Production of Chicken Carcass and Non Carcass of Kampung Chickens who Received Rations Skin Dragon Fruit Flour (*Hylocereus Polyrhizus*) Fermented

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ABSTRACT

The research aims to study the production of carcass and non carcass Kampungchicken who received rations of flour skin dragon fruit (Hylocereuspolyrhizus) has been implemented for 3 months. The design is completely randomized design (CRD) with 4 treatments, 5 replications with each replication consisted of 10 chicken used for a total of as many as 200 birds. The treatment is given as follows: R0: no flour diet dragon fruit skin, R1: 5% ration with dragon fruit peel flour, R2: 7% ration with dragon fruit shell flour and R9: 9% with dragon fruit shell flour.Variabel : production of carcass and non carcass chicken. Data were analyzed by analysis of variance, if significantly different between treatments ($P < 0.05$), then continued with Duncan range test (Steel and Torrie, 1993).

Results showed treatment R0; R1, R2 and R3 are significantly different ($P < 0.05$) on the production of carcass, carcass weight than R0 treatment whereas non carcass weight of abdominal fat Kampung chicken was not significant ($P > 0.05$) on the R0. These studies conclude dragon fruit peel flour 5% , 7% to 9% in the ration affect the production of carcass and non carcass does not affect the appeal of Kampung chicken in the ration without dragon fruit skin.

Keywords: chicken, non carcass weight, skin dragon fruit (Hylocereuspolyrhizus), flour, fermented

INTRODUCTION

Many factors interact and many objectives compete in the optimal production of Kampung chicken. However, the maintenance of Kampung 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% . The high feed costs due to raw materials derived from imported commodities and its use compete with humans. The high price of feed is indirectly require that farmers are looking for alternative feed ingredients so it can lower the feed costs and maximize revenues.

According Mustika (2014) dragon fruit peel is agricultural waste which has not been widely used by the community, especially in Indonesia. 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).The low protein and high crude fiber in fruit peels is a constraint in the utilization as animal feed especially Kampung chickens.

Fermentation process is often defined as the process of breakdown of carbohydrates and amino acids in anaerobic, that is without need the oxygen. An increase in the value of dragon fruit skin can be done by applying biofermentation by utilizing microbial services, ie utilizing the ability of the yeast Sacharomyces cerevisiae contained in tape.Sacharomyces

cerevisiae yeast can increase fibrous fiber digestibility and can act as a probiotic in poultry (Ahmad, 2005 dan Dewi et al., 2014).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). And can decrease the amount of broiler fat (Katarin et al., 1999). However, Sacharomyces cerevisiae can increase the digestibility of high fiber feed into fatty acid products (acetate, propionate and butyrate) (Wallace and Newbold, 1993).The results of Bidura et al. (2009) showed that the use of yeast tape as pollard fermented inoculant was found to improve protein digestibility and crude fiber pollar in ducks. Application of feed technology is absolutely must be applied in the optimization of waste utilization. Application of supplementation technology utilizing superior sacharomyces cerevisiae origin of yeast is very potential developed. So this research is designed to optimize the utilization of dragon fruit leaf waste (poultry breeding business development, in order to support the diversification of national meat source and improve the farmer's welfare.

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. While for the fermentation product has been no research. From the description above, the researchers interested in using dragon fruit peel meal without and fermented as a feed ingredients in diets Kampung chicken.

MATERIALS AND RESEARCH METHODS

Time and Location Research

This research conducted over three months and this research is located in Teaching Farm, Campus Bukit Animal Science, University of Udayana.

Livestock

Livestock used in this research is Kampung chickens produced by PT. Jatinom, Jember, were 200 tails 2 week age.

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 fruitpeelmeal, dragon fruit peel mealfermented, coconut oil, premix and CaCO3. Dietsgiven is iso energy (2,900 Kcal/kg) and iso protein (20%).

Cage used in this research is battery cage with a length of 80 cm, width of 50 cm and height of 75 cm is filled with 10 chickens as many as 20 cages. The cage made of wood, the bottom cage made of wire so that livestock faeces can be accommodated, each plot of cage is equipped with a feed and drinking water are made of bamboo.

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.

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 andgrinded up into flour.Second process namely the making of dragon fruit peel meal fermented with Saccaromyces Sp. 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

This research uses a completely randomized design (CRD) with 4 treatments and 5 replications. Treatments were as follows: R_0= Ration without used dragon fruit skin flour (control); R_1= Ration with used 5% dragon fruit skin flour fermented;R_2 = Ration with used 7% dragon fruit skin flour fermented and R_3 = Ration with used 9% dragon fruit skin flour fermented.

Chickens Maintenance

One day old chickens or Day Old Chick (DOC) maintained as many as 300 individuals and maintenance through two stage, the first chickens given feed commercial BR1 produced by PT. Cargill Indonesia for 2 weeks.Chickens being given vaccinated using ND vaccine . Chickens inserted in a cage that has been given a number treatments and every unit cage filled 10 chickens.

Variable Observed

Slaughter weight. Slaughter weight is obtained by weighing a live chicken at the end of the study (8 weak) after were fasted for 12 hours. slaughter weight expressed in grams/tail (Soeparno, 1994).

