Retrospective analysis of the spread of bacterial poultry diseases on the territory of Ukraine for the period 2012–2020


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uncertainty of imports and exports, confusion in regulations due to raw poultry products, which are an important part of the global food market. In humans, concerns about dietary salmonella have prompted many countries to implement measures to control salmonella contamination of raw chicken. Of particular concern to this group is the use of criteria that assume zero tolerance to salmonella and complete absence of the pathogen. Researchers and experts have pointed out that terms such as “zero tolerance” or “microbial absence” for raw poultry should be avoided unless defined and interpreted by international agreements. Risk evaluation provides a more meaningful approach than the “zero-tolerance” philosophy, and new indicators such as human health performance targets should be used throughout the food chain to help identify risk and identify ways to reduce negative influence on public health (Mead et al., 2010; Cox et al., 2011).

Salmonella, staphylococci and clostridia (pathogens of anarobic enterotoxemia) are pathogens that cause acute intestinal diseases (toxicoinfections). The causative agent of avian colibacillosis Escherichia coli can be present in the intestines of poultry almost permanently. The causative agent of colibacillosis often complicates diseases in poultry caused by viruses, pasteurelles, mycoplasmas or other bacteria. The pathogen can cause fever, diarrhea, and skin rashes (Sukumaran & Prasadana, 2003). E. coli O157:H7, which is dangerous to humans, is often circulated in poultry farms and is even isolated from broiler meat (Bitzan et al., 1993). Tuberculosis in poultry is caused by Mycobacterium avium. The pathogen can affect people with immune problems (immunodeficiency). Pseudomonas aeruginosa (blue purulent bacillus) is also common in poultry. However, people with a high level of immunity and intact mucous membranes do not develop the disease. The disease occurs in people with immunodeficiency; the elderly and children. Of the respiratory bacterial infections in poultry farms, the most common are pasturellosis and respiratory mycoplasmosis (Bakulin, 2016; Reuben et al., 2021). Anaerobic enterotoxemia, caused by Clostridium perfringens, is characterized by damage to the small intestine, and leads to losses due to loss of productivity caused by the influence of toxins on the organism of poultry, increasing mortality. In addition, there is an increased risk of the pathogen and toxins entering poultry products (Van Immerseel et al., 2004; Wei et al., 2020).

Given the relevance of bacterial diseases of poultry in the world and, in particular, in Ukraine, the aim of our work was to conduct a retrospective analysis of the spread of these diseases in Ukraine over nine years by analyzing and systematizing the results of bacteriological investigation.

Materials and methods

The authors conducted a retrospective analysis of the spread of bacterial diseases of poultry in Ukraine for the period 2012–2020. For this purpose, the reports of the regional laboratories of the State Food and Consumer Service and the State Research Institute for Laboratory Diagnostics and Veterinary Sanitary Examination (SSRLDVSE, Kyiv) for 9 years were studied, systematized and analyzed.

In order to analyze the spread of bacterial diseases of poultry in the context of the regions in Ukraine, we analyzed data on 20 diseases of poultry, namely: hemorrhagia, enterotoxemia, yersiniosis, campylobacteriosis, colibacillosis, coligranulomatosis, klebsiella, listeriosis, mycoplasmosis, meningitis, pasteurellosis, pathogenic protozoa, pneumococcosis, pseudomononosis, pullorosis, erysipelias septicaemia, salmonellosis, staphylococcosis, streptococcosis and tuberculosis.

Numerical data are presented in the article without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and part of the temporarily occupied territories of Donetsk and Luhansk regions.

Information on the total number of poultry on the territory of Ukraine was obtained on the website of the State Statistics Service of Ukraine (http://ukrstat.gov.ua), information on poultry in the world, the number of poultry meat and eggs produced from site statistica.com (http://sur/l/bjknp, http://sur/l/bjkot).

Area mapping was presented in the software Quantum GIS 3.16.0 (International Quantum GIS Project, version 2020, Germany), which is freely available (www.qgis.org/ru/site/forum/download.html). Vector layers for the borders of the regions of Ukraine were downloaded at www.diva-gis.org/Data. A quantile with 4 data classes was chosen for classification with 4 data classes.

