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The Growth and Carcass Quality Performance of *Ciayumajakuning* Muscovy Ducks First Offspring

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***Abstract*— Muscovy ducks are meat-producing poultry, and meat quality is affected by growth performance and carcass quality. This research aimed to investigate the growth performance and carcass quality of the best Muscovy ducks and determine the regions from which Muscovy ducks with the best performance and carcass quality. This study used 120 Muscovy ducks aged 1-6 months (60 drakes and 60 ducks) collected from the regencies in this study (15 drakes and ducks each). An experimental method was conducted in a factorial, completely randomized design. The first factor was the Muscovy ducks' place of origin *Ciayumajakuning* (Cirebon, Indramayu, Majalengka, and Kuningan), and the second factor was the sex of Muscovy ducks (drake and duck) with three replicates for each treatment. The result showed that the interaction in Muscovy ducks' growth performance was non-existent. Muscovy ducks from Kuningan had the most significant growth performance and carcass quality from Cirebon, Indramayu, and Majalengka. It was evident from the qualities of drake vs. duck Muscovy ducks, such as feed consumption (21,92 vs. 14,11 kg), body weight (3,48 vs. and 2,14 kg), mortality (3,17% vs. 3,53), feed conversion (6.59 vs. 6.30). Additionally, Muscovy ducks had 71,26% carcass percentage, 80,85% edible cuts, 19,15% inedible cuts, 19,53% meat protein, 6,89% meat fat and 72,58% meat fatty acid. Conclusively, Kuningan Muscovy ducks had better growth performance and carcass quality than those of Cirebon, Indramayu, and Majalengka.**

***Keywords*— Growth performance; carcass quality; Muscovy ducks; Ciayumajakuning.**

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I. INTRODUCTION

Poultry, including Muscovy ducks, plays a vital role as a meat producer. Muscovy ducks are assumed to come from Central America, South America, and Mexico [1] and are currently reared across the globe, such as Afrika [2], Europe [3], Asia [4], and Indonesia [5]. Two Muscovy ducks species are Cairina moschata and Anatidae family related to mallards [5]. Muscovy ducks are generally superior in performance, carcass traits, and economic values to Pekin and Mulard duck [6]. Muscovy ducks are an optimum meat producer, supported by their proportional body conformation as reflected from drake vs. duck body weight body (2,7 kg vs. 1,5 kg) and carcass percentage (74.68 % vs. 70.28 %) [7].

In Indonesia, raising Muscovy duck in rural areas is a side job and the main job of farming or employees. Breeders can sell Muscovy duck whenever needed. Muscovy duck population in Indonesia is 8.7 million, and in West Java as much as 1.5 million [8]. Ciayumajakuning is the Muscovy duck center in West Java with a population of 1.03 million, with the following details: Cirebon 253 thousand, Indramayu 770 thousand, Majalengka 129 thousand, and Kuningan 68 thousand [8]. The logs kept in Ciayumajakuning are local types, so there is an incredibly good opportunity to be developed.

Muscovy ducks generally inhabit the coastal or water areas [9]. In a tropical area like Indonesia, Muscovy ducks are reared in rural areas, particularly in agricultural land, paddy field, farm, and the backyard, including in Ciayumajakuning area (Cirebon, Indramayu, Majalengka and Kuningan). The maintenance is semi-intensive with forage food and a simple-structured cage [8].

The diversity of areas can affect differently to the environment, poultry management, and the production performance of Muscovy ducks, especially growth performance and carcass quality. However, there have been limited studies on this issue, such as Gidenne *et. al*. [10] on Muscovy duck maintenance di South Africa and Yakubu *et al* [11] on Muscovy ducks in the humid, tropical regions. This research aimed to investigate the growth and carcass quality performance of Ciayumajakuning Muscovy ducks first offspring. The study can be the guide for sound Muscovy farming maintenance in the tropical regions.

