



BMG Labtechnologies

Nephelometric Test for Determination of Colostrum Quality

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Introduction

The nephelometric colostrum test is a high throughput, robust and rapid assay for the quantification of IgG1 in milk and colostrum. It is used by the dairy industry to measure colostrum contamination in milk and for determining the quality of colostrum supply for production of colostrum-based products.

Test principle

The nephelometric colostrum test is based on the ability of antibodies to recognise and bind to specific proteins. Antibodies, which recognise the IgG1 component of colostrum, form a complex with this protein that changes the turbidity of the solution. The change in turbidity is directly proportional to the amount of IgG1 present and can be measured with a nephelometer. The use of nephelometry is a tried and proven method for the quantification of proteins in biological solutions in the medical field and has been adapted for use in the dairy industry to produce a test for colostrum that is quick, accurate and cost effective.

Test parameters

The assay range for the detection of colostrum contamination in milk is 0.45 to 5.4 g/L IgG1. For testing colostrum quality, the sample requires an additional ¼ dilution. At this dilution the test has a detection range from 1.8 to 22 g/L IgG1. The test can determine results for one 96 well plate every 25 min - this is equivalent to 230 samples per hour.

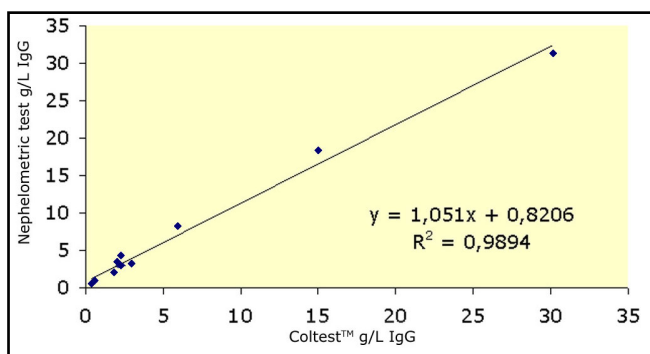


Fig. 1: Correlation of the nephelometric test and the Coltest™

At a Glance...

- Quick, accurate, and cost effective test for colostrum quality
- Test exhibits good precision (CV's: 4-5%)
- Detection range from 1.8 to 22 g/L IgG1
- More than 200 samples per hour

Test validation

The nephelometric test has been compared with the Immuno-Chemical Products Ltd Coltest™, an RID assay, for a variety of milk and colostrum samples. The results, shown in Figure 1, demonstrate that both tests give similar results over the entire range of milks and colostrums that are likely to be tested. The nephelometric colostrum test exhibits good precision with average %CV's of 4 to 5% in the lower assay range (0.5 g/L IgG1).

Test requirements

1. Colostrum test kit supplied by AgResearch
2. NEPHELOstar plate nephelometer supplied by BMG
3. Centrifuge capable of spinning deep-well 96 well plates. The Eppendorf Model 5804 centrifuge with rotor microtitre plate type A-2-MTP is recommended.
4. Nephelometer plates: Labsystems Cliniplates are recommended.
5. 96 DeepWell Plates. Both Nunc 96 DeepWell Plates (1mL round bottomed, Cat. No. 278607) and Eppendorf 6 DeepWell Plates (1.2 mL polypropylene, autoclavable, Cat. No. Epp0030127.544) are recommended.
6. Diluent buffer. Recipe supplied by AgResearch.

Test operating procedure

1. Dilute mixed whole milk samples 1/100 with diluent buffer, into a 96 deep-well plate
2. Centrifuge the plate at 3000 rpm for 5 min
3. Using an 8 channel pipette, remove 50 µL of the bottom non-fat milk layer from each well
4. Rinse the pipette tips in warm water to remove adherent fat and quickly wipe the tips with tissue paper to remove water from the outside of the tips*
5. Add the defatted milk samples to wells in a 96 well Labsystems Cliniplate
6. Visually examine the plate to ensure that milk samples are clear and free from turbidity caused by milk fat
7. Insert the plate in the NEPHELOstar plate nephelometer
8. Run the nephelometric colostrum test
9. Test results can be exported to data management systems (Fig. 1)

* For testing colostrum quality an additional ¼ dilution is required after this step