PRODUCT FACT SHEET

CHROMEASE

CHROMEASE ITEM #: 3626-0090-01

Combines pre-formed biologically active niacin-bound chromium (ChromeMate) with alpha-lipoic. This high-potency specialized product supports glucose tolerance.

BACKGROUND

In 2007, diabetes cost the US in excess of $174 billion and is expected to take an increasingly large financial toll in the future. At present, in 2010, approximately 1 in 7 adults have type 2 diabetes and this is projected to increase to 1 in 4 adults by the year 2050 (1). The growth of diabetes and its precursor condition, syndrome X, is related to an excessive intake of calories, sedentary living, excess adipose tissue, and obesity, all of which are associated with the development of chronic inflammation.

Research has demonstrated that chronic systemic inflammation is the key factor that promotes the development of insulin resistant state (2-6). Indeed, "evidence at present favors chronic inflammation as a trigger for chronic insulin insensitivity, rather than the reverse situation" (2). By 2006, conclusive statements by researchers had been made regarding the causal link between chronic inflammation and the expression of diabetes:

> "Unequivocal experimental, epidemiological and clinical evidence produced during the past decade causally links inflammation, or the molecules and networks integral to inflammatory responses, to the development of these metabolic diseases and/or the complications that emerge from these pathologies, particularly in the context of obesity and type 2 diabetes" (3).

A combination of physical examination and laboratory findings have been identified that point to the presence of insulin resistance and the metabolic syndrome. If three of the five predictors in table 1 are present, a patient should be characterized as having the metabolic syndrome X.

PREDICTOR	ABNORMAL VALUE
Blood sugar	> 100 mg/dL
Triglycerides	> 150 mg/dL
HDL cholesterol	< 50 for women; < 40 for men
Blood pressure	> 130/85
Waist circumference	≥ 36" for women; ≥ 40" for men

Table 1. Diagnostic predictors for the insulin resistance metabolic syndrome X (7)

DESCRIPTION

Chromease is combination of chromium in the form of C® niacin-bound chromium and alpha-lipoic acid for the support of glycemic regulation.

HOW SUPPLIED

90 tablets per bottle.

DIRECTIONS

Take 3 tablets daily: 1 tablet 1 hour before each meal on an empty stomach, as or directed by your doctor.

WARNING

When taking chromium and alpha-lipoic acid, blood glucose levels should be monitored to avoid hypoglycemia. This is especially important for those taking anti-diabetic medications such as sulfonylureas, alpha-glucosidase inhibitors, glinides, glucophage and thiazolidinediones, and dipeptidyl peptidase-4 (DPP-4) inhibitors and the glucagon-like peptide-1 (GLP-1).

Supplement Facts

Serving Size 1 Tablet — Servings Per Container 90

Amount Per Serving		% Daily Value
Chromium [chromium polynicotinate (ChromeMate®)]	250 mcg	210 %
Alpha Lipoic Acid	200 mg	*

* Daily Value not established.

ANABOLIC LABORATORIES
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BACKGROUND

The primary metabolic defect in syndrome X and type 2 diabetes is insulin resistance in skeletal muscle, the leading metabolizer of blood glucose, followed by the liver and lastly, adipose tissue. After a meal, approximately one third of the ingested glucose is taken up by the liver and the rest by peripheral tissues, primarily skeletal muscle via an insulin dependent mechanism (8,9). Multiple nutrients participate in preventing insulin resistance by enhancing insulin sensitivity in skeletal muscle.

Key nutrients that promote insulin sensitivity – chromium and lipoic acid

Several nutrients have been identified that play key roles in promoting proper insulin sensitivity, including vitamin D (10), magnesium (11-13), and omega-3 fatty acids (14,15). It is possible to get adequate vitamin D from sun exposure and adequate amounts of magnesium and omega-3 fatty acids from food, which can lead to improved insulin sensitivity. However, the supplemental levels of chromium and alpha-lipoic acid that lead to improved insulin sensitivity and reduced insulin resistance cannot be obtained in food and must be supplemented.

Chromium and glycemic regulation

Research between 1955 and 1977 lead to the suggestion that chromium may be a key mineral involved in glycemic regulation (16). Diets high in refined sugar and flour are deficient in chromium, and worse, they lead to an increased urinary excretion of chromium (17,18). Of importance to note is that chromodulin, which is directly involved in insulin signaling, may be the major form of chromium lost in urine (17). Clearly, all individuals and especially those with insulin resistance should avoid refined carbohydrates.

While the adequate intake of chromium for adults ranges from only 20 to 45 micrograms (mcg) per day (19), supplemental doses of chromium that benefit glycemic regulation, which range from 200 to 1000 mcg, are not the levels found in food (16,18,20-22). It is thought that higher levels of chromium help to activate insulin responsive mechanisms within skeletal muscle.

Human studies using 1000 mcg per day for 8 months have been shown to be safe and animal models using significantly more are not associated with toxicological consequences (18,22). Supplemental chromium can be taken with or without meals (23-25).

Alpha-lipoic acid and glycemic regulation

The foods richest in alpha-lipoic acid are animal tissues with extensive metabolic activity such as heart, liver, and kidney, which are rarely consumed. The plant sources of alpha-lipoic acid, listed from highest to lowest, are spinach, broccoli, tomatoes, garden peas, brussel sprouts, and rice bran (26). While these foods are not consumed in large amounts, the resultant reduced consumption of lipoic is not a likely promoter of insulin resistance. This is because the supplemental amounts of alpha-lipoic acid used in the treatment of diabetes (300-600 mg) are likely to be as much as 1000 times greater than the amounts that could be obtained from the diet (26). Supplemental alpha-lipoic acid has been used extensively in patients suffering from insulin resistant related conditions (26).

Food intake is reported to reduce the bioavailability of supplemental alpha-lipoic acid. Consequently, it is generally recommended to be taken on an empty stomach (1 hour before or 2 hours after eating) (26). In general, alpha-lipoic acid supplementation has been found to have few serious side effects. In a five week study, patients with diabetic polyneuropathy were supplemented with either a placebo (n=43) or alpha-lipoic acid at 600 mg (n=45), 1200 mg (n=47), or 1800 mg (n=46). Side effects were similar in the placebo and 600 mg group (27).

Summary

The metabolic syndrome and type 2 diabetes are complex conditions and their prevalence is expected to increase substantially in the coming years. Diet and exercise are the keys to managing these conditions, which can be supported with key nutrients, such as vitamin D, magnesium and omega-3 fatty acids. Chromium and alpha-lipoic acid should be viewed as specific nutrients that should be taken during the process of restoring appropriate insulin sensitivity and signaling.

(REFERENCES FOUND ON NEXT PAGE)

BACKGROUND

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THE ANABOLIC DIFFERENCE

Anabolic Laboratories' nutritional products are made in a registered, licensed and inspected pharmaceutical facility. Our in-house laboratories and manufacturing facilities are routinely inspected by the United States Food and Drug Administration (FDA) and Drug Enforcement Administration (DEA). We also maintain a Good Manufacturing Practice (GMP) certification from the Natural Products Association.

As a pharmaceutical manufacturer, the standards used for raw materials, production and finished product testing exceed FDA requirements for the nutritional products industry. Our pharmaceutical requirements for manufacturing are the foundation for the guaranteed quality of our nutritional products. Anabolic Laboratories sets the nutritional supplement industry standard for label accuracy, potency and purity as dictated by the FDA for pharmaceutical and nutritional products.