**Poultry Breeding**

The science of genetics deals with the mechanisms of heredity, the transmission of characteristics of parents to their offspring.

The science of poultry breeding, as applied to poultry production, makes use of the principles of genetics to develop strains or breeds best suited for the production of poultry meat and eggs.

The rapid production cycle (chicken short life), lead to quick development in poultry breeding and observation of several generations and choose the best to bred.

**Sex determination**

Females produce two types of ova (Z and W) chromosomes, they are called heterogametic.

Males produce spermatozoa with only (Z chromosomes), they are called homogametic.

**Chromosomes of a chicken**

The hereditary material of a chicken is located on 39 pairs of chromosomes in the nucleus of a cell.

These chromosomes carry the genes, the units of heredity.

Each gene occupies a specific location or locus on the chromosome.

**Inbreeding and crossing inbred lines**

Inbreeding involves the mating of closely related individuals, such as the mating of brother Χ sister for several successive generations. Other forms of close inbreeding involve matings of a mother X son, father Χ daughter. In­breeding increases homozygosity in a population. The genes carried on the chromosomes of highly inbred stock are much more uniform than if the stock is less inbred.

Line breeding: mating between related individuals from the same line to keep the maintenance of hereditary characteristics.

However, when inbred lines are crossed (not closely related individuals), heterozygosity in the resulting hybrid is greatly in­creased and crosses of inbred lines often show hybrid vigor. This system has been used extensively in hybrid corn production and is used for the production of some commercial stocks of chickens (increases sexual maturity, egg weight, size and number of eggs).

**Crossbreeding**

Mating between not related individuals, lines, different strains.

Thus when breeds are crossed, considerable hybrid vigor in the offspring often results, and give offspring that perform considerably better than the parent strains.

**Poultry Breeding Companies**

Breeding companies have been able to assemble the scientific personnel, and the marketing organization, to generate sufficient sales to support research and breeding establishments far greater in size than was possible in the early days of scientific poultry breeding. Most of these breeding companies market on a world-wide basis. Essentially all commercial stocks for broiler production and for laying hens are crosses of breeds, or strains within the breed.

This has the benefit of giving hybrid vigor to the commercial chick produced, and it also provides a means for the breeder control the stock necessary to produce the commercial chick. For example, if the mother of the commercial chick destined to be layer is a cross between two strains, the mother will show **hybrid vigor** and be a good producer of commercial chicks. In addition the mother is a hybrid and since hybrids do not breed true, the breeder can safely send her to supply flocks throughout the world without fear that someone would be able to reproduce the stock ii competition with the breeder.

This would not be possible without the original grandparent lines, which were crossed to produce the mother of the commercial chick. These grandparent fines are safe- guarded because they represent the basic product of the breeder on which he relies for the superiority of his commercial chick.

These companies may specialize and may produce only egg-laying stock, or broiler stock. In fact in broiler bleeding some breeding companies specialize in a male or female line specifically intended for crossing for the commercial broiler chick.