

## **Arrowroot (*Marantha arundinacea*) Starch Modification Through Autoclaving-Cooling Cycling Treatment to Produce Resistant Starch Type III**

*Sugiyono ., Ratih Pratiwi, Didah Nur Faridah*

### **Abstract**

The objectives of this research were to modify arrowroot starch to produce resistant starch type III by autoclaving-cooling cycling and to characterize the modified arrowroot starches according to their chemical properties. The research consisted of three steps : arrowroot extraction, starch modification, and chemical characterization. The extraction of arrowroot produced 10.78% starch. Starch modification by autoclaving-cooling cycle(s) was run in 6 different treatments with the aim of observing optimal yield of resistant starch. Resistant starch (RS) was produced through 1, 3, 5 cycle(s) of autoclaving-cooling treatment with different gelatinization periods (15 and 30 minutes autoclaving) for each cycle. Properties analyzed were starch digestibility, fat content, protein content, resistant starch content, and dietary fiber content. Native starch and commercial RS type III (Novelose 330) were also analyzed as a comparison. Based on the starch digestibility, modified starch from 5 cycles, 15 minutes gelatinization period had the lowest digestibility while modified starch from 3 cycles, 15 minutes gelatinization period had no significant difference with commercial RS type III. Those two modified starches, native starch, and Novelose 330 were chosen for further chemical analysis. The fat content and protein content of the four samples were below 1% (db). Low fat and protein content were required to optimize the RS yield. The modification treatment increased the dietary fiber content. The RS content of native starch, Novelose 330, modified starch 3 cycles, 15 minutes gelatinization period, and modified starch 5 cycles, 15 minutes gelatinization period were 2.12% (db), 20.80% (db), 10.91% (db), and 12.15% (db), respectively. It means that repeating autoclaving-cooling cycling could increase RS yield up to 6 times.

**Key words :** arrowroot, resistant starch, starch modification, autoclaving-cooling