

# Helminth management in sheep for healthy rangeland

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# INTRODUCTION

- Sheep and goat production is threatened by the development of resistance among helminth parasites to anthelmintic chemicals.
- This leads to a vicious circle if higher dosages of more toxic chemicals are applied more often.
- The toxicity of the chemicals furthermore threatens dung beetles

# Importance of dung beetles

- **Dung beetles cycle minerals between animal and soil**
- **and prevent flies and parasites from breeding in dung**



# Threats to ecosystem services are not sufficiently recognised



**Dung  
beetle  
beware!**

# Ignore smile and count stars



↑  
**Product's use should be limited, for example to stock feedlots, and shouldn't be used in pastures because the effect on dung beetles would be severe**

↑  
**Minimal impact on dung beetles**

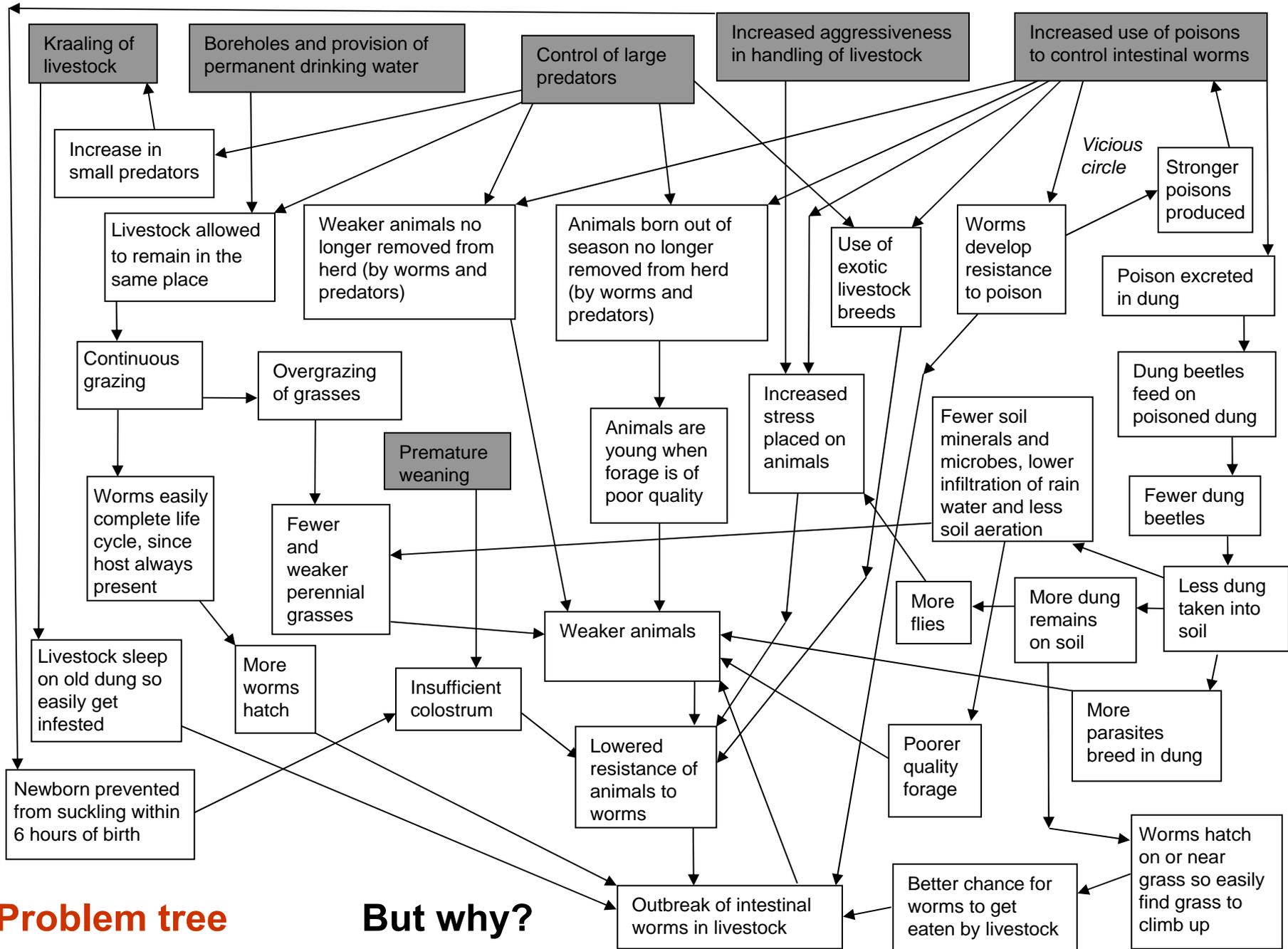
# Problems occur if lots of dung remains unprocessed aboveground

