

The Hypoglycemic Health Association

NEWSLETTER

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The NEWSLETTER of the Hypoglycemic Health Association is distributed to members of the Association and to Health Professionals with an interest in nutritional medicine and clinical ecology.



Please note that the **Annual General Meeting** will be held at 1.30 pm half an hour before the public lecture by Dr Mark Donohoe. Copies of the Statement of Income and Expenditure for the year ended 31 December 1997 and the Auditor's report will be made available at the meeting. The Association would like to thank Mr Hugh Macfarlane, Chartered Accountant, for his free time given to the Association in the preparation of these documents. The activities of this Association are entirely voluntary. We don't receive any funding from government or private industry. Yet the cost of provision of public lectures and distribution of our Newsletters are the lowest of its kind, thanks to the members and the assistance given by health professionals. We also would like to thank Dr Robert Buist for sending copies of The International Clinical Nutrition Reviews, which keeps us up-to-date with the latest developments in clinical nutrition. This year we received a donation from Caryn Preston of Stockton. Many members have already paid the 1998 membership fees, but many others have not as yet sent in their fees. Expiry dates are shown in the top-right corner of address labels. We need more members, though, to keep us going. If you know of anyone that might be interested in becoming a member, please send in his/her name and address and we will send one free copy of the Newsletter as an introduction. Take photographic copies of the application form on the back of the Newsletter. Fees have remained the same: \$15 pa or \$10 for pensioners and students.

Our Next Public Meeting will be at 2 PM
on Saturday, the 7 March, 1998
at the YWCA,
2 Wentworth Ave, Sydney and
our guest speaker is

Dr Mark Donohoe MB BS FASEM

who will be speaking
on the subject of

***"Managing Multiple
Chemical Sensitivity"***

Dr Mark Donohoe is well known in the area of natural and environmental medicine. In 1980 he obtained his bachelor of medicine and surgery at the Faculty of Medicine at Sydney University. He received further postgraduate qualifications with the Australian College of Nutritional Medicine and the Australian Society of Environmental Medicine. He was a founding member and now President of the Australian Comprehensive Medicine Association (ACMA) with a membership of about 200 medical practitioners. This association promotes and fosters safe and effective complementary medical practice within a framework of Total Health Care.

From 1991-1996 he was clinical director of the Original Australian Chronic Fatigue Syndrome team at the University of Newcastle using data gained from patients referred to the Environmental Medicine Centre (EMC) at Manly. He has contributed scientific article discussing the relationship between low level contamination with organochlorine pesticides and alteration of immunology and haematology [J Biochem and Molecular Medicine (1996 Jun) 58(1): 77-84].

Dr Mark Donohoe is an excellent public speaker and the Association is lucky to have him talk to us

on Saturday, 7 March 1998. March, 1998, Vol. 14, No 1

Previous Copies of the Hypoglycemic Newsletter

Back issues of the Hypoglycemic Newsletters are available at the NSW State Library, Macquarie Street, Sydney. They are filed under NQ616.466006/1 in the General Reference Library.

Other libraries holding copies are: Stanton Library, North Sydney; Leichhardt Municipal Library; The Tasmanian State Library; The Sydney University; The University of NSW, Newcastle University. The Association will provide free copies to any library upon request.

Books for sale at the meeting

Jurriaan Plesman: **GETTING OFF THE HOOK**

This book is also available in most public libraries (state and university)

Sue Litchfield: **SUE'S COOKBOOK**

Any opinion expressed in this Newsletter does not necessarily reflect the views of the Association.

Dr George Samra's book

The Hypoglycemic Connection

(now out of print) is also available in public libraries.

Contributions of articles by members and practitioners are very welcome. The Editor is interested in meeting any person aspiring to research natural medicine and contribute articles as a sub-editor to this Newsletter.

The Newcastle branch of the Association are still meeting with the assistance of Bev Cook. They meet on the last Saturday of each month beginning 1.30 pm to 3.30 pm at the Hillsborough Primary School. Enter the school from the Waratah Avenue. For further information ring Mrs. Bev Cook at 049-59-4369.

Local meetings at Wahroonga

Marina Bridle would like to meet other

members for mutual support and discussions. Her phone number is **9487 2910**.

Entrance fee at meetings

Because of increase in costs the Committee has decided to charge an entrance fee of \$2 per person or \$3 per family at our public meetings.

Donations for raffle

One way of increasing our income is by way of raffles. If any member has anything to donate towards the raffle, please contact Dr George Samra's surgery at 19 Princes Highway, Kogarah, Phone 9553-0084. The Association thanks Elaine Campbell of Gynea for her donation of a plate for the raffle held at the 6th December 1997 meeting.

At the last meeting, **Nicole Samra** won the lucky door prize and unbelievably a second prize. She has just finished her final school examinations and we wish her the best of luck. **Gesina Den Dulk** also won the raffle at our last public meeting on the 6 December 1997. Please note that Gesina has won raffles at the last three meetings in a row. You better sit close to Gesina at the next meeting, you never know, her luck might rub off.

THE WHOLISTIC MANAGEMENT OF MENOPAUSE AND PRE MENSTRUAL SYNDROME

By Dr Katrina Watson

Menopause

Menopause is the cessation of menstruation and fertility. It occurs between the age of forty five to fifty five and may be a brain event rather than the popular conception that the ovaries run out of their egg supply and shrivel up.

An experiment conducted with mice revealed that young mice with old ova were able to reproduce, while old mice with young ova were infertile.

The result of menopause is that fewer egg follicles are stimulated. This results in reduced progesterone, oestrogen and testosterone, and menstruation ceases. The production of hormones does not cease altogether, it continues in the adrenals, body fat and a small amount from the ovaries. Better insulated women therefore continue to produce more oestrogen.

Symptoms of Menopause

- Hot flushes due to luteinizing hormone (LH)¹ rise in response to a decrease in the amount of progesterone and oestrogen.

- gen.
- Depression, irritable, panic attacks, decreased ability to cope, decreased self confidence
- Decreased libido, vaginal dryness, susceptibility to thrush
- Fatigue
- Unstable blood sugar levels
- Urinary symptoms
- Rheumatic aches and pains
- Memory impairment
- Androgenising effects such as facial hair can occur when the ovaries continue producing relatively higher amounts of testosterone than oestrogen.

Increased risk of:

- Osteoporosis
- Heart Disease

The role of Oestrogen (Oestradiol, Oestrone, Oestriol)

- Build up endometrium
- Secondary sexual characteristics
- Slows bone loss
- Improves HDL: LDL (cholesterol) ratio which leads to a decreased risk of

heart disease.

The role of Progesterone

- Produced by ovary after ovulation and placenta in pregnancy
- Fall in progesterone 2 weeks after ovulation causes shedding of endometrium/ menstruation
- In pregnancy progesterone increases secretory lining of endometrium which is essential for fertilised egg implantation
- Low amounts of progesterone leads to miscarriage
- Progesterone is a precursor for other hormones - oestrogen, testosterone, cortisone, thyroid

Cholesterol Progesterone sex and cortico steroid hormones

- Counters stress and aids immunity (precursor of cortisone)
- Burns fat
- Normalises blood clotting
- Strengthens and hydrates skin

- Prevents osteoporosis, creates new bone growth
- Diuretic: so protects against the oedema and sodium ion retention caused by oestrogen
- Antidepressant
- Restores libido. Surge of progesterone at ovulation increases libido.
- Synergistic with oestrogen - increased sensitivity of oestrogen receptors and is converted to oestrogen
- Protects against fibro cystic disease of the breasts
- Only 2 roles shared by synthetic progesterone [Hormone Replacement Therapy (HRT)] = protection against cancer of uterus and sustains lining of uterus - decreases heavy bleeding

Should menopause be treated?

Whether to interfere at the time of menopause is a decision each woman will make for herself. It may depend on whether there are symptoms which are compromising the quality of her life (e.g. hot flushes, depression) and whether there is an increased risk of diseases such as heart disease or osteoporosis.

Although menopause is a natural event, the average life expectancy of women in 1900 was fifty years; in 1990 it is eighty years. With women living almost another life time again after menopause, the need to understand the management options is very important.

The management of Menopause

Examination and Investigations:

- Pap smear
- Breast examination and teach monthly breast self examination
- Blood pressure and cholesterol assessment
- Test urine for glucose
- Mammogram
- Bone densitometry to evaluate the risk of osteoporosis

Treatment Options:

Oestrogen:

- Asian countries have a higher proportion of phyto-oestrogens in their diet. They also have a lower incidence of breast and colon cancer, heart disease, osteoporosis and menopause symptoms
- 2 cups phyto-oestrogens (soy, linseed, yam and rice)
- Red Clover tablets, strongest of the plant oestrogens; 200 times weaker than human oestrogen
- Human oestrogen replacement - Strongest = oestradiol tablets, implants and patches; Weakest = oestriol tablets or vaginal cream

Herbs with oestrogenic action:

- Dong Quai ("restores warmth and vitality to the tissues", thickens wall of vagina, nourishes skin)
- Black Cohosh (natural salicylates for muscle and joint pains, relieves fatigue)
- Licorice (tonic for adrenal exhaustion/

fatigue)

- Sarsaparilla (slight testosteronal effect, therefore has been used as an aphrodisiac)
- Vitex Agnus - castus (hormone balancing, also progestogenic action)
- Sage (drying herb for flushes with sweats)
- Fennel
- Hops and alcohol

Progesterone

- Yam cream - which enters blood stream transdermally
- Troches - dissolve in mouth to enter blood stream directly, thereby avoiding digestion and liver breakdown
- Synthetic (HRT)

Wild yam (Dioscorea) contains a plant hormone which has a potent anti-inflammatory action and is very similar to progesterone and DHEA. Some creams contain this plant hormone while other creams and troches contain human progesterone which has been converted from the soy bean or yam plant hormone. Both are useful in treating depression, loss of libido, fatigue, fluid retention, muscle and joint pains, increasing bone density.

Anti-oxidants:

- Oxygen free radical scavengers
- Free Radicals cause cell damage and are produced by stresses such as pollution, pesticides, dietary fats, electromagnetic radiation, and excessive sunlight.
- Common anti-oxidants include vitamins A, C, E, Zinc, and Selenium

B Complex:

B vitamins assist neurological system and adrenals resulting in decreased stress, increased energy and increased memory.

Exercise 3 times per week:

- Increases circulation
- Increases energy
- Stimulates digestion
- Strengthens bones
- Regulates hormones
- Increases ability to cope with stress

Diet:

- Decreased coffee, sugar, alcohol, fat
- Increased water (1-2 L)

Additional Herbs:

- Chinese herbs
- St. John's Wort (depression, anxiety)
- Siberian ginseng (mental alertness, ability to cope with stress, fatigue)
- Dandelion tea (liver drainage, diuretic)

What's wrong with coffee?

