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## *Trigonella foenum-graecum* seed extract promotes cholesterol and lipid synthesis, in comparison to insulin, under a hyperglycaemic condition in HepG2 cells

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Fenugreek (*Trigonella foenum-graecum*) is globally recognized for its medicinal properties including cholesterol and lipid lowering effects. The seed extract as well as its active compound, 4-hydroxyisoleucine (4-OH-Ile), have been shown to aid in controlling cholesterol and lipid synthesis. The mechanism by which this occurs has not been investigated in human liver cells (HepG2) in comparison to insulin and the anti-hyperglycaemic drug, metformin. We investigated the effect of fenugreek aqueous seed extract (FSE), 4-OH-Ile and metformin in human hepatoma (HepG2) cells relative to insulin as a positive control. Cells were treated with FSE and 4-OH-Ile at 100 ng/ml under normoglycaemic (5 mM glucose) and hyperglycaemic (30 mM glucose) conditions for 72 h. Gene expression of sterol regulatory element binding protein 1c (SREBP1c), sterol regulatory element binding protein 2 (SREBP2), HMG-CoA reductase, fatty acid synthase (FAS) and low-density lipoprotein receptor (LDL-R) was evaluated by qPCR. Under normo- and hyperglycaemic conditions, FSE induced the most significant changes in the expression of SREBP1c, SREBP2, HMG-CoA, FAS and LDL-R as compared to 4-OH-Ile, metformin and insulin. FSE up-regulates LDL-R which is imperative in the absorption of cholesterol during insulin resistance. Collectively, these findings provide a preliminary mechanism by which FSE positively regulates both cholesterol and lipid synthesis during a hyperglycaemic state.

### Biography

Nikita Naicker has completed her undergraduate degree in Biomedical Sciences, Honours degree in Medical Biochemistry and Masters in Medical Science (Medical Biochemistry) from the University of KwaZulu Natal (UKZN). She is currently in her first year of PhD at UKZN. She has currently submitted a manuscript to the *Journal of Phytomedicine*.

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