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Is the treatment of diarrhoeic calves with paromomycin sulphate, at the height of *Cryptosporidium parvum* infection, safe and effective?

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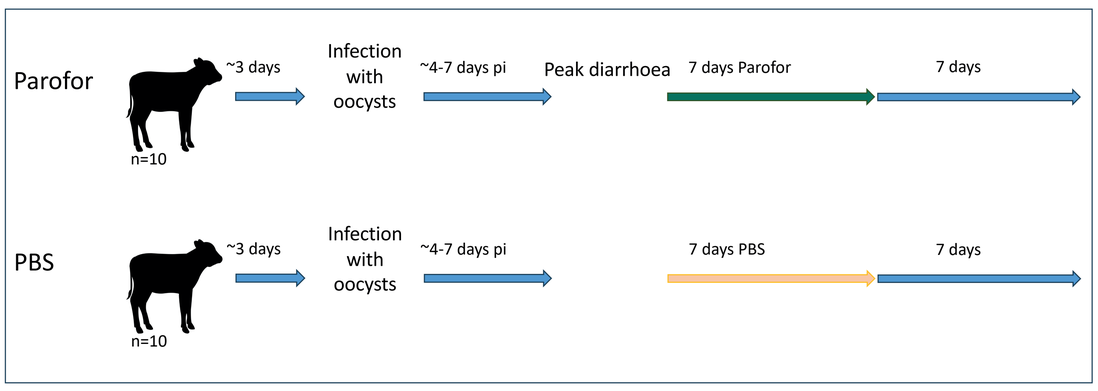
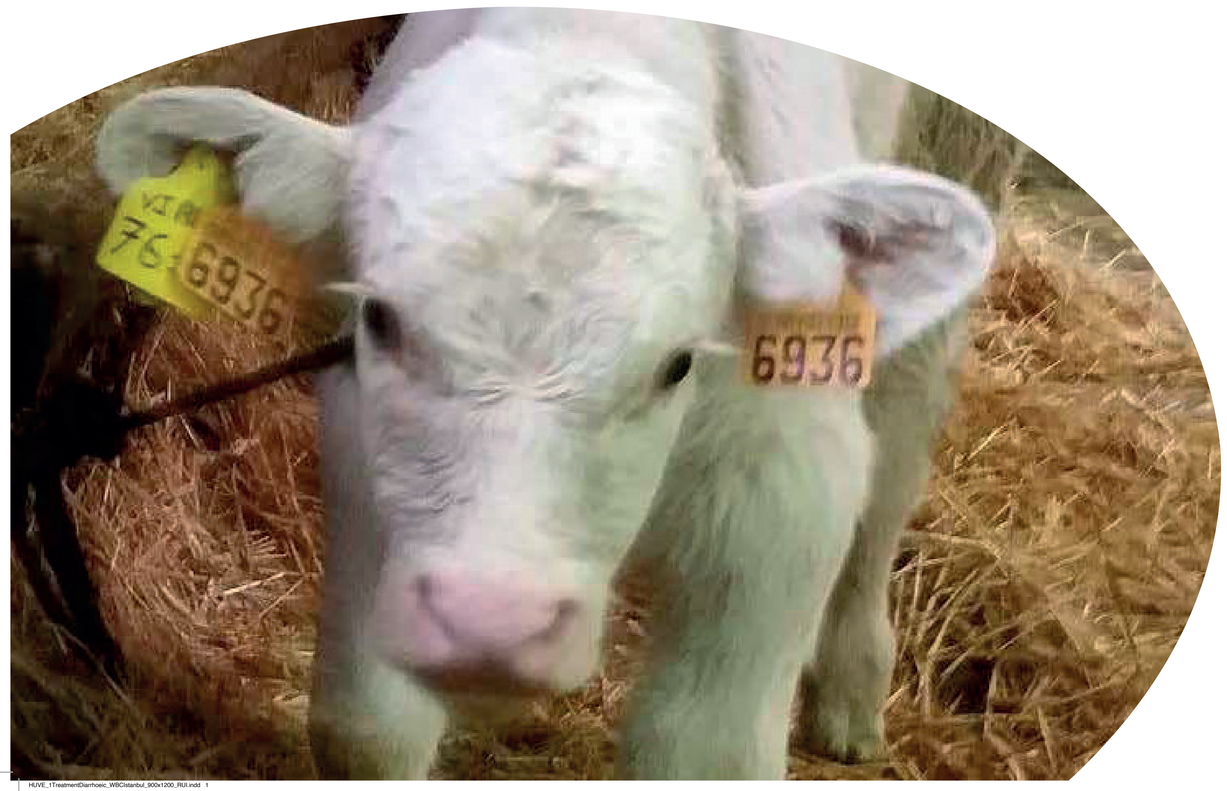
Background and Objectives

Cryptosporidium parvum infection is one of the major causes of neonatal diarrhoea in calves worldwide. A study has shown that clinical cryptosporidiosis in beef calves resulted in a reduction in growth of 34kg, when animals went to market at 6 months of age. Another study looking at the economic costs of cryptosporidiosis in dairy calves in three European countries attributed losses of between 43.83 to 60.62 Euro per affected calf, depending on country. Currently there are different products licensed for the prevention and/or treatment of cryptosporidiosis in neonatal calves, but their licensed application is restricted to use prior to or 24 hours after the onset of diarrhoea. Therefore, the are no products licensed to treat severely affected calves. The objective of this study was to address if treatment of diarrhoeic calves, at the height of *Cryptosporidium parvum* infection, with Parofor® CRYPTO is safe and effective?

