- **Asthma has increased in the UK by 250% in the last 20 years**
- **Environmental factors and family history play a part**
- **Diet is important in determining risk; and dietary changes have been critical in driving the increase in asthma**
- **A diet rich in fruits, vegetables and Omega 3 fatty acids is protective; a fast food diet increases the risk significantly**
- **Flavonoids, and the sterols and sterolins, are effective therapeutic agents**

Chapter 19

Unlocking the chest

When I was at school there was a boy with asthma. Unable to do sports, and having to miss classes nearly every week, he was an oddity. Today there are asthmatic children in every classroom, and schools have cupboards full of their pupils' inhalers. The latest UK figures show that one child in eight is being treated for asthma, while another one in eight have asthma but are untreated. This means that one child in four is now asthmatic, and one in 12 adults. Worryingly, some scientists say the situation will deteriorate even further[1].

Asthma is distressing, and can be disabling. And although current treatments suppress the symptoms, they cannot cure. Pharmaco-nutrition, however, may offer something altogether more substantial. But to understand this, we need to understand what asthma is.

Complementary/ Alternative Medicine (CAM)

USA: 425 million CAM visits vs 388 million visits to primary care providers, 1990[9].

UK: CAM and orthodox treatments 'on equal terms'[10].

USA/UK: CAM more popular in allergy and asthma than any other chronic diseases[11].

These figures clearly show that many asthmatics are unhappy with current drug therapy.

Understanding what asthma is

To the sufferer, asthma means recurrent episodes of wheezing, breathlessness and coughing, and hyper-reactive airways that twitch and constrict in response to trigger factors such as cold air, exercise, house dust, animal dander, pollen etc. Doctors think of asthma in terms of bronchial smooth muscle spasm, with inflammation and oedema of the airways, and mucous plugging. To the immunologist, asthma is a chronic inflammatory disorder of the airways involving mast and T-cells, eosin- and neutrophils,

macrophages and epithelial cells[2]. The inflammation is basically an over-active local immune response, which is why the immuno-suppressant steroids are so often used to treat it.

Cause v. Trigger

The asthmatic has inflamed, hyper-reactive airways. Smoke, animal fur, pollen and exhaust fumes can trigger attacks in such a subject – but are not **causes** of asthma.

The real cause is dietary shift, which has led to multiple micro-nutrient depletion; leaving irritant receptors exposed, reducing our intake of anti-inflammatory compounds like sterols and flavonoids, and pushing the bronchioles toward inflammation.

Risk Factors

A good deal of work has been done to identify risk factors. Family history is one, especially if the mother was asthmatic. Atopy – a genetic predisposition to develop allergy-type responses to inhaled allergens – is another[3], and has been linked to a specific genetic mutation (ADAM33) by Professor Stephen Holgate's group at the University of Southampton. On the other hand, breast feeding has been identified as protective[4].

But do any of these factors really matter?

The incidence of asthma has increased in the UK by 250% in last 20 years[1]; the USA, where under-reporting is common, has shown a 100% increase over the same period[6, 7, 8]. Our genes haven't changed in two decades, so these huge increases in asthma must be caused by environmental factors. House dust mites, traffic fumes and the so-called 'hyper-clean environment' were fashionable culprits for a while, but have all fallen from favour; leaving diet, and dietary change, as the main suspect.

Diet is highly significant in determining the risk of developing asthma. Many research papers show that the risk is greater in those who eat less fruit and, to a lesser extent, vegetables and oily fish such as herring or mackerel[12-21]. It is no coincidence that during the last 20 years, while the incidence of asthma was doubling and trebling, our intakes of fruit and vegetables were in persistent decline – as was our consumption of oily fish.

Fast Foods

Children are abandoning traditional diets for junk food. A recent key study showed that children who ate more fruit, vegetables and grains were protected from asthma; those who ate at fast food outlets were at far greater risk[49].

Partly in response to these data, a range of nutritional products have appeared on the market. Magnesium supplements relax the smooth muscle in the airways[22], but do little to affect the underlying disease. Omega 3 fatty acids help reduce asthma attacks, but only at doses over 3-4g per day[40-41]. The functional food 'Airozin', which delivers these sorts of doses, gives some benefit[23] but is unduly expensive.

More interesting candidates include quercitin, a powerfully anti-inflammatory flavonoid derived from apples and onions. It

undoubtedly helps in some cases, but is not yet proven in clinical trials. Lyprinol, an extract derived from the green lipped mussel, is another powerful anti-inflammatory agent[24], shown to be effective in rheumatoid arthritis[25] and asthma[26].

Lyprinol is supposed to work by supplying Omega 3 fatty acids, but this is incorrect, as it contains relatively little – less than 300mg a day. The active ingredients in Lyprinol are actually sterols and sterolins, molecules rather like cholesterol which are powerful immuno-modulators, and extremely good at damping down the B-cells that dominate the inflammatory process[27-29].

