

Preliminary research regarding the prevalence of digestive and respiratory parasitosis in meat cattle from the Hârtibaci Valley, Sibiu County

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Abstract

In Romania, the data regarding gastrointestinal and respiratory parasitism in cattle are scarce and incomplete. This study was undertaken on Angus breed cattle from an intensive-type exploitation in Nocrich, Sibiu County. The faeces samples were examined both through qualitative and quantitative methods. The most widespread type of parasitism was the one caused by the ciliate *Balantidium coli* (51.61%), followed in equal manner by *Eimeria* (32.25%) and *Fasciola/Paramphistomum*. The digestive strongyles (22.58%) were less representative. These were followed in a decreasing order by the infestation with *Dictyocaulus viviparus* (16.13%) and by *Strongyloides* spp. (12.90%).

Key words: Angus breed cattle, internal parasites, prevalence, Nocrich.

Introduction

In most cases, cattle are raised for milk, meat and skins but, more seldom, they can be used to keep a good maintenance of pastures, various sporting activities (rodeo, corrida) and for participation in contests in the agricultural field. Thus, they produce up to 90% of the total quantity of milk consumed worldwide, 30% of the meat quantity and 90% of the skins used in the leather industry (Acatincai, 2004).

The production forcing, along with the impact of dejections on the environment are deficiencies in the management of cattle. The prejudice brought to the state of health (and implicitly to production) by the presence of internal and external parasites should also be added. Although cows can host more species of parasites in the digestive and respiratory tracts, only some of them have a clinical or economic significance. We can list the species of the *Ostertagia* genus, located in the abomasum, species of the *Eimeria* genus especially *E. bovis* and *E. zuernii* but also the pulmonary nematode *Dictyocaulus viviparus*. Several species of trematodes like *Fasciola hepatica* and those of the genus *Paramphistomum* to which you can add cryptosporidia, *Neospora caninum* or *Echinococcus granulosus* as well as others can be mentioned (Darabus et al., 2011, Imre et al., 2010, 2012, Morariu et al., 2011). Their transmission is achieved mostly through a digestive path but it can also be realised transcutaneous, at pasture. In addition, the economic losses are owed to the expenses of antiparasitic treatments though more alternatives that are efficient are available like vaccines against some parasitic diseases (Morariu et al., 2005, 2010).

Bibliographic studies indicate a high incidence of parasitic diseases in cattle on an international level, especially in the case of those raised in a free-range system, on grazing lands (Darabus et al., 2006, Jager et al. 2005, Pilarczyk et al., 2009). This is the reason why the present paper aims to establish the epidemiological situation regarding the internal parasitism in cattle raised in an extensive system, especially of Angus breed cattle from the Hârtibaci Valley, Sibiu County.

Materials and methods

The Hârtibaci Valley is found in the central-Eastern part of the Sibiu County and it is part of the Hârtibaci Plateau. This area spreads on a surface of 237.515 ha, distributed as follows: 51% in the Sibiu County, 35% in the Braşov County and 14% in the Mureş County (Figure 1).



Fig. 1-Ethnographic areas of the Sibiu County
(after <http://bjastrasibiu.ro/biblioteci-din-judet/>)

During the year 2016, a number of Angus cattle were subjected to coproparasitic examinations. They belonged to Karpaten Meat (KM) beef cattle exploitations in the Nochrich area, Sibiu County (Table 1). Both quantitative and qualitative coproscopic methods were used during examinations.

Results and discussions

From a total of 31 examined samples, using the above-mentioned methods, three were negative (9.67%), nine were positive with a single parasite species - monoparasitism (29.03%) and most of them presented polyparasitism, harbouring two or more species of parasites (61.29%).

The most widespread parasite was the ciliate *Balantidium coli* (51.61%), followed by *Eimeria* (32.25%) and in equal measure, by *Fasciola/Paramphistomum*. Surprisingly, the digestive strongyles were less representative (22.58%). These were followed, in a decreasing order, by *Dictyocaulus viviparus* (16.13%) and by *Strongyloides* spp. (12.90%). The data are presented in Figure 2.

The massive presence of *B. coli* denotes feeding deficiencies, which permitted an excessive multiplication of the ciliate and its transmission in the cattle herd.

Eimeriosis is largely spread, both in Europe and on the other continents where cattle are bred as well (Davoudi et al. 2011). The registered prevalence varied from country to country and from region to region (Bangoura et al. 2012) from 8.25% in Iran (Heidari et al., 2014) and 93% in Poland (Pilarczyk et al., 2009).