II. Material and Method

A. Material

This study used 120 Muscovy ducks aged 1-6 months (60 drakes and 60 ducks) collected from the regencies in this study (15 drakes and ducks each). The Muscovy must be the first brooding of the parents. Sexing was conducted when the Muscovy was one day old. Feed for Muscovy ducks was composed for starter and grower phases [12]. Feed composition is presented in Table 1.

TABLE I
FEED COMPOSITION FOR MUSCOVY DUCKS AT PRE-STARTER, STARTER, AND GROWER PHASE

Feed composition	Pre-starter	Starter	Grower
Corn (%)	61.00	66.00	22.00
Soybean kernel (%)	20.00	5.50	6.00
Fishmeal (%)	11.00	9.00	5.00
Ricebran (%)	5.00	18.00	65.00
$CaCO_3$ (%)	1.00	1.00	1.00
Top mix (%)	0.50	0.50	0.50
ME and metabolic energy			
Metabolic energy (kcal)	3014.72	2953	2604.22
Crude protein (%)	22.03	16.13	15.15
Crude fat (%)	5.74	6.22	8.23
Crude fiber (%)	3.06	8.27	10.81
Calcium (%)	0.92	0.72	0.65
Phosphor (%)	0.42	0.67	1.18
Lysin (%)	1.35	0.84	0.95
Methionine (%)	0.50	0.35	0.35
Methionine + Cystine	0.89	0.56	0.18

The study was conducted in Jatinangor at a medium-elevation area (725-800 m.a.s.l). The cage for Muscovy ducks was made of bamboo and wood, measuring 1x1m (24 units). The cage was equipped with a heater, food container, and drinking water.

B. Method

This study applied an experimental method with a factorial Completely Randomized Design (two factors). Factor One is four regencies where Muscovy ducks were originated, namely Cirebon or K1 (the low-elevation coastal area of 0-300 m.a.s.l), Indramayu or K2 (low-elevation, coastal area of 0-18 m.a.s.l), Majalengka or K3 (low to medium-elevation area of 19-857 m.a.s.l), and Kuningan or K4 (low to high-elevation area of 120-700-1500 m.a.s.l). Factor Two is the Muscovy sex, i.e., drake (J1) and duck (J2). Each treatment received three replicates.

The pre-starter period's maintenance includes weighing the calves, separating drakes and ducks (sexing), giving ND vaccine (Newcastle Diseases), giving vitachicks solution, and giving week 1 and 2 rations of 10 and 20 grams per head per day. Weigh and record the remaining rations to obtain ration consumption data and weigh entog each week to obtain bodyweight gain data. Then the entog child is moved to the starter cage.

Maintenance of the starter period includes placing the entog in the cage unit according to the treatment. Providing rations 3, 4, 5, 6, and 7 weeks of 30, 50, 70, 80, and 100 grams per head per day, and provision of drinking water 1, 1.5, 2, 2.5, and 3 liters per cage unit per day. Weigh and record the remaining rations to obtain ration consumption data and weigh entog each week to obtain body weight gain data. Then the entog is moved to the grower cage.

Maintenance of the grower period in the ranch cage. Providing rations of entog aged 8-12 weeks as much as 150 grams per head per day, entog aged 13-16 weeks as much as 200 grams per head per day, entog aged 17-20 weeks 250 grams per head per day and entog aged 21-25 weeks as much 300 grams per head per day. Provide drinking water as much as 4-6 liters per head per day. will be given adlibitum. Weigh and record the remaining rations to obtain ration consumption data and weigh entog each week to obtain body weight gain data. Ration conversion data were obtained by dividing ration consumption by body weight gain.

Maintenance of entog is carried out until it reaches sexual maturity (age 22-25 weeks). Recording the age of adult sex for duck entog is indicated by the presence of one duck entog that has laid eggs and the drake entog is indicated by a hissing sound. After the duck entog reached maturity, the sexes were separated for seedlings and the drake entog was slaughtered to observe the percentage of carcass, meat protein, meat fat and meat fatty acid.

The growth performance of the firsth offspring Muscovy Ducks: feed consumption, body weight, mortality, and feed conversion ratio. Carcass quality Performance of the firsth offspring Drake Muscovy Ducks: carcass percentage, edible cuts, inedible cuts, meat protein, meat fat, and fatty acid.