Healthy soil  
fertility from  
dung beetles



More flies and  
diseases





# MANAGEMENT OPTIONS

- There are Namibian farmers who manage to produce healthy livestock without the use of any toxic chemicals.
- They tend to treat the root causes, thus preventing the conditions that favour parasites.
- By leaving their animals out in the rangeland they avoid the close contact between dung and animals that would otherwise occur during kraaling.
- This requires good control over jackals and other small predators.

# PREDATOR CONTROL, BY:

- conservation of wild animals to provide favoured prey for the predators;
- hunting down of individual problem animals;  
regular maintenance of jackal-proof fencing;
- raising puppies with lambs to imprint them to become guard dogs;
- narrow breeding seasons to avoid providing predators with year-round lambs;
- and the use of indigenous sheep breeds with strong mothering and herding instincts.

# PREDATOR CONTROL, BY:

- A few farmers even welcome low densities of jackals for the selective pressure they apply by removing the sick and weak animals from the herd and maintaining mothering and herding instincts.
- One farmer in South Africa strictly prevents his sheep from seeing any domesticated dogs, and he no longer experiences any loss to predators.
- However, more farmers apply their own selection by selling or slaughtering individual animals with high parasite loads.

# TREATING CAUSES

- Farmers who practice rotational grazing are able to interrupt the life cycle of parasites so that the larvae which hatched after sheep were removed from a paddock find no host and die before the sheep return to the paddock.
- There are also a few farmers who treat the root cause of aggressive handling of their livestock by applying methods of stress-free herding, based on animal behaviour.

# Problem tree for worms

## Root causes

Treating the problem at or near the root causes is likely to be more effective in the long term, preventing new symptoms from appearing and possibly allowing old symptoms to eventually healing themselves, with the help of biodiversity.

