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Overstocked dairy farmers and drought sufferers have found PKE a saviour. It comes from making palm oil in south east Asia, mainly Malaysia. A decade ago, before New Zealand and Australia started buying PKE, much of it was just dumped or burned, so whether dairy farmers buy it or not will make no difference to the expansion of palm oil plantations, for which the greensies are blaming New Zealand dairying. Unfortunately the Greensies are often wrong. Fonterra should publicise this and expose the ignorance of the few vocal Greensies, some of whom are vegans out to ruin the animal industries, and bring up their mineral and vitamin deficient children, with large starch filled tummies, and lacking in brain power. The far brighter Asians are eating more meat and getting bigger, while the anaemic vegetarians spread inaccuracies about exaggerated problems of red meat, most of it based on northern hemisphere grain-fed marbled with fat beef. They should go to central Africa and see the agile people who have lived on mostly meat, blood and milk from cattle there for perhaps a million years. To save going there, look at the Africans in USA and those winning Olympic Games's races.

Know about PKE before buying it

There have been cow ill health and deaths from PKE. Google for 'Palm Kernel + cattle deaths' to see some. Losing six cows and their production takes a lot to replace. One farmer lost 20 cows from milk fever, something which should not happen today. Calciumborogluconate injections didn't save them because the milk fever was the third whammy on top of PKE-caused excess copper and manganese toxicities.

When starting to feed PKE, or any supplement, do so after the cows have had a feed of pasture, and increase the quantity gradually over 10 days, starting with half a kg per cow per day, to allow the rumen to adjust. Some suggest starting with 1 kg per day, but some cows eat rapidly and get 2, or even 3, kg, while initially others may eat none. Too much, too quickly, to hungry animals on an empty rumen can be a killer, but some promoting it say that adding PKE to the diet of cows need not be done gradually.

Fine-cut silage fed on an empty stomach is also hard to regurgitate, so should also be done after some pasture has been eaten, and close to fence lines to prevent walking over it, and to reduce waste. Some farmers feed the supplements in bins after milking, when the rumen is empty. This reduces cud chewing, which means less saliva and poorer digestion, and less milk. Also, bins cause uneven feeding.

The extremely high iron, phosphorus, copper and manganese levels mean that PKE should not be fed in too large a quantity, or for too long a period. An article published in Gribbles Veterinary Newsletter, Labtalk, highlighted the potential for cattle to develop copper toxicity. The copper content in PKE is 20 mg per kg of dry matter, which is twice the optimum for cattle, and has built up in the liver of Waikato cows to 3,000 nmol per kg, which is more than three times the optimum figure of 900 nmol per kg.

Calcium (%)	0.21 – 0.34
Phosphorus (%)	0.48 – 0.71
Magnesium (%)	0.16 – 0.33
Potassium (%)	0.76 – 0.93
Sulphur (%)	0.19 – 0.23
Copper (ppm)	20.5 – 28.9
Zinc (ppm)	40.5 – 50.0
Iron (ppm)	835 – 6130
Manganese (ppm)	132 – 340
Molybdenum (ppm)	0.70 – 0.79
Selenium (ppm)	0.23 – 0.30

Manganese can be 340 ppm in PKE, which is five times higher than the optimum in New Zealand pasture, where it is mostly already too high, especially if wet or soils lack calcium which 90% do. Parts of the UK and USA are low in manganese, so mineral mixes designed there and fed in New Zealand can stress cows - and milkers here. This happened to a Tauhei farmer and his cows. I fixed it in a week by changing his feeding minerals with manganese to the DeLaval Feedtech one with 9 minerals deficient in NZ, but no

manganese.

A Morrinsville herd had the problem of three times the copper and manganese levels in livers due to 5 to 6 kg of PKE being fed for months. Its ill effects caused cows to die of mild milk fever or other ailments months later, when they should not have died. This double whammy negative effect occurs in farming. One is facial eczema affected cows, then dying of **mild** milk fever or bloat, despite being treated correctly.

PKE is dusty and gritty, so ample water is necessary. Feeding the PKE away from the water supply encourages cows to move for water and not keep gorging PKE for too long, but doing this is no guarantee that some won't kill themselves, as has happened on some farms - especially if hungry so short of other feeds. Googling for 'PKE cow deaths' found it has happened in New Zealand and overseas.

Why do some die?

PKE is a variable product, sometimes containing soil, and in one case a dead monkey! Excess P, Cu and Mn can build up in livers if 3 kg or more per cow is fed for too many months. A maximum of 2 kg is safest, but impossible to control when feeding in troughs where only a few can access it at once. One of my best dairy farmer clients feeds it much more satisfactorily on the clean dense short grass under fence lines with no problems.

Keep palm kernel dry, because mould allergy problems from mycotoxins have occurred on a number of farms. If kept dry, it can be stored for a few months in cool conditions. If moist it can go mouldy, so should be disposed of, because feeding mould can be disastrous to lungs.

In 2007 some PKE was rejected by cows, even after they had been on it for a while. The PKE concerned was darker than usual, so could have previously heated from being too moist, so became mouldy.

Too much tapioca mixed with PKE by mistake killed some with acute ruminal acidosis, because the tapioca was not introduced gradually. It has very low starch and sugars.

When feeding supplements, ensure that all get equal quantities, to avoid excess illnesses. Feeding it in farm dairies is best, provided cows are not hungry, so have empty rumens.

It can cause the very serious dust problem, which can be reduced by mixing water or diluted molasses with it **just before** feeding.

PKE which is dry and dusty, with its very high manganese level, increases the incidence of catarrh, lung problems and virus infections.