The data analysis of growth performance was subjected to ANOVA. The observed variables from growth performance were feed consumption, body weight gain, and feed conversion. The carcass quality was measured from the carcass percentage, edible cuts, inedible cuts, meat protein, meat fat, and meat fatty acid.

III. Results and Discussion

A. Growth Performance

The growth performance of the first offspring of Muscovy ducks is presented in Table 2. This study did not observe any interaction between the average growth performance, including feed consumption, body weight, mortality, and feed conversion of drake Muscovy ducks. Additionally, drake Muscovy ducks' feed consumption was not significantly different (P>0,05) across treatments because of the similar feed quantity and quality given to the ducks. This result confirmed Chisembe *et al.* [13], who reported an equal feed intake despite similar metabolic energy and protein in different feeds.

1) Feed Consumption: The feed consumption of drake and duck Muscovy ducks in this study ranged from the highest to lowest was Cirebon Muscovy (22,52 kg and 18,48 kg), Indramayu (22,44 kg and 15,11 kg), Majalengka (22,27 kg and 14,59 kg), (21,92 kg and 14,11 kg). Meanwhile, the average feed consumption (gram/duck/day) of drake vs. duck Muscovy ducks in Cirebon, Indramayu, Majalengka, and Kuningan was 125,1 vs. 102,6; 124,6 vs. 83,9; 123,7 vs. 78,7; and 121,7 vs. 78,3, respectively. This result was similar to 128,54-131,14 gram/duck/day [14] but higher than 40,81 gram/duck/day [12].

Ration consumption can also be affected by palatability, physical and chemical properties of rations. Palatability includes aroma, texture, and color of the ratio. The rations' physical properties include the form of rations, including mash, crumble, and pellets. The rations' chemical properties include the nutritional content of the rations, including crude protein, crude fat, minerals, vitamins, and metabolic energy of the ration. Ration palatability is an important factor that determines the level of ration consumption, and palatability depends on the smell, taste, color, and texture of the feed ingredients that make up the ration [15]. Besides, the treatment ratio holds the same metabolic energy; as a result, the amount of ration consumed is the same for each treatment. The ratio consumption will be the same in each treatment if the metabolic energy content is the same [12]. Ration consumption can be influenced by maintenance management, different feeding methods, and genes' influence [4].

TABLE II
THE GROWTH PERFORMANCE OF THE FIRST OFFSPRING OF MUSCOVY DUCKS

Treatments		Feed consumption	Bodyweight	Mortality	Feed conversion
Regency	Sex				
		(kg)	(kg)	(%)	
K1	J1	22.52^{a}	3.29^{b}	4.27^{a}	8.98^{b}
	J2	18.48^{a}	2.07^{b}	3.43^{a}	6.84^{b}
K2	J1	22.44^{a}	3.13^{a}	3.87^{a}	8.66^{b}
	J2	15.11^{a}	1.75^{a}	4.57^{a}	7.17^{b}
K3	J1	22.27^{a}	3.31^{b}	3.37^{a}	7.12^{a}
	J2	14.59^{a}	2.05^{b}	4.10^{a}	6.72^{a}
K4	J1	21.92^{a}	3.48^{b}	3.17^{a}	6.59^{a}
	J2	14.11^{a}	2.14^{b}	3.53^{a}	6.30^{a}

Note:
Different alphabets within row show a significant difference (P<0,05)

2) Body Weight: The body weight of drake, first-offspring Muscovy ducks from Cirebon, Indramayu, Majalengka, and Kuningan did not show any interaction. The bodyweight of drake Muscovy ducks in this study ranged from the highest to lowest was Kuningan 3,48 kg, Cirebon 3,29 kg, Majalengka 3,31 kg, and Indramayu 3,13 kg. The heavyweight of drake and duck Muscovy ducks from Kuningan may be due to high adaptability to a new environment (from cold-to-cold region), so the feed's energy content was fully used for living and growing. Bodyweight can be affected by feed intake and environmental conditions [16]. However, drake Muscovy ducks' body weight in this study was lower than 4,7-5,1 kg by [17]. Another study compared the bodyweight of 12-weeks Muscovy ducks reared in a ranch and a cage, i.e., 1812,73 g and 1721,65 g, respectively [24]. The curve of drake and duck body weight gain is presented in Figures 1 and 2.

