



## **Karakteristik dan Performa Induk Ayam Keturunan Ayam Hutan Merah Pada Masyarakat di Kota Bengkulu**

(Characteristics and Performance of Hens from Red Jungle Fowl Offspring in the Community in Bengkulu City)

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### **ABSTRACT**

Red Junglefowl (RJF) is a germplasm in Bengkulu, living in forests and plantations, and its population is estimated to continue to decline. Domestication has been carried out by the community, and there has been crossbreeding with local chickens and producing offspring. The study was conducted for 4 months in Bengkulu City to identify rearing management of hen, characteristics of hen, production characteristics, and to develop development scenarios. Twenty-seven respondents were used in the study. Data were obtained through observation and interviews, and filling out questionnaires. The data collected were maintenance management of hen, population, body weight, age of first laying eggs, egg production, and egg weight. The results of the study, farmers rearing hen by caged, released, and a combination of both methods. The feed given was local feed (corn, rice, brown rice, cooked rice) and commercial feed BR 1. The maximum weight of the hen was 995.00 grams and the minimum was 600.00 grams, the average was  $738.96 \pm 93.07$  grams, egg production was  $9.68 \pm 2.60$ /hen/period, egg laying period 3.42 times/year, egg weight  $28.56 \pm 5.28$  grams. The initial population was 90 and the final 570, the average length of raising chickens was 9.45 years, an increase of 50.77/year (56.41%). In conclusion, the development of the population of jungle fowl offspring was slow; and the values of body weight, egg production, egg weight were higher than red jungle fowl and lower than native chickens. Development, genetic improvement, increasing the number of parent hens and egg hatching, and improving maintenance management.

Key words: Hen characteristic, performance, red junglefowl offspring

### **ABSTRAK**

Ayam Hutan Merah (RJF) merupakan plasma nutfah di Bengkulu, hidup di hutan dan perkebunan, dan diperkirakan populasinya terus menurun. Domestikasi telah dilakukan oleh masyarakat, dan telah terjadi persilangan dengan ayam kampung dan menghasilkan keturunan. Penelitian dilakukan selama 4 bulan di Kota Bengkulu untuk mengidentifikasi manajemen pemeliharaan dari induk ayam keturunan RJF, karakteristik induk ayam dan produksi, dan menyusun skenario pengembangan. 27 (Dua puluh tujuh) responden digunakan dalam penelitian. Data diperoleh melalui observasi dan wawancara, dan mengisi kuisioner. Data dikumpulkan adalah manajemen pemeliharaan dari induk ayam keturunan RJF, populasi, bobot badan, umur pertama kali bertelur, produksi telur, dan berat telur. Hasil penelitian, peternak memelihara induk RJF dengan cara dikandangkan, dilepasliarkan, dan kombinasi kedua cara tersebut. Pakan diberikan adalah pakan lokal (jagung, beras, beras merah, nasi) dan pakan komersial BR 1. Berat maksimum induk ayam adalah 995,00 gram dan minimum 600,00 gram, rata-rata  $738,96 \pm 93,07$  gram; produksi telur  $9,68 \pm 2,60$ /induk ayam/periode; periode bertelur

3,42 kali/tahun; dan berat telur  $28,56 \pm 5,28$  gram. Populasi awal 90 ekor dan akhir 570 ekor, rata-rata lama memelihara ayam adalah 9,45 tahun, kenaikan adalah 51 ekor ayam/tahun (56,41%). Kesimpulannya, perkembangan populasi keturunan ayam hutan merah adalah lambat; dan nilai bobot tubuh, produksi telur, berat telur adalah lebih tinggi dari ayam hutan merah dan lebih rendah dari ayam kampung. Pengembangan dilakukan untuk meningkatkan produksi dan populasi melalui perbaikan genetic dengan seleksi individu, persilangan dengan ayam unggul, meningkatkan jumlah induk dan penetasan telur, dan perbaikan manajemen