Apply stress-free handling

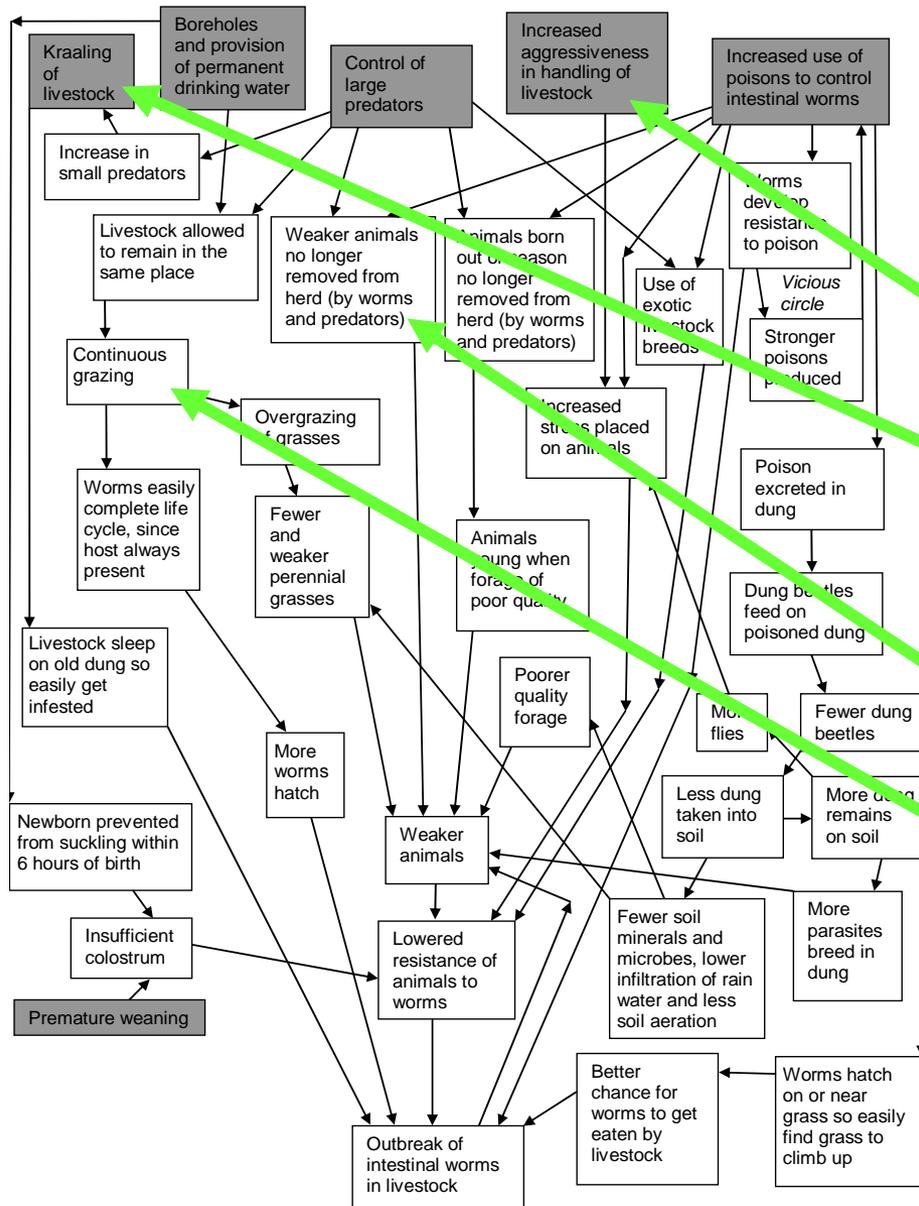
Avoid overnight kraaling

## Intermediate causes

Select for resistance

Rotate to disrupt cycle

## Symptoms



# TREATING SYMPTOMS

- When farmers are still forced to overnight their livestock in kraals, there are ways to administer toxic chemicals that minimise their negative effects,
- and there are non-toxic treatments that will at least avoid harm to non-target species.
- One of these treatments involves the use of Effective Microorganisms (EM)

# Problem tree for worms

## Root causes

Treating the problem at or near the root causes is likely to be more effective in the long term, preventing new symptoms from appearing and possibly allowing old symptoms to eventually healing themselves, with the help of biodiversity.

