

Percentage of commercial carcass cuts of superior native chickens Balitbangtan (KUB)

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Abstract

KUB chicken helps meet the community's meat needs as a source of animal protein. Efforts to increase commercial carcass yields by providing natural supplements in rations, consisting of maggot flour, spirulina and turmeric. Research to determine the effect of providing natural supplements in commercial rations, on the percentage of commercial carcass cuts of KUB chicken. The study used a completely randomized design (CRD) with four treatments and five replications, and each treatment unit was filled with 3 KUB chickens. The treatment of natural supplement "*Nutrigold feed supplement*" in commercial rations is: P0 = 0% *Nutrigold feed supplement*; P1 = 1% *Nutrigold feed supplement*; P2 = 2% *Nutrigold feed supplement*; and P3 = 3% *Nutrigold feed supplement*. The variables observed were: carcass weight, percentage of chest, percentage of back, percentage of wings, percentage of upper thigh, and percentage of lower thigh. The results showed that the addition of 1-3% *Nutrigold feed supplement* was not able to increase the percentage of commercial carcass cuts of KUB chickens, but the addition of 3% *Nutrigold feed supplement* to commercial rations was able to increase carcass weight (624.00 g / head / 8 weeks). It can be concluded that the addition of 1-3% *Nutrigold feed supplement* was not able to affect the percentage of commercial carcass cuts, but the addition of 3% *Nutrigold feed supplement* could increase the weight of KUB chicken carcasses.

Keywords: Nutrigold feed supplement; KUB chicken; Commercial cuts; Carcass weight

1. Introduction

Ration is the most important element to support livestock health, growth, energy supply for metabolic processes, and for optimal livestock growth and development. One of the poultry livestock such as KUB chickens, has an important role in improving community nutrition and increasing income, through the carcasses produced. Efforts to improve local chicken meat by providing natural supplements "*Nutrigold feed supplement*" which is composed of maggot flour, spirulina, and turmeric.

Maggot (*Hermetia illucens*) as an alternative to insect-based rations and does not compete with humans, contains crude protein (40-50%), and essential amino acids [10]. Maggots have antibacterial activity, can inhibit the growth of pathogenic bacteria so that the absorption of nutrients for muscle or meat formation is better [2]. The high protein and vitamin content in spirulina can be used as an antioxidant, and activates antioxidant enzymes in cells, inhibits lipid peroxidation and DNA damage, binds free radicals, increases superoxide dismutase and catalase activity [11]. Furthermore, turmeric containing curcuminoid compounds acts as an antioxidant, can improve chicken digestion, help repair body tissue, and maintain chicken immunity. The addition of maggot flour in broiler rations up to 9%, has no effect on the percentage of commercial broiler carcass cuts [12]. Giving 5% maggot worms to commercial rations, can increase the percentage of carcasses and commercial carcass cuts in chicken breast [5]. Furthermore, giving turmeric

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extract through drinking water with a concentration of 1-3% can improve the organoleptic quality of KUB Chicken meat [9].

2. Material and methods

2.1. Place and Time of Research

The research was conducted in Luwus Village, Baturiti District, Tabanan Regency, Bali, and the research lasted for 8 weeks from May - June 2024.

2.2. Cages and Equipment

A total of 20 colony cages, made of wood and bamboo. Each cage is equipped with a place for food, drinking water, a light bulb for lighting, and each cage is filled with 3 KUB chickens. The bottom of the cage is filled with a plastic base, to facilitate cleaning.

2.3. KUB Chicken

KUB chicken chicks aged 1 week, as many as 60 chickens with homogeneous body weight, from Farm Manuk Lestari Badung Bali, 80352.

2.4. *Nutrigold feed supplement*, Rations, and Drinking Water

Nutrigold feed supplement in the form of crumble, with an energy content (GE) of 6203 kcal/kg, crude protein (54.3%), crude fiber (6.7%), and crude fat (33.6%) (Laboratory of animal nutrition and feed, Faculty of Animal Husbandry, Udayana University, 2023). Commercial rations (CP 511B) with contain energy (GE) 3961 kcal/kg, crude protein (20%), crude fiber (5%), and crude fat (5%) (PT. Charoen Pokphand, 2013). The standard nutrient requirements for KUB chickens use the SNI Standard (2013), as follows: crude protein 19%, crude fiber 7%, and crude fat 3%. Nutrient content of treatment rations (Table 1).

