

## РОЗДІЛ 8. ПАРАЗИТОЛОГІЯ

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### DISTRIBUTION AND SEASONAL DYNAMICS OF POULTRY PROTOZOASIS IN FARMS IN THE SOUTH OF UKRAINE

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*The article presents data regarding distribution and seasonal dynamics of poultry protozoasis in specialized and homestead farms in the south of Ukraine. It was found that the extensiveness of eimeriosis invasion in both types of households was highest in summer, but in specialized holdings by 3.7 % higher. Poultry affection by trichomoniasis was highest in birds from private households from 3.1 % in spring to 4.6 % in summer and fall, while in specialized farms in spring and summer the extensiveness of invasion did not exceed 1.0 %. Mixed eimerio-cryptosporidiosis invasion was more common in private households at 23.8 % while the specialized EI did not exceed 9.3 %.*

**Keywords:** poultry, eimeriosis, cryptosporidiosis, histomoniasis, trichomoniasis, distribution, extensiveness.

Poultry production is the dominant sector in agriculture. In addition to social and economic problems one reason that hinders its development is a parasitic disease of poultry and their associations.

Significant economic losses are caused by the protozoasis including eimeriosis, cryptosporidiosis, trichomoniasis and histomoniasis with different extensiveness and intensity of infestation [1–4].

The high reproductive capacity of single-celled organisms, their resistance to various environmental factors, long-term preservation of viability and virulence of exogenous stages and rapid adaptation to chemical antis-protist measures complicate these diseases control [5, 6].

As for the spread of poultry protozoasis, the significant effect is caused by social or organizational and economic measures that affect the settlement of protozoon in environment; temperature, humidity, lighting, feeding, gas exchange, poultry density and other conditions are changing [7].

It is known that, provided intensive poultry industry the influence of biotic and non-biotic environmental factors on extensiveness and intensity of certain parasitic diseases significantly reduces. However, in half-extensive system of the industry, which occupies the majority in southern Ukraine, favorable conditions for the spread of poultry parasites are created [8].

It is known that at the high intensity of infestation there is a sharp decline in immune reactivity and natural resistance of the body and especially during the acute disease.

**Purpose.** To set the spread and seasonal dynamics of fowl protozoasis in indecstrial and backgard farms in southern Ukraine.

**Materials and methods.** The analysis of the epizootic situation concerning poultry protozoasis was conducted from 2012 to 2014 in poultry farms of Odessa, Mykolaiv and Kherson regions under different ownership and maintenance technology. In specialized farms 2865 chickens were investigated by laboratory methods, in private households – 1692 fowls 35–120 days old.

Extensiveness of eimeriosis invasion was determined by the combined method of modification by I.I. Kovalenko (1998), using flotation solution of ammonium nitrate with a density of 1.3. Faeces samples each, not less than 10 g, were taken from the floor of the room where poultry was kept, immediately after defecation.

Cryptosporidiosis was diagnosed by smear feces, selected individually from cloaca by conventional method by Kester using an aqueous solution safranin and KOH.

Histomonad was found by making a scraping from mucosa of colon blind outgrowths of forced slaughtered poultry and from cloaca mucosa of live poultry.

The diagnosis of trichomoniasis was confirmed by making native smear with further coloration by Romanovsky-Giemsa stain in a dark field of microscope.

The degree of lesion was assessed by indicators of invasion extensiveness (EI), conducting laboratory tests according to the season.

**Results.** The results of study the epizootic situation and parasitological surveys of young hens registered protozoasis represented by eimeria, cryptosporidia, histomonad, trichomonad and mix-invasion – eimerio-cryptosporidiosis.

Data of the distribution and seasonal dynamics of poultry protozoasis are listed in Table 1.

So, in spring extensiveness of eimeriosis invasion in surveyed livestock did not exceed 15.9 %, in summer was the highest and reached 21.9 %, in the fall the rate decreased to 8.5 %, and in winter was 3.8 %.

