# NFU Cymru Briefing

| | | |
|---|---|---|
| Circulation: | Date: | 5th February 2015 |
| | Ref: | kwo |
| | Contact: | Kevin Owen |
| | Tel: | 01982554200 |

## Milk and Human Health

**Overview**

At its meeting on Thursday 29th January 2015, the NFU Cymru Milk received a presentation from Professor Peter Elwood (medical epidemiologist) at Cardiff University who outlined details of his overview study which seriously challenged dietary guidelines that recommend a limitation in milk intake or recommended low-fat dairy products.

His more detailed scientific summary is repeated below but in essence Professor Elwood explained that his overview of study, which had involved reading the abstracts of 703 research papers, the detailed study of 200 of these and the extraction of data from over 60 directly relevant papers, showed an actual protective association between milk consumption and incident heart disease, stroke and diabetes.

He stressed that it was really important to appreciate that the conclusions from this overview study had not been reached from selected research but from all available evidence. It all pointed to there being no valid evidence that milk or dairy foods increased the risk of either heart attack or stroke, or increased all-cause mortality. The magnitude of this study he said couldn't be over emphasised; it had used an enormous volume of data and the statistical analysis proved the conclusions to be extremely robust.

In outlining the detail, Professor Elwood said that in fact, a large body of evidence from long-term cohort studies showed small reductions in the risks of vascular disease and type 2 diabetes. Two very large and detailed studies showed that dairy fat consumption was associated with reductions in insulin resistance and type 2 diabetes.

He concluded that these results seriously challenged current dietary guidelines and other advice that recommended a limitation in milk intake or recommended a diet of low-fat dairy products and reinforced the fact that whole milk and full-fat dairy products had a positive effect on our health and well-being.

### *The myth of fat-reduced milk and dairy foods!*

### *By Professor Peter Elwood*

*The recommendation for low-fat dairy is philosophical and not evidence based.* Weaver 2014[1]

In 2006 Alvarez-Leon et al.[2] pointed out that statements about the benefits and risks of dairy product consumption appear usually to be based on selected physio-pathological data, such as relationships with cholesterol level, and not on valid epidemiological evidence, and he added: 'Public health nutrition should not be unaware of the need for evidence-based conclusions'.

In 2004 we reported a protective association between milk consumption by 2,512 subjects in our Caerphilly Prospective Study and incident heart disease, stroke and diabetes.[3] We followed this with

## The heart of Welsh farming

an overview of all the available published data (30 observational studies in which 1,132,000 subjects were followed for 4-28 years).[4] This showed that the fifth of subjects with the highest milk intakes had a reduction of around 5% in incident heart disease, almost 11% fewer strokes and around 15% fewer subjects developed diabetes. These results were broadly confirmed in later overviews.[5-7]

A number of reports however raised the question: 'Do fat-reduced milks provide any advantage further to the benefits conferred by the consumption of whole dairy foods or milk, or does the removal of fat reduce the benefit of the whole items?'[4] This echoed an earlier statement by German and Dillard:[8] 'such hypotheses [about fat-reduced milks] are the basis of sound scientific debate; however they are not the basis of sound public health policy'.

Recent studies give a firm evidence-base for the evaluation of dairy fats, but first it should be noted that the results referred to above came from studies conducted before fat-reduced milk became popular. In 2010 however, a large study in the USA,[9] based on 3,700 subjects, showed that blood levels of the fatty acid *trans*-palmitoleate, which is characteristic of milk and dairy products, were associated with a three-fold lower risk of incident Type II diabetes.

This evidence was strongly confirmed in a case-control study of 16,154 individuals across Europe (the EPIC-interAct Study[10]) in which relationships between individual saturated fatty acids and type II diabetes were examined. Saturated fatty acids with even numbers of carbon atoms were found to be positively associated with incident type 2 diabetes, while odd-chain fatty acids, including 15:0 (pentadecanoic acid) and 17:0 (heptadecanoic acid), both characteristic of dairy items, were strongly and negatively associated with diabetes.

An editorial[11] published along with the EPIC study, commented that the nutritional guide-lines on milk should now be changed, adding: *'.... these results add to growing evidence that dairy fat might reduce insulin resistance and type 2 diabetes…"*

--------------------------------------------------------------

But then a paper in the BMJ paper on milk and mortality…. and 27 pages of comments!

