

Influence of management measures on gastrointestinal parasites in dairy cattle herds in northern Italy

Gazzonis AL^{1*}, Zanzani SA¹, Villa L¹, Aloisio G¹, Migliorati E¹, Manfredi MT¹

¹ Department of Veterinary Medicine, Università degli Studi di Milano, Italy

*Corresponding author: alessia.gazzonis@unimi.it

Background

Parasitic infections represent an important health issue for the livestock sector. In particular, gastrointestinal nematodes (GIN) have a significant impact especially for dairy cattle because they can affect animal health, welfare and productivity [1]. In addition, protozoan infections caused by *Eimeria* spp. are among the most common causes of intestinal diseases in cattle, especially among young animals [2]. The intensification of dairy production and the non-use of pasture has led to a poor consideration of the problems related to GIN and parasites in general by both farmers and veterinarians. However, despite the modern breeding techniques can help to combat the spread of parasites, several factors related to the host, i.e. the lower specific resistance of host animals due to the productive drive of genetic selection, and to farm management, i.e. the increase the size of the herds and the time of occupation of the structures, can facilitate the spread and maintenance of parasites even within intensive farms.



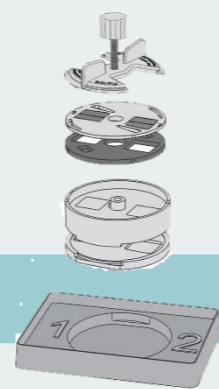
Aim of the study

The scarcity of updated epidemiological data and the lack of an analysis of the management risk factors that can contribute to the spread of parasites has led to the need to plan a study concerning the parasitological status of dairy cattle raised in northern Italy. In particular, the management and structural factors potentially capable of influencing the infection dynamics of gastrointestinal parasites in dairy cattle were considered and analyzed.

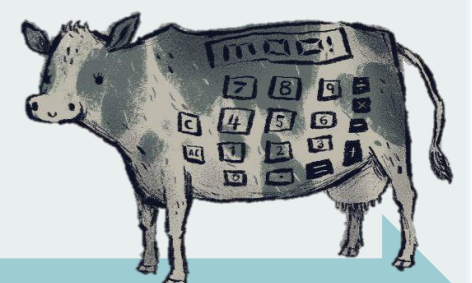
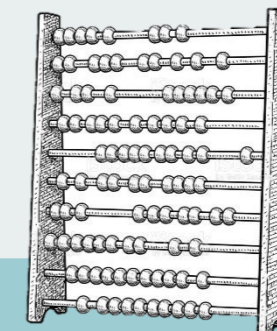
Material and Methods



- from
- ✓ 10 lactating cows
 - ✓ 5 dry cows
 - ✓ 10 heifers
 - ✓ 5 calves <1month
 - ✓ 5 calves 1-6 months



- Questionnaire on management procedures
- ✓ Facilities
 - ✓ Sanitary procedures
 - ✓ Biosafety procedures