Results

Epidemic situation regarding bacterial diseases of poultry in Ukraine. Analyzing the volume of bacteriological diagnosis of poultry diseases in Ukraine for the period 2012–2020, we see that the largest number of samples from poultry was studied in 2012 and 2013 – 137,809 and 121,987 samples, respectively, and the lowest in 2020 – 58,320 samples. It should be noted that for the entire analyzed period, the volume of bacteriological diagnosis of poultry diseases is constantly declining, as evidenced by the trend line. The number of bacterially tested samples from poultry decreased from 137,809 samples in 2012 to 58,320 samples in 2020 (the number of tested samples decreased by 57.7% between 2012 and 2020, Fig. 1).

In order to compare the volume of bacteriological studies of poultry and the number of poultry, Figure 1 shows the dynamics of the number of the poultry population in Ukraine, according to the State Statistics Service of Ukraine as of January 1 of each year. As can be seen from the graph, the number of poultry in Ukraine during the analyzed period fluctuated significantly: from 2012 to 2014 it increased – from 200,760.6 to 230,289.8 thousand head; from 2014 to 2017 it decreased – from 230,289.8 to 201,668.0 thousand head; from 2017 to 2020 it increased – from 201,668.0 to 226,333.0 thousand head. Thus, during the period 2012–2020, when the decrease in the volume of bacteriological diagnostics began, the poultry population in Ukraine ranged from 200,760.6 to 230,289.8 thousand head, i.e. there was a fluctuation in the number of the poultry population by 14.7% for the specified period. Comparing the indicators of reduction of bacteriological diagnostics (by 57.7% in 2012–2020) and indicators of fluctuations in the number of the poultry population (by 14.7% over the same period), we can affirm that the volume of bacteriological diagnostics of poultry has significantly decreased recently and they are not related to objective reasons, namely fluctuations in poultry population.

As shown in Figure 2, the infection of poultry with bacterial pathogens during the analyzed period was the highest in 2013 and 2017 – 0.9%
and 0.8%, respectively. The lowest infection rate was observed in 2019 – 0.5%. In 2014–2017, there was a gradual increase in infection, in the next three years (2018–2020) the infection began to decrease – from 0.8% in 2017 to 0.5% in 2019. In general, during the analyzed period, from 2012 to 2020, there was a steady trend to reduction in the number of positive samples from poultry during bacteriological studies.

In the nine years (2012–2020) that were analyzed, the veterinary laboratories of Ukraine conducted 882,121 bacterial investigations of poultry samples and obtained 6,614 positive results. The generalized results of bacterial investigations of poultry diseases are presented in Table 1.

### Table 1

<table>
<thead>
<tr>
<th>The name of the disease</th>
<th>Number of tested samples</th>
<th>Number of positive samples</th>
<th>Prevalence, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemorrhagiosis</td>
<td>1,778</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>Yersiniosis</td>
<td>2,409</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Infectious enterotoxemia</td>
<td>376</td>
<td>17</td>
<td>4.5</td>
</tr>
<tr>
<td>Campylobacteriosis</td>
<td>1,178</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>2,107</td>
<td>6</td>
<td>0.3</td>
</tr>
<tr>
<td>Colibacteriosis</td>
<td>212,759</td>
<td>3,766</td>
<td>1.8</td>
</tr>
<tr>
<td>Coligranulomatosis</td>
<td>1,316</td>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>34,467</td>
<td>6</td>
<td>0.02</td>
</tr>
<tr>
<td>Mycoplasmosis</td>
<td>354</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Neisseriosis</td>
<td>2,414</td>
<td>5</td>
<td>0.2</td>
</tr>
<tr>
<td>Pasteurelliosis</td>
<td>88,877</td>
<td>463</td>
<td>0.5</td>
</tr>
<tr>
<td>Pathogenic proteus</td>
<td>9,959</td>
<td>10</td>
<td>0.1</td>
</tr>
<tr>
<td>Pneumococcosis (diplococci)</td>
<td>18,225</td>
<td>35</td>
<td>0.2</td>
</tr>
<tr>
<td>Pseudomonosis</td>
<td>21,063</td>
<td>440</td>
<td>2.1</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>46,861</td>
<td>237</td>
<td>0.5</td>
</tr>
<tr>
<td>Erysipelotuberculosis</td>
<td>16</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>Salmonellosis (patmat.)</td>
<td>306,466</td>
<td>892</td>
<td>0.3</td>
</tr>
<tr>
<td>Staphylococcosis</td>
<td>62,666</td>
<td>516</td>
<td>0.8</td>
</tr>
<tr>
<td>Streptococcosis</td>
<td>66,944</td>
<td>174</td>
<td>0.3</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>186</td>
<td>26</td>
<td>0.14</td>
</tr>
<tr>
<td>Total</td>
<td>882,121</td>
<td>6,614</td>
<td>0.8</td>
</tr>
</tbody>
</table>

