

## The Effect Of Rice Bran With Tamarind Seed In Feed Impact On Carcass Weight, Carcass Procentage And Internal Organ Weight In Broiler

O. Sjofjan<sup>1 a)</sup>, E.. Widodo, M.H. Natsir. D. N. Adli<sup>1</sup>, and D.C. Sembiring<sup>1</sup>

<sup>1</sup> Animal nutrition and feed. Faculty of Animal Science. Brawijaya University

Corresponding author: O. Sjofjan

### -----ABSTRACT-----

The substitution of rice bran with tamarind seed in broiler feed is expected to have the same effect on carcasses weight, the percentage of carcasses, and internal organ weight in broiler. The method employed in this study is Completely Randomized Design method of 5 treatments : P0 = corn 60% + concentrate 30% + rice bran 10% (control) P1 = corn 60 % + concentrate 30 % + rice bran 7,5 % + tamarind flour 2,5 %, P2 = corn 60 % + concentrate 30 % + rice bran 5 % + tamarind flour 5 %, P3 = corn 60 % + concentrate 30 % + rice bran 2,5 % + tamarind flour 7,2 %, P4 = corn 60 % + concentrate 30 % + tamarind flour 10 %, and 4 treatments with 5 broiler any treatment. The variable observed in this study were weight carcass, weight percentages, and internal organ weight broiler, maintenance begins from 1 day to 35 days with treatment feed on 21 days of maintenance until harvest, on this study the weight of the carcass bring out good result as well as well as on the internal organs a little bigger ( gizzard and heart), but they still have the same effect as gifts. The conclusion of the study is that the removal of bran with tamarind beans had a similar effect on the same bean powder for weight carcass, weight percentages, and internal organ weight broiler although the internal organs are slightly different, its not affecting the result of the calculations . The best treatment in the study is P4 with a use of 10 % tamarind seeds in feed by showing a higher yield than the others.

**KEYWORDS:** Broiler, Tamarind Seed Flour, carcass weight, carcass percentage, and internal organs

Date of Submission: 20-01-2020

Date of Acceptance: 05-02-2020

### I. INTRODUCTION

The increase in population in Indonesia from year to year continues to increase, this will have an impact on increasing consumption of livestock products (meat) which indirectly provides business opportunities in advancing the Indonesian livestock industry including poultry. Poultry provides a major contribution to the fulfillment of nutrition, especially animal protein. Based on data from the Director General of Animal Husbandry and Animal Health (2017), broilers are the largest component in the production of other livestock meat by 67 %. Broilers or broilers are one type of poultry that is easily maintained, grows fast, and has low maintenance costs. The final output of broilers is meat which is a source of protein from animal origin that is consumed by many people, and the price is relatively affordable.

Broiler rearing can be successful, one of which is determined by feed. Feeds spend approximately 60-70% of production costs (Pasarihu, 2007). In developing a broiler business, farmers generally use commercial feed that has been adapted to their nutritional needs. The influence of climate greatly determines the availability of feed for broilers. To overcome this problem, farmers are usually farmers to feed the leftovers from agriculture. Alternative feed derived from agricultural / industrial waste can be considered for use in livestock business. Agricultural waste is available throughout the year and is generally of low quality in terms of protein content and also high fiber content, such as rice bran, tofu pulp and cassava flour (Rakhmani, 2005).

Rice bran is an agricultural waste feed material that is widely used for animal feed, is easily obtained and the price is relatively cheap because rice bran is a by-product of rice milling. Low protein content, high crude fiber and the presence of phytic acid which is able to bind Ca minerals and protein into phytate salt and phytate proteins cause low digestibility in poultry (Sujono, 2001). The nutritional content of bran is protein 13.11-17.19%, fat 2.52 - 5.05%, carbohydrates 67.58 - 72.74%, and crude fiber 37% - 38.3% (Wulandari and Handarsari, 2010). One way to improve digestibility is to use other agricultural waste as a substitute for rice bran. One alternative ingredient is the use of tamarind seeds (*Tamarindus indica*)

Tamarind seeds have enormous potential, because they are native to Indonesia, easily cultivated, and are one of the agricultural wastes that have been widely used by the people of East Nusa Tenggara as one of animal feed ingredients. Productivity of tamarind seeds is higher compared to soybeans, which ranges from 1.5-4 tons in one hectare while for soybeans the average production is only 1.3 tons in one hectare (Suharjanto,

