

Essential oils

Food manufacturers have the unenviable task of convincing the average consumer that omega-3 fortified products have profound health benefits. Patience is required.

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The idea of adding polyunsaturates to everyday foods for health benefits is not a new one. Since the 1960s, the public has been exhorted to buy margarines that are 'high in polyunsaturates' because they are good for the heart. Twenty years later, it was realised that the polyunsaturates from fish are different to those from sunflowerseed oil and that they too have valuable health-promoting qualities. Since then, various foods with added fish oil have been launched, yet few have become popular in the UK so far. The question is: why?

Background

Polyunsaturates are divided into families on the basis of their structure. Two of these families are necessary for human (and animal) health. Since neither the human body nor animals can make these polyunsaturates, they must be supplied in the diet – hence the term essential fatty acids (EFAs).

The two EFA families are the omega-3 family (found primarily in fish and marine algae) and the omega-6 family (found principally in vegetable oils such as sunflowerseed oil). Both are necessary for optimal health. In fact, the evidence suggests that when one or the other dominates, health deteriorates. Nutrition experts are concerned that Western societies currently have an unbalanced polyunsaturate intake.

Not until the late 1970s did the true health significance of the omega-3 polyunsaturates begin to be appreciated. Work with Inuit people showed that although their diet was extremely high in fat and cholesterol, they rarely developed heart disease. The Japanese are also known for their large consumption of fish and, like the Inuit, show very low rates of heart disease. In short, it seems that the high level of omega-3 polyunsaturate in fish has a profoundly positive impact on heart health.

Fish oil and heart disease

Increasing omega-3 intake has a number of effects, all of which contribute to a reduction in the risk of heart disease:

- ❖ A fall in levels of fat (triglyceride) in blood
- ❖ A reduction in the risk of blood clot (thrombosis) formation
- ❖ A slight fall in blood pressure
- ❖ A reduction in blood viscosity
- ❖ A reduction in the development of dangerously unstable heart rhythms

Alone, not one of these factors is likely to be significant enough to account for the observed effects on heart disease rates. But a combination of effects over long periods is probably strong enough.

To date, controlled intervention trials have provided 'gold standard' evidence of the link between fish oil and heart disease. Over the past 12 years, three of these trials have been completed among people who have survived heart attacks. The main criterion for participation was likelihood of future attacks. All three studies showed a reduction in death rate of between 20 and 40 per cent among the patients given omega-3.

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Stroke

Stroke is what occurs when the blood flow to the brain is interrupted. When deprived of oxygen for more than a few minutes, brain tissue begins to die. Like heart attacks, a blood clot is the most common cause of a stoppage. Typically, a clot forms in the arteries that supply blood to the brain and block the flow. A 'thrombotic' stroke results.

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Animal tests have suggested that recovery from stroke is better when increased amounts of omega-3 are present in the diet. What is more, several epidemiological studies have shown that stroke is less common in people who eat moderate amounts of fish compared with those who do not eat fish at all.

Arthritis and other inflammatory diseases

The body uses polyunsaturates of both EFA families to create a range of powerful biological control agents called eicosanoids (prostaglandins, leukotrienes). When omega-3 polyunsaturates are added to the diet, the resulting eicosanoids are less overactive, which has an anti-inflammatory effect. The value of this effect has already been demonstrated in patients with arthritis, ulcerative colitis, psoriasis and kidney disease.

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Brain function

EFA's are major structural components of brain, eye and nerve tissue. Diet has been shown to affect brain polyunsaturate composition which, in turn, is proven to have an impact on how the brain works. This means that dietary changes can alter brain composition and could, ultimately, change human behaviour for the better.

So far, there is evidence to show that fish oil can help schizophrenics, children with dyslexia and children affected by ADHD (hyperactivity). Patients suffering from clinical depression also benefit from fish oil as do those who show aggressive behaviour under stress.

Foetal development

The docosahexaenoic acid (DHA) that a foetus need to build its brain, nerves and eyes derives from its mother. If the mother's diet does not contain enough DHA, her body stores will be seriously depleted once they have supplied the quantities necessary to ensure the foetus' healthy growth. Since the brain is a major DHA repository, it seems likely that a mother's brain may be called on to make up the shortfall once she has given birth.

Whether this process makes a mother more vulnerable to post-natal depression no one yet knows, but it remains a possibility. The impact of several pregnancies in quick

succession in a DHA-poor environment could be cumulative, with potentially serious consequences for the mother and her children. In such a scenario, the amounts of DHA available to build brain, nerves and eyes could diminish with each successive pregnancy. This in turn could lead to lower IQ and possibly a greater risk of problems such as dyslexia, hyperactivity, depression and schizophrenia, as well as heart disease and inflammatory diseases.

Health claims?

The 1994 Committee on Medical Aspects of Food and Nutrition (COMA) policy report recommended that UK adult consumption of long-chain omega-3 polyunsaturates should double from 100mg/day to 200mg through increased consumption of oil-rich fish. Though fish intake has increased since then, it has not doubled. It is safe to assume, therefore, that people in the UK need to include more omega-3 in their diet.

Addition of omega-3 oils to basic foods is an obvious way to encourage this process and manufacturers have made efforts to do this since the early 1980s. However, to date, it has proven virtually impossible for any product fortified with long-chain omega-3 polyunsaturates to gain significant market share in the UK.

First on the UK scene was a low-fat cake, followed by a spread, a white sliced loaf and brown pasta. Columbus eggs, laid by hens given linseed-enriched feed, are the only exception, having survived in the UK for several years. Recently, eggs from Stonegate Farms and a sliced loaf from Warburtons have joined the line of hopefuls. Whether or not they succeed will depend in large part on the staying power of their backers and their resources.

Explaining to consumers why they should pay more for a product with added omega-3 is difficult. Even more challenging is getting them to accept that they should pay more without having positive assurance that the product will protect them from heart disease (make their children better behaved, alleviate depression and so on).

All is not gloom and doom, however. Recent evidence that one UK consumer in six supplements their diet with omega-3 (mostly with cod liver oil capsules) suggests that the 'omega-3 is good for you' message is getting through. The establishment of the UK Joint Health Claims Initiative also makes it more

likely that approval of an 'omega-3 is good for your heart' claim will be granted sooner rather than later. The FDA, Canada's Health Protection Branch and EU legislators are also examining proposals for 'disease risk reduction' claims, which will facilitate the success of omega-3 fortified foods.

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How much is enough?

The problem with a health claim is that it needs to be linked to the delivery of a specific amount of the active substance so that the label can make the claim 'product X is a rich source of omega-3', 'consumption of omega-3 polyunsaturates may help to maintain a healthy heart' and so on.

If it can be agreed that intake of the COMA recommended daily 200mg of long-chain omega-3 polyunsaturates per person is a desirable target, then foods supplying 40-50mg per serving should be able to make the 'rich source' claim, and foods supplying 20-30 mg should be able to describe themselves as 'sources' of omega-3.

But the process will not be cheap, quick or easy. Consider the sums that Unilever has spent over the past 20 years promoting Flora margarine with the 'polyunsaturates are good for your heart' message. Consider also the length of time it took to achieve success. But consider also the rewards of that success. Food manufacturers must not be deterred by the fact that the road to market penetration will be a long and hard one.

The omega-3 fortified products that will succeed will be backed by companies with patience, money, and a brand name and market presence consistent with the message they are delivering. Keen observers will note that Unilever has recently announced the addition of omega-3 to its Flora range of margarines. ❖