaginitis, conjunctivitis, dermatitis, etc.). Diplococcosis was recorded in 1 animal (Magdaliniivs'kij district).

Streptococcosis of pigs has been confirmed by 4 animals (Sinel'nikivs'kij district). For malignant edema of

swines, 1 examination was conducted and the positive result was obtained (Pyatyhatskyi district).

On pseudomonosis of the poultries, 73 examinations were conducted and 6 positive results were obtained (Dniprovskyi and Pyatyhatskyi districts). In addition, the culture of *Pseudomonas aeruginosa* was isolated from the dog and lamb biomaterial.

From the 360 examinations on fish aeromonosis, the diagnosis was confirmed in 5 samples (Novomoskovs'kij and Dniprovskyi districts).

Among the diseases of bees, laboratory tests have been recorded parafoul brood and proteose of bees.

Conclusion

Causative agents of 13 infectious animal diseases have been identified in the Dnipropetrovsk region by means of bacteriological investigations. Most commonly isolated pathogens of intestinal infections (colibacteriosis and salmonellosis).

Prospects for further research are to conduct an analysis of bacteriological examinations on animal bacteriosis in the Ukraine and to evaluate the effectiveness of specific prevention of infectious diseases of animals in the Dnipropetrovsk region.

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