WEIGHT MANAGEMENT STRATEGIES

Nutritionals Can Stave Off Obesity

The best way to lose or to maintain a healthy weight would be to eliminate or heavily reduce sugar. There are some worthwhile nutraceuticals on the market which are worth considering, however.

by Coriander Stone

Obesity poses a severe health problem; as a primary condition and a risk factor for other serious disorders such as diabetes mellitus, high blood pressure, some cancers, liver disease and cardiovascular disorders. NHS costs directly related to obesity are estimated at £5.1 billion per year in the UK and were $147 billion in 2008 in the US. With these facts in mind, there is little doubt that the most lucrative markets would be those offering safe, effective weight loss. However, while there are ongoing attempts by the food industry to develop products that control weight gain or enhance loss, there are few that are able to claim long-term benefits. In order to understand the difficulty in achieving and maintaining a healthy weight, the complexities of obesity must be understood and considered.

Understanding Obesity

When there is one or several chronic functional imbalances in the body, the end result is disease. Which disease that is depends on how the imbalances manifest themselves in the affected person and may therefore vary enormously between one individual and another. Rather than seeing obesity as the result of lack of willpower, it is important to understand that obesity is in fact a disease – no different from diabetes mellitus or cancer; resulting from one or several functional imbalances in the body. Just like any other disease, obesity does not occur overnight; so where is its most common starting point?

Cortisol is our stress hormone, released via the sympathetic nervous system in response to any kind of physical, physiological or psychological stressor. Cortisol leads to the release of glucose stores in the body, which in turn alerts insulin. Insulin levels will be particularly high if the glucose released via the stress response is not burnt off efficiently i.e. in the case of sedentary stress (a common western occurrence).

Sugar acts as a physiological stressor, also triggering the release of insulin in order to clear the excess glucose from the bloodstream. However, once this excess sugar has been cleared, our blood glucose levels drop dramatically, resulting in sugar cravings in an effort to acquire energy again. Cortisol has been shown in research to not only increase the intake of comfort (i.e. sugary, fatty) foods but also to increase adipose tissue, particularly visceral (abdominal). If sugar is frequently consumed and insulin is constantly being told to circulate, eventually it will stop listening; a condition called "insulin resistance."

Orexigenesis State

In obesity, the brain stops recognizing the excess body weight because the high circulating levels of insulin block the signals that the hormone leptin – which tells us when we have enough energy and do not need to eat any more – sends to the brain. This places the body in a constant state of orexigenesis – where it believes it is hungry and needs to store energy continually. The vast majority of obese people are also insulin resistant.

But there's a nail in the coffin to these complexities of obesity. Visceral and inflamed white adipose tissue (as in the case of obesity) also acts as an endocrine tissue, releasing hormones and other signalling molecules. This tissue actually stimulates the conversion of cortisone to cortisol – thus contributing further to the disruption described above. These factors become a vicious hormonal cycle, almost impossible to break with sheer willpower – just as an undiagnosed diabetic challenged to drink less water will almost always fail. Figure 1 illustrates these processes.

Effective Weight Loss?

With the above in mind, it would seem that the best way to lose or to maintain a healthy weight would be to eliminate or heavily reduce sugar. When low fat became popular in the 1980s, the obesity epidemic began. Why? Because as the fat came out

