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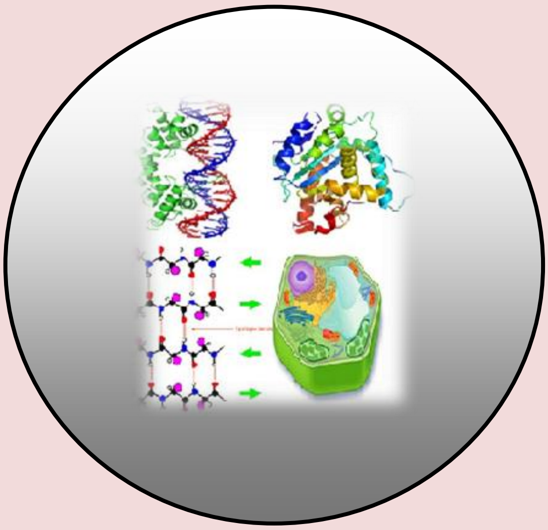

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RESEARCH PAPER

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Provision of Saccharomyces Cereviseae Probiotics in Rice Bran-Based Rations on the Performance of Balinese Duckling (Anas sp)

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ABSTRACT

This study aims to examine the effect of the addition of Saccharomyces cerivisea in rice bran-based rations to the growth performance of the Balinese duckling phase. Yeast culture product, which have some fermentation ability consist of yeast (S. cereviseae) and the media which the Yeast grew on. The research used a completely randomized design (CRD) with four treatments in six replicates. There were ten birds in each replicate with relative homogenuous body weight. The experimental basal diets for the experiment period were formulated to 25% rice bran as a control diet (A), the diet with 25% rice bran plus 0.10% probiotics S. cereviseae (B); the diet with 25% rice bran plus 0.20% probiotics S. cereviseae (C), and the diet with 25% rice bran plus 0.30% probiotics S. cereviseae (D), repectively. Experimental diets and drinking water were provided ad libitum during the entire experimental period. The results of this experiment showed that supplemented of probiotics S.cereviseae in race bran-based rations (C and D treatments) in diets were increased significantly different (P<0,05) on body weight gains and feed efficiencies of Bali drake than control groups (A). For using of probiotics S. cereviseae in raci bran-based rations were decreased significantly different (P<0.05)t on pad-fat and abdominal-fat of birds than control groups (A). It is concluded that supplemented of 0.20-0.30% S. cereviseae in race bran-based rations can improve growth performances of Balinese drake aged 0-8 weeks.

Key words: S. cereviseae, Rice Bran, Abdominal-fat and Balinese drake.

INTRODUCTION

Agro-industry by-product as well as rice bran, is one such product abundantly and cheaply available during the season. Rice bran in the harvest season is very available, but in the dry season it is very difficult to obtain and expensive (Bidura *et al.*, 2012). These antinutrition factors are trypsin inhibitor, lectin (hemagglutinin), phytic acid as phytate, and crude fiber. These anti-nutritive factors have been reported to reduce feed intake and depress performance of poultry. Crude fiber has been defined as the complex macromoleculer substances in food plants that are not degraded by poultry digestive enzymes. Feeding high fiber resulted in a lowered rate of lipogenesis and tendency of an increased capacity to utilize acetyl-CoA in pigs (Zhu *et al.*, 2003). *Aspergillus oryseae (AO)* and *yeasts*, particularly *Saccharomyces cerevisiae*, have been used as probiotics by many workers (Bidura *et al.*, 2012, Bidura and Siti, 2017, Bidura *et al.*, 2014, Bidura *et al.*, 2015, Bidura *et al.*, 2016, Candrawati *et al.*, 2014.

Both *Aspergillus spp*. and *Saccharomyces* belong to the *Ascomycoyina* subdivision and have many industrial applications in the brewing, destilling, and baking industries (Ahmad, 2005). Probiotic yeasts such as *Saccharomyces* have also been shown to stimulate the immune system of chicks without decreasing growth performance (Bai *et al*., 2013).

