QUALITY OF ISA BROWN CHICKEN EGGS PROVIDED WITH FERMENTED DRAGON PEEL (*Hylocereus Sp*) AND CALCIUM

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ABSTRACT

This study aims to study the quality of Isa Brown's chicken eggs fed fermented dragon fruit peel (Hylocereus sp) and calcium, which has been carried out for 10 weeks. The research design used was a completely randomized design (CRD) consisting of 3 treatments, each treatment was 6 replications and each unit of replication consisted of 1o chickens so that a total of 180 chickens were 80 weeks old. The treatment are: A = ration without fermented dragon fruit skin ,B= ration plus fermented dragon fruit peel and C=ration plus 5% fermented dragon fruit peel and 1% calcium. The variables measured : daily egg production, egg weight, HU,yolk color,egg shell thickness, egg shell weight. The results of the study showed that the quality of the eggs that the ration treatment added 5% dragon fruit peel (B) and the ration treatment added 5% dragon fruit peel and 1% calcium (C0 had a significant effect (P<0.05) than the ration without fermented dragon fruit peel (A). Based on the results of the study, it can be concluded that the quality of Isa Browns chicken eggs which received the treatment of 5% fermented dragon fruit peel and 5% fermented dragon fruit peel ration plus 1% calcium affected daily egg production (HDP), egg weight, egg yolk color, egg shell thickness, compared to rations without being given fermented dragon fruit peel.

Key words: Isa Brown, calcium, dragon fruit peel, quality eggs

INTRODUCTION

Isa Brown chicken is one of commodities of meat and egg producing poultry that is increasingly interested to be reared by the community in Bali. According to Hargitai *et al.*, (2011) chicken Isa Brown is rejected at the age of 80 weeks because the increasing age of the chicken has decreased its quality. This is due to a decrease in the digestive and metabolic ability of the chickens body so that the mineral content in the chickens body decreases, so that the eggs produced have thin, cracked eggshells and reduced the economic value of the eggs produced, the breeders lose. However, breeders still maintain 80-week-old Isa Brown chickens to raise because the cost of maintaining DOC until they are ready to lay eggs is also very expensive, DOC are difficult to obtain, Hand Day Production is obtained still in the range of 63-65% , so it need to be given feed and additional calcium.

Many factors interact affecting to optimal production of However, the maintenance of Isa Brown chickens faced with the variety of problems such as the increasing feed prices are enough sharply, because the feed is a primary need at a cost of approximately 60-70% . Balance feed containing either macro and micro nutrients is one factor that influence and has important role in laying period. The high price of feed is indirectly required that farmers are looking for alternative feed ingredients so it can lower the feed costs and maximize revenues.

Dragon fruit peel is agricultural waste which has not been widely used by the community, especially in Indonesia (Mustika ,2014). Dragon fruit is a key raw material in the manufacture of juices, jams, syrups, chips or other food ingredients by key material the dragon fruit. According Citramukti (2008) part of dragon fruit 30-35% is peel and still rarely or even not been fully utilized, although some studies have reported peel dragon fruit contains high antioxidant and contents phenolics in the dragon fruit peel amounted 28.16 mg/100 g, in addition to having antioxidant also contain anthocyanins (Nurliyana *et al.*, 2010).

According Ahmad (2005) and Dewi *et al*. (2017) sacharomyces cerevisiae yeast can increase fibrous fiber digestibility and can act as a probiotic in poultry. At the time of fermentation by yeast, the crude fiber content of ration can be degraded, so it can be utilized by poultry. Another benefit of fermentation products is to suppress the enzyme activity of *3-hydroxy-3-methylglutarylCo-A* reductase that serves to synthesize cholesterol in the liver (Tanaka *et al.*,1992). Application of supplementation technology utilizing superior *sacharomyces cerevisiae* origin of yeast is very potential developed.

Research on dragon fruit peel for livestock feed is still rarely done according Mustika *et al*. (2014) dragon fruit peel can be given up to the level of 1% and Rosa *et al*. (2013) can be given up to the level of 4%, without have negative effects on the body of livestock. Dewi et al. (2017) used 5, 7% dragon fruit peel fermentation by *Sacharomyces cerevisiae* increase performance broiler chickens at 5 weeks. While for From the description above, the researcher using dragon fruit peel meal without and fermented as a feed ingredient in diets for productivity and quality of eggs Isa Brown.

MATERIALS AND METHODS

Animal, ration and Feeding Treatment

This research conducted over 10 weeks and this research is located in farmers in Pesedahan Village, Manggis District, Karangasem-Bali and Poultry Laboratory at Campus Faculty of Animal Science, Udayana University . A total of 80 weeks Isa Brown Hens used in this study were kept in individual cages of 40 x 40 x 45 cm .

Diets

Diets is used in this research was independently prepared by recommendation Scott *et al*. (1982) which consists of yellow corn, fish meal, soybean meal, rice bran, dragon fruit peel meal, dragon fruit peel meal fermented, coconut oil, premix and CaCO3. Diets given is iso energy (2,900 Kcal/kg) and iso protein (20%), and Calcium. Feed Ingredients were obtained, nutrient content of the treatment diet : Metabolizable energy (kcal/kg) 2900, Crude protein (%) 17-19; fat (%) 3-11; Crude fiber(%) 5-6; Ca (%) 3.5; P (%) 0.45.

Instrument

Instrument used in this research is a diet and drinking water, torch lighting cage, machine grinding feed, knife, bowl, spoons stirrer, scissors, paper labels, markers, plastic bags, oven, stove, pans, trays, thermometer, wood, bamboo, wire, plastic carpet, sprayer and digital scales *Egg Multi Tester*.