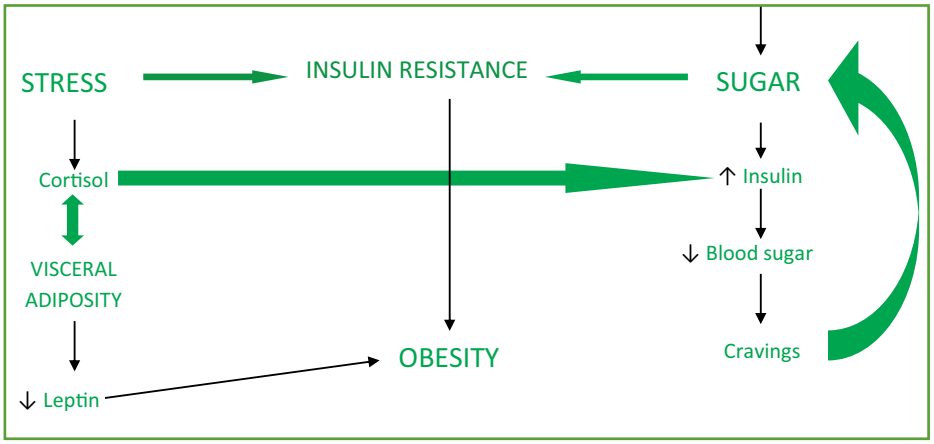

Figure 1: The Processes Leading to Obesity

of pre-prepared foods, the sugars went in. Daily fructose consumption has doubled in the past 30 years across the developed and developing world and world sugar consumption has tripled – all of this coincides with the obesity pandemic. It seems more logical therefore, to eliminate or reduce sugars in pre-prepared meals to an absolute minimum, in order to control the insulin and stress responses and balance the ratio of protein and fat to carbohydrate to stabilize blood sugar levels, reducing the probability of cravings. After all, adding nutraceuticals to foods in an effort to reduce weight gain seems senseless if there is poor macronutrient ratio, or added sugar. There do seem to be some worthwhile nutraceuticals on the market which are worth considering alongside the above strategies, including glucomannan (konjac), olive leaf extract, green tea and resveratrol.

Konjac Fiber

Konjac flour, from the Amorphophallus plant, is a soluble dietary fiber consisting of the polysaccharide glucomannan, which may be used in the place of gels, pectin or flours to add to or form common foods such as pasta. Although some clinical trials have shown positive results in weight management using konjac, it has no official FDA approval for the treatment of obesity, though Health Canada has approved some products. Konjac is already being used in a wide range of food products, notably pastas such as "Slim Pasta."

Mechanisms of action: Konjac claims to aid as a weight loss product via various mechanisms, the most important of which are:

1. It is a dietary fiber, therefore it reduces transit time and aids peristalsis, facilitating bowel movements.
2. It swells in the stomach, increasing the sensation of satiety.
3. Due to its properties as a soluble fiber, konjac has been shown to increase production of butyric acid which optimizes gut flora and which may be helpful to weight loss via other mechanisms.

Considerations: Being a fiber, konjac binds to foods, therefore decreasing absorbability of foods and nutrients as well as decreasing excretion time of foods and may therefore result in certain nutrient deficiencies. It has also been linked to gastrointestinal discomfort and bloating. Although konjac has shown "promising" results, a systematic review showed no clear evidence of it being effective in reducing body weight.

Olive Leaf Extract

The active ingredient for weight loss is oleuropein, a phytochemical found to reduce fat stores in rats with metabolic syndrome. In human trials, olive leaf extract was associated with improved glucose management and homeostasis – another key factor in controlling weight. It is usually marketed for diabetics as aiding in the control of insulin and glucose levels rather than a weight-loss product and is also frequently marketed as promoting healthy cholesterol levels due to its ability to lower triglycerides.

Mechanisms of action: The results of the metabolic syndrome rat trial are explained by the leaf's anti-inflammatory properties via its ability to improve insulin sensitivity; inflammation is a key pathology of obesity and metabolic syndrome and so tackling inflammation may be key to making advances in weight-loss products.

