



GLUCOSTATE

MECHANISM OF ACTION

Magnesium - this is added to prevent hypomagnesaemia which is commonly seen among people with blood sugar imbalances. (1,2,3)

Chromium GTF - is a complex of molecules found in the body and has a greater activity than metallic Chromium. Low chromium levels are associated with impaired glucose, insulin, and lipid metabolism and resultant increased cardiovascular risk. (4,5)

Vanadium - a cofactor for various enzyme reactions. Some evidence suggests that vanadium can mimic the actions of insulin, possibly by causing phosphorylation of insulin receptor proteins. Vanadium activates the receptor, stimulates glucose oxidation and transport, inhibits lipolysis in adipose tissue, stimulates glycogen synthesis in the liver, inhibits hepatic gluconeogenesis, inhibits intestinal glucose transport and increases glucose uptake, utilization, and glycogen synthesis in skeletal muscle. (7,8)

Omega 3 - gives rise to prostaglandins which have insulin-like effects. There may also be a shortage of DHA in people with sugar imbalances because high blood sugar inhibits the delta-6-desaturase enzyme which is responsible for DHA production from Alpha Linolenic Acid (ALA).

Bitter melon - contains an insulin-like polypeptide with an onset of action between 30-60 minutes. Bitter melon seems to have hypoglycaemic activity. (9,10)

Cinnamon extract - appears to have insulin stimulating effects. (11,12)

Fenugreek - may slow glucose absorption and stimulate insulin in the presence of moderate to high glucose concentration. It also contains galactomannan which helps to normalize blood sugar levels. (13)

Gymnema - seems to reduce the intestinal absorption of glucose and may stimulate beta cell growth. (14,15)

INDICATIONS

Assists with balancing blood sugar levels. The following symptoms suggest the presence of high blood sugar:

- Polyphagia, polyuria, polydipsia
- Blurred vision
- Fatigue

- Weight loss
- Poor wound healing (cuts, scrapes, etc.)
- Dry mouth
- Dry or itchy skin
- Impotence (male)
- Recurrent infections such as vaginal yeast infections, groin rash, or external ear infections (swimmers ear)

INTERACTIONS AND WARNINGS

May have additive effects if used in conjunction with herbs or drugs with hypoglycemic potential, so monitor blood glucose levels.

There is some concern that some of the fenugreek constituents might have additive effects when used with anticoagulant or antiplatelet herbs or drugs, resulting in increased risk of bruising and bleeding, although the constituents might not be present in concentrations that are clinically significant.

Fenugreek is a member of the Fabaceae family and cross-reactivity has been shown in patients allergic to fenugreek and other Fabaceae plants such as chickpea and green peas. Fenugreek can cause a maple syrup odour in urine. Avoid confusion with "maple syrup urine" disease. (16)

DOSAGE AND DIRECTIONS FOR USE

Two tablets daily.

OTHER COMPLIMENTARY THERAPIES

- Essential Fatty acid Formula
- Magnesium Complex
- Multivitamin and mineral Formula



NUTRITION INFORMATION

Each tablet contains:

FoodState® blend:

Magnesium	15mg
Chromium GTF	75µg
Vanadium	25µg

Omega 3 powder	100mg
Fenugreek extract	45mg
Gymnema extract	50mg
Cinnamon extract	50mg
Bitter melon extract	50mg

REFERENCES

1. Guerrero-Romero F, Rodriguez-Moran M. Low serum magnesium levels and metabolic syndrome. *Acta Diabetol* 2002;39:209-13.
2. Paolisso G, Sgambato S, Gambardella A, et al. Daily magnesium supplements improve glucose handling in elderly subjects. *Am J Clin Nutr* 1992;55:1161-7.
3. Guerrero-Romero F, Tamez-Perez HE, Gonzalez-Gonzalez G, et al. Oral magnesium supplementation improves insulin sensitivity in non-diabetic subjects with insulin resistance. A double-blind placebo-controlled randomized trial. *Diabetes Metab* 2004;30:253-8.
4. Anderson RA. Chromium, glucose intolerance and diabetes. *J Am Coll Nutr* 1998;17:548-55
5. Anderson RA, Cheng N, Bryden NA, et al. Elevated intakes of supplemental chromium improve glucose and insulin variables in individuals with type 2 diabetes. *Diabetes* 1997;46:1786-91.
6. Harland BF, Harden-Williams BA. Is vanadium of human nutritional importance yet? *J Am Diet Assoc* 1994;94:891-4.
7. Malabu UH, Dryden S, McCarthy HD, et al. Effects of chronic vanadate administration in the STZ-induced diabetic rat. *Diabetes* 1994;43:9-15
8. Leatherdale B, et al. Improvement in glucose tolerance due to Momordica charantia. *Br Med J (Clin Res Ed)* 1981;282:1823-4.
9. Welihinda J, et al. Effect of Momordica charantia on the glucose tolerance in maturity onset diabetes. *J Ethnopharmacol* 1986;17:277-82.
10. Ahmad N, Hassan MR, Halder H, Bennoor KS. Effect of Momordica charantia (Karolla) extracts on fasting and postprandial serum glucose levels in NIDDM patients (abstract). *Bangladesh Med Res Counc Bull* 1999;25:11-3.
11. Khan A, Safdar M, Ali Khan M, et al. Cinnamon improves glucose and lipids of people with type 2 diabetes. *Diabetes Care* 2003;26:3215-8.
12. Madar Z, Abel R, Samish S, Arad J. Glucose-lowering effect of fenugreek in non-insulin dependent diabetics. *Eur J Clin Nutr* 1988;42:51-4.
13. Gupta A, Gupta R, Lal B. Effect of Trigonella foenum-graecum (fenugreek) seeds on glycaemic control and insulin resistance in type 2 diabetes mellitus: a double blind placebo controlled study. *J Assoc Physicians India* 2001;49:1057-61.
14. Shanmugasundaram ER, Rajeswari G, Baskaran K, et al. Use of Gymnema sylvestre leaf extract in the control of blood glucose in insulin-dependent diabetes mellitus. *J Ethnopharmacol* 1990;30:281-94.
15. Baskaran K, Kizar-Ahamath B, Shanmugasundaram MR, Shanmugasundaram ERB. Antidiabetic effect of leaf extract from Gymnema sylvestre in non-insulin-dependent diabetes mellitus patients. *J Ethnopharmacol* 1990;30:295-300
16. Bartley GB, Hilty MD, Anderson BD, et al. "Maple-syrup" urine odor due to fenugreek ingestion. *N Engl J Med* 1981;305:467.