The body size of drake Muscovy duck was higher than that of duck [18]. Therefore, drake is generally used as a meat producer and duck is used for breeding programs [19]. The difference in body weight size of drake and duck is thought to be due to differences in body metabolism, drake is more efficient in converting rations into meat muscle structure, while duck converts rations for growth and development of the reproductive tract. This concurs with a study that different body weight and body size between drakes and ducks have different efficiency and feed conversion [20]. The feed conversion of drake aged 8 weeks reached 2.83, this was the same as commercial ducks which had a feed conversion value of 2.9-2.77 [2].

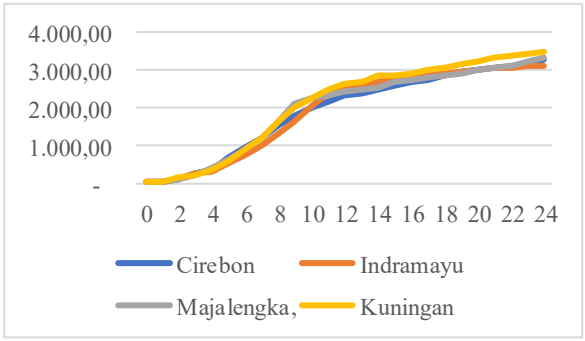

Fig. 1 Drake Body Weight Gain of Muscovy duck

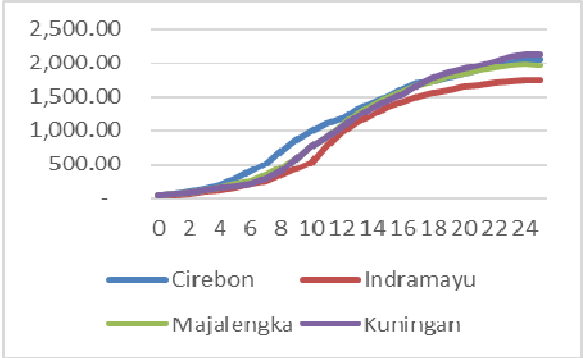

Fig. 2 Duck Body Weight Gain of Muscovy duck

At the age of 8 weeks, the weight of breast meat in Muscovy duck is greater than that of thigh meat. This is because Muscovy duck fat deposition during growth occurs in the chest. However, Muscovy duck rejected will have a greater weight of thigh meat than breast meat because fat deposition occurs in the thigh. This situation is inversely proportional to the rejected ducks, which will have a greater weight of meat in the breast than the meat's weight on the thighs.

3) Mortality: Table 2 shows that the mortality of drake and duck Muscovy ranked from the lowest to highest was Kuningan (3,17 and 3,53%), Majalengka (3,37 and 4,10%), Cirebon (4,27 and 3,43%), and Indramayu (3,87 and 4,57). Kuningan and Majalengka Muscovy's high adaptability to the research location's temperature (Jatinangor) may contribute to this low rate. This result confirmed that a contributing factor to livestock mortality is their adaptability to the environmental condition [11]. This study's average mortality rate of drake and duck Muscovy ducks was better than 8.33% [7] on Muscovy ducks aged 0-6 months. It showed that the average mortality rate under 5% in this study was a success. Successful commercial broiler farming has a mortality rate of under 5 % [21].

The mortality of first offspring did not show a significant difference (P> 0.05). This is presumably because the quality

and quantity of feed given are good enough, maintenance management is carried out well, and health management is quite good. Mortality can be influenced by body weight, breed, type of livestock, climate, cleanliness and environmental temperature, sanitary equipment, pens, and disease. The cage is very important in creating the desired microclimate so that physiological processes can run perfectly [22]. The roles of the cage include creating an atmosphere to stay fresh even in summer, creating a warm atmosphere even in winter, reducing high humidity levels, reducing ammonia levels that are too high, and providing good airflow through the walls of the cage.

