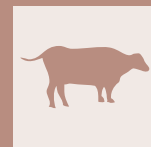


A case of pediculosis in a beef herd



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SUMMARY

An owner called for hair loss and itching in his beef herd since the last three weeks.

Thirty animals were in good general conditions, with a body condition score (BCS) in line with the age and the breed (average BCS 3.5/5), ten animals showed poor coat texture and a BCS < 2.5. The animals were kept into a too small area and dirty pens are with bad natural-lighting. Several fighting has been observed. Some animals were seen waiting for eating.

All the animals presented itching, alopecia on head and neck. The animals looked nervous and stressed. Differential diagnosis included pediculosis, mange and parasitic gastroenteritis for animals with poor BCS. Blood, fecal and hair samples were collected in order to evaluate anemia, GI parasites and infestation.

In 12/20 cattle sampled, many nits, nymphs and adult lice were found on microscopic examination, in 8/20 cattle only lice nits have been visualized. Based on the ratio head:thorax and on the head shape, lice have been identified as Anoplura. The identification of the species resulted in *Solenopotes capillatus*, because *Solenopotes* spp. presented tubercles carrying spiracles that project from abdominal segments. *Solenopotes capillatus* is also known as “Little blue cattle louse” and is the most common *Solenopotes* spp. species that could be found in bovine. No other ectoparasites were found. Microematocrit and TP were normal in all animals. Feces were negative for endoparasites.

The owner was strongly encouraged to decrease the number of animals *per* pen in order to decrease the direct physical contact and the stress due to fighting and feeding competition. Also, removing some of the cover materials and a better storage of the hay, might lead to a better illumination of the all area. Natural lighting not only improves cattle welfare, but directly acts against lice. As soon as the sunlight becomes stronger, lice may lose their comfortable environmental inside the winter hairs (9-11). Another critical point was the cleanness of the pen. Dirty and moisty environmental might increase lice infestation, thus not only a disinfection with specific products, but also providing clean and dry environmental to animals was recommended to the owner.

Treatment was made by application of deltamethrin at a dosage of 10 ml/500 kg of body weight.

At the follow up the fattening area looked well illuminated. The pens had been cleaned and the animals were organized in the 10 pens (3-4 animals per pen). All the animals presented better condition and looked less stressed. Their coat was less dry and scaly but still presented some alopecia in the most of affected animals.

Animals kept under extensive management system were more likely at risk for lice infestation than because poor feeding, overcrowded and stress might occur. This case underlines the importance of good environmental conditions and hygiene, which reduce stress and predisposes less to lice infections.

KEY WORDS

Beef cows, beef herd, pediculosis, *Solenopotes capillatus*, beef herd management.

An owner called for hair loss and itching in his beef herd since the last three weeks. He noted small areas of hair loss, especially around the eyes, in several groups of post-weaning and fattening calves.

The herd was composed by a total of 72 Mucco Pisano cattle: 30 grazing cows with their own calves, 26 post-weaning calves, 14 fattening calves and 2 bulls. Cows calved all year round and were permanently kept with the 2 bulls. Calves were kept with the dams until 6 months of age, then they were housed in a fattening area until the slaughter. The animals were grazed all the year round in an area of 180 ha. Hay, grass silage and maize silage were self-produced and administered two times per day as total mixed ration. Mineral sup-

plementation didn't take place. Fattening calves received hay twice a day, grass silage and cereal-based concentrates in line with age and body weight.

The fattening area hosted 40 animals at the time of our visit. Six to seven calves were housed in each pen. The pens were very dirty and moisty. Each pen was divided into a feeding area with concrete floor, composed by 3 food places per pen and a resting area with a natural surface, which was earthy and muddy. The whole fattening area was roofed with a shaped tinplate. Three out of 4 sides were occupied by hay bales piled until the roof; this made the all fattening area quite dark.

Six groups of 6 to 7 animals each have been evaluated, for a total of 40 cattle (26/72 post-weaning calves and 14/72 fattening calves). Thirty out of 40 animals were in good general conditions, with a body condition score (BCS)¹ in line with the age and the breed (average BCS 3.5/5)^{1,2}, while ten out 40 animals showed poor coat texture and a BCS < 2.5.

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The first impression was that the animals were kept into a too small area and dirty pens are with bad natural-lighting. During the time spent at the farm, several fighting has been observed. Also, some animals were seen waiting for eating. All the animals presented itching, alopecia on head and neck. Twenty-one animals also presented lesions on the shoulders and front limbs. The animals looked nervous and stressed. Differential diagnosis included pediculosis (*Mallophaga* vs *Anoplura* lice), mange (sarcoptic vs chorioptic vs psoroptic mange) and parasitic gastroenteritis for the 10 animals with poor BCS. Blood, fecal and hair samples of the 10 worse animals and of 10 out of the 30 lefts cattle were collected in order to evaluate anemia, GI parasites and infestation.

