TECH TALK

Fine-tuning fertility in a high production herd

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CopRice Model Farm Manager

CopRice's model farm in northern Victoria is celebrating significant gains in the reproductive efficiency of the herd. In 2017, the six week in-calf rate was 50%. In just two years, CopRice has helped to boost this to 73% – an impressive gain by any standard[1]

CopRice operates a 'model farm' in northern Victoria to examine the effectiveness of integrated nutritional strategies and new formulations under 'real world' conditions. Each year, our nutritional team implements dozens of projects that aim to optimise animal health, fertility, productivity, environmental sustainability and profitability.

Our model farm partners, Fred, Sonyia, Daniel and Ben DeCicco, milk a herd of a high production registered Holstein cows at Undera. Fertility has long posed a challenge to the profitability of the herd. Producing sufficient high quality replacements ensures constant genetic improvement and helps to maintain average age in the herd at the most productive and profitable level.

Working in partnership with the DeCiccos, the CopRice team focussed on five key areas for improvement:

- ensuring heifers achieved growth targets
- maximising dry matter intake during early lactation
- reducing early embryonic losses during the joining period
- monitoring body condition throughout the lactation
- nutritional management of dry cows

1 Ensuring heifers achieve growth targets

Maximising the growth potential of heifers is the starting point for achieving peak milk production, reproductive performance and lifetime profitability. Historically, the DeCiccos have not objectively monitored the growth of their heifers and up to 10% of replacements are not joined until 21 months.

CopRice implemented a tailored heifer plan in 2018 to ensure all heifers attained their target joining weights by 15 months of age (385 kg) and their target calving weight (660 kg) by 24 months with body condition score of 5.5. Bodyweight and hip height are measured every three months, with any 'outliers' are identified early and allocated into specific feeding groups.

Heifers are fed a mix of CopRice Calf Pellets and home-grown hay to deliver an adequate intake of metabolisable protein to support bone and muscle development and allow puberty to be reached as early as possible. After mating, heifers are maintained on a growth rate of 900 g/day.

This program has achieved a 100% success rate, with all heifers calving by 24 months of age at the desired calving weight and body condition score. This has important flow-on benefits in milk production.

In turn, heifer milk production has increased from 77% of mature cow production to 87% of mature cow production, demonstrating that valuable energy has been partitioned towards milk production rather than growth.

2 Maximising dry matter intake during early lactation

Maximising dry matter intake in fresh cows begins with an effective transition management program to prepare close-up cows for the onset of lactation. It is important to offer cows a nutritionally-balanced transition ration.

Specific focus was placed on delivering adequate dietary protein to the autumn-calving portion of the herd. As with most farms in northern Victoria, the absence of green feed during late summer/autumn can result in protein deficiency in dry cows.

CopRice transition rations are formulated with a low dietary anion/cation difference DCAD value to reduce the risk of metabolic disease, are high in amino acids to stimulate mammary activity and provide a unique blend of nutrients to boost immune function, metabolism and reproductive efficiency.

The next step is to meet the dramatic increase in nutrient demand that comes with the onset of lactation. The CopRice Lac Cycle Fresh Cow concentrate has been utilised in the model farm herd to improve dry matter intake and feed conversion efficiency, whilst reducing the incidence of metabolic disease, the mobilisation of body reserves and body condition losses in fresh cows.

A sharp reduction in the time taken to return to oestrus has resulted in an increased three-week submission rate from 75% in 2018 to 89% in 2019, while the six-week in-calf rate has increased from 50% to 73%.

3 Reducing early embryonic losses during the joining period

Once dry matter intake has been optimised and condition losses minimised, attention can be focused on the mating period. By supporting both metabolic and endocrine functions, alongside sound management practices, the model farm cows are now returning to oestrus earlier and achieving higher conception rates.

CopRice Lac Cycle Mating Pellet has four main aims: to support oocyte development in the cow; to maintain healthy hormone regulation; to support healthy embryonic implantation; and to balance carbohydrates-to-nitrogen retention.

Optimising blood glucose efficiency supports fertility and peak milk solids production. Bypass fats improve energy density and support blood progesterone levels, thereby reducing early embryonic loss and a unique blend of organic minerals and antioxidants boost immune function and improve follicle integrity.

4 Monitoring body condition throughout the lactation

Managing the body condition of dry cows through to peak milk production is a key priority in the model farm herd. Our objective is to minimise body condition losses in early lactation by limiting the time spent in negative energy balance (which reinforces the importance of maximising DMI in fresh cows, above), minimising the incidence of metabolic disease and maximising peak milk production.

During spring calving in 2018, fresh cows were utilising 1.3 BCS units from parturition through to peak milk. This has been reduced to 0.7 BCS units, with the goal to reduce this loss further to 0.6 units, with a particular focus on reducing body condition loss in young cows.

Supporting glucose metabolism, promoting increased dry matter intake and enhancing the immune function during early lactation; supporting cows through heat stress events; and promoting the partitioning of energy to milk production during late lactation can all be managed with sound nutritional management.

Managing the body condition of stale or carry-over cows to ensure they are dried off at the desired score; of dry cows to ensure they have the target BCS at calving; maintaining steady growth rates to ensure heifers enter the herd at 24 months of age at the target BSC (but are not over-conditioned), also directly contribute to reproductive performance.

5 Nutritional management of dry cows

Finally, good nutritional management during the dry-off stage should aim to assist the cow in maintaining its body condition and improving her general health during late gestation. This ensures that the cow has adequate body reserves for early lactation.

A good nutrition program replaces essential macro and micro-minerals lost during the previous lactation to support tissue regeneration, bone remodelling and mammary involution and to boost immune function. Pastures often lack sufficient levels of these essential nutrients.

Alongside a balanced ration, dry cows on the model farm have access to CopRice Lac Cycle Dry Cow, a mineral lick that contains a rich source of vitamins and macro and micro-minerals. The provision of the lick resulted in fewer calving difficulties, reduced incidence of metabolic disease and improved colostrum quality.

Reducing the incidence of metabolic disease helps to maintain mineral reserves in the cow, thereby helping to maintain immune function, which in turn, affects reproductive performance. Improved colostrum quality ensures heifers have the best start to life and sets them up for a lifetime of high milk production and fertility.

Good nutrition pays

Fertility is a multifactorial challenge but the success of the CopRice model farm is proof that fine-tuning existing management practices and the adoption of cutting-edge nutrition technologies can have a significant impact on farm profitability. In just two years, we have achieved the following milestones:

- 100% heifers calving by 24 months of age at the desired weight and body condition score
- Heifer milk production has increased from 77% to 87% mature cow production
- Body condition loss from parturition through to peak milk has decreased from 1.3 BCS to 0.7 BCS
- Three-week submission rate has increased from 75% to 89%
- Six-week in-calf rate has increased from 50% to 73%

CopRice Model Farm Manager, Ellen Fitzgibbon, is an accredited advisor for the Dairy Australia InCalf Program and a committee member of the Australian Association of Ruminant Nutrition. Originally from north-east Victoria, she graduated from La Trobe University with a Bachelor of Veterinary Bioscience (Hons), majoring in ruminant nutrition and reproduction. Ellen's research on markers of fertility in colostrum was awarded Ag Institute Australia's Richardson Memorial Award in 2015 for outstanding contribution to agricultural research.