

**UNIT:4TH (ANIMAL
HUSBANDRY &
POULTRY)**

**Principles
Of
Breeding**

14.6. BREEDING (Principles of Breeding)

Poultry breeding is the scientific practice of improving the genetic make-up of the birds, with maximum possible desirable qualities, through planned reproduction. The successive generations thus produced are superior in respect of productive capacity, number and size of eggs and quality and quantity of meat. This has transformed backyard poultry rearing into an industry.

The fundamental principals of poultry breeding are :

1. Breeding has always to be purpose oriented. The selection and breeding may be for bird size, mature weight, growth rate (daily live-weight gain), age at coming into lay, annual egg production, weight of egg, hatchability, viability of chicks, meat quality, efficiency of food conversion, adult viability and resistance to diseases.
2. During selection for breeding, birds that do not possess the desired standards should be discarded (culling).
3. Parents selected for any desired trait should be pure breeds.
4. For selection of the breeds, the parent should be watched carefully from hatching to maturity.

5. Favourable conditions in respect of housing, feeding, sanitation and general care are must for successful breeding.

14.6.1. Mating

Mating is the act of getting cock and hen (of desirable qualities) to join for getting the fertilized eggs. The number of hens to be served by a cock depends upon many factors like, breed, body weight, season, age and physical condition of the cock. For lighter breeds (white leghorns), the number of hens mating one cock can be more than in the heavier breeds (Rhode Island Reds). Similarly young cockerels can mate with more number of pullets than an old cock. More hens are allowed to mate with one cock in spring than during winter. Mating should not be permitted during summer as fertility is low at higher temperature and also birds get very much exhausted.

Mating is of following types :

A. Pen mating : In this mating method, 10 hens are mated with 1 cock in a pen. Fertility may not be as high due to social order of birds where all the hens in a pen may not have similar liking to mate with the provided male.

B. Flock mating : It is the most common method of mating where ordinary farm conditions are prevalent. In this method males are allowed to run with entire flock of females in the ratio of 1 :10. Excellent fertility is usually obtained but parentage of offsprings cannot be determined. It permits housing for a large number of fowls as one unit thereby reducing the overhead costs.

C. Stud mating : In stud mating, male is kept in a pen and hens are let into that pen one by one at intervals and after mating they are removed to their own pen. The male's utility is increased but labour involvement is much more. It is practiced for pedigree breeding.

D. Alternate males : In this method 2 cocks are used for mating a flock of hen but only one at a time is allowed to serve for 1 day while the other one is kept in the coop. Next day the male used earlier is removed and second one is allowed into the pen of these hens. In this method also the paternity of offsprings cannot be determined.

Artificial insemination : This method may not be feasible for the village level poultry in the absence of trained personnel and necessary infrastructure. This method is more common for breeding in turkey where poor fertility is encountered.

14.6.2. Systems of breeding

Generally, following systems of breeding are employed :

A. Inbreeding : It is the mating of close blood relations in poultry birds such as between individuals of a generation belonging to same parents, or parents and offsprings. If this system of breeding is allowed to continue for many generations, it may result in poor hatchability, low rate of growth, reduced egg production and short life span.

B. Line breeding : This system is followed for producing chicks with selected and desirable quality of a particular breed. It is similar to inbreeding but involves mating between less closely related birds, like cross between cousins or grand offsprings.

C. Out-crossing : In this system of breeding, birds of same variety but of different strains are made to mate in order to obtain the desirable quality in the offsprings. The purpose of this breeding is to preserve the good trait of the family line and capture the desirable one from other strain.

D. If one strain of a variety (white leghorn) has high egg production but small size and the other strain of same variety has large sized egg but low production, their cross may give us the pullets with high production of large sized eggs.

E. Cross breeding : It is the mating of individuals of different varieties and breeds. It has resulted in high hatchability, fast growth, low chick mortality and regaining of vigour in the new breeds.

F. Grading : It is employed to improve our village poultry. Any pure-bred cock is allowed to mate with non-descript flock of hens. The pure breed cock is changed every year by introducing fresh cock of the same pure breed to mate with successive generations of hens. It is possible to get the same pure breed cock after some generations.

✓ 14.6.3. Selection of breeds

Selection of breeds refers to the choosing of birds, with desirable qualities, for mating to produce the chicks with those traits. The breeds are selected for their desirable qualities in respect of egg production, meat production, resistance to diseases, adaptability under local conditions and breeding success.

For egg production, such of the breeds are selected that possess good layer qualities like, capacity to lay large number of standard sized eggs and early maturity for laying. White leghorn and their hybrid strains like, Babcock, Ranishavers, Unichix, Hyline, Hisex, and HH-260 are considered good for egg laying qualities, laying large number of standard sized eggs. The standard size of the egg weighs about 55-60 grams.

Similarly birds that attain weight of 2 kg in 10-12 weeks are considered good meat producers, though this weight is attained by good broilers in 7 weeks. Plymouth Rocks, Cornish and New Hampshire breeds are good meat producers. The hybrid varieties, like Indian River, Venkob, Ross Broilers, Hubchix, and Unichix are also good meat producers.

Some breeds are dual purpose, possessing good laying qualities as well as fast growth, hence good meat producers. These include Rhode Island Reds and Australorps. However these breeds are not considered feasible for our rural poultry conditions as birds have to be available at cheap price, have to be hardy to adapt to local conditions, able to survive on free range, agile to overcome the attack of predators, and resistant to diseases. Since indigenous breeds have all these traits, it is preferred to have their cross with exotic or cross-bred cocks for bringing in other good qualities (egg laying and meat production) in the offsprings.

Selection of pullets for laying is equally important. Pullets should be selected when they are 20 weeks old as at this age they start laying. Early layers are considered a good variety and also cost less to purchase and rear. Pullets are considered profitable when from a unit of 10 birds, 6 eggs are obtained daily. The pullets with laying capacity less than that should not be selected or kept in the farm as that will prove an unprofitable venture.

14.6.4. Selection of individual bird

While breed selection is based on the desirable trait of the variety or the strain, the selection of individual bird from the flock of selected breed has to be based on his/her individual characters. Thus birds with good ancestry are preferred over good birds with poor ancestry. Similarly, birds with good vigour are chosen as they are active yet easier to handle, with a good feed conversion capacity and take interest in different activities. The other traits of a good layer birds are bright and prominent eyes, short strong and well curved beak, waxy soft and well developed ear lobes, stocky and a short neck, red hot soft and waxy comb, thin straight pubic bones set well apart, long keel bone, and non-broody with late moulting.

14.6.5. Culling of poultry

Birds with poor qualities of egg laying and meat production are eliminated from the poultry unit and this is called culling. This is opposite of selection of the breeds with desirable qualities. During the course of breeding of the selected varieties, some individuals are produced that do not possess the targeted desirable qualities and their rearing becomes uneconomical. Such birds not only reduce the efficiency of the flock but also require the same maintenance cost and care that of the good layers. This is where culling is recommended to weed out the unwanted and unprofitable birds and should be carried out continually. Since the feed of poultry costs about 60% of the return in terms of egg production it is always advisable to remove poor laying birds from the poultry unit. Similarly the birds with slow growth, lack of vigour and diseased birds should also be culled.