

IonAcp

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( )Tj 0.56 0 T24DC 18 0Fr

blood so total calcium levels could be measured.

Ion-selective electrodes are widely used to measure the concentration, specifically, the activity, of ions in solution. Printed ion-selective electrodes serve the same purpose but are cheap, disposable, and more portable. This is what makes them ideal for the diagnosis of hypocalcemia, a potentially deadly disorder, in dairy cows. Immediately after a cow calves, the farmer needs to know whether the blood calcium levels of the cow are too low and if she needs to be given calcium. Sending blood samples out to a laboratory is time consuming and a cow-side test is needed as milk fever can be fatal within 24 hours if left untreated. The loss of a single cow can cost a dairy farmer thousands of dollars, the money they spent raising the cow and the money that is lost during milk production. Printed ion-selective electrodes are an ideal basis for a cow-side test; the farmer can draw blood from the cow and test it right away with little preparation necessary. The main goal of this research was to develop a printed electrode and establish test conditions that would successfully measure total calcium levels in whole cow blood. Most previous work in clinical chemistry with ion-selective electrodes has focused on the use of serum rather than whole blood and was also primarily measuring ionized calcium. This project used acidification of whole blood as a means of measuring total calcium and used printed electrodes prepared with a calcium-selective membrane. Overall, these methods were chosen because they acowsright at the farm. In this study, the development of printed calcium ion-selective electrodes to measure calcium levels in bovine blood was the major focus. The method of acidification of the blood to a pH of 3.5 using acetate buffer was used to unbind calcium from