- Insomnia
- Loss of important minerals and vitamins (leads to osteoporosis)
- Blood vessels constrict which leads to high blood pressure and headaches.
- Increases cholesterol
- Unstable blood sugar
- Increased stomach acid
- Dehydration (diuretic)

HORMONE IMBALANCE - PRE MENSTRUAL SYNDROME AND PERI-MENOPAUSE

Normal Hormonal Situation:

- **Oestrogen**, progesterone and testosterone produced by ovaries and adrenals.
- **Oestradiol** - strongest oestrogen (OC pill and HRT).
- **Oestrone** - post menopausal oestrogen, mainly made in fat cells.
- **Oestriol** - weakest, 1000 times weaker than oestradiol
 - made in placenta during pregnancy.
- **Progesterone** - large amount produced in last stage of pregnancy.
 - ovulation triggers progesterone in 2nd half of cycle. Progesterone drops at onset of menstruation.
- **Testosterone** - produced by adrenals and ovaries.

Symptoms:

- Fluid retention, high BP
- Carbohydrate craving, hypoglycemia
- Irritable, depressed, insomnia, 'chaos' in brain
- Constipation
- Fatigue
- Headaches
- Breast pain
- Acne
- Heavy periods

Oestrogen Dominance

One of the main factors according to Dr. John Lee's twenty years work is a relative oestrogen excess or progesterone deficiency. The side effects of oestradiol (OC pill and HRT) in Mims are listed as "PMS like syndrome."

How does this Oestrogen dominance occur?

- 1) Xeno-oestrogens are mock oestrogens which latch onto oestrogen receptors and accumulate in fat. They are found in pesticides, pesticide fed chickens and plastics. Fifty one of these oestrogen mimics have been discovered, and the consequences are a fifty percent drop in sperm count world wide in the last fifty years, breast, prostate and testicular cancer, oestrogen dominance and neurological diseases.
- 2) The OC pill and HRT contain only the strong oestrogen and synthetic progesterone
- 3) Constipation/gut dysbiosis, low fibre and high fat, diet result in increased synthesis of oestrogen and reduced oestrogen breakdown in the liver.
- 4) One alcoholic drink/day results in oestrogen production.
- 5) Irregular or absence of ovulation leading up to menopause and earlier due to xeno-oestrogens and OC pills result in absence of ovulatory progesterone surge which leaves unopposed oestrogen cy-

cles, the consequence being heavy periods and PMS.

TREATMENT OF HORMONAL IMBALANCE IN PMS AND PERI- MENOPAUSE

- Blood test to check the ratio of oestrogen to progesterone day 21 of the cycle can be used although the best guide is the clinical picture of symptoms.
- Natural progesterone delivered as a wild yam cream or sublingual troches. See 'role of Progesterone' for the benefits of natural progesterone.
- Low fat, sugar, coffee and high fibre diet.
- Sugar causes fluid retention, increases magnesium loss and compounds premenstrual hypoglycemia which causes sugar craving. A low fat diet reduces fluid retention, and breast inflammation. Coffee aggravates hypoglycemia and nervous tension. Fibre increases oestrogen binding and excretion.
- Magnesium (Mg) and Zinc are co-factors in over two hundred enzyme reactions.
- Zinc has an important role in hormone synthesis, brain function and glucose tolerance.
- Mg is often low in PMS, has a vital role in neur- muscular transmission (pelvic pain and calf cramps), energy production, reduces anxiety and reduces fluid retention.
- Multi B vitamin to aid oestrogen breakdown in the liver and combat stress.
- Vitamin B6 increases intracellular Mg, assists conversion of tryptophan to serotonin (which improves mood and sleep) and improves sugar metabolism.
- Vitamin E protects fats and sex hormones from oxidation effect. Taken with Vitamin C which regenerates Vitamin E and has an anti stress effect.
- Omega 3 and 6 oils (e.g. Flaxseed) necessary for hormone synthesis and metabolism and prostaglandin synthesis to reduce breast pain.

Herbs

Chinese herbs to relieve liver stagnation
Mother wort - stabilises emotions.

"There is no better herb to drive melancholy vapours from the heart, to strengthen it and make the mind cheerful, blithe and merry."

Black Cohosh - "Squaw root", calms nerves, balances hormones

Dong Quai - Calms nerves and mood swings, hormone balancing

Vitex Angnus-castus Hormone balancing, progesterone like effect

- Acupuncture once a month
- Homeopathy
- Aromatherapy e.g. Lavender oil.

PROS and CONS OF HRT (Oestradiol and Synthetic Progesterone)

PROS

- Oestrogen decreases heart disease through improving cholesterol profile. i.e. Increases HDL and decreases LDL

levels. Nurses study: 50% decrease in heart attacks and deaths from heart disease over ten years in a study following forty eight thousand nurses.

- Oestrogen decreases osteoclastic (bone breakdown) activity at menopause.
- Increase in breast cancer deaths small compared with deaths from osteoporosis and possibly heart disease, but studies are still being done to determine the number of heart disease deaths.

CONS

- Oestradiol increases the risk of breast cancer
- A 1995 study published in New England Journal of Medicine on 121,700 women concluded that women on HRT for more than five years had increased their risk by forty five percent.
- Can't safely give Oestradiol on it's own as unopposed Oestradiol causes an increased risk of uterine cancer (PEPI trial 1995). Synthetic progesterone in HRT reverses the benefit of unopposed oestrogen on blood lipid profile heart disease.
- Liver dysfunction risk
- No increase in osteoblastic activity, doesn't build bone.
- Side effects of synthetic progesterone - depression, thrombosis, weight gain, fluid retention, liver dysfunction, headaches, breast pain, acne and hirsutism, increased blood pressure, insomnia (i.e. symptoms which natural progesterone relieves.)
- Oestradiol side effects - heavy bleeding, breast pain, fluid retention, varicose veins, weight gain, migraine, depression, chloasma (E dominance situation)
- Oestradiol destabilises blood glucose levels.

Summary:

Each person needs to decide her own treatment needs according to family history and symptoms e.g. A lady with flushes and a family history of breast cancer and osteoporosis may opt for HRT in the form of phyto oestrogens and natural progesterone with annual bone densitometry to monitor her bone mineral mass. She may also take extra herbs or homoeopathics in initial phase to deal with flushes and a mineral and vitamin D supplement to assist in the prevention of osteoporosis.

The diagnosis of hormonal imbalances is not difficult to make. The complexity comes in tailoring the treatment plan to each individual's symptoms, risk of future diseases and personal treatment preferences, at the same time ensuring the treatment carries no risks. As far as preventative medicine goes, a good diet of water, fish, soy, rice, vegetables, fruit, nuts and seeds with the optional supplementation of anti-oxidants, Calcium, Magnesium and multi minerals, multi B vitamins, and Omega 3 and 6 oils. It is also very important to exercise regularly and, above all, to maintain a relaxed, positive outlook on life.

References:

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- Holfman, The New Holistic Herbal, Element, 1996.
- Dr. Robyn Cosford, Lecture Notes from course in Nutritional and Environmental Medicine, ACNEM, 1997.
- Dr. S. Cabot, Menopause, WHAS, 1995.
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Footnote

- 1) Luteinizing hormone (LH) is a hormone produced in the anterior pituitary gland, that stimulates the release of sex hormones by the ovaries and testes. In men it induces secretion of testosterone by the interstitial cells of the testes. In females, LH working together with follicle stimulating hormone (FSH) in the ovary, triggers the secretion of oestrogen. High concentrations of oestrogen stimulates the release of LH, which stimulates ovulation.

ENGLISH USED BY DOCTORS!

The following quotes were taken from actual medical records dictated by physicians. They appeared in a column written by *Richard Lederer, PhD for the Journal of Court Reporting*. These and other language gems will be featured in Lederer's new book, *Fracture English*, to be published by Pocket Books in the fall of 1997.

- By the time he was admitted, his rapid heart had stopped and he was feeling better.
- Patient has chest pain if she lies on the left side for over a year.
- The patient states there is a burning pain in his penis which goes to his feet.
- On the second day the knee was better and on the third day it had completely disappeared.
- She has had no rigors or shaking chills, but her husband states she was very hot in bed last night.
- The patient has been depressed ever since she began seeing me in 1983.
- I will be happy to go into her GI system, she seems ready and anxious.
- Patient was released to outpatient department without dressing.
- I have suggested that he loosen his pants before standing, and then, when he stand with the help of his wife, they should fall to the floor.
- The patient is tearful and crying constantly. She also appears to be depressed.
- Discharge status: Alive but without permission.
- The patient needs disposition, and therefore we will get Dr Blank to dispose of him.
- Healthy-appearing, decrepit 69 year old male, mentally alert but forgetful.
- The patient refused an autopsy.
- The patient has no past history of suicides.
- The patient expired on the floor uneventfully.
- The patient has left his white blood cells at another hospital.
- The patient was becoming more demented with urinary frequency.

- The patient's past medical history has been remarkably insignificant with only a 40 pound weight gain in the last three days.
- She slipped on the ice and apparently her legs went in separate directions in early December.
- The patient experienced sudden onset of severe shortness of breath with a picture of acute pulmonary edema at home while having sex which gradually deteriorated in the emergency room.
- The patient left the hospital feeling much better except for her original complaints.

Eat twice as much bread!

by CSIRO

(From a CSIRO nutrition talkback session on ABC Radio, 24 June 1996)

Produced by the CSIRO Division of Human Nutrition

Despite the historical importance of bread and the fact that nutritionists support it, bread has had a poor image.

Bread should be one of the most important foods in our diet. It provides protein, complex carbohydrates and dietary fibre, and nutrients such as zinc, iron and the B-group vitamins. The basic ingredients of bread are flour, water, yeast and salt. Breads are made from many types of cereal flour though, which means that a tasty, low fat, low kilojoule, high fibre food is readily available. Riots have occurred in ancient times when bread became scarce. Bread became known as the "staff of life" in the 1700s and continued to be a staple food until fairly recently. For thousands of years bread was made by hand. Mass-produced, shop or bakery bread is equally as good. Today's baking techniques allow for a greater choice in types, flavours and textures of bread.

During the period of "no-bread" diets, Australians became convinced that bread was fattening. Later, nutritionists cautioned that the amount of bread and hence fibre consumed in the diet had fallen well below recommended levels for good health and sought to reverse the damaging trend.

Breads are not fattening - it is the toppings we add to bread or toast that provide the extra unwanted kilojoules. Sportsmen and women eat bread and other cereal products for energy and our children could well do the same.

How much bread should we eat? As much as we like. At least five serves a day of breads or cereals is recommended. One serve is equal to one slice of bread, one muffin or scone, or a small bread roll.

Most breads and cereals provide some dietary fibre but wholegrain or wholemeal varieties provide the most. Those breads with lower salt and sugar content are a better choice. Good nutrition is very cheap. A loaf of bread costs a little over a dollar and yet can provide a family of four with most of their bread and cereal needs for the day. Bread may be stored in a clean, ventilated bread bin or crock to keep it fresh. Bread can also be stored in the

freezer for later use.

