EMERGING CATTLE DRENCH RESISTANCE IN AUSTRALIA

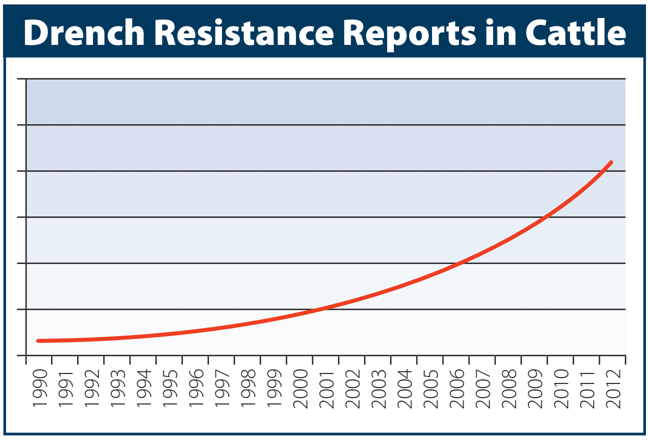
Rapidly Emerging Problem

Over the past decade there have been increasing reports of worm resistance to cattle drenches from around the world, including Australia. More than 145 reports have been published worldwide to date, and include resistance to all 3 drench groups (Mectin [ML], White [BZ] and Clear [I/T such as Levamisole]), and at least 10 different species of cattle worms.[1]

A recent survey in New Zealand found up to 94% of beef cattle properties surveyed had some degree of resistance detectable.[2]

Drench resistance is said to be present in a mob or on a property when the normal dose of a drench fails to reduce the faecal egg count of a group of representative cattle by more than 95%. That is, if the drench is less than 95% effective.

Drench resistance leads to less effective worm control, which can in turn lead to losses in liveweight gains, productivity, and even deaths in some circumstances.



Graph 1: Representation of the rapid increase in the number of cattle drench resistance reports over the past decade.

Year Published	Country	Cattle Drench Resistance
1996	NZ	ML resistance reported in cattle in NZ[3]
2006	NZ	Drench resistance on 94% of farms ML resistance on 90% of farms[2]
2007	Brazil	ML resistance on 92% of farms[4]
2007	Argentina	ML resistance on 60% of farms BZ resistance on 32% of farms[7]
2009	Belgium	Drench resistance on 41% of farms[8]
2009	Europe	ML resistance on 70% of farms[5]
2009	USA	Drench resistance on >44% of farms[6]
2010-2012	Australia	ML resistance on up to 63% of farms[9,10]

Table 1: Incidence of ML Drench Resistance in cattle from around the world.

ML Drench Resistance in Cattle

There have been published reports of resistance to MLs in cattle from the mid 1990s[3], with most of these emerging over the last 6 years. ML-resistance has been found on more than 90% of beef properties tested in New Zealand[2], and on up to 92% of cattle properties tested in South America[4], 70% in Northern Europe[5], and 44% in the USA.[6] (Table 1)

While *Cooperia* is the most common ML-resistant parasite found in cattle, ML-resistant *Ostertagia*, *Haemonchus*, *Oesophagostomum* and *Trichostrongylus* species have also been found. [2-11]

Cattle Drench Resistance in Australia

Since the first reports of thiabendazole and levamisole resistance in *Ostertagia ostertagi* in the late 1970s[11] and oxfendazole resistance in *Trichostrongylus axei* in 1986[12], more and more data on cattle drench resistance in Australia has been emerging, with studies finding evidence of resistance right across the country.[9,10,13] The table overleaf (Table 2) clearly highlights the widespread nature of resistance in Australia.

In more recent years, increasing reports of ML resistance in cattle in Australia have been seen. ML resistance has been found in *Cooperia*, *Ostertagia* and *Haemonchus* in cattle in south east QLD[13], and on up to 63% of properties in trials conducted in VIC[9] and WA[10]. As further studies are conducted, it is likely that more cases will be found over coming years.

Given that ML products have dominated the cattle drench market since 1987 – with a recent survey indicating that they make up to 94% of cattle drenches used in WA[10] – it is only a matter of time before ML drench resistance in major cattle parasites becomes regularly reported.