The paper reported that two large groups of subjects: 61,433 women and 45,339 men, had been followed for 20 years. Compared with subjects who drank less than one glass per day, those subjects who regularly consumed three or more glasses of milk, had an almost        double risk of death: adjusted HR 1.93 *(1.80,1.06)*.

This result is remarkable and is totally inconsistent with the findings in two major overviews, in neither of which is there evidence of any excess (or reduced) mortality associated with milk and dairy consumption. In one overview of eight cohort studies, the relative risk (RR) of death in the fifth of subjects with the highest milk intake, relative to the mortality in the subjects who drank little or no milk was 0.87 *(0.77, 0.98)*.[9] In another overview[10] the relative risk in the highest milk consumers was 0.99 per 200 ml. *(0.95, 1.03)*.

It is said that Sabita Soedamah-Mattu et al, who conducted one of the overviews mentioned above, added these results from Sweden to her analysis and there was no **significant** excess mortality. But this is strictly inadmissible because the original meta-analysis of 8 studies is reported to have shown significant heterogeneity (P<0.05), and the incorporation of the new Swedish data into their overview must have markedly increased the heterogeneity ….. confirming that the Swedish results are significantly inconsistent with the other studies.

Furthermore, a statistician (who works with Elwood) commented on an odd interaction with age in the Swedish data, and adjusting for age appears to reverse the relationship. She went on: '…. I divided 'person years of follow-up' by the number of women in each milk category to give (I think) the average follow-up time in each group. This gave, for increasing milk consumption, 28years, 19years, 15years and 7years. Why does this decrease so steeply? We know only 20% died in the top milk group, so did they die very young and/or were a big proportion lost to follow-up?' Clearly, the Swedish report, the milk used in Sweden, and possibly other factors will have to be examined very carefully, and hopefully the differences from other studies will be resolved.

**In conclusion:**

Despite the Swedish report, it appears that there is no convincing evidence that either milk or dairy products are harmful to human health.  Furthermore, it appears that there is no evidence to support the reduction of dairy fat in milk and other dairy products, and the process appears likely to be harmful.

The editorial already referred to, states: '….it is time to move away from unhelpful classifications and policies based on crude groupings of merely chemically related nutrients [eg, total saturated fat] and their predicted or postulated effects on risk…. and move towards food-based guidelines that mainly consider prospective evidence for effects on clinical endpoints."

It would seem eminently reasonable therefore for the consumption of whole milk and diary products to be vigorously promoted throughout the community.

*Peter Elwood*   Cardiff University

**REFERENCES**

1. Weaver CM. How sound is the science behind the dietary recommendations for dairy? . Amer J Clin Nutr 2014;99:1217S-22S.
2. Alvarez-Leon E-E, Roman-Vinas B, Serra-Majem LS (2006) Dairy products and health: a review of the epidemiological evidence. Brit J Nutr. 96:594-599
3. Elwood et al. Milk drinking, ischaemic heart disease and ischaemic stroke I. Evidence from the Caerphilly Cohort. European J Clinical Nutrition 2004;58:711-7
4. Elwood et al. The consumption of milk and dairy foods and the incidence of vascular disease and diabetes: an overview of evidence.    Lipids 2010;45;10:925-30.
5. Soedamah-Muthu et al. Am J Clin Nutr. 2011;93:158-71
6. Gibson et al.  Brit J Nutr 2009;102:1267-75.
7. Pitas et al. 2007
8. German J B., Dillard CJ. 2004. Saturated fats: what dietary intake? Am. J. Clin. Nutr. 80:550–559.
9. Mozaffarian et al. 2010. Trans-Palmitoleic Acid, metabolic risk factors, and new-onset diabetes in U.S. adults. Ann. Intern. Med. 2010;153:790-9.
10. Forouhi NG et al. Differences in the prospective association between individual plasma phospholipid saturated fatty acids and incident type 2 diabetes: the EPIC-InterAct case-cohort study. The Lancet Diabetes & Endocrinology, Early Online Publication, 6 August 2014.  doi:10.1016/S2213-8587(14)70146-9
11. Mozaffarian D. Saturated fatty acids and type 2 diabetes: more evidence to re-invent dietary guidelines.  Lancet Diabetes & Endocrinol.http://dx.doi.org/10.1016/52213-8587(14)70166-4
12. Michaelsson et al. Milk intake and risk of mortality and fractures in wo