The influence of extract Kasumba Turate (*Carthamus tinctorius linn*) on broiler chicken performance

S Rahmah1 S Purwanti2 and W Pakiding2

1Postgraduate of Animal Scince and Technology Study Program, Universitas Hasanuddin
2Faculty of Animal Science, Universitas Hasanuddin

Email: rahmahiphone25@gmail.com

Abstract. Increased broiler performance can be achieved with the addition of Kasumba Turate Extract (KTE) in drinking water. The purpose of this study is to determine how the effects of the addition of KTE in drinking water of broiler with different levels. The research was carried out for 5 weeks using its commission 5 and 4 replicates and thus require 20 plots. The treatment consists of R0: without KTE and Vit C; R1: Vit C 0.1 ml/1 L of drinking water; R2: 1.25 ml/1 L KTE of drinking water; R3: 1.50 ml/1 L KTE of drinking water; R4: 1.75 ml/1 L KTE of drinking water.

The results showed that the treatment did not affect (p>0.05) on the amount of feed consumption, water consumption, body weight gain and carcass of a broiler. Treatment R0, R1, R2 shows an increasing trend in water consumption, feed consumption, and carcass, while the treatment of R3, R4 showed an increasing trend in body weight gain of a broiler. Conclusions from the study showed that the KTE can be used as an antioxidant for the broiler until the highest level of 1.75 ml, but does not affect the performance of broiler.

1. Introduction

Broiler is one of a group of animals poultry a bird that its main production of meat. Broiler poultry meat producer has the speed to grow rapidly in a short time, so it can be used as a commercial business potential [1,2].

Broiler farm is one of the potentials in the field of poultry farms especially beneficial for the survival of society, because can increase the income of farmers, support the public demand for nutritious fulfillment.

In the maintenance of broiler sometimes there are obstacles that lead to decreased performance of broiler, one of which is caused by free radicals that are triggered by the amount of ammonia gas in the cage as well as the occurrence of heat stress so that the resulting lack of oxygen in broilers pedaging. Amonia is the air pollutant of domesticated cattle farm with the largest contributor to the emission of ammonia into the atmosphere. The detrimental effects of ammonia emissions in the environment have an impact on the performance of broiler and human health [3]. Every living thing has a zone called the zone of physiological homeostasis [4]. In the event of stress, then this homeostatic zone will be disrupted and the body will try to restore to the condition before the stress.

Poultry suffering from stress will show the characteristic feature of anxiety, a lot of drinking, decreased appetite and flapped the floor of the cage. In addition to that cattle suffering from stress will experience panting with a frequency that is directly proportional to the level of stress, increased rectal temperature were determine with increased levels of the hormone corticosterone and expression of HSP 70.

The advent of heat stress in poultry can lead to various diseases, growth rate and decreased broiler performance. Accompanied rectal temperature increased with increased levels of the hormone corticosterone and expression of HSP 70. The advent of heat stress in poultry can lead to various diseases, growth rate and decreased broiler performance.
Various efforts have been done to overcome it including synthetic vitamin C because vitamin C contains antioxidants which can counteract free radicals to avoid stress and reduce the ammonia gas in the broiler. Antioxidants are needed to protect the body from free radical attack. The antioxidant is a compound or chemical component in a grade or a certain amount capable of preventing or slowing damage caused by the oxidation process [6]. Therefore, it is necessary to find alternative materials that can be used as substitutes vitamin C as an antioxidant.

Kasumba turate (Carthamus tinctorius Linn) is a plant that has a high antioxidant. Kasumba turate contains 63.10% antioxidant [7]. Kasumba turate main contains active substances polyphenols, chartamian, chartamone, neo-chertamin, nona-cosane, yellow dye, safflomin A, dipalmitin, adenosid, betasitosterol, flavonoids and polysaccharides [8]. Kasumba Turate analysis of essential oils containing thymol, carvacrol, linalool and eugenol [9]. Based on the potential for the use of extracts Kasumba turate who added into the drinking water of broiler with different levels are expected to improve the performance of broiler.

2. Material and Methods

2.1 Material

The materials used include DOC broiler strain Logan, kasumba turate extract (KTE), commercial feed, water, paper, ash, plastic, paper labels, analytical balance, beaker, flask, pipette, infuse pot, stove, flannel and thermometer. Tools used include experimental cage, where food and drinking water, electric scales, disinfectant spray equipment, incandescent lamps, sanitary equipment, container storage, shovels, basins, drapes, surgical equipment, gloves, pot and stationery.

2.2 Research design and data analysis

The study design used was completely randomized design (CRD) with 5 treatments and 4 replications. Each of the experimental unit consists of 5 chickens so that the overall amount of chicken is 100 broiler chickens. The composition of the treatment consists: R0 (drinking water without KTE and Vit. C); R1 (Vit C 0.1 mL/L); R2 (1.25 mL KTE/L); R3 (1.50 mL KTE/L); R4 (1.75 mL KTE/L). The analysis of the data used to use ANOVA [10].

