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as a **Presenter** of a paper entitled:

Utilization of fermented cassava skin ration on carcass weight and percentage of broiler carcass

in the 5th Annual Applied Science and Engineering Conference (AASEC) 2020 Universitas Pendidikan Indonesia "Green Technologies for Environmental Sustainability", 20-21 April 2020.

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Preface

Preface

This present volume contains the proceeding of the 2nd Annual Conference of Science & Technology (Ancoset) 2020. In this year, the 2nd Ancoset was virtually delivered through online platform due to Covid-19 Pandemic on November 28, 2020. This conference was organized by Universitas PGRI Kanjuruhan Malang and co-organized by Rumah Publikasi Indonesia.

Taking the theme of *The Role of Science and Technology Application on Building Community Resilience during New Normal*, we provided intellectual forum for students, researchers, lecturers, and practitioners. There are 221 papers collected which propose an insightful thought on the frontier knowledge about science and technology and its application. This conference opens an opportunity for scientific cooperation as well as international collaboration as it attended by almost two hundreds participants both across Indonesia and Asia.

We really appreciate all support given for the success of the 2nd Ancoset 2020 and thus would like to express our gratitude to everyone who has taken part in this event:

- The scientific reviewers for helping authors come up with a good quality paper,
- The distinguished keynote speakers: **Assoc. Prof. Sudi Dul Aji, M.Pd** (Universitas PGRI Kanjuruhan Malang), **Assoc. Prof. Dr. Massudi Mahmuddin** (Universiti Utara Malaysia), **Prof. Ida Hamidah, M.Si** (Universitas Pendidikan Indonesia), **Prof. Dr. Ade Gafar Abdullah, M.Si** (Universitas Pendidikan Indonesia),
- Co-Host universities: Universitas Al-Ghifari, Universitas Hamzanwadi, Universitas PGRI Semarang, Institut Teknologi Nasional Malang, Universitas Ma Chung, Universitas Bhinneka PGRI, Universitas PGRI Adi Buana Surabaya, IKIP PGRI Jember,
- All presenters and participants, and
- The committee members for the commitment, effort, and hard work in accomplishing the conference and proceeding.

We wish you all a fruitful gathering and see you on the next conference.

The Editors,

Prof. Dr. Ade Gafar Abdullah, M.Si.
Asst. Prof. Ayu Liskinasih, M.Pd.
Asst. Prof. Muhammad Nur Hudha, M.Pd.