4) Feed Conversion: The feed conversion of the first offspring drake and duck Muscovy ducks ranked from the lowest to highest was observed in Muscovy ducks from Kuningan (6,59 and 6,30), Majalengka (7,12 and 6,72), Cirebon (8,98 and 6,84), and Indramayu (8,66 and 7,17). The contributing factors to feed conversion are feed consumption and body weight, and it was confirmed by a previous study [16]. Furthermore, the high feed conversion rate in Muscovy is closely related to the fiber content in the feed [13]. Therefore, the higher the fiber, the more optimum feed protein, which subsequently improves feed conversion.

The average ration conversion from this study was still higher than the previous study results [12]. The average conversion of entog rations maintained with the ranch and cage systems is 5.17 and 4.88. This can be caused by differences in the age of the Muscovy duck. This research was carried out until the age of the entog was 24 weeks, while maintenance was carried out until the age of the entog was 12 weeks [5]. The older the entog is, the bigger its body size. The rate of feed conversion will increase according to body size [14].

B. Carcass Quality

The carcass quality of the first offspring drake is presented in Table 3.

1) Carcass Percentage: The average carcass percentage in this study is presented in Table 3.

TABLE III
CARCASS QUALITY OF THE FIRST OFFSPRING DRAKE

Treatments	K1	K2	K3	K4
Carcass percentage (%)	73,99^{a}	75,09^{a}	70,70^{a}	71,26^{a}
Edible (%)	84,10^{a}	85,04^{a}	81,52^{a}	80,85^{a}
Inedible (%)	15,90^{a}	14,96^{a}	18,48^{a}	19,15^{a}
Meat protein (%)	16,13^{b}	18,19^{a}	19,11^{a}	19,53^{a}
Meat fat (%)	8,46^{a}	6,15^{b}	5,71^{b}	6,89^{b}

Note:
Different alphabets within row show the significant difference (P<0,05)

Table 3 above shows the average carcass percentage: (the highest to the lowest) was observed in drake Indramayu (75.09%) followed by Cirebon (73.99 %), Kuningan (71.26%), and Majalengka (70.70 %). The average body weights of Drake were similar across the regencies; therefore, the carcass percentages were not significantly different. The contributing factors to carcass percentage are live weight as well as inedible and edible parts. This study demonstrated that the carcass percentage of drake from Indramayu was higher than the other regencies because of the low inedible and edible cuts. The carcass percentage of drake Muscovy ducks in this study was similar to 72,01-74,90% [2] but higher than 65% [3] and 66,66–68,24% [14].

Measurement bodyweight of drake before carcassing process is presented in Figure 3.

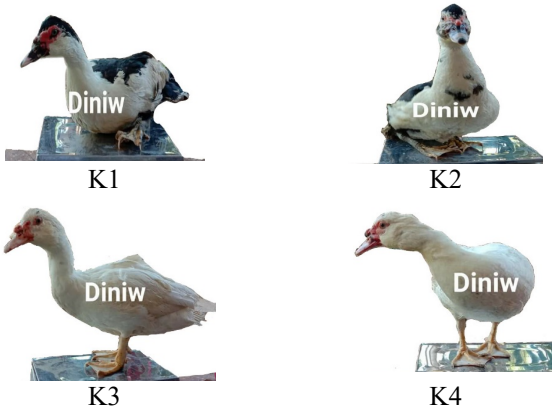

Fig. 3 First Offspring Drake

Carcass percentage results in this study are close to the research results [3]; the carcasses percentage of drake is 72.01-74.90%. This study's results are higher than previous studies [23], which obtained 65% drake carcass percentage, and another study [24] obtained 66.66% -68.24% drake carcass percentage. Another study [25] obtained a drake carcass percentage of 78.8%. This happened because there was a reduction in the live weight of the Muscovy duck, Drouilhet *et al.* [20] used a larger local Muscovy duck species. This difference in carcass percentage observed in this study was higher than that reported by Omojola [26] and southwest Nigeria (66.66% -68.24%).

