Your Monthly Update

Dear Colleague

Welcome to the September newsletter from Pure Bio Ltd.

Did you know. . .?

The UK organic market grew by 30% and averaged sales of £7million a week in 2005!

Our topic for this month is Type 2 Diabetes

Type 2 (Adult Onset) Diabetes

Ranking	Nutritional Supplements	Botanical Medicine
Primary	Alpha lipoic acid Brewer's yeast (providing approximately 60 mcg of chromium per tablespoon) Chromium Evening primrose oil Magnesium	Cayenne (topical for neuropathy) Fenugreek (seeds) Psyllium
Secondary	Acetyl-L-carnitine (for diabetic neuropathy) Biotin Coenzyme Q10 L-carnitine Multiple vitamin–mineral supplement (for preventing infections) Vitamin B12 (for diabetic neuropathy) Vitamin B6 Vitamin C Vitamin E (for prevention of diabetic retinopathy)	Aloe vera Asian ginseng Bilberry Cinnamon Onion
Other	Following are associated with diabetic retinopathy: Selenium, vitamin A, vitamin C, and vitamin E (combined) Fructo-oligosaccharides (FOS) Taurine Vitamin B3 (niacin) Vitamin E (associated with abetalipoproteinemia)	Olive leaf Reishi

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.

Symptoms of Diabetes

Type 2 diabetes is frequently diagnosed in aymptomatic patients during a routine medical examination. Symptoms of diabetes include:

- **Frequent urination**
- **Thirst**
- **Weight loss**
- **Blurred vision**
- **Fatigue**
- **Nausea**
- **Fungal and bacterial infection**
- **Itching due to vaginal yeast infection**

Late complications of diabetes include: heart disease, infections, skin ulcers, kidney disease, numbness and tingling in the hands and feet, impotence, constipation, pain and poor circulation in the legs, vision loss.

Dietary Modification

The relationship between eating carbohydrates and type 2 diabetes is complex. While eating carbohydrates increases the need for insulin to keep blood sugar normal, diets high in total carbohydrates do not necessarily increase the risk of type 2 diabetes. Researchers have found that diets very high in sugar may worsen glucose tolerance in nondiabetic animals and humans. However, the amount of sugar used in these studies in proportion to other foods was much larger than is typically found in human diets.

Eating carbohydrate-containing foods, whether high in sugar or high in starch (such as bread, potatoes, processed breakfast cereals, and rice) will temporarily raise blood sugar and insulin levels. The blood sugar–raising effect of a food - its "glycaemic index" - depends on how rapidly its carbohydrate is absorbed. Many starchy foods have a glycaemic index similar to table sugar (sucrose). People eating large amounts of foods with high glycaemic indexes have been reported to be at increased risk of type 2 diabetes. On the other hand, eating a diet high in carbohydrate-rich foods with low glycaemic indexes is associated with a *low* risk of type 2 diabetes. Beans, peas, fruit, and oats have low glycaemic indexes, despite their high carbohydrate content, due mostly to the health-promoting effects of soluble fibre.

Diabetes disrupts the mechanisms by which the body controls blood sugar. Until recently, health professionals have recommended sugar restriction to people with diabetes, even though short-term high-sugar diets have been shown, in some studies, not to cause blood sugar problems in people with diabetes. Currently, the British Diabetic Association (BDA) guidelines do not prohibit the use of moderate amounts of sugar, as long as blood levels of glucose, triglycerides, and cholesterol are maintained within normal levels.

Most doctors recommend that people with diabetes reduce the amount of sugar eaten in snacks and processed foods, and replace these foods with high-fibre, whole foods.

This tends to lower the glycaemic index of the overall diet and has the additional benefit of increasing vitamin, mineral, and fibre intake.

A high-fibre diet has been shown to work better in controlling diabetes than the diet recommended by the BDA, and may control blood sugar levels as well as oral diabetes drugs. In this study, the increase in dietary fibre was accomplished exclusively by eating foods naturally high in fibre—such as leafy green vegetables, porridge and fruit—to a level beyond that recommended by the BDA. No fibre supplements were given. All participants received both the BDA diet (providing 24 grams of fibre per day) and the high-fibre diet (providing 50 grams of fibre per day) for a period of six weeks. After six weeks of following each diet, tests were performed to determine blood glucose, insulin, cholesterol, triglyceride, and other values. When glucose levels were monitored over a 24-hour period, participants eating the high-fibre diet had an average glucose level that was 10% lower than participants eating the BDA diet. Insulin levels were 12% lower in the group eating the high-fibre diet compared to the group eating the BDA diet, indicating a beneficial increase in the body's insulin sensitivity. Moreover, people eating the high-fibre diet experienced significant reductions in total cholesterol, triglycerides, and LDL cholesterol compared with those eating the BDA diet. They also had slight decreases (improvements) in glycosylated haemoglobin levels - a measure of long-term blood glucose regulation.

