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Seasonal and Age Dynamics of the Prevalence of Eimeria and Helminth Parasitic Infestations of Cattle in the Eastern Kazakhstan

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Abstract

Associated infestation of farm animals is currently one of the major problems in the modern veterinary parasitology in Kazakhstan. The article presents the results obtained during the study of Eimeria and helminth parasitic infestations of cattle in the East Kazakhstan region. We review the prevalence and the seasonal dynamics of Eimeria and helminth parasitic infestations of cattle in farms of the Eastern Kazakhstan.

Keywords

Eimeria infection; Helminth infestations; Parasitology; Extensivity of infestation; Intensity of infestation

Eimeria and intestinal helminth infections in cattle can be found everywhere, causing considerable economic damage to livestock farmers. Eimeria and helminth infections in cattle were studied in various areas of CIS [1-3] and also in many other countries [4-10]. However, the associated Eimeria and helminth infections of cattle are poorly studied in Kazakhstan [11,12]. In this regard, we have a task to study this infestation under the terms of East Kazakhstan region.

We carried out our work in the peasant farms “Moldagali,” “Zhomart” in Urdzharsky district, LLP “Shalabay” in Zharminsky district, peasant farm “Lada” in Borodulikhinsky district, LLP “Prirechny” in Zhanasemeysky district of the East Kazakhstan region.

We studied three age groups of animals: calves of the current year of birth, youngsters from 1 to 1.5 years, and the adult population of animals.

Scatological studies were conducted by the method of Darling with determining extensivity of infestation (EI) and intensity of infestation (II). As a result of the conducted studies, we have found that Eimeria and helminth infections in cattle can be found almost everywhere in farms of East Kazakhstan.

According to Tables 1 and 2, the greatest extensivity of infestation (EI) was observed in up to 60-100% calves in all farms of the East Kazakhstan region. The intensity of infestation (II) was equal to the range from 1-2 to 150 oocysts in one field of view of the microscope. The greatest amount of II was equal to 150 oocysts in LLP “Shalabay” in Zharminsky district and peasant farm “Lada” in Borodulikhinsky district.

The greatest extensivity of infestation (EI) with strongyloidosis was observed in calves of p.f. “Moldagali,” and p.f. “Zhomart” in Urdzharsky district, LLP “Prirechny” in Zhanasemeysky district—up to 72%, while the intensity of infestation (II) was in the range from 1 to 8 eggs in one field of view of the microscope.

The greatest extensivity of infestation (EI) with strongyloidosis was observed in calves in p.f. “Lada” in Borodulikhinsky district, LLP “Prirechny” in Zhanasemeysky district—up to 68%, while the intensity of infestation (II) was in the range from 1 to 5 eggs in the field of view of the microscope.

Thus, the highest extensivity of infestation (EI) by Eimeria infection— in the range from 55 to 100%—was in young animals from 1 to 1.5 years in all farms of the East Kazakhstan region. The highest EI was in the range from 90 to 100% in p.f. “Moldagali,” p.f. “Zhomart” in Urdzharsky district, LLP “Shalabay” in Zharminsky district and in p.f. “Lada” in Borodulikhinsky district.

Infestation of young animals at the age from 1 to 1.5 years old with Eimeria infection was 65% in LLP “Prirechny” in Zhanasemeysky district.

The highest extensivity of infestation (EI) with Strongilata infection was observed in young animals from 1 to 1.5 years old in the LLP “Shalabay” in Zharminsky district. It was equal to 65%, while the intensity of infestation (II) was from 1 to 6 eggs in one field of view of the microscope. In the remaining farms EI was in the range from 20 to 65%, while II was from 1 to 6 eggs.

The highest extensivity of infestation (EI) with Strongyloides in young animals from 1 to 1.5 years old was observed in p.f. “Moldagali” in Urdzharsky district, p.f. “Lada” in Borodulikhinsky district. It was in the range from 35 to 40%, while the intensity of infestation (II) was from 1 to 2 eggs in the field of view of the microscope. An extensivity of infestation in the region ranged from 15 to 40%, while the intensity of infestation was from 1 to 3 eggs of Strongilata.

