

SHORT COMMUNICATION

Pseudozyma aphidis as inoculant for local chicken

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Local chicken breeding under traditional farming system is common in Asia (Ahuja & Sen 2007). Ayam known as a local ecotype of Indonesian native chicken does not have any specific characteristics, and usually rises as free range in most rural areas in Java (Nataamijaya 2010). The bodies are normally small size, low in growth rate, and have massive variation of growth rate character (Riztyan *et al.* 2011). In the other hand, native consumers preferred local chicken to commercial broiler ones because of its remarkable palate and healthy meat, as well as quality of eggs. The eggs usually use to herbal drink complement that popular in Indonesian traditional refreshment which is called *jamu*.

Microbial biomass for chicken is prepared through fermentation process, and its probiotic function is exploitable to prophylactic and accelerates body growth. Fermented feed could be beneficial to poultry practice (Chen *et al.* 2009). Fermentation process is able to convert less available nutrient into digestible nutrient which is advantageous to chicken growth and their health. Introducing microbial probiotics into feed is also favorable even though birds have short gastrointestinal tract because of microbial producing digestive enzymes for retention in the intestines. The role of chicken intestinal microbiota has effects on nutrient intake (Rintilä & Apajalahti 2013). Microbial inoculants augmented into feed addition result efficient nutrient absorption. However, it is possible that cecal microbial profile is also a reflection of feed digestion.

Following the above reason the study dealt with feed addition of yeast *Pseudozyma aphidis* in the local chicken husbandry. Yeast is noticed as probiotics supplement for speeding up chicken growth. The objective of the study was to investigate effect of the microbial probiotics dietary on weight gain of ayam kampung growth.

In this study, 30 samples unsexed local chicken were kept per pen (200 length x 180 width x 150 cm height). Five identical pens were used, and five diets

variation represent to each pen (Table-1). Clean water supplied *ad libitum*. Live weights of the progeny were taken at two days hatching as initial weight; and birds were individually weighed in order to determine their relative growth agree with De Smit (2005) method. The chickens were raised in rice hull litter-floored cage. Lights turned on along night till chickens have enough sunlight in the next morning. At day forty the light completely turned off because feather had come up and enough to keep warm.

The yeast prepared for probiotic as feed addition. Yeast used is a working collection in Microbial Division, Research Center for Biology, Indonesian Institute of Sciences, collection code Y.10 BS.16. Yeast was grown in agar solution media (3.0 g NaNO₃, 0.3 g MgSO₄, 0.3 g KH₂PO₄, 1.0 g Yeast Extract, 80 mL coconut oil, make up to 1 L aquadest) to have population 10⁷.mL⁻¹ for inoculant preparation following the method described by Rao *et al.* (2005). That inoculant was used as probiotic augmented in mill feed. The mill feed had contexture of moisture content 13%, protein 21 to 23%, fat 5%, fiber 5%, ash 7%, Calcium 0.9%, Phosphor 0.6%, and metabolized energy (ME) 3000 to 3100 Kcal/kg. Body weight data were construed by statistical package as analyze of variance, then tested by list significant different, and declared at P<0.05 (Parker 1972). The study was carried out on July to August 2013 in Cibinong Science Center, Research Center for Biology.

In this study, the essential work deals with accelerating growth rate that have relation with feed practical system. Improvement of local chicken breeding techniques useful to support market needs. Yeast additional feed as probiotic was effective to chicken and the body growth rate increased. Individual body weight has small variation in 15 days compared to reach in the 35 days ages (Figure-1). The six big weight percentiles value (WPV) of 15 days chicken ages had more difference WPV at 35 days ones (Figure 1A). Real mass showed in illustration Figure-1B that weighty range at 150 to 450 g for the entire samples. Genetic variation in local

chicken is dominantly influence variation of growth performance (Nataamijaya 2010). In the study, mill feed combined with fine rice husk caused minimum in weight gain. It is assumed to cause nutrient deficient that evenly probiotic addition used to support the nutrient intake.

Indonesia has many small farmers which favor raising traditional method, since had low input cost to

reach high income. Mill feed had indeed fine commercial quality one, but if it was added by yeast inoculant in this study (D feeding system) raise ten percent bird weight average in five weeks growth (Figure 2). Probiotic feed in chicken gut could increase organic acid that caused nutrient intake and keep health. Chicken obtain energy from short-chain fatty acids (SCFA), and SCFA was produced in the

Table-1. Treatments on five different feed diets for each pen

Feed code of pen	Percentage composition		Feed addition (10 ml/kg mill feed)	Feed consuming & microbial augmentation			
	Mill feed	Find bran		The first 2 weeks	Third week	Fourth week	Fifth to sixth week
A	100	0	-	12.5 g/ chicken/ day	17.5 g/ chicken/ day	25 g/ chicken/ day & probiotic diet per 2 days	30 g/ chicken/ day & probiotic diet per 3 days
B	60	40	+	& probiotic diet per day	probiotic diet per 2 days		
C	40	60	+				
D	100	0	+				
E	50	50	+				