2010). Other acquisitions, tamarind seeds have great potential because it can be harvested more than 5 times at a time with dry seed yields more than 1 ton / ha at one harvest (Subagio, 2006), can grow and produce on less fertile land, the cost of cultivation is cheaper than soybeans, low prices, protein content is quite high 30%, contains lysine and tryptophan which is relatively high, carbohydrate content is 67.23%, crude fat content is 1.9%. Nutritional content of tamarind seeds contains crude protein 13.12%, crude fat 3.98%, crude fiber 3.67%, dry matter 89.14%, calcium 1.2%, phosphorus 0.11%, ash 3.25 %, BETN 75.98%, and metabolic energy 3368 Kcal / kg, but have methionine and cysteine deficiency constraints and contain anti nutrients namely trypsin inhibitors, phytic acid and tannins (Teru, 2003).

After knowing the content of tamarind seeds that have a high protein content of about 30%, then conducted a study of some protein replacement treatment of rice bran with tamarind seeds in broiler fodder whose purpose is to determine its effect on the quality value of broiler production including carcass weight, carcass percentage, and organ weight in broilers.

## II. MATERIALS AND METHODS

The research material used in this study was broilers used in this study were one day broilers (DOC) strain Lohman, the number of chickens used in the study was 200 tails and not sexed (unsexed) with an average body weight of  $40.00 \pm 4.7$  g. At the time of maintenance, the feed used is divided into two stages: the type of feed given. At the age of 1-20 days the feed used is complete feed or feed complete, while at the age of 21-35 days using treatment feed where the bran in the feed is replaced by tamarind seed flour. The feed used is in the form of crumble and is given to broilers ranging from DOC to 35 days old. Feed is given in a tray and given ad libitum. The feed used in this study consisted of yellow corn, concentrated, rice bran and tamarind seed flour which will be mixed based on the percentage of use of feed ingredients. Before mixing the feed ingredients, a proximate test was carried out to determine the metabolic energy content and protein.

**Table 1.** Nutrients content feedstuffs treatments.

Feedstuffs	ME (Kkal/g)	CP (%)	CF (%)	Fat (%)	Ca (%)	P (%)
Corn Meal	3226	9,2	2,74	5,46	0,01	0,26
Concentrate	2700	41	5	5	2,50	1,40
Rice bran	2860	12	12	3	0,04	1,40
Tamarind seed Meal	3368	3,12	3,67	1,9	1,2	0,11

**Table 2.** Composition and treatments feed content in broiler *finisher period*

Feedstuffs	Composition (%)				
	P0	P1	P2	P3	P4
Corn Meal	50	50	50	50	50
Concentrate	40	40	40	40	40
Rice bran	10	7,5	5	2,5	-
Tamarind seed	-	2,5	5	7,5	10
EM (Kkal/kg)	2979	2992,01	3004,71	3017,41	3030,11
CP (%)	22,22	22,22	22,25	22,28	22,31
CF (%)	4,57	4,36	4,15	3,94	3,73
Fat (%)	5,03	5,00	4,97	4,94	4,92
Ca (%)	1,01	1,03	1,06	1,09	1,12
P (%)	0,83	0,79	0,76	0,73	0,70

The research method used was a field experiment with a completely randomized design. The treatment began at the age of 21-35 days using as many as 5 treatments and each was repeated 4 times with the number of chickens per unit of 5 birds and a total of 20 units of the experiment. This research was conducted by giving tamarind seed flour with the following treatment details are:

- P0 = Corn 60% + 30% concentrate + 10% bran (control)
- P1 = Corn 60% + concentrate 30% + bran 7.5% + tamarind seed flour 2.5%
- P2 = Corn 60% + 30% concentrate + rice bran 5% + tamarind seed flour 5%
- P3 = Corn 60% + 30% concentrate + rice bran 2.5% + tamarind seed flour 7.5%
- P4 = Corn 60% + 30% concentrate + 0% bran + tamarind seed flour 100%

### Analytical data

Data were analyzed by analysis of variance from a Complete Randomized Design (CRD) with the Duncan's Multiple Distance Test (DMRT)