Table 1: Various Nutraceuticals Tested For Impact on Weight Loss

Nutraceutical	Trial design	Result
Glucomannan (Konjac)	Two-arm crossover design over 15 days using 32 human subjects.	Increase in satiety but no change in body weight.
	Double-blind RCT trial using patients with 20% increase in body weight over ideal.	Significantly larger weight loss in treatment groups than placebo.
Olive Leaf Extract	Rats were fed a high-fat, high-carbohydrate (HFHC) diet for 8 weeks, then 1 group supplemented with 3% olive leaf extract for a further 8 weeks alongside the HFHC diet.	Rats developed metabolic syndrome after 8 weeks and the supplemented group showed complete reversal of symptoms and reduction of fat stores after supplementation.
	Randomized, double-blind placebo-controlled trial lasting 14 weeks using humans diagnosed with type 2 diabetes given 500mg olive leaf extract.	Significant decrease in fasting insulin levels but no difference in postprandial insulin and glucose levels between control and trial group.
Green tea	Meta-analysis of effect of catechins on fasting insulin levels.	Catechins both with and without caffeine resulted in significantly decreased fasting insulin levels.
Resveratrol	Animal study using mice fed a high fat diet and mice supplemented with 0.4% resveratrol supplement.	Supplemented mice showed significantly less weight gain and lower levels of inflammation.
Macronutrient ratio	2 groups assigned either CHO/protein ratio of 3.5 or 1.4 for 10 weeks.	The protein group lost significantly more weight of which a higher % was fat loss. The protein group also reported higher satiety and reduced postprandial insulin levels.

SOURCE: INNOVA MARKET INSIGHTS

› *Eat Water Slim Pasta Fettuccine (the Netherlands) is formulated with konjac mannan.*

Considerations: Oleuropein does have approval from the FDA for sale but, as always, individual supplements or foods must seek individual approval for any health claims.

Resveratrol & Green Tea

Green tea is well known for its antioxidant properties via its phenolic active ingredients, the catechins. It has been of great interest in recent years and has had some positive results in research for weight loss. The catechin EGCG has been shown particularly potent in weight loss trials.

Resveratrol is another potent phenolic antioxidant present in grape skins and other plants, also showing interesting evidence regarding weight loss. The two seem to work via similar mechanisms, undoubtedly due to their phenols.

Mechanisms of action: Both green tea and resveratrol have been shown to be anti-inflammatory and to exhibit cholesterol-lowering effects and thus help prevent and control metabolic syndrome.

Green tea has been shown to reduce body weight and fat in several studies, via a variety of mechanisms:

1. Increase in energy expenditure
2. Fat oxidation
3. Inhibition of lipogenesis
4. Anti-inflammatory

Resveratrol has had some interesting results showing reduction of body weight, inflammation and white adiposity in obese animals fed a high fat diet via similar mechanisms to green tea. It has also been shown to reduce blood insulin and hyperglycaemia in animals with insulin resistance.

Considerations: While green tea has had many positive trial results, in others it has been shown to be useful only in maintaining weight after loss via other methods, so evidence is mixed regarding its usefulness as a weight loss product. Weight loss using green tea may also be due to its caffeine content and these two ingredients may work synergistically, making them more effective when combined. Green tea has been shown to have no adverse effects, making its addition to other foods potentially interesting in terms of FDA approval.

Resveratrol is just one of many potent phenolic antioxidants which, via inflammatory mechanisms, may be useful in maintaining a healthy weight and combating metabolic syndrome. Neither has it been shown to have any adverse health effects.

Moving Forward

The question that arises from understanding the complexities and imbalances of obesity is; are added ingredients aimed at weight loss worthwhile if the basic macronutrient ratio is wrong, or if the product contains added sugars? Would it be more effective to market a range of products with a macronutrient ratio shown to benefit weight loss via the management of blood sugar levels, insulin and inflammatory processes? In trials looking at the effects of macronutrient ratios on weight, people following a carbohydrate to protein ratio of 1.4 (125g of protein and 50g of fat per day) lost more weight than the 3.5 ratio group who consumed 68g protein daily. In addition to this, the protein group reported higher levels of satiety. These ratios are in line with other findings studying macronutrient ratios.

It needs to be considered that many of the differences in weight loss from these studies diminish over time; however, if the key to breaking the obesity cycle is managing blood sugar levels and thus insulin metabolism, it may be that altering the macronutrient ratios to favor proteins and healthy fats over carbohydrates may be crucial in managing weight.

In conclusion, perhaps the most effective weight-loss product would be a combination of a healthy macronutrient ratio, one of the above nutraceuticals and no added sugar.▼