The Dietary Guidelines for Australians promote the eating of plenty of breads and cereals (preferably wholegrain).

Some types of breads ...wholemeal, multigrain, high-fibre, rye, white, bread rolls, crumpets, muffins, Lebanese bread, pita bread, pocket bread, lepinja, pumpernickel, sourdough, breadcrumbs, fruit bread, foccaccia, bagel, plain fruit buns

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- Beckman, R. "The good that fibre does" ECOS, no.51, Autumn 1987, pp3-6.
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- Mugford, D.C., "Dietary fibre in Australia. A brief history" Food Australia, 46 (12) December 1994, pp559-563.
- Samman, S. and Anison, G., "Dietary fibre and beyond - Australian perspectives", Nutrition Society of Australia, 1993.
- Saxelby, C. "Food what's in it" Frenchs Forest, NSW, Reed Books, 1989, p6.
- Topping, D.L., "Changing perceptions of dietary fibre", Food Technology in Australia, 40 (7) July 1988, pp266-267.
- "EatSmart" factsheets about Dietary Fibre, Cholesterol, and Nutritional Value of Processed Foods
- 12345+ Food and Nutrition Plan booklet. Write to the Anti-Cancer Foundation, 202 Greenhill Road, Eastwood SA 5063 for copies of this booklet (available in a number of languages).

Link between hyperglycaemia and strokes

Unstable blood sugar is associated with poorer stroke prognosis and explains the diminished survival prospects of diabetic after stroke. This study sought to determine whether raised plasma glucose concentration independently influences stroke outcome or is a stress response reflecting increased stroke severity, however the latter was found to be unlikely.

The authors conclude that hyperglycaemia (raised blood sugar levels) is associated with higher morbidity independently of other risk factors. Plasma glucose concentration above 8mmol/L after acute stroke appears to be critical. The risk is greater for haemorrhagic ischaemia (heart failure) stroke. The mechanism whereby hyperglycaemia may influence stroke severity is discussed, particularly in relation to increased lactate production.

Weir CJ, Murray GD, Alexander GD, Lees KR, (1997), Is hyperglycaemia an independent predictor of poor outcome after acute stroke? Results of a long term follow up study, *Br Med J* 314, 1303-1306

State Medical Boards attack Complementary Medicine

Early last year, a conference of the Federation of State Medical Boards of the US in San Diego, attended by representatives from various Australian State Medical Boards issued a report stating that "medical boards must be sufficiently knowledgeable to recognise health care fraud in the area of alternative medicine. Likewise, incompetent and unscrupulous practitioners must be targeted".

The implication is that complementary doctors - now numbering 2,000 in Australia - are more likely to be fraudulent than mainstream doctors. Dr Ian Brichto, President of ACNEM has written a "please explain note" ACNEM NEWS Dec 97, p1

The Supplements Industry: Introduction to "Rich Sources of Nutrients"

by Jurriaan Plesman,

A recent report by the University of Adelaide and the South Australian Health Commission indicated that Australians spend \$1 billion per year on alternative therapies, nearly half the population visited an alternative therapist at least once.¹ A recent Swedish study showed that about one-third of licensed physicians had a positive attitude towards 'alternative medical modalities'.² Australians spend \$100 million a year on Evening Primrose Oil alone. They consume \$309 million a year in alternative medicines. The development of such an industry is not without its opponents. The president of the Australian Medical Association, Dr Keith Woollard, warned that some herbal products contain toxic substances. However, the Federal Parliamentary Secretary of Health is reported to have said that most of the products sold in Australia were tested by the Therapeutic Goods Administration and "that there is nothing on the market that can kill you". Of course the government has an interest in 'cleaning up' alternative medicine as it would save tax-payers money when people pay for their own treatment.³

Because of competition and financial investment in the health industry there is bound to be spurious arguments defending one side or the other. One argument runs the line that alternative health therapists are better able to sell the worth of their treatment modality. This begs the question why traditional medicine - despite their greater access to the media and tax-payers subsidies - are unable to sell theirs and remove doubts in the minds of many Australians about the validity of mainstream medicine.

The orthodox medical establishment maintained for many years that food supplementation is not only unnecessary, but a waste of money. Many doctors still pooh-poo their patients for taking vitamins and minerals. Hospitals forbid as a matter of course their patients bringing in their supplements. Yet, many cardiologists take their vitamin E in secret, knowing full well its protective effects against atherosclerosis.

Why supplements at all?

Few nutritionists would dare to suggest that we can do away with food supplements in today's society. The literature is replete with the way how modern technology in the food production industry has denatured our foods^{4, 5}. Zinc, an important co-enzyme in the metabolism of foods has been depleted because of farming practices. There are approximately 200 zinc-requiring enzymes in the body.⁶ Zinc deficiency not only inactivates many of these enzymes, but also causes the body to absorb more readily toxic heavy metals, such as mercury, lead and cadmium.

Trace mineral deficiencies have been reported in all states of US, zinc deficiency in 32

states in US soil.⁷ Copper (daily requirement 2 mg) in the soil is lost through our agricultural practices of using nitrogen-phosphorus-potassium fertilizers.⁸ Some geographical areas with severe climatic conditions or a history of glaciation in the past may be deficient in iodine, boron, molybdenum, selenium manganese or magnesium. Soils in New Zealand and the East coast of Australia may well be deficient in micronutrients.⁹ Studies have shown that aboriginal communities in the north-west of the continent are deficient in zinc (50 percent of population) and other micronutrients contributing to their poor health^{10, 11}. Zinc is an essential mineral in the metabolism of alcohol.

Essential fatty acids normally found in wheat has been processed out of food. When vegetable oils are refined approximately 50-80 per cent of vitamin E is lost. In making white flour from wheat, nearly all of the vitamin E is lost. Meat is a poor source of vitamin E.¹²

Poultry farming has been transformed into factory farming, whereby chickens cooped up in small cages are encouraged to lay eggs to their ultimate capacity for the sake of 'economic efficiency' (read profits). Biologists know that overcrowding breeds diseases and hence chickens are saturated with antibiotics. More than 40% of all antibiotics and other antibacterials produced every year in the US are used as animal feed additives and for other animal purposes. Almost 100% of poultry, 90% of pigs and calves, and 60% of cattle have regular amounts of antibiotics added to their feed.¹³ These artificial conditions provide an opportunity for viruses to flourish, and pandemics such as the 'chicken flu' in Hongkong are not surprising.

"Antibiotics are most effective in the early growing period and in warding off disease in animals that are crowded or improperly housed or malnourished", writes RH Hall.¹⁴ One of the problems associated with these practices is that bacteria become resistant to antibiotics, nature will present new diseases and above all humans become immune to 'antibiotic treatment'.

Monoculture - the practice of growing large fields of the same crops - by farmers normally attract specific insects and pests who would have a 'field-day'. Thus the use of pesticides in the growing of foods is inevitable.

According to some authors, there is a greater incidence of Parkinson's disease in the country and this may be linked to the use of pesticides.¹⁵ Organophosphorus inhibit enzymes such as acetylcholinesterase.¹⁶ Many pesticide residues seep from the land into the rivers and estuaries, and invade the food chain of fish and ultimately reach human consumption.

Sexual reproduction ensures a certain degree of variation in the immune system among the off-spring of farm animals and with it a certain degree of protection against mass infection. It is now possible through genetic engineering to create monocultures of farm animals. That is, production of meat can be increased through cloning of a 'desirable' species of animal. In the near future all farm animals will have exactly the same immune system. This opens the way for one particular bacterium, fungus or virus to invade the entire cloned population.

This could well explain the emergence of mad cow's disease or Creutzfeldt-Jakob disease, because of breeding techniques.

Thus the radical transformation of our food sources, the depletion of essential nutrients, together with environmental pollution poses a serious threat to our health and well-being.

The message is clear: *the only way to protect ourselves is to fortify our immune system through nutritional supplementation.*

The alternative health industry

This message has spawned a new lucrative health industry. People out there in the market are encouraged to buy supplements and many of us now find that we have cupboards full of vitamin and mineral pills. The problem is that not all of us can afford it. It is true that in case of certain illnesses we need concentrated forms of supplemental nutrients. We may have to ensure our zinc intake by extra tablets or our consumption of essential fatty acids by taking Evening Primrose Oil and/or fishoil.

But nutritionists are now learning that nutrients taken in isolation from other nutrients may have unexpected consequences. A case in point is a recent trial called Beta-carotene and Retinol Efficacy Trial (CARET) investigating a group of 18000 smokers at risk of developing lung cancer. It was found that after 4 years the treatment group receiving 30 mg beta-carotene and 25000 IU retinyl palmitate had 28% increased risk of developing lung cancer. The trial was stopped in January 1996.¹⁷ The health minister of Denmark responded by declaring that all high doses of beta-carotene should have a warning label to smokers.¹⁸ Had beta-carotene been consumed in its natural form, for instance in carrots, there could have been a different outcome.

Beta-carotene is only one of the many carotenoids found in yellow and orange leaves, vegetables and fruits. Carotene is also to be found in descending order in watercress, endive, plums, Edam Cheese, chickpeas, pistachio nuts, cherries, pineapple, and orange to mention a few. The main types of carotene are the alpha-, beta-, gamma-carotene and many more, most of which are not precursors of vitamin A. The yellow pigment of carotene is masked by chlorophyll in green leaves. Plants use carotenoids to protect chlorophyll from excessive sun-light and from oxidation by the oxygen produced in photosynthesis. Hence carotene is an antioxidant. Humans use beta-carotene to produce vitamin A in the liver. It may well be that other chemical components not yet fully understood are required for carotenoids to play out their role in human nutrition.

For example, if we look at carrots they contain amounts of thiamine, bioflavonoids, niacin, pantothenic acid, B6, folic acid (15mcg/100g), calcium, magnesium, phosphorus, sodium, potassium, iron, copper, manganese, zinc, chromium, selenium and vanadium. Less than 1 percent consists of proteins containing amino-acids in descending order: leucine, lysine, isoleucine, valine, threonine, phenylalanine, methionine, tryptophan.¹⁹

The vitamin, mineral and amino acid content of other foods follow a similar pattern.

Thus there are several reasons why we should

return to the very food sources of our vitamins and minerals, instead of pill-popping. Many people simply cannot afford to maintain their health through buying synthetic products of supplementation. The next best thing is to resort to their natural food sources.

In this issue I have included a list of nutrient sources, called "**Rich Sources of Nutrients**" on page 7, that will enable readers to choose nutrients from natural sources. This could well be an alternative to buying nutritional supplements. The list was accumulated from readings in the literature and may not be totally accurate or complete. It will be updated as we go along. You should always consult your health professional when using the list as some nutrients - even in natural form - may be toxic in your specific medical condition.

