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# Interaction Between the Cage Floor and the Variation of Different Fur Colors the Behavior and Against Perfomans of Kampung Super Chickens (Gallus domesticus Sp)

*Interaksi antara Lantai Kandang dan Variasi Warna Bulu yang Berbeda terhadap Perfomans dan Tingkah Laku Ayam Kampung Super (Gallus domesticus Sp)*

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## ABSTRACT

**The Super Kampung chicken has a non-uniform coat color, this is related to the genetics of its parents. Genetics has a relationship with aggressiveness and this must be supported by a supportive cage floor. This study aims to examine the effect of the interaction between variations in coat color and different types of cage floors. The experimental material used was 120 DOC which were maintained for 70 days. This study used a completely randomized design (CRD) with a 5x2 factorial pattern with 10 treatments, namely 5 coat colors (W) and 2 cage floors (L), the treatments were repeated 3 times so there were 40 experimental units. The results showed that there was an interaction between the color of the coat and the type of floor of the cage on the pecking order variable. Color variation had a very significant (P<0.01) effect on roaming behavior, but had no significant effect (P>0.05) on pecking order behavior, feed conversion and performance index. The cage floor treatment had no significant effect (P>0.05) on all variables. The conclusion of this research is genetic such as genes (SORCS2) will be related to the level of aggressiveness. So that there are interactions of these two factors to the intensity behavior of pecking and pecking orders.**

**Keywords: kampung super chicken, floor type of cage, performance, chicken behavior feather color**

## ABSTRAK

**Ayam Kampung Super memiliki warna bulu yang tidak seragam, hal tersebut berhubungan dengan genetik tetuanya. Genetik hubungan dengan agresifitas dan hal tersebut harus di dukung oleh lantai kandang yang mendukung. Penelitian ini bertujuan untuk mengkaji pengaruh interaksi antara variasi warna bulu dengan jenis lantai kandang yang berbeda. Materi percobaan yang digunakan 120 DOC yang dipelihara selama 70 hari. Penelitian ini menggunakan rancangan acak lengkap (RAL) pola faktorial 5x2 dengan 10 perlakuan yaitu 5 warna bulu (W) dan 2 lantai kandang (L), perlakuan diulang 3 kali sehingga terdapat 40 unit percobaan. Hasil penelitian menunjukkan bahwa terdapat interaksi warna bulu dengan jenis lantai kandang terhadap variabel pecking order. Variasi warna berpengaruh sangat nyata (P<0.01) terhadap tingkah laku roaming, namun berpengaruh tidak nyata (P>0.05) terhadap tingkah laku pecking order, konversi pakan dan, indeks performance. Perlakuan lantai kandang berpengaruh tidak nyata (P>0.05) terhadap semua variabel. Kesimpulan pada penelitian adalah Genetik seperti gen (SORCS2) terkait dengan tingkat agresivitas. Sehingga ada interaksi dari dua faktor ini terhadap perilaku intensitas mematuk dan *pecking order*.**

**Kata Kunci: ayam kampung super, jenis lantai kandang, performans, tingkah laku ayam, warna bulu**

## INTRODUCTION

Free-range chicken is a type of chicken that is closely related to people's lives because it is easy to find, especially in rural areas (Sudarmawan *et al*. 2014). Free-range chickens are widely kept in rural areas because they are easy to maintain, their meat is supple and low in fat, unlike broiler chickens. The demand for free-range chicken is very high, but free-range chicken has slow growth, this is a problem, so many people are trying to improve genetic quality through crossing (Sartika 2016).

This crossing aims to obtain a heterotic effect from the positive traits of the parents, including lower mortality, faster growth, better body posture, low feed conversion, and increased resistance to disease. One of the crosses that was successful and developed by the community is known as the Super Kampung Chicken or the Java Super Chicken (Kampung Super). Super Kampung Chicken is the result of this cross (Ismail *et al*. 2021). Super Kampung Chicken can be harvested at the age of 45 to 75 days. Even at the age of two months, the weight can reach 1.5 kg. This is different from the newly harvested free-range chicken after 3-6 months. (Djunu and Saleh 2015).

