Your Monthly Update

Dear Colleague

Welcome to the first newsletter in 2008 from Pure Bio Ltd.

Did you know. . .?

Omega 3 fatty acids, in the form of EPA and DHA, have been shown to reduce resting heart rate and improve post-exercise recovery.

Our topic for this month is – somewhat topically following the Christmas season! :

Weight Loss and Weight Control

Ranking	Nutritional Supplements	Botanical Medicine
Primary	Multivitamin-mineral (for very-low-calorie diets) Pyruvate	
Secondary	5-HTP 7-KETO Calcium Chitosan Conjugated linoleic acid (CLA) Fibre	Cayenne Green tea
Other	Amylase inhibitors Biotin Blue-green algae (Spirulina) Chromium DHEA L-carnitine Sesamin Soy	Bitter orange Coleus Guaraná

Primary – Reliable and relatively consistent scientific data showing a substantial health benefit.

Secondary – Contradictory, insufficient, or preliminary studies suggesting a health benefit or minimal health benefit.

Other – An herb is primarily supported by traditional use, or the herb or supplement has little scientific support and/or minimal health benefit.

Definition

- **The individual's need for carbohydrate, fat and protein, along with an appropriate balance of vitamins, minerals and fibre is as individual as a set of fingerprints.**
- **Rigid diets that specify what foods can be eaten and which must be avoided cannot possibly work for a whole population of people.**
- **At one time in history, people knew instinctively what to eat and when; they were exactly in tune with their body's requirements. Commercial invasion and over-production and availability of food have driven us from our ancestral dietary instincts. However, our body chemistry has not adjusted with these changes.**
- **Obesity should be considered a disease i.e. the process of weight gain should be considered a chronic disease process.**
- **Excess fat on the abdomen – *Central Fat Distribution* – is associated with a greater number of metabolic complications than extra fat that is principally in subcutaneous sites i.e. hips and legs.**
- **Central fat distribution is mainly under genetic control; but is also influenced by nutritional status in early life.**
- **Fat distribution is also influenced by physical activity, smoking and excess alcohol**

Causes of Weight Gain

- **Three components govern energy balance: *diet, exercise* and *genes***
- **A failure in one component allows compensation from the others: Thus, in populations with food provisions in excess of requirements, with high fat diets (>30% of daily calories); and without the need for physical exertion to obtain the food, many will gain body fat.**
- **These factors all interact so that a high-fat diet (usually in association with a low carbohydrate one) is particularly fattening for individuals with a genetic susceptibility to gain weight.**
- **Low physical activity actually increases appetite paradoxically, therefore promoting obesity – the "couch-potato effect".**
- **Appetite is one of the strongest survival forces and without it the human species would have disappeared long ago. It is only when there are excess calories available all the time and people do not have to work physically, that the natural appetite causes problems. The mismatch need be only very small – a 1% error will accumulate 10,000kcal/yr = a weight gain of 1 -2 kg/yr.**

The Psychology of Eating

- **Leptin is a peptide produced in adipose tissue and released, in the well-fed state, to reduce appetite by acting on receptors in the brain**
- **Defects in this system – either in leptin production or in its receptor – cause obesity**
- **There is usually an excess of leptin in the plasma of overweight humans, who appear to be resistant to its appetite-regulatory activity**
- **Leptin appears to regulate appetite in obese people only when they undertake physical activity, possibly due to an – as yet undiscovered - chemical produced during exercise which allows leptin to enter the brain**
- **Brain neurotransmitters and stress hormones significantly contribute to weight gain and obesity through their effect on appetite and the emotions**

Food as Energy

- **The food from which the most potential energy is derived is fat, followed by carbohydrates; with protein providing only small amounts.**
- **A person's individual metabolism determines how much energy will come from each of these macronutrients.**

- **The amount of each food in the diet, along with the state of the nervous system, all affect a person's metabolism.**
- **Both stress and too much stored body fat provokes the metabolism to burn more sugar and less fat.**
- **The endurance system – *the aerobic system* – is activated by easy exercise and proper diet and facilitates fat-burning; whereas the speed system – or *anaerobic system* – is activated under stress and facilitates sugar-burning whilst maintaining fat stores.**

Optmising Energy

Energy is obtained from the macronutrients: carbohydrates, fats and proteins. Broadly speaking these are obtained as follows:

