



HI-TECH FEED

by Cliff Harrington

The last few years have seen technology changing our lives dramatically and the dairy farmer is no exception.

On-farm feed formulations are now done with the help of prediction models, the most widely used being Cornell Net Carbohydrate and Protein System (CNCPS) and the one from Agricultural Modeling and Training Systems (AMTS). These models have been developed by various academics and researchers, largely in the USA at universities where a combination of research trial data, on-farm feedback, and applied IT knowledge have been used to develop programmes that mimic that which occurs within the cow.

Prediction models are, however, only as good as the information given to them. Background information on the farm includes weather conditions, distances cows have walked, as well as the elevation thereof and the feeding system used. In short, anything and everything concerning the cow and the raw materials available for use,

both on farm and from the feed supplier, are all taken into account when formulating a suitable diet, depending on what milk production and milk solids are targeted. Accurate dry matter intake data is still difficult to obtain but remains critical to the successful application of any of these models.

Feed analysis

Analysis techniques have also changed. The advent of near-infrared spectroscopy (NIR) technology has speeded up the process considerably. Methodology and equipment have also improved and new calibrations defined. Fibre digestibility (including non-digestible fibre or NDF) and amino acid profiles are now analysed quickly and accurately, which further increases the accuracy with which to make decisions on the comparative value of raw materials; thus improving buying decisions. It has also provided the means to monitor diets consistently. It is imperative that total mixed ration (TMR) diets are monitored regularly.

The feed industry has not stayed behind, with improved milling technology for better control over particle size.



What's new in the feed industry?

The feed industry has not been left behind, with milling technology being improved to better control particle size. This, together with revised screening/sieving processors, is used to optimise the use of particle size manipulation in diets to the fullest. This has increased the digestible energy value of especially grains substantially, enabling nutritionists to vary grain particle size used in order to achieve set goals.

Animal proteins are normally included in dairy cow diets in order to increase the amount of rumen bypass protein fed, bearing in mind that high-production cows cannot always produce sufficient microbial protein to fulfil amino acid needs, thus limiting milk production. Researchers have perfected techniques to protect protein oilcakes against rumen degradation, enabling digestion in the lower digestive tract, thus significantly improving the deemed bypass fraction of these. The most widely

IT ALL HAPPENS ON THE FARM

On-farm management and feeding systems, the best known being Afikim and Alpro, have changed the way cows are fed in the milking parlour. It is now possible to feed individual cows accurately. This has led to the concept of fractionated feeding being introduced in some herds, whereby energy, protein and, in some cases, mineral sources are fed separately in the dairy in order to improve feed efficiency, milk production and of course, farm profitability.

Feed intake (both from pastures and from the TMR) is normally used to form the basis for recommendations after which in-parlour feed is used to balance any nutrient shortfall. Individual cow weights and milk production data are now available daily. This, used with regular body condition scoring (BCS), has led to the development of a number of systems that enable diets to be fine-tuned. This information is being used to further refine applications such as the ideal weight concept, which is now used on a number of farms with the cow weight at point of calf (with BCS 3 – 3,5) forming the base or ideal weight of a given cow. Milk production and concentrate level fed are expressed as percentages of this ideal weight. The feeding programme is then set up to achieve this goal. It is imperative that one of the prediction models be used to evaluate recommendations made before they are implemented, Afikim being the most widely used for this purpose at the moment.



treated being soya oilcake. It must be remembered that amino acid composition of the oilcake is not changed, only the site of digestion thereof.

Techniques, such as encapsulation, have also been developed whereby certain specific nutrients are protected from rumen degradation, for example protected methionine and a stable lysine. The price of these treatments is such that these products are normally only fed to cows with extremely high production.

The inclusion of fats or oils, both very good energy sources, in cow diets normally has a negative effect on fibre digestion in the rumen. This too has been overcome by the rumen protection thereof, making it possible to feed higher levels of fat than previously used.

Adapted technologies have also been used to develop various organic minerals. The increasing use of by-products and poor-quality silage have, however, resulted in increased exposure to toxins. Fortunately, new-generation toxin binders are developed regularly. It is strongly advised that a toxin binder be part of any diet fed. Silage inoculants have also improved the quality of silage made, also reducing the time taken between chopping and silage use substantially.

Increasingly, farmers make poor-quality silage, increasing the cows' exposure to toxins.



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CONCLUSION

“ It is profit that drives success, and measuring your margin over feed cost remains the only reliable way to evaluate a present or future application.”

Cost cutting has become a way of life for the modern dairyman, as it becomes increasingly difficult to remain profitable in an ever-tightening industry. It is, however, profit that drives success, and measuring your margin over feed cost remains the only reliable way to evaluate a present or future application.

The future holds exciting challenges. Innovative people, companies and academic institutions continue to look for ways to improve cow comfort and all aspects of nutritional support for the dairy cow. Make sure you are part of the implementation. Contact your technical advisor in order to make sure you are making full use of the technologies available.