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Feed Conversion Efficiency

Feed conversion efficiency is one of those popular terms that nobody seems to have a concise definition of. The term itself is not hard to understand, but just what does it mean in the sense of how do we measure it, how do we manage it and what will it do to profit if we do neither?

Perhaps if we start with what can be assured: if we don't have a correct energy, fibre and protein balance, you can guarantee we will not have 'feed conversion efficiency'. Does a tractor have fuel efficiency with blocked air filters?

A general and good definition would be the ratio of feed intake to litres produced. Perhaps even more importantly, would be milk income to feed cost as this is the one that's going to impact profit more than anything else. The next problem is this ratio will vary according to stage of lactation. Early lactation, due to mobilisation of body fat, the ratio could be 1.6:1 (30lts from 19 kgs DM feed). Mid lactation could be 1.4:1 (28lts from 20 kgs DM feed), and late lactation due to rising body condition, it could be 1.1:1 (20lts from 18 kgs DM feed). Also energy densities of rations at various times of the season are going to wreck havoc with comparisons.

So, when asking your neighbour what his feed conversion efficiency is, you'll need to specify at least stage of lactation. Or better still, when the salesman calls and tells you his product will improve feed conversion efficiency; ask at what stage of lactation. All jokes aside, but this is such an elusive term in itself that comparisons within Australian grazing based dairying are little more than hypothetical conjecture. Having said that, the term itself is not useless, but needs a clearer definition and then discussion on what effects the movement toward improved feed conversion efficiency. I think it is a 'goal' to move toward through various management decisions and actions rather than a fixed numerical ratio to be achieved.

Fertility, another very popular word in the industry, and longevity in the herd needs to be thrown into this equation. We could 'pump' a ration with high by-pass protein and extract some very cheap litres by mobilising large volumes of body fat. Fat can be as high as 30 MJME in energy (compared to wheat at 12.8 MJME). We all know the result of this.

A balanced ration must be the first consideration; this includes not just energy, fibre and protein, but minerals too. Mineral imbalances can have as greater negative effect as energy or protein deficiencies on milk production.

Our goal ration is: energy 12 MJME, NDF (fibre) 32% and crude protein at 18%.
Add to this a good trace mineral mix (NRC recommendations), rumen modifiers of Rumensin/Tylan or similar and 18+ gms of magnesium, 50 gms salt, 35 gms calcium, and perhaps some sulphur to manage high ration DCAD.

Once we have this in place, intake becomes the sole criteria for "Feed Conversion Efficiency". With the ration balance above, appetite should be very good, so only the manager is to blame for restricting intake by not allowing cows to eat to capacity. The more our cow eats, the greater will be her feed conversion efficiency as energy required to maintain her (a fixed amount – 70 MJME/day - Holstein) becomes a smaller percentage of total energy intake. In other words, more energy/kg DM feed is converted to milk.

Obviously this 'balanced ration', particularly the balance of energy/fibre/protein does not just happen. In August most years I write on Feed Budgeting. I prepare for my clients at this time each year a plan to attempt to achieve this balanced ration throughout the year within the context of their farm and resources through planned feed production and complementary grain mix projections.

This pretty well covers the "macros" of Feed Conversion Efficiency. Pursuing the 'micro's, without the above in place is folly. It is possible for grazing herds with appropriate concentrate supplementation to produce 10,000 litres and be doing a very good job of feed conversion efficiency, verified in their milk income over feed cost due mostly to dilution of maintenance.

Some easy indicators to observe that will tell us whether we have compromised feed conversion efficiency are: firstly, our daily milk test figures – litres, BF%, MP%, and BMCC. All are telltale when they are not right and are a call to address specific issues. As mentioned in previous articles, I'm hopeful of milk processors publishing MUN (Milk Urea Nitrogen) data shortly which will tell us where we are in protein utilization. MUN data has potential to assist us in managing dietary protein which is a significant cost factor in rations; both in excess and deficiency, either will impact feed conversion efficiency. Environmental restrictions that will be placed on us in the future will demand this data to manage nutrient and gas emissions.

My favourite phrase: "Litres Drive Profit" could also be "Litres Drive Feed Conversion Efficiency". Litres determine milk income, and to achieve litres we must have feed conversion efficiency through optimum feed intake which simply does not happen unless rations are balanced and nutrient densities achieved.