Super Kampung chickens come from different parents, including laying hens, perong chickens, and bangkok chickens (Kholik 2016). Because of this, the Super Kampung Chicken has uneven coat colors such as black, white, brown, white brown, and spots (black and white). The appearance of coat color is genetically determined by dominant and recessive genes (Johari *et al*. 2009). Black and white are the predominant colors of the cock's tail feathers. The dominant black coat color comes from the Bangkok chicken and the brown coat color comes from the Lohmann Brown strain laying hens.

The result of a cross with the predominant white coat inherited from the oldest White Leghorn breed. Commercial laying hens of the Lohmann Brown and white, white-brown, brown-brown, black-brown and black strains. Black and white color caused by sex chromosome Z. Pelung chickens have a heterozygous $Z^B$ $Z^b$ genotype, while laying hens have $Z^{bW}$ (Hidayatullah *et al*. 2018). The weight of black chickens is higher than white chickens, 838.54 and 759.15 grams, which is related to the function of melamine (Sudaryati 2010).

The color of chicken coat has the function of visual communication and camouflage and varies greatly between species and populations (Matthew *et al*. 2017). Shawkey *et al*. (2009) added that colorful structural colors in poultry are generally produced by the laminar or crystalline arrangement of melanin granules embedded in keratin. The three main compounds involved are L-3.4-dihydroxyphenylalani-L-DOPA, DOPA quinon, DOPAchrome. Poultry pigmentation is based on the synthesis of two types of melanins: eumelanin (brown/black) and pheomelanin (yellow/red). The melanin biosynthesis process, both eumelanin and pheomelanin, requires an enzyme, namely tyrosinase, which is the precursor for tyrosine initiation. Tyrosinase is involved (along with the enzymes TYRP1 and Dct) in the process of melanin synthesis in the melanocyte membrane. The tyrosinase enzyme oxidizes the amino acid L-tyrosine to L-3.4-dihydroxyphenylalanine (L-DOPA) and converts L-DOPA to DOPA quinone. Tyrosinase enzyme also converts DOPA quinone into DOPA chrome, which in turn becomes 5,6-dihydroxyindole (DHI) and 5,6-dihydroxyindole-2-carboxylic acid (DHICA), black and brown melanin, forming eumelanin (Chang 2009).

Pheomelanin production requires presence of cysteine and some tyrosinase activity. When tyrosinase is expressed at low levels, it adds cysteine to dopaquinone to produce pheomelanin. Poultry pigmentation is classified into three types: complete pigmentation, partial pigmentation and non-pigmentation (Hidayatullah *et al*. 2018). Hens have different plumage colors due to differences in melanin pigmentation. The presence and concentration of melanin pigments such as trichochromes is associated with coat color and is believed to represent genetic differences between certain coat colors. Mundy (2005) added that apart from pigmentation, melanin also has the function of body protection, parasite defense, and camouflage.

Particularly in the chicken sector, technological developments continue to increase chicken productivity. However, these developments must go hand in hand with the welfare/comfort of the chickens. International animal welfare is stating that domesticated chicken, including poultry, must not be thirsty, hungry, malnourished, injured, sick, scared, and free to move (Sunarti and Sugiharto 2015). Comfort and discomfort in poultry is reflected in daily behavior (Sunarti and Sugiharto 2015). The color of chicken feathers is associated with aggression and chicken welfare/comfort and affects performance (Nie *et al*. 2019). Hens with black and white plumage are more aggressive than black and white plumage, and white ones are brown. Black and white chickens tend to be more aggressive, and aggressive chickens will definitely get feed more quickly and therefore consume more feed. This will affect the performance of Kampung Super chickens.

The aggressiveness of Kampung Super chickens requires a supportive cage floor. In general, there are two types of cage floors, namely tight and hollow cages. The floor of the cage that is tight is called the litter cage and the floor of the cage with holes is called the slat cage. The advantage of this litter system is that the chickens are free to move so they are not easily stressed in the cage (Setiawati *et al*. 2016). Chickens raised in slat cages cannot move freely, so the nutrients obtained are used for growth of meat not for activity, but sometimes chickens can become stressed and die. The interaction between the type of floor of the cage and the different color of the coat, the behavior of the chicken (roaming and pecking orders), and the performance (feed conversion and performance index) of Kampung Super chickens is not yet known, so it is necessary to do research on this matter.