Avoids this vicious circle

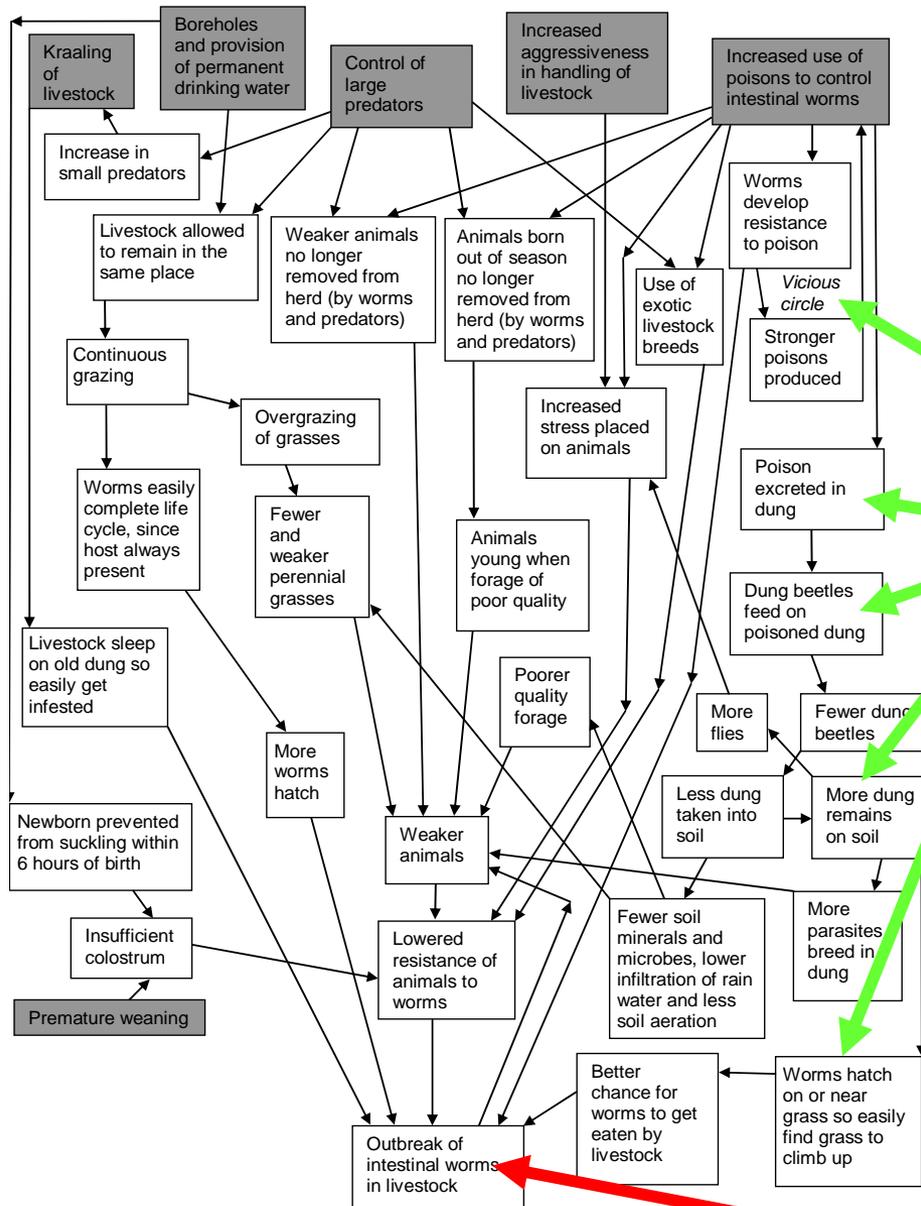
Avoids these effects

## Intermediate causes

Treating the problem at or near the symptoms is likely to result in new symptoms soon re-appearing, so the management will need to be repeated often.

## Symptoms

Eco-friendly products, like EM



# PROJECT

- This project, is trying out an environmental friendly method to control internal parasite to enhance the survival of dung beetles survival.
- The main aim of this project is to try Effective Microorganisms (EM) in controlling sheep internal parasites in partnership with farmers.

# Methods

- EM-Bokashi was made from malt dust.
- This is a cheap source of loose organic matter, available from Namibia Breweries.
- The procedure for making the EM-Bokashi is shown on the following slides.



**Small quantities of molasses and M-EM are measured out**



**Water is first made warm. To save firewood it can be left in the sun in a black pot with lid**



**The molasses is dissolved in warm water and M-EM is then stirred in**



**Malt dust is poured into a mixing tub**



**The dilute molasses / M-EM is then mixed into the malt dust**



**... until all the malt dust is evenly moistened ....**



**... and a pressed sample maintains shape without crumbling.**



**Then the moistened malt dust is poured into a heavy duty plastic bag ....**



**... and compacted to remove air.**



**The bag is then tied with string .....**



**And stored in shade to ferment anaerobically for a month or two.**

# **Treatments applied to 20 sheep per group**

- **Control group, receiving no treatment**
- **Conventional group, receiving the anthelmintic normally applied by the farmer, twice or three times per year**
- **Bokashi alone, daily**
- **Bokashi daily, plus M-EM twice a year**



