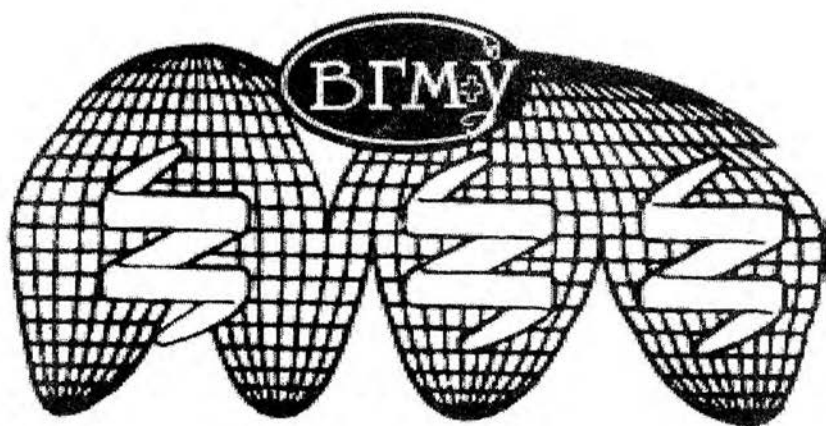


Министерство здравоохранения Республики Беларусь  
УО “Витебский государственный медицинский университет”

**СОВРЕМЕННЫЕ АСПЕКТЫ ПАТОГЕНЕЗА,  
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ПРОФИЛАКТИКИ ПАРАЗИТАРНЫХ  
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Труды VIII Республиканской научно-практической конференции  
с международным участием



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**Витебск, 2012**

УДК 616.99  
ББК 55-17я431+48.736я431+44.7я431  
П 18

**Рецензенты:**

Семенов В.М., Дмитраченко Т.И., Адаскевич В.П., Бурак И.И.

П 18 Современные аспекты патогенеза, клиники, диагностики, лечения и профилактики паразитарных заболеваний. Труды VIII Республиканской научно-практической конференции с международным участием (под ред. проф. В.Я. Бекиша). – Витебск: ВГМУ, 2012. – 223 с.

**Редакционная коллегия:**

В.Я. Бекиш (председатель), А.М. Субботин, В.В. Зорина, Г.Н. Чистенко, С.И. Стасюкевич, Е.И. Бычкова.

ISBN 978-985-466-591-7

Труды конференции посвящены изучению эпидемиологии заболеваний, вызываемых одноклеточными животными, гельминтами и членистоногими, их роли в передаче трансмиссивных заболеваний, вопросам диагностики, лечения и профилактики паразитарных заболеваний человека и животных. Обсуждаются современные генетические механизмы патогенеза заболеваний человека и животных, вызываемых гельминтами, а также новые аспекты лечения гельминтозов с учетом новых аспектов их патогенеза.

Труды предназначены для врачей-практиков, ветеринаров, биологов, научных работников и студентов старших курсов биологических, медицинских и ветеринарных университетов.

УДК 616.99  
ББК 55-17я431+48.736я431+44.7я431

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медицинский университет», 2012

ISBN 978-985-466-591-7

## EFFICACY OF MODERN METHODS STRONGYLID CONTROL: EXPERIENCE OF HEBEI PROVINCE, CHINA

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Strongylid nematodes are the main and the most pathogenic group of parasites of horses and donkeys worldwide including China [1, 2, 3]. All wild and domestic equids are infected with intestinal strongylids; intensity of infection can reach hundreds of thousands nematodes per host [1, 4]. They caused severe problems in donkey and horse health such as weight loss, diarrhea, acute abdominal colic [5]. Severe strongylid infection can lead to the death of horses and donkeys, especially in young animals [1, 4, 5].

In China, donkeys are bred in small and large farms mainly for meat and used as a beast of burden [6]. There are many methods of parasite control for horses and donkeys such as anthelmintic treatment, rotation of pastures, pasture cleaning, zoo-hygienic methods (quarantine, disinfection of stables and paddocks), biological control using predacious fungi, food supplements, etc. Nowadays the main and the most widespread method of parasite control is anthelmintic treatment. There are three main classes of anthelmintics used to control of gastro-intestinal parasites in livestock – benzimidazoles (albendazole, mebendazole, fenbendazole), tetrahydropyrimidines (pyrantel) and macrocyclic lactones (ivermectin, moxidectin, aversectin). All these drugs are of complex effect of parasites, including endo- and ectoparasites. However, resistance of gastro-intestinal strongylids to the first two classes of the anthelmintics was registered worldwide [7].

In People's Republic of China, the most of donkeys farm use macrocyclic lactone antelmintics (ivermectins) in different schemes to control parasites. We examined efficacy of modern programs of macrocyclic lactone deworming of donkeys twice a years at a donkey farm at the Hebei Province.

**Material and methods.** Our study was carried out at the donkey farm near Handan (Hebei Province, China) in November, 2011. About 200 donkeys were kept at the farm for meat. Donkeys were kept at stable-paddock conditions and have no access to pasture grazing. All donkeys were routinely dewormed with

macrocyclic lactone anthelmintics (ivermectin) twice a year. The last deworming was performed six months prior our examination

We examined the level of donkey infection by intestinal parasites by the McMaster method with sensitivity of 25 nematode eggs (EPG) per 1 gram of faeces using the Paracount™ kit [8]. About 10% of donkeys (22 samples) from a herd of 200 animals were examined according to description of Uhinger [9] to estimate level of infection in the donkey herd. Diagnostic deworming technique [10] with modification for group of donkeys was used to collect gastro-intestinal parasites. Totally, 30 donkey mares were dewormed with the single injections of ivermectin anthelmintic. Faecal samples (20) of about 400 g each were collected from 20 of the dewormed donkeys after 24 and 48 hours after treatment. Faecal samples collected were consequently washed with saline and examined in Petri dishes for manual collecting gastro-intestinal parasites.