The coat was manually groomed, carefully palpating and parting the hairs in order to reveal the underlying skin. Long hairs were parted and examined. The legs and the ventral abdomen were carefully evaluated. A hand lens has been used to check alopecia areas and predilection sites more in detail. Surface debris has been collected using stiff brushes and then stored until the laboratory processing. Also, hair plucks and skin scrapes were performed. On detail examination, the animals presented lice on the above indicated sites with rough scruffy coat appearance around the infested area, presence of small sized blue to black colored lice on the neck, face and head region of the animal. In particular, 23/40 cattle clearly showed moving adult lice, while 17/40 showed nits and we were not able to visualize adults. In the laboratory, samples were mounted on a microscope slide in liquid paraffin and examined by a X4 or X10 lens.

In 12/20 cattle sampled, many nits, nymphs and adult lice were found on microscopic examination, in 8/20 cattle only lice nits have been visualized. Based on the ratio head:thorax and on the head shape, lice have been identified as *Anoplura*⁴. On a deeper evaluation, lice had no ocular points, a first pair of legs smaller than the second and the third one, thus were identified as lice from genera *Linognathus* spp. or *Solenopotes* spp. The identification of the species resulted in *Solenopotes capillatus*, because *Solenopotes* spp. presented tubercles carrying spiracles that project from abdominal segments⁴. *Solenopotes capillatus* is also known as “Little blue cattle louse” and is the most common *Solenopotes* spp. species that could be found in bovine⁵. No other ectoparasites were found. Microematocrit and TP were normal in all animals, ranging between 22 to 29% and 7.0 to 7.5 g/dl, respectively⁶⁻⁸. Feces were negative for endoparasites.

The owner was strongly encouraged to decrease the number of animals *per pen* in order to decrease the direct physical contact and the stress due to fighting and feeding competition. To remove some of the cover materials and a better storage of the hay for a better illumination of the all area. Another critical point was the cleanness of the pen. Dirty and moisty environmental might increase lice infestation, thus not only a disinfection with specific products, but also providing clean and dry environmental to animals was recommended to the owner.

Application of an appropriate topical insecticide to infested animals and to all contact animals once and at 2-week intervals for 2, or 3, treatments is usually curative for both types of lice. Repetition of treatment is necessary to break the louse life cycle because eggs are not killed by insecticides and will hatch despite therapy. Literature reported that effective topical agents include pyrethroids, permethrins, sele-

nium sulfide, imidacloprid, phoxim and fipronil⁹. Ivermectin at 200 µg/kg every 14 days for 2 applications is effective against sucking lice, but not biting lice. In this case, treatment was made by application of deltamethrin (Butox 7.5 ml/mg pour-on, registered for bovine and ovine) at a dosage of 10 ml/500 kg of body weight (bw), or 20 ml/>500 kg bw. The same active compound (deltamethrin) has been used for deep disinfection of the animals environmental and other fomites. Before disinfection, all the animals were treated and moved in a clean stable for the all cleaning and disinfecting time.

A second visit was planned 2 weeks after the first treatment. The hay bales had been removed from the fattening area which looked well illuminated. The pens had been cleaned and the animals were organized in 3-4 animals *per pen*. Concerning the herd evaluation, all the animals presented better condition and looked less stressed. Their coat was less dry and scaly but still presented some alopecia in the most of affected animals. The owner was advised to repeat the treatment for both animals and environment.

DISCUSSION

Lice are obligatory ectoparasites that are generally host specific. Adults and nymphs are seldom able to live more than a few days away from their host. Bovine suffer from infestation with several species of lice that belong to the orders *Mallophaga*, the biting lice, and *Anoplura*, the sucking lice^{5,9}. Recognized cattle lice include *Damalinia (Bovicola) bovis* (biting louse, order *Mallophaga*) and *Haematopinus eurys-ternus*, *Linognathus vituli*, and *Solenopotes capillatus* (sucking lice, order *Anoplura*). There seems to be no breed, age, or sex predilections. Clinical infestations are most apparent during the winter months and reflect efficient louse reproduction during the late fall and intolerance to high temperatures on body areas exposed to sunlight¹⁰⁻¹². Apparent carrier animals within a herd maintain populations during the “off” season and serve as a source for reinfestation of the herd during the fall^{5,9,13}. The main symptom is pruritus and clinical changes result from self-trauma. The head, neck and tail are typically affected first, but infestation and clinical signs may become generalized. The coat becomes dry and scaly. Patchy alopecia and crusted ulcerations result from excoriation. A heavily infested animal may become anemic^{5,9}. Reduced productivity and weight loss result from decreased feed intake associated with restlessness.

