could produce lipase enzyme. The difference was also likely to occur due to material type and condition, and PKC extraction process.

The increasing ash content in FPKC was mostly due to mineral supplementation on substrate medium. Fermentation process on required a minuscule mineral to support yeast enzyme activity. Ash was composed of Ca, Mg, P and micro substance. Living organism needs very little mineral for metabolism [22] and not all of them were made into new compounds, even mostly served as co-factor in enzyme activity which woud return as original mineral after enzyme reaction. Accordingly, mineral content before and after fermentation would be detected in form of ash with the same amount.

N-free Extract (NFE) in fermented palm kernel cake was significantly decreasing. NFE was carbohydrate building blocks. [23] stated that plant carbohydrate consisted of NFE and crude fiber. The decreasing NFE showed the assigned carbohydrate as carbon compound in cell building synthesis. From the carbohydrate composition of palm kernel cake, enzymes in fermentation product were mannanase, alpha-galactosidase and cellulase. Those enzymes hydrolyzed mannane, galactomannane and cellulose to produce simple but more carbohydrate. Carbohydrate was degraded by microbe into energy and CO_2 for the cell life to improve *Candida utilis* and eventually produced higher cell protein.

Mannose value in FPKC product increased insignificantly)>0,05) although hemicellulose value significantly increased (P<0,05) (Tabel 2). It might due to the lack incubation period. Mannose was one of mannane hydrolysis products. Mannane physical form was molecular ribbons but more flexible and less strong compared to cellulose, straight and expandable [24]. Mannane from oil palm generally posses strong hardness, high crystalline and is water-insoluble. Mannanase enzyme excreted by *Candida utilis* hydrolyzed mannane into mannose. Mannane was composed of main component of D-glucose and D-mannose. D-glucose was synthesized from glucose-1-phosphate catalyzed by *GDP-G-pyrophosphorilase* into GDP-glucose by releasing pyrophosphate and guanosine 5'- triphosphat. From GDP-D-glucose by *GDP mannose 2-epimerase* enzyme would be catalyzed into GDP-D-mannose or vice versa. If both components was catalyzed by transferase inside golgi, glucomannane would form. Around 3-5% glucomannane as matrix material of cell wall in form of hemicellulose fraction was 3-12% [24].

3.2. Fiber Volume Fraction

Cellulose, hemicelluiose and lignin content did not decrease (Table 2) because of the degradation of cellulose with limited hydrogen bridge and unsystematic space between microfibrils; furthermore, crystalline cellulose was hydrolyzed and it degraded covalent bond of crystalline cellulose. Glucose was then metabolized by microbe to induce cell growth and secondary product synthesis. Accordingly, cellulose content in this research was the remaining cellulose in substrate and the one formed by the microbe as one of cell components. therefore, although substrate had been fermented, statistical value of cellulose did not show any changes.

Lignin statistical value in fermented PKC was not significantly different. Lignin was a phenylpropane unit and 5-15% methoxy cluster [25]. Lignin is resistant to chemical degradation including enzymatic. Lignin contained 61-65% C, 5-6% H and 30% O. Lignin in the wood was 17-32% of the dry matter. Coumaryl alcohol and synapil alcoholwere served as the precursor. Lignin had a strong bond with polysaccharide and cell wall protein of plant, therefore the compound was indigestible during digestion.

TABLE 2
LEVEL OF CELLULOSE, HEMICELLULOSA AND LIGNIN IN PKC AND FPKC (% DRY MATTER)

Parameter	Treatments		T-test
	PKC	FPKC	
Cellulose	38.91	41.13	ns
Hemicellulose	21.12	22.93	*
Lignin	21.12	19.18	ns

*Note: *Value bearing different superscript on the same line showed significant difference (P<0,05).*
ns = not significan (P>0.05).

FPKC hemicellulose (Tabel 2) was significantly higher (P<0.05) than that of PKC because of the loosening lignocellulose bound resulted from lignocellulose activity, that helped cellulase and hemicellulose enzymes to penetrate the substrate. Hemicellulose molecule had shorter chain than cellulose and was soluble in hot acidic solution [26]. This compound bound with cellulose and lignin through Hydrogen Bridge. Hemicellulose is hydrolysable non-crystal like. Hemicellulose hydrolysis produced pentose and hexose [5].

4 CONCLUSION

Two-day fermentation of palm kernel cake using *Candida utilis* provided the essential nutrition for poultry by increasing crude protein, hemicellulose, and mannose.

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