MERIAL
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Resistant herds in Australia

Northern QLD[14]	Severe ML (IVM and MOX) resistance in *Ostertagia* and *Cooperia*
SE QLD[13]	ML (IVM and MOX) resistance in *Cooperia* and suspected in *Haemonchus*
Northern NSW[15, 25]	Resistance to ML, BZ and LEV
NSW[16]	BZ resistance in *Ostertagia* and *Trichostrongylus* ML resistance in *Ostertagia* LEV resistance in *Ostertagia*, *Trichostrongylus* and *Oesophagostomum*
NSW/Northern VIC[17]	BZ resistance in *Haemonchus*, *Trichostrongylus*, *Ostertagia* and *Cooperia* ML resistance in *Cooperia* and *Ostertagia*
Eastern VIC[18]	Resistance to ML
South West VIC[9, 19, 20]	BZ resistance in *Ostertagia* and *Trichostrongylus* LEV resistance in *Ostertagia* ML resistance in *Cooperia* and *Ostertagia* MOX resistance to *Trichostrongylus*, *Ostertagia* and *Cooperia*
Southern WA[10]	BZ resistance in *Ostertagia* and *Cooperia* LEV resistance in *Ostertagia* (1 property in *Cooperia*) ML resistance in *Cooperia*

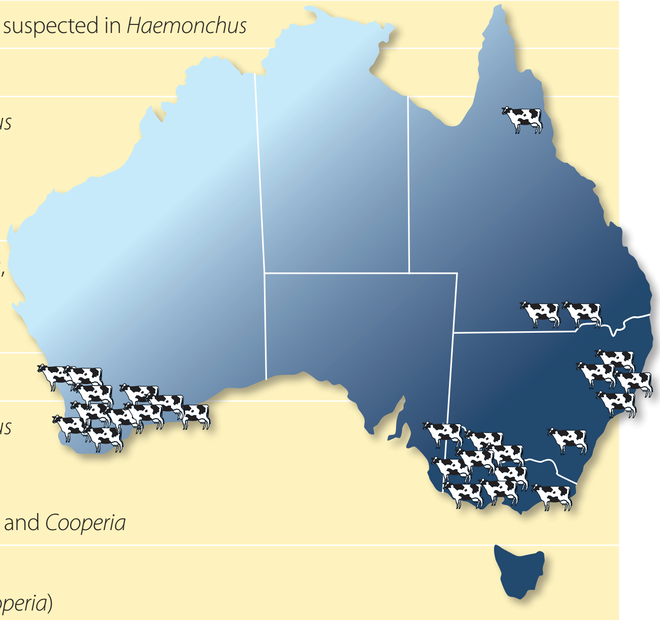

Table 2: Resistant herds in Australia (June 2012)

No obvious visual clues that resistance is present

Drench resistance can result in poor growth rates for some time before overt signs of disease are seen[21], with field trials indicating that young cattle can lose 10% or more of production due to gastrointestinal worms without obvious signs.[22, 23]

Recently published independent research indicated that on some affected properties, producers were not even aware of the impact resistant worms were having until they trialled a combination drench and observed a substantial production response.[19] In fact, none of the 19 properties tested in WA[10] and only 1 of 13 properties in a recent Victorian study[9] had expressed any concerns about drench efficacy in their cattle prior to the studies being conducted.

With ineffective worm control potentially costing more than 20-30 kg per animal in lost production, without any obvious signs of disease,[22] it is even more important to get drenching right.

The Solution:

Using effective combinations of two or more actives is widely recognised by parasitologists to be a key approach for preventing the development of resistance.

By hitting the parasite population hard with multiple actives at the same time, combination drenches can:

1. Be effective against parasites that have developed resistance to one or other of the actives.
2. Slow the development of resistance, as it is highly unlikely that parasites will possess and express resistance to all actives at the same time.

The benefits of combinations in delaying resistance development are higher when the efficacy of the individual active components are high.[24]

This means that the best time to use a combination drench is BEFORE resistance develops, or at least while the efficacy of the individual actives is still high.

References:
1. Sutherland and Leathwick (2010) 2. Waghorn et al (2006) 3. Vermunt, West and Pomroy (1996) 4. Soutello, Seno and Amarate (2007) 5. Demeler et al (2009) 6. Stromberg et al (2009) 7. Suarez and Cristel (2007) 8. Charlier et al (2009) 9. Rendell (2010) 10. Cotter (2012) 11. Anderson and Lord (1979) 12. Eagleson and Bowie (1986) 13. Lyndal-Murphy et al (2010) 14, 15 and 16. Data on File. 17. McMillan et al (unpublished data) 18. Richard Shephard (pers comm 2012) 19. Rendell (2008) 20. Rendell (unpublished data) 21. Sargison (2011) 22. Watt and Eppleston (2011) 23. Forbes, Cutler and Rice (2002) 24. Leathwick (2011) 25. Data on File.