As shown in Table 1, the predominant number of positive samples in the bacteriological diagnosis is detected in poultry with colibacteriosis – 56.9% of the total number of all positive samples. Also, the dominant bacterial diseases of poultry in Ukraine during the analyzed period were: salmonellosis (13.5%), staphylococcosis (7.8%), pasturelliosis (7.0%), pseudomonosis (6.8%), pullorosis (3.6%) and streptococcosis (2.6%).

Significantly fewer positive samples were registered in the bacteriological investigation of other diseases: pneumococcosis 0.5%, tuberculosis 0.4%, infectious enterotoxemia 0.3%, pathogenic proteus 0.2%, erysipelas septicaemia 0.1%, klebsiella 0.1%, listeriosis 0.1%, neisseriosis 0.08%, coligranulomatosis 0.05% and hemophilliosis 0.02%. According to the results of bacteriological investigations of poultry for such diseases as yersiniosis, campylobacteriosis and mycoplasmosis – no positive test was found for the entire analyzed period.

According to most leading experts in the study of infectious bacterial diseases of poultry, the nosological profile of bacterial diseases of poultry requires constant monitoring in both poultry and wild, synanthropic and zoological birds. Therefore, we conducted a retrospactive ecological and geographical analysis of the spread of the seven most common bacterial diseases of poultry in Ukraine.

The investigation of the spread of colibacteriosis among poultry in Ukraine. During the analyzed period during the bacteriological diagnosis of poultry we received 3,766 positive samples for colibacteriosis, which is 56.9% of the total number of all positive samples. This disease is widespread in Ukraine among poultry, and ranks first (in the number of positive samples) in the etiological structure of bacterial diseases of poultry. (Fig. 3). Infection of poultry with colibacteriosis in the analyzed period was the highest in 2013 – 2.4%. The lowest infections were in 2019 and 2020 – 1.1% and 1.2%, respectively. In general, during the analyzed period, we observed a steady decrease in the infection of poultry with colibacteriosis. In absolute terms, a similar trend was observed to reduction in the incidence of this disease.

**, Study of the prevalence of salmonellosis among poultry in Ukraine.**

During the period analyzed, the state veterinary laboratories of Ukraine received 892 positive samples for salmonellosis, which is 13.5% of the total number of positively responding poultry. Such a significant percentage of infection indicates that on the territory of Ukraine this disease is one of the dominant, and the causative agents of this disease play a significant role in infecting poultry with bacterial diseases (Fig. 4). The peak of poultry infection with salmonellosis in the analyzed period was in 2013,
2014 and 2015 and amounted to 0.4%, 0.5% and 0.4%, and the fewest cases were observed in 2019 – 0.05%. In general, from 2012 to 2020, as evidenced by the trend line, there was a steady decrease in the infection of poultry with salmonellosis.

Research on the spread of staphylococcosis among poultry in Ukraine. During the analyzed period, 516 positive samples for staphylococcosis were detected, which is 7.8% of the total number of positively responding poultry. This disease plays a leading role in the etiological structure of bacterial diseases of poultry in Ukraine (Fig. 5). The morbidity of poultry for staphylococcosis in the analyzed period was the highest in 2020 – 2.0%, and the lowest in 2012, 2015 and amounted to 0.4% and 0.3%, respectively. During the analyzed period, two periods were observed: the first – from 2012 to 2017 when there were slight fluctuations in indicators of the poultry disease staphylococcosis from 0.3% in 2015 to 1.1% in 2013; second – from 2017 to 2020 there was a steady annual increase in cases of infection of poultry with staphylococcosis from 0.5% in 2017 to 2.0% in 2020. In general, during the analyzed period, we observed a steady trend of increasing rates of infection of poultry with staphylococcosis. In absolute terms (the number of positive samples per year), we observed a variety of indicators – fluctuations over the years from 40 to 88 positive samples.