Sterols and sterolins are also the active ingredients in Moducare, an extract of pine oil which is generating very positive results in arthritis and asthma[30]. Even more exciting is news that these compounds' ability to stimulate T-cells is helping HIV+ patients to keep the virus at bay. More on this in the next edition!

Sterol(in) – essential micro-nutrient?

Sterols and sterolins help immune systems from over-reacting. Dietary changes which have reduced our intake of these 'damping' compounds are undoubtedly linked to increased incidence of asthma.

Sterols and sterolins have been shown to help conditions such as rheumatoid arthritis, benign prostatic hyperplasia and asthma[26,43-46].

TOP FOODS FOR STEROLS AND STEROLINS[48, 54]

per 100g

Rice bran	735mg
Scallops	681mg
Clams	518mg
Sesame seeds	443mg
Oysters	362mg
Sunflower seeds	349mg
Avocado	76mg

Sterol(in) Remedies

Saw Palmetto, pumpkin seeds and the herb Pygeum africanum are all traditional remedies for prostate disorders. All contain sterols and sterolins and should be beneficial to asthmatics.

Sterol absorption problems

Absorption of sterols and sterolins from food is reduced by cholesterol in meats and dairy products; and by the sterol and stannol esters in cholesterol-lowering margarines. Excess consumption of these foods depletes the body of sterols and sterolins and may therefore increase the risk of inflammatory diseases[47].

Sterols and sterolins seem to be particularly important in maintaining prostate health. In Germany, the sterol/sterolin medicine Harzol has long been used to treat prostatitis and benign prostatic hyperplasia[50-52]. Long-term users of cholesterol-reducing spreads are especially likely to be depleted in sterols and sterolins; recent reports suggest that male consumers do indeed have a higher incidence of prostatitis[47].

Asthma – a multi-faceted disease

Many different things are going wrong in asthma. Irritant receptors in the airways, normally covered by layers of protective phospholipids, are exposed and begin to react to inhaled particles that do not affect healthy lungs. Gaps between the cells that line the airways open up, allowing those particles to enter the tissues and encounter immune cells, which recognise them as foreign and mount an immune response. Inflammation and oxidative damage ensue, leading to twitchy, inflamed lungs and all the symptoms of asthma.

In the process, a cascade of destructive enzymes are activated

with names such as PLA2, COX, 5-LO, matrix metallo-proteases (MMPs) and proteases. Inflammatory mediators flood out, with names like HETEs, leucotrienes, prostaglandins, Tumour Necrosis Factor alpha (TNFa), Platelet Activating Factor (PAF), interleukins, cholesterol oxidation products (COPs), nuclear factors and others.

Herbs and spices

Other routes to asthma healing originate in the herb garden, spice rack and fruit bowl. Unfamiliar to the drug-trained professional, but easily understood in terms of their actions in the body, these invaluable foods include tomatoes (which provide lycopene), berries (which yield oligomeric pro-anthocyanins), turmeric (curcuminoids), and ginkgo (terpene lactones and flavonoids). A diet rich in these foods (or a well-designed supplement programme that includes lycopene, flavonoids, blueberry extract and anti-oxidants) often provides, in my experience, very significant relief from asthma. They are best used in combination because each one blocks a different part of the complex process that drives the inflammation of the airways.

Slow cooking

Foods cooked at high temperature contain glycation end products (AGEs) which exacerbate inflammation of the lungs and elsewhere in the body. Asthmatics should switch to low temperature cooking – ie no fast foods, which combine toxic AGEs with few protective micro-nutrients[5].

A multi-faceted defence

To deal with the complex biochemistry of asthma we need a multi-faceted defence strategy. This is why the fruit and herb extracts work best in combination.

Ginkgo, for example, reduces PAF formation and activity[31, 32]. The pro-anthocyanins in berries (particularly elderberry, chokeberry and blueberry) reduce the formation of the tissue-destructive MMP enzymes[33], and block them as well[34]. The curcuminoids in turmeric inhibit the inflammatory substance interleukin 1 alpha[35], and damp down TNFa and Nuclear Factor Kappa B[36-38].

Add phospholipids to the programme (as in lecithin, for example), to re-cover the irritant receptors[39]; and a selection of the usual anti-oxidants and anti-oxidant co-factors to reduce oxidative stress in the affected tissues, and by now the entire respiratory system has calmed down.

In my experience, even quite severe asthmatics who tried this regime were able to come off oral steroids, and maintain themselves perfectly well with occasional inhaler use. If a sterol-sterolin supplement such as Moducare or Lyprinol is added to the mix, asthma medications can often be stopped altogether. Try it yourself.

Fast Foods = Slow Disease

1 **High cholesterol** blocks uptake of anti-inflammatory sterols and sterolins.

