FEEDING FERMENTED *JATROPHA CURCAS L.* MEAL SUPPLEMENTED WITH CELLULASE AND PHYTASE TO KAMPONG CHICKEN

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INTRODUCTION

✓The increasing of *Jatropha curcas* cultivation as raw material of biodiesel in Indonesia leads to increase *Jatropha curcas* meal as byproduct.

✓*Jatropha curcas* (physic nut or purging nut) is a drought-resistant shrub or tree belonging to the Family *Euphorbiaceae*, which is cultivated in Central and South America, South-East Asia, India and Africa (Schmook and Seralta-Peraza, 1997).

✓*Jatropha curcas* meal may serve as a highly nutritious protein suplement in animal feed if the toxins and antinutrients present in the meal are removed

✓The meal has high trypsin inhibitor and lectin activities, which could be inactivated by heat treatment; high phytic acid

✓The main toxic of *J.curcas* meal is phorbolesters

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✓Untreated *Jatropha curcas* meal was toxic to rats, mice and ruminants (Becker and Makkar, 1998) as well as to poultry (Sumiati *et al*., 2007).

✓ Feeding *Jatropha curcas* meal at the level of 5% in the diet to the broilers reduced feed consumption, caused 100% mortality at the age of 22 days and it damaged the liver as well as kidney (Sumiati *et al*., 2007)

J.Curcas meal detoxification

✓Martinez-Herrera *et al*. (2006) used different treatments to decrease or neutralize the antinutrients present in the meal.

✓ Trypsin inhibitors were easily inactivated with moist heating at 121°C for 25 min. Extraction with ethanol, followed by treatment with 0.07%$NaHCO_3$ considerably decreased lectin activity.

✓The same treatment also decreased the phorbolester content by 97.9% in seeds.

- Sumiati *et al*. (2008) fermented Indonesian *Jatropha curcas* meal using *Rhizopus oryzae* and it could decrease the fat contained in the meal (5.8% Vs 0.39) and eliminated trypsin inhibitors up to 67.95 %.
- The decreasing of fat content indicated the eliminating of the main toxic substance contained in the meal, i.e. *phorbolesters.*
- However, the fiber and phytic acid contained in the meal were still high.

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OBJECTIVE

- to study the effects of using fermented *Jatropha curcas* meal using *Rhizopus oryzae* supplemented with cellulase and phytase in the kampong chicken diets on the growth and mortality rate.

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MATERIAL AND METHODE

- Untreated and fermented *J.curcas* meal used in the experimental diets
- This experiment used 200 kampong chickens which were reared from d.o.c up to 10 weeks of age.
- This experiment using completely randomized design with 5 treatment diets and 4 replications, each replication used 10 birds.

D.O.C

10 weeks

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Table 1. Chemical composition of untreated and fermented *Jatropha curcas* meal

Component	Untreated J.curcas	Fermented J.curcas
Dry matter, %	84.99	94.01
Ash, %	5.63	5.95
CP, %	24.71	22.39
EE, %	5.8	0.39
CF, %	32.58	44.22
NFE, %	16.27	21.06
Ca, %	1.00	0.68
P, %	0.99	0.35
GE, kcal/kg	3893	3984
Phytic acid, %**	10.18	7.45

Experimental diets

T0 =control diet, without *J. curcas* meal

T1 =the diet contained 5% untreated *J.curcas* meal

T2 =the diet contained 5% fermented *J.curcas* meal + cellulase 200 ml/ton of feed

T3 =the diet contained 5% fermented *J. curcas* meal + 1000 FTU phytase

T4 =the diet contained 5% fermented *J. curcas* meal + cellulase 200 ml/ton + 1000 FTU phytase

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Table 2. Composition of experimental diets

Ingredient	To	T1	T2	T3	T4
	.... (%)				
Yellow corn	51.23	53.21	53.21	53.21	53.21
Rice bran	20.5	15.0	14.5	14.5	14.5
Soybean meal	17.0	16.5	16.5	16.5	16.5
Unt.J.curcas meal	0	5.0	0	0	0
Ferment.J.curcas meal	0	0	5.0	5.0	5.0
MBM	7.5	7.0	7.0	7.0	7.0
Palm oil	3.0	2.5	3.0	3.0	3.0
Salt	0.1	0.1	0.1	0.1	0.1
Premix	0.5	0.5	0.5	0.5	0.5
Dl-meth	0.173	0.187	0.187	0.187	0.187
Cellulase, ml/ton			200	0	200
Phytase, FTU/kg			0	1000	1000