3. Result and discussion

Results of analysis of variance showed that the KTE in the drinking water of broiler with different levels, showing the results yangtidak significant effect (p>0.05) on the performance of broiler chickens which include weight gain, feed consumption, water consumption and carcass percentage. The result of the performance of broiler presented in table 1.

### Table 1. The average performance of broiler production with KTE.

| Treatment | Weight Gain g/tail/week | Feed consumption g/tail/week | Water consumption mL/tail/week | Carcass g/tail |
|-----------|-------------------------|-----------------------------|-------------------------------|---------------|
| R0        | 357.45 ± 21.96          | 685.60 ± 28.26              | 908.92 ± 66.37                | 1.879 ±189.43 |
| R1        | 336.30 ± 16.91          | 703.65 ± 30.14              | 926.21 ± 33.75                | 1.814 ±161.98 |
| R2        | 333.30 ± 15.02          | 694.75 ± 36.12              | 880.67 ± 42.03                | 1.872 ±59.64  |
| R3        | 323.57 ± 36.86          | 688.35 ± 7.27               | 853.55 ± 101.12               | 1.822 ±285.61 |
| R4        | 317.25 ± 11.21          | 699.80 ± 36.21              | 875.68 ± 51.47                | 1.733 ±53.72  |

Note: R0 (drinking water without KTE and Vit. C); R1 (Vit C 0.1 mL/L); R2 (1.25 mL KTE/L); R3 (1.50 mL KTE/L); R4 (1.75 mL KTE/L).

3.1 Weight gain

The results of variance showed that the KTE in the drinking water of broiler was not significant (p>0.05) on the western gain weight broiler. Weight gain is calculated from the difference between the
end of the week weight with the initial weight showed an average weight gain of broiler in treatment R0 until R4 are 357.45; 336.3; 333.3; 323.25 and 317.25 g/tail/week respectively. These data suggest that weight gain in line with feed intake seen that where the initial weight gain increased at R0 and R1, are consistent with feed intake increased in treatment R0 and R1, then decrease in the carrying out of R2, R3 and R4, in line with consumption feed decreased in R2, R3 and R4.

In table 1 shows that weight gain was highest in the treatment without KTE (control) compared with the treatment given KTE. It is influenced by the amount of feed consumption, which means that high weight gain is influenced by the amount of consumption of broiler. This is following the opinion [11,12] that the rapid growth sometimes supported by feed intake that much anyway. Supported also by the opinion [13] that for to reach optimal growth rate according to the genetic potential, the necessary nutritional elements of food contain qualitatively and quantitatively, so there is a connection speed of growth by the amount of food consumption.

Low body weight gain during the study can also be caused by high ambient temperature during maintenance. Wahyu [14] stated Fator factors that affect body weight gain, among others, food, environment and maintenance in temperature. The ambient temperature during the study average is 31ºC, the temperature is too high for broiler maintenance because the ideal temperature for boiler maintenance is 21ºC. This is following opinions [15] that a comfortable temperature for broilers ranging between 20-26ºC.

3.2. Feed consumption
Analysis of variance showed that the extract kasumba Turate in the drinking water of broiler was not significant (p>0.05) on feed consumption of broiler. Average feed consumption of broiler in treatment R0 (685.60), R1 (703.65), R2 (694.75), R3 (688.35), R4 (699.80) g/tail/week respectively, so it can be said that the increase Turate kasumba extract level in drinking water of broiler no effect on feed consumption of broiler. Given broiler feed in large quantities, does not mean that it will achieve a weight gain is high.

Abidin [16] states that feed intake increases when energizing the ration is low and feed consumption will decline when fed diets with high energy. The data show that the average consumption of feed consumption research results lower than the standard [17] that the consumption of broiler chicken rations of 3.670 g during 5 weeks. Low feed consumption caused by the high temperatures during the day during the study as well as the humidity is erratic. This is following the opinion [18], one of the concentration due to heat stress, then the chickens will reduce feed intake resulting in decreased nutrient intake. Added by [19] that a comfortable temperature for broilers ranged between 20-26ºC.

3.3. Water consumption
Analysis of variance showed that the KTE in the drinking water of broiler was not significant (p>0.05), the consumption of broiler drinking water. Average water consumption of broiler in treatment R0 (908.92), R1 (926.21), R2 (880.67), R3 (853.6), R4 (857.68) mL/tail/week respectively, so it can be said that KTE in drinking water does not give effect to the water consumption of broiler. Broiler studied is placed at the same ambient temperature, the age of the same chicken and nearly the same amount of feed intake. The results of this study are not in line with the water consumption of each supporting research done by [20] where the average feed consumption for all treatments between 175.96 to 197.05 g/tail/week. Water consumption depends higher feed intake or nutrient content of the ration is given, where the consumption of chicken feed ration given nutrient content, where the water consumption of chicken in the period ranging from 1.5-2 mL production while consuming 1 gram of feed. The result is in contrast to the opinion [21], which indicated that the chickens consume drinking water 2 times greater than the amount of feed consumed for drinking water serves as a solvent and transport of nutrients to be dispersed throughout the body so that it takes more water on his food.
3.4. Carcasses
Analysis of variance showed that the administration of KTE in the drinking water of broiler was not significant (p>0.05), on the broiler carcass weight. The average carcass weight broiler in treatment R0 (1879), R1 (1814), R2 (1872), R3 (1822), R4 (1733) g/tail respectively. There is no real difference between the carrying out due carcass weight is almost the same. According to [22] a small weight in broilers generally have a percentage of body weight greater waste (such as legs, head and neck and viscera) compared to the great weight.

