SYUHAIRAH Ahmad's toffee took a gold medal at an international competition. Not a cooking competition, though. It was at the British Invention Show 2013 that the Food Technology graduate beat researchers, lecturers and students from 20 countries to win the gold medal.

Syuhairah, from Universiti Sains Malaysia School of Industrial Technology, said her final year project explored the application of oil palm syrup in the production of toffee. Her research was aimed at tapping the potential of the sap in oil palm trunks, as a food ingredient. The inner part of the oil palm trunk contains large quantities of oil palm sap; in fact, the sap makes up 70% to 80% of the trunk weight.

"We are the second largest palm oil producer in the world. An estimated 8.8 million tonnes of oil palm trunk biomass are produced annually," says Syuhairah.

Syuhairah notes that the oil palm industry faces the challenge of utilising the biomass residue in an efficient, sustainable and environmentally-friendly way.

"Oil palm trunk can be used as a source of renewable energy and lumber. The outer part of the trunk is used for the production of compressed wood and lumber, while the inner part is discarded because it is not strong enough due to the high percentage of sap content," Syuhairah explains.

When the idea to utilise sap in oil palm trunks for the production of toffee was mooted by her project supervisor, Assoc Prof Dr Fazilah Arifin, Syuhairah decided to take up the challenge for her final year project.

The sap contains a high amount of glucose. It has been used as a source of sugar for the production of raw materials, namely biorefinery and lactic acid. I believe there is not enough usage of the inner part of the oil palm trunk in food application," says the bubbly 23-year-old and lactic acid. I believe there is not enough usage of the inner part of the oil palm trunk in food application," says the bubbly 23-year-old.

The sap is high in glucose. Making oil palm syrup which is made from the sap, is high in glucose. Making oil palm syrup, is produced during the replanting of oil palm. "Commercially, 500ml of glucose syrup is sold at RM19.90 while the price of oil palm syrup can be reduced by half," she added.

Syuhairah, who is currently pursuing a Masters degree in Food Technology, hopes to take her research further by using the same raw material in oil palm trunks in other food applications, such as natural colouring for confectionery.

"The main aim is to eliminate wastage of biomass which is produced during the replanting of oil palm," says Syuhairah. "We are the second largest palm oil producer in the world."

Another objective of her project is to reduce the use of commercial glucose syrup in toffee production, and substitute it with oil palm syrup.

"The new toffee is high in calcium, iron and contains a wide range of amino acids. It has an original and unique toffee flavour," says Syuhairah.

"Firstly, the oil palm trunk is pressed using a mechanical scale which acts like a juicer, until all the sap is squeezed out. "An enzyme is used to remove all the sediments and unwanted solid particles from the freshly squeezed sap before the sap undergoes a simple heating process at 140°C until it turns into syrup. The syrup must be cooked until it reaches the standard of 60 to 75 degree brix (measurement for total soluble solid) for it to be considered a syrup, according to the Food Act and Regulation Act in Malaysia.

"To make the toffee, the oil palm syrup is then mixed with whipping cream, milk and sugar," explains Syuhairah.

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"The main aim is to eliminate wastage of biomass which is produced during the replanting of oil palm," says Syuhairah. "Syuhairah experimented with the formula of 60% oil palm syrup and 40% glucose syrup for the best toffee in terms of aroma, flavour, texture and colour. The Elaeis toffee, as she calls it, is a non-crystalline sugar confection; each toffee is coated with chocolate."

"A mound of 500ml of glucose syrup is sold at RM19.90 while the price of oil palm syrup can be reduced by half," she added.