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Research Article

**SEASONAL DYNAMICS OF CATTLE THELAZIOSIS IN
NORTHERN TRANS-URAL REGION AND PATHOGENETIC
MECHANISMS OF ITS CLINICAL MANIFESTATIONS**Larisa A. Glazunova¹, Yuri V. Glazunov², Abduvahob A. Ergashev³¹Candidate of veterinary sciences, associate professor, sciences, researcher ASRIVEA –
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Thelaziosis of cattle is the helminthic disease caused by parasitizing of nematodes of a suborder of Spirurata, the Thelaziidae family. The purpose of our researches was detailed studying of seasonal dynamics of thelaziosis at cattle, terms of its invasive thelaziosis as well as specification of clinical implication of a disease at the cattle in the Northern Trans-Ural region. Researches were conducted in 2002-2016, surveyed 27122 heads of cattle belonging to the agricultural enterprises and citizens. It is established that in the conditions of the Northern Trans-Ural region clinical signs of thelaziosis are shown from first decade of May (EI of 3.39%), by the end of month this indicator increases more than twice (EI of 7.04%). In summer months quantity clinically sick thelaziosis animals the highest. The maximum values of extensiveness of an invasion fixed during the period from third decade of July to the first decade of August (15.83 and 15.36% respectively). In the second decade of August the number of the diseased still is at the high level – 12.23%, and then systematically decreases, and by the end of September the number of animals with clinical signs of thelaziosis made less than 5%. During the stall period the extensiveness of thelaziosis invasion was minimum - less than 1%. Clinical implication of thelaziosis is characterized by development of the catarrhal exudative inflammation which is quickly changing on in the beginning is purulent - catarrhal, then there is a loss of transparency of a cornea, fusion of tissues of eye and formation of erosion and ulcers on it. In lack of treatment there is a perforation of an iris of the eye, or formation of a white or red cataract that comes to the end with loss of sight and premature rejection of a sick animal.

Key terms. Cattle, thelaziosis, seasonal dynamics, clinical implication.

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INTRODUCTION:

Change of political climate around the world was reflected in an economic situation and in our country. Sanctions and conditional isolation of Russia stimulated development of the separate industries in Russia. The special attention is deserved by development of agro-industrial complex thanks to which there is an import substitution of food products and implementation of the program of food security. Recently providing the population with fowl and pork reached absolute measures, there is not enough only beef meat. Cattle breeding - rather expensive and technologically complex branch of agriculture but to replace beef meat which contains full-fledged protein a large amount of iron at the same time rather dietary, today in our country it is not possible. In spite of the fact that development of cattle breeding is under close attention and control of the state, it is not possible to provide with the reason for that the population beef fully. In many respects diseases of animals of various etiologies are. During the summer period the most part of cattle pasturage on the remote pastures, especially it is relevant for animals of the meat direction that spend on pastures about half a year [1,2,3,8,13,22]. Except traumatic damages the pasturable type of contents is dangerous to animals by an invasive parasites and continuous influence of insects and ticks [21]. One of widespread summer diseases in the Northern Trans-Ural region is thelaziosis [6,7].

Thelaziosis of cattle – the helminthic disease caused by parasitizing of nematodes of a suborder of Spirurata, the Thelaziidae family [10,14,15]. Helminthes parasitize in channels of the lacrimal gland, the nasolacrimal channel, under the third century and in a conjunctival sac. Without treatment of this disease leads to decrease in additional weights and milk yield of milk, and in the started cases to loss of sight and, as a result, to premature rejection [19].

The infectiousness of cattle in some farms reaches 60-80% [2,9,18]. Cases of parasite invasion of specific parasites of cattle of *Thelazia gulosa* and *Tskrjabiniare* known at the person [4,5,11,16,17,20]

Thelaziosis this seasonal disease as intermediate owners of thelasia are zoophilous flies. In the Northern Trans-Ural region pasture of animals is begun since the end of April of the beginning of May that coincides with the beginning of activity of zoophilous flies – intermediate owners of thelasia which become more active in the first from second decade of April (dependence on meteoconditions) [6,7]. Animals, having come to pastures, are infested in 14-28 days after the beginning of attack on them of flies that is caused by biology of the activator

which metamorphosis passes an intermediate phase in an organism of these dipterous insects [6,7,10].

The purpose of our researches was detailed studying of seasonal dynamics of thelaziosis at cattle and terms of an invasive of cattle thelasia in the Northern Trans-Ural region as well as specification of clinical implication of a disease at the cattle in the region.