CARBOHYDRATES	FATS	PROTEINS
Bread and cereals Pasta and rice Fruit and fruit juice Sugar	Oils Butter High-fat cheeses Nuts Egg yolks	Meat Fish Eggs Cheese (curds & whey) **Beans**

- **Protein should constitute about 15% of energy input (although this is generally significantly exceeded in the modern Western diet)**
- **Energy is mostly generated in the aerobic muscles and, when aerobic function is at its most optimal, up to 90% of the body's entire energy source can be derived from fats**
- **The more energy derived from fat the better - by being a better fat burner, the body will store less fat, have more physical and mental energy and maintain a more stable blood sugar level**
- **For optimal fat burning, the aerobic muscles must be utilized and there must be adequate intake of good quality unprocessed dietary fats**
- **To maintain efficient fat-burning, the body must also burn some sugar. The less efficient the aerobic system is; the more the person will rely on dietary sources of sugar to maintain energy**
- ***In order to burn fats, exercise must be undertaken at the maximum aerobic pulse, otherwise the tendency is to burn glucose. In order to burn fat, carbohydrate intake should be reduced.***

BROWN and WHITE FAT

- **Most of the body's fat stores are white fat, making up as much as 5% - 50% of total body weight. White fat's main function is storage**
- **Brown fat makes up only about 1% of total body weight. It is brown fat that helps to regulate the fat-burning aspect of metabolism, depending on how it is stimulated**
- **Brown fat encourages weight gain and sluggish mentality in the winter**
- **If caloric intake is too low, brown fat slows down the burning of white fat**
- **Brown fat is controlled by temperature – the cooler the body, the more brown fat is activated and the more white fat is burned**
- **If there is too much thermal stress during exercise, brown fat activity reduces, leading to less burning of white fat . . . therefore thermal sweat-suits during exercise are counter-productive if the objective is to burn fat. Similarly, sitting in a sauna / jacuzzi after exercise decreases fat-burning (although causes temporary weight loss through increased perspiration)**

Goals of Weight Management

- Adipose tissue fundamentally contains lipid (9kcal/kg), but the extra blood supply, fibrous supporting tissue, musculature etc. means that the energy content of weight loss is ultimately ca. 7000kcal/kg.
- So, a person of 95kg whose ideal weight is 60kg would need to shed 35 x 7000 = 245,000 kcal. On a 1000 kcal/day deprivation, this could be achieved in ca. 250 days
- Experience shows that successful slimmers lose 0.5 – 1.0kg/week. This demands a daily dietary restriction of 500 – 1000 kcal below previous intake
- In simple terms, effective weight management requires that an overweight person spends a period of time in negative energy balance i.e. energy expenditure exceeds energy intake
- If eating habits are to change, the entire process of food choice, acquisition and consumption must be addressed
- A useful start is for patients to complete a diary of food and eating habits for 14 days. This allows food content to be analysed; and also habits that are detrimental to weight management e.g. evening snacking, often due to inactivity and boredom
- Physical activity in the overweight helps to overcome depression, reduces blood cholesterol and BP, reduces the risk of diabetes and reduces appetite
- Increasing physical activity also helps to protect muscle during weight loss
- The BMR of a person who has lost 7 kg will be reduced by ca. 120 kcal/day. Thus, to maintain this weight, he must either eat 120 kcal/day less or take about 20 mins/day of exercise

Fashionable Dieting

Weight-loss diets are typically designed to limit calories either by restricting certain foods that are thought to result in increased calorie intake, and/or by emphasizing foods that are believed to result in reduced calorie intake. Some currently popular diets restrict fat while emphasizing fibre and a balanced intake of healthy foods. Others restrict carbohydrates, either to extremely low amounts as in the Atkins diet, or to a lesser degree, emphasizing foods low in the glycaemic index or high in protein. However, it should be remembered that no diet has been proven effective for long-term weight loss, and many people find it difficult to stay on most diets.