Kata kunci: induk ayam, karakteristik dan performa, keturunan ayam hutan merah

## INTRODUCTION

Red junglefowl is a type of poultry that lives in the wild. In the wild, this species is very adaptable, and is found in various habitats, including: humid forests, secondary forests, dry bushes, and remote forests (Mackenzie, 2017). In Indonesia, these chickens are found in forests, plantation crops, and areas between agricultural crops and plantations (Sutriyono *et al.*, 2016). In nature, these chickens play a role in the food web, namely as prey for carnivores. For humans, these chickens function as game animals, food sources, genetic sources, for ornamental chickens, and sources of income. In their habitat, red junglefowl eat various types of food from plants and animals. Plant food consists of young leaves, various types of seeds, some fruits, and various types of tubers; and animal food consists of several types of insects, worms, and larvae (Nurcholis *et al.*, 2021). Egg production is low and the body is smaller than local chickens, and production is low. Anwar *et al.* (2016) reported that red junglefowl production in Pakistan National Parks was  $5.5 \pm 1.5$  eggs per nest. Compared to local and domestic chickens, red junglefowl have fearful behavior towards humans, much smaller body weight than local chickens, but have brighter colors. Meanwhile, domestic and local chickens have characteristics: diverse genetics, and are able to adapt to various environmental conditions, and are resistant to disease (Hata *et al.*, 2021).

Red junglefowl have been domesticated by communities in several areas, including Bengkulu and its surrounding areas. Domestication is carried out by capturing red

junglefowl in nature, namely in locations around forests, plantation locations, and transitional areas between agricultural crops and forest crops. Chicken capture is carried out using roosters as lures, nets, rattles, and snares (Wahyudi *et al.*, 2017, Setianto *et al.*, 2021). The lure chickens used are roosters from red junglefowl descendants, and the captured chickens are then raised, crossed with local chickens, sold or slaughtered (Setianto *et al.*, 2021). Based on preliminary studies and observations, the catches are male red junglefowl, and are kept in closed individual cages. This is because red junglefowl after being captured are wild and afraid of humans, sudden sounds and lights and other living things. Over time, the fear will decrease. This habituation process makes individual chickens have adaptive characteristics to thrive in an environment regulated by humans (Ferreira *et al.*, 2022). Therefore, in domestication, red junglefowl have experienced morphological changes (Eda, 2022) and life in the form of changes in feed, changes in reproduction, changes in the environment, and changes in behavior as a result of management (Sutriyono, 2021).

In domestication, red junglefowl are crossed with female local chickens. Crossing chickens by putting female chickens in the cage. Crossing red junglefowl with local chickens produces offspring, and red junglefowl offspring produce fetal eggs, incubate eggs, and care for chicks (Sutriyono *et al.*, 2021;

Sutriyono *et al.*, 2022). The resulting chicks are then raised and developed for hobbies, ornamental chickens, production, and business.

In producing poultry, especially chickens, the performance of hens is one of the determinants of chicken production and growth performance. The performance of hens is influenced by several factors, namely genetic and non-genetic factors such as feed management, cage management and maintenance, and disease prevention management are also important factors and have a major influence on production performance. To obtain good performance, the selection of prospective hen and hen needs to be considered in cultivating and developing a chicken farming business, especially local chickens.

Based on the description above, red junglefowl offspring need to be developed to support the genetic preservation of red junglefowl, support food security, community income, and the diversity of poultry species. The chickens to be developed are selected individual chickens that produce high and have a large body weight and are resistant to disease. For this reason, it is necessary to conduct research related to the conditions of chickens kept by the community, especially the performance of the hen. This study aims to evaluate the performance of female red jungle fowl offspring kept by the community in Bengkulu City.