## MATERIALS AND METHODS

The material used in the study was 120 Super Kampung DOC chickens produced by Berlin farm Yogyakarta from high quality hens (males) from Bangkok

and laying hens of the Lohmann brown strain. 120 DOCs consisting of 24 white, 24 black, 24 brown, 24 yellow and white and 24 spots were grown for 70 days. Homogeneity test was carried out to determine the uniformity of the test material. Data correction was carried out to determine the dominant sex in the study.

The equipment used in this study was a slatted cage floor and a litter cage floor each consisting of 20 pieces of bamboo. The cage is equipped with a place to eat and drink, the length x width x height of one cage package is 60 cm x 60 cm x 50 cm. The tools used for measurement are digital scales with an accuracy of 0.1 g with a capacity of 5 kg, a manual counter (hand tally counter) and a stopwatch. The materials used in this study are commercially available foods with nutritional values in Table 1.

Table 1 . Nutrient content of commercial feed

| Nutrition | Starting Period (BR11) | Finishing Period (BR12) |
|---|---|---|
| Water content (%) | Max 13 | Max. 13 |
| Crude protein (%) | Min 20 | 19-21.5 |
| Fat (%) | Minimum 5 | Min. 5 |
| Fiber (%) | Max 5 | Max. 5 |
| Ash (%) | Max 7 | Max. 7 |
| Calcium (%) | Min 0.8 - 1.10 | Min. 0.9 |
| Phosphorus (%) | Minimum 0.5 | Min. 0.6 |
| Alfatoxin (pbb) | max. 50 | Max. 50 |
| Energy Metabolism (Kkal/kg) | 2900-3000 | 3000-3100 |

Source: PT Cargill Indonesia.

Super free-range chickens that are kept have 5 variations of feather color, namely black, white, brown, black and white (blirik) and 1 day old brown and white. Maintenance was carried out for 10 weeks in different types of cages, namely litter cages and slat cages. The treatment was started when the chickens were 14 days old and lasted 56 days or 8 weeks.

The research design used was a completely randomized design (CRD) with a factorial model (Steel and Torrie, 1993). This study uses the 2×5 CRD factorial, namely:

The first treatment was a variation of feathers color (W) which consisted of:

$W_1$: Black
$W_2$: White
$W_3$: Chocolate
$W_4$: Black and White
$W_5$: White Chocolate

The second treatment was the type of cage floor (L) which consisted of:

$L_1$: Litter
$L_2$: Slat

There are 10 treatment combinations as follows:

$W_1L_1$: Black feathers chicken litter cage floor
$W_1L_2$: Black feathers chicken slat cage floor
$W_2L_1$: White feathers chicken litter cage floor
$W_2L_2$: White feathers chicken slat cage floor
$W_3L_1$: Brown feathers chicken floor of litter cage
$W_3L_2$: Brown feathers chicken slat cage floor
$W_4L_1$: Black and white feathers chicken litter cage floor
$W_4L_2$: Black and white feathers chicken slat cage floor
$W_5L_1$: Brown and white feathers chicken litter cage floor
$W_5L_2$: Brown and white feathers chicken slat cage floor

**Data Analysis**

There were 10 treatments and 4 replications, so there were 40 experimental units. Each experimental unit contains 3 Super Kampung chickens , so it is needed 120 rats and the placement of experimental units was done randomly.

$$Y\ ijk = \mu + W\ i + L\ j + WL\ ij + \varepsilon\ ik$$

Y ijk : Observation of factor W at level I, factor L at level j of the k-th repetition.
μ : middle value of response
W i : The influence of factor W on level i
L j : Effect of factor L on the jth level
WL ij : Interaction of factor W at the i-th level and factor L at the j-th level
ε ij : random effect (random deviation) on factor W level i, factor L level j and repetition k-th

**Parameters observed Roaming (walking)**

Roaming or walking was measured every day by calculating the roaming time for 5 minutes in each cage at 09.00-11.00 WIB for 1 week at the age of 8-9 weeks. Roaming measurements are measured with a stopwatch.

