Dynamics by seasons and by age and extension of infestation of the Eimeria and Helminths invasion of cattle in the east of Kazakhstan

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Abstract. The article contains results obtained at studying the Eimeria and Helminths invasion of cattle in the East Kazakhstan Province and considers the extension and seasonal dynamics of Eimeria and Helminths of cattle at the farms of the eastern Kazakhstan. The study took place at the Moldagali and Zhomart peasant farms of the Urdzharsky district, TOO Shalabay of the Zharminsky District, the Lada peasant farm of the Borodulikhinsky District, and TOO Prirechny of the Zhanasemeysky District of the East Kazakhstan Province. Three age groups were studied: calves born this year, young stock between 1 and 1.5 years of age, and adult stock of cattle.
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Abbreviations:

TOO – limited liability partnership
p/f – peasant farm
EKP – the East Kazakhstan Province
EI – extent of invasion
II - intensity of invasion

Introduction

Currently, one of the serious problems of the veterinary parasitology in Kazakhstan is the associative invasions among livestock.

Eimeriosis of cattle and Helmintoses of the gastrointestinal tract are widely spread and cause considerable economic damage to livestock farms. Eimerioses and Helmintoses of cattle have been approached in various areas of the CIS [1-3] and in many countries [4-10]. However, associative Eimeria and Helminths invasions of cattle in Kazakhstan have been paid little attention by scientists [11; 12]. In this view, we set ourselves a task to study this invasion in the circumstances of the East Kazakhstan Province.

The study took place at the Moldagali and Zhomart peasant farms of the Urdzharsky district, TOO Shalabay of the Zharminsky District, the Lada peasant farm of the Borodulikhinsky District, and the TOO Prirechny company of the Zhanasemeysky District of the East Kazakhstan Province.

Three age groups were studied: calves born this year, young stock between 1 and 1.5 years of age, and adult stock of cattle.

Coprological surveys were carried out by the Darling method with determination of the extent of invasion (EI) and intensity of infestation (II). As a result of the performed study, it was stated that Eimeria and Helminths invasion of cattle is commonly observed with livestock farms of the Eastern Kazakhstan.

According to Tables 1 and 2, the highest extent of invasion (EI) with Eimeria was observed with calves at all peasant farms of the East Kazakhstan Province – up to 60-100% – at the intensity of infestation (II) between 1-2 and 150 oocysts within the single microscope field of view. The highest II of up to 150 oocysts was observed at TOO Shalabay of the Zharminsky District and the Lada peasant farm of the Borodulikhinsky District.

The highest extent of invasion (EI) with Strongylata was observed with calves at the Moldagali and Zhomart peasant farms of the Urdzharsky District and TOO Prirechny of the Zhanasemeysky District – up to 72 % – at the intensity of infestation (II) between 1 and 8 eggs within the single microscope field of view.

The highest extent of invasion (EI) with Strongyloides was observed with calves at the Lada peasant farm of the Borodulikhinsky District and TOO Prirechny of the Zhanasemeysky District – up to 68 % – at the intensity of infestation (II) between 1 and 5 eggs within the single microscope field of view.

At that, the highest extent of invasion (EI) with Eimeria was observed with young stock between 1 and 1.5 years of age at all peasant farms of the East Kazakhstan Province at the rate of 55-100%. The highest EI between 90% and 100% was observed at the Moldagali and Zhomart peasant farms of the Urdzharsky District, TOO Shalabay of the Zharminsky District, and the Lada peasant farm of the Borodulikhinsky District.

Table 1. Prevalence of the Eimeria and Helminths invasion of cattle at farms of the East Kazakhstan Province

Name of farms	Spring																	
	Eimeria							Strongylata						Strongyloides				
		Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)		Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)		Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)	
	Season	EI %	II with oocysts	EI %	II with oocysts	EI %	II with oocysts	EI %	II eggs	EI %	II eggs	EI %	II eggs	EI %	II eggs	EI %	II eggs	EI %	II eggs
Moldagali peasant farm of the 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
	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
	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	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	30	1-2
Zhomart peasant farm of the 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	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	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	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	30	1-2
TOO Shalabay of the Zharminsky 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	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	1-2
	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	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
Lada peasant farm of the 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	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	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	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	40	1-2
TOO Prirechny of the Zhanasemeysky 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	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	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	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	20	1-2
Total across the province		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. Dynamics by seasons and by age of the Eimeria and Helminths invasion of cattle in the East Kazakhstan Province

Season	Eimeria						Strongylata						Strongyloides					
	Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)		Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)		Calves of 2-6 months of age		Young stock of 1–1.5 years of age		Adult cattle (cows)	
	EI %	II with oocysts	EI %	II with oocysts	EI %	II with oocysts	EI %	II with eggs	EI %	II with eggs	EI %	II with eggs	EI %	II with eggs	EI %	II with eggs	EI	II with 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 across the province	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

Infestation of young stock between 1 and 1.5 years of age with Eimeria at TOO Prirechny of the Zhanasemeysky District was equal to 65%.

The highest extent of invasion (EI) of up to 65% with Strongylata was observed with young stock between 1 and 1.5 years of age at TOO Shalabay of the Zharminsky District at the intensity of infestation (II) between 1 and 6 eggs within the microscope field of view, and at other peasant farms, EI was between 20% and 65% at II equal to 1 to 6 eggs.

The highest extent of invasion (EI) with Strongyloides was observed with young stock at the Moldagali and Zhomart peasant farms of the Urdzharsky District and the Lada peasant farm of the Borodulikhinsky District – between 35% and 40% – at the intensity of infestation (II) between 1 and 2 eggs within the single microscope field of view. Across the province, the observedextent of invasion was equal to 15-40% at the intensity of infestation between 1 and 3 eggs of Strongylata.

The highest extent of invasion (EI) with Eimeria with the adult stock was observed at the Moldagali and Zhomart peasant farms of the Urdzharsky District, TOO Shalabay of the Zharminsky District, and the Lada peasant farm of the Borodulikhinsky District – between 40% and 90% – at intensity of infestation (II) between 1 and 10 oocysts within the single microscope field of view.

The highest extent of invasion (EI) with Strongylata was observed with adult stock at the Lada peasant farm of the Borodulikhinsky District and TOO Prirechny of the Zhanasemeysky District – between 20% and 60% – at the intensity of infestation (II) between 1 and 4 eggs within the single microscope field of view.

The highest extent of invasion (EI) with Strongyloides was observed with adult stock at all peasant farms of the East Kazakhstan Province – between 20% and 60% – at the intensity of infestation (II) between 1 and 3 eggs within the single microscope field of view.

In the east of Kazakhstan, the associative Eimeria and Helminths invasion is commonly observed. The extent of invasion at association of Eimeria and Strongylata is equal to 28-72% for calves, 20-65%foryoung stock between 1 and 1.5 years of age, and 20-60% for cows; and at association of Eimeria with Strongyloidoses, the extent is equal to 20-68%, 15-40%, and 20-60%, accordingly.

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