Percentage Carcass. Kampung chickens carcass was parts of the body of broilers after deducting feathers, removed viscera and abdominal fat, cropped the head and neck well as both legs (National Standardization Agency, 1995).Carcass percentage obtained dividing the carcass weight with slaughter weight multiplied 100% (Resnawati, 2004).

$$\text{Percentage carcass} = \frac{\text{Carcass weight}}{\text{Slaughter weight}} \times 100\%$$

Table1. Composition Ingredients Ration and Nutrient Content of Diets (age 2-10 weeks)

	Composition (%)				
Ingrediens(%)	**R0**	**R1**	**R2**	**R3 1)**	
Corn	**43,57**	**41.39**	**40.86**	**40.34**	
Fish Meal	**8**	**8**	**8**	**8**	
Soybean Meal	**18,44**	**18,49**	**18,51**	**18,53**	
Race Brand	**25**	**21,93**	**20,43**	**18,53**	
Dragon Fruit Skin Flour Fermented	**0**	**5**	**7**	**9**	
Coconut Oil	**4,79**	**5**	**5**	**4**	
Premix	**0,1**	**0,1**	**0,1**	**0,01**	
CaCo3	**0,1**	**0,1**	**0,1**	**0,01**	
Nutrient Content of Diets					***Standard**
Energy KCal/kg	**2900**	**2900**	**2900**	**2900**	**2900**
Crude Protein (%)	**20**	**20**	**20**	**20**	20
Crude Fat (%)	**10,35**	**10,14**	**9,95**	**9,76**	8
Crude Fiber (%)	**3,08**	**3,73**	**3,90**	**4,10**	5
Calsium/Ca (%)	**0,65**	**0,73**	**0,77**	**0,80**	0,90
Phosfor/P (%)	**0,67**	**0,64**	**0,62**	**0,60**	0,60

Explanation 1) P_0= Ration without used dragon fruit skin flour (control); P_1= Ration with used 5% dragon fruit skin flour fermented;P_2 = Ration with used 7% dragon fruit skin flour fermented and P_3 = Ration with used 9% dragon fruit skin flour fermented.

*** Standard (Scott *et al.*,1982)**

Percentage Carcass Parts. Percentage carcass parts is obtained by dividing the weight of carcass parts (breast, wing, thigh and the backs) with carcass weight a then multiplied by 100% (Resnawati, 2004).

$$\text{Percentage carcass parts} = \frac{\text{Weight of carcass parts}}{\text{Carcass weight}} \times 100\%$$

Liver, Heart, and Non Carcass. Taking viscera is done by inserting a hand into the abdominal cavity and attractive the entire stomachs contents out (Soeparno, 1994). Percentage is calculated include the liver, heart, abdominal fat and Non Carcass.

$$\text{Percentage Liver} = \frac{\text{Weight liver}}{\text{Slaughter weight}} \text{ X } 100\ \%$$

$$\text{Percentage Heart} = \frac{\text{Weight heart}}{\text{Slaughter weight}} \text{ X } 100\ \%$$

Data analysis

Data were analyzed statistic by ANOVA and when there are significant differences continued test Duncan (Steel and Torrie, 1993). The data were analyzed using statistic application program SPSS 17.

RESULTS AND DISCUSSION

Chicken slaughter weight, Carcass Percentage

In this research the average value of chicken slaughter weight ranging between 351.00- 392,00 grams (Table 2). Results of analysis variance showed significant effect (P<0,05) among the treatment R0,R1 betwin R2 ,R3 slaughter weight of of Kampung chicken slaughter. According Weiss and Hogan (2007) that a 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 average percentage of carcass at this research approximately 56.08 to 58.02%. Working with chickens, Mulyono *et al*. (2009) also found that utilization of waste from the rumen of Bali cows as bio-inoculant and supplement products in the ration of broiler chickens proven to improve the quality and digestibility of the ration based nonconventional waste thus produced higher carcass quality and can reduce non-carcass weight. This finding is also consistent with the finding of Siregar (1982), who found that carcass percentage duct meats is closely related to slaughter weight, carcass weight and non-carcass weight (blood, feathers, internal organs). But in according Mahfuzd (2000) that the broiler chicken carcass percentage is between 62-66%. This difference is due to the age , chicken strains and the type of feed given. The factors that affect the percentage chicken carcass according Brake *et al*. (1993) such as age and body weight. Analysis of variance showed no significant differences (P>0,05) on carcass percentage. This is caused by the final weights were not significantly different as a result of feed consumption and slaughter weight were also not significantly different.

Table 2. Effect of Treatment of Slaughter Weight, percentage Carcass and Carcass Portion, Liver, Heart and Non Carcass.