Extensiveness of cryptosporidiosis invasion as in spring and throughout the summer-autumn period was almost at the same level from 3.4 % to 5.3 % and in winter extensiveness dropped to 1.3 %.

**Table 1** – Distribution and seasonal dynamics of poultry protozoasis in specialized and poultry farms (data from candling)

Invasions	Seasons, investigated heads							
	Spring, 930 heads		Summer, 870 heads		Autumn, 750 heads		Winter, 315 heads	
	Invasions. heads	EI,%	Invasions. heads	EI,%	Invasions. heads	EI,%	Invasions. heads	EI,%
E	148	15.9	192	21.9	64	8.5	12	3.8
C	32	3.4	46	5.3	39	5.2	4	1.3
H	68	7.3	39	4.5	62	8.2	13	4.1
T	7	0.8	9	1.0	5	0.6	-	-
E + C	96	10.3	77	8.8	45	6.0	6	1.9

Note: E – eimeriosis, C – cryptosporidiosis, H – histomoniasis, T – trichomoniasis, E + C – eimeriosis + cryptosporidiosis

Extensiveness of poultry histomoniasis invasion depends on the season, which was 7.3 % in the spring, in summer it declined slightly to 4.5 % and was highest in the fall – 8.2 %. It should be noted that during the winter period the extensiveness of invasion was high 4.1 %, but as a carrier.

In specialized farms trichomoniasis was recorded in spring with extensiveness 0.8 %, in the summer at 1.0 %, in the fall was the lowest rate – 0.6 %, and during the winter invasion was not registered.

In addition to monoinvasion these farms recorded mixed eimerio-cryptosporidiosis invasion, the extensiveness of which was the highest in spring – 10.3 %, in the summer this figure decreased to 8.8 %, in the fall – 6.0 %, and in winter did not exceed 1.9 %.

In the small farms of South Ukraine the distribution and seasonal dynamics of poultry protozoasis were significantly different from those in specialized economies and farms (Table. 2).

**Table 2** – Distribution and seasonal dynamics of poultry protozoasis in private households (data from candling)

Invasion	Seasons, investigated heads							
	Spring, 512 heads		Summer, 470 heads		Autumn, 520 heads		Winter, 190 heads	
	Invasions heads.	EI,%	Invasions heads	EI,%	Invasions heads	EI,%	Invasions heads	EI,%
E	60	11.7	86	18.2	72	13.8	4	2.1
C	25	4.9	2	6.8	36	6.9	5	2.6
H	18	3.5	36	7.7	34	6.5	3	1.6
T	16	3.1	22	4.6	22	4.2	2	1.0
E + C	63	12.3	112	23.8	98	18.8	12	6.3

Note: E – eimeriosis, C – cryptosporidiosis, H – histomoniasis, T – trichomoniasis, E + C – eimeriosis + cryptosporidiosis

In spring the extensiveness of eimeriosis invasion was also quite high and amounted to 11.7 %, in summer it increased to 18.2 % and remained at a high level – 13.8 % during the autumn, in winter EI did not exceed 2.1 %.

It should be noted that in the small farms extensiveness of cryptosporidiosis invasion during the year was almost at the same level from 4.9 % in spring to 6.8 % and 6.9 % in summer and autumn and in winter – at 2.6 %.

As for the distribution and seasonal dynamics of histomoniasis we can note that its extensiveness both in specialized and private households throughout the year has similar dynamics: peak is in spring and autumn 3.5–6.5 %, in winter EI was 1.6 % as a carrier, without evidence of clinical signs.

As for poultry trichomoniasis, in private households extensiveness of invasion is much higher than in specialized farms. Thus, in spring EI was 3.1 %, the highest was in summer – 4.6 %, and kept at the same level during the fall – 4.2 %, and in winter dropped to 1.0 %.

Extensiveness indicators of mixed poultry eimerio-cryptosporidiosis infestation in private households were highest in summer – 23.8 %, while in spring EI was 12.3 %, and 18.8 % in the fall.