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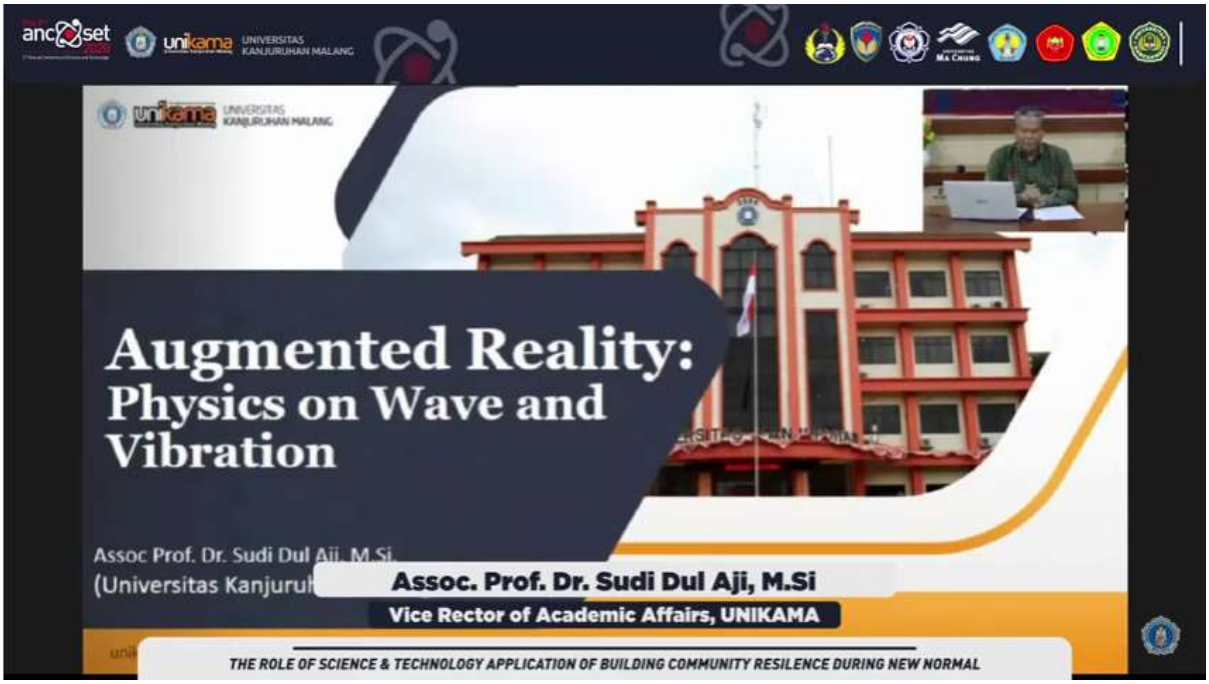
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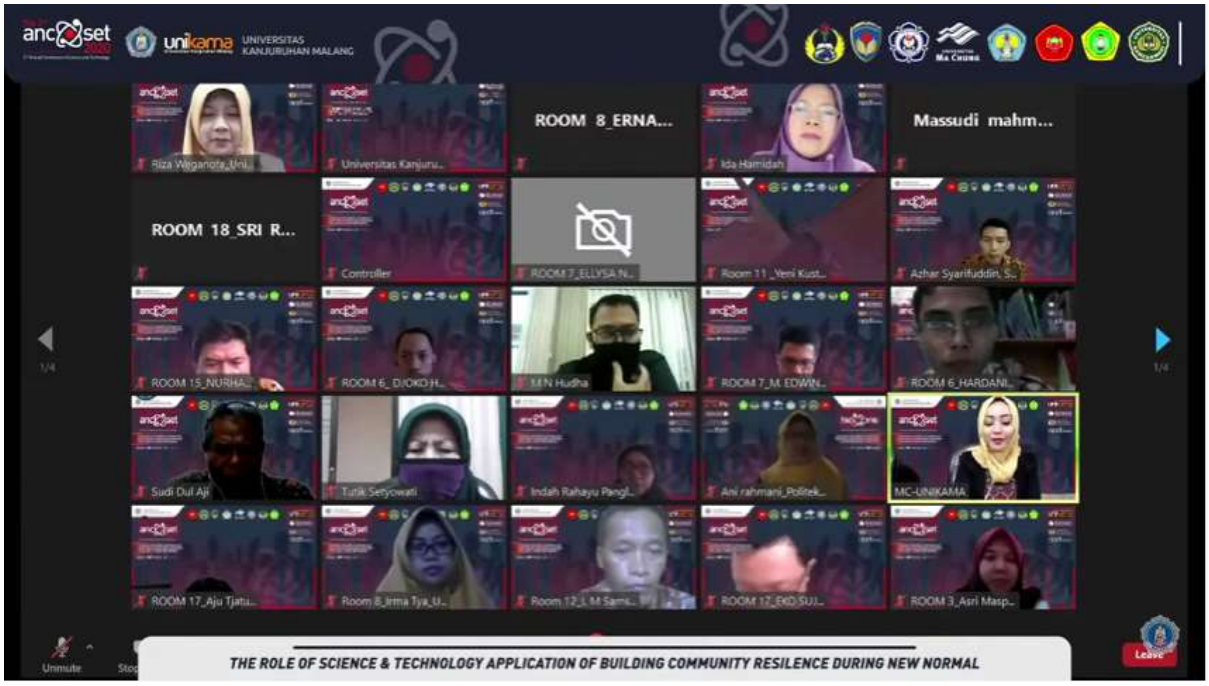
