

UGM Students Make Particle Board from Chicken Feather and Plastic Bottle

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Animal Science students of Universitas Gadjah Mada have made a prototype of particle board that is based on chicken feather and plastic bottle. The three students are Imaniar Rusyadi, Fahmi Arrasyid, and Dian Setya Budi. They made the product as a solution to the pollution problems due to the great amount of waste that is hard to decompose naturally.

Recent data from Statistics Centre mentioned that the production of broiler in Indonesia in 2018 was 2,144,013 tons. Each chicken would produce feather as much as 9.6 percent. Meanwhile, the amount of plastic waste in Indonesia is as high as 64 million tons per year or the second in the world.

Imaniar, team chairperson, said both types of waste had been underused. So, they are potential to be used as an alternative to particle board that is made from forest wood and synthetic glue. The high demand of wood product has decreased the extent of forested lands drastically. According to Environment and Forestry Ministry, from 2014–2015 the decrease was 0.82 million Ha. The glue that is normally used is formaldehyde that is sourced from petroleum processing. Currently, the source of this material has decreased in the world. Meanwhile, chicken feather mostly consists of keratin protein that can serve as a filler to give volume and strength.

“Keratin fibre is nonabrasive, environmentally friendly, decomposing naturally, cheap, not dissolved in organic solvent, having good mechanical strength and low density, and waterproof. The plastic bottle waste is made of Polypropylene Terephthalate (PET) that serves as a bind or matrix. The ratio between filler and matrix is 75:25,” she said at Faculty of Animal Science on Tuesday (3/12).

She explained the particle board named as Eco-Palapa offered benefits which are environmentally friendly and waterproof. The keratin in the feather and PET are hydrophobic which is hated by termites. Eco-Palapa is light as it has gone through hydration process during hot forging. Eco-Palapa also has high resistance to heat because it is composed of dense feathers and PET.

The students explained Eco-Palapa met three beneficial aspects, economy, social, and environment. It gives profits to the maker, plastic waste processing operator, and slaughtering houses. There will be new social relations arising between distributors, producers, and consumers. Meanwhile, environmentally, Eco-Palapa reduces organic and anorganic waste.

Potential to get a patent, Eco-Palapa is inventive and applicative. Imaniar is optimistic that Eco-Palapa could be produced continually due to the abundance of chicken feathers and plastic bottle waste.

“This product has won third place award in the Universitas Teuku Umar (UTU) Awards in the category of Agriculture and Marine Based Innovative Products in November 2019,” she said.

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