**Each sheep gets a numbered eartag**



**Each numbered sheep gets weighed**



**A dung samples is collected ...**



**3g of dung gets weighed out**



**The dung gets crushed in 30ml of water**



**Dung solution gets sieved through 250 $\mu$**



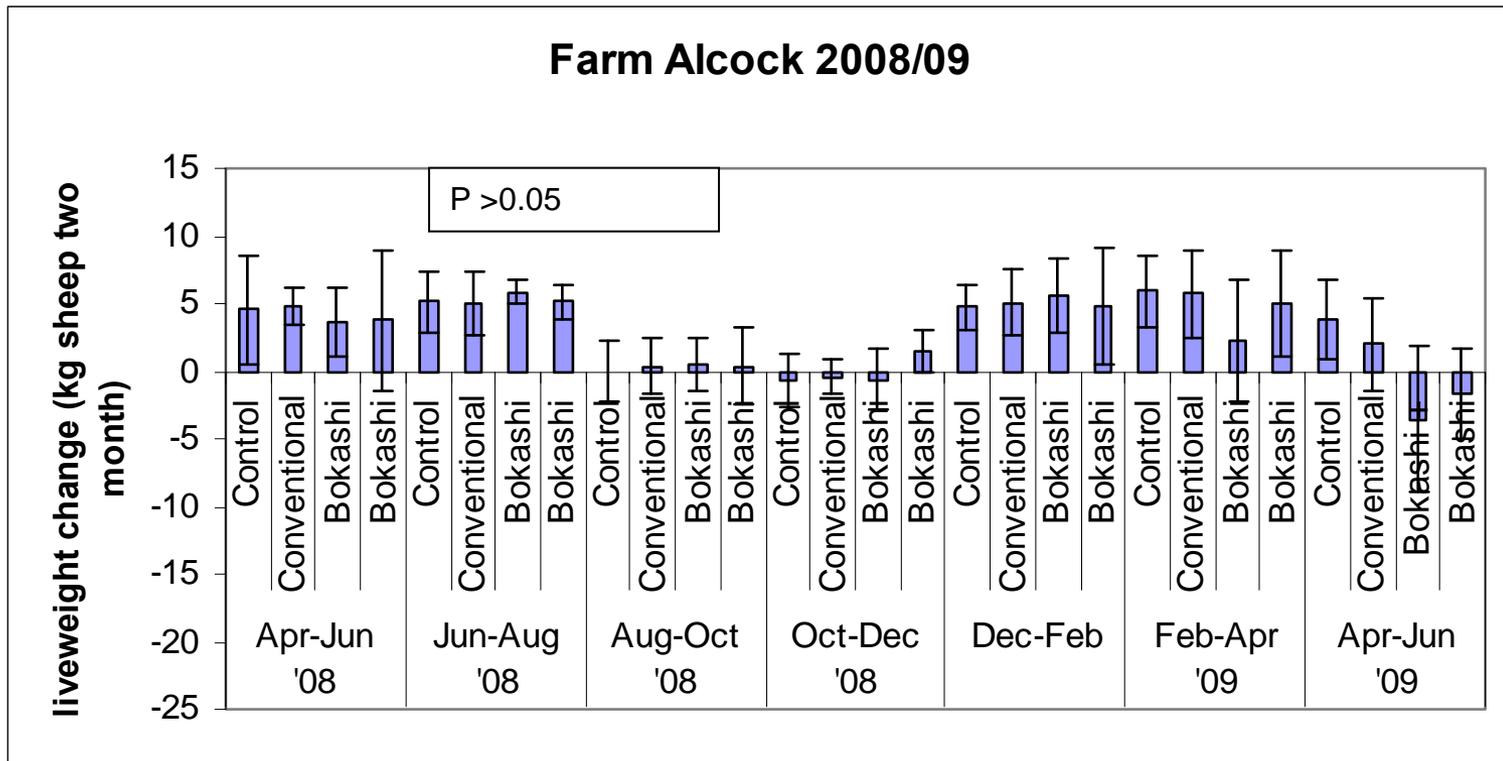
**Dung solution gets sieved through 250 $\mu$**



