

## APPENDICES

*W*hat are the best nutrient forms?

*D*rug/nutrient reactions

*T*otal anti-oxidants in dietary plants

*G*<sup>I</sup> Table of Foods

## APPENDICES: Nutrient forms

### WHAT ARE THE BEST NUTRIENT FORMS?

In some cases the **form** of the nutrient matters a great deal. So if you follow the optimum supplement programme proposed on page 348, you should check to ensure that the following nutrients are in the form recommended.

#### Vitamins

Vitamin E	natural (dA tocopherol succinate) plus mixed tocopherols
Vitamin A	retinol (oil filled capsules)
Vitamin B1	thiamin hydrochloride
Vitamin B3	nicotinamide
Vitamin C	without sodium

#### Carotenoids

Mixed	oil-filled, light-opaque capsules
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#### Minerals

Iodine	potassium iodide
Iron	ferrous fumarate

#### Trace minerals

Zinc, Selenium )	in food state forms, ie yeast or 'chelated' (bound to amino acids)
Chromium, Manganese )	
Molybdenum, Copper )	

#### Flavonoids

Polyphenols	Green tea powder or leaves
Oligo-proanthocyanidin	(OPCs) Grapeseed or bilberry extract
Isoflavone complex	Soy extract containing genistein, daidzein and other isoflavones in aglycone form

#### Other nutrients

Omega 3	gel capsules with Vitamin E Look for the highly concentrated fish oils containing 60% Omega 3 oils, delivering approx 330mg EPA and 220mg DHA (both are Omega 3 oils)
Q10	oil-filled, light-opaque capsules
Glucosamine	hydrochloride, not sulphate

**Notes: FOS:** Doses of Oligofructose should not exceed 5g unless laxative effects are desired. Start with a low dose and build up in stages; some people are very sensitive to these compounds. It can be stirred into fruit juice or yoghurt or sprinkled on cereal.

**Iron:** Iron-deficiency anaemia is common amongst teenagers and women of child-bearing age. This group only should supplement with iron at 10mg a day, if indicated.

## DRUG/NUTRIENT INTERACTIONS

A final note of caution to all self-supplementers. The micro-nutrients listed in this book have many positive effects, and can bring about striking improvements in function and well-being. But this very activity may, in some circumstances, amplify or reduce the effects of certain medications. This is one of the reasons why we urge you

to check with your doctor before embarking on any intensive nutraceutical programme.

The better known drug/nutrient interactions are listed below. The list is not comprehensive, and I will be grateful to hear from any practitioners or clinical scientists who know of any other interactions.

**A** Nutrients which may **amplify the effects** of certain drugs. Here, taking a supplement may permit the dose of a drug to be reduced; or it may necessitate reducing the dose of the drug(s) to prevent overdose.

<b>Bromelian</b>	Anti-coagulant, thrombolytic and anti-hypertensive drugs
<b>Betaine</b>	Anti-depressants
<b>Carnitine (high dose)</b>	Anti-angina, anti-arrhythmic and lipid-lowering drugs
<b>Cayenne</b>	Anti-coagulants
<b>Chromium</b>	Oral hypoglycaemic drugs
<b>Co-enzyme Q10</b>	Anti-hypertensive, anti-angina and anti-arrhythmic drugs
<b>Garlic (high dose)</b>	Anti-coagulant drugs
<b>Ginkgo</b>	See proanthocyanidins
<b>Ginseng (Korean)</b>	Diuretics
<b>Hawthorn</b>	Anti-hypertensive, anti-arrhythmic and anti-angina drugs, also tranquillisers
<b>Magnesium</b>	Anti-hypertensive, anti-angina, anti-arrhythmic and anti-coagulant drugs
<b>Niacin (high dose)</b>	Cholesterol-lowering drugs
<b>Non-digestible oligo-saccharides (pre-biotics)</b>	Cholesterol-lowering drugs
<b>Omega 3 fish oils (low dose)</b>	Anti-arrhythmic drugs
<b>Omega 3 fish oils (high dose)</b>	Anti-coagulant, lipid-lowering and anti-inflammatory drugs