## MATERIALS AND METHODS

The research has been carried out for 3 months in Bengkulu City, Bengkulu. Respondents were determined through two stages. The first stage is looking for people who keep red jungle fowl and their offspring using the snoball sampling method, and record all the keepers of red jungle fowl breeds. The second stage is to determine the research respondents who are determined purposively, namely the keepers of male and female red jungle fowl offspring. Based on this

method obtained 27 respondents. Data were obtained by means of discussions and interviews, filling out a list of questions, farmer's notebooks, and observations; includes respondent characteristics, maintenance management, and chicken performance which includes chicken weight, egg production and weight, egg laying period in a year, number of eggs incubated, incubation time, and production of chicks. Data from survey sites were tabulated and presented in tabular form, and discussed descriptively.

## RESULTS AND DISCUSSION

### *General Condition of Research Site*

Bengkulu City is located on the West Coast of Sumatra, Indonesia and is located at 3<sup>o</sup>45'-3<sup>o</sup>59' South Latitude, and 102<sup>o</sup>14'-102<sup>o</sup>22' East Longitude; and is the capital city of Bengkulu Province. To the north it is bordered by Central Bengkulu Regency, to the south by Seluma Regency, to the east by Central Bengkulu Regency, and to the west by the Indian Ocean. Administratively, Bengkulu city is divided into 9 sub-districts and 67 villages. The population based on the 2020 population census is 373,591 people, 188,624 males and 184,967 females, and the population growth from 2010 to 2020 is 1.87%.

Agriculture is an important sector in the economy of Bengkulu City and contributes quite a lot to the Gross Regional Domestic Product, consisting of several types of activities, namely agriculture, animal husbandry, forestry, and fisheries. The livestock that are cultivated by the community are beef cattle, buffalo, goats, sheep, quail, ducks, broilers, laying hens and native chickens.

### *Characteristics of Respondents*

Respondents in this study were 27 people, namely people who raise red

jungle fowl offspring, and have male and female chickens. The age of the respondents varied, 20% aged 20-30 years, 18% aged 31-40 years, 22% aged 41-50 years, 38% aged 51-60 years, and 2% aged over 60 years. The respondents' education was elementary school (4%), junior high school (10%), senior high school (46%), and college (40%). The respondents' occupations are civil servants (26%), retired civil servants (8%), farming (4%), trading (6%), private employees (6%), and self-employed (50%). Respondents used chickens for crossbreeding (47% of total respondents), chick production (28%), for hunting chickens in the forest (62%), and for ornamental chickens (82%).

### *Chicken Rearing Management*

#### *1. Chicken raising system*

Respondents raise chickens in 3 ways, the chickens (hen, rooster, chicks) were kept in cages during the day and night, released during the day and night, and caged at night and released during the day. Chickens kept in cages during the day and at night are wild chickens, sick chickens, chicks before being weaned, ornamental chickens, hens laying eggs, and hens incubating eggs. Chickens released during the day and night are young and adult tame chickens, weaned chicks, adult chickens that group with local chickens. Chickens released during the day and night have adapted to the surrounding environment, looking for food during the day and returning to the cage by themselves in the evening. This method pays little attention to the health and safety of the chickens. Keeping chickens in a cage is safer and more controlled, food and drinks are easy to provide, prevention and treatment of disease is easy to do. On the other hand, some farmers choose the technique of raising chickens by releasing them in the yard. Some of the reasons are (1) chickens can find and choose feed, so that by releasing chickens they will get sufficient and appropriate food, (2) Chickens are still wild,

according to their natural habitat, chickens are more free to carry out activities and find food, (3) do not have adequate cages. Raising chickens by releasing them in the wild, chicken safety is not guaranteed, chickens are difficult to control, and run to the forest as feral animals.