Live probiotic is feed additives can balance microorganism populations in the digestive tract and can improve the feed efficiency more than 15% and provide economic benefits for farmers raising starter ducks (Zurmiati *et al*., 2017). There are two possible mechanisms for the beneficial effects of probiotics bacteria on gastrointestinal disturbances are: i) production of antimicrobial compounds such as lactic acid and bacteriocins, and ii) adherence to the mucosa and co-aggregation to form a barrier that prevents colonization by pathogens (Chen *et al*., 2017), to replace antibiotics in broiler feed as a growth-promoter while enhancing immune system responses and inducing beneficial modulations in the caecal microflora (Manafi *et al.,* 2018), decreased both abdominal fat and serum cholesterol levels of ducks and broiler (Puspani *et al*., 2016, Bidura *et al*., 2016, Ristiani *et al*., 2017) and egg cholesterol levels (Bidura *et al*., 2016). Most of the recent studies focus on the effect of the bacterial and fungal enzymes used in rice bran based diets. More than 50% of phosphorus in rice bran is in the form of phytate, which is poorly available in the digestive tract of monogastric animals (Ilyas *et al*., l995). Phytic acid found in rice bran feed sources affect the protein and amino acid digestibilities negatively by preventing the activities of the proteolytic enzymes such as pepsin/trypsin. Monogastric animals can not make use of phytin phosphorus due to lacking of phytase enzyme in their digestive systems and consequently phytin posphorus is mostly excreted in the faeces. Therefore, it is suggested that fermented of feeding by yeast (*S. cerevisiae*) can be used in order to alleviate the negative effect of phytic acid. The use of probiotics in poultry production as become an area of great interest, because continued use of probiotics in animal feeds may result in the presence of antibiotics residues in animal products (Khan and Naz, 2013). Therefore this study aimed to examine the effect of probiotic *Saccharomyces cereviseae* supplementation on rice bran-based rations on the performance of the growth phase of the Balinese duck (*Anas sp*).

MATERIAL AND METHODS

Management of experimental Birds

Two hundred and fourty of day-old-duck (*Anas sp*.) were randomly allotted to colony wire-floored cages, 10 birds per cages. A 1000 ml plastic muge/bottle equipped was placed of each cage. Experimental diets and drinking water were provided *ad libitum* during the entire experimental period (for a 8-week period). Body weight and feed intake were recorded weekly.

Diet and Drinking Water

The four experimental diets (Table 1) based on corn-rice bran were formulated to 25% rice bran as a control diet (A), the diet with 25% rice bran plus 0.10% probiotics *S. cereviseae* (B), the diet with 25% rice bran plus 0.20% probiotics *S. cereviseae* (C), and the diet with 25% rice bran plus 0.30% probiotics *S. cereviseae* (D), respectively. The basal diets (Table 1) were formulated to meet or exceed nutrient requirement (NRC, 1994). All of diets in mash form and compiled by iso-energy (2900 kcal ME/kg) and iso-protein (CP: 18%). Through all the experimental period, birds were allowed *ad libitum* access to feed and water. The composition of ration compiler substances and nutrient which is used in diets can be seen in Table 1. All birds were further processed by trained personnel of the plant in a commercial abattoir. Birds were weighed to the nearest gram, subjected to 24 h-feed withdrawal with free access to water, reweighed and slaughtered by neck cutting. Bled immediately through cutting carotid arteries and partial slicing of the neck by a manual neck cutter, and then removed the feather and the horny layer of claw and beak following the scalding. After five minutes of bleeding, each bird was scalded, defeathered, and eviscerated after removal of head, neck and legs. The carcass without giblets was weighed, expressed as a percentage of its live weight and considered as the carcass yield (Zurmiati *et al.,* 2017).

Saccharomyces cereviseae **:***Saccharomyces cerevisiae* used in this experiment were isolated from "Ragi Tape". It's a culture produced locally by fermenting the rice bran with *S. cereviseae*. *Saccharomyces cerevisieae* from ragi tape which used is the common yeast used in "tape" making title "Na Kok Liong", ensiled in number 26895 (Bidura *et al.,* 2012).

Table 1. Formula and chemical composition of diets of growing Bali drake aged 0-8 weeks (as-fed basis)[1].

Ingredient (%)		Level of *S.cerevisiae* in Rice Bran[2]				
		0% (A)	0.1% (B)	0.2% (C)	0.3% (D)	
Yellow corn		54.30	54.30	54.30	54.30	
Rice bran		25.00	25.00	25.00	25.00	
Fish meal		14.60	14.60	14.60	14.60	
Coconut meal		13,60	13,60	13,60	13,60	
Soybean		5.00	5.00	5.00	5.00	
Palm oil		0.64	0.64	0.64	0.64	
NaCl		0.46	0.46	0.46	0.46	
Saccharomyces cereviseae		0.00	0.10	0.20	0.20	
Total		100	100	100	100	
Metabolizable Energy	(kkal/kg)	2901	2901	2901	2902	2900[3]
Crude Protein	(%)	18.04	18.04	18.04	18.0	18.00[3]
Crude Fibre	(%)	4.48	4.48	4.48	4.85	5-7[3]
Eter Extract	(%)	8.22	8.22	8.22	6.76	5-10[3]
Ca	(%)	1.18	1.18	1.18	1.08	0.9-1.2[3]
P-available	(%)	0.68	0.68	0.68	0,63	0.40[3]
Argynin	(%)	1.35	1.35	1.35	1.52	1.00[3]
Lysine	(%)	1.37	1.37	1.37	1.31	0.82[3]
Metyonine + Systeine	(%)	0.82	0.82	0.82	0.79	0.60[3]

Note:

1. Calculation based ingredient by Scott *et al*. (1982)
2. Level of *S. cerevisiae* on rice bran in rations
3. Standard of Farrell (1995)

Statistical Analysis

All data were subjected to a one-way analysis of variance test. Statistical significances among treatment means were determined by method of New Multiple Range Test of Duncan when the F value was significant at 5 % level (Steel and Torrie, 1980).