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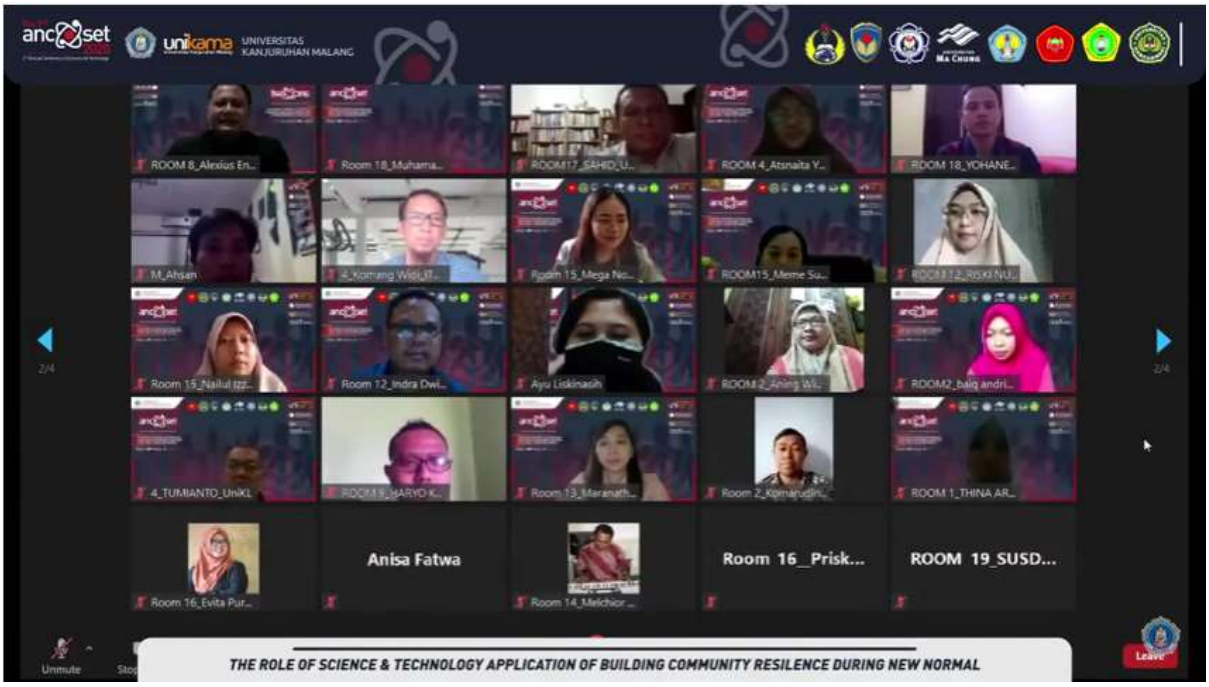
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Utilization of fermented cassava skin ration on carcass weight and percentage of broiler carcass