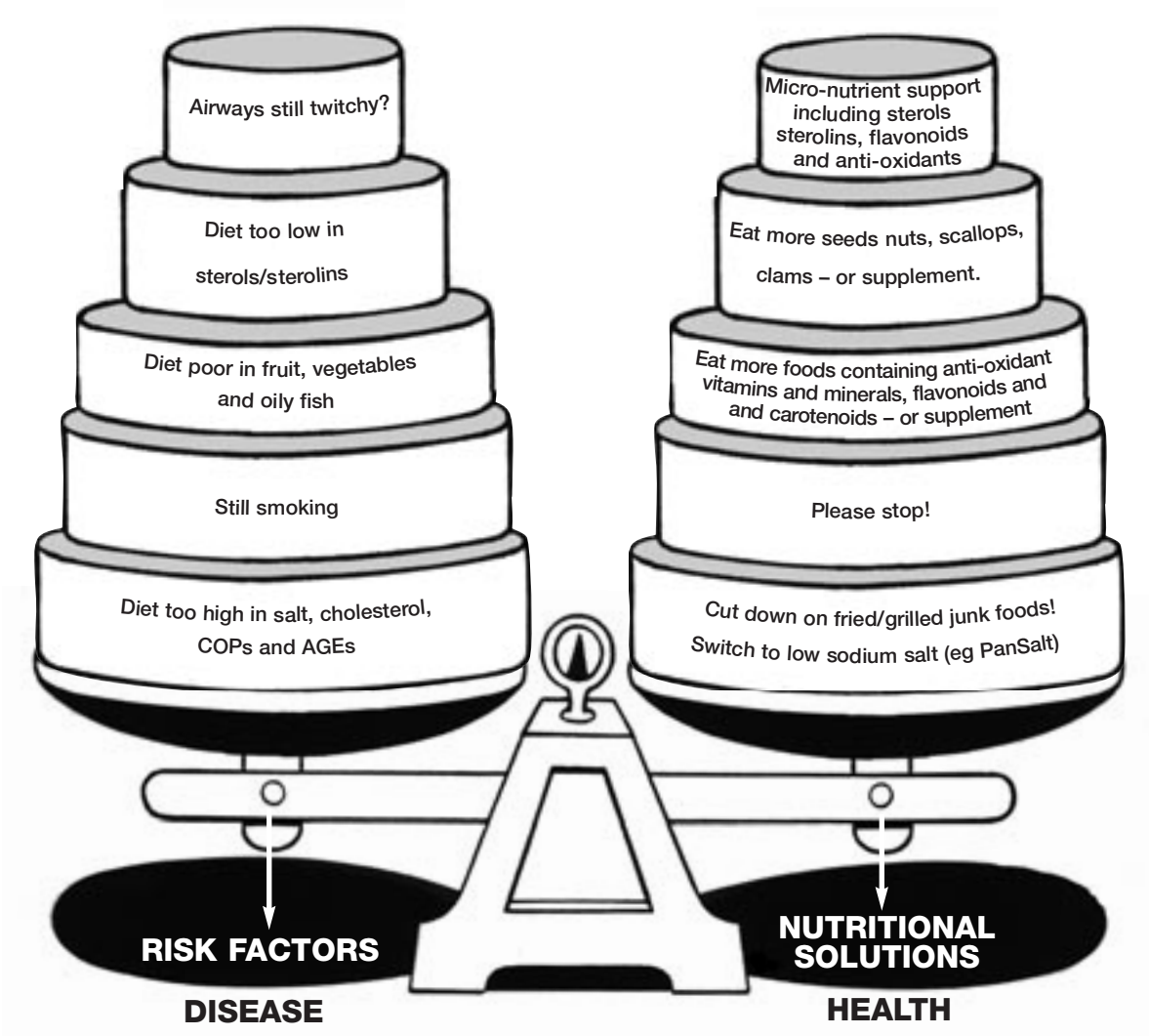
2 **High temperature cooking** produces pro-inflammatory AGEs and cholesterol oxidation products (COPs).

3 **High sodium** increases bronchiolar constriction.

4 **Fast-digesting sugars and starches** make surges in blood glucose and insulin.

Preventing asthma

Counterbalancing the risks



SUMMARY

Avoiding and treating asthma

- The incidence of asthma has increased by 250% in the last 20 years in the UK.
- Asthma = inflammation of the airways. Inflamed airways are twitchy and hyper-reactive to stimuli which have no effect on normal lungs.
- Asthma attacks may be triggered by irritants, eg smoke or house dust mite, pollen or animal dander – but these do not cause asthma.
- Quercitin, a powerful anti-inflammatory flavonoid obtained from onions and apples, helps some people
- Because of dietary shift, we have become depleted in protective, anti-inflammatory micro-nutrients.
- Children who eat a fast food diet are much more at risk of asthma those those who eat a traditional diet.
- A diet rich in fruits, vegetables, nuts, seeds and wholegrains is protective.
- The anti-asthma micro-nutrient programme should contain lecithin and the anti-inflammatory agents flavonoids, sterols/sterolins and the Omega 3 fatty acids.
- In a supplement look for sterol/sterolins (Moducare is probably the best), the full range of anti-oxidant trace elements – zinc, copper, manganese, selenium and iron (if needed), flavonoids at 250mg or more, mixed carotenoids at 15-20mg, Vitamin C at 500mg and Vitamin E at 200mg or mixed tocopherols at 100mg.