2.5. Experimental design

Using a completely randomized design (CRD), consisting of 4 treatments and 5 replications. The treatment of *Nutrigold feed supplement* in commercial rations is as follows: P0 = 0% *Nutrigold feed supplement*; P1= 1% *Nutrigold feed supplement*; P2= 2% *Nutrigold feed supplement*; and P3= 3% *Nutrigold feed supplement*.

Table 1 Nutrient Content of Treatment Rations

Nutrient Content	Treatment ¹⁾			
	P0	P1	P2	P3
Energy (GE) Kcal/kg	3961.00	3983.42	4005.84	4028.26
Water content (%)	14	13.90	13.80	13.60
Protein (%)	20	20.34	20.68	21.02
Fat (%)	5.0	5.29	5.57	5.86
Fiber (%)	5.0	5.02	5.04	5.05
Ash (%)	8.0	7.97	7.94	7.91

Description: P0 = 0% *Nutrigold feed supplement*, P1= 1% *Nutrigold feed supplement*, P2=2% *Nutrigold feed supplement*, dan P3= 3% *Nutrigold feed supplement*

2.6. Randomization of KUB Chickens and Mixing of Rations

KUB chickens totaling 60 heads, weighed (Standard deviation 65 g $\pm$ 0.34 g). KUB chickens were put into 20 cages, randomly, and given a code. The ration mixing process is carried out every week, with a weight of 2000g. Treatment rations P0 (2000g commercial ration); P1 (1980g commercial ration + 20g *Nutrigold feed supplement*); P2 (1960g commercial ration + 40g *Nutrigold feed supplement*; and P3 (1940g commercial ration + 60g *Nutrigold feed supplement*).

2.7. Disease Prevention

The biosecurity system is carried out by spraying formaldehyde evenly into the cage, namely 2 weeks before the KUB chicken is put into the cage.

2.8. Chicken Cutting

Before being cut, the KUB chicken is fasted for 12 hours, to empty the feed in the digestive tract. KUB chicken cutting is based on [8], by cutting the jugular vein and carotid artery. Furthermore, the chicken is dipped in hot water, to facilitate the process of plucking feathers. Removal of entrails and cutting (head, neck, and legs) to obtain the weight of the KUB chicken carcass. Furthermore, the carcass is separated (wings, chest, thighs, and back) to obtain commercial carcass cuts.

2.9. Observed variables

- Carcass weight (g)

Carcass weight, obtained from the slaughter weight (after bleeding, plucking feathers, separating the head, feet, and removing internal organs).

- Percentage of breast (%)

$$\text{Percentage of breast (\%)} = \frac{\text{Weight of breast (g)}}{\text{Weight of carcass (g)}} \times 100\%$$

- Percentage of back (%)

$$\text{Percentage of back (\%)} = \frac{\text{Weight of back (g)}}{\text{Weight of carcass (g)}} \times 100\%$$

- Percentage of wing (%)

$$\text{Percentage of wing (\%)} = \frac{\text{Weight of wing (g)}}{\text{Weight of carcass (g)}} \times 100\%$$

- Percentage of upper thigh (%)

$$\text{Percentage of upper thigh (\%)} = \frac{\text{Weight of upper thigh (g)}}{\text{Weight of carcass (g)}} \times 100\%$$

- Percentage of lower thigh (%)

$$\text{Percentage of lower thigh (\%)} = \frac{\text{Weight of lower thigh (g)}}{\text{Weight of carcass (g)}} \times 100\%$$

2.10. Data Analysis

The research data were analyzed using analysis of variance. If there is a significant difference between treatments ($P < 0.05$), then proceed with Duncan's multiple range test [7].

3. Results and discussion

Results of the study of *Nutrigold feed supplement* administration in commercial rations on the percentage of commercial carcass cuts of KUB chickens (Table 2).