Utilization of fermented cassava skin ration on carcass weight and percentage of broiler carcass

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Abstract. The purpose of this study was to determine the effect of fermented cassava peel flour on carcass weights and parts of broiler carcasses. This study used 45 CP-707 broiler strains. The design used was a randomized design complete with 3 replications. This study uses fermented cassava peels mixed in ration with 5 level administration, namely: without fermented cassava skin flour (P0), fermented cassava skin flour 3% (P1), fermented cassava skin flour 6% (P2), fermented cassava skin flour 9 % (P3), and 12% fermented cassava peel flour (P4). The application of fermented cassava peel at 9% level in the 6-week broiler ration did not significantly affect all observed variables, but application at 6% level tended to increase carcass weight, breast weight, thigh weight, and wing weight. The fermentation of cassava peel flour at 12% in the ration had a significant effect in reducing carcass weights and weight of broilers at 6 weeks. The results showed that fermentation of cassava peel flour in rations up to 6% tended to increase carcass weight, chest weight, thigh weight, and swing weight, whereas at 12% had a significant effect in reducing carcass weight and weight of broilers at 6 weeks.

1. Introduction

Broilers are the largest provider of animal protein from livestock because of its rapid growth with a short life cycle compared to other livestock meat. The price is quite affordable, meets the tastes of the community and is easily available [1]. Broiler chickens are male or female chickens that have growth properties and weight gain that is fast and efficient in using rations [2]. Nowadays many food additives are a combination of prebiotics and probiotics as substitutes for growth promoter antibiotics. There are a number of agro-industrial wastes that can be used as alternatives to overcome high feed costs, one of which is cassava peel waste. Cassava skin waste is an agro-industrial waste from agricultural products that has a high enough potential in Indonesia, amounting to 3,327,188.6 tons/year [3] and containing 21.20% crude fiber, crude protein 4.80%, crude fat 1.22%, dry matter 32.61 %, calcium 0.36%, phosphorus 0.11%, and energy metabolism (EM) of 2960 kcal/kg [4]. Cassava peel has weaknesses which are high levels of crude fiber and HCN, so before it is used as feed material it needs to be processed first. Cassava skin with high crude fiber has a high oligosaccharide content [5], can be used as feed for Lactic Acid Bacteria (BAL), in the digestive tract, because BAL can digest high crude fiber content.

An important factor that must be maintained is the nutritional content of the ration. Costs in livestock up to 70% of all production costs [6]. The high price of raw material for the rations, some of which are still imported, needs to find alternatives or substitutes. The utilization of food crop waste and the food industry began to be seen as one solution to overcome the problem of providing food [7]. One of the

food and industrial wastes that can be utilized is cassava peel. The carbohydrate content of cassava peels is relatively high and can be used as an energy source for livestock. Cassava peel easily separated from the tubers with a thickness of 2-3 mm. The percentage of cassava peel produced ranged from 8-25% by weight of peeled tubers and contained nutritional content such as crude protein 28%, Ca 1.69%, metabolic energy 2700 Kcal/kg, and crude fiber 14.96% [8]. Cassava peel contains anti-nutrition in the form of cyanide acid (HCN) is very high. Therefore, it is necessary processing to reduce the anti-nutrients that exist in the cassava skin, one way of processing cassava skin is by fermentation [9]. Fermentation causes better nutritional value than its original ingredients, where microorganisms that are catabolic will break down complex components into simple ones so that they are easily digested. During this time the fermentation process has been widely used as an effort to increase the nutritional content of a feed ingredient, especially the protein content [10].

Fermentation is the process of breeding selected microorganisms on cassava skin media with certain conditions so that microorganisms can develop and change the chemical composition of the media into better nutritional value. Fermentation can reduce and eliminate HCN contained in feed ingredients [8]. The use of cassava skin fermentation products up to 10% does not result in a decrease in body weight gain of broiler chickens but at levels of use above 10% cause a decrease in body weight gain [11]. Application of fermented cassava skin to broilers can improve the carcasses of broiler chickens and does not affect feed quality [12]. The percentage of broiler carcasses ranges from 65-75% of the live weight at the time of slaughtering [13]. Based on the description above, it is necessary to conduct research into the provision of several levels of fermented cassava peel flour in broiler chickens so that it can provide a good influence on the carcass weight and parts of broiler chicken carcasses.

2. Materials and methods

This study used a completely randomized design with 5 treatments and 3 replications. The five treatments are Chicken without the provision of fermented cassava skin flour (P0), chicken has given fermented cassava skin flour as much as 3% (P1), 6% (P2), 9% (P3) and 12% (P4). Each test uses 3 broilers. The chicken used in this study was a CP-707 strain broiler chicken with an average body weight of 513 ± 5 g, obtained from PT Tohpati Poultry Shop located on Jl. WR. Supratman 281, Denpasar.

The study was conducted in Banjar Kebon Kori Klod, Kesiman Village, East Denpasar District, Denpasar City Regency. The research was conducted for 6 weeks, from February 2 to March 14, 2018. Cages with a multi-level battery system were 3 plots and divided into 15 plots. Each enclosure is 60 cm long, 50 cm wide and 40 cm high, 30 cm high from the ground, each plot contains 3 chickens. Cages made of bamboo slats each cage is equipped with a place to eat made from 30 cm long pipe Farallon and as lighting at night used 15-watt incandescent bulbs. Under the cage, plywood is used to collect fallen chicken manure, cleaned every two days so that the chicken's health is maintained from the smell of ammonia produced from chicken manure.

Ration nutrition according to the standard of Scott et al., The ingredients of rations in the form of yellow corn, rice bran, fish meal, soybean meal, fermented cassava skin flour, coconut oil, and minerals are presented in Table 1 [14].

