

Abstract

Biopolymer Composites for Slow Release to Manage *Pimelea* Poisoning in Cattle †

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Abstract: Cattle grazing the pastures of inland Australia can be poisoned by ingestion of certain native *Pimelea* plant species, particularly *Pimelea trichostachya* and *Pimelea simplex*. The *Pimelea* toxin, simplexin, causes often fatal restriction of the pulmonary venules, with resultant heart impacts and characteristic fluid accumulation (oedema) of the jaw and brisket regions. In certain years heavy livestock losses can occur. Currently, there is no effective vaccine or antidote for *Pimelea* poisoning and the only management strategy is to reduce contact between toxic plants and susceptible stock, for beef producers to avoid potentially devastating poisoning events. Nevertheless, previous research has demonstrated that prolonged low dose feeding diminished the effect in animals. It was postulated that the animal exposed to prolonged low doses developed a mechanism for detoxifying simplexin, possibly through adaptation of the rumen microbial environment. The present study seeks to investigate the use of a biopolymer/toxin composite to foster toxin-degrading microbe populations. The objectives are to manufacture biopolymer composites based on biodegradable polylactic acid (PLA), polyhydroxyalkanoates (PHAs) and/or polycaprolactone (PCL), as toxin slow-release systems for the rumen that would have broad utility across a range of plant toxins and other beneficial rumen compounds. The poster covers the manufacturing, characterisation and performance of the biopolymers in a simulated rumen environment. Preliminary results of different biopolymers/composites containing *Pimelea* material and toxin extracts in an in vitro simulated rumen environment for up to 30 days are presented. It was found that the release rate could be tailored by choosing the right type of biopolymer.

Keywords: biodegradable biocomposite; slow release; *Pimelea* poisoning

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