The Effect of The Use of Taro Leaf Flour on The Digestiveness of Native Chicken Rate

Ni Ketut Etty Suwitari[1], Luh Suariani[2], Ni Made Yudiastari[3]
{suwitary62@yahoo.co.id}

Universitas Warmadewa, Denpasar-Bali, Indonesia[123]

Abstract. The alternative ingredient that can be used to feed native chickens and the ration and provide a good opportunity is taro leaf flour. Taro leaves have good nutrition, such as protein, carbohydrates, fat, calcium, phosphorus, iron, and vitamins A, B, and C. The nutritional content of taro leaves is 86.94% water content, 16.48% crude protein, and crude fiber. 17.24%, Potassium 1.45%, Phosphorus 0.4%, Fat 4.3%, BETN 30.46% and gross energy 3966 kcal/kg. The design has 5 (five) treatments and used a completely randomized design (CRD). Chickens were given treatment starting at three weeks of age, and at ten weeks of age, feces were collected. Variables observed were crude protein digestibility, N retention, dry matter digestibility, and feed organic matter digestibility. Native chicken rations added with 9% taro leaf flour resulted in crude protein digestibility, dry matter digestibility, organic matter digestibility, and optimal N retention with values of 74.15% and 92.52%, 62.00%, and 63.05%, respectively.

Keywords: digestibility; kampung chicken; taro leaf flour

1 Introduction

Native chicken is a type of poultry that has spread throughout the archipelago. For the people of Indonesia, raising native chickens is not a foreign thing, with easy maintenance and resistance to disease [1]. Native chicken is local poultry kept by farmers in rural areas as a producer of hatching eggs, consumption eggs, and meat producers. This poultry has promising prospects economically and socially because it is a highly nutritious food ingredient [2]. The demand is relatively high [3], so it needs to be developed to improve community nutrition and increase family income. The demand for native chicken is rising every year, it can be seen from 2001 - 2005 there was a demand of 4.5%, and in 2005 - 2009 the consumption of native chicken from 1, 49 million tons increased to 1.52 million tons [4]. The contribution of native chicken to meat production is 322.8 tons or 16% of national meat production, while the contribution of native chickens to poultry meat is 31% and 1996 tons of eggs [5].

Considering the existing potential, efforts need to be made to increase the population and efficient production to maintain native chickens. It is necessary to upgrade from the traditional rearing system towards agribusiness. The increase in the production of native chickens is influenced, among other things, by the feed given, especially the provision of feed that has not

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taken into account the need for nutrients for various levels of production [6]. The need for nutrients needed by livestock is an absolute requirement that must be met for survival, production and is an important factor for determining the success of a chicken farming business. Feed is the highest cost component in the livestock business, especially chicken farming, which is managed intensively. The cost of feed is getting more significant due to the price of conventional feed ingredients, which tends to increase. Efforts to reduce feed costs by looking for alternative feed ingredients that are readily available do not compete with human needs and negatively affect livestock [7].

One alternative feed that can use for animal feed is taro leaves. Taro is a tropical plant that can be used as animal feed, tubers, stems, and leaves. Taro leaves contain quite good nutrition, such as protein, carbohydrates, fat, calcium, phosphorus, and iron. Besides that, they have several vitamins such as vitamins A, B, C and contain polyphenol substances that function as accessible antidotes that can damage cells. Cells in the body. [8] said taro contains calcium, Vitamin A, and Vitamin C, which is much better than rice and wheat. Taro leaves also contain anti-nutrient cyanogenic glucosides.

The tubers contain trypsin inhibitors and compounds that cause a biting taste, but these compounds can be inactivated by heating. [9] stated that the nutritional content of taro leaves is 86.94% water content, 16.48% crude protein, 17.24% crude fiber, 1.45% potassium, 0.4% phosphorus, 4.3 fat. %, BETN 30.46%, and gross energy 3966 Kcal/kg. In addition, taro leaves also contain oxalate compounds, tannins that cause the protein to be indigestible. To reduce it, it can be done by withering, drying, or in the form of flour before being given to livestock.

The main factor in the preparation of the ration is the content of crude protein and energy. Energy makes animals able to do a job and production process [10]. Digestibility of a feed ingredient reflects the high and low value of the benefits of the feed ingredient. Digestibility measurement attempts to determine the number of substances that the digestive tract can absorb by measuring the amount of food consumed and the amount of food excreted through the feces. Based on the description above, a study was conducted on measuring the digestibility value of rations containing taro leaves in native chickens.