#### *2. Feeding Management*

Chicken feed provided by farmers is in the form of local feed ingredients and commercial feed. Respondents who gave commercial feed (BR 1) were 81.48%, corn 81.84%, rice 29.63%, rice seeds 3.7%, cooked rice 29.63%, bran 37.04%, crickets 3.7%, and ant eggs 7.41%. Farmers feed chickens in the morning is 7%, in the afternoon 11%, in the morning and evening 78%, and in the morning and afternoon and evening 4%. The time of feeding chickens varies between breeders, namely: (a) morning, (b) afternoon, (c) evening, and a combination thereof. Feed greatly influences the performance of female chickens (hens). Simeneh (2019) stated that feed greatly determines the growth of female chickens. Furthermore, it is explained that providing unlimited feed makes chicken growth faster and the weight of sexually mature female chickens is achieved faster, but female chickens do not lay eggs before the age of laying eggs is reached. Excessive or insufficient feeding will have a negative impact on egg and chick production. Egg weight is higher in chickens that are given unlimited feed. Limited feed during maintenance inhibits the development of the oviduct (Simeneh, 2019).

The time of feeding can affect egg production and quality, reproductive efficiency, and oviposition time (Modu *et al.*, 2014). Egg production, fertility and hatchability of broiler chicken eggs can be achieved by feeding chickens twice a day,

Table 1. Characteristic and performance of hens of red jungle fowl offspring

No	Parameter	Maksimum	Minimum	Average	SD
1	Number of hens			53	
2	Hen's body weight (grams)	995	600	738.96	93.07
3	Age of the hen laying her first egg (months)	8	5	6.31	0.77
4	Egg Production (egg/hen/period)	14	5	9.68	2.6
5	Egg weight (grams)	39	20	28.56	5.28
6	Egg-laying (period/year)	6	2	3.42	1.00
7	Number of eggs incubated (egg)	12	5	9.73	2.17
8	Length of time the hen incubates the eggs (days)	21	20		
9	Number of eggs hatched (egg/hen/period)	12	5	8.41	1.88
10	Production of chicks (hen/period)	12	5	8.41	1.88
11	Weight of chicks 1 to 2 days old (grams)	32	15	20.92	7.35
12	Age of chicks weaned or separated from the hen (weeks)	16	1	5.97	4.41

25% during the day and 75% in the afternoon (Soltanmoradi *et al.*, 2013).

Feeding chickens with high frequency can fulfill feed requirements, chicken health and safety and the environment are controlled. If feed requirements are met and environmental conditions are suitable for chickens, then growth and production and reproductive performance will be better. Increasing feeding frequency will improve production performance in broiler chickens and can improve production and reproductive performance at the beginning of the egg-laying cycle. Emous and Mens (2021) reported that feeding twice a day is better than once a day, feeding and drinking times throughout the day, and egg production is higher.

Farmers give one type of feed is 7%, two types of feed are 30%, three types of feed are 41%, and 4 types of feed are 22%. Feeding with the number of types is getting better. Chickens can accurately select a nutritional balance to meet specific physiological needs (Pousga *et al.*, 2005). In addition, if the chickens are given the opportunity to choose sufficient and easily available feed, the chickens will be healthy and productive, the

digestive tract will develop normally and the immune system will be better. Low availability of feed ingredients causes poultry to choose less feed, and can affect the nutritional intake needed by chickens, which will have an impact on the growth performance, production and reproduction of red jungle fowl. Nurcholis *et al.* (2021) reported that jungle fowl eat animals and plants. The types of animals eaten are insects (*Ryllidae*, *Isopetra*, *Ofilamentosum*, *Rhynchophorus ferrugineus*, *Oecophylla smaragdina*, *Hymenoptera*, *Coleoptera*, *Chilopoda*, *Araneida*, *Nematoda*). While the food from plants is *O. filamentosum*, *Oncosperma tigillarum syn tree fruit*, *Ulin tree fruit*, *Oil palm fruit*, *Puspalum sp leaves and seeds*, *Cyperus seeds*, *Panicum nodosum seeds*, *Unidentified weed seeds*,

#### Characteristic and Performance of hens of red jungle fowl offspring

In this study, the performance of the hen from the red jungle fowl offspring was measured based on body weight, age at first laying, egg production, egg weight,

egg laying period, number of eggs incubated, length of incubation, number of eggs hatched, hatching weight, and age of chicks weaned or separated from the hen (Table 1).