### III. RESULTS AND DISCUSSION

**Table 3.** Effect of treatment on carcass weight, carcass percentage, and organ weight in Broilers.

Variable	Treatments are				
	PO	P1	P2	P3	P4
Carcass Weight (g/bird)	1343,25 ± 13,15	1368,75 ± 17,65	1450,25 ± 140,92	1550,75 ± 13,05	1612,75 ± 6,18
Carcass Percentage (%)	69,57 ± 4,56	70,51 ± 0,45	71,30 ± 0,87	72,33 ± 1,79	74,76 ± 0,48
Hart (%)	1,71 ± 0,17	1,94 ± 0,19	2,15 ± 0,14	2,00 ± 0,13	1,81 ± 0,17
Cord (%)	0,43 ± 0,04	0,42 ± 0,02	0,39 ± 0,04	0,36 ± 0,03	0,43 ± 0,11
Gizzard (%)	2,91 ± 0,21	2,95 ± 0,17	2,65 ± 2,4	2,68 ± 0,21	2,93 ± 0,24
Lymph (%)	0,30 ± 0,11	0,15 ± 0,10	0,15 ± 0,04	0,40 ± 0,34	0,18 ± 0,17

#### Effect of Treatment on Weight of Broiler Carcasses

The results of statistical analysis showed that the use of tamarind seed flour as a substitute for rice bran gave no significant effect ( $P > 0.05$ ) on the weight of broiler carcasses. The results of the analysis of variance using the ANOVA test showed that P4 had the highest carcass weight. The carcass weight statistical calculation data can be seen in Table 3. Based on the data obtained in Table 3, the use of tamarind seed flour as a substitute for rice bran can increase the yield of broiler carcasses because acidic flour contains high protein in the amount of 30% and carbohydrate content of 67.23% so that it can be utilized as an ingredient broilers' feed (Venkatachalam, et al., 2002). Tamarind seeds (*Tamarinds indica*) are ground into flour to make it easier for cattle (broilers) to consume and digest feed that has been mixed with tamarind seed flour. The function of carbohydrate itself is as an energy source, carbohydrates are composed derived from the elements H and O which are useful as an energy source in poultry (Aswandi, 2016). In addition, tamarind seed flour also has another very good content to increase the production of broiler carcasses, namely the protein content, as a source of protein containing quite high pigments such as xanthophyll and carotenoids so that it has the potential as a source of poultry feed (Akbarillah et al, 2010). Tamarind seeds (TBAJ) can be used as a substitute for rice bran because of the high carbohydrate and protein content compared to rice bran. High fat content in rice bran causes rice bran easily experience rancidity and low energy content in rice bran that is equal to 2860 Kcal / kg so it is easy to satiate (Dhamayanthi, 2006)

#### Effect of Treatment on Broiler Chicken Carcass Percentage

The results of statistical analysis showed that the use of tamarind seed flour as rice bran substitute had an insignificant effect ( $P > 0.05$ ) on the percentage of carcasses (%) of broilers. Variance analysis results with ANOVA test showed that P4 had the highest percentage of carcass weight. Statistical data on the percentage of carcasses from highest to lowest can be seen in Table 3. The percentage of carcasses is directly proportional to the weight of life; the more increasing the weight of life, the percentage of carcasses obtained is increasing. According to Daud (2016), the percentage of carcasses is closely related to gender, age and weight. Increasing age will also increase. The increase in life weight is followed by a decrease in abdominal fat content so that the production of meat produced will increase. Fat and internal organs are by-products that are not counted in the percentage of carcasses (Risnajani, 2012). Cutting age is very influential on the results of the percentage of carcasses because the longer the cutting age, the greater the percentage of carcasses (Indra, Tanwiriah and Widjastuti, 2015). The increase in the percentage of carcasses indicates that the weight value of the internal organs is low due to good absorption of nutrients from broilers. The percentage of carcasses is related to the live weight of chickens, if the carcass weight produced does not increase but the percentage of carcasses produced increases can be said to have an effect on internal organs (Wijaya, 2010).

#### Effect of Treatment on the Percentage of Organs in Broilers

Organs or innards are organs from poultry that have been separated from the body and before cleaning giblets (liver, bile, heart) and fat deposits in the gizzard. Feed texture, feed fiber content, the amount of feed consumed as well as additional feed in the form of grit can affect the amount of gizzard that the impact on the weight is also increasing). Increased body weight other than carcass, such as percentage of head, legs, blood, fur and internal organs. Feeding with different metabolic energies and proteins provides almost the same effect on the growth of internal organs such as the heart, heart. Spleen and kidneys (Wiranata, et al., 2013). Organs in broilers observed in this study included liver, heart, gizzard and spleen.

