THE USA JOURNALS
THE AMERICAN JOURNAL OF VETERINARY SCIENCES AND WILDLIFE DISCOVERY
(ISSN – 2689-0968)
VOLUME 06 ISSUE03

PUBLISHED DATE: - 21-06-2024
DOI: - https://doi.org/10.37547/tajvswd/Volume06Issue03-06 **PAGE NO.: - 24-28**

RESEARCH ARTICLE **Open Access**

ESTROSIS OF SHEEP AND DEVELOPMENT OF MEASURES AND CONTROL (LITERATURE REVIEW)

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Abstract
The article summarizes the distribution of oestrose in sheep, epidemiological data and a review of the literature.

Keywords Systematic position, biology, phenology, population ¬ecology, range of the sheep gadfly, Biotechnology, Veterinary Medicine.

INTRODUCTION

Extent of Oestrus ovis range and the need to ensure veterinary well-being regarding estrosis have necessitated a complex of fundamental and applied research.

Scientists have carried out extensive research on the biology, ecology, phenology and distribution of estrosis pathogens in sheep (Beklemishev V.N., 1951; Gan E.V., 1964; Domatsky V.N., 1988; Shcherban N.F., 1971, 198 7 ; Ternovoy V.I., 1986; Marchenko V.A., 1994, 1997; Sivkov G.S., 1995; Migunov I.M., 1998, etc.).

The research results created the necessary prerequisites for the development of effective measures to combat the botfly.

To combat estrosis, drugs from different groups of chemical compounds have been proposed, ensuring high efficiency of therapeutic and preventive measures.

The prospects of using the chemical method of protecting animals from harmful arthropods are emphasized. Currently, in the practice of combating ectoparasites of farm animals, synthetic pyrethroids, which are 4th generation pesticides and are characterized by selective toxicity to arthropods, the ability to rapidly biodegrade and are harmless to warm-blooded animals, are increasingly used.

It has been established that the long-term use of

insecto-acaricides requires constant improvement of the technology of their use due to the threat of the formation of resistant races of insects. There is a need for strict regulation, competent toxicological analysis for the selection and use of drugs that, against the background of pronounced therapeutic and prophylactic effectiveness, would meet the sanitary and hygienic requirements for them.

Systematic position, biology, phenology, population ¬ecology, range of the sheep gadfly

Sheep botfly (Oestrus ovis Line , 1864) belongs to the class of insects In- secta , the order of Diptera Diptera , the family of nasopharyngeal gadflies Oestridae .

Adult O. ovis a small insect 9-12 mm long. The body is covered with small hairs. The head is large, the abdomen is short, oval. The head and dorsal surface of the chest are inseparable, brown-gray in color, the abdomen is yellowish-gray with small checkerboard patterns (Gan E.I., 1953).

In the literature of recent decades there are multiple reports ¬concerning the study of the biology of the banded gadfly (Beklemishev N.D., 1951; Blagoveshchensky D.I., 1937; Breev K.A., 1975; Gan E.I., 1964; Grunin K. N., 1956; Dukalov I. A., 1957; Kolomiets Yu. S., Alfimova A. V., 1956; Shcherban N. F., 1968, 1971; I., 1971, 1972, 1986; Semenov P. V., 1986; Marchenko V. A., 1985;

According to V.P. Tolokonnikov (1995), the flight of the sheep gadfly in the Stavropol ¬Territory begins in June and ends in the third ten days of October - the first ten days of November.

In summer, males live 3-9 days, in autumn somewhat longer. The life expectancy ¬of females in summer is 15-20 , in autumn - up to 40 days (Ternova V.I., 1995)

Fertilized females do not fly. Within 10-15 days, ¬larvae form in a queen-like receptacle. Adults do not feed; they live off the nutrients accumulated in the larval phase. Upon completion of the larval maturation process, the females become active and begin to fly. Female gadflies are viviparous; the fertility of one female is about 700 larvae. (Tolokonnikov V.P., 2005).

Insects lay larvae within 2-4 days. At one time, the female injects 8-12 1st stage larvae into the nasal cavity of the sheep.

Stage 1 larvae are localized on the inner surface of the inferior turbinates, the nasal septum, and the wall of the nasal cavity. The strong attachment of the larvae to the nasal concha mucous membrane is crucial for their survival and development. This allows them to access a good source of nutrients and oxygen, which are essential for their growth and maturation. The larvae's ability to secure themselves in this location demonstrates their adaptability and evolutionary advantage in their environment. The armament of larvae of the 2nd and 3rd stages is weaker; they are localized in the maxillary, frontal sinuses, and cavities of the horny processes (Gan I.N., 1942).

During ontogenesis, the larvae molt twice in the host's body. Larvae of the 1st ¬stage molt in the nasal turbinates; they undergo the second molt in the labyrinths of the ethmoid bone and frontal sinuses (Krivko A. M., 1956).

In stage 3 larvae, the dorsal side of each segment has pigmented transverse stripes of brown-black color. During pupation ¬, the larvae shorten to 15 mm, the outer shell turns black, hardens, and turns into a false cocoon (Ternova V.I., 1972).

