

NZIAHS Forum

**“Where do we want our dairy industry to be in 20 years time?”
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Is the production and consumption of dairy products ultimately to our detriment dietetically?

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Before we look to the future of the dairy industry it may be helpful to consider the past. Take for instance the free school milk scheme that operated in New Zealand between 1937-67. Many people may prefer to forget it. At a time of milk surplus half-pint bottles of whole milk were distributed to school children each day. Studies at the time (Turbott & Roland 1932; Bell 1955) reported improvements in the height and weight of New Zealand children, but at a time in their lives now when they should be drinking milk for stronger bones, many of our baby boomers (now in their 50's and 60's) report being put off drinking milk as a child. They recall being forced to drink warm, fatty milk that tasted like cardboard after being left too long at the school gate in the morning sun or in a warm corridor outside the classroom.

Should we ever be bold enough to try school milk schemes again then let us hope we choose low-fat, calcium-enriched milks that have at least been chilled on delivery. We should also offer non-dairy options for those with milk allergies and intolerances

There are several barriers to drinking milk. Some dislike the taste; some have bad childhood memories; some fear it is fattening; some worry about their cholesterol levels; some have concerns about food allergies or lactose intolerance; some suffer from headaches if they drink it; some are concerned about the cost and some are confused by too much choice. Many people are unaware of it's importance while others are confused by mixed messages in the media saying it is good for one thing and not another.

It is time for some consistent health messages about milk.

Dairy and bone health

Osteoporosis affects more than half of all women and nearly a third of all men over the age of 60. More than 3000 New Zealanders break a hip each year, a number expected to rise to 4800 in ten years time (IOF 2007). The Ministry of Health recommend that to maintain strong bones and teeth New Zealanders need to consume at least two servings of calcium-rich food each day, one serving being 250mls milk, 2 slices of cheese or 1 (150ml) pottle of yoghurt.

Unlike calcium supplements which can increase blood levels of calcium-endangering heart health, the protein in low-fat milk aids calcium uptake by bone making the drinking of low-fat, calcium-enriched milk a better health alternative.

From a “bone health” point of view, perhaps we should be asking where would we be in 20 years without the dairy industry?

Calcium intakes are poor

The National Nutrition Survey in 1997 found the calcium status of New Zealand men and women was poor, which is no doubt contributing to our osteoporosis statistics. Men in the 15-44 age group were not meeting their daily recommended allowances. This problem for men appears to resolve itself later in life because the respiratory disturbance index (RDI) scores decline for men after the age of 45 years.

Sadly this is not the case for women who appear to be calcium-deficient for most of their lives. Rather than declining in later years the calcium requirements for women increase after menopause as oestrogen levels fall. Pregnant and breast-feeding women in the 15-44 age group are also at risk of falling bone density as their intakes of calcium generally fall well below the 1200mg recommended intake level.

Because milk and milk products are such good sources of dietary calcium, dairy industry efforts over the next 20 years should address some of the barriers that prevent people from drinking milk. Families should be encouraged to make milkshakes after work and school that include fresh fruit such as bananas and berries, without the need for extra sugar or flavourings. This would also contribute valuable dietary folate that is also in short supply.

The calcium status of NZ adults

(ref: National Nutrition Survey 1997)

Gender	Diet (mg)	RDI (mg)
Men		
15-44	957 – 938	1000
24-44	959	
45-60	864	800
65+	799	800
Women		
15-44	783 – 760	1000
24-44	759	
45-60	712	1500
65+	670	1500
Preg/Breast		1200

The calcium status of New Zealand children

The National Nutrition Survey in 2002 found that only boys aged 7-10 years manage

to consume sufficient calcium to meet their RDI's. The remaining age groups are deficient. This is particularly evident as they enter their adolescent years. Girls appear to be deficient at every stage of their lives.

Young people are always looking for new beverages these days. This is one group of the population that the dairy industry needs to focus on with plenty of scope to develop new products.

**The calcium intakes of NZ children
(Ref-National Nutritional Survey 2002)**

Age/Gender	Diet	RDI's
Males	mgs	Mgs
5-6yrs	698	800
7-10yrs	806	800
11-14yrs	921	1200
Females		
5-6yrs	651	800
7-10yrs	653	900
11-14yrs	757	1000

The relevance of milk today

Milk should not be hard to sell. Humans have always relied on it for sustenance. Babies drink breast milk ideally for their first year before being weaned onto modified milks that are whey or casein dominant and then on to follow on formulas. Several modified milks, moreover, are available for babies born prematurely or suffering from allergies, reflux, lactose intolerance or congenital abnormality.

Very few natural foods are available that provide the main macronutrients protein (casein and whey) fat and carbohydrate (lactose) people need for good health. For this reason milk can be considered a 'complete food' While not high in iron, it is a good source of B group vitamins, minerals and water.