2 Research Methods

Location and Length of Research

The research locationi is in Sedap Malam street and Laboratory of Basic Sciences, Faculty of Agriculture, Warmadewa University. The research was conducted from April 2021 to July **2021.**

Experimental design

The study used a completely randomized design (CRD). The treatments were as follows: R0 = Native chickens were not given additional taro leaf flour (control), R1 = Native chickens were given an extra 3% taro leaf meal ration, R2 = Native chickens were given an additional 6% taro leaf meal ration, R3 = Native chickens given an extra 9% taro leaf meal ration, and R4 = Native chickens were given an extra 12% taro leaf meal ration.

Materials and tools used

Native chicken

Native chickens used were 75 chickens obtained from PT. Maket Gusti is located in Maket Gusti Village, Susut District, Bangli. Three-week-old native chicken with homogeneous body weight

Cages and Equipment

This study used a battery cage with 15 plots of cages, with cages made of bamboo slats. These cages are located in one cage building. For the size of the cage for each plot, namely, 50 x 50 x 47 cm, it is equipped with a place to feed and drink. The feed holder is made of paralon pipe, split in half, and given a bulkhead in each cage so that the feed ingredients do not mix with one treatment with other treatments. In comparison, the drinking water uses a small bucket and is channeled utilizing a hose and nipple. In addition to these tools, this study uses different means such as scales, thermometers, lamps, cleaning equipment, brooms, and hoses.

Taro leaves

Taro leaves in the Kintamani area, Bangli Regency, as much as 400 kg and dried in the sun for one week using a zinc mat to accelerate water evaporation in the taro leaves. After the water content decreased and dried, the taro leaves were crushed by pounding, then sieved to get fine taro leaf flour and put in a plastic bag.

Tool

The equipment used in this study consisted of: Trays; Pounding; Flour Sieve; Plastic Bag; Balance; electronic kitchen scale SF-400 capacity 10 kg with a sensitivity of 1 g, plastic; bucket; Color Yarn

Ration and Drinking Water

The ingredients for the ration consisted of corn, rice bran, soybean meal, fish meal, taro leaf meal, coconut oil, and minerals. Drinking water is provided ad-libitum. Water comes from drilled wells near the cage.

Table 1. Composition of Ration Ingredients

	Treatment				
material	R0	R1	R2	R3	R4
Corn	57	55	52	46.4	44.5
Taro leaf flour	0	3	6	9	12
Rice bran	16	14	14	15.5	15
But Fish	13	12.5	13	13	13.5
Bkl Soybean	12	13	13	13.5	13
Coconut oil	1	1.5	1.4	2	1
Mineral	1	1	0.6	0.8	1
amount	100	100	100	100	100

Statistical Analysis

Data analysis using ANOVA. If the results have a significant effect ($P < 0.05$), then Duncan's multiple distance test is then carried out [11].

3 Results and Discussion

The use of taro flour in native chicken rations on digestibility and N retention can be seen in caterpillars in Table 2.

Table 2. Digestibility and Potential of N rations containing taro leaf flour in native chicken Ration.

Variable	Treatment				
	R0	R1	R2	R3	R4
Crude Protein Digestibility (%)	59,46a	65.76c	73,96b	74,15b	72,22b
Dry Matter Digestibility (%)	89,08c	90,15b	91,86a	92,52a	92,39a
Digestibility of Organic	57,82a	59,53a	59,38a	62,00a	57,60a
Ingredients					
Retention N (%)	49,08c	51,09b	62,80a	63,05a	60,31a

Information:
Values with different letters on the same line but the amount of difference is very significant (P(0.01) Treatments were R0 (without taro leaf flour), R1 (containing 3% taro leaf flour), R2 (including 6% taro leaf flour), R3 (including 9% taro leaf flour), and R4 (containing 12% taro leaf flour).

Protein Digestibility

From the statistical analysis results, it was found that the provision of taro leaf flour in the Super kampung chicken ration showed a very significant effect ($P < 0.01$) on the digestibility of crude protein. The highest protein digestibility of the diet was obtained in the treatment of R3 (9% addition of taro leaf flour), R4 (12 taro leaf flour), R1 (3% taro leaf flour), and R0 (0% taro leaf flour). The highest digestibility value, 74, 146%, was obtained in the R3 treatment. After a laboratory analysis was carried out on the ratio, it turned out that the R3 treatment had the highest protein content.

However, before being given to livestock, the ratio had been compiled based on calculations and made based on iso-calorie and iso-protein. The percentage of feed protein influences the digestibility of protein. The composition of the feed and the physical form of the feed. In addition, taro leaves contain amino acids, including tryptophan, threonine, isoleucine, lysine, methionine, phenylalanine, valine, histidine, and vitamins C, B12, A, E, and minerals [12]. Furthermore, [14] stated that taro leaves contain the nutrients needed by chickens, namely protein 21.67%, fat 10.45% and crude fiber 17.91%, and ash 13.19%.

