PARASITIC DISEASES

Effect of potassium sorbate on *Cryptosporidium* Gp40 antibodies in colostrum

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INTRODUCTION

A recently launched vaccine (Bovilis Cryptium, MSD Animal Health) stimulates active immunity of pregnant heifers and cows by raising antibodies in their colostrum against Gp40 of *Cryptosporidium parvum,* intended for passive immunisation of calves to reduce clinical signs (i.e. diarrhoea) caused by *C. parvum.* Potassium sorbate (PS), a widely used food preservative, has shown antimicrobial properties against various microorganisms. However, its effect on Gp40 antibodies in bovine colostrum following vaccination with Gp40 antigen vaccine has not been examined.

OBJECTIVE

This study aims to investigate the impact of PS on the stability and functionality of *Cryptosporidium* Gp40 antibodies in bovine colostrum obtained from cows vaccinated with the Gp40 antigen vaccine.

MATERIALS AND METHODS

A 50% solution of PS in water for injection (WFI) was prepared : 1g PS (CH-886, Merck KGaA Life Science, the Netherlands) was supplemented to 2ml WFI. Frozen colostrum samples from an efficacy trial with the cryptosporidiosis vaccine (Timmermans et al. 2024) were obtained and were thawed at 4°C the day before use.
Each colostrum sample was tested in four conditions:

- A: Room temperature (RT) without mixing of PS
- B: Room temperature with PS
- C: 4°C without PS
- D: 4°C with PS

When PS was added, 20µl of the 50% PS solution was added to 1.98ml colostrum to obtain a 0.5% PS end concentration. The colostrum samples were tested with an in house Gp40 Elisa (Center for Diagnostic Services, Boxmeer, The Netherlands) on day0 (d0), d1, d2, d3, d4, d8 and d10. The statistical analyses were performed using a three-way repeated measures Anova, conducted in R (R core team 2022) with $p<0.05$.

The addition of a potassium sorbate solution to colostrum has no negative effect on the amount of *Cryptosporidium* Gp40 antibodies in colostrum. In this trial, it has been reconfirmed that the addition of potassium sorbate is an effective way to conserve colostrum at room temperature.

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RESULTS

Three-way interaction, two-way interactions and main effects all are non-significant. So, there is no significant influence of time (p=0.112), storage condition (RT or 4°C) (p=0.769) or addition or not of PS (p=0.127) on the Gp40 concentration in bovine colostrum **(Fig 1).**

RESULTS

- An important finding was that 5 of the 18 samples that were stored at room temperature became solid, indicating spoilage due to bacterial growth.
- Four of the five spoiled samples did not contain PS, further supporting the anti-microbial properties of PS in bovine colostrum **(Fig 2).**

FIGURE 1.

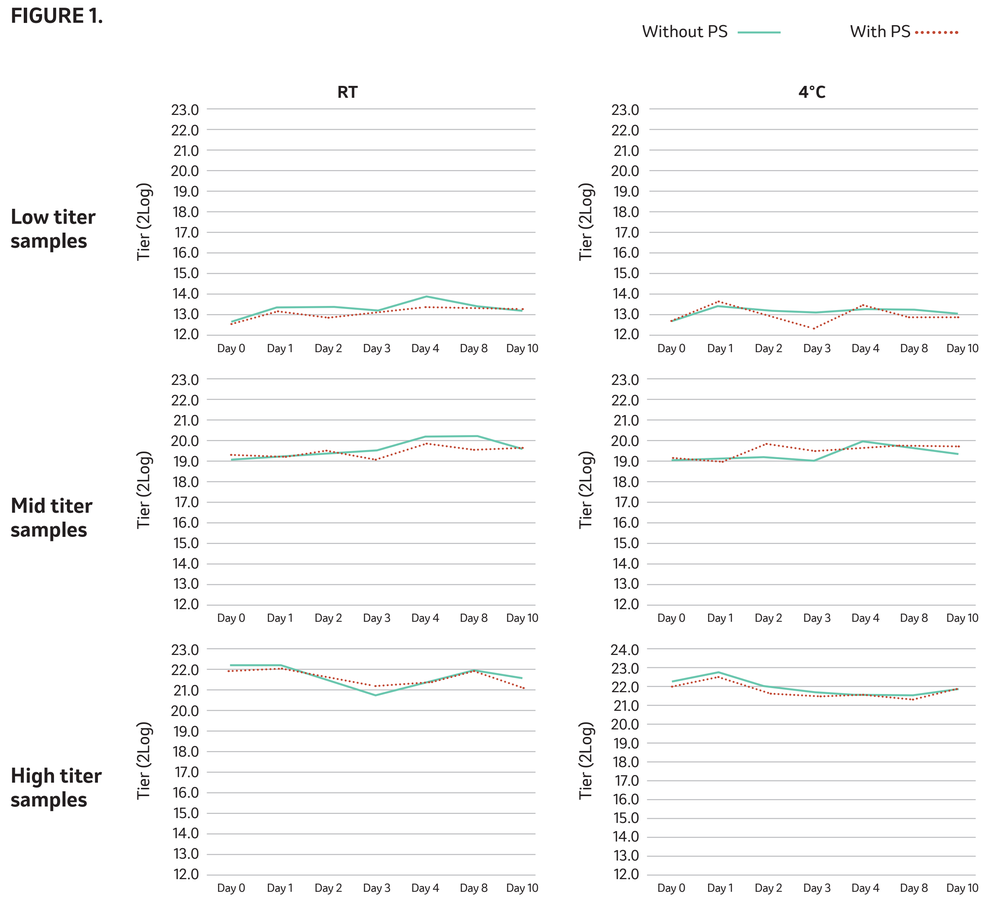
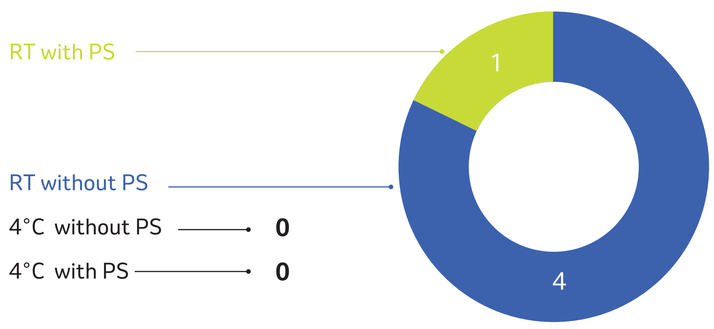


FIGURE 2. Number of spoiled samples at Day 10 by storage conditions



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