

# FENUGREEK

*(Trigonella foenum-graecum)*

An Overview of the Research  
and Clinical Indications



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## Fenugreek – An Overview of the Research and Clinical Indications

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### **BACKGROUND AND USES**

Fenugreek is an important and one of the oldest medicinal plants on record, but not one that we are likely to see growing in North America. It is native to the Mediterranean, India, China, Northern Africa and the Ukraine, as well as being widely cultivated in those locales. Cultivated commercial products in the United States come mainly from Morocco, Turkey, India and China.

I say it is one of the oldest medicinal plants we know of, because we have recorded information that dates back to ancient Egypt when it was mentioned as a plant to induce childbirth as well as an embalming agent. Its use spread throughout the Arab world, Greece and India, and then eventually spread to China where it is still used today for abdominal pains, hernia, edema and “cold-damp” conditions. In the 1800s, it was used in the U.S. as part of an infamous Lydia Pinkham formula called “Vegetable Compound”--- for menstrual cramps and for postmenopausal vaginal dryness. It also has a food based tradition, used to supplement wheat and maize flour for making bread , and as a condiment.

Historical and theoretical uses abound and the list is long, but a sampling includes: abortifacient, appetite stimulant, baldness, boils, breast enhancement, bronchitis, cellulites, constipation, cough, diarrhea, eczema, flatulence, galactagogue, hepatitic disease, hernia, indigestion, leg ulcers, menopausal symptoms, myalgia, postmenopausal vaginal dryness, hyperglycemia, tuberculosis and wound healing. We will discuss more modern uses and research in this document, including its hypoglycemic, hypocholesterolemic and galactagogue properties.

### **ACTIVE CONSTITUENTS**

The leaves and seeds of the fenugreek plant are used as powders and extracts for medicine use. Fenugreek seeds contain 45-60% carbohydrates, most of which is a mucilaginous fiber which is 30% soluble and 20% insoluble fiber. It also contains about 20-30% proteins that are high in lysine and tryptophan, a small amount of oils (5-10%), a small amount of pyridine alkaloids (mostly trigonelline), and a few flavonoids, free amino acids, saponins, vitamins and volatile oils.

Constituents in fenugreek that are thought to be responsible for its hypoglycemic effects include the testa and endosperm of the defatted seeds called the A subfraction, the 4-hydroxyisoleucine and the fiber. It is also thought that the saponins in the seeds are transformed in the gastrointestinal tract into saponins and this is responsible for the lipid lowering effects.

### **CLINICAL RESEARCH SUMMARY**

#### ***Type 2 diabetes***

Several human trials report the ability of fenugreek to lower fasting serum glucose levels both in the short run and over time. The results of a small, randomized, controlled, double-blind trial evaluated the effects of fenugreek in 25 patients with newly diagnosed type 2 diabetes mellitus (T2DM).<sup>1</sup> Subjects were assigned to either 1g/day of fenugreek seed extract or diet and exercise advice. After 2 months, the mean fasting glucose levels reduced in both: 148.3 to 119.9 in the fenugreek group and 137.5 to 113.0 in the diet and exercise group. At the end of the 2 months, the glucose tolerance tests were similar in both groups. While both of these parameters were not statistically significant between fenugreek and diet/exercise, insulin resistance measurements were better with fenugreek and significant decreases in triglyceride levels and increases in high-density lipoproteins (HDL) were also reported in the fenugreek group. All in all, these results suggest that fenugreek seed extract and diet/exercise may be equally effective approaches for achieving glycemic control in T2 diabetics.

Another small trial was conducted in 10 patients with T2 diabetes using 12.5g of powdered fenugreek seeds twice daily with meals compared to meals without fenugreek.<sup>2</sup> For the first 15 days, 5 patients were in each group and then without any washout period, they crossed over for an additional 15 days. Prior to beginning, diet and anti-diabetic medications were stabilized. During fenugreek usage, patients had statistically significant average improvements in glucose-tolerance tests and serum-clearance rates of glucose.

A small randomized, controlled, crossover study in 15 individuals with T2DM was conducted in which subjects received 50g of defatted fenugreek seed powder twice daily with meals, or subjects received fenugreek free meals for 10 days.<sup>3</sup> Patients were again then crossed over to the other group for another 10 days. In the fenugreek treated groups, significant mean improvements in fasting blood glucose levels and glucose tolerance tests were observed. A 64% average reduction in 24 hour glucose levels was observed along with improvements in decreasing thirst and frequent urination.

Several case series have also been reported suggesting fenugreek reduced post-prandial hyperglycemia in individuals with and without diabetes or improved glycemic control in individuals with T2DM.<sup>4, 5, 6, 7, 8</sup>

A small study was also conducted in 10 patients with type 1 diabetes.<sup>9</sup> Individuals were given meals either with 50g of fenugreek seed powder twice daily or without. After 10 days, significant improvement was seen in the fenugreek group in reductions of glucose

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found in the urine over 24 hours, average reductions in glucose tolerance tests and fasting glucose from 15.1 to 10.9 nMol/L.

Hopefully, these small randomized trials and the several case series will lead to stronger, larger and longer studies with consistent preparations and dosing regimens that will be conducted for more insight into the scope and significance of fenugreek on glycemic control. In the meantime, the data does suggest a role for fenugreek seeds and extracts as part of a management strategy.