High-fibre supplements, such as psyllium, guar gum (found in cluster beans), pectin (from fruit), oat bran, and glucomannan, have improved glucose tolerance in some studies. Positive results have also been reported with the consumption of 1 to 3 ounces of powdered fenugreek seeds per day

Eating fish also may afford some protection from diabetes. Incorporating a fish meal into a weight-loss regimen was more effective than either measure alone at improving glucose and insulin metabolism and high cholesterol.

Vegetarians have been reported to have a low risk of type 2 diabetes. When people with diabetic neurological damage switch to a vegan diet (no meat, dairy, or eggs), improvements have been reported after several days. In one trial, pain completely disappeared in 17 of 21 people. Fats from meat and dairy may also contribute to cardiovascular disease, the leading killer of people with diabetes.

Vegetarians also eat less protein than do meat eaters. Reducing protein in the diet has lowered kidney damage caused by diabetes and improved glucose tolerance.

Diets high in fat, especially saturated fat, worsen glucose tolerance and increase the risk of type 2 diabetes, an effect that is not simply the result of weight gain caused by eating high-fat foods. Saturated fat is found primarily in meat, dairy fat and the dark meat and skins of poultry. In contrast, glucose intolerance has been improved by diets high in mono-unsaturated oils, which may be good for people with diabetes. The best way to incorporate mono-unsaturates into the diet is to use olive oil, especially extra virgin olive oil, which has high antioxidant values.

Lifestyle Modification

Most people with type 2 diabetes are overweight. Excess abdominal weight does not stop insulin formation, but it does make the body less sensitive to insulin. Excess weight can even make healthy people prediabetic, though weight loss can reverse this problem. In most studies, type 2 diabetes has improved with weight loss.

Exercise helps to decrease body fat and improve insulin sensitivity. People who exercise are less likely to develop type 2 diabetes than those who do not. However, exercise can induce low blood sugar in diabetics taking blood sugar–lowering medications, so blood sugars need to be carefully monitored when commencing an exercise programme.

Moderate alcohol drinking in *healthy* people improves glucose tolerance. However, alcohol has been reported to worsen glucose tolerance in the elderly and in people with diabetes in some studies. People with diabetes who drink have also been reported to have a high risk for eye and neurological damage.

For healthy people, light drinking will not increase the risk of diabetes, and may even reduce the risk of developing type 2 diabetes; however, heavy drinking does increase the risk of developing diabetes and should be avoided. People with diabetes should limit alcohol intake to two drinks per day. In one report, older people with type 2 diabetes who drank daily, but moderately, had a dramatically lower incidence of deaths from cardiovascular disease compared with non-drinkers. This outcome is not surprising since moderate alcohol intake is associated with protection from cardiovascular disease in most other reports. This finding may be of particular importance because cardiovascular disease is the leading killer of people with diabetes.

People with diabetes who smoke are at higher risk for kidney damage, cardiovascular disease and other diabetes-linked problems. Smokers are also more likely to develop diabetes.

Although most healthcare professionals agree on the necessity of self-monitoring of blood glucose (SMBG) by people with type 1 diabetes, disagreement exists within the medical community regarding the efficacy and necessity of SMBG by people with type 2 diabetes. Nevertheless, it is likely that self-monitoring of blood glucose, if used properly, can have a positive effect by increasing a person's involvement in overall diabetes care.

Nutritional Supplement Treatment Options

A variety of vitamins, minerals, amino acids, and other supplements may help with symptoms and deficiencies associated with diabetes.

Multiple Vitamin–Mineral Supplement

In a double-blind study, supplementation of middle-aged and elderly diabetics with a multiple vitamin and mineral preparation for one year reduced the risk of infection by more than 80%, compared with a placebo.

Chromium

Medical reports dating back to 1853, as well as modern research, indicate that chromium-rich brewer's yeast (9 grams per day) can be useful in treating type 2 diabetes. In recent years, chromium has been shown to improve glucose levels in people with type 2, gestational, and steroid-induced diabetes. Chromium supplements improve glucose tolerance in people with type 2 diabetes, apparently by increasing sensitivity to insulin. Chromium improves the processing of glucose in people with pre-diabetic glucose intolerance and in women with diabetes associated with pregnancy. Chromium even helps healthy people, although one such report found chromium useful only when accompanied by 100 mg of niacin per day. Chromium may also lower levels of total cholesterol, LDL cholesterol, and triglycerides (risk factors in cardiovascular disease).

