

# Milk Urea Nitrogen in Milk Samples

Fresh vs. Refrigerated and frozen

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In recent years it has become customary to test milk samples for the concentration of urea nitrogen in order to monitor the efficiency of protein utilization. While the need to test for milk urea nitrogen (MUN) has increased, the number of commercial laboratories testing for MUN has not. Several dairies have to send their samples to distant labs. Shipping costs could be reduced if milk samples could be accumulated over time and sent to the lab. Consequently, a question has arisen if test results will be different if milk samples are frozen.

To answer this question Cooperative Extension in San Bernardino County conducted a six-week field trial from August to December 1998. In the trial three hundred and sixty bulk tank samples were split between two groups, 180 fresh samples and 180 frozen. Fresh samples were tested the day after they were taken. The other samples were frozen for one week and then tested. All samples contained one drop of preservative. The same technician at the Southern Counties DHIA laboratory using a Milko Scan 4000 instrument tested all samples. The mean MUN of the fresh samples was 11.23 with a range of 8.30 to 15.40 mg/dl. The mean MUN concentration in the frozen samples was 11.68 with a range of 8.10 to 18.20. These results show a significant statistical difference in MUNs when milk samples are frozen; the MUN reading is higher in the frozen samples.

This trial answered the desired question but left at least two unanswered. One question whether the difference in MUN was caused by aging or by the freezing itself. Another question was if the difference was caused because the Milko Scan uses a near-infrared method to test for MUN. To answer these questions, a second trial was conducted in the fall of 1999. Each week sixty bulk tank milk samples were collected from one dairy, with twenty in each group. Over a period of seven weeks, four hundred and twenty samples were collected. One hundred and forty fresh samples were tested for MUN. One hundred and forty samples were refrigerated for one week and then tested. The same number were frozen for one week and tested for MUN. As with the earlier test, all samples contained one drop of preservative and were tested by the same technician at the Southern Counties DHIA laboratory. For this trial a ChemSpec 150 instrument was used. The Chemspec uses wet chemistry to check for MUN, replacing the near-infrared method.

The trial found no difference between the fresh samples and those refrigerated for one week. The mean for both the fresh and refrigerated samples was 15.4 mg/dl. The frozen samples were significantly higher with an average MUN of 16.2 mg/dl. These results reaffirm that frozen milk samples produce higher MUN tests than unfrozen samples. The Chemspec also detected an elevation in MUN in frozen samples. This trial also demonstrates that MUN results remain constant when milk samples are refrigerated for one week.

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