2) Edible Cuts: The edible cuts were affected by carcass percentage. This study found that Indramayu drake had the highest edible cust (85.04%) followed by Cirebon (84.10%), Majalengka (81.52%), and Kuningan (80.85%) because of the similar average body weight of the drake Muscovy ducks from these regencies. Additionally, the edible parts are affected by carcass weight and giblet weight. Feed types would affect the heart, liver, and gizzard weights. The present study offered feed in powder and produced 25g heart, 57g liver, and 84g giblet. This result confirmed Pasichnyi *et al.* [27], who reported 72% carcass percentage, 63g heart, 80g liver, and 24.6g giblet.

The edibles cuts can be affected by carcass weight and giblet weight. Heart, liver, and gizzard weight can be affected by the type of feed you eat. This study used a feed-in flour, resulting in an average heart weight of 25 g, liver weight of 57 g, and gizzard weight of 84 g. The results of this study are almost the same as Steczny *et al.* [28], who obtained a carcass percentage of 72% and heart weight and gizzard weight of 63 g, 80 g, and 24.6 g. Abd-Elsamee *et al.* [23] observed a similar weight dimorphism of these organs. Gizzards of ducks and gents in semi-intensive systems tend to be heavier than those in intensive systems. This situation maybe due to increased consumption of fibrous substances

in semi-intensive care systems, whereas in intensive care systems all the nutrients needed by Muscovy duck are already present in the ratio [29], [28]. The values obtained are similar to previous reports [30]. Sexual dimorphisms were also found in the beak, neck, and calf lengths of three different types of ducks in Indonesia [25].

3) Inedible Cuts: The percentage of inedible cuts of Muscovy ducks (highest to lowest) was 14.96% (Indramayu), 15.90% (Cirebon), 18.48% Majalengka, and 19.15% Kuningan. This study reported similar carcass percentages and body weight across treatments, which resulted in a comparable percentage of inedible cuts. The other contributing factor was the intensive maintenance system. This study confirmed Kokoszyński *et al.* [31], who investigated the dimorphism of these organs' weights. The gizzards of drake mallard and Muscovy ducks reared under the semi-intensive maintenance tend to be heavier than those in the intensive maintenance. This situation could be due to the increased intake of high-fiber feed in the semi-intensive maintenance, whereas intensive farming has provided all important nutrition for Muscovy ducks in their feed [3], [11].

4) Meat Protein Content: The crude protein content in the meat of the first offspring, drake from Indramayu, Majalengka, and Kuningan were significantly higher ($P<0,05$) than that of Cirebon drake. The average meat protein of Muscovy ducks ranked from the highest to lowest was 19.53 % (Kuningan), 19.11 % (Majalengka), 18.19 % (Indramayu), and 16.13 % (Cirebon). The difference may be due to different adaptability to the environmental condition, which may cause stress. This result confirmed that meat quality could be affected by feed quality and ducks' activity and stress level [31]. The crude protein of the first offspring Muscovy ducks in this study was similar to the study that reported that the meat protein in the breast and thigh of Muscovy ducks was 18.29 % and 20.56 %, respectively [32].

5) Meat Fat Content: Table 3 shows that the meat fat of the first offspring Muscovy ducks from Cirebon, Indramayu, Majalengka, and Kuningan is 8.46%, 6.15%, 5.71%, and 6.89%, respectively. This study found that the meat fat in Cirebon Muscovy ducks was the highest because of the adaptability to the environmental condition, which could lead to stress. In line with Onbaşilar and Yalçin [33], the contributing factors to meat quality were feed quality, duck's activity, and stress level. Furthermore, Castillo *et al.* [3] and Magalhães *et al.* [34] reported a lower cholesterol content in breast meat than thigh meat. Tavernier *et al.* [35] stated that Muscovy duck meat's cholesterol level was lower than that of Pekin ducks and crossbred ducks. The other previous studies reported that older ducks contained more fat [36].