Table 1. The results obtained after the examination of faeces from Angus cattle

No.	Owner	Registrationno	Sex	Age (years)	Observations
1.	Karpaten Meat	27541	F	6	Digestive strongyles, Eimeria, Balantidium
2.		31642	F	5	Eimeria, Balantidium
3.		18666	F	6	Eimeria, Balantidium
4.		8488	F	1	Negative
5.		9203	F	1,5	Digestive strongyles, Eimeria, Balantidium
6.		8978	F	1,5	Negative
7.		2385	M	1,5	Digestive strongyles, Eimeria
8.		2389	M	8 months	Digestive strongyles, Eimeria
9.		9306	F	8 months	Digestive strongyles, Eimeria
10.		9256	M	2	Dictyocaulus
11.		9264	M	2	Dictyocaulus
12.		9250	M	2	Negative
13.		9254	M	2	Balantidium
14.		8021	F	10 months	Balantidium
15.		8233	F	10 months	Fasciola/Paramphistomum
16.		8078	F	10 months	Fasciola/Paramphistomum
17.		8164	F	10 months	Fasciola/Paramphistomum
18.		8369	F	4	Fasciola/Paramphistomum
19.		8301	F	4	Fasciola/Paramphistomum, Balantidium, Strongyloides
20.		8256	F	4	Fasciola/Paramphistomum, Balantidium, Strongyloides, Digestive strongyles, Dictyocaulus
21.		8266	F	4	Fasciola/Paramphistomum, Balantidium, Strongyloides
22.		1572	F	6	Fasciola/Paramphistomum
23.		4269	F	5	Fasciola/Paramphistomum, Eimeria
24.		9527	F	6	Fasciola/Paramphistomum, Digestive strongyles, Dictyocaulus
25.		1637	F	6	Balantidium, Eimeria
26.		9526	F	7	Balantidium
27.		1634	F	7	Balantidium
28.		8104	F	2	Balantidium
29.		8138	F	2	Balantidium
30.		3400	F	4	Balantidium, Eimeria, Strongyloides, Dictyocaulus
31.		3397	F	4	Balantidium

However, cryptosporidiosis has a different distribution and even in the neighbouring areas, higher variations in values may be noticed: 5% in Sweden (Bjorkman et al., 2003) and 86.7% in Tunis (Soltane et al., 2007).

Fasciolosis has affected 0.5% cattle in Turkey (Sariozkan and Yalcin, 2011) and 90.7% of the Ethiopian herds (Behre et al., 2009) while *Paramphistomum* was present in 4.25% of the

cattle from Pakistan (Khan et al., 2008) and 53.4% of the Irish cattle population (Toolan et al. 2015).

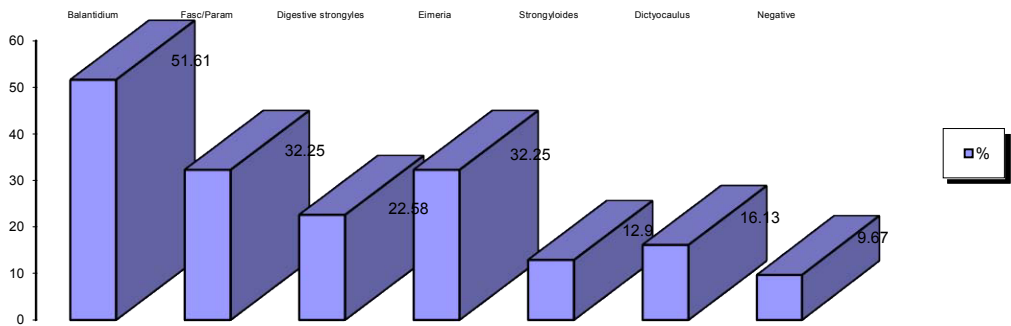


Fig.2- The percentual repartition of types of parasites identified in Angus cattle

Dictyocaulus viviparus was diagnosed in 1.8% of the calves investigated in Costa Rica (Jimenez et al. 2007) and 50% of the cattle investigated from a farm in Canada after the introduction of carrier calves (Wapenaar et al., 2007).

Regarding the trichostrongyles, data are variable according to the implied genus and according to the region. Thus, the prevalence ranges from 0.3% in Italy (Forbes et al., 2008) of serum samples and 81.4% in Costa Rica (Jimenez et al., 2007).

For Romania, the data regarding gastrointestinal nematodes is abundant for sheep and goats in the detriment of cattle. The research from the past few years has been addressed especially to parasitic diseases in sheep. The most recent detailed research in this matter was conducted by Avram (2003), who studied the situation of the internal parasitism in cattle from Satu-Mare County. It was observed that the prevalence of parasitism with gastrointestinal nematodes ranged according to region, having total values comprised between 38.6% and 66.2%. The most important genera implied in the parasitic pathology of cattle from Satu-Mare County were in decreasing order: *Trichostrongylus*, *Cooperia*, *Ostertagia*, *Haemonchus* and *Nematodirus*.

Conclusions

In the Karpaten Meat exploitation the infestation with various genera of parasites was reported.

Parasites from three classes were identified: Protozoa, Trematoda and Nematoda.

The most widespread parasites were: *Balantidium coli* (51.61%), *Eimeria* and *Fasciola/Paramphistomum* (32.25%), and less noticed were: *Dictyocaulus viviparus* (16.13%) respectively *Strongyloides* spp (12.90%).

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