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# The effect of types of mold, fermentation duration and palm kernel cake substrate composition on cellulase and mannanase enzyme activities

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The objective of this research is to determine the types of mold, the substrate composition (Palm kernel cake dose) and the optimum fermentation duration toward cellulase, mannanase and protease in producing enzymes from cellulotic and mananolitic fungi in order to be used in poultry rations that contain Palm Kernel Cake (PKC). The utilization of the aforementioned enzymes are expected to increase the usage of PKC in poultry rations. The statistical method applied in this research is the Completely Randomized Design (CRD) with a 3x3x3 factorial arrangement with 3 replications. Factor A is the types of molds to be used which are Aspergillus niger as A1, *Eupenicillium javanicum* as A2, and *Sclerotium rolfsii* as A3. Factor B is the substrate composition of PKC which are: 5% of PKC as B1, 8% of PKC as B2, and 11% of PKC as B3. Factor C is the fermentation duration which are 36 hours as C1, 48 hours as C2, and 60 hours as C3. The variables measured are the enzyme activities of cellulase enzyme (U/ml), mannanase enzyme (U/ml), and protease enzyme (U/ml). The result of variance analysis showed that there is an interaction among the types of molds, the substrate composition, and the fermentation duration toward cellulase, mannanase and protease enzyme activities, while each factor in the types of molds, the substrate composition and the fermentation duration is highly significant ($p<0.01$) to cellulase, mannanase and protease enzyme activities. Based on the results obtained in this study, it can be concluded that *Sclerotium rofsii* provides an optimum enzyme activities for cellulase, mannanase and protease enzymes with enzyme activity of 21.89 U/ml, 24.58 U/ml, and 22.92 U/ml respectively, compared to *Eupenicillium javanicum* and *Aspergillus niger*.

## Biography

Mirnawati has completed her PhD in 2010 from University of Andalas. She is the Study Program Secretary of Animal Science Faculty, Department of Poultry Nutrition, Andalas University, West Sumatra. She has published more than 8 papers in reputed journals.

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