**Pecking order (the activity of pecking other chicken)**

Pecking orders or other chicken pecking activities were measured every day by calculating the intensity of the pecking orders for 5 minutes per cage at 09.00-11.00 WIB for 1 week at the age of 8-9 weeks. Pecking order measurements are measured with a stopwatch.

**Feed Conversion Ratio (FCR)**

Feed conversion can be calculated by comparing feed consumption with body weight gain. Feed consumption and body weight gain were measured using a digital scale brand Electronic Kitchen Scale WH-805 with a level of accuracy of 0.1 g with a capacity of 5 kg. The following is the feed conversion formula:

$$\frac{\text{Feed consumption}}{\text{Body weight gain}}$$

**Performance Index (IP)**

The performance index (IP) can be calculated by comparing the percentage of live chickens multiplied by the average weight (kg) divided by age multiplied by FCR multiplied by 100. The following is the Performance Index formula according to Marbun and Manurung (2020).

$$\frac{\text{Live chicken (\%) x Average weight (kg))}}{\text{Age x FCR}} \text{ x } 100$$

### Time and Place of Research

This research was conducted from 27 June 2022 to 18 September 2022. The research location is Ketapang Farm, Sokaraja Kulon Village, Sokaraja District, Banyumas Regency, Central Java Province.

## RESULT AND DISCUSSION

### Roaming Behavior of Kampung Super Chickens

Roaming behavior (walking) is intended to determine the level of aggressiveness of chicken based on variations in coat color that are kept on different floors of cages in units of seconds. The aggressiveness of chicken is determined by the genetics of its parents, where aggressive chickens tend to have a longer roaming time than non-aggressive chickens.

Average roaming behavior of Kampung Super chickens based on variations in coat color were as follows: $W_1$ (84.070 seconds), $W_2$ (87.075 seconds), $W_3$ (63.488 seconds), $W_4$ (56.921 seconds), and $W_5$ (70.525 seconds). Based on ANOVA it was found that the treatment of coat color variations had a significant effect (P>0.01) on roaming behavior. Feather color in chickens is closely related to chicken genetics. Genetics is related to the character and anatomy of chicken which will ultimately affect the performance of Kampung Super chickens. In the appendix related to shank length, it is explained that there are anatomical differences between black-feathered chickens and other feathered chickens. Black and white feathered chickens tend to have a longer shank than other feathered chickens with an average of 10.25 cm, and 10 cm.

Based on the Honest Significant Difference (HSD) test in Table 2. It can be seen that there is a significant difference between $W_1$ and $W_4$, but there is no significant difference to $W_2$, $W_3$, and $W_5$. $W_2$ is significantly different from $W_3$ and $W_4$, but has no significant difference with W1, and $W_5$. This means that chickens with black, white and brown and white feathers have a longer roaming time, while chickens with brown and black and white feathers have a faster roaming time. When roaming chickens roam freely and consume whatever food they find (Redding 2015). Chicken will get feed when roaming which will later be associated with increased performance of Kampung Super chickens.

Table 2. Roaming Behavior of Kampung Super Chickens

| Color** | Floor type (second)$^{ns}$ | | Average |
|---|---|---|---|
| | $L_1$ | $L_2$ | |
| $W_1$ | 70.94 | 97.20 | 84.070 ab |
| $W_2$ | 91.80 | 82.35 | 87.075 a |
| $W_3$ | 60.17 | 66.80 | 63.488bc |
| $W_4$ | 58.71 | 55.13 | 56.921c |
| $W_5$ | 76.50 | 64.55 | 70.525 abc |
| Average | 71.626 | 73.206 | |

Note : Different superscripts in the column show a significant difference (P<0.05) $W_1$ : Black $W_2$ : White $W_3$ : Brown $W_4$ : Black and White $W_5$ : Brown White $L_1$ : Litter cage floor $L_2$ : Slat cage floor ns : not significant ** : very significant effect