#### Effect of Addition of tamarind seed flour on liver percentage Broiler

Based on the results of the analysis of research that has been carried out presented through Table 3, shows that the addition of tamarind seed flour which is used as a substitute for rice bran in broilers has no significant effect ( $P > 0.05$ ) on the percentage of liver weight of broilers. The liver is one of the most vital organs

in the broiler's metabolic system. Liver in broilers is located between the gizzard and bile. The liver has an important role in the production of broilers. In general, the liver functions as glucose and lipid metabolism, helps with digestion, absorption of fat, protein, carbohydrate and iron metabolism, detoxification, formation of red blood, and storage of fat-soluble vitamins, and detoxification of the body against toxic liver substances play a role in bile secretion. The liver will release yellowish fluid and the liquid is stored in a sac called the gallbladder located in the right lobe. Feed that enters the duodenum will stimulate the gallbladder to shrink and the gallbladder will secrete bile sap into the duodenum which can help the absorption of fat by the small intestine. The amount of fluid or bile that will come out depends on several factors, namely the factor of blood flow in, the food consumed, the nutritional content contained in the food consumed, and the circulation of bile. One factor in the production of bile latex in chicken livers depends on the food consumed that is why the food consumed by broilers must contain adequate nutrition and anti-bacteria.

#### **The Effect of Use of Tamarind Seed Flour on the Percentage of Broiler Heart**

The heart is a very important organ for every living thing, especially for broilers. The heart has a very critical role. The role of the heart in the broiler's circulatory system is as a pumping blood through blood vessels throughout the body. Based on the results of the statistical analysis in Table 3 which is also shown in Appendix 10, it can be seen that the administration of tamarind seed flour as a substitute for rice bran in feed has no significant effect ( $P > 0.05$ ) on the percentage of heart. During 35 days of maintenance of broilers, the growth of body weight of chickens grew normally even exceeding the standard body weight of broilers, which is more than 1.6 kg / head. In candis acid seeds contained secondary metabolite compounds (phytochemicals) will be safe and effective against certain bacteria so it is good for growth and protective for animal health. Although in the candis Acid seed there are antioxidants and antibacteri that have been stated by Nurma, et al (2014), in fact the candis acid seed flour does not have any effect or influence on the growth and increase in the percentage of heart weight in broilers. This is because the nutrient content in tamarind flour is still in accordance with the needs of broilers.

#### **The Effect of Use of Tamarind Seed Flour on the Percentage of Broiler Chicken Gizzard**

Based on the results of the analysis presented in Table 3. showed that the replacement of bran with tamarind seed flour in broiler feed had an insignificant effect ( $P > 0.05$ ) on the percentage of broiler gizzard. Gizzard is one of the special organs in digestion, gizzard is owned by several animals such as poultry, reptiles, and several types of fish. Gizzard or gizzard is included in the largest digestive organ in poultry. Gizzard or gizzard in poultry has the same function as teeth in mammals, which is to reduce the given feed particles into smaller sizes. The feed that is served for broilers is in the form of complete crumble feed which is then mixed with candis acid seed flour in accordance with the respective treatment dose. The feed is then digested mechanically in the gizzard or gizzard, and then processed into the intestinal digestive organs. The factor that influences the size of the gizzard is the performance of the gizzard itself. The higher the gizzard performance of broilers, the more the size and weight of broilers will also increase. This is also comparable to the statement made by Suryanah (2016) that the size of the gizzard changes based on the size of the food eaten, the larger the size of the food eaten causes a large contraction in the gizzard, resulting in a large size gizzard.

#### **Effect of the Use of Java Tamarind Seed Flour on the Percentage of Broiler Spleens**

Based on the results of the research analysis presented in Table 3, it can be seen that the replacement of tamarind seed flour has no significant effect ( $P > 0.05$ ) on the percentage of spleen weight. This is because in Javanese tamarind seed flour has an anti-nutrient that does not have a major effect on the spleen of broilers. The spleen is one of the lymphoid organs that has a function as a place for the maturation and formation of antibody cells which then antibody cells can protect and fight foreign antigen cells or poisons that come attacking the body through edible food. In broilers, the spleen is slightly dark red, which is located near the gizzard which has the role of storing red blood cells. Broiler spleens are very unique because fibromuscularity in poultry histologically appears thin. Based on the statement of Aughey and Frye (2001) in Susanti (2013) that trabeculae in some birds cannot be found, so the spleen in broilers is located next to the gizzard.

