

## 5. Conclusion

In this study, blood metabolite concentrations were investigated as an indication of the freshened dairy cows' metabolic, productive and nutritional status. The use of blood metabolites as an indication of the animal's metabolic status has been used before, but there have been arguments against using this for individual animals due to the fact that there are many daily factors and non-nutritional factors affecting the concentration of the various metabolites. However, with regular monitoring and sound advice in the interpretation of the results from an animal scientist and / or veterinarian, the use of blood metabolites is a useful tool in the management of a dairy operation.

A cow will produce well below her capabilities, or she will develop metabolic disorders and health problems if she is unable to alter nutrient intake and whole body metabolism rapidly, or to the extent needed to meet the demands for milk synthesis. Changes in the partitioning of metabolites associated with energy use are of the greatest magnitude at the onset of lactation (Bauman and Currie, 1980). It is important to supply the cow with an energy rich diet during early lactation. This requires the inclusion of a high percentage of grain, but liberal grain feeding can lead to metabolic disorders.

In this study, it was found that blood glucose concentration decreased after parturition and blood cholesterol concentration increased. This is an indication that the animal is mobilising body reserves to make up for the shortfall in the feed. The extent to which the animal mobilises her reserves can influence both her production and reproduction. The use of the hand-held glucometer to monitor this is of little value due to the many factors affecting both blood glucose concentration and blood cholesterol concentration.

Also in this study, it was found that low blood glucose concentration corresponded to retarded conception. This was also found by many other authors ( Rowlands et al., 1980; Kappel et al., 1984, McClure, 1994). It was found that mean blood glucose concentration had an effect on the time it took an animal to reconceive. The hand-held glucometer can be used to determine the mean blood glucose concentration of an animal. This will give an indication of the likelihood that the animal will conceive when she comes on heat. In this way one can have the option of not inseminating when the blood glucose concentration is too low and the

chances of conception are small. Also, with constant monitoring of the blood glucose concentration one can try and keep the blood glucose concentration above a certain level so that when the time comes to inseminate the cow, the chances of conception are high.

Although in this study, blood urea was only examined in Experiment 1 and not in Experiment 2 with respects to the relationship to reproduction, it has been shown by many researchers (Canfield et al., 1990; Elrod et al., 1993; Butler et al., 1996) to affect reproductive function. It was found that a blood urea concentration of above 19 mg/dl had a negative effect on reproduction. Also, researchers have found that blood urea and milk urea concentrations were highly correlated (Bergman,1983). It is therefore of importance to monitor the blood urea concentration via the milk to make certain it does not affect reproduction.

The hand held glucometer can be a useful tool on dairy farms. It can give the farmer an indication of the cow's reproductive status almost immediately. It is a tool that must be used on a regular basis on each animal due to the fact that there are various factors, besides nutrition that affect blood metabolites. The farmer should have the help of a veterinarian and/or an animal scientist to help interpret the results and advise on solutions to any problems. This is due to the fact that interpretation of the results is rarely straightforward. It should be kept in mind that the use of the hand held glucometer is not a simple solution to reproductive problems. This should be considered as an early warning system and used in conjunction with body condition score, milk production, milk urea analysis and general regular visual appraisal of the cows. It should only be used where intense management is present and the solutions suggested can be implemented.