The highest extensivity of infestation (EI) with Eimeria infection in the adult population of animals was observed in p.f. “Moldagali,” p.f. “Zhomart” in Urdzharsky district, LLP “Shalabay” in Zharminsky district, p.f. “Lada” in Borodulikhinsky district. It was in the range from 40 to 90%, while II was from 1 to 10 oocysts in one field of view of the microscope.

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Abbreviations: LLP: Limited liability partnership; p.f.: Peasant farm; EKR: East Kazakhstan region; EI: Extensivity of infestation; II: Intensity of infestation

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Name of the farm	Spring																								
	Eimeria infection												Strongylata						Strongyloides						
	Calves, 2-6 months of age		Youngsters from 1 to 1.5 years old		Adult cattle (cows)		Calves 2-6 months of age		Youngsters from 1 to 1.5 years		Adult cattle (cows)		Calves 2-6 months of age		Youngsters from 1 to 1.5 years		Adult cattle (cows)								
	EI, %	II, oocysts	EI, %	II, oocysts	EI, %	II, oocysts	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs					
p.f. "Moldagali," Urdzharsky district	Spring	100	1-60	100	1-35	70	1-3	72	1-5	45	1-2	50	1-2	36	1-2	40	1-2	50	1-2	36	1-2	40	1-2	50	1-2
	Summer	88	1-15	80	1-10	66	1-2	60	1-2	35	1-5	30	1-2	24	1-2	25	1-2	30	1-2	24	1-2	25	1-2	30	1-2
	Autumn	100	1-50	75	1-12	70	1-2	40	1-5	40	1-2	60	1-2	32	1-2	20	1-2	60	1-2	32	1-2	20	1-2	40	1-2
	Winter	76	1-8	65	1-5	50	1-2	60	1-3	25	1-2	40	1-2	28	1-2	25	1-2	40	1-2	28	1-2	25	1-2	30	1-2
p.f. "Zhmart," Urdzharsky district	Spring	100	1-50	100	1-50	70	1-3	72	1-4	40	1-3	60	1-2	36	1-2	30	1-2	60	1-2	36	1-2	30	1-2	50	1-2
	Summer	84	1-12	75	1-15	60	1-3	60	1-2	35	1-2	40	1-2	28	1-2	30	1-2	40	1-2	28	1-2	30	1-2	30	1-2
	Autumn	96	1-25	80	1-18	70	1-2	64	1-2	40	1-2	60	1-2	36	1-2	40	1-2	60	1-2	36	1-2	40	1-2	30	1-2
	Winter	68	1-5	65	1-8	50	1-2	56	1-2	35	1-2	50	1-2	24	1-2	30	1-2	50	1-2	24	1-2	30	1-2	30	1-2
LLP "Shalabay," Zhamninsky district	Spring	100	1-35	90	1-4	50	1-3	44	1-3	65	1-5	50	1-4	40	1-2	30	1-2	50	1-4	40	1-2	30	1-2	20	1-2
	Summer	100	1-150	90	1-12	80	1-10	60	1-4	40	1-4	40	1-3	32	1-4	20	1-2	40	1-3	32	1-4	20	1-2	40	1-2
	Autumn	84	1-12	75	1-5	50	1-3	40	1-3	45	1-2	60	1-4	28	1-2	30	1-2	60	1-4	28	1-2	30	1-2	30	1-2
	Winter	60	1-3	60	1-3	60	1-3	40	1-2	35	1-2	20	1-2	20	1-2	20	1-2	20	1-2	20	1-2	20	1-2	20	1-2
p.f. "Lada," Borodulikhinsky district	Spring	100	1-90	90	1-6	80	1-2	32	1-2	50	1-2	50	1-2	68	1-5	35	1-2	50	1-2	68	1-5	35	1-2	60	1-2
	Summer	92	1-42	75	1-4	60	1-2	36	1-5	50	1-2	50	1-3	20	1-2	30	1-2	50	1-3	20	1-2	30	1-2	40	1-2
	Autumn	100	1-96	80	1-12	70	1-3	64	1-8	60	1-6	50	1-2	40	1-4	30	1-2	50	1-2	40	1-4	30	1-2	60	1-2
	Winter	76	1-4	70	1-4	50	1-2	32	1-2	30	1-2	50	1-2	24	1-2	20	1-2	50	1-2	24	1-2	20	1-2	40	1-2
LLP "Prirechny," Zhanasemeyevsky district	Spring	100	1-18	65	1-3	60	1-2	68	1-4	50	1-2	60	1-4	52	1-2	30	1-2	60	1-4	52	1-2	30	1-2	40	1-3
	Summer	100	1-42	85	1-4	60	1-5	52	1-6	55	1-5	60	1-3	36	1-3	25	1-3	60	1-3	36	1-3	25	1-3	30	1-2
	Autumn	84	1-5	75	1-3	90	1-5	52	1-3	55	1-2	50	1-3	28	1-2	35	1-2	50	1-3	28	1-2	35	1-2	40	1-2
	Winter	72	1-3	55	1-3	40	1-2	28	1-2	20	1-3	30	1-2	30	1-2	15	1-2	30	1-2	30	1-2	15	1-2	20	1-2
Total in the region		60-100	1-150	55-100	1-50	40-90	1-10	28-72	1-8	20-65	1-6	20-60	1-4	20-68	1-5	15-40	1-3	1-6	1-4	1-4	20-68	1-5	15-40	1-3	1-3