Feed Value

PKE has 14 to 16% crude protein and 90% dry matter, with very low starch and sugars. Most of the energy comes from the oil, protein and digestible fibre, so cows are unlikely to show any signs of acidosis, but digestive problems can occur, even if changed to it gradually. Mixing 10% of rolled barley with PKE improves the feed value, increases carbohydrates and improves its flow. If barley is unavailable, look into the cost benefits of feeding maize grain meal, which causes no animal health problems on its own, unless fed at more than 3 kg per cow per day. Feeding 2 kg of PKE **with** 2 kg of maize meal to hungry cows lacking pasture roughage can cause digestive problems, usually shown in slight scours.

The best and most profitable feeds are correctly fertilised pasture with, if needed, limited silage or limited maize silage and hay - always with an optimum soluble mineral mix of nine elements spread evenly on with it or in the drinking water.

Over-stocking costs you, your cows and your pastures. Because of it, PKE sometimes has to be bought. Read Dairying > Milk Profit & Quality.

The above was sent to New Zealand's Straight Furrow and the Waikato Times, but not published, I presume because the PKE marketers take frequent large colour advertisements.

This problem of not getting the correct information is another of the those with which farmers have

to live - commercialism and greed, rather than service to the farming industry, from those who ride on its back.

Keep your stocking rate correct so you don't have to buy expensive non-profit making, often toxic supplements. If you see that you'll have to buy feed, aim early for silage and/or hay before it's all sold, but check the quality.

On average, dairying is following meat and wool's decline in profitability, accentuated by high land prices up to \$80,000 a hectare in the Tatura area, high farm costs, and high interest rates, which are double those in Japan and Switzerland where at 3% they are the world's lowest. New Zealand's urban rates are lower than those charged farmers, despite farmers being a lower risk. Farmers also suffer higher inflation which is double the NZ national average figure. There are more dairy farmers below the breadline and more dairy farms for sale now (not all publicly) than ever. For help, read more in this eBook. The inflation adjusted milk payout in 1956 was \$14 per kg of milk solids, and now 55 years later it is half that, and costs are many times higher.

There is nothing to show that the profit line won't continue to decrease, meaning that in another 50 years the milk payout will be zero. Governments don't even know it is happening, so they continue their inflationary policies of 20% more politicians than needed, debt of 31% of GDP in 2010 compared with only 17% in 2007, extravagances, selling the silver, and waste. Read the Sheep chapter to see how their costs have increased and returns decreased.

Another statistic that highlights the dairying decline is that of the average herd sizes. The average herd size was sixty cows in the 1950s which earned a family a good living, whereas 380 are needed today, with much less net profit. In 1958, with no lending assistance, we bought a new three bedroom Lockwood house out of income from approximately 60 cows. Today that could not be done with 360 cows. Similarly, a farmer in the 1960s with the average herd size of 100 cows, could put three children through private boarding school, but would have no chance of doing so with 600 cows today.

To try to keep growing, some farmers changed to what has failed, and is still failing, in the northern hemisphere, which is to buy feed. Some Waikato dairy farmers tried to cut and carry pasture to the cows in the 70s and all failed. Doug Woolerton told me that it was the biggest mistake of his life. He lost his farm. People don't learn from history and the pendulum swings, so some are trying this again.

The simple low-cost basics that made New Zealand dairying, are impossible to beat. Farmers owning the high-priced dairy land have to try to get the best out of it, otherwise it becomes a cost in interest without a return. Animal farmers have doubled production per animal and per hectare in approximately 40 years. No other group has done anywhere near as much. The size of your herd is crucial as you cannot allow it to get too big. The land needed to graze 1,000 cows requires a walking distance to the back paddocks greater than cows can tolerate.

Driving around the Waikato emphasises the fact that very few farmers are getting the best from their soils and cows. The best farmers are producing 30% more per cow and per hectare than others on similar land - without supplements.

In 2009, AgResearch and DairyNZ blamed the dairy decline on misinformation and scheduled a meeting to discuss it, but nothing emerged. Ironically, most of the misinformation came from them, followed by the commercial companies and consultants, most of whom are actually commission agents, and the 'establishments' who should know better and inform farmers before problems occur, not after, as is occurring now with palm kernel extract (PKE). Examples of misinformation include: applying too much urea too often and not enough lime, and over-stocking, which makes animals unprofitable, because less than half of underfed cows' feed then goes to production, while more than half of well fed cows' feed goes to production. Most dairy farmers are over-stocked and have not been able to sell cows at reasonable prices, because so many others are also overstocked.

Compared with grazing pastures and grazing forage crops, buying supplements used to be very expensive. However, as the price of dairying land increased, the advantages of buying supplements in droughts improved, but profit doesn't increase unless the payout is high. When pasture quantity is lacking because of overstocking, drought or flood, feeding 2 kg of PKE per cow per day, if it costs less than 5% of the milk price, with some maize silage and pasture, makes a balanced feed, but with lush pasture only it doesn't. So if the milk price is \$7 per kg of milk solids, 5% is 35 cents a kilogram of bought feed, or \$350 for 1,000 kg.

Those on high-input farming at 2012 milk prices are losing money and I know some are going broke. One lost \$244,000 in 2008 until I saved them and in 2009 they lost nothing. In 2010 they netted \$200,000, thanks to milking 50 fewer cows, buying less feed and increased milk production from cows almost fully fed on pasture. Their 2011 profit was \$300,000.

The software program Pasture Silage Hay Crop & Nitrogen Costs shows that the cost of growing pasture, before the inclusion of land value, is about 7 cents per kg of dry matter, but the high price of bare land, at 7% of \$40,000 per hectare, increases the cost to 25 cents fed, or \$250 per tonne of feed.