According to [10], the quality of protein is determined by the essential amino acids and their ability to support the growth of chickens. The protein consumed depends on the protein in the ratio. Protein digestibility in this study ranged from 59.46 - 74.15%. This digestibility rate is still in the range of protein digestibility of broiler chickens, which is 60 - 65%. The high and low levels of protein availability can be seen from the digestibility value. The digestibility of a feed ingredient reflects the high and low weight of the benefits of the feed ingredient. A low digestibility value indicates everyday use.

Otherwise, if the digestibility is high, then the benefit value is also high. Proteins are composed of amino acid units, both essential and non-essential. The function of protein in feed is a source of amino acids needed to synthesize and replace chicken body tissue, production, and reproduction. Protein balance includes protein consumption, protein lost in teases, digested protein, and protein retained in the body. The increase in the protein content of the ration causes an increase in the amount of protein consumed by chickens. The protein in food is very important to support the growth and repair of damaged tissues in livestock that consume it. The protein consumed depends on the protein content in the ratio. Therefore, the higher the protein level in the ration, the higher the protein consumption, which will affect the ration protein's digestibility [14].

Dry Matter Digestibility

Dry matter digestibility in this study ranged from 89.08 to 92.52%. The highest dry matter digestibility was obtained in treatment R3 (9% taro leaf flour), which was 92.52%, higher dry matter and protein digestibility in treatment R3 than other treatments, presumably caused by higher feed consumption that treatment. in Bandung another treatment. The provision of taro leaf flour in chicken rations was super real ($P < 0.01$) increased digestibility up to 9% (R3). In contrast, the lowest dry matter digestibility was obtained in the R0 treatment (without the addition of taro leaf flour).

According to [15] the digestibility of a material is the part that is absorbed in the digestive tract and is not excreted in the feces. The purpose of determining digestibility is to obtain a crude value of absorbable feed ingredients. [15] stated that a low feed ingredient results in a large amount of energy being lost in the form of excreta.

Digestibility of Organic Ingredients

The digestibility of organic matter Taro leaf flour in this study ranged from 57.60 to 62.00%. From the results in Table 5.1, it can be seen that the digestibility of organic matter did not show a significant difference ($P > 0.05$) in all treatments. The highest digestibility was obtained in treatment R3 (9% taro leaf flour) which was 62.00%. However, there was an increase in the digestibility of organic matter from R0 to R1, R2, and R3 and then decreased at R4. This is also because dry matter digestibility also increases. That most organic matter is a dry matter component. If the dry matter digestibility coefficient is the same, then the organic matter digestibility coefficient is also the same. Digestibility of organic matter in a feed shows the quality of the feed digested by the body.

The content of crude fiber and crude protein of feed, treatment of feed ingredients, livestock species factors, and the amount of feed would affect digestibility. Furthermore, it is said that the factor that affects the digestibility of organic matter is the content of nutrients in the ration. The high crude fiber of feed that cannot be digested in the digestive tract causes other nutrients that can be digested to be undigested and come out with the excreta, thereby reducing the digestibility of other nutrients [16].

Retention N

Giving taro leaf flour in the ratio of native chicken showed a significant effect ($P<0.01$) on N retention. The application of taro leaf flour caused changes in nitrogen retention that were increasingly involved, and the highest nitrogen retention was obtained in treatment R3 (9% leaf meal). taro) of 63.05 %. This means that the optimal use of the ratio in this study is R3 because R4 (12%) has decreased. Judging from the value of N retention, the more nitrogen than the animal's body can retain, the less nitrogen is found in the excretory content. [17] stated that more nitrogen was retained, among other things, due to better digestion and absorption of food substances, thereby accelerating the rite of passage.

Factors that affect nitrogen retention include protein digestibility, protein quality, and balance ratio [18]. If the quality of the protein is low or one of the amino acids is lacking, then the nitrogen retention will below. Furthermore, it was explained that the efficiency of protein retention by broilers was 67% of the protein ratio consumed.

From the research results using taro leaf flour, it turns out that the N retention obtained is lower than the retention of boiler chicken with a range of 49.08 - 63.05 %. The level of nitrogen retention depends on the nitrogen consumption and metabolic energy of the ration [18]. However, increased nitrogen consumption is not always accompanied by an increase in body weight, especially if the energy provided in the ratio is low. At a certain level of protein use, there is a tendency for ratio consumption to increase, but bodyweight gain decreases.