Low-carbohydrate, high-protein diets

Low-carbohydrate, high-fat diets such as the Atkins diet are very popular among people trying to lose weight. In a preliminary study, overweight individuals who adhered to a very-low-carbohydrate diet (25 grams per day initially, increased to 50 grams per day after a certain weight loss target was achieved), with no limit on total calorie intake, lost on average more than 10% of their body weight over a six-month period. The participants also engaged in aerobic exercise at least three times a week, so it is not clear how much of the weight loss was due to the diet. An analysis of other preliminary studies of this type of diet concluded that its effectiveness is primarily due to reduced calorie intake. Recently, three controlled trials found people using low-carbohydrate, high-fat diets lost more weight in six months than those using diets low in fat and calories. However, one of these trials continued for an additional six months, at the end of which there was no longer a significant difference in weight loss between the two diet groups.

Blood tests suggest that low-carbohydrate diets induce a condition called mild metabolic acidosis, which might increase the risk of osteoporosis and kidney stones.

The effect of low-carbohydrate diets on cardiovascular risk is also an unresolved issue. The short-term studies discussed above found that blood cholesterol levels did not worsen with these diets. Other heart-disease risk factors (triglyceride levels and insulin sensitivity) actually improved with a low-carbohydrate diet. Some studies, however, have shown a worsening of certain cardiovascular risk factors in people using a low-carbohydrate, high-fat diet for up to one year. Adverse changes included

increases in blood levels of homocysteine, lipoprotein(a), and fibrinogen; and a decrease in blood flow to the heart.

One small study has shown that the most effective weight-loss diet for any particular person might depend on whether or not they have insulin resistance. In obese people with insulin resistance, weight loss was greater with a low-carbohydrate (40% of calories), high-fat (40% of calories) diet than with a high-carbohydrate (60% of calories), low-fat (20% of calories) diet. In contrast, obese people who did not have insulin resistance lost more weight on the high-carbohydrate, low-fat diet.

Low-glycemic-index foods

Diets that emphasize choosing foods with a low glycemic index have been shown to help control appetite in some, though not all, controlled studies. A controlled study in two phases found no difference in weight loss between a low- and a high-glycemic-index diet in the first 12-week phase, but when the diets were switched for a second 12-week phase, the low-glycemic-index diet was significantly more effective for weight loss.

Fibre

Adequate amounts of dietary fibre are believed to be important for people wishing to lose weight. Fibre adds bulk to the diet and tends to produce a sense of fullness, helping people consume fewer calories.

Stabilizing food sensitivities

Although the relationship between food sensitivities and body weight remains uncertain, according to one researcher, chronic food allergy may lead to overeating and obesity.

Long-term changes

People who repetitively diet frequently complain that it takes fewer calories to produce weight gain with each weight fluctuation. Evidence now clearly demonstrates that the body gets "stingier" in its use of calories after each diet. This means it becomes easier to gain weight and harder to lose it the next time. Dietary changes need to be long term.

Nutritional Supplement Treatment Options

Multiple vitamin minerals

Diets that are low in total calories may not contain adequate amounts of various vitamins and minerals. For that reason, taking a multiple vitamin-mineral supplement is advocated by proponents of many types of weight-loss programs, and is essential when calorie intake will be less than 1,100 calories per day.

- ***Nutrient 950 PE***
- ***Nutrient 950 w/o Copper and Iron PE***

Fibre

Fibre supplements are one way to add fibre to a weight-loss diet. Several trials have shown that supplementation with fibre from a variety of sources accelerated weight loss in people who were following a low-calorie diet.

- ***NUTRAFLAX PE*** **- Low glycaemic dietary carbohydrate and fibre. Flax seed delays carbohydrate digestion and absorption, due to the soluble fibre content and a higher percentage of outer seed coat mucilage, which becomes gel-like in the intestinal tract. This helps to slow the release of glucose into the bloodstream and promotes normal laxation.**

Pyruvate

Pyruvate, a compound that occurs naturally in the body, might aid weight-loss efforts. A controlled trial found that pyruvate supplements (22 to 44 grams per day) enhanced

weight loss and resulted in a greater reduction of body fat in overweight adults consuming a low-fat diet. Three controlled trials combining 6 to 10 grams per day of pyruvate with an exercise program reported greater effects on weight loss and body fat than that seen with a placebo plus the exercise program. Animal studies suggest that pyruvate supplementation leads to weight loss by increasing the resting metabolic rate.

