

genetic engineering and sugarcane — health & consumers

an update from the Cooperative Research Centre for Sugar Industry Innovation through Biotechnology (CRC SIIB)

GE is giving sugar a chance to prove its versatility and potential as a health product and as a replacement in the fossil fuel-to-product chain.

Human health

Sugarcane molasses has potential to fight Type 2 Diabetes

In healthy people, the carbohydrates we eat are broken down to sugar in the blood to give us energy. Enzymes like alpha-glucosidase in the intestine help this happen.

Our blood sugar is regulated by insulin. However, for a person with diabetes type 2 or non insulin-dependent diabetes, this regulation doesn't work well. A type 2 diabetic typically has high blood sugar levels, poor insulin secretion and insulin resistance.

Researchers have found that a special molasses extract stops the alpha-glucosidase enzyme from working efficiently. If this extract eventually proves effective in reducing blood sugar levels in Type 2 diabetics, it could slow or even stop the onset of insulin-dependent diabetes and its associated health risks.

Consumers

From sugar to plastics, drugs and solvents

An Escherichia coli (E-coli) that grows very quickly on sugar is being developed to help produce plastics, pharmaceuticals, solvents, detergents, fibres and food products. Currently, these products are mostly produced from fossil fuels.

Through fermentation, sugarcane can replace crude oil, natural gas and coal as raw material. Sugarcane is the preferred plant to use because it is highly water, energy and land-use efficient and because crop residues are collected and can be used to supply the processing energy.

Over the next generation, the global chemical industry (nearly US\$2 trillion) will shift from being petrochemical-based to being biomass-based, driven by high petrochemical and environmental compliance costs.

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