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Popular article

Impact of Parasitic Diseases on Health and Production of Dairy Cattle

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Abstract

The effect of internal and external parasitism on productivity of dairy cattle is considered as the most unidentifiable underlying cause for low productivity. Parasites are found externally *viz.*, ticks, mites, flies and internally such as worms, protozoa etc., are a major cause of disease and production loss. Various species of protozoans and helminths cause economically important parasitic diseases with economic loss by decrease in milk production, decreased weight gain, treatment costs and mortality. While abortion losses, organ condemnation, carcass weight loss and decreases hide value, and fecundity are other effects. A major concern in the control of parasitic diseases is the development of resistance by worms, flies, ticks etc. The parasitic challenge experienced and the outcome of that challenge is a dynamic one in which environment, management practices, including housing or grazing management, nutritional status, the host's ability to develop effective immunity and the speed with which this can occur, play a significant role.

Introduction

The farm animals such as cattle, sheep, goats and pigs are reared for meat, milk, wool etc. Parasitic diseases in livestock husbandry is a major problem encountered worldwide. Cattle have been killed by extremely heavy infection and infestation with parasites. Ectoparasites and endoparasites reduce the productive performance of dairy cattle as well as other livestock. It frequently causes significant economic loss and severe impact on animal welfare. Livestock parasites account for 13% of livestock mortality and are generally responsible for reducing animal productivity by reducing the quantity of meat, milk, and other animal products (Grace *et al.*, 2015). Rashid *et al* 2019 reported that the average decrease in milk production and organ condemnation as 1.16 litre per animal per day and 12.95% respectively from overall cattle parasitic infections worldwide. Moreover, the average calculated financial and percentage



losses globally were US\$50.67 per animal per year and 17.94%, respectively. Also, parasite infection leads to poor livestock reproduction and food insecurity. In addition to the impact on animal health and production, control measures are costly and often time consuming.

Parasitic diseases

The parasitic diseases affecting cattle (Table 1) can be broadly classified as helminths, protozoa and insects. There are direct and indirect effects due to parasite which severely affect the productivity of animals. Among the gastrointestinal worm infections, haemonchosis, amphistomosis have deleterious effects along with vector borne haemoprotozoan diseases like theileriosis, babesiosis and anaplasmosis. Ticks apart from acting as vectors they have serious direct effects on general body condition of livestock with severe production loss. The effects of parasitism can be subclinical or clinical.

Table 1: Parasites of cattle commonly found in India having economic importance

Sl.No	Scientific name	Common name
	Gastrointestinal parasites	
1.	<i>Haemonchus contortus</i>	Barbers pole worm, wire worm
2.	<i>Trichostrongylus axei</i>	Small stomach worm
3.	<i>Mecistocirrus</i> spp.	-
4.	<i>Bunostomum</i> spp.	Hook worm
5.	<i>Strongyloides</i> sp.	Thread worm
6.	<i>Paramphistomum</i> sp (Family: Paramphistomatidae)	Rumen flukes
7.	Coccidia <i>Eimeria</i> spp.	-
	External parasites	
1.	Family: Ixodidae	Ticks
2.	<i>Tabanus</i> sp., <i>Stomoxys</i> sp, etc	Biting flies

Impact on cattle health

Parasitic infections on animals and livestock can be broadly divided into internal and external parasites. They cause poor growth, affects digestion and absorption of nutrients, damage and injury to organs and sometimes death. Losses in animal productivity namely milk production, conception rate, milk quality, weight gain, altered carcass composition etc and roughness of coat, anemia, edema and diarrhoea are of major economic importance to the producer. An estimated \$93.6 million is lost to parasite infestation in Australia, mainly due to treatment costs and production loss in livestock (Zoetis, 2018). Loss of appetite in heavily tick-



infested cattle was found responsible for 65% of the body weight reduction (Rodriguez-Vivas *et al.*, 2017).

Effect on production

Livestock parasites are common worldwide; the disease burden due to parasites is worse in developing countries. Financial losses due to weight loss, poor feed utilization, general unthriftiness, and loss of reproduction have been reported (Kumar *et al.*, 2013). Economic loss incurred in livestock production due to parasitic diseases worldwide is summarised in Table 2 (Strydom *et al.*, 2023 and Narladkar 2018).

Table 2: Economic loss due to parasitic diseases in livestock production

Sl.No	Country	Internal parasites (US \$)	External parasites(US \$)
1.	North America- USA	8.5 B	n/a
2.	Central America- Mexico	0.58 B	0.57 B
3.	South America- Brazil	7.32 B	3.24 B
4.	Australia	0.05 B	0.10 B
5.	India	n/a	13.9-18.7 B

*n/a – not available, B- currency in Billion

Management and control of parasitic diseases

Planned preventative programs are necessary to minimise the risks of parasitic disease outbreaks and sub-clinical losses of animal production, and to ensure the most efficient use of chemicals to control. Integrated parasite management programs aim to provide optimal parasite control for the minimal use of chemicals by integrating pre-emptive treatments, parasite monitoring schedules and non-chemical strategies such as nutrition, genetics and pasture management.

Conclusion

Parasites are a significant cause of disease and livestock production loss, frequently causing consequential economic loss and affecting animal welfare. Farmers should be adequately trained on the effective management and control of animal parasites, efficient use of acaricides, and veterinary medicines for chemoprophylaxis. The need to control internal parasites will exist as long as cattle are on grazing pastures. The methods of controlling internal parasites should be developed to fit individual production situations.

Regular and proper use of insecticides, dewormers, and acaricides to control the parasites is highly recommended as an effective preventive or control measures to tame the



tides of high parasitic disease prevalence. Furthermore, parasitic infection can also negatively impact reproduction and immune response to vaccination hence strict implementation/enforcement of preventative measures against parasitic diseases is vital. A successful deworming program, along with overall herd management will increase milk production in cows and thereby increasing the weaning weights of calves in turn resulting in high economic returns.

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