Carcass weight is influenced by body weight, so the weight of life will be followed by a good carcass weight, and vice versa. This is following with the opinion [23] that high carcass weight is supported by a live weight of cattle is concerned. According to [24] states that the resulting carcass weight is influenced by several factors such as age, sex, weight cut, big and body conformation, fatty, quality and quantity of rations and strain are maintained.

The percentage of the broiler carcasses were given extracts of kasumba Turate in drinking water showed no significant results, this is because kasumba Turate which have high antioxidant role in lowering fat in the broiler that causes carcass percentage decline.

4. Conclusion
The conclusion of the study get Turate kasumba that the extract can be used as an antioxidant for the broiler until the highest level 1.75 mL, but has no effect on the performance of broiler.

References
[1] Rasyaf M 1994 Makanan Ayam Broiler (Yogyakarta: Kanisius)
[2] Wibawati P A, Mufasirin M and Estoeangepstie S 2019 Stunning of Broiler and its Effect on Meat pH Value and Corticosterone Hormone: Study of Animal Welfare Indian Vet. J. 96 17–9
[3] Aneja V P, Schlesinger W H, Niyogi D, Jennings G, Gilliam W, Knighton R E, Duke C S, Blunden and Krishnan S 2006 Emergingnational research needs for agriculturalairquality Union 87 25- J29
[4] Noor R R dan Seminar K B 2009 Rahasia dan Hikmah Pewarisan Sifat (Ilmu Genetika dalam AlQur’an) (Bogor: IPB Press)
[5] Tamzil M H, Noor R R, Hardjosworop S, Manalu W and Sumantri C 2013 Keragaman gen heat shock protein 70 ayam kampung, ayam arab dan ayam ras J Vet. 14 317
[6] Winarsi H 2007 Antioksidan Alami dan Radikal Bebas ed. V (Yogyakarta: Kanisius)
[7] RahmathS 2018 Uji Antioksidan Tanaman Kasumba Turate (Carthamus tinctorius Linn) Sebagai Alternatif Feed Additive untuk Unggas Skripsi (Makassar: Fakultas Peternakan Universitas Hasanuddin)
[8] Wijayakusuma H 2008 Atasi Kanker dengan Tanaman Obat (Jakarta: Puspa Swara)
[9] Ziarati P 2012 Determination of contaminants in some iranian popular herbal medicines J. Environ. Analytic Tox. 2
[10] Gaspersz V 1994 Metode Rancangan Percobaan (Bandung: Armico)
[11] Fadillah R 2004 Kunci Sukses Beternak Ayam Broiler di Daerah Tropis (Jakarta: Agromedia Pustaka)
[12] Soekwanto L and Anwar C 2019 Enhancement of Broiler Chicken Growth by Laserpuncture Treatment 40 Indian Vet. J. 96 40–4
[13] Ensminger M E, Oldfield J E and Heimer W W 1990 Feeds Nutrition (California)
[14] Wahju J 2006 Ilmu Nutrisi Unggas Ed V (Yogyakarta: Gadjah Mada University Press)
[15] Rasyaf M 2001 Beternak Ayam Pedaging (Jakarta: Penebar Swadaya)
[16] Abidin Z 2002 Meningkatkan Produktivitas Ayam Ras Pedaging (Jakarta: Agromedia)
[17] Wahju J 1997 Nutrisi Unggas (Yogyakarta: Gadjah Mada University Press)
[18] Japfa Comfeed Indonesia 2012 Performa Broiler MB 202 (Jakarta: PT. JCI)
[19] Soeharsono 1976 *Respon Ayam Broiler terhadap Berbagai Kondisi Lingkungan* Disertasi (Bandung: Universitas Padjajaran)

[20] Abidin Z 2002 *Meningkatkan Produktivitas Ayam Ras Pedaging* (Jakarta: Agromedia)

[21] Sartika 2017 *Pengaruh Pemberian Probiotik Terhadap Performa Broiler* Skripsi (Makassar: Universitas Islam Negeri Alauddin)

[22] Resnawati H 2014 Bobot organ-organ tubuh pada ayam pedaging yang diberi pakan mengandung minyak biji saga (*Adenanthera pavonina* L.) *JITV* 19

[23] Wahju J 1992 *Ilmu Nutrisi Unggas* Ed III (Yogyakarta: Gadjah Mada University Press)

[24] Hayse P L dan Merion W W 1973 Eviscerated yield components part and broiler *Poult. Sci.* 52, 718–21