

PROSIDING

INTERNATIONAL SEMINAR

*"The Role and Application of Biotechnology on
Livestock Reproduction and Products"*

Hotel Pusako Bukittinggi, West Sumatra
June 28-29, 2009



Organized By:

Livestock Services of West Sumatra Province
Jln. Rasuna Said No. 68 Padang
June, 2009

SEMINAR PROGRAM

Day-1 (Sunday, June 28, 2009)

Room: 1

Time	Activities	Moderator/ Coordinator
14.00–19.00	Registration	Desrianti, Ir, Eka Syawalia (MC)
20.00–22.00	Wellcome Party	Edwardi, Ir., MM

Day-2, June 29, 2009

Room : 1

Time	Activities
09.00–09.05	Opening Speech of Chairman OC Seminar: DR. Ir. Sarbaini, MSc
09.05–09.10	Opening Speech Head of Livestock Services of West Sumatra
09.10–09.25	Opening Speech Governor of West Sumatra
09.25–09.50	Opening Speech Ministry of Agricultural of Indonesia
09.50–10.05	Coffee Break
10.05–12.00	Plenary Session I Moderator: Sarbaini, Dr, MSc, Ir. Chairman Malaysian IMT-GT Delegation Chairman Thailand IMT-GT Delegation Prof. Dr. H. Harimurti Martojo, MSc (IPB, Bogor) Prof. Jothy Malar Panandam, Ph.D (UPM, Malaysia)
12.00–13.00	Lunch Break/Praying/Poster Viewing
13.00–14.15	Plenary Session II Moderator: Prof. Dr. Ir. Yose Rizal, MSc Dr. drh. Fachruddin (IPB, Bogor) Dr. Frank Muller Schlosser (Minitube Germany) Prof. Dr. Suheimi Mustafa (UPM Malaysia) Prof. Drh. Hj. Endang Purwati, MS., Ph.D (Unand)
14.15–15.15	Plenary Session III

Day-2, June 29, 2009

Room : 2

Time	Activities
15.30-16.30	Paralel Session Moderator: DR. Ir. Hendri, MS Fridarti, S.Pt., MP dan Irwandi (UNITAS) Johan Setianto, Warnoto and Nurmeiliyasari (UNIB) ✓ Warnoto and Johan Setianto (UNIB) ✓ Feri Lismanto (Unand)
16.30-17.00	Paralel Session Moderator: Dr. Ir. Jaswandi, MS Hermon (Unand) Zulkarnaini, Mardiat Zain, N. Jamarun (Unand) Rusmana WSN and Khasrad (Unand) Khasrad and Rusmana WSN (Unand) Rusfidra (Unand)

The Characteristic of Egg Production and Reproduction of Various Crossbreeding Offspring Between Burgo Chicken With Nature Chicken

Warnoto and Johan Setianto

Department of Animal Science, Faculty of Agriculture, University of Bengkulu
Jalan Raya Kandang Limun, Bengkulu. Telp. (0736) 2170 ext.219.

ABSTRACT

The objects of the research were 300 female chicks, offspring from 4 different crossbreds of Burgo chickens with Nature chickens. The research was aimed to achieve the best crossbreds between Burgo chicken with Nature Chicken by using Burgo Chicken's genetic as the offspring of Red Forest Chicken (*Gallus gallus*) to increase the egg production of Nature chicken. The various crossbreds are 1). Nature Cock with Nature Hen; 2). Nature Cock with Burgo Hen; 3). Burgo Cock with Nature Hen; 4) Burgo Cock with Burgo Hen. The reproduction parameters measured were age of puberty, body weight at puberty and clutch. The Egg production measured were egg weight, egg production/60 days and weight of DOC. The experimental results showed that Burgo chicken can be crossbred with nature chicken although the size of Burgo chicken relatively smaller. This crossbreeding method of nature cock with Burgo hen and Burgo cock with nature hen could increase the egg weight. It is suggested to use Burgo hen with nature cock for a better egg production.

Key word : Burgo chicken, puberty, egg weight, egg production, reproduction

Introduction

Nowadays poultry effort had found many obstacles such as the increasing cost of production, especially in feedstuff and breed. To fight that obstacle, diversification effort was mostly needed. One of this diversification effort that could have been done was supplying superior local poultry that capable to be breed in minimum condition. It's needed to explore the potency from potential fowl to increase the fowl diversification production. One of the fowl that had the potential to be cultivated is Burgo Chicken.

Burgo Chicken was the result of cross-mating method between Red Jungle Cock (*Gallus gallus*) with Native Hen (*Gallus domestica*) (Warnoto, 2000). This cross-mating method had produced new species that had superiority. Superiority that Burgo Chicken have were the resistance of many kinds of disease, high egg production, attractive feather color and specific hi-pitched crow.