Average roaming behavior of Kampung Super chickens based on the type of cage floor is as follows: $L_1$ (71.626 seconds), and $L_2$ (73.206 seconds). Based on ANOVA data, it can be seen that the type of cage floor has no significant effect (P>0.05) on roaming behavior. The different floor of the cage from the floor of the litter cage and the slat cage floor had no effect on roaming behavior. This is related to the comfort of chicken where both floors of the cages used are equally comfortable for raising Kampung Super chickens. The comfort and discomfort of poultry can be known from the behavior shown in their daily life (Sunarti and Sugiharto 2015).

The effect of the interaction between fur color variations and the type of cage floor also had a significant (P>0.05) effect on roaming behavior. In Table 2. It is found that the longest roaming behavior between the two factors is $W_1L_2$ with a time of 97.2 seconds and the lowest is $W_4$ $L_2$ which is 55.13 seconds. There was no interaction between the two factors on roaming behavior because the type of cage floor had no effect on the length of roaming time. Roaming behavior is more influenced by chicken genetics, chicken that roam for longer get more feed than chickens that roam for less time. Porimau *et al*. (2021) added that feed behavior affects body weight gain because low ration consumption can cause low body weight gain.

### Pecking Order Behavior Kampung Super Chicken

Pecking order behavior in Kampung Super chickens is something that can endanger other chicken. The pecking order of Kampung Super chickens is influenced by the chicken's age, genetics and sex. Chicken aggressiveness is determined by differences in coat color, it is influenced by peck order. Peck order is a social behavior of chickens that begins to appear at the age of 6 weeks and peaks at the age of 8-9 weeks (Sunarti and Sugiharto 2015). Sopian *et al*. (2015) added that, the dangerous behavior of pecking each other as a follow-up action of intensive pecking of feathers.

Table 3. Pecking Order Behavior of Kampung Super Chicken

| Color$^{ns}$ | Floor type (times/5 minutes)$^{ns}$ | | Average |
|---|---|---|---|
| | $L_1$ ** | $L_2$ ** | |
| $W_1$ | 0.000b | 18.000a | 9.00 |
| $W_2$ | 0.000b | 2.500b | 1.25 |
| $W_3$ | 7.000 ab | 0.000b | 3.50 |
| $W_4$ | 7.500 ab | 7.750 ab | 7.62 |
| $W_5$ | 6.750 ab | 1.250b | 4.00 |
| Average | 4.25 | 5.90 | |

Note : Different superscripts in the column show a significant difference (P<0.05) $W_1$ : Black $W_2$ : White $W_3$ : Brown $W_4$ : Black and White $W_5$ : Brown White $L_1$ : Litter cage floor $L_2$ : Slat cage floor ns : not significant ** : very significant effect

Variations in fur color in chickens have to do with the genetic of their parents. Genetic will determine the level of super -native chicken aggressiveness. The color of the fur in chickens has something to do with the aggressiveness and welfare of the chicken, which in turn affects the performance (Nie *et al*. 2019). Shawkey *et al*. (2009)

added that, the structural colors of the colors in poultry are generally produced by the arrangement of laminar or crystals from melanin grains embedded in keratin. Kampung Super chicken aggressiveness is influenced by the genetic of its parents where the genes that affect aggressiveness are sortilin-related VPS10 domain receptor 2 (SORCS2). SORCS2 Gen can contribute to chicken aggressive behavior, this provides new insights about the genetics of aggressive behavior in chickens. The SORCS2 gene interaction lies in the 4th chromosome, shows that chickens (Gallus gallus) Chromosome 4 (GG4) area is the most frequently associated with aggressive behavior (Turner 2014). These results indicate that the interaction containing 17 genes obtained by SORCS2 can affect the expressions of NGF, NGFR, L-Dopa, and Dopamine, and then can play an important role in regulating aggressive behavior of chicken (Li *et al*. 2016).