Readers who have an electric juice-extractor are also advised to obtain books on juicing their own vegetables, which is another means of obtaining one's supplemental vitamins and minerals. Three excellent books mentioned are:

Charmine, Susan E.(1977), **THE COMPLETE RAW JUICE THERAPY**, Thorsons Publishers Ltd., Wellingborough

Clinkard,C.E.(1991), **THE USES OF JUICES**,

Walker,N.W.(1970),**RAW VEGETABLE JUICES; WHAT'S MISSING IN YOUR BODY?**, Norwalk Pres, Pub. Phoenix Arizona

Working with herbs try out the herbs in natural form obtainable from some health food stores. Medicinal herbs are cheaper than those in tablet form, although concentration of ingredients may vary. Some herbal manuals show you how to extract the ingredients from herbs by infusion or decoction. Better still grow your own herbs!

Nevertheless, when using nutrients therapeutically, professional advice is still the best.

Footnotes

- 1) Taylor, AW (BA), Prevalence and cost of alternative medicine in Australia, **Lancet**, **347(9001)**: 569-573, 1996 March 2.
- 2) **Scan J Soc Med** **20(1)**, 55-60 (1992).
- 3) As reported in The Daily Telegraph (Afternoon edition) 22 July, 1996
- 4) Hall, RH(1974), **FOOD FOR NOUGHT: THE DECLINE IN NUTRITION**, Vintage Books N.Y.
- 5) Cheraskin E, Ringdorf WM et al. (1968), **Diet and disease**, Keats Publishing, Conn. p17
- 6) Kirk Hamilton in **Journal of Australasian College of Nutritional and Environmental Medicine**, Nov 95, P 15
- 7) Null, G &S(1978), **THE NEW VEGETARIAN**, A Delta Book Dell Pub.Co.Inc.N.Y. page 235
- 8) Bland,J.(1981), **YOUR HEALTH UNDER SIEGE**, Harper & Row,Pubs.Sydney, p80.
- 9) Buiet, Robert (1990), Who needs vitamin supplements?, **Hypoglycemic Health Association Newsletter**, **6 (1)**: 5, March 1990
- 10) Cheek DB, Spargo RM, Holt AB.Evidence for zinc deficiency in aboriginal settlements in Northwestern Australia. **Medical Journal of Australia**, **1(2 Suppl)**:4-5, 1981 May 2.
- 11) Cheek DB, Smith RM, Spargo RM, Francis N., Zinc, copper and environmental factors in the aboriginal peoples of the North West. **Australian & New Zealand Journal of Medicine**, **11(5)**: 508-12, 1981 Oct.
- 12) Florence TM & Setright RT (1994), **THE HANDBOOK OF PREVENTIVE MEDICINE**, Kingsclear Books, p 202
- 13) Drugs in Livestock Feed, vol 1, Technical Report, Office of Technology Assessment, Washington, D.C. June 1979, p3.
- 14) Hall, RH (1974), p 89. Continuous feeding low levels of antibiotics stimulates growth of animals, increased feed efficiency by 16%, 16% more pig was achieved with the same amount of feed. p 91 In 1970 about 1300 tons of antibiotics worth almost \$100 million were fed to animals in the United States, p 92
- 15) Florence TM & Setright RT (1994), **THE HANDBOOK OF PREVENTIVE MEDICINE**, Kingsclear Books, p 63
- 16) Acetylcholinesterase is an enzyme present at the endings of voluntary nerves and parasympathetic involuntary nerves. It inactivates and prevents the accumulation of acetylcholine during nerve impulse transmission

RICH SOURCES OF NUTRIENTS

By Jurriaan Plesman, BA, Post Grad Dip Clin Nutr

High levels are shown in *italics*, wherever possible, * denotes supplemental form. Minerals depends on state of the soil.

Acid Ash-forming diet: (Promotes calcium loss, therefore avoid in Osteoporosis) Buckwheat, cheese, cranberries, grains (including wheat, corn, rye, barley rice) lentils, meat (including fish, poultry, shellfish and eggs), plums, prunes, refined sugar. Salivary enzyme, ptyalin, which is alkaline will neutralize acid-forming foods by thorough chewing.

Alkaline Ash-forming foods: fruits (except cranberry and plums), milk, molasses, certain nuts (almond, chestnut, coconuts) vegetables (except corn and lentils) (Werbach, 1993, 273)

Alpha-linolenic acid: (Omega-3 fatty acid) converted to eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) which reduce platelet aggregation, promote vasodilation and inhibit inflammatory substances thromboxane and leukotrienes derived from linseed, rapeseed, soybean, walnut and fishoil.

Arachidonic acid: (C20:4 n-6) Dairy products, egg yolk, milk, liver, kidney, Atlantic salmon, turkey, some in chicken, pork, beef, lamb and peanuts.

Arginine: (Non-essential AA, but essential to children) avoid in herpes found in: *Almonds, bacon, Beer, Brazil nuts, buckwheat, carob, chicken-breasts, chocolate, cashews, barley, coconuts, dairy products, eggs, gelatine, hazel nut, lentils, linseed, meats, millet, oats, cooked oatmeal, oysters, peanuts, peanut butter, green peas, chick peas, pecans, popcorn, raw cereals, raisins, rice (brown), sesame, skim milk, Beef, soybeans, sunflower, turkey, walnuts, wheatgerm, white flour, whole-wheat bread.* Also found in garlic and ginseng. **Supplements:** take on an empty stomach (Excess could promote herpes, kidney and liver failure). **Ornithine** derived from arginine and vice versa shares many of arginine's properties and stimulates thymus gland to produce Lymphocytes. **Supplement** of arginine and ornithine to be taken on empty stomach with juice or water, no proteins. Avoid in pregnancy, schizophrenia more than 30 mg/day,

Arginine & lysine: taken together in equal amounts may inhibit adverse effects of arginine (kidney or liver failure)

Arsenic: (essential in growth, methionine metabolism) fish, grains, cereals

Ascorbic acid: (see Vitamin C).

Asparagine: (Stabilizes nervous system), mainly in meat.

Aspartame: used as artificial sweetener (NutraSweet, Equal) aspartyl-phenylalanine, 200 times sweeter than sucrose. Stable in solution for only a few months, when it breaks down. Avoid in phenylketonuria. Reported to cause hyperactivity, migraines, skin rashes, mild depression, nausea, ringing in ears (tinnitus), insomnia, loss of motor control, changed taste, memory loss, blurred vision, don't use during pregnancy. Not advisable for young children. *Avoid in phenylketonuria.*

Aspartic acid: (NEAA) (It aids cell function and function of RNA & DNA) Increases stamina, CFS may be due to low AA, helps remove excess ammonia from liver. Sprouting seeds contains abundance of aspartic acid.

Beta carotene: Apricots, asparagus, *watercress, avocados, beetroot greens, broccoli, Brussels sprout, rockmelon (cantaloupe), carrots, chard, chilli peppers, yellow corn, cress, pink grapefruit, greens (mustard, turnip, beet, collard etc), kale, lettuce, butterhead or Romaine lettuce, mandarin oranges, mangoes, papayas, parsley, peaches, bell peppers, plums, pumpkins, tangerines, spinach, squash, winter squash, sweet potatoes, tomatoes and water melon.* Conversion of beta carotene to vitamin A stimulated by thyroxine from the thyroid gland. (Almanac, 14)

Bioflavonoids: (rutin, hesperidin): (There are 400 different plant flavonoid compounds) Found in skins of fruit and vegetables, the pith of Citrus fruits, orange, lemon, lime, tangerine peels, fruits, grapefruit.

grapes, prunes, apples, apricots, cherries, onions, peppers, black currants, buckwheat. Green growing shoots of all plants. Bioflavonoids also found in tea, coffee, red wine, beer, cocoa and cola. **Herbs:** chervil, elderberries, hawthorn berry, horsetail, rose hips, shepherd's purse.

Biotin: Egg yolk, liver, unpolished rice, Brewer's yeast, whole grains, sardines, legumes, nuts, milk, vegetables, organ meats. (Raw egg white contains the anti-biotin avidin, which prevents absorption)

Boron: Sodium borate: (May prevent postmenopausal osteoporosis, arthritis & builds muscles) alfalfa, cabbage, lettuce, peas, snap beans, apples, dates, prunes, raisins, wine, parsley, dates, almonds, hazelnuts, peanuts, peaches, kelp, soy, fruit, vegetables, nuts, legumes. Meat and fish are poor sources.

Brominated vegetable oil (BVO): Used as an emulsifier in some foods and a clouding agent in many popular drinks. Bromate is the main ingredient which can poison a child.

Butylated hydroxyanisole: (BHA) and butylated hydroxytoluene (BHT) used to prevent fats and oils becoming rancid added to food packaging. In the diet of pregnant mice there was a decreased (50%) activity of brain cholinesterase, responsible for brain nerve impulses. Affects animals sleep, levels of aggression, weight. See also Tertiary butylhydroquinone (TBHQ)

Cadmium: Toxic chemical replaces zinc receptors. Source tobacco, tobacco smoke, cigarette paper, superphosphate fertilisers, burned tyres, Ni-Cd batteries, solders

Caffeine (May cause migraines) coffee exceeding 4-5 cup a day, soft drinks, tea (herbal tea may be caffeine-free): Coffee (150 ml - 85-90 mg), Tea (150 ml - 40-60 mg), Coca (150 ml - 4 mg) Cola (180 ml - 15-23 mg), Dark chocolate (30g - 20 mg)

Calcium: Milk and milk products may be a poor source because of high phosphorus content and milk allergy, use plain yoghurt, sardines, cheddar cheese, salmon with bone, tofu, green leafy vegetables, nuts, potatoes, almonds, mushrooms, shellfish, molasses, rhubarb, watercress, kale, broccoli, Bone meal*, Dolomite*, Calcium citrate*, especially in achlorhydria (low hydrochloric acid).

Carbohydrates: Whole grains, sugar, syrup, honey, fruits, vegetables

Carnitine: (NEAA) (Long-chain fatty acid used in transport system for energy production, oxidation of fatty acids in mitochondria). Synthesised in liver from lysine and methionine dependent on vitamin C, thiamine (B1), pyridoxine (B6). Not found in vegetable form. Major sources are muscle and organ meats & dairy products and richest source among plant foods *avocado*. Supply of carnitine enhanced by lysine ingestion. Vegetarians more likely to be deficient, they should eat grains, such as cornmeal, that have been fortified with lysine.

Cellulose and hemicellulose: (Chemically modified forms of cellulose are used in food processing as fillers, stabilizers, emulsifiers, thickeners, foodformulated to be low in gluten) Apples, green beans, wax beans, beetroot, bran, broccoli, Brussels sprout, cabbage, carrots, aubergine, whole-grain flour, pears, peas, peppers, radishes.