The typical amount of chromium used in research trials is 200 mcg per day, although as much as 1,000 mcg per day has been used.

Supplementation with chromium or brewer's yeast could potentially enhance the effects of drugs used for diabetes (e.g., insulin or other blood sugar-lowering agents) and possibly lead to hypoglycemia. Therefore, people with diabetes taking these medications should supplement with chromium or brewer's yeast only under the supervision of a doctor.

Magnesium

People with type 2 diabetes tend to have low magnesium levels. Double-blind research indicates that supplementing with magnesium overcomes this problem. The Diabetes Association acknowledges strong associations between magnesium deficiency and insulin resistance but does not acknowledge that magnesium deficiency is a risk factor. Many doctors, however, recommend that people with diabetes and normal kidney function supplement with 200 to 600 mg of magnesium per day.

Alpha lipoic acid

Alpha lipoic acid is a powerful natural antioxidant. Preliminary and double-blind trials have found that supplementing 600 to 1,200 mg of lipoic acid per day improves insulin sensitivity and the symptoms of diabetic neuropathy. In a preliminary study, supplementing with 600 mg of alpha lipoic acid per day for 18 months slowed the progression of kidney damage in patients with type 2 diabetes.

Evening primrose oil

Supplementing with 4 grams of evening primrose oil per day for six months has been found in double-blind research to improve nerve function and to relieve pain symptoms of diabetic neuropathy.

Vitamin E

People with low blood levels of vitamin E are more likely to develop type 1 and type 2 diabetes. Vitamin E supplementation has improved glucose tolerance in people with type 2 diabetes in most double-blind trials. Three months or more of at least 900 IU of vitamin E per day may be required for benefits to become apparent.

Glycosylation is an important measurement of diabetes; it refers to how much sugar attaches abnormally to proteins. Excessive glycosylation appears to be one of the causes of the organ damage that occurs in diabetes. Vitamin E supplementation has reduced the amount of glycosylation in repeated studies.

Vitamin E appears to lower the risk of cerebral infarction in people with diabetes who smoke.

Vitamin C

As with vitamin E, vitamin C may reduce glycosylation. Vitamin C also lowers sorbitol levels in people with diabetes. Sorbitol accumulates inside the cells and damages the eyes, nerves, and kidneys of people with diabetes. Vitamin C supplementation (500 mg BID for one year) has significantly reduced urinary protein loss in people with diabetes. Urinary protein loss (proteinuria) is associated with poor prognosis in diabetes. Recommended dosage for people with diabetes is 1 to 3 grams per day of vitamin C.

B Vitamins

Many people with diabetes have low blood levels of **vitamin B6**. Levels are even lower in people with diabetes who also have associated neuropathy. Vitamin B6 supplementation has improved glucose tolerance in women with pregnancy-induced diabetes.

Biotin is a B vitamin required for glucose metabolism. When people with type 2 diabetes were given 9 mg of biotin per day for two months, their fasting glucose levels dropped dramatically. Biotin may also reduce pain from diabetic neurological damage.

Vitamin B12 is needed for normal functioning of neurons. Vitamin B12 taken orally has reduced symptoms of neurological damage caused by diabetes in 39% of people studied; when given both IV and orally, two-thirds of people improved. Oral vitamin B12 up to 500 mcg TID is recommended by some practitioners.

500 to 750 mg per day of **niacin** for one month followed by 250 mg per day may help some people with type 2 diabetes, although this research remains preliminary.

Coenzyme Q10
Coenzyme Q10 (CoQ10) is needed for normal blood sugar metabolism. Animals with diabetes have been shown to be CoQ10 deficient. People with type 2 diabetes have been found to have significantly lower blood levels of CoQ10 compared with healthy people. In one trial, blood sugar levels fell substantially in 31% of people with diabetes after they supplemented with 120 mg per day of CoQ10.

L-carnitine
L-carnitine is an amino acid needed to properly utilize fat for energy. When people with diabetes were given DL-carnitine (0.5 mg/kg body weight), high blood levels of fats—both cholesterol and triglycerides—dropped 25 to 39% in just ten days in one trial.

Acetyl-L-carnitine
In a double-blind study of people with diabetic neuropathy, supplementing with acetyl-L-carnitine was significantly more effective than a placebo in improving subjective symptoms of neuropathy and objective measures of nerve function.

