

# UGM Students Develop Bio-ethanol Stove from "Salak Pondoh" Waste

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SLEMAN (KU) - An infusion bottle complemented with a hose was brought by Purwanta (67) from his house. Then, he hung it into a hook, as the infusion which is often found in hospital rooms. The difference is the hose is not injected into the patient's arm, but to a gas stove. He adjusted the flow of liquid droplets in the hose, then a click, and the stove was on. The man looked happy. Later, his wife rushed to bring a kettle of water and put it on the stove.

The infusion tube does not use electrolyte liquid, but bio-ethanol which is the result of *salak pondoh* (snake fruit) waste. The waste is from bad salak fruit when harvested or already decomposed. Up to now, salak fruit which are not worth selling are often discarded by farmers or left to rot in their yard. However, after the arrival of UGM students, the habit of salak farmers in Ledoknongko hamlet, Turi, Sleman, to throw away the fruit gradually changed. By those students, salak waste is processed into bio-ethanol by using distillation tool. "Every month there are 1-3 tons of salak waste that are not worth selling. We make the waste into bio-ethanol. The rest of distillation in the form of pulp can be made as organic fertilizer for agriculture," Adhita Sri Prabakusuma, one member of research team, said in Ledoknongko on Sunday (10/10).

The student of Department of Agriculture explained that of 10 kilogram of salak, at least 1 liter of bioethanol is produced. Previously, salak waste is fermented for one week by adding yeast and urea. "This fermented liquid is heated in temperature of 70 degrees in the distillation tube. The result of this warming will produce bio-ethanol," Praba said. He has recently been invited to present his research findings in the International Agriculture Symposium in Malaysia. The bio-ethanol liquid is then put in a plastic bottle with a hose pipe and closed tightly. Furthermore, the liquid is flowed to a gas stove by injection.

Praba also introduced to the farmers that ethanol is not only for stove fuel, but can also be marketed to the pharmacy or lab. "Currently, the selling price could reach 20,000 rupiah - 30,000 rupiah per liter," the award-winner of exemplary student of Faculty of Agriculture UGM 2010 said.

The man born in Sragen, 13 February 1988, delivered that Salak Pondoh of Sleman is already exported to China, the regions outside Java and around Yogyakarta Special Province. In accordance with the regulation, waste can not be disposed into the garden. The student's research is expected to assist communities in dealing with salak waste, to support an integrated agricultural program, and implements eco-friendly energy. "In Turi, an independent energy village and sustainable and integrated agricultural development can be initiated," he said.



Currently, the bio-ethanol production reaches 20-30 liters per month. It is managed by *Si Cantik*, salak farmer groups of Ledoknongko, Bangunkerto, Turi, Sleman. Purwanta Ismaya (67), head of the group, claimed that it is difficult to socialize the new technology to the farmers. "It's not easy to socialize it because of their educational level. Moreover, this is new, so, economically, it does not directly give profits," Purwanta said.

The amount of salak that is not worth selling at harvest time is estimated at 5 percent of the total yields. Now, farmers slowly do not consider it a waste, but something that can generate benefits and potential for additional revenue sources.

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