

Productivity diversity of Sensi 1 Agrinak chicken crossed with KUB Chicken

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Abstract. Bali Island has been a tourist destination, always lacking in the supply of native chicken, both chicks and ready to cut. For that, Bali Assessment Institute Of Agriculture Technology (BPTP Bali) took the initiative to develop superior native chicken breeding to overcome the existing gaps. KUB Chicken and Sensi 1 Agrinak are superior chicken produced by Agency Animal Research Ciawi Bogor. KUB chicken, which stands for superior native chicken from the Indonesian Agency for Agricultural Research and Development, is the result of selection of native chickens in Indonesia for female line and Sensi 1 Agrinak, which are 6 generations from male line. Sensi 1 Agrinak (Male line) with KUB (Female line) is then crossed to produce native chicken chicks that have superiority in both egg and meat production. The study was conducted in Jehem Village, Bangli Regency. Using 300 KUB chickens (male line) and 80 tails Sensi 1 Agrinak (female line). Maintenance is carried out in a letter enclosure between males and females mixed to facilitate marriage among them. The feed given is chicken feed which is producing with a composition of 40% corn, 35% bran and 25% concentrate. The results of the study show male weight averages 1,718 grams/head with a range of 1,595 - 1,830 grams/head, while females (KUB) average 1,233 grams/tail with a range of 1,210 - 1,420 grams/head. Daily egg productivity (Henday) reaches 45% with an average egg weight of 44,81 g/grain with a range of 32-50 g/grain. The egg fertility produced reached 83.67% with the number of eggs hatching 71.84% and those that hatched in normal conditions reached 93.89%. Mortality is still high at 17.93%, with an average weight of newly hatched chicks (DOC) of 32.23 g/head.

1. Introduction

Native chicken is one of the providers of animal protein that is still much in demand and in demand by the people of Indonesia. Local/Native chicken is a potential genetic resource as a provider of meat and eggs [1]. In Bali, free-range chicken, as well as consumption material, is also widely used as a ceremonial ingredient. Currently the population of free-range chicken in Bali reaches 3,263,391, only 19.77% of the total number of chickens [2]. The current population continues to decline, this year it declined 17.18% compared to the previous year. And in the last 5 years, it has decreased to 20.70%. Similarly, the production of livestock products, for Native Chicken meat for 2017 reached 3,769.20 tons, down 20.69% compared to production in 2013 [3]. The contribution of Native Chicken to poultry meat production is

quite high [4]. The large demand for poultry products in the form of meat and eggs has not been able to be fulfilled by poultry farmers, especially if the demand is large and continuous. On the other hand the demand for Native Chicken meat from year to year continues to increase [5]. This is in line with the increase in income per capita which will have an impact on the quality of consumption, in addition to the increasing number of residents and tourists who come to visit Bali.

In Bali, in addition to being used as an ingredient in consumption of Native Chicken, it is widely used as a material for religious ceremonies, including being used as a fighting chicken. Communities in Bali have had difficulty finding free-range chicken seeds.

The quantity of poultry farming in Indonesia has been so rapid. In the context of poultry, advancing public welfare, it can be seen that until now the poultry industry can provide employment in both cities and villages up to 2.54 million workers. If every one worker supports four family members, then this poultry can provide as much as 10 million lives [6]. The low productivity of local livestock is influenced by several factors, one of which is due to the provision and use of superior livestock breeds at affordable prices by farmers are still difficult to obtain. However, more massive development needs to be addressed more focused in government programs that are in synergy with the private sector, as well as the farming community, so that the superior livestock breeding process is sought after by the small and medium enterprises. Livestock seeds have a very strategic role in the livestock production process, so that the availability of livestock seedlings is needed continuously, both in quantity and quality. The IAARD has assembled and released new superior varieties and strains of livestock, but which farmers use are still limited so that intensive efforts are needed to socialize these superior varieties and strains.

The success of technology dissemination in utilizing superior new varieties and strains, among others, is determined by the ability of the livestock seed industry to supply up to the hands of farmers. Therefore, the existence of a robust (productive, efficient, competitive and sustainable nursery system) is needed to support efforts to increase production and quality of livestock products. In an effort to respond to the technological needs of superior chicken breeding, the Animal Research Institute has conducted various research activities on native chickens. The results of the study show that through selection technology accompanied by a maintenance system that is intensified, productivity can be improved.