Based on ANOVA, it was found that there was a very significant interaction (P>0.01) between variations in coat color and the type of cage floor on pecking order behavior. Measurement of pecking order behavior aims to determine the dominance effect of super free-range chickens based on variations in feather color and different types of floor of the cage. The color of the fur in chicken affects the aggressiveness of the chickens and the aggressiveness must be balanced with a supportive cage floor, therefore there is an interaction between these two factors. One of the factors that influence the pecking order is gender. Roosters have the testosterone hormone, the hormone also affects the aggressiveness of the chickens. Partasasmita *et al*. (2020) added that, testosterone is the most important androgen hormone in chickens which is synthesized and released by the testes and is responsible for secondary sex characteristics. The hormone facilitates aggressive behavior such as fighting and group formation. Androgen hormone production increases as birds approach puberty.

Based on the Honest Significant Difference (HSD) test in Table 3. It can be seen that there is a very significant difference between $W_1L_1$ and $W_1L_2$, $W_3L_1$, $W_4L_1$, $W_4L_2$, $W_5L_1$, but not significantly different from $W_2L_1$, $W_2L_2$, $W_3L_2$, and $W_5L_2$. The level of aggressiveness of chickens can be seen from the pecking behavior of other chickens or pecking orders. Chickens that are dominant in one cage plot will certainly have more feed consumption and can improve the performance of Super Kampung chickens. Age, genetics and sex of chicken greatly affect the pecking order. Treatments $W_1L_1$, $W_2L_1$, $W_2L_2$, $W_3L_2$, and $W_5L_2$ tend to have a lower pecking order than $W_1L_2$, $W_3L_1$, $W_4L_1$, $W_4L_2$, and $W_5L_1$. Based on the data correction in the appendix, it can be seen that pecking order behavior in chicken is affected by the number of bulls in one cage plot.

## Kampung Super Chicken Feed Conversion Ratio (FCR)

Feed conversion is an illustration of the efficiency of the feed consumed by chicken and is a determinant of success in a poultry farm. Porimau *et al*. (2021) added that the feed conversion value can be expressed as a measure of feed efficiency, which describes the level of chicken's ability to convert feed into a number of production in a certain unit, both for meat and egg production. The average research results are better than Munira's and Tasses (2016) research. Based on research by Munira and Tasse (2016) found that the average feed conversion for super free-range chickens aged 10 weeks was in the range of 4.091-4.997. However, the research results were worse than the results of conversion of broiler feed such as broiler chickens, where the FCR of broiler chickens was around 0.8-1.5. This shows that the productivity of Kampung Super chickens is lower than that of purebred chickens. Free-range chicken is not efficient with respect to feed conversion (Trisiwi 2016).

The average feed conversion based on coat color variations is as follows $W_1$ (3,566 grams/tail), $W_2$ (3.619), $W_3$ (3.59), $W_4$ (3.624), and $W_5$ (3.694). Based on ANOVA it was found that coat color variations had no significant effect (P>0.05) on feed conversion. This can happen because one of the factors that affect feed conversion is feed. Where at the time of the study each coat color variation was given the same feed so that the feed conversion results had no significant effect. This is in accordance with the statement of Anggitasari *et al*. (2016) Factors that affect conversion include metabolic energy and food substances contained in the feed.

The average feed conversion based on the floor of the cage is as follows $L_1$ (3.603) and $L_2$ (3.634). Based on ANOVA it was found that the type of cage floor had no significant effect (P>0.05) on feed conversion. The average feed conversion on floor litter ($L_1$) tends to be 0.31 lower than the average feed conversion on slat floor ($L_2$). This means that chickens that occupy the liter floor have a better feed conversion value compared to chickens in cages that use a slat floor type.