Warnoto (2001) clarified that Burgo Hen had high egg production that approximately lay around 16-18 eggs a period and the interval between egg production was relative short, approximately around 7-10 days compared to Native Hen that usually laid 10 eggs a period with the laying period interval interval approximately around 14-30 days. However, with this big amount of eggs produced, the weight of egg that was produced was light with an average weight that was approximately around 30 grams each from the interval of 25-35 grams. Low egg weight was correlated to the average weight of Hen that was usually around 750 grams a hen. Another characteristic that was beneficial as local layer, the sexual maturity of Burgo Chicken was around 4-5 month, shorter than Native Chicken's that was around of 5-7 month.

Until at the present time, Burgo Chicken still become the only one that have a lot of admirer as decorative chicken and in the chicken's crow competition Burgo Chicken also become favorite because of its good sound, hi-pitched and special. From the previous research, it's known that Burgo Hen had a big potential to be layer (Warnoto, 2002). The total of annual production amount doesn't have much difference with the total annual production amount of Native Chicken if it compared. However, this high production total amount was not get along with the egg weight. The egg weight was lighter than the weight of Native Chicken's Egg. That's why, it's needed to find an alternative to produce a better egg, especially on its weight. One of the ways to do it is increasing the genetic quality by cross-mating method.

The research was aimed to obtain the cross-mating model between Burgo Chicken and Native Chicken by using Burgo Chicken's gene to increases the Native Chicken egg production by its cross-mating result.

Research Method

The object of this research were Burgo Chicken and mature Native Chicken as the elder, that was consist of 24 Burgo Hens, 6 Burgo Cocks, and

24 Native Hens, 6 Native Cocks. The elder chicken than grouped in 4 groups of mating such as :

- P1 = Mating group of Native Cock with Native Hen
- P2 = Mating group of Native Cock with Burgo Hen
- P3 = Mating group of Burgo Cock with Native Hen
- P4 = Mating group of Burgo Cock with Burgo Hen

Each mating group consists of 3 postal coops. Each postal coop was filled by 5 elder chickens which means there were 1 Cock mate with 4 Hens. Each chicken were identified clearly so that there won't be a mate changes.

The elder chickens were raised for a month to be given the chance to mate. Elder chickens were raised intensively by *ad libitum* feeding. Feeds that were given are corn, mixture of rice and bran, and concentrate with the composition of 40:30:30.

The eggs withdrawn from each postal coop was done every day and identified by its mating group. The eggs that had been collected hatched in every 7 days after withdrawn by incubator. Inside the incubator, these eggs were divided according their mating group with gauze wire as its borders for each egg (6 cm x 5 cm). This bordering started from the 18th day of hatching.

All of the chicks that hatched were used as the object material of the observation so that when it hatched the DOC was identified by the egg identity, than it is raised intensively until twice laying periods (around 5-6 month).

The variables that would be observed along the research that will be taken from the Hen offspring (300 chickens) were weight of DOC, the growth of weight until its sexual maturity, weight at sexual maturity, age of sexual maturity, egg weight and the laying period interval.

All of the variables that were observed was analyzed with Random System Program (Nested). If there were real differences at the variant analysis, than it will be continued by the different average test with Duncan's Multiple Range Test (DMRT).

Result and Discussion

Production characteristic

Egg's weight average, total amount of the eggs, and weight of chicks from each elder's mating group since it's still an egg until 3 month old subscribed in table 1. The average egg weight of the elder chickens that was subscribes in the table 1 was the average egg weight of the elder chickens before the cross-mating result. This variable represented as a comparison object to the average egg weight of its offspring, especially the offspring of KB mating group (Native Cock with Burgo Hen) and the offspring of BK mating group (Burgo Cock with Native Hen), while the mating group of KK and BB are the homogeny mating between Burgo Chickens and Native Chickens.

Table 1. Egg weight average, body weight, egg production based on the elder's mating group:

Variable	Mating groups			
	KK	KB	BK	BB
Egg weight of elder's (g)	45,07 ^a	30,75 ^b	44,98 ^a	31,08 ^b
DOC weight (g)	35,03 ^a	22,24 ^b	34,97 ^a	22,86 ^b
Body weight of female (3 month old) (g)	917,04 ^a	758,02 ^b	898,65 ^a	576,43 ^c
Egg weight of Offspring (g)	45,38 ^a	29,70 ^{b,c}	36,98 ^b	22,73 ^c
Egg production (60 days)	25,32 ^b	28,44 ^{a,b}	26,21 ^b	32,67 ^a

Explanation: Differences of Superscript in the same row were significant difference ($P<0,05$)

KK = Mating between Elder Native Cock with Native Hen

KB = Mating between Elder Native Cock with Burgo Hen

BK = Mating between Elder Burgo Cock with Native Hen

BB = Mating between Elder Burgo Cock with Burgo Hen

Average egg weight of Native Hen (KK and BK) was significantly heavier than the average egg weight of Burgo Hen. Low egg weight was related to the body shape of Burgo Hen that was relatively smaller than Native Hen's that makes Burgo Chicken's Egg had less demand upon the society. However, from previous observation (Warnoto, 2000) it was known that intensively well-raised Burgo Chicken had bigger period of laying that produce more eggs and had better reproduction characteristic as layer than Native Chicken's. It is hoped that its cross-mating offspring will inherit the advantageous combination characteristic from both species of its parent.