Milk is considerably adaptable

In New Zealand dairy products are manufactured mainly into various milk types - milk powder, butter, cheese, yoghurts/custards, and pharmaceuticals (such as special milk formulae). Milk is also used for commercial products such as biscuits, sauces, soups. It is now being produced to suit the tastes and needs of various sectors of the community from the weight to the calcium conscious.

Not all milks are dairy-based. Rice, soy and goats' milk share supermarket shelf space and a great number of products are labeled organic. Many modern milks are flavoured and fortified with extra calcium, Vitamins and omega 3 essential fatty acids. With so many milks on the market consumers are complaining that they are unsure which ones to buy.

The Ministry of Health recommends the following:

0-2 years - Breast milk or whole milks or modified milks for babies that are premature or allergic. Babies are normally weaned on to either casein or whey-dominant-based formula and then on to follow-on formula.

2-5yrs - Junior or Mega milk offers more protein and calcium with less fat than whole milk, which is important for growth.

5yrs and over - Trim or Calci-Trim for all the same reasons as listed above.

If we are to be crystal-ball gazers, then dietitians would recommend that rather than widening the milk market by developing more varieties of milk, the dairy industry should acknowledge the existence of non-dairy milks and encourage everyone to drink more low-fat milks.

The composition of various milks per 100mls

Milk Type	Energy (kJ)	Protein (g)	Fat (g)	Sat Fat (%)	Carbo(g)	Calcium (g)	Sodium (mg)	Cost (\$)
Dairy								
Standard	260	3.2	3.3	2.2	4.9	116	43	0.22
A2	260	3.3	3.3	2.4	4.7	115	40	0.34
ReduceFat/Lite	200	3.5	1.5	0.5	5.0	125	44	0.25
Trim	168	3.7	0.5	0.4	5.1	132	45	0.25
Calci-trim	192	5.8	0.2	0.1	4.7	200	45	0.22
Junior	255	3.2	3.3	2.1	4.7	115	40	0.25
Mega	234	4.5	2	1.4	4.9	160	45	0.25
Non-Dairy Milks								
Goats	195	3.6	1.5	0.9	4.7	120	69	0.25
Rice Milk	210	0.4	1.1	0.1	9.5	120	55	0.38
Soy Milk	159	3.0	1.5	0.3	3.0	115	90	0.37
Oat Milk	250	1.0	1.8	0.2	9.1	120	40	0.38

Consumer acceptance– could dietetic concerns limit industrial growth?

New Zealand is the world's largest exporter of dairy products, which account for 27% of our export income. With good management of its technology, costs, reputation, efficiency and collective spirit within the dairy industry there is huge potential for growth. How we manage any domestic threats to the industry will be important. The industry will need to juggle not only environmental issues of water, land use, nitrogen emissions and animal rights, but also how the public perceive the impact of dairy products on their health (Mackle 2010).

The industry needs to be mindful of food security and the impact of cost on

consumption. For many families drinking soft drinks has become a cheaper fluid option for their children.

Dieticians as a profession are well placed to listen to people's fears and concerns about the use of dairy products in their diets. They can assess, educate and (where necessary) alter the use of milk and milk products in the pursuit of good health and the treatment of disease.

Heart health

Diseases of the circulatory system (heart and stroke) are the main cause of death in New Zealand, accounting for 37% of all deaths in 2005-6. While cardiovascular disease is multi-factorial disease associated with issues such as lifestyle, cigarette smoking, obesity and so on, the affects of saturated fat on heart disease as well as other diseases such as liver and gall bladder disease, some forms of cancer, diabetes and so on are well documented (NZDA Position Paper 2000,USDA 2010)

Despite efforts by groups such as the National Heart Foundation to reduce saturated fat in the diet by promoting polyunsaturated margarines and low-fat dairy products, we still consume large quantities of full-fat dairy products such as milk, butter and cheese. In 2006 on a per capita basis New Zealand ranked 14th out of 21 countries for consumption of milk and milk products.(Int Dairy Fed Bulletin 2007).

Butter is a major contributor of saturated fat in the diet with a 61% saturated fat content compared to other fats such as rice bran oil 19.7%, olive oil 15%; avocado oil 11.5%, flaxseed oil 9%; canola oil 7%.

Too much saturated fat slows brain function, impairing learning acquisition and memory, whereas unsaturated fat aids discrimination learning and decreases depression. (Morris 2003). These health factors have led many to wonder whether New Zealand, on moral grounds, should be exporting its saturated fats to other parts of the world so readily.

Over the next 20 years it will be interesting to follow the dairy research directed at altering the fat content of butter by feeding extra fibre and fat supplements to the diet of dairy cattle to increase the polyunsaturated fats in milk and milk yield (Gurr 2007). Also the production of milk with higher bioactive component levels of conjugated linoleic acid (CLA) should open plenty of areas for new product development (Mackle 2000).