Chlorine: Table salt, seafood, meats, ripe olives, rye flour, Dulse*.

Choline or Phosphatidylcholine: (Non-essential as body can produce it from serine. Important forerunner of acetylcholine, a neurotransmitter) Egg yolk, organ meats, green leafy vegetables, lecithin, milk, soybeans, spinach, nuts, Brewer's yeast, wheat germ, soybeans, fish, legumes, lecithin* contains 13%.

Chromium: Brewer's yeast* (not torula) 1-3 tsp per day, round beef, calf's liver*, corn on the cob, corn oil, buckwheat raw, apple, sweet potato, potatoes, green pepper, butter, egg, tomato, all bran cereal, Mozzarella cheese, puffed rice, orange juice, Cheddar cheese, molasses, clams, oysters, whole-grain cereals*, wheat germ, bran, staple foods, particularly cereals and milk, are very low (less than or equal to 10

micrograms/kg) in Cr. Low in fish. (Those marked * may be biologically active as Glucose Tolerance Factor (GTF)). Chromium enriched Brewer's yeast, or Chromium picolinate.

Citrulline: (NEAA) component of the urea cycle metabolized from arginine, aspartate and ornithine, found in onions and garlic. Found in liver.

Citrus Red Dye No 2: Used to colour orange skins. Is a possible carcinogen, FDA has recommended to ban it.

Cobalt: (A constituent of B12) Organ meats, kidney, oysters, clams, poultry, milk.

Coenzyme Q10: (CoQ10, Q10: or Ubiquinone:) Functions as oxygen transfer coenzyme and part of the system across which electrons flow in the mitochondria of cells in energy production. Important in heart muscle. Stimulates insulin production and may stabilise blood sugar levels. Synthesised in body, depends on vitamin E. Available in supplemental form and used in treatment for angina pectoris and other heart problems. Vegetables are a poor source, but it is to be found in rice bran, wheat germ, walnuts, sesame seeds, soya beans, broccoli, spinach, peanuts & peanut butter, salmon, sardines and mackerel (very high), eggs, butter, beef and pork. Take with vitamin E as this helps preserve Q10. Some cholesterol lowering drugs interfere with the synthesis of CoQ10.

Copper: (Essential co-enzyme in *Superoxide dismutase* which protects against hydrogen peroxides) (may be a cause of migraines in excess) found in *oysters, lobster, calf and beef liver, avocado*, Brazil nuts, almonds, hazelnuts, walnuts, pecans, peanuts, cod liver oil, banana, dried bean, soy beans, soy lecithin, peas, pulses, whole wheat, prunes, prawns (shrimp) and most seafood, legumes, molasses, potatoes, organ meats, poultry, game, chicken, grain products, *dark chocolate*, raisins, beer, cider, coconut, mushrooms, black pepper, thyme, paprika, Bay leaves, Bone meal*. (Drinking water from copper piping should also be considered a source of copper) RDA: 1.5-3 mg p/d. Wear a copper bracelet

Cruciferous vegetable: broccoli, cabbage, cauliflower, Brussels sprouts rich in Vit C, carotene, B9 (Folate), fibre, anti-cancer

Cysteine and glutathione: (NEAA) (contains sulphur and inactivates free radicals) is a precursor of glutathione (a tripeptide of glutamate, cysteine & glycine), a major antioxidant. A selenium dependent enzyme - glutathione peroxidase together with glutathione attacks free radicals. Source: Egg, meat, dairy products and some cereals. Take with Vit C as a precaution against kidney-stone and bladder-stone formation.

Cystine & cysteine: (NEAA) (Also N-acetylcysteine used in radiation sickness and chemotherapy). Cystine consists of two molecules of cysteine. Cysteine is unstable form but easily converted from one to the other. Important in the production of collagen in nails, hair, bones, skin. Cysteine is formed from *methionine*. Should be taken with vitamin C and requires B6 as coenzyme. Caution: dangerous to diabetics, may inactivate insulin production. Cysteine production depends on adequate levels of methionine.

Essential Amino Acids: Histidine (Partial), Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, Valine. (Non-essentials: Alanine, Arginine, Asparagine, Aspartic acid, Cysteine, Cystine, Glutamic Acid, Glutamine, Glycine, Ornithine, Proline, Serine, Tyrosine).

Essential Fatty Acids: See Omega-3 and Omega-6 Fatty acids are essential because the body is unable to produce them. *Linoleic acid* (C18:2 w6) is converted in the body to gammalinolenic acid (GLA) -> dihomogammalinolenic acid (DGLA) and then to prostaglandins series E1 (PGE1), which are anti-inflammatory substances. -Linolenic acid (C18:3 w3) is converted to eicosapentaenoic (EPA) and docosahexaenoic acids (DHA) -> prostaglandins series E3 (PGE3). They also inhibit the inflammatory prostaglandins. Some people lack the first enzyme - *delta-6-desaturase* - in these conversions and may have to take Evening Primrose Oil (EPO)* or fishoils (Max-EPA)*. The conversion can be blocked by saturated fats, cholesterol, sucrose (high insulin), trans-fatty acids (margarine), alcohol, aspirins, salicylates, NSAIDS, and deficiencies of zinc, B6 & magnesium. For natural sources see Omega-3 and Omega-6 Fatty Acids below.

Fats: Butter, margarine vegetable oils, fats in meat, whole milk, milk products, nuts and seeds.

Fibre: *Insoluble* (for lower bowels) whole grains, brans, wheat, wheat bran, rye, rice, corn, cellulose

Soluble (for lowering cholesterol, aiding diabetes & obesity) in

fruits, dried peas, beans, barley, oats, gums (guar, xanthan, locust bean) mucilages (psyllium) and pectins

Fluoride: (Naturally the fluoride content of water ranges between 0.05 and 14 ppm. (1 ppm in water is said to protect against dental caries) Tea, seafood, fluoridated water, Bone meal*.

Fluorine: (Deposited in bone, teeth, excreted in urine, associated with dental health, small amounts prevents dental caries, excess causes fluorosis) Wide distribution, tea, coffee, fluoridation of water with sodium fluoride 1.0-2.0 ppm

Folic acid or folate (B9): (deficiency may be responsible for birth-defects: spina bifida, anencephaly, encephalocele) (Coenzyme for single carbon transfer, purines thymine, haemoglobin) Dark-green leafy vegetables (asparagus, spinach, chard, kale), broccoli, bean sprouts, Brussels sprouts, carrots, melon, apricot, pumpkins, avocado, dark rye flour, organ meat (liver), tortula yeast, Brewer's Yeast, root vegetables, whole grains, wheat bran, wheat germ, oysters, salmon, milk, egg yolk. Daily supplement 500mcg for at least one month before and during first three months of pregnancy. Several drugs interfere with folate: contraceptives, alcohol, nicotine, anticonvulsants chemotherapeutic, anti-malarial and antibacterial agents.

Food additives: Tartrazine (E102), benzoate (E210-210), butylated hydroxytoluene (E321), monosodium glutamate (E621)

Fructose or laevulose: (Also known as fruit sugar, a 6-carbon monosaccharide. A constituent of the disaccharide sucrose (table sugar, glucose + fructose). Fructose 1.7 times as sweet as sucrose. Transported to the liver where it is converted to energy via pyruvate & acetyl CoA. Fructose was used in diabetes mellitus before insulin was discovered as it elicits a lower glucose and insulin response.

Gamma-Aminobutyric Acid (GABA): formed from glutamic acid. Decreases neuron activity and together with niacinamide and inositol prevents anxiety. May help in epilepsy, hypertension, enlarged prostate, attention deficit disorder ADD.

Glutamic Acid: non-essential derived from other AAs. Excitatory neurotransmitter. Glutamate + B6 -> GABA. Glutamate a component of folic acid, and GTF, rich source Brewer's Yeast. Glutamic Acid present in Monosodium glutamate + pressor amine tyramine (aged cheese, pickled herring -> headache. Use B6.) Helps in transport of potassium across blood-brain barrier. Picks up ammonia to form glutamine and thus detoxifies brain.

Glutamine, Glutamic Acid: Synthesized in body. When AAs are broken down, they release nitrogen, which can form ammonia and is toxic to the brain. Glutamine contains 2 atoms of nitrogen (forerunner of ammonia -> urea -> urine). Glutamine* available as a supplement synthesized from glutamate. Sources: raw spinach and parsley. Avoid in cirrhosis of the liver, kidney problems, Rye's syndrome (Encephalopathy following a viral infection)

Glutathione: (High levels are found in the lens of the eye) A tripeptide consisting of glycine, glutamic acid and cysteine involved in oxidation-reduction via the selenium containing enzyme *glutathione peroxidase*. *Cysteine* derived from *methionine* (see *methionine*). Milk thistle (*Silybum marianum*) is believed to increase glutathione content of liver.

Gluten: Coeliacs should avoid protein portion of wheat, rye, oats, barley, sorghum, triticale (a cross of wheat and rye), millets (including milk & milk products): substitutes buckwheat, rice, corn. Papain supplement (500-1000 mg) may help to digest wheat gluten.

Glycine: NEAA, the simplest of all AAs, has sweet taste, often mixed with saccharin as sweetening agent. It is often given as dimethylglycine (DMG). Is used in liver for detoxification as part of glutathione. Supplementation may enhance immune system, boost mental acuity, reduce blood cholesterol & triglycerides, improve oxygen utilization, may help control epileptic fits, normalize blood pressure, blood glucose levels (Diabetes). Also involved in bone formation. Derived from -> **methionine** + serine (from glycolysis).

Goitrogens (Inhibitors of the thyroid gland (interferes with iodine), to be avoided in hypothyroidism); Kale, turnips, Brussels sprout, raw cabbage, cauliflower, kohlrabi, mustard seeds, cassava root, soybean, peanuts, pine nuts and millet, rutabagas, soy flower. Cooking deactivate the goitrogens in these foods.

Growth Hormones: (Released from the pituitary gland) Releasers: Ornithine, Arginine, Tryptophan, Glycine, Tyrosine.

High-Cholesterol foods: Eggs, beef liver, shrimp or prawns, spare ribs (pork), Cheddar cheese. But high cholesterol levels may be due to

excess production by liver, regardless of food sources. 80% produced by liver, 20% from diet. Oxidation of cholesterol causes atherosclerosis, therefore use antioxidants, especially vitamin E.

Histamine: (released by leucocytes and derived by decarboxylation of the amino acid histidine causing dilation of blood vessels), also found in small amounts in cheese, beer, chocolate, sauerkraut, salami, sausage meat and red wines (which may cause headaches).

Histidine: (EAA in growing child, NEAA in adults) (Converted to histamine with B3 niacin and pyridoxine B6) Skim milk, peanuts, peanut butter, beef, poultry, Turkey, chicken breast, veal, pork, ham, calf's liver, cheddar cheese, cottage cheese, boiled eggs, corn flakes, beans, pecans, brown rice.