Mature larvae of the 3rd stage migrate from the frontal sinuses to the nasal ¬cavity and irritate the mucous membrane, which causes reflex sneezing in sheep, which contributes to the release of parasites into the environment. The larvae penetrate the soil to a depth of 1-5 cm. The pupal phase is 14-16 days (Akbaev M. Sh., 2002).

The duration of development of larvae in the host's body in the ¬North Caucasus zone is 150-240 days for autumn infection, 30-45 days for spring infection (V.I. Ternovoy, 1985, 1995).

S.P.Kuklin, (1952), I.I.Klenin (1958), Ch.E.Rogers , F.W.Knapp (1973) noted that during the adaptation process of 1st stage larvae of O. ovis In the host organism, their mass death (up to 90%) is observed in the first days after infection, and only

after 20-30 days the death of larvae decreases.

P.V. Semenov (1987) notes that the natural and climatic conditions of the habitat of O. ovis affect the amount of generation per year. In years with one generation, the development of larvae in the body of sheep lasts 8–11 months ¬; with two generations, the duration of the development cycle of larvae of the autumn generation is 8-10 months, in the spring - 1-3.

A number of authors (Krivko A.M., 1956; Spiryukhov I.A., Machulsky S.N., 1959; Kalkis Ya.I., 1965; Manytskov A.Ya., 1969; Ponomarev I.A., 1971; Mi ¬Gunov I.M., 1971; Kamarli A.P., Tuganbaev A.T., 1972; Shcherban N.F., 1976; Sivkov G.S., 1981) established that the timing The emergence of 3rd stage larvae for pupation depends on the climatic conditions of the insect habitat. In biotopes with the development of one generation of the botfly, larvae pupate from April to July. In zones of two generations, the larvae of the first generation leave the host's body in the period from February-March to May-July, the second - from July to September-October.

V. A. Marchenko (1985) reports that the transformation of larvae into the 2nd stage occurs in the fall, and into the 3rd stage in winter.

G.S. Sivkov (1979) noted in the metamorphosis of gadflies of the autumn generation a delay in the development of larvae of the 1st stage, which reached 6.5-7 months.

According to P.V. Semenov (1985), A.S. Pushkarev (1986), larvae of the 2nd and 3rd stages produce metabolites that have an ¬inhibitory effect on larvae of the 1st stage. Thanks to this evolutionarily developed technique, the number of O. ovis larvae is preserved in the parasite carrier's body ¬, while minimizing harm to the host body. It is possible that the delay in the development of stage 1 larvae is due to the immune reactions of the host body to the increasing intensity of the botfly invasion.

The development of two generations of the banded gadfly in the spring-summer period in Uzbekistan is reported by E. I. Gan (1942), in Ukraine - Yu. S. Kolomiets (1956), in Kyrgyzstan - A. Tuganbaev (1968), in the steppe zone North Caucasus - N.F. Shcherban, V.I. Ternovoy (1971).

A. S. Smychkov, N. A. Kodenatsii (1975) report that climatic conditions in the steppe zone of the Omsk region create the prerequisites for the development of one generation of the sheep gadfly.

According to V.S. Akchurin, Kh.F. Ayupov (1957), P.V. Semenov (1980), I.M. Migunov (1972), ¬only one generation is developing in the Altai Territory, Bashkiria, Buryatia, and Chita Region sheep gadfly.

The sheep gadfly is widespread. This species has been recorded in Bashkiria, Buryatia, Azerbaijan, Ukraine , Kazakhstan, Kyrgyzstan, Uzbekistan, certain regions of Siberia, Altai Territory, the Far East, Orenburg Region, in the south of the European part of the Russian Federation (Baskakov V.P., 1936, 1946; Klenin I. I., 1958; Kolomiets Yu. S., Alfimova A. V., 1956; Dukalov I. A., 1957; Nosik A. F., Goncharov O. P., 1956; ; Makevnin S. G., 1956; Spiryukhov S. N., 1962; Dzhamuratov U., 1965;

A., 1966; Tuganbaev A. T., 1968; Bukshtynov V.I., Sultanov F.R., 1970; Alekhine ¬R. M., 1971; Ponomarev I. A., 1971; Karpenko I. G., 1971; Migunov I. M., 1971; Ishmuradov A., 1971; Ternova V.I., 1971; Pokidov I.I., 1974;. Azimov Sh. A, 1978; Kamarli A.P., Tuganbaev A.T., 1980; Sivkov G.S. Yamov V. 3, 1981; Marchenko V. A., 1985; Mozulyaka N. S., Zolotukhina L. 3., 1994; Sivkov G.S., 1995; Tolokonnikov V.P., 1995; Zharov V. G., Remez V. I., 1997; Migunov I.V., 1998; Marchenko V. A., 1998; Moiseev O.N., 1999; Abramov V. E., 1999; Lysenko I. O., 2001; Okrut S.V., 2003; Stepanenko E. E., 2004; Bulkhukova U.P., 2005; Atayeva U. B., 2006).