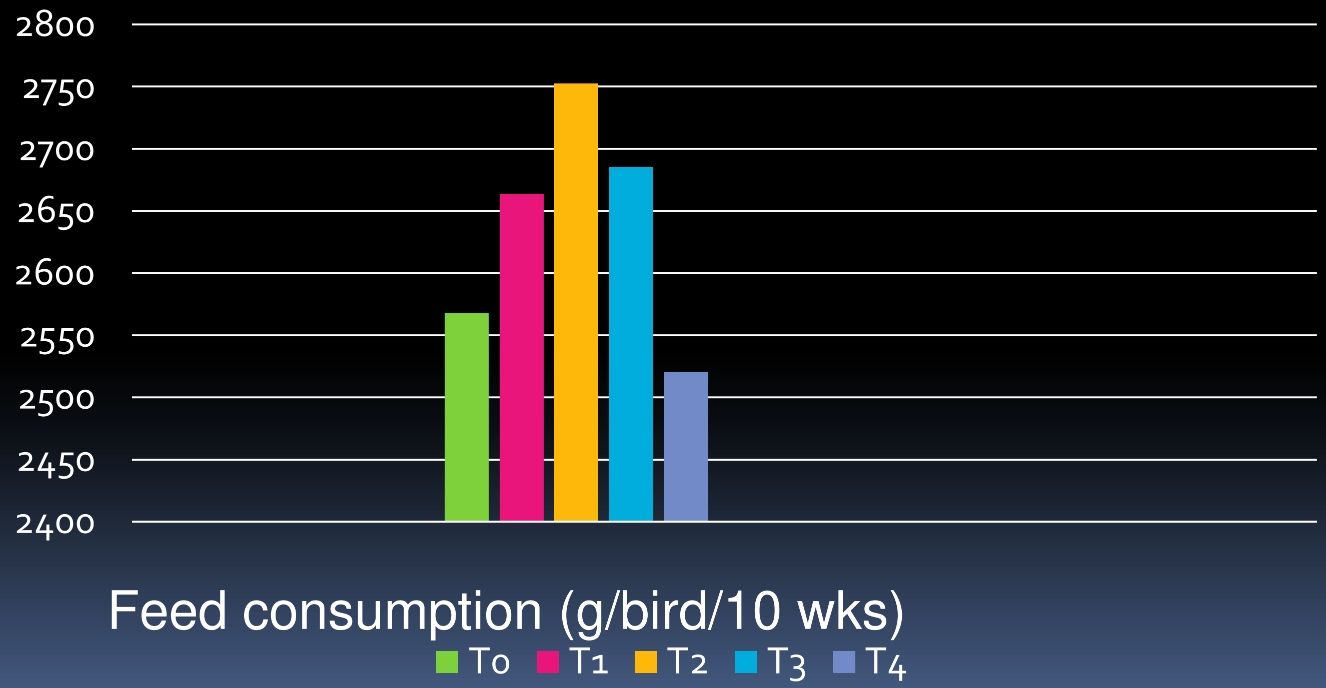
Table 3. Nutrient composition of experimental diets

Nutrient	To	T1	T2	T3	T4
ME, kcal/kg	2855.64	2862.71	2865.11	2865.11	2865.11
CP, %	18.23	18.39	18.26	18.26	18.20
EE, %	5.6	5.15	5.43	5.43	5.40
CF, %	3.81	4.77	5.65	5.65	5.65
Ca, %	0.91	0.91	0.91	0.91	0.91
nPP, %	0.61	0.56	0.56	0.56	0.56
Na, %	0.14	0.13	0.13	0.13	0.13
Lysine, %	0.83	0.83	0.82	0.82	0.82
Meth, %	0.36	0.37	0.37	0.37	0.37
Meth+cyst,%	0.62	0.62	0.62	0.62	0.62

- The experimental diets were fed to 2 weeks old up to 10 weeks old of chicks in order to minimize the mortality. During two weeks (0-2 weeks of age), the chicks were fed commercial diets.