Homocysteine: is an intermediate product in conversion of methionine to cysteine and is toxic to the body. It requires B6, and possibly folic acid, B2 & B12 for conversion to cysteine. High levels of homocysteine may contribute to atherosclerosis.

Inositol: Whole grains, whole wheat bread, citrus fruits, Brewer's yeast, molasses, milk, nuts, vegetables, dried Lima beans, organ meat, raisins, grapefruit, lecithin*, lime, green beans (unshelled), Rockmelon (Cantaloupe), (diets high in unsprouted seeds and grains are rich in phytates, which may prevent proper absorption of many trace elements. By leavening the grains or germination prior to use phytates are eliminated and inositol is liberated into food product). Important cofactors of inositol are folic acid, B12, B6, choline, betaine, methionine.

Iodine: (Absorbed as iodides, taken up by thyroid gland under control of thyroid-stimulating hormone [TSH], synthesis of thyroxine regulates cell oxidation) (RDA 140 mcg/day) Sealife-plant and animal-seaweed (kelp), fresh salt water fish, sea salt (many do not contain iodine), mushrooms, Irish moss (depending on iodine content of soil), seafood, prawns (shrimps), oysters, lobster, clams, Milk (evaporated, skim), egg, cheddar cheese, *iodied salt*, Morton Light Salt substitute*, Nutritional yeast*, potassium iodide*.

Iron: Haem iron from organ meats and meats, lean meats, tongue, liver, eggs, fish, poultry; *blackstrap molasses*, cherry juice, green leafy vegetables, beans, clams, *dried apricots*, raisins, peaches, poor in dairy products, Desiccated liver*. [Ferrous sulphate or gluconate 300mg orally 3xpd]. Absorption of iron can be improved with consumption of vitamin C, citric acid; and inhibited by calcium, phytates, phenols, tea drinking and soy protein.

Isoflavones: Phytoestrogens (similar to oestradiol) found in leguminous plants, especially soy beans, Tofu. See also *Lignans*

Isoleucine: (EAA) (Branched-chain AA - others leucine and valine) (Haemoglobin formation, regulates blood sugar levels, muscle metabolism, repair tissue damage): almonds, cashews, beef, chicken, chickpeas, lentils, fish, soy protein, soybean, eggs, liver, cottage cheese, baked beans, milk, rye, pumpkin seeds, sesame seeds, sunflower seeds, most seeds. In supplemental form should be balanced with other branched-chain AA leucine and valine. 2mg leucine & 2mg valine for each 1mg of isoleucine.

Lactose (Lactase - enzyme present in the brush border of intestinal mucosal cells - hydrolyzes lactose to glucose and galactose. Also known as milk sugar, (may cause migraines). In lactose intolerance try buttermilk, cottage cheese, sour cream, yoghurt.

Laetrole: Whole kernel of apricots, apples, cherries, peaches, plums.

Leucine: (EAA) (branched-chain amino acid - others are isoleucine and valine and they should be taken in balance) (Lowers elevated blood sugar levels): corn (low in isoleucine), beef, baked beans, chicken, soya protein, soy-bean, fish, cottage cheese, liver, whole wheat, brown rice, almonds, Brazil nuts, cashew nuts, pumpkin seeds, Lima beans, chick peas, lentils, corn.

Lignans (Lignins): Phytoestrogens (similar to oestradiol) and having anti-cancer/tumour properties) found in cereals and vegetables, oilseeds, especially flaxseed (linseed) see also Isoflavones, green beans, bran, aubergine, pears, radishes, strawberries.

Lithium: Milk, eggs, water, beer (Poor in peas, beans, cereal products)

Lycopene: Red carotenoid pigment found in tomato, pink grapefruit and palm oil. A potent antioxidant especially abundant in tomato (the redder the better). Bioavailability greater in tomato paste.

Lysine: (EAA) In herpes choose high lysine/arginine ratio; pork, fried liver, skim milk, flounder (baked), Parmesan cheese, tuna, canned in oil drained, soya flour, poultry, turkey, Edam cheese, sirloin steak, trout

(raw), chicken (breasts), chicken breasts, beef (roast), Mackerel, pickled herring, salmon (canned pink), pork (roasted) Cheddar cheese, fish, cod (canned), Halibut, raw, round medium fat veal, veal roast, haddock, raw, prawns (cooked), liver (cooked), Lima beans, chicken liver, lamb (leg), cottage cheese, chickpeas dry-raw, pork, (loin), pumpkin seeds, liverwurst, pork, ham, lamb (rib), pistachios, peanuts (roasted), peanut butter, lentils (cooked), boiled egg (raw), soybeans (cooked), cashews, wheatgerm, pork, cured, bacon medium fat, almonds, sesame seeds, oatmeal, rolled oats, Vitamin C protective of lysine. Anti-viral therapy (Herpes) 500-1500mg* spread throughout day. Forerunner of carnitine.

Magnesium: Wheat germ, wheat bran, *banana, avocado, peanuts, peanut butter, cashews*, seafood, fish, whole grains, *dark-green vegetables*, spinach, molasses, legumes, *almonds and Brazil nuts*, cashews, pecans, hazel nuts, Lima beans, sesame seeds with hulls, millet & wheat, rolled oats, walnuts, wholemeal flour, dried figs, dried apricots, beetroot greens, brown rice, dates, Cereals, *soybeans*, buckwheat, Bone meal* (see NHS 205, p16 for percentage content).

Manganese: (Co-enzyme in *Superoxide dismutase* which protects against hydrogen peroxides) Pecans, Brazil nuts, almonds, barley, rye, buckwheat, tea, raisins, carrots, spinach, blueberries, whole grains, green leafy vegetables, broccoli, legumes, split peas (dry), beets, nuts, orange, apple, pineapples, egg yolks, milk.

Metabisulphite: (Sulphites, Sulphur dioxide, sodium bisulphite may cause adverse reactions in asthmatics) Preservative used in many foods to prevent browning: used in dried fruits (but not raisins, sultanas, currants or prunes), fruit bars, dried vegetables, instant mashed potatoes, commercial prepared potatoes (chips, crisps etc.), French fried potatoes, pickled onions, pickles, pastries, crackers, mushrooms, frozen pizzas, sauerkraut, wine, cordials, beer, Champagne etc, chicken loaf, Devon, frankfurter, sausages, sausage mince, uncooked fresh prawns (shrimp), fruit yoghurt, cheese pastes, dessert toppings, flavouring essences, jams, vinegar-containing items, salad dressings, olives, tomato puree, tomato paste, frozen pizzas, sweet pastries. Also used in processing gelatin, beet sugar, corn sweeteners, food starches.

Methionine: (EAA) (contains sulphur and inactivates free radicals) bean, eggs, pork, fried liver, Brazils, Parmesan Cheese, skim Milk, flounder baked, tuna canned in oil drained, Edam Cheese, lamb, trout (Raw), sesame seeds, salmon canned pink, soya flour, turkey, Fish Cod (canned), pumpkin seeds, sirloin steak, chicken breasts, roast beef, onions, garlic, lentils, soybeans, yoghurt, cooked prawns, cooked liver, calf liver, cottage cheese, chicken liver, boiled eggs, roast veal, pistachios, cashews, walnuts, peanuts, chickpeas, almonds, Lima beans, yoghurt, buttermilk, brown rice.

Molybdenum: (Component of enzyme xanthine oxidase, which aids in breakdown of purine into uric acid) Sources depends very much on content in soil. Vegetables, fruits and grains. Organ meats (liver, kidney), legumes, whole-grain cereals, pulses, buckwheat, red cabbage, milk, beans, dark-green vegetables. (see also Pfeiffer, 1978, 119). (Needed with iron to make haemoglobin) *Supplement:* sodium molybdate. Caution against high levels of uric acid (gout). Not to exceed 10 mg

Mono- or polyunsaturated fatty acids (MUFA): fatty acids with only one double bond like oleic acid. Olive oil and canola oils (rapeseed oil) are effective in protecting against oxidation of serum cholesterol. Corn, cottonseed, olive, safflower, sesame seeds, soybean, sunflower.

Monosodium glutamate: (MSG is a flavour enhancer in fast foods and Chinese meals, may cause headaches, flushing of the skin, tightness of the chest, heart palpitations, nausea) try vitamin B6, before ingestion, otherwise avoid.

Nickel: (Constituent of protein nickeloplasmin, associated with thyroid hormone, high in RNA) whole grain bread and cereals, chocolate, peas, fruits, vegetables, legumes, nuts, cooked dried beans and peas. High meat diet low in nickel.

Nightshade family: Tomatoes, potatoes, tobacco, eggplant, capsicum, chilli, pepper: (*Alternatives:* sweet potatoes, cauliflower, pumpkin, marrow, choko, lettuce, celery, cucumber and other vegetables)

Nitrites: (Used as preservative in cured meats, may provoke migraines. Nitrites form nitrosamines in gastrointestinal tract and are known carcinogens) bacon, ham, smoked fish, bologna, hot dogs, salami, sausages.

Omega-3 and/or fish oil: salmon, mackerel, herring, sardines, sablefish, shark, lake trout, fresh tuna, whitefish and anchovies. Others halibut, blue fish, rockfish, rainbow, sturgeon, turbot and sea trout, tuna,

ocean perch, bass, hake, pollock, smelt and mullet. Among shellfish, oysters supply fair amounts of oil. *Plant sources:* soybean, legumes, rapeseed oils, walnuts, chestnuts, flax seed (linseed), green leafy vegetables. Tasmanian Mutton Bird

Omega-6 Essential Fatty Acids: (Precursor of GLA—>DGLA—>Prostaglandins Series 1 (anti-inflammatory), safflower seeds oils, sunflower seed oils, wheatgerm, corn oil, Walnuts, Evening Primrose Oil* (by-passes defective enzyme and contains GLA).

OPC (Procyanidolic Oligomers, or oligomeric proanthocyanidins) Tradename *Pycnogenol(s)* is a group of colourless bioflavonoids with powerful antioxidant activity. It is said that OPCs have a antioxidant potency 15 times that of vitamin C and 42 times that of vitamin E. Repairs collagen and elastin damage, counteracts inflammation and allergies by inhibiting histamine. Found in woody parts, barks and leaves of many plants. Rich sources: grape seeds, pips and skin, red wine, pine bark, peanut skin, Sudan cola nuts, hawthorn fruit, Ginkgo biloba, seeds of honey locust pods, Chinese wisteria and bilberries.

Orotic acid: Orotate (An intermediate in the synthesis of pyrimidines - nitrogenous compounds - also called vitamin B13) Used in treatment of Multiple Sclerosis: Organically grown root vegetables and whey. Orotoc acid is utilized by body in metabolism of folic acid and B12.

Oxalate foods: (To be avoided by kidney stone formers) Beans, cocoa, instant coffee, parsley, rhubarb, spinach, tea. Relative high: beetroot tops, carrots, celery, chocolate, cucumbers, grapefruit, kale, peanuts, pepper, sweet potatoes.