Table 4. Kampung Super Chicken Feed Conversion

| Color$^{ns}$ | Floor type$^{ns}$ | | Average |
|---|---|---|---|
| | $L_1$ | $L_2$ | |
| $W_1$ | 3.435 | 3.698 | 3.566 |
| $W_2$ | 3.663 | 3.575 | 3.619 |
| $W_3$ | 3.575 | 3.605 | 3,590 |
| $W_4$ | 3.540 | 3.708 | 3.624 |
| $W_5$ | 3.803 | 3.585 | 3.694 |
| Average | 3.603 | 3.634 | |

Note: $W_1$: Black $W_2$ : White $W_3$ : Brown $W_4$ : Black and White $W_5$ : Brown White $L_1$ : Litter cage floor $L_2$ : Slat cage floor ns : not significant

The effect of the interaction between the variation of coat color and the type of floor of the cage also had no significant effect (P>0.05) on feed conversion. Table 4 shows that the lowest feed conversion between the two factors is $W_1L_1$ with a feed conversion of 3.435 and the highest feed conversion value is $W_5L_1$, namely 3.803. Low feed conversion indicates the efficiency of chicken in digesting feed and turning it into meat. Super Kampung chickens with predominantly black feathers tend to be more aggressive than brown and white chickens, this is

related to the genetics of their parents. Aggressive chickens must be balanced with a supportive cage floor so that the chickens do not experience stress and will be related to their productivity.

**Index Performance (IP)**

One of the criteria used to determine the success of raising chickens is IP. Fadillah (2007) added that the greater the IP value obtained, the better the performance of the chickens and the more efficient use of feed. The higher the IP value, the greater the profit. It means that Kampung Super chicken.

The mean IP of Kampung Super chickens based on variations in coat color were as follows: $W_1$ (39.121), $W_2$ (35.499), $W_3$ (34.956), $W_4$ (33.829), and $W_5$ (32.186). Based on ANOVA data, it can be seen that coat color variations have no significant effect (P>0.05) on the performance index (IP). One important component related to IP is the percentage of live chickens. Fitro and Dihansih (2017) added that the performance index value is calculated based on body weight ready for slaughter, feed conversion, harvest age, and the percentage of chickens that live during rearing. Feather color variations do not have a significant effect on IP because all super free-range chickens that are kept have a 100% survival rate, meaning that no chickens die.

The average IP of Kampung Super chickens based on the type of floor of the cage is as follows: $L_1$ (35.659), and $L_2$ (34.577). Based on ANOVA data, it can be seen that the type of cage floor has no significant effect (P>0.05) on the index performance (IP). Chickens reared in litter cages had higher IP than chickens reared in slat cages. However, statistically there was no effect of the floor of the cage on the IP of Super Kampung chickens. This means that Super Kampung chickens of various coat colors can be reared both on litter and slat cage floors.

Table 5. Index Performance (IP) of Kampung Super Chicken

| Color$^{ns}$ | Floor type$^{ns}$ | | Average |
|---|---|---|---|
| | $L_1$ | $L_2$ | |
| $W_1$ | 42.147 | 36.095 | 39.121 |
| $W_2$ | 34.545 | 36.453 | 35.499 |
| $W_3$ | 34.150 | 35.763 | 34.956 |
| $W_4$ | 36.543 | 31.115 | 33.829 |
| $W_5$ | 30.913 | 33.460 | 32.186 |
| Average | 35.659 | 34.577 | |

Note : $W_1$: Black $W_2$ : White $W_3$ : Brown $W_4$ : Black and White $W_5$ : Brown White $L_1$ : Litter cage floor $L_2$ : Slat cage floor ns : not significant

The effect of the interaction between fur color variations and the type of floor of the cage also had no significant effect (P>0.05) on the index performance. In Table 5. it is found that the highest IP between the two factors is $W_1L_1$ with IP 42.147 and the lowest IP value is $W_5L_1$, namely 30.913. The average research results in Table 4. are lower than those of Lopi *et al*. (2020). Lopi *et al*. (2020) added that the average IP value of $F_1$ chickens resulting from crossing different strains was 79.07 ± 1.98 and 77.53 ± 9.62. The low results of all study combinations were due to the high conversion of Kampung Super chicken feed. A high feed conversion value indicates poor feed efficiency, whereas a low feed conversion value indicates a more efficient use of feed by chicken (Aryanti *et al*. 2013).

## CONCLUSION

The color of the feather has something to do with genetic, genetic such as genes (SORCS2) will be related to the level of aggressiveness, so that there are interactions of these two factors to the intensity behavior of pecking and pecking orders.

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