## APPENDICES: Interactions

<b>Potassium</b>	Anti-hypertensive, anti-angina and anti-arrhythmic drugs
<b>Proanthocyanidins (and most flavonoids)</b>	Anti-coagulant, anti-hypertensive and anti-inflammatory drugs, and in some cases anti-histamines also
<b>Soy isoflavones</b>	HRT, Tamoxifen
<b>Taurine</b>	Anti-hypertensive, anti-angina, anti-arrhythmic and lipid-lowering drugs
<b>Vitamin E (high dose)</b>	Anti-coagulant and anti-arrhythmic drugs
<b>5-HTP</b>	Prozac and similar serotonin-specific anti-depressants

**B** Nutrients which may **reduce the efficacy** of certain drugs. Here, taking a supplement may contribute to treatment failure.

<b>Fibre (ie brans)</b>	May reduce absorption of minerals including iron and calcium
<b>Fibre (insoluble, ie pectins)</b>	May reduce absorption of the cholesterol-lowering drug lovastatin
<b>Folic acid</b>	Anti-folate drugs such as methotrexate, trimethoprim
<b>Iron</b>	May reduce absorption of carbidopa (anti-convulsant), thyroxine (thyroid hormone), captopril (anti-hypertensive)
<b>Vitamin B6</b>	Anti-Parkinsonism drug levodopa
<b>Vitamin K</b>	Anti-K anti-coagulant drugs such as warfarin

## TOTAL ANTI-OXIDANTS IN DIETARY PLANTS

A diet rich in fruits and vegetables reduces the risk of many diseases, and there is good evidence that the protective effects are mediated via anti-oxidants. Each food plant contains hundreds of different anti-oxidant compounds. As trials with single anti-oxidants (Vitamins C, E and beta carotene) have been negative<sup>(1-4)</sup>, the health benefits of plants are clearly mediated by the other anti-oxidant compounds they contain.

At the University of Oslo, Professor Rune Blomhoff has developed a new method of measuring the total anti-oxidant capacity of foods: the so-called FRAP assay.

The table below is derived from his important paper in the Journal of Nutrition<sup>(5)</sup>, showing the highest ranking foods in each category. Berries have the highest scores; but as most people consume much larger amounts of fruits and cereals, these tend to contribute most anti-oxidant capacity to the diet. The validity of the ranking is supported by the long-established medicinal use of most of the plant foods cited.

For the technically minded, FRAP values are measured in terms of mmol Fe+++ -> Fe++ per 100g food.

PLANT	Anti-oxidant Score FRAP	PLANT	Anti-oxidant Score FRAP
<b>BERRIES</b>		<b>ROOTS</b>	
Rose hip	39.46	Ginger	3.76
Pomegranate	11.33	<b>FRUIT and VEGETABLES</b>	
Crowberry	9.17	Chilli pepper	2.48
Blueberry (wild)	8.23	Kale	2.34
Blackcurrant	7.35	Red cabbage	1.88
Strawberry (wild)	6.88	Bell pepper (sweet pepper)	1.85
Blackberry (wild)	6.13	Parsley	1.70
Sour cherry	5.53	Grape	1.45
Blackberry (cultivated)	5.07	Orange	1.14
Cranberry	5.03	<b>PULSES</b>	
Elderberry	4.31	Broad bean	1.86
Raspberry (wild)	3.97	Pinto bean	1.14
Blueberry (cultivated)	3.64	<b>CEREALS</b>	
Raspberry (cultivated)	3.06	Wholemeal barley	1.09
Strawberry (cultivated)	2.17	Wholemeal oats	0.59
<b>NUTS &amp; SEEDS</b>		White flour (wheat)	0.13
Walnut	20.97	White rice	0.17
Sunflower seed	5.39		
Sesame seed	1.21		

### NOTES

Berries: cultivated plants give significantly lower FRAP scores than wild plants. Growth in the wild requires plants to produce more defence compounds, many of which are anti-oxidants.

