SELECTION OF THE BASIS OF PROGENY PERFORMANCE (PROGENY TEST)

Selection on the basis of progeny means that the breeder makes a decision to keep or cull a sire or dam based on average merit of their offspring as compared to the average merit of the progeny of contemporary sires and dams. Progeny testing may be used to predict more accurately the Probable Breeding Value (PBV) of a parent for quantitative traits. It has been said that "Individual tells us what an animal seems to be, his pedigree tells us what he ought to be, but the performance of his progeny tells us what he is". The idea of progeny testing is not new, Robert Bakewell is reported to have used progeny testing in eighteenth century by letting out bulls and rams on annual basis. Then he could later use those which proved to be outstanding transmitters.

The principle involved in progeny test is that each progeny receives a sample one half of its inheritance from each of its parent, and this is a sample one half of the parents breeding value. By increasing the number of progeny tested for a certain parent and calculating the average of their progeny, it is possible to obtain an estimate of repeated parents breeding value based of this relationship. Two or more offspring of the same parent will vary from each other genetically because of the segregation of genes in the gametes (sometimes called as Menedelain error). However, more progeny obtained from a particular parent, the better the assessment. Usually sire rather than dams are progeny tested, because sire generally produce more progeny in a given season or year. In litter bearing species and with the increasing use of MOET technique, progeny test is feasible wit female.

Several precautions should be taken to make progeny tests more accurate_

1. Dams mated to all sires on a given progeny test should selected randomly.
2. Standardize rations and feeding practices should be followed.
3. Do not feed all progeny of a single sire in the same pen, this tend to increase environmental variations among the different sire groups.
4. Compare the different parent groups raised in as nearly the same environment or location as possible.
5. Compare the parents group born during the same year or same season of the year when possible.
6. Include all healthy progeny of a particular parent in the test, to reduce Mendelian and environmental error.

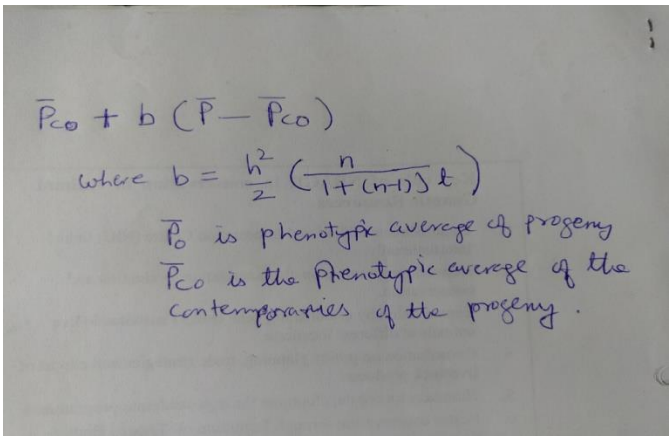
In case of progeny testing the accuracy of selection (which is the correlation of the genotype of the parent with the average phenotype of its progeny) may be calculated as follows:

$$\frac{h}{2}\sqrt{\frac{n}{1+(n-1)t}}$$

Where, h is the square root of heritability for a trait
n is the number of progeny used in the average
t is ¼ of h^2 for half sibs.

The relative accuracy of selection on the basis of progeny tests as compare to selection on the basis of individual performance show that progeny tests are relatively more accurate at lower levels of heritability. Progeny test including at least five or more progeny are required to give as high a degree of accuracy in selection as a record of individual own performance.

The PBV in progeny test is determined as follows:



Short comings of progeny testing:

- Progeny test greatly lengthens the generation interval. Which may lower the amount of progress made in selection for additive gene effects over a period of years.
- Adequate number of progeny per parent must be tested in order to make the progeny test meaningful and it is desirable to progeny test and to compare many sires for selection among many parents. This increases the expense of testing and under some conditions it is not practical.