6) Meat Fatty Acids Content: The profile of the meat fatty acid of the first offspring Ciayumajakuning drake is presented in Table 4.

Muscovy ducks meat contained saturated fatty acids, which include palmitic acid and stearic acid [27]. The average stearic acids of Muscovy ducks in this study were not significantly different across treatments. The ranking of average stearic acid (highest to lowest) was Cirebon (7,53%) followed by Indramayu (6,97%), Majalengka (5,82%), and Kuningan (5,52%).

The average palmitic acid of Kuningan drake (13,4 %) was higher than that of Indramayu (13,34%), Majalengka (13,3%), and Cirebon (12,13%) because of the equal nutrition content in feed and the same age of drake. Feeds are the important factors for fatty acid levels in meat [37] because the fat content in feed significantly affects the fatty acid profile in Muscovy duck meat [15].

TABLE IV
THE PROFILE OF MEAT FATTY ACID OF DRAKE

Variables	Drake			
	K1	K2	K3	K4
Crude fat	8.46	6.15	5.17	6.89
Crude protein	16.13	18.19	19.11	19.53
Fatty acid:				
Caprylic acid	0.3	0.4	0.2	0.2
Capric acid	0.2	0.2	0.2	0.2
Lauric acid	0.25	0.29	0.17	0.18
Myristic acid	0.45	0.53	0.42	0.45
Pentadeconoid acid	0.05	0.04	0.05	0.05
Heptadecanoid acid	0.07	0.08	0.05	0.04
Palmitic acid	12.13	13.34	13.3	13.4
Stearic acid	7.53	6.97	5.82	5.52
Arachidic acid	0.18	0.19	0.20	0.21
Behenic acid	0.16	0.17	0.10	0.09
Mirystolic acid	0.02	0.02	0.03	0.02
Palmitoleic acid	0.66	0.78	0.87	0.88
Oleic acid	35.88	37.66	38.44	37.76
Elaidic acid	0.13	0.16	0.13	0.16
Cis-11Eicosenoic acid	0.20	0.20	0.29	0.25
Nervonic acid	0.03	0.03	0.03	0.03
9,4Linoleic acid	7.64	7.47	9.45	10.33
y-linolenic acid	0.02	0.02	0.03	0.02
Linolenic acid	0.36	0.35	0.37	0.26
Cis-11,14-Eicosedienoic acid	0.10	0.11	0.12	0.13
Cis-8,11,14-Eicosetrieconic acid	0.37	0.44	0.13	0.11
Arachidonic acid	1.28	1.27	1.56	1.96
Eicosapentaenoic acid	0.28	0.26	0.10	0.09
Docosahexaenoic acid (DHA)	0.97	01.32	0.36	0.24

The concentration of unsaturated fatty acid (oleic acid) in this study's drake meat is very high. This study reported the highest level of oleic acid in drake from Majalengka (38,44%), followed by Kuningan (37,76%), Indramayu (37,66%), and Cirebon (35,88%). The similar value was due to the equal nutrition content in the feed and the drake's same age across treatments. This result was higher than that of drake fed on soybean meal (30.20%) [32] but lower than 40% [15]. There is a correlation between the high concentration of meat fatty acid with the age of drake. The Muscovy ducks in this study were 24-week-old, while in Baeza *et al.* [32] were 16-week (higher fat content), and in Belghit *et al.* [15] were 8-weeks.

IV. CONCLUSION

The growth and carcass quality performance of Kuningan Muscovy ducks first offspring were better than those Cirebon, Indramayu, and Majalengka. It was reflected from drake vs. duck feed consumption (21,92 kg vs. 14,11 kg),

body weight (3,48 kg vs 2,14 kg), mortality rate (3,17 % vs. 3,53), as well as feed conversion (6.59 vs. 6.30). The other properties included 71,26% carcass percentage, 80,85% edible cuts, 19,15% inedible cuts, 19,53% meat protein, 6,89% meat fat, and 72,58% meat fatty acid profile.

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