



# Dairy Nutrition & Management Solutions Ltd

## Optimizing grass-based systems

### Cow Housing – A Viable Option?

A recent review of housed systems led the authors to question the value of cow housing concluding that housed systems were good either environmentally or economically, but seldom both. This raised some perceptions that need to be addressed.

#### Environmental sustainability

Comparing the N leached of farms pre-housing and post-housing, is not a fair comparison if there is any other system change. Cow numbers, management practices and production often differ considerably before and after housing making comparison meaningless. Similarly, comparing N-leaching of a 10 month on-farm system with the problem 2 month winter period “exported” to someone else, with a 12 month on-farm system, is not comparable. Using Overseer to compare two identical farms, except for the wintering system, one with traditional winter cropping compared to silage grown on the cropping area and fed in a wintering barn, showed the housed system leached more than 30% less N over a 12 month period, depending on soil type. In reality, farms with cow housing will use the housing during wet periods in early spring and autumn and not only for 60 days, further reducing leaching and reducing pugging and pasture damage. There is no question that housing cows during winter and storing effluent for later use reduces leaching significantly, making it considerably more environmentally friendly than a traditional winter cropping system.

#### Financial viability

The very sound investment tool, Net Present Value (NPV), was used to show most housed systems in the review to be financially non-viable. NPV is influenced by 3 factors, extra cash generated, expected lifetime of the project and the cost of capital or discount rate chosen. For a projected cash benefit the NPV answer will be negatively affected if a short lifetime and high discount rate is chosen. Depending on the input values, NPV can “prove” what you want it to prove. There are many barns overseas that are over 30 years old and still going strong, which raises questions around the choice of a 20 year life span and the higher 8% cost of capital. Using a 30 year life span and 6% cost of capital can give a totally different answer.

#### Added benefits

Consideration needs to be given to future environmental constraints about to be imposed on farmers and the impact this can have on future profitability. Councils are setting leaching limits and if housed systems reduce the leaching of a farming system by 30%, it will be able to carry more cows and generate more cash, potentially making the NPV answer more favourable. If wintering dairy cows on crop uses up a substantial amount of a graziers “N-leaching quota”, limiting the graziers ability to generate other income, the cost of wintering cows will likely increase when limits are imposed. N-leaching will therefore come at a financial penalty. Any savings in wintering costs will naturally add to the extra cash advantage of housed systems and will affect current NPV answers. The extra control housing provides, also reduces the environmental risk around wintering. Entrepreneurs, farmers or businessmen in cities, evaluate risk in conjunction with returns before making any decisions, lower risk requiring lower returns. High levels

of intensification can however also increase the amount of effluent produced and exceed environmental constraints unless the effluent can be “exported” or traded with a cropping farmer.

#### Economic risks

Investing large amounts of capital in housing has encouraged some farmers to make radical changes to their farming systems. Using a barn throughout the year with total mixed rations, as opposed to being used primarily for wintering, is a possibility but does require a considerable increase in production per cow to be viable. Moving away from pasture based systems can increase the financial risk considerably, especially in years with low milk prices and high volatility. Systems that purchase a large percentage of the cows’ diet have a greater exposure to changes in the milk/feed price ratio, similar to pig farming. Farmers need to focus on maximising profit by undertaking an economic analysis of their system. This will ensure that their chosen system produces at an optimal level that maximises profit.

#### Resilient housed systems

Farmers with cow housing still need to be pasture based and maximise the use of home grown nutrients. The appropriate stocking rate is important in maximising cows’ pasture intakes. This will ensure the maximum amount of pasture is converted into milk. Supplements need to be used strategically to increase production per cow rather than carrying more cows. Carrying too many cows uses silage to replace pasture. The ensiling process comes at an energetic cost and to “reconstitute” good quality grass silage of 11 MJME and 17% protein back to 12 MJME and 20% protein pasture will require roughly 50% good silage, 25% barley and 25% canola oilcake, at a cost much higher than the cost of pasture. Farming out of season and using silage instead of pasture can be costly, requiring a significant premium on the milk price. When considering the cost of feeding supplements, all associated variable costs must be included, not only the cost of the feed. There are considerable financial benefits to farming in harmony with nature having cows’ maximum demand coinciding with the pastures’ maximum growth period and maximising the use of pasture, making supplemented pasture-based systems financially hard to beat.

#### Conclusions

Housed systems are environmentally hard to beat. Building a capital intensive barn may not be a feasible alternative for all farmers in the short term, as current high debt levels are arguably one of the biggest threats to the NZ dairy industry’s ability to withstand lower milk prices and international competition. Housed systems do require some new skills but need not be overly complicated. Experienced farmers and consultants are available to assist. Choose the system that produces the most profit and not simply maximising production. Using the most appropriate hybrid system can be profitable and is arguably the most environmentally sustainable system devised so far.