Research on the spread of pasteurellosis among poultry in Ukraine. During the analyzed period, veterinary laboratories received 463 positive samples for pasteurellosis, which is 7.0% of the total number of positive samples from poultry. This disease is widespread in Ukraine among poultry, and ranks fourth (in the number of positive samples) in the etiological structure of bacterial diseases of poultry in Ukraine (Fig. 6). Infection of poultry with pasteurellosis for the analyzed period was the highest in 2017 and 2018 – 0.82% and 0.81%, respectively, and the lowest in 2019 and 2020 – 0.2% and 0.3%, respectively. In general, from 2012 to 2020, as evidenced by the trend line, there is a slight tendency to reduction in the incidence of infection of poultry with pasteurellosis.

Research on the spread of pseudomonosis among poultry in Ukraine. During the research period, 449 positive samples for pseudomonosis were received, which is 6.8% of the total number of positively responding poultry (Fig. 7). Infection with pseudomonosis for the analyzed period was the highest in 2019 – 4.9%. The lowest number of infections were in 2014, 2015 and 2016 and amounted to 0.90%, 0.93% and 1.20%, respectively. In general, from 2012 to 2020, there was a steady trend to increase in the incidence of infection of poultry with pseudomonosis.
Research on the spread of pullorosis among poultry in Ukraine. During the experimental period, 237 positive samples for pullorosis were received, which is 3.6% of the total number of all positive samples. This disease ranks sixth (in the number of positive samples) in the etiological structure of bacterial diseases of poultry in Ukraine (Fig. 8). The incidence of pullorosis in poultry for the analyzed period was the highest in 2019 – 1.0%. The lowest infection rate was in 2014 – 0.2%. In general, during the analyzed period, we observed heterogeneity in the rates of infection of poultry with pullorosis. From 2012 to 2020, as evidenced by the trend line, there was a tendency to increase in the share of poultry infection with pullorosis. But in absolute terms, there was a tendency to reduction in infections.
Research on the spread of streptococcosis among poultry in Ukraine. During the period subjected to analysis, 174 positive samples for streptococcosis were received, which is 2.6% of the total number of positive samples from poultry. By the number of positive samples detected, this disease ranks seventh in the etiological structure of bacterial diseases of poultry in Ukraine (Fig. 9). Infection of poultry with streptococcosis in the analyzed period was the highest in 2020 – 1.0%, and the lowest in 2014 – 0.01%. In general, from 2012 to 2020, as evidenced by the trend line, there was a steady increase in the share of infection of poultry with this disease.

Territorial spread of the main bacterial diseases of poultry on the territory of Ukraine. We have also performed an ecological and geographical analysis of the spread of poultry diseases in Ukraine for each of the seven most common bacterial diseases of poultry: colibacteriosis, salmonellosis, staphylococcosis, pasteurellosis, pseudomonosis, pullorosis and streptococcosis. Based on the data on the results of bacterial examination of poultry samples, using the software “QGIS 3.16.0”, we created “Maps of the spread of bacterial diseases of poultry” (Fig. 10), on which the density of the number of positive samples for the most common bacterial diseases of poultry in the context of the regions of Ukraine is visualized with the help of different color intensities of each region.

For the purpose of territorially analyzing the etiological structure of bacterial diseases of poultry, a map of the etiological structure of poultry diseases in all regions of Ukraine was drawn up (from 2012 to 2020), which shows the percentage of the seven most common poultry diseases with the help of pie charts, according to the results of bacteriological investigation conducted by state laboratories of veterinary medicine Figure 11.

Fig. 10. Maps of the spread of bacterial diseases of poultry in Ukraine (2012–2020):
a – colibacteriosis, b – salmonellosis, c – staphylococcosis, d – pasteurellosis, e – pseudomonosis, f – pullorosis, g – streptococcosis
As can be seen from the map of the nosological profile of bacterial diseases of poultry, the etiological factors of bacterial diseases in different regions of Ukraine are not homogeneous. So, for example, in the Luhansk region the nosological profile is varied and is represented by all seven diseases: colibacteriosis – 45.5%, salmonellosis – 12.8%, staphylococcosis – 16.6%, pasteurellosis – 9.4%, pseudomonosis – 9.7%, pullorosis – 4.2% and streptococcosis – 1.6%. The following regions are also heterogeneous in terms of nosological profile: Volynj, Sumy, Cherkasy, Kharkiv and others. However, there are areas where the nosological profile is monotonous, for example in Mykolajiv it is represented by only a few diseases: colibacillosis – 45.0%, salmonellosis – 45.0%, pasteurellosis – 5.0% and streptococcosis – 5.0%. The following districts are also homogeneous in terms of etiological structure: Vinnytsja, Zakarpattia, Ivano-Frankivsk, Chernihiv, Chernivtsi and other districts.