Table 1 shows that the weight of the chicks of red jungle fowl in this study varied, the highest was 995 grams and the lowest was 600 grams, an average of  $738 \pm 93.07$  grams. Body weight affects the growth of chickens and their offspring. Chickens with heavy body weight have a higher chance of producing chickens with high growth rates (Tan *et al.*, 2014).

The first time the red junglefowl offspring laid eggs in this study was  $6.31 \pm 0.77$  months, the earliest was 5 months and the latest was 8 months (Table 1). In the poultry industry, age at first laying eggs is one of the important reproductive indicators in chickens (Haiping *et al.*, 2011), and delayed puberty has negative effects on the reproductive system of female chickens, especially on ovarian function (Han *et al.*, 2016). Individuals who experience premature sexual maturity due to abnormal ovulation function in the early stages and this negative effect will affect the entire cycle of egg production (Fuqua, 2013).

Egg production varied, from 5 to 14 eggs/hen/period, the average was  $9.68 \pm 2.6$  eggs/hen/period. The minimum egg weight is 20 grams and the maximum is 39 grams, an average of  $28.56 \pm 5.28$  grams. The hen's egg-laying period is 2 to 6 times per year with an average of  $3.42 \pm 1.00$  egg-laying periods per year. The number of eggs incubated was at most 12 and at least 5 eggs/hen/period, an average of  $9.73 \pm 2.17$  eggs. Chicks production is 8 chicks/hen/period, maximum 12 and minimum 5 chicks or 27 chicks/hen/year; with the average chick weight was  $20.92 \pm 7.35$  grams, the highest was 32 grams and the lowest was 15 grams. Chicks are weaned or separated from the hen at 1 to 16 weeks. Chicken egg production is influenced by many factors, namely chicken age, feed consumption (quality and quantity), water intake, intensity and duration of light received,

parasites, diseases, management, and the environment (Jacob *et al.*, 2018). In this research, there were differences in chicken age, chicken rearing management, food, different environmental conditions, and rearing systems. These conditions will affect the performance of the hen. Egg weight is influenced by feeding, age of the chicken, environmental factors, type of chicken, live weight of the chicken, and genetics (Nonga *et al.*, 2010). Apart from that, the chicken rearing system will affect the quality of the eggs (Ahmad *et al.*, 2019). Egg weight from wild rearing systems is influenced by nutritional factors and the surrounding microclimate (Sekeroglu *et al.*, 2008). In environmental conditions that support the needs of chickens, their needs will be met, so that egg production and quality will be better.

#### *Population development*

The population development of red junglefowl offspring is slow. The total initial population was 70 chickens and the final population at the time of the study was 570 chickens, the average maintenance period was 9.45 years or an increase of 51 chickens/year. This value is very low when compared to births per year. The average chick production is 8.41 chicks/hen/period, the average brooding frequency is 3.42 times/year. The estimated chick production per year is 28.76 chicks/hen/year. The low population development is caused by death, being eaten by predators, and being consumed. Chicken deaths can be caused by disease and accidents, being eaten by predators due to lack of control and protection of chickens, and being consumed because they have reached slaughter age and the chickens are old. Several scenarios can be carried out for population development, namely improving maintenance management

(genetic improvement of chickens, improving feed and cages, controlling chicken health and safety).

## CONCLUSION

The development of the red junglefowl offspring population is relatively slow; body weight, egg production, egg weight are higher than pure red junglefowl and lower than native chicken. Development and improvement of performance can be done by genetic improvement through individual chicken selection and crossing with superior chickens, increasing the number of parent chickens and egg hatching, and improving maintenance management.

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