Pangamic Acid (B15): (Active ingredient; dimethylglycine DMG) Brewer's yeast, rare steaks, whole brown rice, sunflower seeds, pumpkin seeds and sesame seeds, whole grains.

Pantothenic Acid (B5): (Widely distributed in all foods. Antistress hormone, converts fats, CHs, proteins into energy, involved in neurotransmitters, coenzyme A, depression, fatigue, anxiety, tingling in hands) Especially, organ meats, beef, liver, kidney, Brewer's yeast, Torula yeast, egg, fresh vegetables, yolks, kidneys, mushrooms, legumes, nuts, royal jelly, salt water fish, whole rye flour, whole grains/wheat, wheat germ, salmon.

Para-aminobenzoic acid (PABA): (Constituent of folic acid helps in assimilation of B5, sunburn, skin cancer, formation of RBCs) Dried Lima beans, liver, kidney, molasses, mushrooms, spinach, Brewers yeast, raisins, rockmelon, organ meats, wheat germ, whole grains, bran, brown rice, yoghurt, molasses, green leafy vegetables, whole grains.

Pectin: (Pectins slows down absorption of foods after meals, good for people with diabetes and reactive hypoglycemia. Removes metals and toxins, reduces side-effects of radiation therapy, lowers cholesterol, gallstones) Apples, bananas, beets, green beans, cabbage, cauliflower, carrots, citrus fruits, oranges, grapes, oatmeal, okra, plums, potatoes, sesame seeds, squash. Soft fruits like strawberries, raspberries and cherries are low in pectin.

Phenylalanine: (EAA and forerunner of catecholamines - key neurologic chemicals - such as dopamine, epinephrine and nor-epinephrine, related to brain function, dilation and constriction of blood vessels, stimulation of muscles etc.) Pork liver (fried), soybeans, soy products, dry skim milk, cottage cheese, fish, meat, poultry, almonds, peanuts, Brazil nuts, pecans, pumpkin seeds, sesame seeds, Lima beans, chickpeas, lentils. (As supplement* may suppress hunger if taken one hour before meals with juice or water, mood elevator). These should be **avoided by phenylketonurics**, metabolic disorder characterised by absence of phenylalanine hydroxylase, thus accumulating phenylalanine in body. To be taken with **caution in case of hypertension**. To be **avoided in pre-existing pigmented melanoma**. Lofenalac is a protein hydrolysate (milk substitute) a complete food except for its phenylalanine content.

Phosphorus: (Bone formation, absorption of glucose & glycerol, phosphorylation, transport fatty acids, energy metabolism, buffer system) Fish, meats, poultry, eggs yolk, milk and milk products, legumes, nuts, whole-grain cereals, broccoli, rhubarb, Bone Meal*.

Phyto-oestrogen: (Used in menopausal symptoms: usually isoflavones, phytoosterol, saponins, or lignans, in *italics* most popular) Plant sources when oestrogen is low as in postmenopause or too high as in premenstrual tension: alfalfa, apple, chaste tree, dill, fenugreek, rice, sarsaparilla, wild yam (*Dioscorea villosa*), *dong quai* (*Angelica sinensis*), *liquorice root* (*Glycyrrhiza glabra*), Chinese or Korean *ginseng* (*Panax ginseng*), unicorn root (*Aletris farinosa*), *black cohosh* (*Cimicifuga racemosa*), fennel (*Foeniculum vulgare*), false unicorn root (*Helonias*

opulus), soya sprouts, celery family, parsley, red clove sprouts, flaxseed oil.

Potassium: A) Lean meats, whole grains, vegetables, dried fruits, legumes, sunflower seeds, artichoke, asparagus, avocado, beets, bell peppers, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, chard, mushrooms, potatoes, squash, sweet potatoes, tomatoes, tomato juice, citrus fruit, *fruits:* apricot, bananas, blackberries, grapes, rock melon, nectarines, oranges, peaches, plums, rhubarb, cantaloupe; fish, clams, mussels, oysters, buttermilk, skim milk and yoghurt, sunflower seeds, watercress; potassium based salt substitutes.

Potassium: B) (From Werbach, **Healing through Nutrition**, page280), *Fruits* (Especially dried) apricots, bananas, rockmelon (cantaloup), figs, grapes (raisins) peaches, plums (prunes): *Seeds, pumpkin, squash:* Nuts, almonds, peanuts, soya beans: *Vegetables, avocados, beetroot, broad beans, gruyere, potatoes, spinach, squash, tomatoes: Wheat, wheat bran, wheat germ: Others, Brewer's yeast, skimmed milk.*

Potassium rich foods: see Merck Manual 1134 (Many fruits and juices, Beef, turkey, tomatoes, artichoke, Brussels sprout).

Pressor amino-rich foods: [to be avoided in rheumatoid arthritis and schizophrenia, (Reading 1975, in Hypo Newsletter Dec 95, 5)] Curry, chilli, sauces, spices, herbs, chokoes, zucchini, capsicum, mustard.

Protein: Meats, fish, poultry, soybean products, eggs, milk and milk products, cheese, whole grains. Adelle Davis: Brewer's yeast, skim milk powder, wheat germ, soy flour, and cottonseed flour. *Let's Eat Right to Keep Fit* (39-41).

Purines: (To be avoided in gout) Foods high in purines are anchovies and sardines, herring, meat gravies and broths, mushrooms, mussels, asparagus, sweetbread, liver, kidneys and other organ meats, legumes and poultry. Foods lowest in purine includes eggs, fruits, cheese, nuts, sugar, gelatin and vegetable other than legumes.

Pycnogenols: [Bioflavonoids also known as Procyanidolic oligomers (PCOs), or leukocyanidins, or oligomeric proanthocyanidins (OPC) are powerful antioxidant also involved with collagen synthesis, anti-inflammatory] found in Grape seeds skin (*Vitis vinifera*), bark of Landes' pine, bracts of Lime tree and leaves from Hazelnut tree, peanut skins, Sudan cola nuts, hawthorn fruit, Ginkgo biloba, seeds of honey locust pod, Chinese wisteria, bilberries.

Quercetin: (About 180 quercetin glycosides have been identified. Plasma quercetin half life of about 25 hours). A bioflavonoid inhibits aldose reductase in synthesis of sorbitol from glucose) A yellow, crystalline, flavonoid pigment found in oak bark, in fruits, the juice of lemons, asparagus and other plants. High in fried onions, apples, French beans, *broccoli*, red wine, tea. It is used to reduce abnormal capillary fragility and treatment of gout, oedema, strokes. A flavone found in onion skins, tea, hops and horse chestnuts.

Riboflavin: (Vitamin B2) (Involved in oxidative reactions of fats, carbohydrates & amino acids. Deficiency results in cracked skin at corner of mouth, fissures of lip and tongue, seborrhoeic accumulation around nose and eyes) Brewer's yeast, bran, liver, tongue, organ meats, egg yolk, legumes, nuts, milk, cheese, pulses

Rutin: (Vitamin P) Disaccharide derivative of quercetin, containing glucose and rhamnose, found in grains, tomato stalk and elderberry blossom. May be useful in glaucoma.

Saccharin: Artificial sweetener. May be carcinogenic.

Saponin containing foods: (Lowers cholesterol) Baked beans, lentils, soya beans, alfalfa, fenugreek

Selenium: [Part of enzymes glutathione peroxidase (antioxidant) and thyroxine deiodinase] Important antioxidant depending on soil. Butter, tuna, herrings, Brazil nuts (5 Brazil nuts per day), apple cider vinegar, scallops, barley, lobster, prawn (shrimp), beef, Brewer's yeast, wheat germ, garlic, onions, bran, broccoli, whole grains, pork, chicken, milk.

Serine: (Non-essential amino acid derived from D Glyceraldehyde 3P from glycolysis). Serine precursor of -> choline, cysteine, glycine.

Serotonin: (Produced from tryptophan in presence of vitamin B6 and precursor to niacin (B3) may reduce pain in migraine) Carbohydrates increase tryptophan absorption by provoking the pancreas to secrete insulin. Insulin increases the relative concentration of tryptophan by causing the tissues to soak up competing amino acids from the blood. But raised tryptophan, and therefore raised serotonin levels may also trigger migraines. Thus experiment with tryptophan.

Silicon: (Trace mineral essential in formation of bone, cartilage, connective tissue) root vegetables, whole grains, cereals, cooked fried

beans and peas, seafood. In *supplemental form*: magnesium trisilicate or silicon dioxide, Vegetal Silica from horsetail. Horsetail powder

Sodium: Seafood, table salt, baking powder and baking soda, celery, dill pickles, pretzels, sauerkraut, soy sauce, dried beef, ham, smoked bacon, processed foods, milk products, Kelp*. *Soups*: beef and chicken broth, black bean, chicken gumbo, cream of potato, Manhattan clam chowder, *Processed fish*: canned sardines, tuma, kippered herring, smoked salmon

Soluble fibres: such as in fruits, dried peas, beans, barley, oats, gums, (guar, xanthan, locust bean) mucilage (psyllium), pectins.

Strontium: (Non-radioactive strontium): constituent of bone and teeth, available as strontium lactate, depending on soil water, bonemeal,

Sulphur: (constituent of methionine, cell protein, activate enzymes, high energy sulphur bonds in energy metabolism, detoxification reactions) Fish, eggs, meats, milk, cheese, cabbage, Brussels sprouts, nuts, legumes.

Taurine: (NEAA) (contains sulphur and inactivates free radicals) Synthesised from methionine and cysteine in liver in presence of B6. Estradiol depresses formation of taurine, -> women need more. Maintains cholesterol solubility. High levels during migraine. Taurine + zinc anticonvulsive effects in epilepsy. May reduce need for insulin in diabetics. Improves intelligence in mental retardation. Light deprivation may cause taurine deficiency via low levels in pineal & pituitary glands. Human milk high in taurine, but cow's milk poor. Other sources eggs, fish, meat. Vegetables poor. For vegetarians, synthesis in the body is crucial.

Tertiary butyhydroquinone (TBHQ): Chemical used together with BHA or BHT as preservatives sprayed on the inside of cereal and cheese packages. Said to be toxic and affect childhood behavioural problems. Found in sweet bars, candy bars, baking spray and fast foods.

Thiamine (B1): Brewer's yeast, whole grains, blackstrap molasses, brown rice, organ meats, pork liver, meats, fish, poultry, egg yolks, legumes, potatoes, nuts, rice bran*

Threonine: (EAA) Important in formation of collagen and elastin, lipotropic function with aspartic acid and methionine in liver, available in first class proteins, non-fat dried milk, pork, fried liver, skim milk, soya flour, Parmesan Cheese, baked flounder, trout (Raw), tuna, canned in oil drained, Edam Cheese, chicken breasts, poultry turkey, roasted pork, sirloin steak, liver (cooked), beef (roast), fried calf liver, mackerel. Low in grains. But combination of pulses and grain is complete source for vegetarians.