Cereals: refined cereal products give lower FRAP scores than wholemeal equivalents. Much of the cereal's antioxidant capacity is contained in the outer parts of the grain.

## GLYCEMIC INDEX – TABLE OF FOODS

When sweet and starchy foods are eaten and digested, they pour glucose into your blood. The total amount of glucose delivered by the modern diet (the ‘Glycemic Load’) is about ten times higher than the diet we were designed to eat. The resultant changes in blood sugar and lipids are now considered to be an extremely significant risk factor for Type 2 diabetes, cardiovascular disease and cancers of the colon and breast<sup>(6-10)</sup>. There is also evidence that the insulin responses to repeated surges in blood sugar lead to weight gain<sup>(11,12)</sup>.

There is a strong case for changing our diet in a way that will reduce the amount of sugar entering our bloodstreams; as reflected in the WHO’s recommendation to reduce sugar intake to 30g/day or less, which is of course strongly resisted by the

sugar industry. The Glycemic Index (or GI factor) is a ranking of foods from 0-100 that allows us to achieve this; by shifting the balance from high GI foods (GI > 70) to intermediate (GI 55 – 70) and low (GI < 55) foods. Some foods are effectively zero GI eg the oils and fats, and the intense sweeteners aspartame, steviosides, etc.

The GI of glucose (the so-called ‘energy sugar’) is set at 100, while the GI of white sugar is 58. This is because starch breaks down entirely to glucose, while white sugar breaks down to form 50% glucose, and 50% fructose. All other foods are compared to these standards; and the figures below are from the definitive table of nearly 1300 foods, drawn up by Professor Janette Brand-Miller at the University of Sydney<sup>(13)</sup>.

### GI Factors of Foods (relative to glucose @ 100)

<b>Cakes, sweets, etc</b>		<b>Breads</b>		Rice (white)	56
Croissant	67	Bagel	72	Rice cakes	78
Sponge cake	46	Baguette	95	Spaghetti (white, boiled)	58
Pancakes	67	Barley bread (coarse)	40	<b>Fruit and Vegetables</b>	
Scones	92	Barley bread (fine)	67	Apples	38
Ice cream	40–50	Rye bread (pumpernickel)	50	Bananas	52
Skittles	70	Wheat bread (coarse)	53	Oranges	42
Snickers	55	Wheat bread (fine)	70	Peaches	42
Table sugar	58	<b>Cereals</b>		Plums	39
<b>Drinks</b>		<i>Bran Flakes</i> (Kelloggs)	74	Prunes	29
<i>Coca Cola</i>	58	<i>Cheerios</i> (General Mills)	74	Sultanas	56
<i>Lucozade</i>	95	Cornflakes	81	Strawberries	40
Apple juice (unsweetened)	40	Muesli	40–60	Potatoes	85
Tomato juice	38	(depending on coarseness of milling and added sugar)		Sweet potatoes	61
<i>Yakult</i>	46	Porridge (rolled oats)	58	Swede	72
<i>Gatorade</i>	78	<i>Shredded Wheat</i>	75	Yams	37
<i>Isostar</i>	70	Crisped rice	87	Carrots	32

### NOTE:

It is quite difficult to use the table to make up a menu, so here is a rather simpler guide. To bring down the glycemic load of your diet, eat less confectionery, sweet biscuits and white breads; cut down on potatoes and use more:

- Low GI breakfast cereals based on wheatbran and oats
- Wholegrain breads especially barley and rye
- Pasta (instead of potatoes)
- Use low or zero GI ingredients when preparing foods, eg *Litesse*, *Splenda*, aspartame (*Candere!*).
- Low GI fruits: pears, plums, apples
- Beans, pulses, nuts, seeds and green leaf vegetables are all low GI foods
- When buying processed foods, look for low or zero GI sweeteners used instead of sugar, eg xylitol, aspartame, *Litesse*, *Splenda*.

More GI data is available on Professor Brand-Miller's website [www.glycemicindex.com](http://www.glycemicindex.com)