

## EVALUATION OF GENETIC POTENTIALITIES OF NATIVE BREEDS OF POULTRY FOR EGG PRODUCTION

Evaluación de las potencialidades genéticas de las razas indígenas  
avícolas para la producción huevera

Evaluation des potentialités génétiques de l'aviculture indigène  
pour la production d'oeufs

M. MAKARECHIAN \*

The use of improved indigenous breeds of poultry has some advantages over imported breeds as far as the problems of adaptation to the particular environment is concerned. On the other hand the problem of conservation of poultry gene pool for future use should not be underestimated. There is also great variation in disease resistance between different breeds and even different strains.

The purpose of this experiment was to conduct a preliminary study to evaluate the genetic potential of the indigenous poultry of Fars province, Iran, for egg production.

In case of the existence of promising genetic potential for egg production, it would be feasible to undertake a project for genetic improvement of the indigenous breeds of poultry of this province.

### MATERIALS AND METHODS

In order to obtain a representative sample from the native poultry of Fars province, fertile eggs were collected from different villages of the province. Attempt was made to collect eggs from different geographical regions of the province. The eggs were incubated in different hatches and the healthy normal chicks were raised.

Since the variation in size and also the age of sexual maturity among the chicks was considerably great, it was decided to mate the pullets with the cockerels whose weights at six months of age were close to the average. This practice was continued for two consecutive years while eggs were being collected.

Inbreeding was avoided to a great extent by trying to mate together pullets and cockerels from different geographical origins.

---

\* Department of Animal Science, Pahlavi University, Shiraz, Iran.

In March 1971 one hundred and twenty native laying hens (approximately 10 months old) were randomly selected and divided in to twelve groups. One native cockerels was assigned randomly to each group of hens in a mating cage.

2800 eggs were collected and incubated from the twelve groups. The eggs of each group were separated at hatching time and chicks were identified by punching the spaces between their toes. Three hatches of chicks were obtained from May 1st. till June 17, 1971.

From each progeny groups 12 cockerels were selected at random. One hundred thirty two pullets available from the first hatch and one hundred seventeen pullets from the second hatch were put in individual cages at six months of age and their egg production were recorded for three months.

In order to rank the twelve sires according to their genetic transmitting abilities, the average percentage and the standard error of egg production of all progeny groups were compared by using the ratio of

$$\frac{\text{average percentage of egg production}}{\text{standard error}} \text{ as an index.}$$

Based on the above criterion the two best progeny groups were determined.

In order to evaluate the breeding values of the two superior sires of the two best progeny groups thus obtained, forty eight best producing pullets from all groups except the best two groups were randomly divided in to two groups and each group was mated with one of the two sires of the two best progeny group. Pullets from the two best progeny groups were excluded from these matings in order to avoid inbreeding.

Reciprocal matings were also made between the males and females of the two best progeny groups. In each of these matings twelve pullets from one progeny group and two cockerels randomly selected from the other progeny group were used. These reciprocal matings had two replications.

#### RESULTS AND DISCUSSION

The average hatchability of all the eggs which were incubated was 54 percent.

The average production and standard error of production of the twelve progeny groups is presented in Table 1. Hen day production was used as measure of egg production since vitality was not being considered in the experiment. Considering the production rate and the uniformity of the production within the progeny groups, the progeny groups No. 8 and 2 were ranked as the two best (1st. and 2nd. respectively) progeny groups.

The range in average production was relatively large considering the production of the twelve progeny groups.

The results of the matings of the two outstanding sires with the selected pullets are presented in Table 2.

Considering the fact that the selection differential for hens in the two mating groups was 13 %, nevertheless the progress was less than one percent in one group and negative in the other one. This indicated that the heritability for egg production was in fact very low and therefore mass selection would not be effective for the improvement of this trait in this population.

The results of the reciprocal matings are presented in Table 3.

TABLE 1

Progeny group No. ....	1	2	3	4	5	6	7	8	9	10	11	12
Number of pullets * .....	14	37	14	26	26	30	18	19	21	20	15	13
Av. egg production (%) .....	40.9	50.1	50.5	41.5	39.0	44.1	42.6	58.6	47.6	48.2	53.1	28.7
Standard error .....	4.5	3.4	4.8	3.9	4.9	3.7	5.5	2.9	4.4	4.1	6.0	7.1

\* Three pullets died during the experiment.

TABLE 2

Mating	Sire of progeny group No. 2	×	24 selected hens * ■ from progeny groups	Sire of progeny group No. 8	×	24 selected hens from progeny groups
Av. production of offsprings ..			47.3 %			38.4 %
Standard error .....			5.5 %			5.2 %
Selection differential for dams.			13 %			13 %
Progress .....			0.9 %			—

\* Av. production of selected hens = 59.4 %.

■ Av. production of all hens in progeny groups = 46.4 %

TABLE 3

Mating	2 from progeny group No. 2	×	12 from progeny group No. 8	2 from progeny group No. 8	×	12 from progeny group No. 2
Av. production of offsprings ..			58.6 %			50.1 %
Av. production of dams .....			53.7 %			47.1 %
Standard error .....			3.6 %			6.0 %

The results indicate that progenies of the above matings had produced somewhat more than the average production in the flock but the increase was not considerable.

It can be concluded that based on the sample the genetics variation for egg production is very low among the indigenous poultry of Fars province.

#### SUMMARY

In order to evaluate the genetic potentialities of indigenous poultry of Fars province, fertile eggs were collected from villages and were incubated. A sample of 120 pullets and 12 cockerels were randomly selected and divided in to 12 groups. Pullets and cockerels thus selected were randomly mated and the egg production of the twelve progeny groups was recorded for three months. Then the sires of the two best progeny groups were mated with 48 pullets chosen from all the progeny groups except the best two groups. Reciprocal matings were also performed between the sires of the two best progeny groups and the pullet offsprings. The results of the experiment indicated that genetics variation in egg production in this sample was relatively small.

#### RESUMEN

Para determinar las potencialidades genéticas de la avicultura indígena de la provincia de Fars (Irán) se recogieron huevos fértiles en las aldeas, tras lo cual se incubaron. Una muestra de 120 pollitas y 12 gallitos se seleccionaron al azar, dividiéndose en 12 grupos. Las pollitas y gallitos así seleccionados se cruzaron al azar, registrándose la producción de huevos en los 12 lotes durante tres meses. Entonces, los padres de los dos grupos mejores se cruzaron con 48 pollitas tomadas de todos los grupos salvo los dos mejores. Se realizaron también cruces recíprocos entre los padres de los dos mejores grupos y las pollitas de su prole. Los resultados indican que las variaciones genéticas en la producción huevera en este muestreo fueron relativamente pequeñas.

#### RESUME

Pour déterminer les potentialités génétiques de l'aviculture indigène de la province de Fars (Iran) on a couvé des oeufs fertiles recueillis dans les villages. Un échantillon de 120 poulettes et de 12 coqs on a sélectionné à l'hasard, en leurs divisant dans 12 groupes. Les femelles et les mâles sélectionnés de cette façon ont été croisés à l'hasard, et on a contrôlé la production d'oeufs des 12 groupes pendant 3 mois. Après ça, les pères des deux meilleurs groupes ont été croisés avec 48 poulettes prises de toutes les groupes sauf les deux meilleurs. On a réalisé aussi croisements reciproques entre les pères des deux groupes meilleurs et leurs descendantes femelles. Les résultats ont indiqué que les variations génétiques de la production d'oeufs dans cet échantillonnage furent relativement petites.