Weight gain

Despite the advent of low-fat dairy products, there is a strong public perception that milk and milk products contribute to weight gain. But Michael Zemel, a researcher in Tennessee, found that milk aids weight loss. In randomised studies of overweight people fed a calorie –restricted diet for 24 weeks, those given a low-dose calcium supplement lost 6.4 percent of their body weight. A high-calcium supplement group lost 7.7percent. Those fed the equivalent amount of calcium in dairy foods, lost 10.9 percent of their body weight; two-thirds of the loss was in the abdomen.

When the body isn't getting enough calcium, Zemel found, it releases the hormone

calcitriol, which constricts blood vessels. It also acts as a metabolic switch in fat cells, signaling cells to hold fat and make more (from sugar). High calcium levels, however, suppress calcitriol.

While Zemel was sponsored by the dairy industry, his study group was small and critiques of his methodology research from more reputable groups are gaining pace, especially with regard to sports nutrition.

Along with calcium, milk and yoghurt contain whey. This is rich in Leucine which stimulates the building of muscle, which acts as a furnace to burn fat. It also contains peptides that suppress fat synthesis.

Metabolic syndrome

Metabolic syndrome is a combination of disorders that increase the risk of developing cardiovascular disease and diabetes. Welsh researchers involved in the Caerphilly prospective study of 2375 men without diabetes collected data on fasting blood glucose, plasma insulin, fasting plasma triglycerides and high-density lipoprotein cholesterol. Body mass index and blood pressure were used to define metabolic syndrome.

The prevalence of metabolic syndrome was found to be 15%. The relationship between milk and dairy products was examined using food frequency questionnaires and from a seven-day weighed intake record. The consumption of one pint or more of milk/day and dairy products was found to markedly reduce metabolic syndrome.

Diabetes mellitus

Recent concern regarding milk consumption has centered on the protein in milk, around 25-30% of which is β -casein which comes in many forms depending on the genetic make-up of the cows. One of these forms is called A1 β -casein and it has been suggested that this may cause or aggravate type-1 diabetes (the type most commonly seen in children), heart disease, autism and schizophrenia.

This hypothesis stems from a comparison of 20 countries. Those countries with the highest consumption of A1 β -casein also had the highest rates of type 1 diabetes and heart disease. Changing the dairy herd in New Zealand to more A2-producing cows is one option under consideration. However as the cause of these diseases is multi-factorial the New Zealand Food Safety Authority is monitoring the situation and has cautioned about making major dietary changes before more conclusive evidence is available.

The evidence relating to β -casein, schizophrenia and autism is much less robust. Some individuals with autism have shown improvement with other dietary modifications such as the inclusion of fish oils and removal of gluten as well as casein (NZFSA 2004).

Researchers at Tufts University have found there was nearly a 15 percent lower risk for type 2 diabetes among individuals with the highest dairy intake (3-5 servings per day) compared to those getting less than 1.5 servings/day. The researchers hypothesise that calcium and vitamin D may affect the body's ability to generate or utilise insulin, the hormone responsible for the processing of sugar in the body which

is impaired in those with diabetes (Pittas 2007).

Along with calcium and vitamin D, milk is an important source of magnesium which researchers have also found decreases the risk of developing type 2 diabetes. The analysis concludes that for every 100 milligram increase in magnesium up to the recommended dietary intake, the risk of developing type 2 diabetes decreases by 15 percent (Larsson 2007).

Milk is the new sports drink

Sports science is hailing low fat milk as the latest “sports drink” aiding performance in the following ways:

- Following resistance exercise drinking milk aids muscle building and recovery.
- Research in endurance sports suggest low-fat milk may be more effective than commercially available sports drinks as a re-hydration beverage by lowering urine output after exercise.
- The protein in milk aids the growth and repair of tissue during recovery.
- The whey in milk is rich in the amino acid leucine which stimulates the building of muscle which in turn helps to burn
- Low-fat milks aid weight control and helps to build lean body mass (Roy 2008)
- Milk is suitable for school children and developing athletes. Now that milk and water are being promoted as the preferred drink in schools encouraging children to associate milk with improvements in sporting performance should be a very easy exercise.

It is time that the dairy industry re-styled milk as a healthy lifestyle choice for all those New Zealanders wanting to improve their health and fitness.

Supporting increased productivity is a food safety issue.

Good nutrition is about a balance of all nutrients and so dietitians do have concerns about the impact of increased dairy production on other food groups. For instance:

- What other food groups will be endangered if land use for dairy increases?
- Will cropping area be swapped for pasture to feed dairy?
- What effect will changing water patterns have on existing crops?
- What affects will farm run off into rivers and streams have on other foods sources such as our salmon and whitebait.?
- Will land use swap for dairying reduce availability of other meats such as sheep, deer, llama and free range chicken?
- In our rush to improve pasture growth will pesticides and chemicals use increase and how will this affect our food chain?

But if the dairy industry is able to recognise the many health benefits of drinking milk and develop ways of improving nutrition education across the country and off shore, then the future of the New Zealand dairy industry looks very bright indeed.