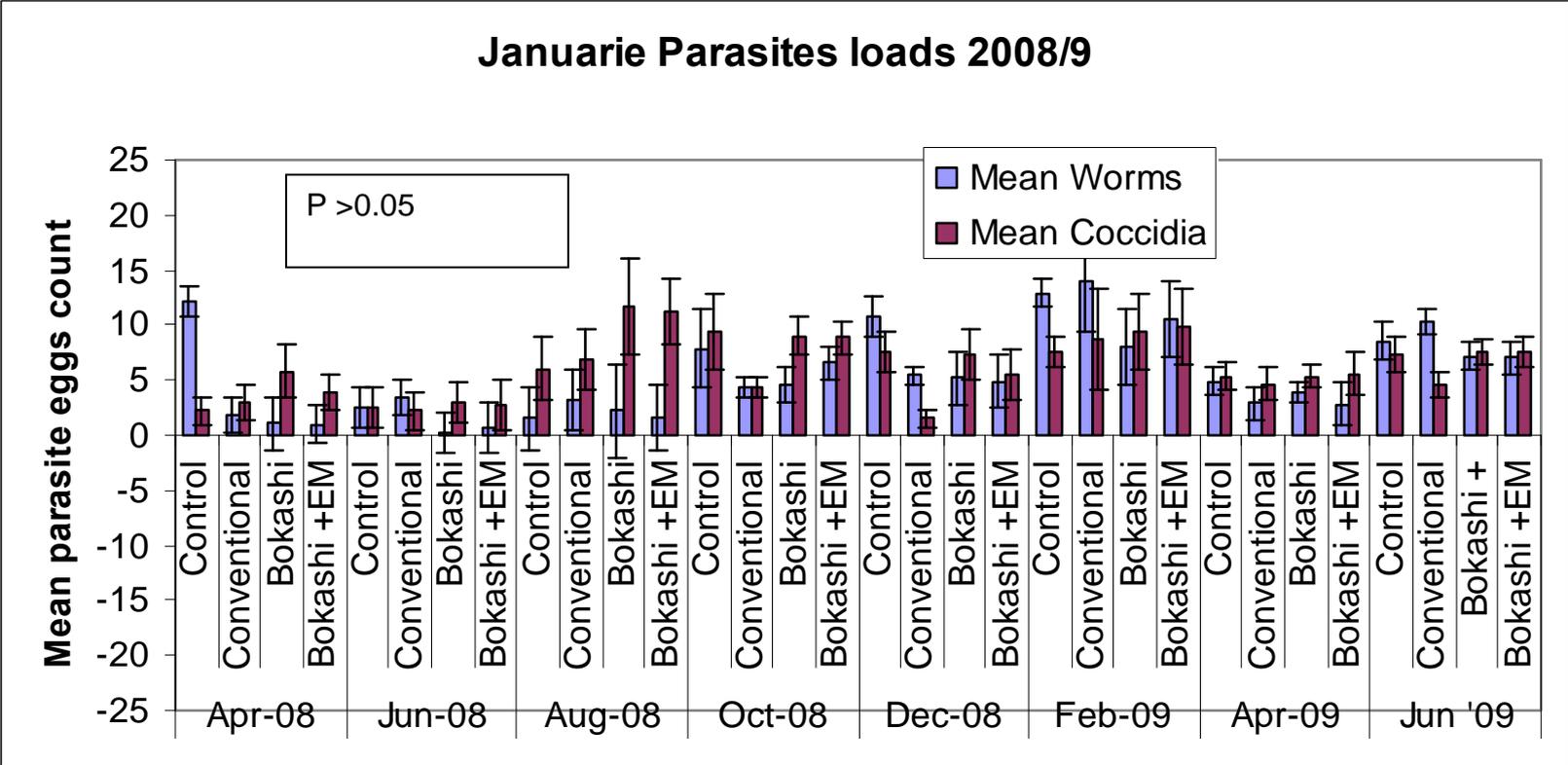
- Filtrate poured into a test tube for eggs to settle.
- Floatation solution then added for eggs to be counted in the McMaster chamber.