- The parameters observed were feed consumption, body weight gain, final body weight, feed conversion ratio, and mortality rate. The data were analyzed using analyses of variance according to Steel and Torrie (1995).

RESULTS



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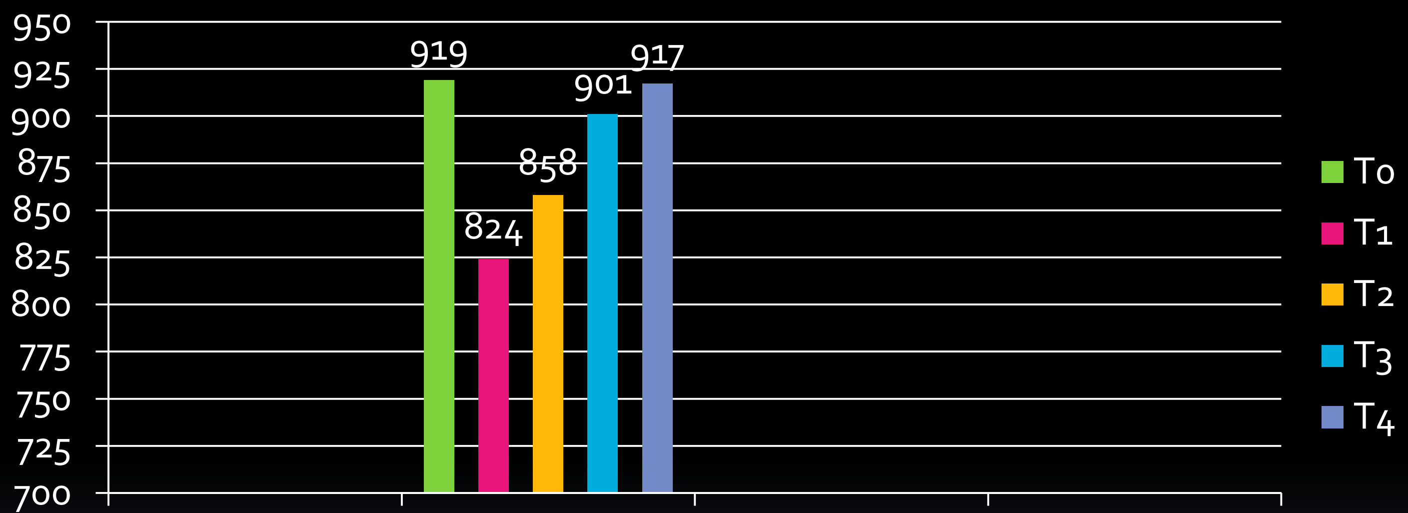
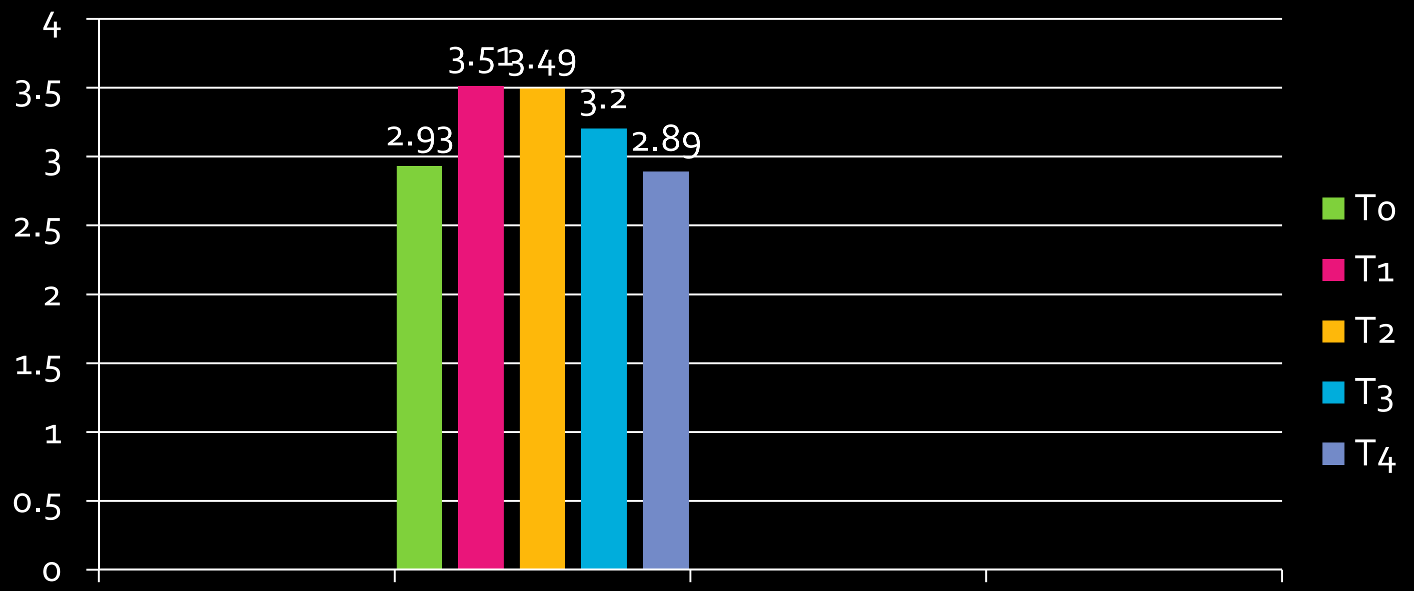