Table 1. The composition of the ingredients of the research ration.

Material Name	Treatment				
	P0 (0%)	**P1 (3%)**	**P2 (6%)**	**P3 (9%)**	**P4 (12%)**
Yellow Corn (%)	55	54	55	54	54
Cassava Skin (%)	15	14.5	12	11.5	9.5
Rice bran (%)	13	12	10	10	11
Fish flour (%)	15.5	15	15.5	14	12
Soybean Meal (%)	0.5	0.5	0.5	0.5	0.5
Coconut oil	1	1	1	1	1
Total (%)	100	100	100	100	100

Cassava skin fermentation process. Cassava skin is washed with clean water to remove dirt. After being drained clean, then sliced into small pieces, then dried in the sun to dry. Cassava peel that has been dried is ground to get cassava skin flour. Cassava skin flour steamed for 30 minutes counted when the water vapor starts to come out of the steaming surface after it is removed then cooled. After being cold the cassava skin flour weighed 3 kg is put into the bucket with 4 ml probiotics added. Stirring until evenly distributed. After evenly stored in a closed container for 14 days. After that, the fermented cassava skin is opened and aerated. The fermentation process will not only reduce or eliminate cyanide acid levels but also increase the nutritional value contained in cassava skin. The composition of feed substances in the ration is presented in Table 2.

Table 2. Composition of feed substances in the study ration.

Nutrition	Treatment					Standard [1)]
	P0	P1	P2	P3	P4	
Crude Protein (%) [2)]	20.31	20.30	20.22	20.18	20.24	19.0 – 21
Crude Fiber (%)	4.25	4.57	4.77	5.04	5.14	5.0 –8[2)]
EM (Kcal/Kg)	3005.65	3001.9	3011.65	3011.95	3023.35	2800-3000
Fat (%)	5.82	5.51	5.43	5.35	5.27	2.0 – 7.0
Calcium (%)	0.9	0.96	1.02	1.07	1.13	0.9-1.1
Phosphor (%)	0.81	0.80	0.82	0.84	0.86	0.8-1.0

Information: 1) Based on Recommendations [14], 2) Based on Recommendations [15].

Of the 100 chickens prepared, it was first weighed to look for an average body weight of 513 ± 5 gr%, then look for 45 chickens that were close to average body weight. After that 45 selected chickens were randomly placed in the experimental unit. Each experimental unit was filled with 3 chickens. A week before the chicken is put into the cage is cleaned and disinfected using Destan brand disinfectant to eradicate bacteria, viruses, pests, and fungi. When Day Old Chick (Doc) arrives given sugar water through drinking water to avoid stress, then given vita chick at a dose of 5 g, vita chick mixed with 7 liters of drinking water, the first vaccination is carried out on day 4 with the Newcastle Disease (ND) vaccine through eye drops with the aim of preventing New Castle Disease, the second and third vaccinations are carried out at 13 and 21 days with the Gumboro vaccine.

The mixing of the ration is done once a week, the material to be used is weighed according to needs. After mixing is done, the ration is put into a plastic bag that has been filled with the code according to the treatment. Feed and drinking water are given on an ad-libitum basis. Feeding is done 3 times a day, morning, afternoon and evening. The water provided comes from the local PDAM. Each ration is given half of the capacity of the feed container with the aim to avoid the rationing of the ration when the chicken is eating. The feed and drink containers are cleaned every day.

3. Results and discussion

To study the effect of electron velocity and magnitude of the magnetic field on the electron trajectory, the application of fermented cassava peel flour in the ratio up to level 9% shows that the results of different carcass weight were not significant, but at the level of 12%, fermented cassava peel flour produced the lowest carcass weight compared to other treatments. The application of fermented cassava peel to 12% level in the ratio showed no significant effect on the variables of breast weight, thigh weight, and back weight. But it has a significant effect in reducing carcass weight and wing weight. However, by giving 6% fermented cassava peel flour, the weight of the portion of the carcass produced in P2 is tended to be higher than other treatments. This shows that the limit of fermented cassava skin flour in broiler chicken ration is 9%. At 9% the chicken body is able to digest and decompose the ratio that is consumed properly, this is in accordance with research conducted by Supriyati and Kompiang [16]. The chest and thighs develop more dominant during growth when compared to the wings and back [17], this is because the wings and back are dominated by bone components and have less potential to produce meat. The difference in growth velocity will affect the weight distribution of body parts or carcass

components [18]. The growth of carcass components begins with bone growth, then muscle growth will decrease after reaching puberty, followed by increased fat growth [19].

