As scientific evidence regarding the link between low vitamin D levels and cardiovascular disease becomes ever harder to ignore, Europe’s public health bodies are mulling over the question of mandatory fortification. The fact that vitamin D fortification has somewhat of a fraught history in the region is probably fueling a certain degree of reluctance, but it is hard to argue against such a potentially effective and cheap measure in the face of spiraling healthcare costs.

**Deficient Europe**
In May 2015, Sweden announced that it was seriously considering expanding the mandatory vitamin D fortification in its food supply. At present, Sweden already fortifies margarines, skimmed and semi-skimmed milk, but wants to extend this to other dairy products like yogurt, dairy alternatives like rice milk as well as cooking oils. The country seems to be set to follow the example of Finland, which opted for widespread vitamin D fortification in 2003/2004—a measure that was deemed successful in significantly reducing vitamin D deficiency in the Finnish population.

The Swedish National Food Agency estimates that, at present, around 67% of its population does not get enough vitamin D. In 2014, the U.K.’s National Diet and Nutrition Survey (NDNS) found that blood vitamin D levels were on the low side in 32% of Scottish adults aged 19 to 64 compared to 23% of the same age group in the U.K. population overall. The situation is similar across much of Europe.

There are two sources of vitamin D: diet (animal products) and sun exposure. Recent studies confirm that vitamin D deficiency remains fairly common, especially in northern latitudes, where the sun during the winter months is not strong enough to trigger the human body into synthesizing “the sunshine vitamin.”
**The Chronic Disease Link**

When the average nutrition-savvy consumer is asked about the benefits of vitamin D, their most likely answer would be that it was good for strong bones.

Bone tissue requires vitamin D in order to absorb and retain calcium. Post-menopausal women, for example, whose bodies are undergoing natural hormonal changes that result in the progressive loss of calcium from their skeletal tissue, will often take vitamin D supplements (alongside calcium) in order to prevent osteoporosis in later life.

In recent years, however, it has come to light that vitamin D fulfills a whole range of biological functions. Often, their precise physiological mechanisms remain poorly understood. Among these is the link between inadequate vitamin D intake and the development of cardiovascular disease and diabetes, for which there is a mounting body of scientific evidence.

In March 2015, for example, the journal *Cell Reports* published a paper indicating that vitamin D deficiency may be an underlying factor in fuelling inflammation, insulin resistance and the build-up of arterial plaques. Earlier this year, in February, a study carried out by the Institute of Biomedical Investigation in Malaga (Spain), and published in the *Journal of Clinical Endocrinology & Metabolism*, added further confirmation of a correlation between low vitamin D levels and impaired glucose metabolism—a precursor of diabetes.

Cardiovascular disease is the number one cause of mortality globally, and diabetes is major risk factor involved. If vitamin D fortification has the power to make a positive difference, it definitely warrants further investigation and, one might argue, prompt action.

**Prevention Cannot Start Early Enough**

 Recommending vitamin D supplements to the consumer group that is at imminent risk of being diagnosed with (or is already suffering from) chronic disease, namely mature adults, would be a very short-sighted approach. Cardiovascular disease can be decades in the making before there are any conclusive signs that something is wrong. A recent study, published in the *Journal of Clinical Endocrinology & Metabolism* in February 2015, concluded that low vitamin D levels in childhood may cause excess thickening of the arterial lining, leading to increased cardiovascular disease risk in adulthood.

Furthermore, low birth weight has long been known to correlate with increased risk of coronary heart disease in adults, and a meta analysis led by the University of Zaragoza in Spain revealed that vitamin D supplementation during pregnancy leads to a slight—but nevertheless significant—increase in birth weight. The systematic review was carried out by a team of scientists in Spain, Peru and the U.S. and was published in *Fertility and Sterility* in April 2015.

Interestingly, vitamin D deficiency during pregnancy is not just a problem in sunlight-deficient climes. A new study presented at the European Congress of Endocrinology in Dublin in May 2015 found that up to 90% of pregnant women in Spain, Italy, Greece and Turkey had low levels of the vitamin in their bloodstream. Particularly at risk were dark-skinned women and/or those who habitually covered up their entire bodies.
Babies born to vitamin D-deficient women are usually also deficient in the vitamin, and, after birth, their meager body stores dwindle fast. A study carried out by the University of Iowa and published in *Pediatric Research* in August 2014 discovered that, at one month of age, infants’ vitamin D levels were just half that of their mothers’, which led the researchers to argue in favor of vitamin D fortification right from birth.

**A Troubled History**
When it comes to the blanket administration of vitamins to the very youngest, health professionals tend to grow twitchy. And it doesn’t help that vitamin D has a bit of a fraught history in this regard.

The role of vitamin D in the prevention of rickets was discovered early last century, when the bone-deforming disease was a major public health concern across Europe (and also North America). Subsequently, milk, dairy foods and much of the rather limited offering of packaged foods that were available back then were fortified with the vitamin.

But in the early 1950s, the U.K. suffered a health scare: hypercalcaemia (excess levels of calcium in the blood) in infants, thought to have been caused by excessive vitamin D fortification. And although this was never conclusively proven as the causative agent, it led to the fortification practice being stopped, not just in the U.K., but all over Europe. Only margarines and some breakfast cereals continued to be fortified in many European countries.

Since rickets never re-emerged in the region as a pressing public health concern, neither mandatory nor voluntary addition of vitamin D across the food supply had ever been seriously reconsidered until the Finnish government decided to take action on the matter a little over a decade ago.

**Working Together to Strike a Delicate Balance**
So, over half a century has now passed since vitamin D fortification suffered a major—and possibly undeserved—setback. Science has moved on, and in the light of the crippling chronic disease burden that is threatening to throttle healthcare systems, it would be foolish to ignore such a potentially effective, cheap and simple measure.

More research still needs to be done, of course, to ensure that young children, in particular, are not exposed to any unnecessary risks. Vitamin D is fat soluble, and accidental overdoses can occur with this category of substances.

The writing—which is in favor of fortification—is on the wall, and it is only a matter of time before other European countries follow the example being set by the Nordic countries. The industry needs to work very closely together with the scientific community and public health authorities to design a sensible fortification plan, ideally composed of both voluntary and mandatory elements, to ensure maximum public health benefits on the one hand, and minimum risk to vulnerable consumers on the other.