Distribution of oestrosis in sheep

Estrosis is an invasive disease of sheep caused by the larvae of the cavitated gadfly that parasitize the nasal and frontal sinuses.This description likely refers to a parasitic infection caused by larvae of certain parasites, such as nasal bots or nasal maggots.These larvae can infest the nasal passages and sinuses of animals, causing irritation, inflammation, and various symptoms in the affected host.The larvae may also migrate to other parts of the body, leading to additional

complications and symptoms.

Treatment for such infections typically involves removing the larvae from the affected areas, often through manual extraction or medication. It is important to consult a veterinarian for proper diagnosis and treatment of parasitic infections in animals

The sheep botfly is an obligate parasite of sheep. There is information that the larvae ¬of the banded gadfly parasitize goats, argali, aurochs, agali, dogs, and humans (Grunin K.N., 1957; Abul - Hab , 1970; Misra et al . , 1976, Grebenyuk P. V., 1955; Grunin K.N., 1953, Oldroyd , 1964, Pavlovsky E.N., 1929; Grunin K.N., 1957; Schmial , 1944; Oldroyd 1961; Shcherban N.F. 1971, etc.).

The wide distribution of the sheep gadfly indicates the pronounced ecological plasticity of this species, capable of adapting to ¬changing environmental conditions in different regions of the planet.

Data on the spread of estrosis in sheep indirectly indicate the relevance of this problem for modern sheep farming, the need to develop effective measures to combat it, and reduce the economic damage caused.

N.F. Shcherban (1971) notes that in the Rostov region the extent of estrous infestation (E.I.) is 96.4-98.2% with an average annual intensity of infestation of 34.1-35.6 larvae per head.

In Kalmykia, 85.7% of sheep are infested. The intensity of invasion (I.I.) reaches 11.1 specimens per animal (Ponomarev I.A., 1971).

According to N.S. Mozulyaki (1994), in the steppe zone of the Stavropol Territory, young sheep (up to one year) are affected more often than adult animals. The intensity of infestation in lambs is 20.5-87, in adult sheep - 13.12 larvae per animal. The extent of invasion in lambs ¬reaches 98%, in adult animals - 85.2%.

L. 3. Zolotukhina (1995) found that ¬sheep in the arid zone suffer from estrosis to a lesser extent, where E.I. in adult livestock it is 46.4%, in young livestock - 51.2%, and I.I. 9.3-10.0 larvae per head. In the moderately humid zone, E.I. in adult animals it reaches 75%, in young animals - 77.5%, I.I. 14.2-14.3 larvae. In the unstable wet zone E.I. is 53.2%, and 55.2%, I.I. - 16.0-16.9 larvae.

V.P. Tolokonnikov (1995) reports that the extent of gadfly invasion ¬in the Stavropol Territory is 71–100%; I.I. varies between 12.1-27.1 larval specimens per animal.

In the Stavropol Territory, estrose is widespread. Animals of all sex and age groups are affected (rams and rams are infected more often than ewes and lambs). The extent of estrous invasion ¬is 78%, the intensity is 41 larvae (Stepanenko E. E., 2004).

In Siberia, the maximum I.I. reaches 100 copies per animal in sheep ¬. E.I. - 71.1-93.6% (Marchenko V.A., 1998).

The incidence of estrosis in adult sheep in the Chita region reaches 60.1%, in young sheep - 74.9%. The intensity of invasion is 28.5 and 21.3 -larvae per animal (Migunov I.V., 1971).

In May 1986, the number of sheep with estrosis in the Volga region reached ¬100% with an infestation intensity of 1-20 larvae per animal (Bukshtynov V.I., 1987).

V.L. Shamin (1996) reports that in the Orenburg region in two ¬natural climatic zones (forest-steppe and steppe), the extent of gadfly infestation was 81.8%, with an intensity of 24.6 larvae.

According to S. Sagasarra (2000) in Sicily E.I. reaches its maximum in August and is 83.3%. The average number of parasites per affected ¬sheep was 9 larvae, of which 3.9 were in the first stage, 2.7 in the second stage, and 2.8 in the third stage.

A. Scala (2001) provides data on the prevalence of oestrosis in sheep on the ¬island of Sardinia. Notes that in sheep aged 2 or more years, the incidence of estrosis in animals varied from 87 to 100%.

The widespread prevalence of oestrosis indicates that this disease ¬is a significant obstacle to increasing the productivity of sheep breeding as an industry and causes significant economic damage.

The above argues for the need to study the pathogenetic ¬basis of the functioning of the "parasite-host" system in estrosis, and to develop effective control measures that make it possible to

reduce the economic damage caused by this disease to an economically imperceptible level.

CONCLUSION

Overall, the improved drug application device simplifies the process of treating infested animals, particularly sheep with oestosis. It not only increases treatment efficiency but also promotes cost-effective drug usage and environmental protection from pesticide pollution. Understanding the effects of O. ovis larval phases on host organisms can help determine treatment timing and preventive measures for estrosis in sheep, as well as expand the range of safe drugs for use and ensure high-quality livestock products.

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