Thus, extensiveness and seasonal dynamics of poultry protozoasis depend on technology and keeping conditions of poultry. It should be noted that the mixed-eimerio-cryptosporidiosis invasion was most common in private households, while in specialized poultry farms eimeriosis invasion dominated exclusively. In the small farms extensiveness of trichomoniasis invasion was at the level 3.1–4.6 % with the manifestation of clinical signs, while in specialized poultry farms EI was from 0.6 % to 1.0 % as a carrier.

**Conclusions.** 1. In specialized and private farms in the South of Ukraine protozoasis of poultry of 35–120 days old was presented by eimeriosis, cryptosporidiosis, histomoniasis, trichomoniasis and mixed eimerio-cryptosporidiosis invasion.

2. Extensiveness of eimeriosis invasion in both types of households was highest in summer, but in specialized farms by 3.7 % higher. Poultry affection by trichomoniasis was highest in fowl from private households from 3.1 % in spring to 4.6 % in summer and fall, while

in specialized farms in spring and summer extensiveness of invasion did not exceed 1.0 %. Mixed eimerio-cryptosporidiosis invasion was more common in private households at the level 23.8 % while in the specialized farms EI did not exceed 9.3 %.

**Prospects for further studies.** Further work will be aimed at clarifying the pathogenesis of mixed eimerio-cryptosporidiosis invasion and development of specific chemoprophylaxis.

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### ПОШИРЕННЯ ТА СЕЗОННА ДИНАМІКА ПРОТОЗООЗІВ ПТИЦІ В ПТАХОГОСПОДАРСТВАХ ПІВДНЯ УКРАЇНИ

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*Мета роботи. Встановити поширення та сезонну динаміку протозоозів курей в спеціалізованих та присадибних господарствах Одеської області.*

*Матеріали і методи. Загальноприйнятими методами досліджено 2865 курей з спеціалізованих та 1692 птиці з присадибних господарств Одеської області.*

*Результати досліджень. Встановлено, що у спеціалізованих птахогосподарствах екстенсивність еймеріозної інвазії навесні не перевищувала 15,9 %, влітку була найвищою і досягла 21,9 %, восени знизилась до 8,5 %, а взимку склала 3,8 %.*

*Екстенсивність криптоспоридіозної інвазії як навесні, так і впродовж літньо-осіннього періоду була майже на однаковому рівні від 3,4 % до 5,3 % і лише взимку екстенсивність знизилась до 1,3 %.*

*Поширення гістомонозної інвазії птиці залежить від сезону року: навесні 7,3 %, влітку зменшилась до 4,5 % і досягла піку восени – 8,2 %.*

*Трихомоноз реєстрували навесні з екстенсивністю 0,8 %, влітку на рівні 1,0 %, восени показник був найменшим – 0,6 %, а упродовж зимового періоду інвазію не реєстрували.*

*Слід зазначити, що в присадибних господарствах екстенсивність криптоспоридіозної інвазії упродовж всього року була майже на однаковому рівні від 4,9 % навесні до 6,8 % та 6,9 % влітку і восени, а взимку – на рівні 2,6 %. Пік гістомонозної інвазії припадає на весняно-осінній період 3,5-6,5 % і лише взимку EI була на рівні 1,6 % у вигляді носійства, без проявів клінічних ознак.*

*Навесні EI птиці трихомонозом склала 3,1 %, найвищою була влітку – 4,6 %, а взимку знизилась до 1,0 %.*

*Показники екстенсивності змішаної еймеріозно-криптоспоридіозної інвазії птиці у присадибних господарствах були найвищими влітку – 23,8 %, в той час як навесні EI склала 12,3 %, а восени 18,8 %.*

*Висновок. В спеціалізованих і присадибних господарствах Одеської області протозоози курей 35-120 добового віку представлені еймеріозом, криптоспоридіозом, гістомонозом, трихомонозом та змішаною еймеріозно-криптоспоридіозною інвазією.*

**Ключові слова:** птиця, еймеріоз, криптоспоридіоз, гістомоноз, трихомоноз, поширення, екстенсивність.