From the results of this selection produced superior chicken called Superior Chicken Village Research and Development Agency (KUB Chicken), for layers that have been officially issued through the Minister of Agriculture Decree Release of KUB-1 chicken lines, no 274/Kpts/SR.120/2/2014 [7] from female line while for broiler also produced superior chicken which is named SENSI 1 Agrinak (Sentul terseleksi).

Agroforestry SenSi-1 Chicken is proclaimed as Balitnak's superior chicken in 2017 through Decree of the Minister of Agriculture No. 39/Kpts/PK.020/1/2017 on January 20, 2017 concerning the release of SenSi-1 Agrinak chicken strains [8]. SenSi-1 Agrinak chicken this agrinak was the result of a six-generation male line selection study. With the results obtained there will be a type of superior native chicken that will develop in the community. Since 2018 the development of this excellent native chicken has been carried out and the results of the crossing have been observed to determine the productivity maintained in the community.

2. Material and methods

2.1. Place and time

The study was conducted in Jehem Village, Tembuku Subdistrict, Bangli Regency, during 11 months from February to December 2018.

2.2. Materials and tools.

The ingredients used were 300 female parent and Grand Parent Kerbs and 60 male Parent Agrinak, the ratio between male and female is 1: 5, this is an ideal comparison to produce good hatching eggs. Other materials are hatching machines with a capacity of 2250 grains per hatching period, letter cages to accommodate the parent, which are equipped with perches, laying places, feed and drink places, feed, heaters (gasolec), trays, egg observation devices, and room temperature, and automatic hatching machines used to incubate eggs with a capacity of 1050 grains per hatch.

2.3. Research methods

Chickens are placed in a letter enclosure with a size of 5 x 4 meters each filled with 60 KUB females and 12 Sensi 1 Agrinak males. with 5 cages, the total number of parent is 300 KUB mothers and 60 male Sensi 1 Agrinak. All mothers, both male and female, have received a complete vaccine. Marriage between male and female is done naturally and feed is given with a ratio of 25% concentrate, 45% corn and rice bran 35%. Feed is given twice a day with a range of 100 grams/head/day and water is given in ad libitum. Egg collection is done twice a day at 10 a.m and 4 o'clock in the afternoon. This is done to reduce the level of bacterial pollution in the eggs to be hatched. To calculate Henday, the number of eggs obtained is divided by the number of days taken 100 times. Whereas observation of fertility is done by observation using a telescope with lights inside. Fertility calculation is done by counting the number of fertile eggs compared to the number of eggs entering the hatchery as a whole.

In this case also differentiated between KUB chickens and Sensi 1 Agrinak, to find out the difference.
 - Morbidity Is the number of animals attacked by disease divided by the total number of livestock (%)
 - Mortality Is the number of deaths divided by the total number of livestock (%)
 - Henday Daily egg production is observed every day
 - Fertility Is a positive fertilized egg after fertilization, observed after 7-10 days after entering the hatching machine. It is the number of chicks that can be hatched in one hatching period from the number of fertilized eggs [8]. The data obtained will then be processed and analyzed descriptively and the percentage using Microsoft Excel.

3. Result and discussion

3.1. Native chicken population in Bali

The population of free-range chicken in Bali is 3,263,391, spread across 9 regencies/municipalities. The largest population is in Buleleng regency, which is 853,857, followed by Badung and Gianyar regencies, respectively 507,424 and 504,315 [2].

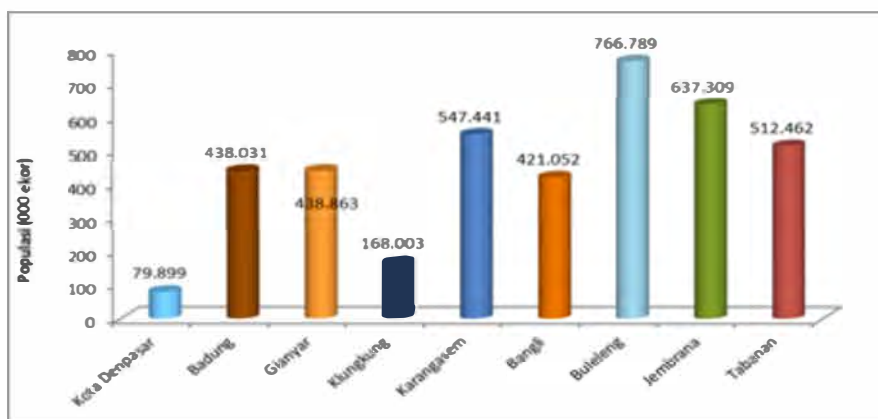


Figure 1. Population of Native chicken in the province of Bali

For Bangli district where the activities carried out only had 335,863 native chicken populations, it was in the 5th place out of 9 regencies, but had a willingness to increase the population of native chickens, especially about nurseries which had not been available. When compared to the population of Ras chickens, which amounted to 16,505,743, domestic chicken was only 19.77% of the existing chicken population (Disnakeswan, 2017a).