**Results and discussion.** According to coprological examination, the level of donkey infection by the gastro-intestinal parasites was very low (from 0 to 75 EPG). Only 6 samples from 22 donkeys examined were positive for strongylid eggs (prevalence – 27.3%). Five donkeys (22.7%) were positive for *Parascaris equorum* eggs; the level of infection was from 25 to 100 EPG.

Method of diagnostic deworming revealed only one species of strongylid – *Cyathostomum tetracanthum* (Mehlis, 1831) Molin, 1861, parasitized in donkeys at the farm. We expected to find strongylid species that are typical for donkeys in Asia; however, we could see that application of modern high-effective anthelmintics drastically reduced biodiversity of strongylid community in domestic horses and donkeys in China.

The results obtained showed the high efficacy of the method of deworming of donkeys by macrocyclic lactones twice a year for control of strongylid nematodes. Despite of high density of donkeys at joint stables and small paddocks, transmission of intestinal nematodes (strongylids and ascarids) at the herd examined was extremely low. The program of deworming that is used in Chinese donkey farms allowed to prevent development of donkey infection and keep the level of animal infection very low. Taking into account low level of donkey infection by the main parasitic nematodes (strongylids and parascarids), we can recommend reduction of number of regular deworming of these donkeys to “once per year” scheme, that allows saving costs for animal keeping at farm.

Strongylids are geo-nematodes and they are transmitted between equid hosts through grazing on the common pasture [1, 9]. As we could see at the donkey farm in Handan, donkeys were kept of small joint paddocks without access to pasture grazing. We believe that such “low-grazing” donkey-keeping conditions prevents transmission of strongylids very effectively. However, even in such situation, *C. tetracanthum* – the most widespread strongylid parasitizing donkeys, was successfully transmitted between these animals. We believe that *C. tetracanthum* has rather high level of genetic diversity that allows this species to survive regular deworming and, perhaps, develop resistance to macrocyclic

lactones as it was registered in donkey strongylids in the UK [11]. However, further molecular studies are necessary to support this hypothesis.

Based on the results obtained we can draw a conclusion about efficacy of the program of regular deworming of donkeys with macrocyclic lactone drugs twice a year. However, further investigation of current state of parasitological situation with donkey strongylids in various provinces of the People's Republic of China is necessary to study and monitoring of the long-term efficacy of current programs of parasite control in donkeys and prevention of development and distribution of anthelmintic resistance in these parasites.

#### References

1. Dvojnjos, G.M., Kharchenko, V.A., 1994. Strongylidy dikikh i domashnikh loshadej. [Strongylida of wild and domestic horses] Naukova Dumka, Kiev. 234 [in Russian].
2. Zhang, L.P., K'ung, F.Y. 2002. Parasite Nematodes from Equus spp. China Agriculture Press, Beijing, 175 pp. [In Chinese].
3. Lichtenfels, J.R., Kharchenko, V.A., Dvojnjos, G.M. 2008. Illustrated identification keys to strongylid parasites (Strongylidae: Nematoda) of horses, zebras and asses (Equidae). *Vet. Parasitol* 156(1-2):4–161
4. Love, S., Murphy, D., Mellor, D., 1999. Pathogenicity of cyathostome infection, *Vet. Parasitol.* 85: 113-122.
5. Lyons, E.T., Swercaek, T.W., Tolliver, S.C., Drudge, J.H., Stamper, S., Granstrom, D.E., Holland, R.E., 1994. A study of natural infections of encysted small-strongyles in a horse herd in Kentucky. *Vet.Med.* 89, 1146–1155.
6. Bu, Y.Z., Niu, H.X., Gasser, R.B., Beveridge, I. and Zhang, L.P. 2009. Strongyloid nematodes in the caeca of donkeys in Henan Province, China. *Acta Parasitologica*, 54(3), 263–268.
7. Kaplan, R. 2002. Anthelmintic resistance in nematodes of horses. *Vet.Res.* 33, 491–507.
8. Herd, R.P., 1992. Performing equine fecal egg counts. *Vet. Med.* 87, 240–244.
9. Uhlinger, C. 1991. Equine small strongyles: epidemiology, pathology and control. *Comp. Cont. Educ. Pract. Veterin.* 13, 863–869.
10. Kuzmina, T.A. Kharchenko, V.A., Starovir, A.I., Dvojnjos, G.M. 2004. Application of the diagnostic deworming method for the horse intestinal helminths investigation. *Vestnik Zoologii.* 38 (5), P. 67-70. [in Russian].
11. Trawford, A.F., Burden, F., Hodgkinson, J.E., 2005. Suspected moxidectin resistance in cyathostomes in two donkey herds at the Donkey Sanctuary, UK. In: Proceedings of the 20th International Conference of the World Association for the Advancement of Veterinary Parasitology. Christchurch, New Zealand, 16-20 October, 2005, p. 196.