RESEARCH DATA AND METHODS:

For studying of distribution of thelaziosis among cattle performed clinical examination of animals all the year round in the period of 2002-2016 belonging to 35 agricultural enterprises as well as the cattle from personal subsidiary farms. For the specified time 27122 heads of cattle are clinically examined. For reliability of the received results examined only the cattle which was not exposed to insecticidal processings. For the purpose of confirmation of the diagnosis conducted microscopic examinations of washouts from a conjunctival cavity. Data processing, the helminths received when accounting, carried out with use of an indicator of the extensiveness of an invasion (EI). The received results processed statistically [12] taking into account average sizes, their mistakes and level of reliability (P) on Student on the computer with use of the Microsoft Excel and Biostat program.

RESEARCH RESULTS:

As a result of the conducted researches it is established that the cattle which is grazed on a pasture, or having a range during the day is exposed to an invasive thelaziosis. The extensiveness of thelaziosis invasion varied within 2.37-36.17% and averaged $10.79 \pm 0.98\%$ [6]. For clarification of seasonal dynamics of an invasivethelaziosis we performed clinical examination of animals during all calendar year (table 1).

It is noticed that for the entire period of observation (from 2002 to 2016) the extensiveness of thelaziosis invasion prior to the beginning of a pasturable season (the first decade of May) and after its termination (the second decade of October) was minimum and made less than 1%. Changes in an epizootic situation happened practically right after an exit to a pasture. So, showing activity, zoophilous flies irritate a mucous membrane of eyes and lead to dacryagogue. At inspection of animals in May it is established that their quantity with clinical signs of thelaziosis increases by the end of month. During this period it is not possible to confirm existence of thelaziosis invasion how larvae are not washed away from a conjunctival sac yet. So, if in the first decade of May of animals in herd with clinic of thelaziosis there were 3.39%, then by the end of month this indicator increases more than, twice and made 7.04%.

Allowed to confirm incidence thelaziosis further observation of animals when eventually they had bright clinical signs of a disease and at microscopy of washouts from a conjunctival sac found larvae of thelazia. In summer months quantity clinically sick thelaziosis animals the highest. So, at the end of June the extensiveness of an invasion was 12.36%, then the quantity of sick animals increased and reached

the maximum during the period from third decade of July to the first decade of August with indicators of 15-83 and 15.36% respectively. In the second decade of August the number of the diseased still was at the high level – 12.23%, and then also by the end of September the number of animals with clinical signs of thelaziosis less than 5% systematically decreased (figure 1).

Table 1 - Dynamics of manifestation of clinical signs of thelaziosis at cattle during the period from 2002 to 2016.

Research month	Quantity of the examined animals	Animals with clinical signs of thelaziosis	EI, %
April			
2 decade	809	3	0,37
3 decade	1304	7	0,54
May			
1 decade	118	4	3,39
2 decade	5085	304	5,98
3 decade	270	19	7,04
June			
1 decade	2118	208	9,82
2 decade	2833	333	11,75
3 decade	1278	158	12,36
July			
1 decade	2599	323	12,43
2 decade	3491	452	12,95
3 decade	4366	691	15,83
August			
1 decade	1074	165	15,36
2 decade	564	69	12,23
3 decade	326	27	8,28
September			
1 decade	306	19	6,21
2 decade	176	9	5,11
3 decade	94	4	4,26
October			
1 decade	124	2	1,61
2 decade	187	1	0,53
Total:	27122	2798	10,04±1,16