Research Methods

In this research there are two stages making process meal dragon fruit peel, first making of dragon fruit peel meal is fresh dragon fruit peel chopped small, then dried and grinded up into flour. Second process namely the making of dragon fruit peel meal fermented with *Saccaromyces Sp.(* Ahmad, 2005).In the process of fermentation, solution is ready for use. Fermentation process dragon fruit peel chopped small , be dried, inserted in plastic, then moistened with solution fermentation, closed tightly (3-5 days), after it is dried, ground into flour and ready for use.

Research Design

The design used was *Completely Randomized Design* (CRD) with 3 treatments, 5 replications in which each replication consisted of 10 chickens so that the total chicken used was 180 heads Isa Brown hens. The treatment given were: A = ration without fermented dragon fruit skin ,B= ration plus fermented dragon fruit peel and C=ration plus 5% fermented dragon fruit peel and 1% calcium.

Variable Observed

The variables measured : daily egg production, egg weight, HU,yolk color,egg shell thickness, egg shell weight

Data analysis

Data were analyzed statistic by ANOVA and when there are significant differences continued test Duncan (Steel and Torrie,1993).

RESULTS AND DISCUSSION

Effect of treatment on the quality of Isa Brown chicken eggs aged 80-90 week can be seen in Table 1. In Table 1. In The Table 1. It can be seen that the chickens that received treatment ration with 5% fermented dragon fruit peel (B) and treatment ration with 5% fermented dragon fruit peel plus 1% calcium (C) increased Han Day Production, Egg weight, egg shell thichness, egg yolk colour, HU significant effect ($P< 0.05$) than Isa Brown received ration without fermented dragon fruit skin . This result agre with the findings of Scott and Silversides (2000) who found that eggs from Isa Brown hens were heavier than those from Isa-White hens. The quality of eggs Isa Brown aged 80-80 weeks can be increase. According to McDonald(2002) that energy intake is useful for growth, besides energy , protein is also suitable for the survival of livestock and it is also influenced by the size , breed , temperature , environment , ration system, health and quality of ration (Dewi, 2017).

Table 1. The effect of treatment for egg quality of Isa Brown hens

VARIABEL	PERLAKUAN 1)			SEM 2)
	A	B	C	
Initial Body weight (80week/ hen)	1680.56[a]	1680.54[a]	1680.56[a3])	2.5
Han Day Production (%)	64.20[b]	65.70 [a]	65.97[a]	0.5
Egg Weight (g)	63.00[b]	65.80[a]	65.95[a]	1.03
Egg shell thichness(mm)	0.365[b]	0.38[a]	0.39[a]	0.05
Index	83,23[a]	82,24[a]	83.33[a]	0.013
Egg Length (cm)	5.19[a]	5.18[a]	5.19[a]	0.02
Egg Width (cm)	4.32[a]	4.26[a]	4.30[a]	0.04
Egg yolk colour	8.24[b]	9.50[a]	9.601[a]	0.016
pH	6.71[a]	6.43[a]	6.43[a]	0.02
HU	96.16[b]	97.33[a]	97.5[a]	0.30

Note:
1) A = ration without fermented dragon fruit skin ,B= ration plus fermented dragon fruit peel and C=ration plus 5% fermented dragon fruit peel and 1% calcium.
2) SEM : *Standar Error of the Treatment Means*
3) Means within superscript the same row with different letters are significantly different (P<0.05).

According Weiss and Hogan (2007) that material having the antioxidant content of livestock can reduce the effects of free radicals such as increasing feed consumption.According Mustika *et.al.* (2014) it is because free radicals can cause oxidative stress in livestock resulting in lower feed consumption. Oxidative stress is a state of imbalance between the amount of free radicals and antioxidants in the body, that can trigger the occurrence cell damage and lowered immune system (Nurliyana *et al*., 2010). The content of fermented dragon fruit peel contains various falconoid compounds , thiamin, pyridosxine, cobalamin ,phenolic, polyphenols, carotene, phytoalbumin and betalain, and has catechin functions as antioxidants and antibacterials (Mustika *et al*.,2014). The fermentation method according to Hentges (1992) in his research was that probiotic increased digestive tract of chicks and decreased pathogenic microorganisms. According to Rolfe (2000) and Tang et al.(2012) fermentation increases chicken immunity and improves chicken performance .

The results show that average treatment B and C rations gave 5% fermented dragon fruit peel and ration 5% fermented dragon fruit peel plus 1% calcium significant effect (P<0,05) increased shell thickness than hens gave ration without fermented dragon fruit skin .This result similar with Lichovnikova (2007) reported that particle size have effect on egg shell thickness. Zita et al. (2009) stated that egg shell thickness of Isa Brown strain is 0.37 to 0.38 mm, according Nys et al.(2011) the egg shell weight about 5.5 g or 8.5-10.5%

CONCLUSIONS

The results of the study, it can be concluded that the quality of Isa Brown hens eggs which received the treatment of 5% fermented dragon fruit peel and 5% fermented dragon fruit peel ration plus 1% calcium affected daily egg production (HDP), egg weight, egg yolk color, egg shell thickness, compared to rations without being given fermented dragon fruit peel.

ACKNOWLEDGEMENT

The author would like to thank the Minister of Education and Culture of Indonesia , through the Director of Research and Community Services and the Rector of Udayana University throught LPPM UNUD ,the Dean animal Science and researchers.

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