Materials and Methods

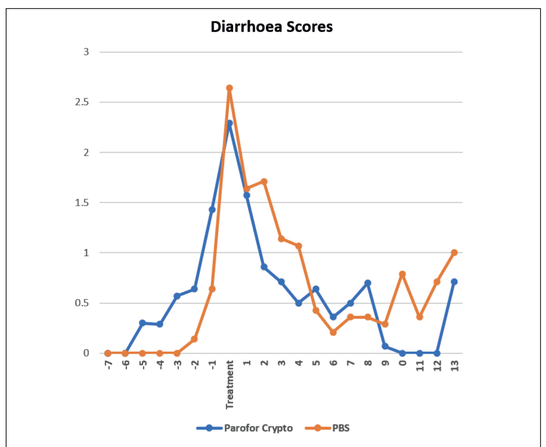
The experimental infection study involved 2 groups of 10 calves each, where each calf was infected with 1x10^6 C. *parvum* oocysts, at ~4 days old. Calves were monitored twice daily for the duration of the study (demeanour, body condition, diarrhoea, skin tent, appetite and oocyst shedding) and were weighed at several timepoints during the study. When animals reached peak of infection, treatment was administered, either Parofor® CRYPTO (2.5ml per 10kg body weight) or with PBS, for a duration of 7 days. Animal groupings were blinded for the duration of the study. Ethical approval was obtained from an Animal Welfare Ethical Review Body (AWERB) and followed Home Office legislation in the United Kingdom.



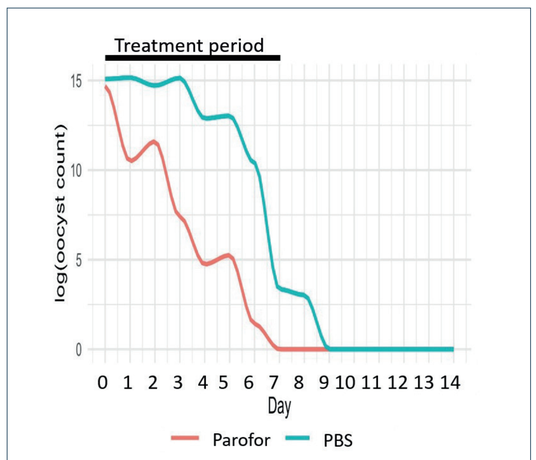


Results

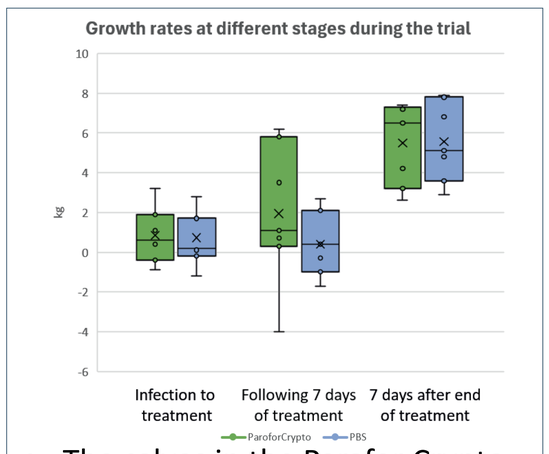
Some neonatal calves, which were brought onto the study farm were already infected with *Cryptosporidium*. There were no significant differences between the groups for demeanour, body condition, skin tent and appetite. However, there were differences in diarrhoea scores, oocyst shedding and weight gain during the treatment period.



- The diarrhoea score tended to be lower in the Parofor treated group post treatment.
- This difference was approaching significance p=0.18.



- There was a statistically significant reduction in oocyst shedding in the Parofor Crypto treated group p=0.005.



- The calves in the Parafor Crypto treated group gained 1.5kg more weight than the control group during treatment.
- Growth rates between groups before and after treatment were about the same.

Conclusion

The study has shown that Parofor® CRYPTO treatment of diarrhoeic calves at the height of *C. parvum* infection did not have any negative health impacts and that treatment resulted in better growth during the treatment period, reduced *C. parvum* oocyst shedding and lower diarrhoea scores, indicating that the product is safe and effective to use in diarrhoeic calves. A higher infectious dose may have increased the difference between the groups as none of the calves were severely affected.

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