Territorial spread of bacterial diseases of poultry in Ukraine. Based on the results of the investigations of poultry for bacterial diseases, for nine years (2012–2020), an epidemiological ranking of the territory of Ukraine was conducted and a map of the density of bacterial diseases of poultry in Ukraine was prepared (Fig. 12). Depending on the number of detected positive samples from poultry, all regions of the country were divided into four zones of risk of infection: high, medium, low and very low risk of infection.

The zone of high risk of the disease includes six regions: Luhansk, Zaporizhia, Kharkiv, Cherkasy, Sumy and Donetsk. The total share of positive samples from poultry in this area is 75.0%. For this zone, the districts with borderline indicators are: Luhansk – 21.8% and Donetsk – 8.9% of cases. Areas with a medium risk of bacterial disease include: Dnipropetrovsk, Ternopil, Volyno, Kirowohrad, Zhytomyr and Kherson. The total number of positive samples from poultry detected in this area is 15.3%. From this zone, the greatest share of positive reactions were observed in Dnipropetrovsk – 3.9%, and the least in Kherson – 2.0%. The zone of low risk of the disease includes: Ivano-Frankivsk, Vinnytsja, Poltava, Khmelnytskyо, Kyiv and Lviv. The total share of positive samples from poultry in this area is 7.4%. For this zone, the districts with limit indicators are: Ivano-Frankivsk – 1.70% and Lviv – 0.69% of positive samples.

Discussion

Control of bacterial factor infections in poultry is one of the leading tasks of veterinary services around the world. Thus, in 2003, the European Commission adopted Law 2160/2003/EC (EC, 2003) on the prevention of Salmonella and other specific food zoonotic agents. This directive and several protocols cover the adoption of targets aimed at reducing the incidence of specific zoonoses at the level of primary production in broilers, laying hens and turkeys. After approval of the relevant control act, even food industry workers must take samples and analyze them for the presence of zoonotic agents (Hafez & Attia, 2020). Now European researchers are currently studying the development of “prebiotic-like” feed additives to reduce the amount of Campylobacter in broiler chickens before slaughter (meat Campybro, to control this pathogen), because the problem of detecting this pathogen in broiler meat is now faced by many European countries. It is considered that a concentration of 4 CFU/g of poultry meat
is already an epidemic danger to humans. The problem with this pathogen is that there are no effective remediation mechanisms of *Campylobacter* in live poultry (Kakoush et al., 2015). One of the methods that improve the microbiological safety of fresh chicken eggs for incubation and human consumption is reliable disinfection and decontamination of their shells (Turtoi & Borda, 2014).

For a long time, the prevention and struggle against bacterial diseases of poultry was carried out with the use of antibiotics. The latter has eventually led to the circulation of antibiotic-resistant strains among poultry (Williams, 2005; Barrow & Freitas Neto, 2011).

At present, epidemiological monitoring with obligatory bacteriological tests is used in Ukraine to control bacterial infections of poultry, immunomodulatory, prebiotic, probiotic, antibacterial preparations are used, and sanitary measures are constantly taken (disinfection, disinsection, decontamination). In poultry farming, the requirements for industrial hygiene and biosecurity are constantly being raised, and specific prophylaxis (vaccines) is being used for prophylactic purposes. Also in our country since 2012 a system of HACCP was introduced—a system of analysis and control of critical points and risks that may arise during any production process related to food. For example, the use of the HACCP system in primary poultry processing is a science-based and obligatory measure in the EU and the USA. The introduction of this system allows one to ensure the epizootic well-being of farms, and thus to obtain products safe from pathogens of factorial bacterial infections. Control of bacterial diseases also involves the prevention of possible diseases in humans, because meat and eggs from infected poultry are factors in the transmission of these diseases (Pires et al., 2014; Skarp et al., 2016; Walker & Baun, 2022).