With a much lower number than broiler chickens and the number decreasing from year to year and increasing needs, technology is needed that can increase productivity and produce free-range chicken seeds independently.

3.2. Parent weight

Growth Maintained weight which will be used as a parent to produce tillers as shown in Figure 2. Where birth weight Sensi 1 Agrinak (male) is 31 with a range of 29 - 33 grams/head while the parent weight of KUB (Female) average is 30 with a range 28 - 31 grams/head. Sensi 1 Agrinak (male) growth is faster than KUB (female), seen from the growth of 10 weeks old male stud reaches 880 grams/head while females only reach 635 grams/head. Similarly, after reaching the age of 20 weeks where males weigh up to 1712 grams/head with a range of 1595-1830 grams/head while females weigh 1233 grams/head with a range of 1210 - 1420 grams/head. The average initial weight achieved for both males and females is the standard DOC weight or ideal for domestic chicken.

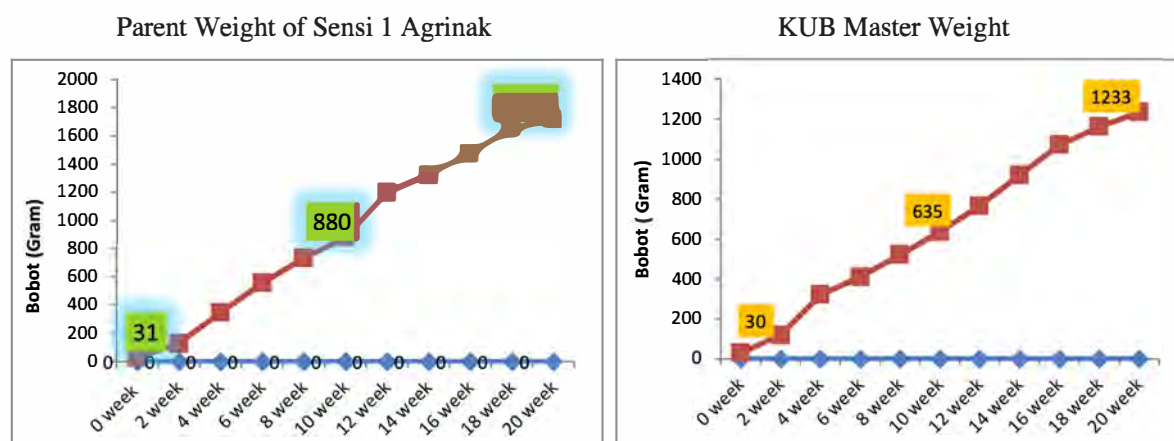


Figure 2. Sensi 1 Agrinak (male) and KUB (female) parent weights

3.3. Feed intake

For broodstock which will produce tillers are given feed with 35% Bran feed ingredients composition, 40% corn while 25% concentrate, from the results of this feed composition analysis has a nutrient content of 89.19% dry ingredients 9.81% ash, 90.19% organic ingredients. While the crude protein content reached 18.84%, and crude fat was 6.69% and crude fiber content and GE calories were 7.40% and 3.69 kcal/g, respectively.

The provision of feed with a crude protein content of 18.84 is in accordance with the standard, where the average protein content of feed for free-range chicken that is currently producing is 17-18%, while the difference in the provision of protein rations at the level of 19% with 21% did not significantly affect body weight and feed conversion in Pelung chickens [10]. The average feed consumption of chickens (male and female) per day reaches 96-100 grams/head/day. For KUB chickens the feed consumption reaches 80-90 grams/head/day while for males (Sensi 1 Agrinak) the feed consumption reaches 90-100

grams/head/day. Consumption of males is higher than that of females because male weight is higher than females as well as the activity of male chickens is more active than females.

KUB chicken feed reached an average of 85-90 grams/head/day [11]. While consumption of domestic chicken in general is very varied, Pelung chicken in the village that is maintained intensively until the age of 12 weeks consumes feed reaching 40.51 grams/head/day [6].