5-HTP

5-HTP (5-hydroxytryptophan), the precursor to the chemical messenger (neurotransmitter) serotonin, has been shown in three short-term controlled trials to reduce appetite and to promote weight loss. In one of these trials (a 12-week double-blind trial), overweight women who took 600 to 900 mg of 5-HTP per day lost significantly more weight than did women who received a placebo. In a double-blind trial with no dietary restrictions, obese people with type 2(non-insulin-dependent) diabetes who took 750 mg per day of 5-HTP for two weeks significantly reduced their carbohydrate and fat intake. Average weight loss in two weeks was 4.6 pounds, compared with 0.2 pounds in the placebo group – *5HTP 50mg PE*

7-KETO

The ability of 7-KETO (3-acetyl-7-oxo-dehydroepiandrosterone), a substance related to DHEA, to promote weight loss in overweight people has been investigated in one double-blind trial. Participants in the trial were advised to exercise three times per week for 45 minutes and to eat an 1,800-calorie-per-day diet. Each person was given either a placebo or 100 mg of 7-KETO BID. After eight weeks, those receiving 7-KETO had lost more weight and lowered their percentage of body fat further compared to those taking a placebo. These results may have been due to increases in levels of a thyroid hormone (T3) that plays a major role in determining a person's metabolic rate, although the levels of T3 did not exceed the normal range.

Calcium

In a study of obese people consuming a low-calorie diet for 24 weeks, those receiving a calcium supplement (800 mg per day) lost significantly more weight than those given a placebo. Calcium was effective when provided either as a supplement, or in the form of dairy products. In a second study, however, the amount of weight loss resulting from calcium supplementation (1,000 mg per day) was small and not statistically significant. In that study, participants' typical diet contained more calcium than in the study in which calcium supplementation was more effective. Thus, it is possible that calcium supplementation enhances weight loss only when the diet is low in calcium.

- ***Calcium aspartate PE***
- ***Calcium citrate PE***
- ***Calcium MCHA PE***

CLA

A naturally occurring trans-isomer of linoleic acid which supports fat reduction and lean body mass. A double-blind trial found that exercising individuals taking 1,800 mg per day of conjugated linoleic acid (CLA) lost more body fat after 12 weeks than did a similar group taking a placebo. Most double-blind trials have found that larger amounts of CLA, 3.2 to 4.2 grams per day, do reduce body fat – *CLA PE*

Biotin

A water-soluble B vitamin that facilitates protein, fat and carbohydrate metabolism by acting as a co-enzyme for numerous metabolic reactions – *Biotin PE*

Blue-green algae

Blue-green algae, or spirulina, is a rich source of protein, vitamins, minerals, and essential fatty acids. Although spirulina has been promoted as a weight-loss aid, the scientific evidence supporting its use for this purpose is weak.

Chitosan

Chitosan is a fibre-like substance extracted from the shells of crustaceans such as shrimp and crab. Animal studies suggested that chitosan supplementation reduces fat

absorption, but controlled human trials have found no impairment of fat absorption from supplementation with 2,700 mg of chitosan per day for seven days or 5,250 mg per day for four days. A double-blind study found that people taking 1,500 mg of chitosan TID during a weight-loss program lost significantly more weight than did people taking a placebo with the same program. Similar benefits were seen in another double-blind study that used 3,000 mg of chitosan per day - *Chitosan Liposan Ultra PE*

Chromium

The mineral chromium plays an essential role in the metabolism of carbohydrates and fats and in the action of insulin. Chromium, usually in a form called chromium picolinate, has been studied for its potential role in altering body composition. In people trying to lose weight, a double-blind study found that 600 mcg per day of niacin-bound chromium helped some participants lose more fat and less muscle. However, three other double-blind trials have found no effect of chromium picolinate on weight loss, though in one of these trials lean body mass that was lost during a weight-loss diet was restored by continuing to supplement chromium after the diet. A recent comprehensive review combining the results of ten published and unpublished double-blind studies concluded that chromium picolinate supplementation may have a small beneficial effect on weight loss.

- ***Chromium picolinate PE***
- ***Chromemate 200mg PE***
- ***Chromemate 600mg PE***

DHEA

One double-blind trial found 100 mg per day of DHEA was effective for decreasing body fat in older men, and another double-blind trial found 1,600 mg per day decreased body fat and increased muscle mass in younger men.