# Result

- Live weight change, example from one farm



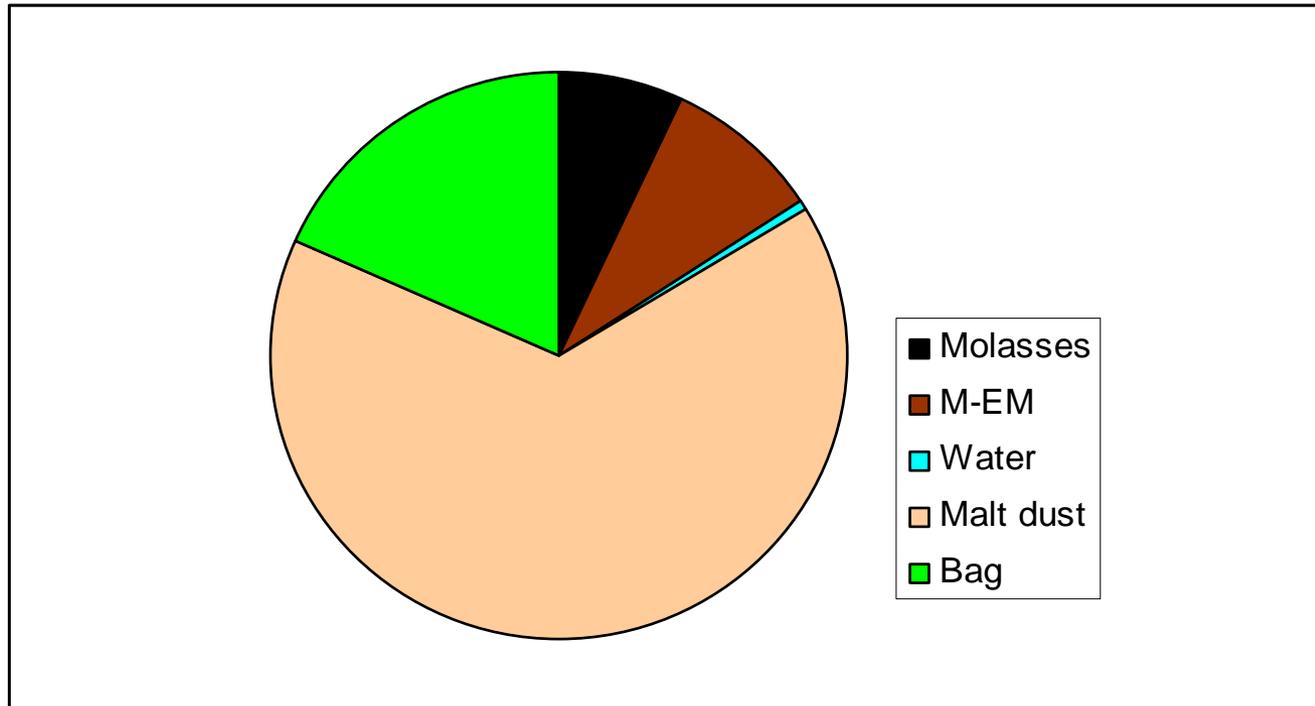
# Parasite loads, example from one farm



# Findings

- Neither results of liveweight change nor parasite loads indicated any consistent pattern among treatments.
- The sheep receiving EM bokashi treatments occasionally indicated higher levels of Coccidia, but this did not appear to be to pathogenic levels.
- The cost of ingredients and materials for the EM treatments was approximately N\$21 sheep<sup>-1</sup> a<sup>-1</sup>.

# Proportional cost of materials



**N\$17 to produce 30kg of bokashi, which could feed 300 sheep per day.**

# Conclusion on project

- Neither the toxic chemicals conventionally applied by the farmers, nor the EM treatments, appeared to make much difference to the liveweight changes and parasite loads in the dung of the sheep.
- Nevertheless, the farmers noticed benefits that have not yet been detected by the research.
- They agreed to continue with bokashi after the project, and discussed how they would organise themselves to purchase the ingredients.

# Overall conclusion

- Farmers who still apply toxic antihelminthic treatments can learn useful lessons from those farmers who avoided their use
- Through integrated management that treats causes rather than symptoms