This is due to reduced nitrogen retention. The value of nitrogen retention will vary for each bird, depending on the bird's ability to retain nitrogen in the bird's body and not be excreted as nitrogen in the urine. The value of nitrogen retention can be positive or negative depending on nitrogen consumption [18]. A positive nitrogen retention value occurs when the nitrogen consumed is greater than the nitrogen excreted. At this value, body weight gain will be obtained because the muscle weave increases.

4 Conclusion

Super free-range chicken rations added with 9% taro leaf flour resulted in crude protein digestibility, dry matter digestibility, organic matter digestibility, and optimal N retention with values of 74.15% and 92.52%, 62.00%, and 63.05%, respectively.

References

[1] Nuroso. 2010. Ayam Kampung Pedaging Hari Per Hari. Penebar swadaya.

[2] Gunawan, dan Sundari. (2003). Pengaruh Penggunaan Probiotik Dalam Ransum Terhadap Produktivitas Ayam.

[3] Bakrie,B.,D.Andayani,M.Yanis dan D.Zaenuddin, 2003. Pengaruh Penambahan Jamu ke Dalam Air Minum Terhadap Preferensi Konsumen dan Mutu Karkas Ayam Buras. 490 – 495. Prosiding Seminar Nasional Teknologi Peternakan dan Veteriner " Iptek Untuk Meningkatkan Kesejahteraan Petani Melalui Agribisnis Peternakan Yang Berdaya Saing " Bogor 29-30 September 2003.

[4] Aman, 2011.Ayam kampung Unggul. Penerbit Penebar Swadaya, Jakarta. Anggorodi, R. 1985, Ilmu Makanan Ternak Umum. Penerbit PT Gramedia Jakarta

[5] Ditjennak. (2016). Statistik Peternakan (2008). Direktorat Jendral Peternakan : Jakarta. Edisi ke 2,ITB Bandung.

[6] Usman, 2007. Potensi Ampas Tahu Sebagai pakan Ternak pada Usaha Pembesaran Ayam Buras Beroreantasi Agribisnis. Dlm 253- 261. Proseding Seminar Nasional dan Ekspose. Percepatan Teknologi Pertanian Spesifik Lokasi Mendukung Kemandirian Masyarakat Kampung di Papua, Jaya Pura . 5-6 Juni 2007.

[7] Rochyat, D.M, 2000. Penyusunan ransum Untuk Itik Petelur. Badan Penelitian dan Pengembangan Pertanian, Jakarta.

[8] Vincent,E.R dan Yamaguchi 1998. Sayuran Dunia I. Prinsip Produksi dan Gizi. CRC Press.

[9] Aliyani, A. (2002). Persentase Berat Karkas Organ Dalam Ayam Broiler Yang DIberi Tepung Daun Talas (Colacosia Esculeta L Schott) Dalam Ransumnya, SKripsi. Fakultas Peternakan, Institute Pertanian Bogor.

[10] Anggorodi, R. 1995. Nutrisi Aneka Ternak Unggas. PT. Gramedia Pustaka Utama. Jakarta.

[11] Steel, R. G. D. dan J. H. Torrie. 1993. Prinsip dan Prosedur Statistika. Diterjemahkan oleh Bambang Sumantri. PT. Gramedia Pustaka Utama. Jakarta

[12] Nur Annisa. 2012. Pengaruh pemberian Pakan Tambahan Daun talas yang dicampur cacing terhadap pertumbuhan ikan nila (Oreochronis sp.). Skripsi. Program sarjana Universitas Muhamadiyah, Purwokerto

[13] Nurhidayanto.2007. Analisa geografi terhadap pola persebaran pemukiman di kec. Mojogedang, Kab. Karanganyar. Skripsi. Fak. Geografif. Universitas Muhamadyah Surakarta.

[14] Mahardika dan G.A.M.K. Dwi, Ariesta A.H.I.G. 2013. Pengaruh level energi dan protein ransum terhadap penampilan Ayam Kampung Umur 0-10 mg. Majalah Ilmiah Peternakan, vol.6 (03)

[15] Mc. Donald, P., R.A. Edward, JFD Greenhalgh, C.A. Morgan, L.A, Sinclair and R.G Wilkinson. 2010. Animal Nutrition. 7 th ed. Prentice Hall, Pearson, Harlow, England, London, New York, Boston, San Fransisco, Toronto, Sydney, Tokyo, Singapure, Hongkong, Seoul, Taupei, New Delhi, Capetwon, Madrid.

[16] Tillman, A. D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo danS. Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah MadaUniversity Press, Yogyakarta
[17] Mateos, G.G., J.L. Sell dan J.A. Eastwood.1992. Rate of food passaqe (transit time) as influences by level supplement fat. Poult. Sci 61:94-100
[18] Wahju, J. 1997. Ilmu Nutrisi Unggas. Yogyakarta: Gadjah Mada University Press..