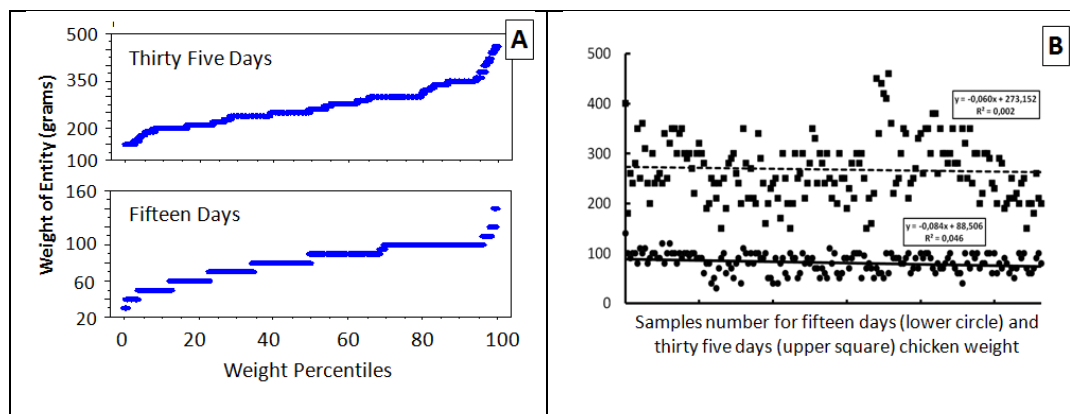


Figure 1. Weight gain variation in chicken growth increase to follow ages

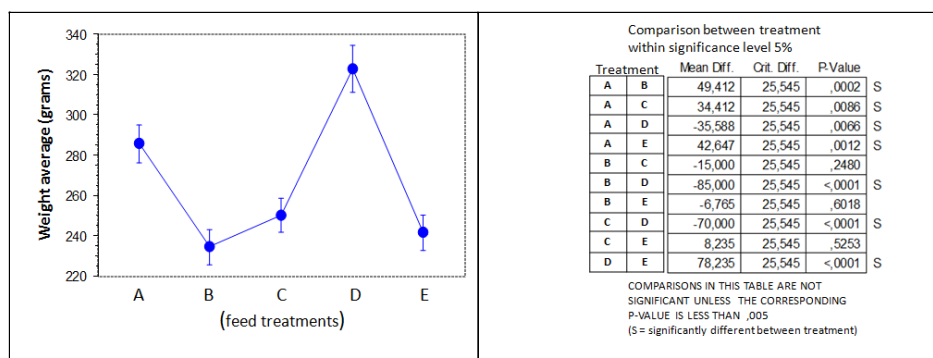


Figure 2. Feed treatments affect on thirty five days (7 weeks) chicken life body weight

rumen. In addition to energy yielding activity, SCFA formation in chicken cecum reduces pH of the intestinal environment, which may inhibit pathogenic bacteria such as the family *Enterobacteriaceae*, by dissipating the proton motive force across the bacterial cell membrane (van Der Wielen *et al.* 2000). The mechanism of probiotic action had been suggested to reduce metabolic reactions of toxicant, stimulate indigenous enzymes, produced vitamins, and serves as antimicrobial substances. In sanitary affect, probiotic competition in gut surface adhesion caused to immune response of chicken to ailment (Guillot 2003). Kabir *et al.* (2004) for instance, conducted a six weeks growth performance had weight gain significantly higher in broilers fed probiotic supplementation. In the other poultry practice, benefits of probiotic supplement (live yeast or bacteria) are made in broilers' performance, and as well as resistance of chickens to Salmonellosis, *Escherichia coli* or *Clostridium perfringens* infections (Banjeree & Pradhan 2006; Higgins *et al.* 2007).

According to feed treatment effect in this study, chicken had almost constant weight value along 15 days kept in pens but body mass variation become increase within 35 and 45 day's aged, as well to the body weight gain (Figure 3). Yeast addition affects to nutrient intake as due to D treatment feed. That treatment could make highest daily growth acceleration to reach 45 days old. In the last next ten days, yeast as feed addition did not influence growth any longer, even though A and D treatments still visible in the last weight average when compared to other treatments (Figure 4).

Use of yeast in the field trials here as feed addition to the main feed was getting success to accelerate local chicken weight, but unclearly yet to diseases immunity impact. Concern to other experience in the poultry work, dry weather can cause various diseases appeared to disturb. Chicken usually get suffer from extreme heat that caused low in feed intake, poor performance, carcass quality and meat traits (Samanta *et al.* 2008). Yeast as feed addition in the henery might become effective to local chicken immunity, particularly in the dry season application. Respect on that matter, some certain places in Indonesia might be stricken by extreme weather due to the global warming, but the farmer still have opportunity to use yeast probiotic in their local henery business to survive.