Body weight gain (g/bird/10 wks)



Feed conversion ratio

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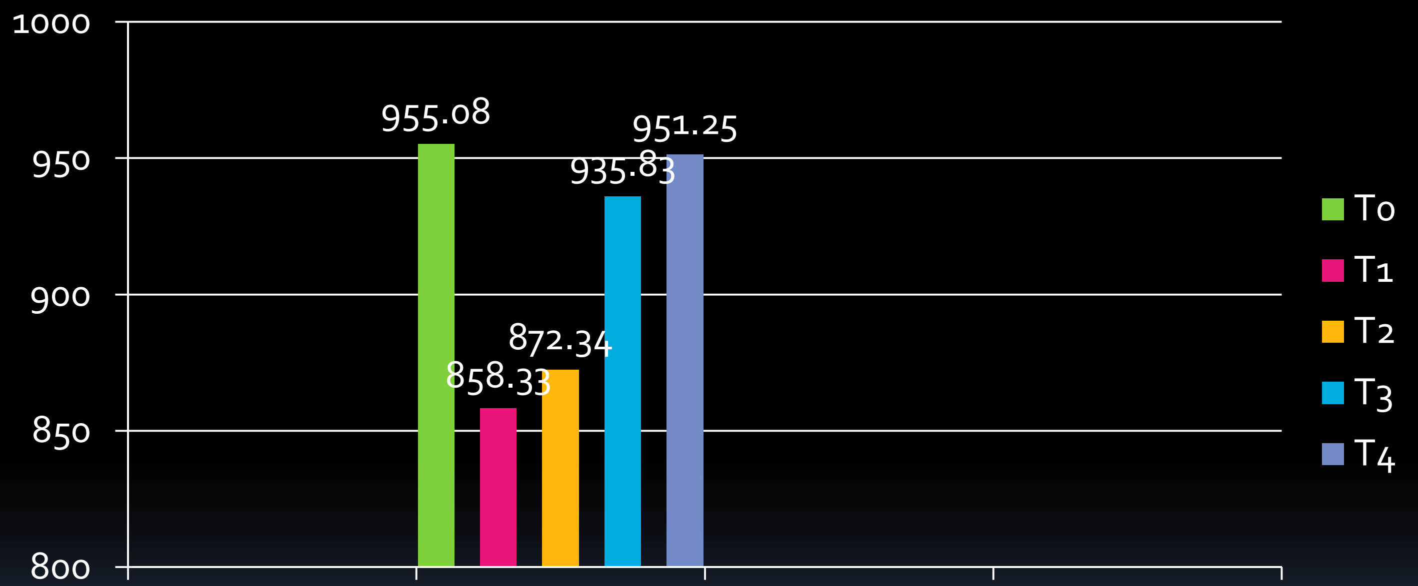

Final body weight (g/bird)

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Mortality

- There was no mortality found in all treatments

CONCLUSION

- Feeding 5% untreated as well as fermented *Jatropha curcas* meal in the diets is safe to kampong chickens.
- Supplementation of cocktail enzymes (cellulase 200ml/ton+ phytase 1000 FTU/kg) yielded the best performance of growth and feed efficiency of kampong chickens.


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