Antioxidants
Because oxidation damage is believed to play a role in the development of diabetic retinopathy, antioxidant nutrients might be protective. One study administered a daily regimen of 500 mcg selenium, 800 IU vitamin E, 10,000 IU vitamin A, and 1,000 mg vitamin C for several years to 20 people with diabetic retinopathy. During that time, 19 of the 20 people showed either improvement or no progression of their retinopathy.

Vitamin D
Vitamin D is needed to maintain adequate blood levels of insulin. Vitamin D receptors have been found in the pancreas where insulin is made, and preliminary evidence suggests that supplementation can improve some measures of blood sugar control in people with type 2 diabetes.

Taurine
Animal studies have shown that supplementing with taurine may affect insulin secretion and action and may have potential in protecting the eyes and nerves from diabetic complications.

Fructo-oligosaccharides (FOS)
In a preliminary trial, supplementation with fructo-oligosaccharides (FOS) (8 grams per day for two weeks) significantly lowered fasting blood-sugar levels and serum total-cholesterol levels in people with type 2 diabetes.

Botanical Treatment Options

Several herbs may help in managing symptoms associated with diabetes, including the control of blood sugar levels.

Aloe
Animal research and preliminary controlled human trials have found that *Aloe vera*, effectively lowers blood sugar in people with type 2 diabetes. The typical amount used in this research was 1 tablespoon (15 ml) of aloe gel per day.

Cayenne
Double-blind trials have shown that topical application of creams containing 0.025 to 0.075% capsaicin (from cayenne *[Capsicum frutescens]*) can relieve symptoms of diabetic neuropathy (numbness and tingling in the extremities caused by diabetes).

Fenugreek
Fenugreek seeds are high in soluble fibre, which helps lower blood sugar by slowing down carbohydrate digestion and absorption. Animal research suggests that fenugreek may also contain a substance that stimulates insulin production and improves blood sugar control. A controlled trial found that taking 2.5 grams of

fenugreek BID for three months reduced blood sugar levels in people with type 2 diabetes.

Psyllium

Supplementing with psyllium has been shown to be a safe and well-tolerated way to improve control of blood glucose and cholesterol. In a double-blind trial, men with type 2 diabetes who took 5.1 grams of psyllium per day for eight weeks lowered their blood glucose levels by 11 to 19.2%, their total cholesterol by 8.9%, and their LDL cholesterol by 13%, compared with a placebo.

Panax Ginseng

Panax ginseng is commonly used to treat diabetes. It has been shown in *in vitro* and animal studies to enhance the release of insulin from the pancreas and to increase the number of insulin receptors. Animal research has also revealed a direct blood sugar–lowering effect of ginseng. A double-blind trial found that 200 mg of ginseng extract per day improved blood sugar control, as well as energy levels in people with type 2 diabetes.

Cinnamon

Test tube studies have suggested that cinnamon may improve the glucose utilization. In a study of people with type 2 diabetes, supplementing with cinnamon at a dose of 1, 3, or 6 grams per day for 40 days was significantly more effective than a placebo at reducing blood glucose levels. The reduction averaged 18 to 29% in the three treatments groups, and 1 gram per day was as effective as 3 and 6 grams per day.

Onion

Preliminary trials and at least one double-blind trial have shown that large amounts of onion can lower blood sugar levels in people with diabetes. The mechanism of onion's blood sugar-lowering action is not precisely known, though there is evidence that constituents in onions block the breakdown of insulin in the liver. This would lead to higher levels of insulin in the body.

Bilberry

Bilberry may lower the risk of some diabetic complications, such as diabetic cataracts and retinopathy.

Olive leaf

Olive leaf extracts have been used experimentally to lower elevated blood-sugar levels in diabetic animals.

Integrative Options

Acupuncture may be helpful in the treatment of diabetes, or complications associated with diabetes. Preliminary trials have suggested that acupuncture can lower blood sugar and improve insulin production in people with type 2 diabetes, but trials on long-term effects have not been concluded. In a preliminary trial, 77% of people suffering from diabetic neuropathy experienced significant reduction in pain following up to six acupuncture treatments over a ten-week period. Many were also able to reduce pain medications, but no long-term change in blood-sugar control was observed. Bladder control problems, a complication of long-term diabetes, responded to acupuncture treatment with a significant reduction in symptoms in both controlled and uncontrolled trials.

For further information, contact:

Tracy S Gates

Director

PURE BIO LTD.

01403 730342

info@purebio.co.uk