Follow to other additional feed research result, bacterial probiotics (*Bacillus* spp.) application were not affect in six weeks chicken ages performance, but it was useful to replace antibiotics utilization. Probiotics consumption throughout feed and water supply *ad libitum* in that henery did not leave residues in animal tissues compared to antibiotic achievement in the observation (Daud 2005; Kompang 2010). In the other hand, charcoal addition to feed could bind various substances even though it was indigestible in the intestine. As ammonia binding, charcoal feed could protects the intestine against alkalization. The mineral contained in charcoal form bases emulsify fat, thereby supporting liver function, enabling digestion and assimilation (Majewska *et al.* 2011; Jiya *et al.* 2014). Onwurah *et al.* (2013) recommend that yeast inoculant application as water additive could make the slightest feed consumption, the best live performance, and the smallest amount load in gastrointestinal bacteria. Dry fat was effective used as source of energy instead of

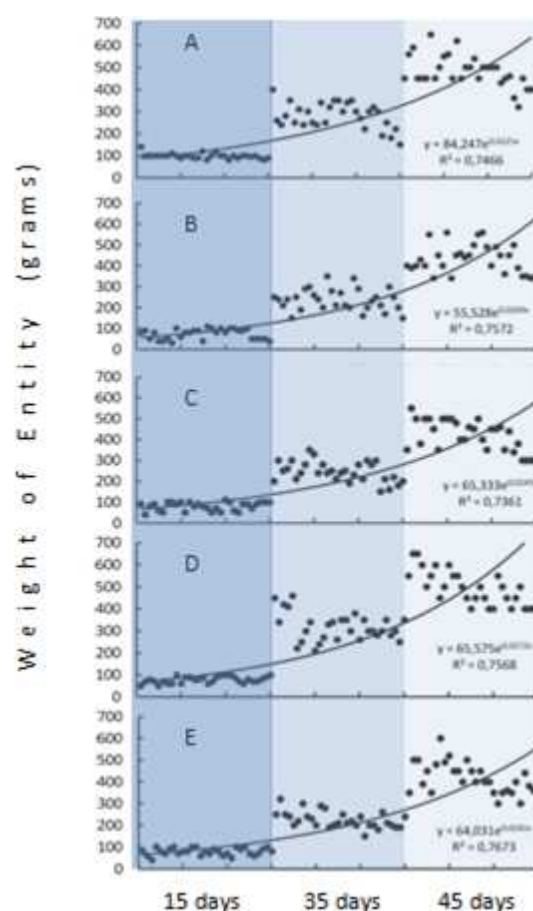


Figure 3. Pattern of chicken weight increasing in different days of observations affected by feed system

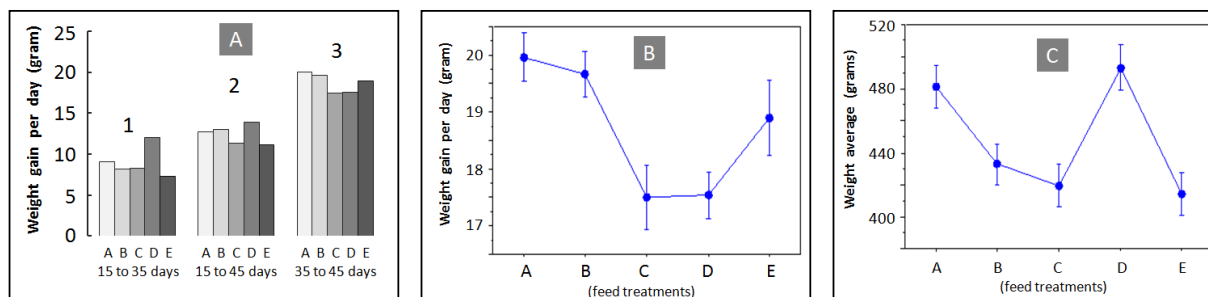


Figure 4. Feed handling affected daily growth of chicken at 15 to reach 35 (Fig.A1) and 45 days ages (Fig.A2). At the last 10 days growth (Fig.A3), yeast feed addition lost its impact (Fig.B), while the average value of body weight was still significant at 45 days ages (Fig. C)

vegetable oil in broiler diets without any negative effect on chicken performance. On the other hand, adding yeast culture (3 kg/ton feed) to a diet containing dry fat decreased the blood serum cholesterol levels, abdominal fat percentages, and improves the general performance of broiler (Abdelrahman 2013).

Turn into conclusion, the addition of *Pseudozyma aphidis* inoculant as liquid probiotic cultures mixed with commercial feed in this observation resulted on daily weight gain raise rapidly to local chicken growth. Diet in the last ten days of 35 to 45 days chicken ages resulted the average weight gain per day decline, and increasing yeast probiotic supplementation might be solution to influence growth insistence. In the other advantage, the yeast is subjected into valuable bioresources in the proffer culture collection utilization.

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