RESULT

The results of the study are presented in Table 2. The treated ducks exhibited higher growth rates and feed/gain than the control bird in terms of final BW and BW gain. No significant differences in the feed consumption and carcass percentage were observed among the dietary treated groups.

BW gain in ducks fed diet containing 0.20% *cereviseae* were significantly higher ($p<0.05$) as compared with that of control in total experimental period. There were no significant differences in feed intake during the period. Feed/gain in the groups fed probiotics (treatment C and D) was superior to that of control. In Table 2 shows that no significant differences were also observed in carcass percentages (carcass weight/body weight x 100%). The treated ducks exhibited (treatment C and D) were significantly higher ($p<0.05$) in breast meat (g/100 g carcass weight) than the control bird. Supplementation of 0.20-0.30% *S. cereviseae* as a probiotics sourches in diets were decreased significantly different ($P<0.05$) on pad-fat and abdominal-fat than the control group of birds.

Supplemented of 0.20-0.30% *S. cereviseae* as a potential probiotic in duck feed showed influenced the body weight gain of ducks, but did not significantly ($P>0.05$) different affect on feed consumption. The results of this study are the same as those reported by Ramasamy *et al.* (2010) that supplementation of probiotic cultures did not influence the feed intake. The increase of final body weight and body weight gains indicated that probiotics *Saccharomyces cereviseae* supplementation showed the better growth performance than the control group during the overall experimental period. However, all supplementations in this study trended to improve the FCR. The improver feed conversion seen in the groups fed probiotics if compared to the control group evidence the reason for the higher weight gain indexes, since almost the treatments had similar feed intake.

Some researchers (Hasan *et al*., 2016; Husain *et al*., 2017; Phuoc and Jamikorn, 2017; Chen *et al*., 2017; Zurmiati *et al.,* 2017; Mahfuz *et al*., 2017) reported that the effect of probiotic were increased body weight gain and meat quality, feed efficiency, and growth performance. *Saccharomyces spp* can ncrease the nutritional value of rice bran (Bidura and Siti, 2017). In contrast some researchers reported that dietary probiotic had no significant effect on live body weight, BWG, and feed conversion ratio (Aliakbarpour *et al*., 2012; Fathi *et al*., 2017; and Zurmiati *et al.,* 2017). According Chen *et al*. (2017), the inconsistent results of probiotic supplementation may be because of the difference of suitable living bacteria number, animal age, and supplementation strains.

Table 2. Addition effect of fermented rice bran by *S. cereviseae* in diets on performance of Balinese drake (*Anas sp*) eged 0-8 weeks.

Variabel	Level of *S. cerevisiae* in Rice Bran Fermented1)				SEM2
	0% (A)	0.1% (B)	0.2% (C)	0.3% (D)	
Final body weight (g/birds)	1045.02b3)	1078.05b	1238.61a	1257.83a	45.084
Body weight gains (g/birds/8 weeks)	985.39b	1017.18b	1177.85a	1195.36a	43.874
Feed consumption (g/birds/8 weeks)	5173.31a	5401.23a	5571.23a	5606.24a	175.92
Feed Conversion Ratio (feed/gains)	5.25a	5.31a	4.73b	4.69b	0.169
Carcass percentage (% body weight)	55.35a	55.41a	55.64a	55.72a	0.874
Breast meat (% carcass meat)	5.48b	5.51b	6.17a	6.25a	0.185
Pad-fat (% body weight)	0.51a	0.54a	0.39b	0.41b	0.029
Abdominal-fat (% body weight)	0.86a	0.82a	0.61b	0.64b	0.057

Note:

1. Level of *S. cereviseae* on rice bran-based rations: 0.0% (A); 0.10% (B); 0.20% (C), and 0.30% (D), respectively.
2. *Standard Error of the Treatment Means*
3. The different superscript at the same row is significantly different (P<0,05)

The treated ducks exhibited (supplementation of 0.20-0.30% *Saccharomyces cereviseae*) were significantly higher in breast meat (g/100 g carcass weight) than the control of birds. But, decreasing on pad-fat and abdominal-fat than the control group of birds. The breast meat of probiotic fed chickens were higher in moisture, protein, ash and lower fat per cent as compared to the breast meat of control chickens (Khaksefidi and Rahimi, 2005). Decreasing pad-fat and abdominal fat (Puspani *et al.,* 2016) due to probiotic supplementation, according to Alkhalf *et al*. (2010) is caused by speculated that probiotics (*Lactobacillus)* reduces the triglycerida in the blood by deconjugating bile salts in the intestine, thereby preventing them from acting as precursors in cholesterol synthesis.

It is concluded that supplementation of 0.20-0.30 % probiotics *Saccharomyces cereviseae* in diets were increased growth performances, feed efficiencies, and breast weight, decreased pad-fat and abdominal-fat in ducks.

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