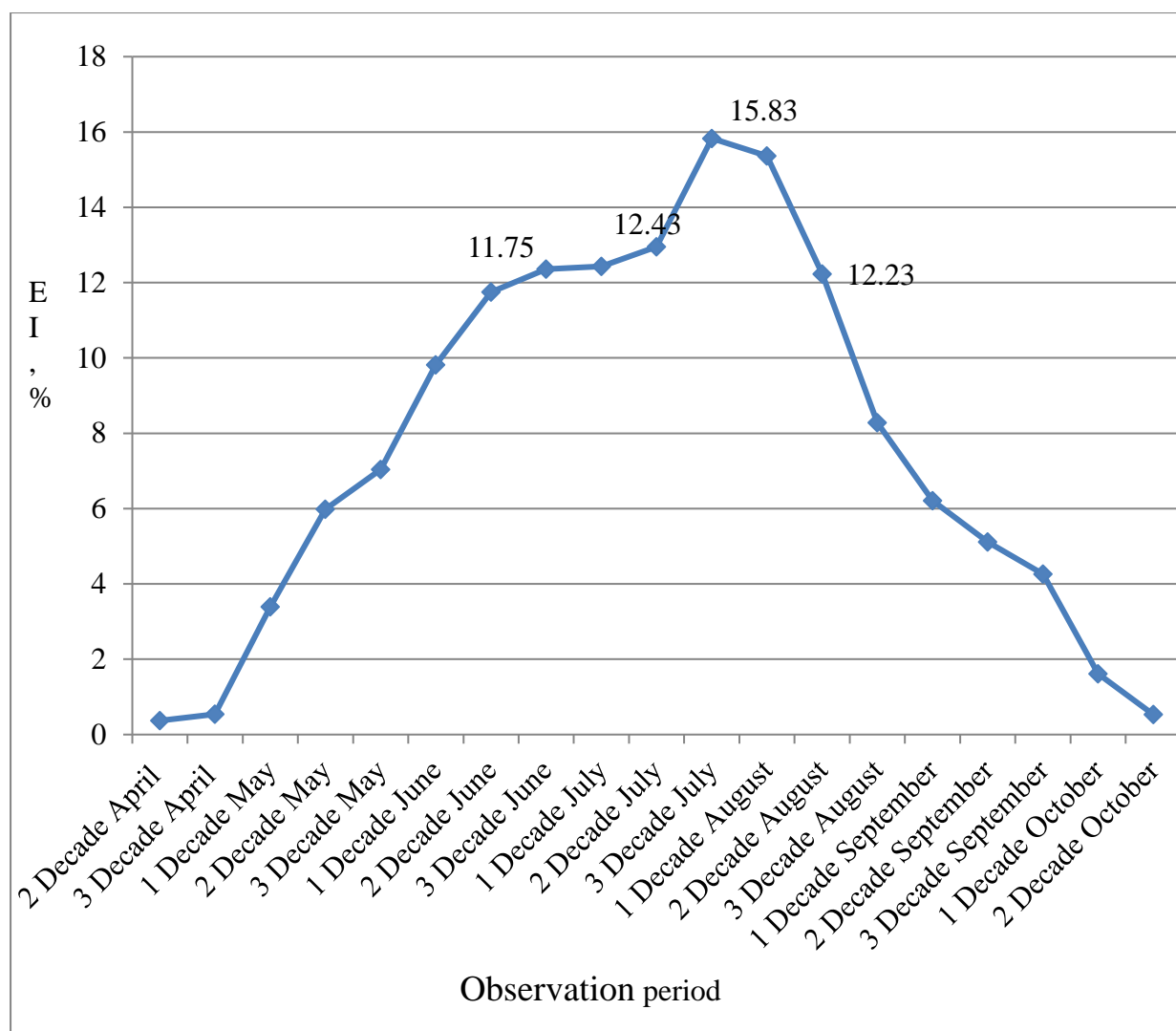


Figure 1 - Seasonal dynamics of clinical implication of thelaziosis at cattle (2002-2016)

Thus, the high incidence thelaziosis (higher than 10%) is fixed during the period from second decade of June to the second decade of August. At the same time it is necessary to consider that animals are infested much earlier, than begin to show a disease clinically. It is noticed that during the winter period animals have no bright inflammatory reaction at thelaziosis, i.e. they have in a latent form and often are not exposed to preventive deworming therefore the cattle which is often infested by thelazia, coming to a pasture, is an invasion source for other animals. So, allocations from eyes attract (physiological)

arthropods, and they actively eat near an eye. During food of a fly, the larva gets to the alimentary system of an insect, migrates and there passes the development cycle. At repeated contact of the infested fly with an animal in 2-4 weeks live larvae independently creep out of her proboscis and get into a conjunctival sac. Hit of larvae of thelazia in a conjunctival sac is followed by alterativny processes in organs of sight, caused by allergic and mechanical influence of a parasite. Clinically it is shown by hypostasis a century and a photophobia (figure 2).



Figure 2 – The century, a photophobia and dacryagogue swelled

The developing exudation at conjunctivitis defines appearance of plentiful dacryagogue that in turn has protective value thanks to what inoculation of a parasite is possible. Besides, development of local inflammation (conjunctivitis) has an immunodepressive effect and reduces the level of local nonspecific protection of tissues of eye that contributes to the development of opportunistic microflora. The created vascular reaction is characterized by formation of the catarrhal exudative inflammation characteristic of a conjunctiva which is quickly changing on is purulent - catarrhal.