Giving 1-3% *Nutrigold feed supplement* in commercial rations, can produce higher carcass weight compared to P0 treatment (0% *Nutrigold feed supplement*). This is suspected to be *Nutrigold feed supplement* in rations containing antimicrobial peptide (AMP) and phytochemical compounds (curcumin, essential oils, Phycocyanin, and β carotene) which have antioxidant and antibacterial activities, so that they can affect the carcass weight produced. Turmeric and spirulina ingredients in *Nutrigold feed supplement* for KUB chickens as antioxidants that play a role in increasing the absorption of ration nutrients. This opinion is supported by [4], phytochemical compounds (curcumin and essential oils) play a role in increasing the absorption of ration nutrients, increasing the work of digestive organs (stimulating the gallbladder wall to release pancreatic bile fluid containing amylase, lipase, and protease enzymes), to help digestion of carbohydrates, fats, and proteins and accelerate the emptying of stomach contents.

Table 2 Effect of *Nutrigold feed supplement* administration in commercial rations on the percentage of commercial carcass cuts KUB chickens

Variabel	Perlakuan ¹⁾				SEM ³⁾
	P0	P1	P2	P3	
Carcass weight (g/head/8 weeks)	524.80 ^{c2)}	571.00 ^b	587.00 ^b	624.00 ^a	10.59
Percentage of wings (%)	15.05 ^a	14.72 ^a	14.41 ^a	13.90 ^a	0.44
Percentage of upper thigh (%)	17.65 ^a	17.70 ^a	17.76 ^a	17.82 ^a	0.50
Percentage of lower thigh (%)	17.08 ^a	17.40 ^a	17.60 ^a	17.81 ^a	0.52
Percentage of breast (%)	26.79 ^a	27.00 ^a	27.26 ^a	27.58 ^a	0.61
Percentage of back (%)	23.43 ^a	23.18 ^a	22.97 ^a	22.89 ^a	0.63

Description: ¹⁾ P0 = 0% *Nutrigold feed supplement*, P1= 1% *Nutrigold feed supplement*, P2=2% *Nutrigold feed supplement*, dan P3= 3% *Nutrigold feed supplement* ²⁾ Values with different letters in the same row indicate significant differences (P<0.05) ³⁾ SEM: "Standard error of the treatment means"

The provision of *Nutrigold feed supplement* in commercial rations of KUB chickens, has not been able to improve the percentage (chest, back, and wings). This is suspected because the components in the chest, back, and wings have many bones, so that the growth of meat in the chest, back, and wings is quite low. The nutrient content factors of KUB chicken rations such as energy, protein, and crude fiber are not much different, so that they affect the percentage of commercial carcass cuts to be the same. This opinion is supported by [3], that the components of the back, chest, and wing carcasses of poultry livestock do not only consist of tissue muscles, but are also composed of bone skeletons and stable back cells.

The percentage of upper and lower thighs of KUB chickens given *Nutrigold feed supplement* in the ration showed no significant differences. This shows that *Nutrigold feed supplement* in commercial rations of KUB chickens, has not been able to improve the percentage of thighs. Turmeric, which contains phytochemical compounds, acts as a stimulus for metabolism and growth rate in livestock, does not affect the digestibility of protein, bones, and fat. Chickens during the starter period, feed consumption is used for the growth and development of bone tissue and body frame. This opinion is supported by [1], that the percentage of thigh meat which is a limb, so that the meat component gets less response. Furthermore [6], the lower thigh which is a limb and supports the livestock's body, has less meat components compared to the upper thigh component. Another causal factor is because the nutrient content in the KUB chicken ration is not much different, resulting in the same thigh percentage. This opinion is supported by [13], that the different thigh weights are not significant, allegedly because the nutrient content of the ration, especially energy and protein, is given the same.

4. Conclusion

From the results of the study, it can be concluded that the addition of 1-3% *Nutrigold feed supplement* to commercial rations, has not been able to affect the percentage of commercial carcass cuts, but the addition of 3% *Nutrigold feed supplement* can increase the weight of KUB chicken carcasses.

Suggestions

It can be suggested to farmers to increase the weight of KUB chicken carcasses, by providing 3% *Nutrigold feed supplement* to commercial rations.

Compliance with ethical standards

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Disclosure of conflict of interest

All authors declare that there is no conflict of interest in this study.

Statement of ethical approval

The Animal Ethics Commission has approved 60 oneday-old ducks (DOD) used in this research from the Faculty of Veterinary Medicine, Udayana University, Badung, Bali, Indonesia.

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