### **IV. CONCLUSION**

Provision of tamarind seed flour as a substitute for rice bran in feed gives no significant effect on carcass weight, percentage of carcass and weight of organs in broilers

### **AKNOWLEDGEMENT**

Thank you to the Directorate of research and community service, the Ministry of Higher Education who have funded this research

#### REFERENCES

- [1]. Akbarillah T, Kususiayah, Hidayat. 2010. Effect of Use of Fresh Indigofera Leaves as Feed Supplements on Yolk Production and Color of Duck. JSPI. 5 (1): 27-33.
- [2]. Aughey E, Frye FL. 2001. Comparative Veterinary Histology with Clinical Correlates. London (EN): Manson Publishing. P: 252-270.
- [3]. Damayanthi, E. And D.I. Listyorini. 2006. Utilization of Low-Fat Rice bran in Manufacturing Simulation Chips. Journal of Animal Sciences, 13 (5): 260-268.
- [4]. Daud M., Mulyadi, and F. Zahrul. 2016. Percentage of Peking Duck Carcasses Fedded in the form of Complete Ration Wafers Containing Coffee Waste. Faculty of Agriculture, Syiah Kuala University, Aceh and Faculty of Agriculture, Abulyatama University, Aceh. Agripet Vol 16, No. 1
- [5]. Directorate General of Animal Husbandry and Health. 2018. 2017 Performance Report. Directorate General of Animal Husbandry and Health. Jakarta.
- [6]. Nurma, M. 2014. Procedures for the Maintenance of Broiler Chicken Broiler Periods at PT. Januputra Farm Yogyakarta, Faculty of Animal Science, Gadjah Mada University. Yogyakarta.
- [7]. Pasaribu, T.2007. Agricultural waste fermentation products as poultry feed ingredients in Indonesia. Wartazoa. 17 (3): 109-116.
- [8]. Rakhmani, S. I. 2005. Improvement of Nutrition Value of Feed Material from Fermented Agricultural Waste. <http://peterna.litbang.deptan.go.id?q=node/778>. [January 8, 2019].
- [9]. Risnajat, D. 2012. Comparison of Final Weight, Carcass Weight and Percentage of Carcass Various Broiler Strains. Animal Science. 10 (1): 11-14.
- [10]. Sujono 2001. Display of Egg Production, Carcass Production and Cement Quality of Arabian Chickens which are Fedded Containing Various Fermented Rice bran Levels with Rhizopus oligosporus. Dissertation. Postgraduate Program. Airlangga University: Surabaya.
- [11]. Suryanah, H Nur and Anggraeni. 2016. Effects of Rations With Defferent Cation-Anion Balances on Carcass and Gibler Weight Broiler Chickens. Journal of Animal Husbandry. Vol. 2 (1): 1-8. ISSN 2442-2541
- [12]. Teru, V. Y., 2003. The Effect of Corn Substitution with Corn Skin Seed Flour without Skin on Life Weight, Carcass Weight and Percentage of Broiler Carrier Phase Finisher. Essay. Undana Animal Husbandry Faculty. Kupang.
- [13]. Wijaya, G. H. 2010. Percentage of Carcass, Abdominal Fat and Ogan in Broiler Chickens which were given rations with the addition of Cassabio. Essay. Department of Animal Husbandry Production and Technology, Faculty of Animal Husbandry, Bogor Agricultural University.
- [14]. Wulandari, M., and E. Handarsari. 2010. Effect of rice bran addition on protein levels and organoleptic properties of biscuits. Journal of Food and Nutrition. 01 (02): 55-62.
- [15]. Wiranata, G. A., I. G. A. M. K. Dewi and R. R. Indrawati. 2013. Effect of metabolic energy and protein feed on the percentage of carcasses and organs in native chickens (Gallus domesticus) females aged 30 weeks. Journal of Tropical Animal Science. 1 (2): 87-100

O. Sjojfan "The Effect Of Rice Bran With Tamarind Seed In Feed Impact On Carcass Weight, Carcass Procentage And Internal Organ Weight In Broiler " *The International Journal of Engineering and Science (IJES)*, 9(01) (2020): 79-83.