3.4. Daily Egg Production (Henday)

Daily egg production (Henday) in this study showed that at the beginning of production it was still low at 24% but the longer the production increased along with the maturity of the mother and after the 4th week began to look stable and chicken productivity Sensi 1 Agrinak crossed with KUB reached 43 - 44%. KUB egg production at the beginning of the study reached 43.08% [12]. KUB chickens were able to produce eggs 44.33±15.63% in the first 24 weeks of production [13]. However, it is slightly lower than the chicken productivity of KUB reported by Tike Sartika, that the range of KUB chicken productivity is 44-70% with an average of 50%, [11] which is delivered in the Puslitbangnak Technical Guidance. This can be caused because KUB chicken is a type of laying chicken used as a female line while chicken Sensi 1 Agrinak which is used as another male is a type of broiler.

Table 1. Daily Egg Production (Henday) of KUB chickens that are crossed with Sensi 1 Agrinak

No	Production time	Daily production	Minimum prod.	Maximum prod.	Percentage (%) (Henday)
1	Week 1	72	60	84	24
2	Week 2	111	90	121	37
3	Week 3	126	112	142	42
4	Week 4	135	110	155	43
5	Week 5	138	129	160	44

3.5. Fertility

Fertility shows that eggs are produced by fertile female parents which means they get fertilization from the male. Fertility achieved from the results of crosses between Sensi 1 Agrinak chickens and KUB chickens showed results like Table 2. The highest fertility reached 91.48% while the lowest fertility was 86.91%. This fertility is high, which is an average of 88.34%, this shows that high fertility due to the occurrence of marriage between males (Sensi 1 Agrinak vs female KUB) is effective. Placement between males and females with a ratio of 5: 1 and a letter cage model is very effective. So that the resulting fertility is quite high.

Table 2. Egg fertility resulting from crossing Sensi 1 Agrinak X KUB

No	Number of eggs hatched (grains)	Fertility (grains)	Fertility (%)	Infertile (grains)	Infertile (%)
1	993	863	86.91	130	13.09
2	343	299	87.17	44	12.83
3	704	644	91.48	60	8.52
4	352	309	87.78	43	12.22

Fertility of Arabian chickens was 79.17% with sex ratio 1:5 while the ratio of 1:7 between males and females obtained lower fertility of 62.50% [14]. This data shows that crossed chicken fertility between Sensi 1 Agrinak and KUB is higher than Arab chickens with the same ratio between males and females.

3.6. Hatchability

The hatchability of eggs in this study is the number of eggs that hatch from fertilized eggs. The average reached 83.03% with the highest variation of 90.94% and the lowest at 77.59% (Table 3). The hatchability achieved was relatively the same compared to that achieved by [15] where hatchability was achieved at an average of 83.75±15.46% in hatching hens with a combination of 7-day Muscovy duck hatching while the hatching combination the 10-day policy is 71.41±15.48%. Based on the results obtained by [14] that hatchability does not significantly affect the sex ratio between male and female where the results obtained are the average percentage of male and female arab sex ratio hatchability of 1: 5 (61.9%), 1:7 (76, 67%), and 1: 9 (56.25%). The results in table 3 also show that chickens born dead both those that are still wrapped and those already outside the egg reach an average of 13.86%, while those born with disabilities such as abnormal feet reach an average of 5.45%, one of which the cause is due to the influence of the hatching machine, especially the unstable moisture.

Table 3. Hatchability of eggs from the crossing of Sensi 1 Agrinak X KUB

No	Hatched Egg Amount (grains)	Hatch (grains)	Hatch (%)	Born dead (Wrapped)	Born dead (%)	Birth defects (tail)	Birth defects (%)
1	993	739	85.63	124	14.37	0	0.00
2	343	232	77.59	67	22.41	17	7.33
3	704	502	77.95	80	12.42	62	12.35
4	352	281	90.94	22	6.25	6	2.14

4. Conclusion

Weight Sensi 1 Agrinak (Male line) adult age 20 weeks is 1720 grams/head while female parent KUB (Female line) is 1233 grams/head. Daily egg productivity (Henday) from crossing between Stud Sensi Agrinak 1 and KUB female is 43-44% Fertility achieved is quite high 88.34% and hatchability reaches 83.03%. With high productivity, fertility and hatchability, the development of chickens is very promising in the future.

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