Animals kept under extensive management system were more likely at risk for lice infestation than animals under intensive management system^{10,11}. Often, in the extensive production system animals are under poor feeding condition, hence they are highly susceptible to lice infestation¹². Moreover, especially in the final fattening phase, many animals are kept together having a chance of direct physical contact contributing to fast transmission and maintenance of lice¹⁰⁻¹². Furthermore, in intensive production system the management practiced in terms of regular spraying of acaricides, housing system and the feeding system is much better than extensive production system¹¹. One of the concerns during the present visit was the presence of too many animals kept together in a too small area. The feeding area did not have enough places for all the animals and calves have been seen



Figure 1 - Signs of alopecia around the muzzle, eyes and neck in a post-weaning calf.

waiting for eating for several times. This usually not only means stress, but also means that some animals could not eat properly. Thus, even in a very good nutritional plan, some subjects may lose weight and are more predisposed to infections and parasites. The pens were also dirty and with a bad natural-lighting. These environmental conditions might represent a severe source of stress for the animals, leading to an increased susceptibility for development of pediculosis or other diseases. Moreover, the high density might increase the direct physical contact contributing to fast transmission and maintenance of lice. In conclusion, main problems of the farm were poor general state in few animals, poor housing and cleaning, different type of stress for animals, itching and alopecia. Clinical signs evaluated in this beef herd were all due to pediculosis. Only the housed animals were affected, while grazing cows and bulls looked healthy and in a very good general state. This case underlines the importance of good environmental conditions and hygiene, which reduce stress and predisposes less to lice infections.

References

- Chenoweth J., Sanderson M. (2005) Beef practice: cow-calf production medicine, 89-107, Wiley-Blackwell, USA.
- NADIS. Condition score (BCS) in beef herds. www.nadis.co.uk. Web. 4.1.2018.
- Neubel A., Nuttal T. (2017) Diagnostic techniques in veterinary dermatology, 21-40, Wiley-Blackwell, USA.
- Greiner E. (2012) Diagnosis of arthropod parasites. In: Veterinary Clinical Parasitology, Zajac A.M., Conboy G.A., 8th ed. 217-303, Wiley-Blackwell, USA.
- Scott D.W. (2018) Color atlas of farm animal dermatology, 2nd ed. 30-44, Wiley-Blackwell, USA.
- Smith B.P. (2015) Large Animal Internal Medicine, 5th ed. backcover chart, Elsevier, USA.
- Bonelli F., Castagnetti C., Iacono E., Corazza M., Sgorbini M. (2015). Evaluation of some physical, haematological, and clinical chemistry parameters in healthy newborn Italian Holstein Calves. Am J Anim Vet Sci, 10 (4): 230.234.
- Giambelluca S., Fiore E., Sadocco A., Giansella M., Vazzana I., Orefice T., Morgante M. (2016). Evaluation of venous blood gas levels, blood chemistry and haemocytometric parameters in milk fed veal calves at different periods of livestock cycle. Pol J Vet Sci, 19(4): 745-752.
- White S.D. (2015) Parasitic skin diseases. In: Large Animal Internal Medicine, Smith B.P., 5th ed. 1206-1207, Elsevier, USA.
- Surafel M. (1996) Survey on tick species in four domestic animals in Tigray Region. DVM thesis, 10-21, FVM, AAU, Debre-zeit, Ethiopia.
- Shifaw A., Asredie T. (2015) Cross-Sectional Study on the Prevalence of Ticks, Mange Mite and Lice Infestation in Bovine and Ovine in and Around Bishofitu, Ethiopia. Acta Parasitologica Globalis, 6(3): 193-200.
- George J., Ogunleye J., Otabo S., Adedimiyi B. (1992) Louse and mange infestations in domestic animals in Northern Nigeria. Trop Anim Health Pro, 24: 121-124.
- Butler J.F. (1985) Lice affecting livestock. In: Livestock entomology, Williams R.E., Hall R.D., Broce A.B., et al., Wiley-Interscience, USA.



Figure 2 - Hair plucks from a fattening calf affected by itching and alopecia. Sample is mounted on a microscope slide in liquid paraffin and examined by a X4 or X10 lens. The identification of the species resulted in *Solenopotes capillatus*.