In general, control over the epizootic situation with regard to bacterial diseases in poultry enterprises of Ukraine is carried out using a full range of veterinary and sanitary and specific and non-specific prevention measures. Scientists note that the use of antibacterial substances in poultry only leads to the formation of polyresistant strains of bacteria, which eventually enter the human body with meat or eggs. Thus, *Enterococcus faecalis* isolated from poultry was resistant to lincomycin, tetracycline and gentamicin (Maass et al., 2015), oxacilase-negative staphylococci isolated from healthy turkeys were insensitive to tetracycline, ampicillin, penicillin, sulfamethoxazole/trimethoprim (Mowad et al., 2019), *Staphylococcus aureus* (ESBL) strains resistant to many groups of antibiotics were found in poultry (Richler et al., 2012), *Campylobacter jejuni* were insensitive to amoxicillin, neomycin, metronidazole, sulfamethoxazole/trimethoprim, naldixic acid, ciprofloxacin, tetracycline (El-Adawy et al., 2012, 2015; Nguyen et al., 2016), reported the occurrence of *Escherichia coli*, which produces β-lactamase with an extended spectrum of action resistant to colistin (Mowad et al., 2018), as well as multiresistance of this pathogen isolated from broiler chickens (Azad et al., 2019; Xu et al., 2019). *Salmonella* isolated in poultry farms has been shown to be insensitive to many antibiotics. *S. infantis* strains had the MDR phenotype in 94.4% of isolates. Strains of *S. typhimurium* had a reduced phenotype of antimicrobial resistance, and 50% showed resistance to one antimicrobial compound. One of the atypical strains of *S. enterica* had an MDR profile for 11 of the 20 antibiotics examined (eight groups), two atypical strains of *S. enterica* showed resistance to two and three antibiotics, respectively (Sánchez-Salazar et al., 2020).

The complete abandonment of the use of antibacterial preparations requires the use of other approaches in the prevention and treatment of bacterial diseases in poultry. For this purpose it is necessary: to increase the number of controlled diseases through monitoring investigations; use commercial vaccines against bacterial diseases and develop vaccines from local strains of microorganisms and implement them in the practice of poultry farms; to use bacteriofages; to introduce into the practice of poultry enterprises preparations for the normalization of the microflora of the gastrointestinal tract (the use of probiotic and prebiotic preparations, oligosaccharides); to develop programs for the prevention and control of factor diseases in poultry.

Our research has shown that the nosological profile of bacterial diseases, the causative agents of which circulate in poultry farms in Ukraine is quite wide and is represented by 17 diseases: *Escherichia coli* (56.9%), salmonellosis (13.5%), *Staphylococcus* (7.8%), pasteurellosis (7.0%), pseudomonosis (6.8%), pullorosis (3.6%), streptococcosis (2.6%), pneu-

**Conclusions**

The epidemiological analysis of the nosological profile of bacterial diseases of poultry in Ukraine for the period 2012–2020 showed that it was formed by 17 diseases. Of the diseases registered in our country, a significant number (14 of 17) are pathogens of so-called factor infections, namely: *Escherichia coli*, salmonellosis, staphylococcosis, pasteurellosis, pseudomonosis, pullorosis, streptococcosis, pneumaticosis, enterotoxemia, pathogenic proteus, *Escherichia coli* septicaemia, neisseriosis, coligranulomatosis, hemophilia. It is found that bacterial diseases of poultry are significantly common in Ukraine, the average rate of infection of poultry with bacterial diseases for the period from 2012 to 2020 is 0.8%. The leading role in the etiological structure of pathogens of bacterial diseases of poultry is played by colibacillosis—56.9% of the total number of all positive samples. Also, the dominant bacterial diseases of poultry in Ukraine during the analyzed period were: salmonellosis (13.5%), staphylococcosis (7.8%), pasteurellosis (7.0%), pseudomonosis (6.8%), pullorosis (3.6%) and streptococcosis (2.6%). Significantly fewer positive samples were registered in the bacteriological examination of other diseases—1.8%. The heterogeneity of the etiological structure of bacterial diseases of
poultry in different regions of Ukraine has been established. It was found that the nosological profile of bacterial diseases of poultry in Ukraine has pronounced differences both in the set of diseases and their importance in the total pathology of bacterial diseases. Measures to prevent factor diseases should include alternatives to antibiotics—the use of bacteriophages, vaccines, reliable sanitation of premises with the use of modern disinfectants, etc.

References


