2002/V06

Producer Research Support

Antibody Testing for Better Calves

Professional Calf Rearers Association

For the Professional Calf Rearers Association in Victoria, this project clearly demonstrated the high number of calves being delivered without having had sufficient colostrum, and the higher death rate amongst these immuno-compromised calves.

The attention of calf rearers and the wider industry has been focused on these issues through dissemination of the project results.

The project

The primary objective of this project was to reduce the economic loss associated with disease and mortality of calves.

Since immunity to disease is passed on to the calf through colostrum soon after birth, Professional Calf Rearers Association quantified the extent of low colostrum intake in dairy bull calves in Victoria, and analysed it's impact on calf mortality. They used serum GGT (gamma-glutamyl-transferase) analysis as an indicator of prior colostrum intake, so they could identify and reject substandard calves, thereby improving the quality of calves available to calf rearers.

Objectives

1. Reduce the economic loss associated with disease and mortality of calves;
2. Improve the quality of calves available to calf rearers by providing an objective criterion by which to identify substandard calves; and
3. Develop strategies to rear immuno-compromised calves.

These objectives were tackled over two seasons, with two separate producer research support applications. In the first season the objective was to quantify the extent of low immuno-gamma-globulin (IgG) status in calves delivered to rearing units in Victoria, and analyse it's impact on rearing outcomes.

The secondary objective of this project was to introduce to calf rearers the relatively simple technique of blood testing, and raise the awareness of all stakeholders in the industry to the problem of low colostrum intake.

What was done

Almost 2,000 calves were tested and their GGT levels correlated with subsequent survival or mortality.

Jugular blood samples were taken from calves sourced from many locations in Victoria, one day after arrival at the calf rearing unit (aged 4-6 days old). Samples were sent immediately to a veterinary pathology lab, and GGT results returned by fax within 24 hours.

In order to validate the use of GGT to indicate prior colostrum intake, we also tested a sub-sample of 200 calves for IgG and compared the results.

Contact details

Dr Steve Sutherland
1911 Hamilton Highway
MURGHEBOLUC VIC 3221
Tel 03 5265 1415

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Producer Research Support

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These activities include:

- Producer Initiated Research and Development
- More Beef from Pastures demonstration trials
- Prime Time Wean More Lambs demonstration trials
- Sustainable and productive grazing grants.

Contact Gerald Martin -
Producer Research Support Coordinator.

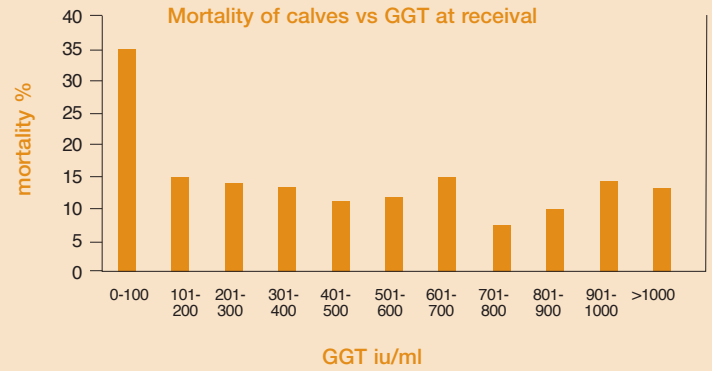
Tel 08 8556 2900 or
producersupport@mla.com.au

What happened?

The GGT and IgG tests correlated well, verifying that GGT is a valid test for colostrum intake. A large proportion of calves arrived at the rearing farm with very low levels of GGT, suggesting that they hadn't received sufficient colostrum on their source farm. Almost 25% had values lower than 100 IU/ml, and a further 17% less than 200 IU/ml, which is considered in US studies to be inadequate. The rest had values up to 3,000, but with most under 1000 IU/ml.

Mortality among calves with less than 100 IU/ml was significantly higher than the group average. Thirty-six per cent of these calves died, compared to 13% among the calves with GGT higher than 100 IU/ml. This definitely indicates that low colostrum intake is a big factor in the high levels of mortality often seen in calf rearing. It is not the only reason for high mortalities, since 13% of the other calves still died, but if the low colostrum intake can be fixed, then other reasons for mortality can be tackled with more confidence.

There were big differences in GGT levels in calves from different dairy farms, reflecting colostrum management practices on these farms. Most calf rearers already recognise this, and develop relations with dairy farms whose calves perform well, and avoid those that supply poor calves. Testing for GGT may take away some of the guess work when the relationship is not there.



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Discussion

There is great value in testing young calves for serum GGT, upon arrival at the calf rearing unit. With a result available within 24 hours, this relatively inexpensive blood test can assist in decision making, providing a basis on which to reject high risk calves, before investing too many resources in rearing them. Where rejection is not practical, for example too far to deliver the calf to an abattoir, it can at least indicate which calves are likely to need more attention. The blood test can also be used to provide feedback to dairy farms supplying calves for rearing, especially if these farms have been paid premium prices for good calves.

Although it was originally planned to take samples from more farms rearing calves, most samples came from one farm, but with calves sourced from far and wide, and with known source property. The project planned to look at analysing growth rates and other performance data in addition to mortality, however this couldn't be achieved with the available time and resources.

Less than in the original estimate was spent, mainly because of having fewer locations to visit. More calves than expected were actually analysed. This was due to the positive results achieved early on, and the subsequent uptake of the testing procedure as a routine practice on one farm, providing us with more data than that paid for with the grant.

Next steps

At least one large calf rearing enterprise has already implemented blood testing all calves received as a routine procedure. By rejecting 'high risk' calves (GGT under 100IU/ml) they have reduced their mortality from above 30% down to less than 10%. Rejected calves are sent to an abattoir, before money is wasted on feeding them. Several other members have said they are likely to do the same in the next season.

The Professional Calf Rearers Association intend to apply for another grant (Super PIRD) to build further on these results and capitalise on the research investment already made.

The GGT test has proven valuable here, but it needs more scientifically rigorous validation and characterisation.

Newborn calves should be fed known amounts of colostrum (of known quality, even compare high and low quality) soon after birth, and blood tested daily for two weeks. This will allow routine test results to be adjusted for the age of the calf when selecting calves. A better understanding of colostrum's impact on intestinal function and growth rates, not only survival or mortality, is also required.

These physiological studies will require a more scientific input than can be achieved with on-farm trials. Investigating how to improve the colostrum intake of calves and develop strategies to rear immuno-compromised calves, is also necessary. More attention needs to be focused on the economic performance of calf rearing, so that the barriers to success can be identified and overcome.

MLA also recommends

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Meat & Livestock Australia
Level 1, 165 Walker Street
North Sydney NSW 2060
Tel 02 9463 9333
Fax 02 9463 9393
Free Phone 1800 023 100 (Australia only)
www.mla.com.au