Variable	Treatment 1)				SEM
	R0	R1	R2	R3	
Slaughter Weight (g)	351.00[b]	359.80[b]	389.60a	392.00a2)	2.256
Carcass Weigh (g)	197.02[b]	200.82[ab]	226.46[a]	221.14[a]	2.125
Carcass Percentage (%)	56.08[a]	56.18[a]	58.02[a]	56.42[a]	0.850
Breast (g)	47.64[b]	49.74[b]	56.92[a]	54.66[a]	0.613
Wing (g)	32.66[a]	30.56[a]	35.22[a]	34.94[a]	1.132
Thigh (g)	63.14[b]	65.78[b]	74.68[a]	74.04[a]	0.875
Backs (g)	53.58[a]	54.74[a]	57.64[a]	57.50[a]	0.807
Liver (%)	0.90[a]	0.89[a]	0.91[a]	0.92[a]	0.256
	0.27[a]	0.28[a]	0.26[a]	0.25[a]	0.125
Heart (%)	43.92[a]	44.19[a]	41.98[a]	43.58[a]	0.420
Non Carcass (%)					

Explanation : 1) R0 = Ration without used dragon fruit skin flour (control)
R1 = Ration with 5% dragon fruit fruit skin flour fermentation
R2 = Rationwith 7% dragon fruit peel fruit skin flour fermentation
R3 = Ration with used 9% dragon fruit fruit skin flour fermentation
2) Values with the same superscript in the same row shows the difference was not significant (P>0,05).
3) SEM : *Standard Error of The Treatment Means*

According Haroen (2003) states that the carcass weight is closely associated with slaughter weight and body weight gain. Abubakar and Natamijaya (1999) adds that the carcass percentage is the ratio between carcass weight with slaughter weight, so its value is directly affected by carcass weight and the slaughter weight. It is also likely caused by the composition of the feed used in this research has a balance of protein and energy are the same. Energy is required for all activities of life and the production of meat, so that the energy shortage can cause stunted growth (Fadilah *et al*., 2007).

Based on the analysis of variance showed that the results were significantly different (P<0,05) on the weight of breast and Thigh it shows that R0, R1 treatments are relatively the low with R2 and R3. This is in accordance with the opinion of Soeparno (1994) that there is a close relationship between carcass weight and carcass parts by slaughter weight, so that if the results the analysis of slaughter weight and carcass obtained results are significant, the results did differ on the part of carcass. It is also suspected chickens consumes the feed with the same nutrients, so it may cause breast percentage was different. Breast value in this study ranged from 47.64 to 56.92g . This value which average difference was likely caused by differences in the strains Kampung chickens used.The use of dragon fruit peel flour was no significant (P>0,05) on the wing and back weight. This is because the weight of wings and back carcass weight showed no significantly different results. As stated Achmanu *et al*. (1997) that will affect the percentage of carcass weight of carcass and its parts. The breast and thighs grow more dominant during growth than on the wings (Abubakar and Nataamijaya, 1999).

Results of analysis variance showed of feeding treatment on the percentage thigh does not significant differences (P>0,05). The results showed that all treatments are relatively the same effect on the percentage thigh. According Widhiarti (1987) that the weight of carcass parts is directly determined by carcass weight.

Percentage of Liver, Heart and Non Carcass

Average of percentage heart on this research within the range 1,60 to 1,78%. This value is within the range of statements Putnam (1991) which states that the percentage of heart

between 1,70 to 2,80% and Suyanto *et al*. (2013) is 1,98 to 2.3%. Similarly, according to research Sinurat et.al. (2002) states the percentage of the liver that is equal to 2,21% with the addition of noni pulp in the diet. Results of the analysis showed no significant differences (P>0,05) on the percentage the liver. This shows that the treatment with the addition of flour diets dragon fruit peel meal without and fermented do not contain toxic substances that can cause the liver becomes excessive. One function of the liver is the detoxification of toxins and in case of abnormalities in the liver indicated by an enlargement or diminution the liver (Ressang, 1998). This is supported by the liver does not have signs of liver toxicity and reddish brown. According McLelland (1990) states that if the liver poisoning occurs then the color will change to yellow the liver.

Results of the analysis showed that the treatment of feeding on the heart , liver, and non carcass percentage occurred not significant differences (P >0.05) among the theatment R0, R1, R2 and R3 (Table 2). The difference that occurs is also suspected because of differences the activity of chicken on each treatment, according to the statement Indarto et.al. (2011) that the size of the heart very affected by the type, age, large and livestock activities states that the heart in broilers known to be very sensitive to toxins and antinutrisi, this concerns the shape of a heart the size of the broiler. Ressang (1998) stated that the enlargement of the heart size is usually caused by the addition of cardiac muscle tissue and the heart wall thickened. According Retnoadiati (2001) the high content of cholesterol in the diet can gave the blood vessels that can lead to the increased size and a weight of the heart muscle due to increased work in the heart. Range of percentage values chicken heart in this study was 0,43 to 0,54%. The value is within the range of statements Putnam (1991) which states the percentage of heart ranged between from 0,42 to 0,70% and Suyanto *et al*. (2013) is 0,46 to 0,50%, and the results of research percentage of heart by giving fish silage-tape cassava was 0,69%.

CONCLUSIONS

These studies conclude dragon fruit peel flour fermented 5% , 7% to 9% in the ration affect the production of carcass and non carcass does not affect the appeal of Kampung chicken in the ration without dragon fruit skin.

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