Generalized linear models (GLMs) → effect of MMS on GIN & *Eimeria*

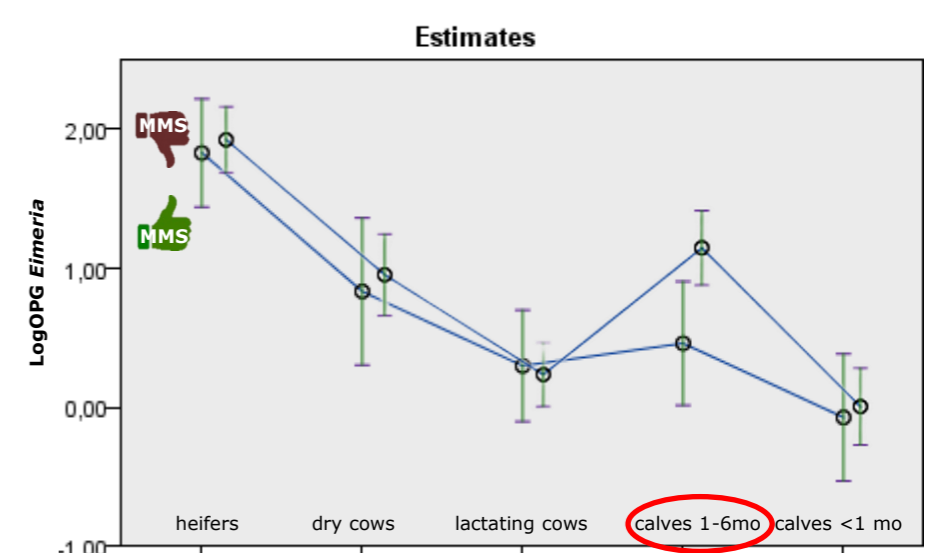
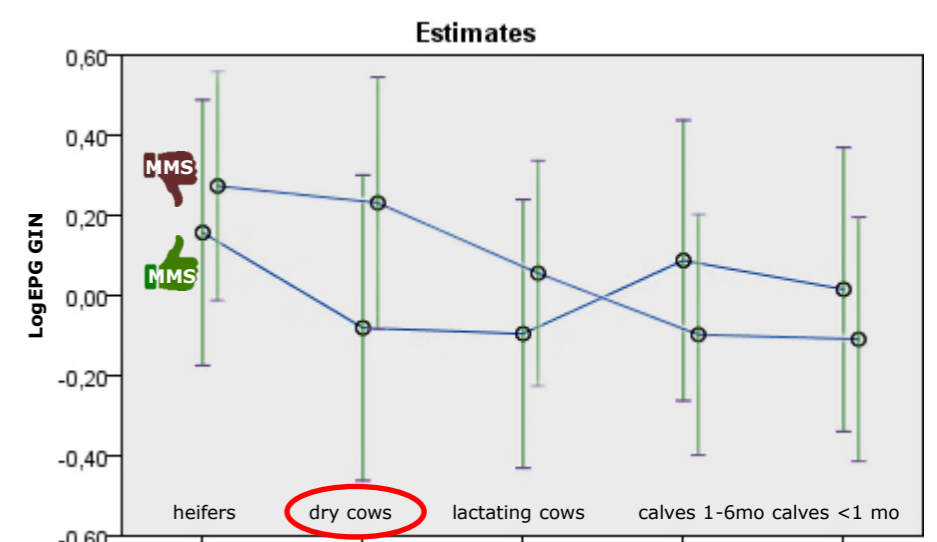
Results

	GIN P% (mean EPG ± s.d.)	<i>Eimeria</i> P% (mean OPG ± s.d.)
Lactating cows	17.5 (4.3±17.1)	20.6 (5.5±24.1)
Dry cows	28.6 (5.1±13.6)	58.9 (23.4±48.1)
heifers	26.5 (3.8±13.4)	90.9 (95.5±153)
Calves <1month	0 (0±0)	6.7 (2.64±19.2)
Calves 1-6 months	4.2 (0.6±2.8)	51.4 (90.1±223.5)
overall	16.6 (3.1±12.83)	45.9 (43.6±125.52)

Different impact of MMS on GIN and *Eimeria*

GLMs, two-way interaction productive category x MMS

- ✓ GIN: p-value=0.021 → dry cows (NMS)
- ✓ *Eimeria*: p-value 0.0001 → calves 1-6 mo (MMS)



Discussion

- ✓ GIN have been found mainly in adult animals → decreased milk production even in cases of pauciparasitic infections. Dry cows were the most at risk in low-scoring farms, while in farms with high MMS lactating cows are the least at risk category.
- ✓ *Eimeria* is the parasitic taxon most frequently found (89.5% herd prevalence), with high prevalence and OPG burden both in heifers and calves 1-6 months. Low MMS, especially in calves, brings to high spread of *Eimeria* infection among young animals, in which coccidiosis may lead to reduced weight gain and failure to achieve productive & reproductive performance.
- ✓ Prevalence and parasitic loads of GIN and *Eimeria*, inversely proportional to MMS → predictors for the evaluation of management protocols applied in dairy cattle farms.
- ✓ A proper management, especially on categories often less considered such as heifers and dry cows, may also have a positive impact on the most important categories from a production point of view, as lactating cows and calves, and therefore on the entire herd.

References

- [1] Charlier et al., 2020. Vet Clin North Am Food Anim Pract 36(1):1-15
- [2] Dauschies et al., 2005. J Vet Med B Infect Dis Vet Public Health 52(10):417-27
- [3] Cringoli et al., 2010. Nature Protocols 5(3):503-15.