The light weight of Burgo Chicken produces significantly smaller DOC's weight than the DOC's weight from the Native Hen's. Observations result informed that DOC's weight had a high correlation ($r>0.8$) with the egg's weight. The more weight that the egg had, the more weight the DOC will had. It's happened because there was more embryo food supply was served inside the egg.

Average weight of egg, 3 month old weight, and total amount of eggs in 60 days shown a very interesting variants that was resulted after the cross-mating. Cross-mating result of the elders (KB and KK) could increase the average weight of the egg and the offspring chick compared to the offspring of the monogamy's mating (BB) but, the result was still below the other monogamy's mating (KK). On the contrary, the 60 days in egg production, the

production of the offspring of KK and didn't have a real differences with BB mating group. Changes that resulted to the offspring from the cross-mating method were the heterocyst effect from additive gene that resulting the average characteristic from both cross-mated parents. However, there are some cross-mating that could resulted better certain characteristic upon the offspring from both of its parents. This changes happened because of the effect of the dominant gene works or the over dominant gene (Warwick, et. al, 1984).

According to the result that was obtained from some of the variable in table 1, it could give the basic information to determine the cross-mating method that will be done with the purpose of Burgo Chicken genetic utilization to increase the egg weight or to increase the weight in certain ages. Cross-mating method of KB was more suitable with the purpose of defending the egg produced with the increasing of the egg weight and the cross-mating method of BK gave more beneficial to the purpose to increase the weight of the chicken and the egg because of the offspring from both variables were closed to the monogamy mating offspring of KK.

Reproduction Characteristic

The observation of the reproduction characteristic was done towards the Hen offspring of the cross-mating of BK and KB and also from the monogamy mating of KK and BB including variable, sexual maturity, body weight at sexual maturity (first time laying), and laying period interval. Those 3 kinds of characteristic had become the important indicator for poultry because those 3 had tight relation with the production efficiency and with the next breeding plan.

Table 2. Average reproduction characteristic of chick based on the elder hen mating.

Variable	Mating groups			
	KK	KB	BK	BB
Sexual maturity (day)	167 ^a	153 ^{a,b}	155 ^{a,b}	140 ^b
Body weight at sexual maturity (g)	1335,67 ^a	952,12 ^b	1154,83 ^a _b	797,79 ^b
Laying period interval (day)	18 ^a	12 ^{a,b}	14 ^{a,b}	10 ^b

Explanation: Differences of Superscript in the same row were significant difference ($P<0,05$)

KK = Mating between Elder Native Cock with Native Hen

KB = Mating between Elder Native Cock with Burgo Hen

BK = Mating between Elder Burgo Cock with Native Hen

BB = Mating between Elder Burgo Cock with Burgo Hen

The analysis towards the average sexual maturity, body weight at sex maturity, and laying period interval was subscribe in table 2. Table 2 indicated that the chick offspring of BB were significantly lower than the chick offspring of KK and the chick offspring of KB and BK had no real difference with those 3 reproduction characteristic. Average of those 3 reproduction characteristic of the cross-mating result had no real difference with the average reproduction characteristic result of both elders monogamy mating (KK and BB), however all of them had the increasing tendency than the monogamy mating of BB and decreasing tendency than the monogamy mating of KK. On the variable of body weight at sexual maturity showed that mother-factor (BK) was more dominant to inherit its characteristic so that the body weight at sexual maturity had the closer tendency to BB.

Sexual maturity variable and laying period interval between both cross-mating offspring (KB and BK) had no real difference so that the monogamy mating (KK and BB) but, it's showed that the offspring of BB average characteristic was significantly shorter than the offspring of KK. The cross-mating offspring chick of Native Cock with Burgo Hen (KB) had closer tendency to its Burgo mother and on the contrary, the cross-mating offspring chick of Burgo Hen with Native Hen (BK) had closer tendency to its Native mother.

The using of Burgo Hen cross-mating method (KB) was seen from some egg reproduction characteristic variable and reproduction characteristic indicated that was better done with Burgo Hen than the using of Native Hen. The only weak point of using Burgo Hen was located on its weight characteristic variable and the weight of each egg. This result will be an advantageous point in the progress of increasing the egg production by genetically and the use of Burgo Chicken genetic, especially Burgo Hen that these day had less demand toward the society / breeder because of the egg produced is below the Native Chicken's egg standard.

Conclusion

According to the observation result, it can be concluded that Burgo Cock and Hen can be crossmated with the Native Chicken without any problem of smaller weight phenotype and the body shape of the Native Chicken. The cross-mating model of Native Cock with Burgo Hen (KB) produced offspring with the reproduction characteristic and egg production that had the tendency closer to Burgo Chicken to defend higher total amount of egg produced but, the weight of the egg and the body was lighter and smaller than Native Chicken's. The cross-mating model of Burgo Cock with Native Hen (BK) offspring indicated heavier egg weight and bigger body shape than the offspring of KB so that could be use as both broiler and layer with more advantages that could be obtained.

References

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