### ***Lipid lowering***

A small amount of research has been done on fenugreek and lipids. The study just discussed in 10 T1DM also showed a small but statistically significant reduction in total cholesterol and in LDL cholesterol although the HDL remained the same.<sup>9</sup>

A few case series have also found that fenugreek can have some cholesterolemic effects. After the ingestion of 100g of defatted fenugreek powder daily for three weeks, triglycerides and LDL levels were lowered in 15 non-obese hyperlipidemic individuals.<sup>10</sup> Lipid profiles were normalized in 60 patients with T2DM when given 25g/day of powdered fenugreek seeds for 24 weeks.<sup>11</sup> Total cholesterol, LDL and triglycerides decreased by an average of 14-16% while HDL levels increased by about 10%. Similar reductions were seen in total cholesterol and LDL cholesterol levels in 20 adults with hypercholesterolemia who received 12.5-18.0g/day of powdered fenugreek seeds for one month.<sup>12</sup> No changes in HDL or triglyceride levels were seen in this small study.

### ***Lactation***

Fenugreek is considered to be the most popular and utilized herbal galactagogue in the world.<sup>13</sup> It is not clearly known how fenugreek increases milk flow but it likely has to do with the phytoestrogens and diosgenin constituents. While there are many anecdotal reports on the effectiveness of fenugreek as a galactagogue, one published study has reported on fenugreek tea. Sixty-six mother-infant pairs were randomly assigned to one of 3 groups where they received either 3 cups per day of fenugreek granule tea, apple granule tea as the placebo or no special recommendations for the first week of the infant's life.<sup>14</sup> The average pumped breast milk volume in the fenugreek tea group was significantly higher than the placebo or control group. Maximum weight loss was lower in the infants in group 1, the fenugreek tea group, compared to either the placebo or control groups. The infants in the fenugreek tea group also regained their birth weight earlier than those in the placebo and control tea groups.

### **SAFETY, INTERACTIONS, PRACTITIONER DOSING**

#### ***Safety/Adverse events***

There appears to be no significant adverse effects to fenugreek. It has a long history of safety and is well tolerated by most. Exceptions can be seen if an individual is allergic to it or to chickpeas. Rare reports exist of allergic reactions including bronchospasm, wheezing, diarrhea, flatulence and dizziness. There is a theoretical concern about the coumarin derivatives in fenugreek interfering with clotting. Fenugreek is contraindicated during pregnancy due to its potential to stimulate the uterus in animal studies.<sup>15</sup> A decrease in serum T3 and T3/T4 ratios and an increase in T4 levels have been reported in mice and rats.<sup>16</sup>

#### ***Dosage range***

Several dosing regimens and forms of fenugreek have been used in studies. Consider the following options:

- Fenugreek seed powder capsules: 2.5g, twice daily
- Liquid extract in water and alcohol: 500mg, twice daily
- Fenugreek seed powder: 12.5g, twice daily
- Fenugreek defatted powdered seeds: 50g, twice daily
- Fenugreek seed tea
- Fenugreek seed powder in combination with other herbs/nutrients

#### ***Potential drug interactions***

High fiber products such as fenugreek fiber can alter the absorption of oral medications. It is for this reason that medications should be taken away from fenugreek seeds, including extracts and powders. Due to the glucose lowering effect of fenugreek, serum glucose levels should be monitored if other glucose lowering medications are being taken. A lowering of potassium levels was seen in a small group of subjects<sup>17</sup>, which should give us a cautious approach if using fenugreek with other medications that can lower potassium levels such as diuretics, laxatives and mineralocorticoids.

### **CONCLUSIONS**

Metabolic syndrome, pre-diabetes and T2DM are increasing dramatically, not only in the U.S. but around the world. These metabolic states lead to significant increased risk of cardiovascular disease and mortality. Diet, exercise and weight management are at the core of a management strategy, but a simple dietary supplement such as fenugreek seed that can modulate glucose, cholesterol, LDL cholesterol and triglycerides is

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extremely appealing. While the research to date is not robust in numbers, the positive effects and safety profile of fenugreek is an appealing part of a holistic plan. Its long tradition as a galactagogue and the one research study confirm its efficacy to improve milk flow.

### **ABOUT THE AUTHOR**

Dr. Tori Hudson, Naturopathic Physician, graduated from the National College of Naturopathic Medicine (NCNM) in 1984 and has served the college in several capacities, including: Medical Director, Associate Academic Dean, and Academic Dean. She is currently a clinical professor at The National College of Naturopathic Medicine (NCNM), Southwest College of Naturopathic Medicine and Bastyr University. Dr Hudson has been in practice for 28 years, is the medical director of her clinic, “A Woman’s Time” in Portland, Oregon, and director of product research and education for VITANICA.

Dr. Hudson was awarded the 1990 President’s award from the American Association of Naturopathic Physicians for her research in women’s health, the 1999 prestigious Naturopathic Physician of the Year award, the 2003 NCNM Alumni Pioneer Award., and the 2009 Natural Products Association Pioneer Award.

She is a nationally recognized author (book: Women’s Encyclopedia of Natural Medicine second edition, McGraw Hill 2008), speaker, educator, researcher, and clinician. Dr. Hudson serves on several editorial boards, including on the Scientific Advisory Board of Gaia Herbs, advisory panels and as a consultant to the natural products industry.

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