At a progression of inflammatory reaction the cornea which being front transparent department of the external capsule of an eyeglobe is involved in process, it is subject to influence of all adverse environmental factors. Features of the building and metabolism of a cornea (anastomosing of regional looped network of vessels of a cornea and an innervation, lack of own vessels, low level of exchange processes) explain its fast involvement in pathological process and specifics of its current, characterized by loss of transparency of a cornea. Usually this process develops promptly, and in 7-10 days after the first clinical signs of conjunctivitis inflammatory process passes to a cornea.

Development of larvae of thelazia in a conjunctival sac, after the third century and in the nasolacrimal channel supports secondary alteration, is followed by hyperplastic changes in a cornea and transition of inflammation to an eye iris of the eye that is characterized by development of an iridocyclitis. Against the background of a progression of inflammatory reaction and its deepening in eye tissue as well as reproduction of pyogenic microflora of reaction of an eyeglobe is various. In most cases at an exudative keratoconjunctivitis and

an iridocyclitis under the influence of proteolytic enzymes of purulent exudate there is a fusion of tissues of eye and formation of erosion and helcomas, and a perforation of an iris of the eye that comes to the end with loss of sight.

In conclusion of pathological process, during proliferation, on a cornea the white or red cataract (figure 3.4) is formed. The white cataract is characterized by fusion of a cornea and underlying tissues of an eye proteolytic enzymes and coagulation of proteins. The red cataract is formed at the expense of active vascularization of the damaged center. In both cases the injured eye loses the function.

Much more rare, on the place of inflammatory reaction the new growth which growth is caused by an invasive of cattle thelazia during the summer period and development by long inflammatory reaction as well as influence of solar radiation develops. Neoplastic changes most often are registered at cattle of Heleford breed that is promoted by a characteristic color of the cattle. It is known that at the white-headed cattle of a tumor of eyes develop much more often than at animals with intensive pigmentation.

Considering a pathogenesis of thelaziosis and its seasonal dynamics studying of ecology of zoophilous flies – intermediate owners of thelazia is necessary for development of a reasonable system of prevention of thelaziosis at cattle. Besides, considering pathogenetic bases of a current of thelaziosis for therapy it is necessary to apply not only antiparasitic, but also antibacterial, protective and immunoperformance-enhancing drugs which allow to adjust damages of a cornea and an iris of the eye of an eye and to prevent loss of sight as a result of turbidity of a cornea and formation on it of hems, perforations of an iris of the eye of an eye and development of new growths (figure 5.6).

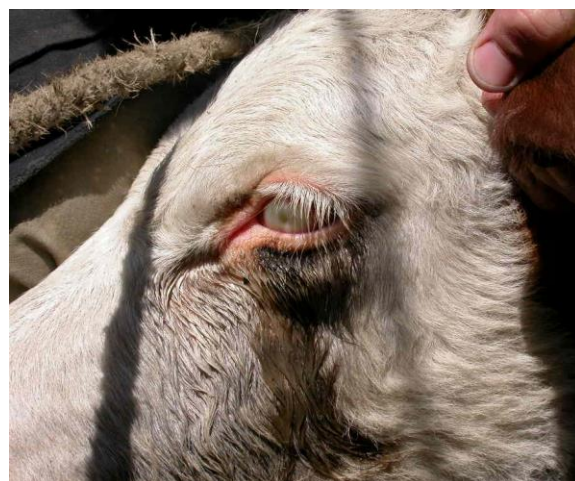


Figure 3 - A white cataract, as a result of fusion of tissues of eye



Figure 4 – A red cataract, as a result of a vaskularization of the damaged center



Figure 5 – A hem on a cornea, after a recovery from thelaziosis



Figure 6 – A cornea perforation after a recovery from thelaziosis

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CONCLUSION:

It is established that in the conditions of the Northern Trans-Ural region clinical signs of thelaziosis are shown from first decade of May (EI of 3.39%), by the end of month this indicator increases more than twice (EI of 7.04%). In summer months quantity clinically sick thelaziosis animals the highest. The maximum values fixed during the period from third decade of July to the first decade of August (% EI 15.83 and 15.36 respectively). In the second decade of August the number of the diseased still is at the high level – 12.23%, and then systematically decreases and by the end of September the number of animals with clinical signs of thelaziosis made less than 5%. During the stall period the extensiveness of thelaziosis invasion was minimum and was less than 1%. Clinical implication of thelaziosis is characterized by development of the catarrhal exudative inflammation which is quickly changing on in the beginning is purulent - catarrhal, then there is a loss of transparency of a cornea, fusion of tissues of eye and formation of erosion and ulcers on it. In lack of treatment there is a perforation of an iris of the eye, or formation of a white or red cataract that comes to the end with loss of sight and premature rejection of a sick animal.

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