Table 3. The average weight of carcass and carcass part of broiler fed with fermented cassava peel flour.

Variable	Treatment					SEM
	P0 (0%)	P1 (3%)	P2 (6%)	P3 (9%)	P4 (12%)	
Carcass Weight (g)	872.19 [a]	870.62 [a]	898.90 [a]	856.68 [a]	749.92 [b]	17.84
Chest Weight (g)	256.50 [a]	246.23 [a]	260.34 [a]	255.90 [a]	221.38 [a]	11.87
Thigh Weight (g)	286.37 [a]	283.93 [a]	297.87 [a]	294.83 [a]	267.30 [a]	7.51
Back Weight (g)	211.13 [a]	212.96 [a]	196.09 [a]	190.31 [a]	183.65 [a]	4.49
Wing Weight (g)	118.20 [a]	127.50 [a]	144.61 [a]	115.64 [ab]	77.59 [b]	6.66

Information:
Values with the same letter in the same line indicate no significant difference
SEM = Standard Error the Treatment Meant

Application of fermented cassava peel flour at a rate of 12% in broiler chicken ration showed a significantly lower effect on carcass weight. P4 treatment (12%) has the lowest carcass weight and is significantly lower than other treatments [20] which states that carcass weight is closely related to cutting weight, the high cutting weight will be followed by high carcass weight and vice versa if the weight of the slice is low then weight carcass and carcass fracture will decrease. The carcass weight produced is influenced by several factors, namely age, sex, cutting weight, body size and conformation, fat, quality and amount of ration and strain maintained [21].

The provision of fermented cassava peel flour up to 12%, can reduce the carcass weight, this is because the fermented cassava peels up to level 12% of the fiber content is too high for broilers and still has HCN content. The content of HCN has harmful antifungal agents in cattle so that it can reduce the cutting weight followed by carcass weight [5]. HCN levels that can be tolerated are no more than 50 ppm and effective processing techniques are needed, namely fermentation which can increase protein levels, digestibility and reduce HCN levels in cassava skin [22]. This is also supported by Hanifah et al., which states that HCN can suppress nitrogen retention and cause decreased digestion of amino acids which must be digested by villous intestinal villi and used for tissue growth and development [23]. Provision of 6% fermented cassava peel in the ration obtained carcass weights tended to be highest. This is caused by the fermentation process which can increase the protein content of the material and reduce the levels of crude fiber from the material that can be used by broilers to produce good carcass weights. The fermentation process can improve the digestibility of organic cassava peels as feed ingredients, fermentation techniques can eliminate HCN from feed ingredients [16].

The application of fermented cassava peel at 9% and 12% levels on the wing weight variable showed a significantly decreased effect compared to the treatments P0, P1, and P2 (Table 3). Wing weight at P4: 77.59 g/head decreased significantly compared to P0, P1, and P3. This is due to the lowest carcass weight in the P4 treatment resulting in a low wing weight. The highest wing weight was obtained at level 6% with a weight of 144.61 g/head. There is a close relationship between carcass weight and carcass parts [24], it is reinforced by Miles et al., that carcass parts are directly determined by carcass weight [25]. The decrease in carcass weight gain is also due to the higher levels of tannin and HCN in the feed because it can suppress nitrogen retention and can cause a decrease in the digestibility of amino acids [26].

4. Conclusion

The provision of fermented cassava peel flour in broiler chicken ration had a significant effect on carcass weight and wing weight variables, while other variables such as breast weight and thigh weight were non-significant. The provision of fermented cassava peel flour at the 6% level tends to increase the

carcass weight and commercial portion. It is recommended that fermented cassava skin flour be at the level of 6% because it tends to increase carcass weight and commercial portion in 6 week broiler chickens.

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