



KOONAC Goat Farm

Sarcoptic and Chorioptic Mange in Goats



Picture 1: A SEM image of a *Sarcoptes* mite (approximately 0.4mm body length)

Sarcoptic and Chorioptic mange are skin diseases, which are caused by tiny mites. Mites and ticks form the subclass Acari within the class of spiders (Arachnida¹). Despite the global occurrence and economic significance of mites, their taxonomy and zoogeography seem fairly unclear. For example, “*The monophyly of the Acari is open to debate, and the relationships of the Acari to other arachnids is not at all clear*” (quote from Wikipedia). Some sources name the mite species *Sarcoptes rupicaprae* as the vector for Sarcoptic mange (“Scabies”), whereas, according to others, it is a goat-specific strain of *Sarcoptes scabiei* (different species!). Similarly, some authors believe the mite that causes Chorioptic mange is the species *Chorioptes bovis*, whereas others consider it to be the goat-specific mite species *Chorioptes caprae*.

¹ All Arachnida are characterised by 8 legs, in contrast to Insects, which have 6 legs, and Crustaceans, which have 10 legs.

Three different types of mite-induced skin diseases exist in goats:

- Chorioptic mange, which affects mostly the lower limbs and the udder or the scrotum.
- Sarcoptic mange (“Scabies”), which affects mainly the head and the neck, but in severe cases can also spread to inner thighs and the udder.
- Psoroptic mange, which affects the ears.

This article is about our experiences with Sarcoptic and Chorioptic mange.

Sarcoptic Mange

Until recently my knowledge about Sarcoptic mange (“Scabies”) was rather blurred:

- Disease fairly common in the medieval age;
- Highly contagious;
- Sign of negligence;
- Normally affects dogs, venison and, sometimes also humans.

So it was quite a surprise for us when, after 8 years of goat farming, one (only one!) of our goats showed all the symptoms of Sarcoptic mange: First she lost her hair on the neck and on the back part of the head, then nodules started to form, and finally the skin thickened and became dark, wrinkly, and necrotic. Quite obviously, the infection was extremely itchy. The goat would not stop scratching the back of her head with her hind legs, until soon it was an open, bleeding wound².

Treatment: Fortunately, Sarcoptic mange is easy to treat: 1ccm of *Ivermectin* injection subcutaneously for every 25 kg of bodyweight, to be repeated after 7 days, kills the mites successfully. Zinc-rich sun cream (the white, sticky stuff surfers like) protects the naked skin against sunburn, and helps the skin to heal.

The main problem was how to prevent the goat from constantly scratching herself. After bandages, band aids, a dog collar (“lamp shade”), and several other failed attempts, hobbling the back legs finally did the job (although the goat did not like it at all!).

The goat recovered, but left us with the question: How is it possible that a single goat gets scabies, where this disease has never occurred before in our closed herd?

Some research and contacting several experts yielded quite intriguing findings:

The incubation period for Sarcoptic mange, from the initial infection until the clinical signs show up, is approximately 2 months. The mites measure 0.2 to 0.4 mm and are highly fertile. The females dig channels into the skin, where they deposit their eggs. After one or two larval stages, the young mites migrate to the surface, where they mate and reproduce at an age of 18 to 24 days.

² Secondary infections from these wounds are the main reason why wild animals die from scabies!

Most sources agree that infection of susceptible wild animals is fairly widespread, but that a clinical outbreak of the disease is strongly dependant on the condition of the animal. Many animals might be infected with the mite (*Sarcoptes* sp.) without ever showing clinical signs (“silent carriers”). A clinical outbreak normally only occurs in animals with reduced resistance (young, old and sick animals). For example, a high infestation of intestinal worms or a weak goat condition due to lactation may favour an outbreak. In fact, our goat struggled with worms and her condition was not the best when she got scabies because she had just raised two kids.

Chorioptic mange

On our farm, Chorioptic mange regularly occurs in winter during the cold and wet weather. Every year some of our goats are affected, but the disease never affects a majority of the herd and in most cases the symptoms are fairly mild (some crusts and ulceration on the lower limbs). Picture 2 shows one of the most severe cases we had so far.



Picture 2: The most severe case of Chorioptic mange we had so far occurred in winter 2015. For reasons explained in the text we stopped treating our goats against Chorioptic mange several years ago. Even in this extreme case the goat recovered on its own at the end of the wet season.

As with Sarcoptic mange, the finding that many goats may be carriers of Chorioptic mites but only some particularly sensitive animals are affected and show clinical signs, agrees with Mary C. Smith & David M. Sherman (“Goat Medicine, 2nd Edition, 2009): “*The mite... may exist on nonclinical carrier goats and can also survive in the environment for as long as ten weeks (Liebisch et al. 1985). In a New Zealand study of feral goats, the prevalence of Chorioptic mites was 100% in the winter, although marked lesions were found on the legs of only five of 368 goats (1.4%) overall.*” (Page 43).

Treatment: Unfortunately, treatment of Chorioptic mange is not as easy as treatment of Sarcoptic mange. *Ivermectin* injection kills most, but not all, of the mites because of their superficial location (the mites feed on skin debris, not on blood).

For several years we treated animals with Chorioptic mange by washing their affected limbs with *Inca Malaban Wash*. The active compound of *Malaban Wash* is Malathion. This is an organophosphorus derivative, which acts as anticholinesterase compound. The *Malaban Wash* MSDS list the following Hazard Statements:

- H302: Harmful if swallowed
- H312: Harmful in contact with skin
- H315: Causes skin irritation
- H332: Harmful if inhaled

The safety directions on the label reflect these severe potential health hazards: *Product is poisonous if absorbed by skin contact or inhaled or swallowed. Avoid contact with eyes and skin. Avoid breathing vapour of spray mist. When preparing and using the product wear elbow length PVC gloves. When using in enclosed areas wear a face shield. If product on skin, immediately wash area with soap and water. If product goes in eyes, wash it out immediately with water. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.*

Our treatment, washing the affected limbs two or three times in 7-days intervals, was normally quite successful and the skin recovered after the treatment. Nonetheless, we stopped using *Malaban Wash*, for several reasons:

- From the safety directions on the label, we conclude that *Malaban Wash* is a fairly nasty stuff, which we don't want to use on our farm.
- No information is available about the food safety (i.e. withholding periods for meat and milk) of *Malaban Wash*, and, hence, *Malaban Wash* cannot be used on animals that are for human consumption or produce milk for human consumption.
- It is not possible to eradicate Chorioptic mites with *Malaban wash* treatment from a farm because the mites can survive in the environment (i.e. on the paddock) for as long as 10 weeks (Liebisch et al., 1985: Dtsch Tierärztl. Wochenschr. 92, 181-185). Washing affected animals with *Malaban Wash* is, therefore, only a treatment of the symptoms,

and re-infection will occur sooner or later. However, as soon as the weather gets drier in spring, Chorioptic mange disappears on its own.

Our current protocol for the treatment of animals with Chorioptic mange is to keep them under close observation to avoid severe health problems due to secondary infections and to treat the affected limbs with zinc-rich sun cream from time to time to support the natural defence and healing process of the skin.

In conclusion, it seems that Sarcoptic mange and Chorioptic mange are primarily a management and husbandry issue, whereas biosecurity aspects are much less relevant.