

# Time to value milk

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There is evidence that milk consumption has fallen over the past 20–25 years in many countries.<sup>1–3</sup> Evidence from the UK shows that the fall overall has been 33% during the past 25 years (Figure 1) and within the UK there is a marked social class gradient, the average milk intake in households in classes IV and V being 10–20% lower than in households in classes I and II.<sup>3</sup> In most countries more than half the dietary intake of calcium come from milk, and particular concern focuses on younger people.<sup>4–6</sup>

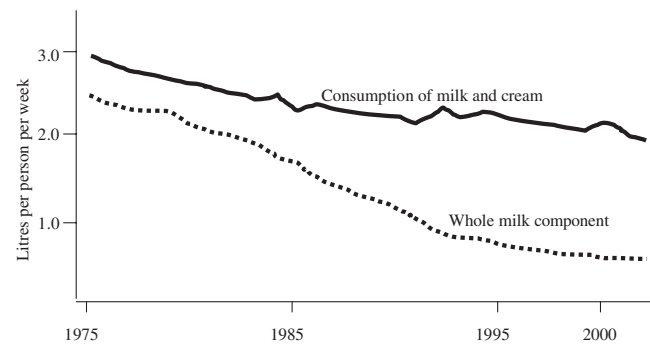
## Vascular disease

A number of hypotheses have been suggested in support of the claim that milk consumption increases the risk of vascular disease.<sup>7</sup> The rise in serum cholesterol level associated with milk drinking would however seem to be the main reason for the widespread decline in milk consumption. Nevertheless, any attempt to estimate the likely effect of the rise in cholesterol on vascular disease incidence would ignore the effects of other mechanisms affected by milk consumption, including a reduction in blood pressure by milk.<sup>8</sup>

Randomized controlled trials of milk drinking and vascular disease incidence are probably unacceptable because of the number of subjects and the degree of compliance which would be required to achieve adequate power. Cohort studies are, therefore, the best source of direct evidence and a literature search identified 10 major cohort studies. The results from these are statistically homogeneous and an overview has been reported.<sup>9</sup> This shows that compared with the risk in subjects who had reported taking little or no milk, the risk ratios in subjects with a high consumption of milk were 0.83 (0.77–0.90) for ischaemic stroke, 0.87 (0.74–1.03) for ischaemic heart disease, and 0.84 (0.78–0.90) for either event. Thus despite the effect of milk consumption on cholesterol level, evidence from cohort studies suggests that milk is protective against vascular disease.

## Bone health

Calcium is of particular importance to children and adolescents and evidence from recent surveys in the UK indicate that ~5% of adolescent boys and 18% of adolescent girls have dietary calcium intakes below the levels recommended.<sup>10</sup> The bioavailability of calcium in milk is high,<sup>11</sup> and randomized trials have shown that additional milk helps ensure the full



**Figure 1** Milk consumption in the UK 1975–2002/3. Based on *Family Food in 2002–03*, a National Statistics Publication by DEFRA, London 2004 (<http://statistics.defra.gov.uk/esg/publications/efs/2003/chapter2.pdf>). Note: I am registered under HMSO copyright license CO2W0006073 and I have drawn the above from the original

growth potential of children,<sup>12,13</sup> and the achievement of an optimal bone mineral mass.<sup>14,15</sup>

Calcium intake is important to bone health throughout life and milk continues to be the most important source, particularly in unfavourable physiological conditions, such as achlorhydria.<sup>11</sup> Several randomized controlled trials have shown a reduction in bone loss and a substantial reduction in fracture rate in elderly subjects given additional calcium.<sup>16–18</sup>

## Diabetes

Limited evidence from a single cohort study has suggested that milk intake may be of relevance to the development of diabetes.<sup>19</sup> The consumption of dairy products by 3000 young adults was recorded in the CARDIA study and related to the development of components of the insulin resistance syndrome (obesity, elevated blood pressure, abnormal glucose control, and dyslipidemia). Although there was no evidence of significant associations in subjects of normal weight, the dairy intake of 909 subjects who had been overweight at baseline was found to have an inverse dose–response relationship with the later development of two or more components of the insulin resistance syndrome. The authors estimated that each additional daily serving of dairy foods was associated with a 21% lower odds of the insulin resistance syndrome in subjects overweight at baseline. Clearly, further evidence is required on this possible association.

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## Colon cancer

Both animal and human studies have suggested a reduction in colon cancer by calcium supplements and by milk. An overview of 10 cohort studies, which together reported almost 5000 incident cases, gave evidence of a lower incidence of cancer in the distal colon with increasing intakes of milk.<sup>20</sup> The adjusted risk in the subjects with the highest milk consumption was 0.85 (0.78–0.94) compared with the group with the lowest milk intake. A possible mechanism has been suggested in that added dietary calcium reduces both epithelial cell proliferation and the growth of colorectal adenomas.<sup>21</sup> Unfortunately, as with vascular disease, adequately powered long-term randomized trials of disease outcome are unlikely to be acceptable, so further evidence from cohort studies and from experimental studies will be necessary before benefit from dietary calcium can be accepted with confidence.<sup>22</sup>

## Body weight

Published evidence on milk or dairy consumption and body weight is fairly extensive, but highly confusing. A negative association between milk drinking and body weight, or BMI is shown in the cross-sectional baseline data of a number of large cohort studies.<sup>23–26</sup> For example, a gradient between dairy food consumption and body fat was found in the NHANES III survey data, the odds ratio of a subject whose milk intake was within the highest quartile, being in the highest body fat quartile, was only 0.16 (0.03–0.88).<sup>27</sup> There have been few randomized trials, and although the results of these are inconsistent, they suggest a negative effect of milk on weight gain and a positive effect on weight loss. In one placebo controlled trial a calcium supplement enhanced weight loss, and the loss was greater if the additional calcium was received through dairy foods.<sup>28</sup> In a limited overview of six observational studies and three controlled trials<sup>29</sup> a consistent negative effect of calcium intake on body fat and body weight was reported and the authors estimated that each 300 mg increment in habitual dietary calcium intake (equivalent to an average portion of dairy food) is associated with ~1 kg less body fat in children and ~2.5–3.0 lower body weight in adults.

## Conclusions

Several of the benefits of milk drinking that have been suggested, such as a negative relationship with the insulin resistance syndrome, a negative relationship with body weight, and an enhancement of weight loss, should be examined more adequately in randomized controlled trials. The present evidence, however, suggests that a general increase in milk drinking throughout the community could help address several of tomorrow's major health concerns within the UK and many other countries. There should, therefore, be major efforts to reverse the current decline in milk consumption.

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