Introduction

- Pimelea poisoning of cattle (Fig. 1) is a uniquely Australia poisoning caused by the toxin simplexin (Fig. 2), found in native Pimelea plants [1].
- To date, there is no effective treatment for Pimelea poisoning.
- Cattle fed a diet containing increasing low doses of simplexin displayed reduced poisoning signs over time [2], suggesting adaption of rumen microorganisms to detoxify simplexin.
- This project aims to develop a protective microbial probiotic derived from the rumen fluid of field-exposed animals that is capable of detoxifying simplexin.

Results & Discussion

- Quantification of simplexin in both in-vitro studies showed decreased levels of simplexin.
- Acid hydrolysis of simplexin resulted in the identification of six possible hydrolysed simplexin products based on predicted molecular formulae (Fig. 4).
- Possible hydrolysed simplexin products also shared several fragmentation ions with simplexin.

Conclusions

- UPLC-MS/MS analysis enabled simplexin quantification at low concentrations (ng/mL).
- Simplexin decrease in in-vitro studies suggestive of potential simplexin degradation by rumen microorganisms.
- Possible simplexin hydrolysed products can be identified using the analytical method.

Future studies

- Identification and characterisation of simplexin degradation products in both in-vitro fermentations and bacteria isolate incubation studies.
- Identified rumen isolates capable of degrading simplexin will be further investigated.

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References