Table 1: Numbers of different infections in various districts.

Season	Eimeria infection						Strongilata						Strongyloides					
	Calves, 2-6 months of age		Youngsters from 1 to 1.5 years old		Adult cattle (cows)		Calves, 2-6 months of age		Youngsters from 1 to 1.5 years old		Adult cattle (cows)		Calves, 2-6 months of age		Youngsters from 1 to 1.5 years old		Adult cattle (cows)	
	EI, %	II, oocysts	EI, %	II, oocysts	EI, %	II, oocysts	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs	EI, %	II, eggs
Spring	100	1-90	65-100	1-50	50-80	1-3	32-72	1-5	40-65	1-5	50-60	1-4	36-68	1-5	30-40	1-2	20-60	1-3
Summer	84-100	1-150	75-90	1-15	60-80	1-10	36-60	1-6	35-55	1-5	30-60	1-3	20-36	1-4	20-30	1-3	30-40	1-2
Autumn	84-100	1-96	75-80	1-18	50-90	1-5	40-64	1-8	40-60	1-6	50-60	1-4	28-40	1-4	20-40	1-2	30-60	1-2
Winter	60-76	1-8	55-70	1-8	40-60	1-3	28-60	1-3	20-35	1-3	20-50	1-2	20-30	1-2	15-30	1-2	20-40	1-2
Total in the region	60-100	1-150	55-100	1-50	40-90	1-10	28-72	1-8	20-65	1-6	20-60	1-4	20-68	1-5	15-40	1-3	20-60	1-3

Table 2: Seasonal and age dynamics of Eimeria and helminth infestations in cattle of the East Kazakhstan region

The highest extensity of infestation (EI) with Strongilata was observed in adult livestock in p.f. "Lada" in Borodulikhinsky district, LLP "Prirechny" in Zhanasemeysky district. It was in the range from 20 to 60%, while the intensity of infestation (II) was from 1 to 4 eggs in the field of view of the microscope.

The highest extensity of infestation (EI) with Strongyloides—in the range from 20 to 60%—was observed in adult livestock in all farms of the East Kazakhstan region, while the intensity of infestation (II) was in the range from 1 to 3 eggs in a field of view of the microscope.

In the East Kazakhstan associated Eimeria and helminth infestation can be found everywhere. An extensity of infestation in the associated Eimeria and Strongilata infections ranges from 28 to 72% in calves, from 20 to 65% in young animals of 1-1.5 years, and from 20 to 60% in cows. Similar associations of Eimeria and Strongyloides infections are in the range from 20 to 68%, from 15 to 40%, and from 20 to 60%, respectively.

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