

## Anthelmintic Resistance

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### Abstract

Anthelmintics are the drugs which are most commonly used against the control of helminth parasites. Indiscriminate usage, underdosing of drug, genetics of the parasite, and targeting and timing of mass treatment are predisposing factors for anthelmintic resistance. Proper utilization of anthelmintic drugs, using combined anthelmintic and applying other alternatives are essential strategies to slow down the development of anthelmintic resistance. As anthelmintic resistance is a serious challenge as it decreases the productivity of the animal, loss of economics to the farmer throughout the world, proper utilization of the existing anthelmintics and reducing dependence on anthelmintics should be implemented to reduce its challenge.

### Introduction

An enormous health issue for animals worldwide is caused by a group of worms called helminths. Managing pastures for domestic animals may be able to lessen the effects of parasites, but these methods are insufficient to completely eradicate them. Currently, anthelmintics are a group of antiparasitic drugs that expel parasitic worms and other internal parasites from the body without causing significant damage to the host. Anthelmintic resistance can be defined as the ability of parasites to survive doses of drugs that would normally kill parasites of the same species and stage. It is inherited and selected for because the survivors of treatments pass genes for resistance onto their offspring. These resistant genes are initially rare in the population or arise as rare mutations, but as selection continues, their proportion in the population increases as does the proportion of resistant parasites. It is a major threat to the sustainability of modern ruminant livestock production, resulting in reduced productivity, compromised animal health and welfare.

### Methods of detection of anthelmintic resistance (Mphahlele *et al.*, 2019)

- In vivo detection method- FECRT (Faecal Egg Count Reduction Method)

- In vitro detection methods-
  - Egg hatch assay
  - Tubulin binding assay
  - Larval development assay
- Molecular techniques- PCR (Polymerase Chain Reaction), RFLP (Restriction Fragment length Polymorphism)

### Prevention of Anthelmintic resistance (Shalaby 2013)

- Refugia - Worms in refugia provide a pool of genes susceptible to anthelmintics, thus diluting the frequency of resistant genes.
- Combined drug strategy
- Follow strict quarantine measures
- Selection of genetically resistance breeds in a population.
- Providing good nutrition especially rich in proteins helps to reduce the infection
- Pasture management by following rotational grazing methods.
- Using of nematode-trapping fungi against the free-living stages of parasite.
- Use of antiparasitic vaccines
- Herbal dewormers are environmentally friendly, and less chances of anthelmintic resistance.

### Conclusion

Anthelmintic is a condition that poses serious risks to the global livestock business, endangering the welfare and future productivity of animals. Excessive treatment frequency and the administration of an inappropriate dose have been deemed to be the most important variables, with the latter being particularly true for poorer nations. It is possible to draw the conclusion that in order to reduce the demand for parasite adaptability, sustainable control measures for helminthosis may necessitate an integrated approach that includes environmental management.

### References

- Mphahlele M, Molefe N, Tsotetsi-Khambule and Oriel T (2019). Anthelmintic resistance in livestock. *Helminthiasis*, 112.
- Shalaby H A. (2013). Anthelmintics resistance; how to overcome it. *Iranian journal of parasitology*, 8(1), 18.