L-carnitine

The primary function of l-carnitine is to support fat utilization and also acts as a carrier of fatty acids into the mitochondria where they are oxidized and converted to energy. It is thought to be potentially helpful for weight loss because of its role in fat metabolism. In a preliminary study of overweight adolescents participating in a diet and exercise program, those who took 1,000mg of L-carnitine per day for three months lost significantly more weight than those who took a placebo - *l-Carnitine PE*

Sesamin

Sesamin is a substance present in sesame oil that manufacturers claim may enhance fat burning by increasing the activity of several liver enzymes that metabolize fatty acids. It is believed that optimizing hepatic fat-burning capacity may promote fat loss; however, there is no published research to support the claims.

Soy

Animal and human studies have suggested that when soy is used as a source of dietary protein, it may have several biological effects on the body that might help with weight loss. A preliminary study found that people trying to lose weight using a meal-replacement formula containing soy protein lost more weight than a group not using any formula – *Soy Isoflavones PE*

PUFAs

Brown fat is stimulated by Ω6 and Ω3 fatty acids; particularly the mid-stage breakdown components GLA (e.g. blackcurrant seed oil); and EPA (fish oil)

- ***Blackcurrant seed oil PE***
- ***EPA/DHA capsules/oil PE***

LIVER FUNCTION

Healthy liver detoxification pathways are essential during weight loss, since fat is a storage depot for inert toxins in the body.

NAC & alpha-lipoic acid – antioxidants that boost glutathione levels and bind to heavy metals

- ***NAC PE***
- ***Alpha-lipoic acid PE***

Curcumin & Silymarin – enhance phase II detoxification enzymes and support glutathione synthesis. Silymarin also supports healthy glucose, insulin, lipid and triglyceride metabolism.

- ***Silymarin PE***
- ***Milk Thistle tincture Pure Bio***
- ***Curcumin PE***

Botanical Treatment Options

Cayenne
Research has suggested that incorporating cayenne pepper into the diet may help people lose weight. Controlled studies report that adding 6 to 10 grams of cayenne to a meal or 28 grams to an entire day's diet reduces hunger AC and reduces calories consumed during subsequent meals. Other controlled studies have reported that calorie burning by the body increases slightly when 10 grams of cayenne is added to a meal or 28 grams is added to an entire day's diet. However, no studies have been done to see if regularly adding cayenne to the diet has any effect on weight loss.

Green tea extract rich in polyphenols (epigallocatechin gallate, or EGCG) may support a weight-loss program by increasing energy expenditure or by inhibiting the digestion of fat in the intestine. Healthy young men who took two green tea capsules (containing a total of 50 mg of caffeine and 90 mg of EGCG) TID had a significantly greater energy expenditure and fat oxidation than those who took caffeine alone or placebo. In a preliminary study of moderately obese individuals, administration of a specific green tea extract (AR25) resulted in a 4.6% reduction in average body weight after 12 weeks. The amount of green tea extract used in this study supplied daily 270 mg of EGCG and 150 mg of caffeine. While caffeine is known to stimulate metabolism, it appears that other substances besides caffeine were responsible for at least part of the weight loss – *Green tea extract PE*

Bitter orange
Although historically used to stimulate appetite, bitter orange is frequently found in modern weight-loss formulas because synephrine is similar to the compound ephedrine, which is known to promote weight loss. In one study of 23 overweight adults, participants taking a daily intake of bitter orange (975 mg) combined with caffeine (525 mg) and St. John's wort (*Hypericum perforatum*, 900 mg) for six weeks lost significantly more body weight and fat than the control group. No adverse effects on heart rate or blood pressure were found.

Coleus
Although no clinical trials have been done, there are modern references to use of the herb coleus for weight loss. Coleus extracts standardized to 18% forskolin are available, and 50 to 100 mg can be taken BID–TID. Fluid extract can be taken at a dose of 2 to 4 ml TID.

Guaraná
The herb guaraná contains caffeine and the closely related alkaloids theobromine and theophylline; these compounds may curb appetite and increase weight loss. Caffeine's effects are well known and include central nervous system stimulation, increased metabolic rate, and a mild diuretic effect. In a double-blind trial, 200 mg per day of caffeine was, however, no more effective than a placebo in promoting weight loss. Because of concerns about potential adverse effects, many doctors do not advocate using caffeine or caffeine-like substances to reduce weight.

For further information, contact:

Tracy S Gates

Director

PURE BIO LTD.

01403 730342

info@purebio.co.uk