Tryptophan: (EAA) Turkey, fried liver, soya flour, pumpkin seeds, bananas, tomatos, *skim milk*, eggs, Parmesan Cheese, *cottage cheese*, cashews, dried dates, Edam Cheese, walnuts, peanuts (*roasted), peanut butter, Cheddar cheese, sesame seeds, flounder baked, liver (cooked), tuna canned in oil drained, salmon, chicken liver, roast pork and meat. Poor tryptophan sources: rye, corn buckwheat.

Tyramine: (to be avoided by those taking MAO inhibitors for depression) (migraine headaches); Tyrosine a tyramine precursor; almonds, avocado, chocolate, figs, bananas, beef or chicken liver, beer, cheese including cottage cheese, aged cheese, coffee, meat tenderizer, peanuts, pickles, pineapple, pumpkin seeds, raisins, aged game, liver, canned meat, salami, sausage, salted dried fish, pickled herring, sesame seeds, Italian broad beans, green bean pods, eggplant, yeast products (ie., Marmite), Brewer's yeast, any products which involves fermentation, alcoholic beverages, yoghurt

Tyrosine: Derived from phenylalanine. It is also the precursor for the synthesis of melanin (skin and hair pigments) and adrenaline and nor adrenaline. Found in almonds, avocados, bananas, dairy products, lima beans, pumpkin seeds, sesame seeds. Pure form the best way taken with carbohydrate meal to avoid competition with other amino acids. Avoid when taking MAO inhibitors as it could raise blood pressure.

Uric acid: End product of purine metabolism. Excess causes crystallization in joints leading to gout. High in sweetbread (pancreas), fish roe, sardines, anchovies, lesser amounts in other fish and meat, little in vegetables, fruits and cereals.

Valine: (EAA) (Needed for muscle energy source & metabolism, tissue repair, nitrogen balance) soy flour, raw brown rice, cottage cheese, dairy products, fish, beef, lamb, chicken, almonds, Brazil nuts, cashews, peanuts, sesame seeds, lentils, chickpeas (garbanzos), Lima beans, mushrooms, soybeans

Vanadium: (Potentiator of insulin) Richest: black pepper, dill seeds, Middle range: whole grains, buckwheat, parsley, fish, meats (liver) and dairy products, soybean-, corn-, olive-oil, gelatine, mushrooms, soybean. Toxicity may lead to manic-depressive illness.

Vasoactive amines: (responsible for changing size of blood vessels which may lead to migraines, **tyramines:** aged cheese, chicken liver, pickled herring, dry fermented sausage, sour cream, red wine (especially Chianti); **Phenylethylamine:** cheese, chocolate. See also, nitrites, lactose, caffeine, copper, aspartame

Vitamin A: Made in the body from —> beta-carotene. Liver, eggs, egg yolk, yellow fruits and vegetables, spinach, dark-green fruits and vegetables, rhubarb, whole milk products, fish-liver oil*, in fishoils such as cod, salmon and halibut.

Vitamin A (retinol): Fish, liver, eggs, yellow fruits, vegetables, dark green fruits and vegetables, whole milk, milk products, fish-liver oil or Cod liver oil*.

Vitamin B: Brewer's Yeast, whole grains, blackstrap molasses, organ meats, egg yolk, legumes, nuts.

Vitamin B-complex: Yeasts, Brewer's Yeast, dried Lima beans, raisins, cantaloupe (rockmelon), liver, beef, cheese, pork, kidney

Vitamin B1 (Thiamine): Most vegetables, Brewer's Yeast, dried yeast, whole grains, blackstrap molasses, bran, brown rice, organ meats, meats (pork or liver), fish poultry, egg yolk, legumes, milk, peanuts, rice polish, sunflower seeds, potatoes and nuts, wheat germ, whole wheat. Enemies: Cooking, caffeine, alcohol, food-processing methods, air, water, oestrogen, sulphur drugs.

Vitamin B2 (Riboflavin): Brewer's yeast, whole grains, almonds, blackstrap molasses, organ meats, egg yolks, legumes, nuts. *see also bioflavonoids*, wheat germ, rice polish, sunflower seeds.

Vitamin B3 (niacin): (Niacin also produced from tryptophan) Lean meats, poultry, fish, Torula yeast, Brewer's Yeast, peanuts with skin, milk and milk products, avocado, baked beans, broccoli, clams, liver, mushrooms, oysters, potatoes, raspberries, rice bran, wheat bran, strawberries, turkey, watermelon, rice bran, desiccated liver*, vegemite.

Vitamin B6: (pyridoxine) Meats, whole grains, organ meats, Brewer's yeast, wheat germ, prunes, raisins, potatoes, soya beans, bananas, avocados, blackstrap molasses, milk, eggs, beef, rockmelon, cabbage, sunflower seeds, rice (whole), walnuts, peanuts, canned tomatoes, Baker's yeast, wheat germ, legumes, green leafy vegetables, liver (beef), turkey, chicken, pork, salmon, Malt extract, Flour (refined desiccated liver*, don't take more than 100 mg of B6. Very low in cottage cheese.

Vitamin B12: (Cobalamin): organ meats, liver (lamb), fish, clams, pork, pig liver, pig kidney, fatty fish, beef, lamb, white fish, oysters, sardines, salmon, Tuna, eggs (yolk), chicken liver, cheeses, milk and milk products. (Spirulina, or and other sea vegetables, tofu and other soy products, fermented or otherwise, pasteurised or not pasteurized, grains, yeast, cereals are **NOT** good sources according to Hendler (1990, 65).

Vitamin B13: (Orotic Acid): Metabolizes folic acid and B12. Root vegetables, liquid whey, liquid portion of soured or curdled milk.

Vitamin C: (Ascorbic acid, ascorbate): Citrus fruits, rose hips, Acerola cherries, alfalfa seeds, alfalfa sprouts, cantaloupe (Rock Melon) strawberries, broccoli, cabbage, tomatoes, green peppers, capsicum, parsley, Brussels sprout, kale, mustard greens, paw paw, spinach, cauliflower, oranges, mangoes, grapefruit, pineapple, radishes, onions, green peas, spinach, sweet peppers. *Herbs:* alfalfa, burdock root, cayenne, chickweed, eyebright, fennel seed, fenugreek, hops, horsetail, kelp, peppermint, mullein, nettle, oat straw, paprika, parsley, pine needle, plantain, raspberry leaf, red clover, rose hips, skullcap violet; leaves, yarrow, yellow dock. Esterified vitamin C (Ester-C) is an effective form of vitamin C supplementation.

Vitamin D: (Absorption of calcium and phosphorus by intestinal tract, heart beat, osteoporosis) Salmon, sardines, herrings, liver, vitamin D-fortified milk and milk products, egg yolks, organ meats, Cod Liver Oils* Bone-meal*, also produced in skin from sunlight. Dandelion greens, alfalfa, horsetail, nettle, parsley. Do not take vitamin D without calcium. Toxicity: >25,000 IUs over extended period. Supplementation rarely needed in sunny Australia.

Vitamin E: (Tocopherol): Almonds, Brazil nuts, cold-pressed oils, cornmeal, dulse, eggs, legumes, nuts, wheat germ oil, brown rice, oatmeal, organ meats, sunflower seeds (& oil), safflower oil, sesame oil, peanut oil, corn oil, hazelnuts, olive oil, organ meats, molasses, nuts, soybean oil, sweet potatoes, leafy vegetables, watercress, whole grains,

Glycemic Index re-defined

A team of scientists from the Human Nutrition Unit, Department of Biochemistry at the Sydney University, SHA Holt, Janette C Brand Miller and Perter Petocz, have been re-defining the glycemic index - a method of ranking foods on the basis of their blood glucose response - which could have important implications in the treatment of diabetes and by implication the 'hypoglycemic syndrome'. The latter term is used by this association to indicate people that have characteristic

unstable blood sugar levels as a result of a glucose intolerance, which is often a sign of latent diabetes.

Glycemic Index (GI) helps individuals with diabetes to choose low-GI foods. For example potatoes have a high GI and legumes have a low GI. However, the GI approach has not been accepted as a useful tool in diabetes management by the majority of scientists. The GI approach may be useful in the comparison of single foods but the addition of fat, protein and other foods renders it useless in meal planning. The National Institute of Health (NIH) recommended against the use of the GI.¹

J Brand Miller et al.² found that the commonly held belief that foods containing added sugars produce higher glycaemic and insulin responses (on the GI scale where glucose = 100), than starchy foods was not tenable. Some 'sugary' foods had a GI lower than 70. Foods rich in simple sugars usually have lower GI values than most starchy foods, although there were exceptions such as canned peaches, yoghurt and soft drinks. Adding sucrose to low GI foods will increase the final GI, but adding sucrose to high GI foods have been found to result in a lower GI. There was a good correlation between GI and insulin index ($r = 0.69, P < 0.001$). This may not be the case in diabetes because hyperglycemia (high blood sugar levels) could be more relevant to the secondary complications of NIDDM.

In the third study³, using 11-13 healthy subjects, insulin responses were compared among thirty-eight commonly eaten foods. The insulin score (IS) was calculated for each

food with use of white bread as the reference food (score = 100%). Although differences were found among foods, overall, glucose and insulin scores were highly correlated ($r = 0.70, P < .001, n = 38$). It would be interesting to compare these results with a group of subjects with a known glucose intolerance.

Western staples, bread and potato, elicited the highest insulin scores. Highly refined bakery products and snack foods induced more insulin secretion than pasta, oatmeal porridge and All-Bran cereal. Protein- and fat-rich foods (eggs, beef, fish, lentils, cheese, cake and doughnuts) produced as much insulin as carbohydrate-rich foods. Similar insulin scores were observed for white and brown pasta, white and brown rice or whole meal bread.

For details the reader should refer to the original articles and particularly to the list of food items given in the study's table 4 on page 1269. There are some surprises (Whitebread = 100, GS = Glucose score, IS = Insulin score) :

	GS	IS
Brown Rice	104	62
White rice	110	79
Baked beans	114	120
Jelly Beans	118	160
Doughnuts	63	74
Crackers	118	87

Footnotes

- 1) Janette C Brand Miller (1994), Importance of glycemic index in diabetes, *Am J Clin Nutr*; **59** (suppl): 747S-52S
- 2) Brand Miller J, Pang E, Broomhead L (1995), The glycaemic index of foods containing sugars: comparison of foods with naturally-occurring v. added sugars, *British Journal of Nutrition* **73**: 613-623
- 3) Holt SHA, Brand Miller JC, Petocz P (1997), An insulin index of foods: the insulin demand generated by 100-kJ portions of common foods, *Am J Clin Nutr* **66**: 1264-76

Editor

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