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Budgeriar parrot.
Indian Ringneck Parrot - The chatty friend.
- males have a black neck ring & pink nape band.
- females & young ones = -nil

Cockatiel - The friendly bird.
Lovebirds - Social & bounding birds.
canary - Melodious singer.
Macaw (parrot) - Intelligent & exotic giant.
common Hill myna (black colour).

Sire index: The result of progeny test are expressed in form of a index which is the index of the genetic worth of sire & such an index is k/a sire index. It is a mathematical expression of a breeding worth of a sire Based on sire index a numerical value is obtained which indicates the prod^{n} ability of the sire. Since, a no. of sires are progeny tested it requires ranking all sires for their genetic worth so as to select the best sire.

Diff. methods for indexing the sire have developed time to time as per need a few of them are discussed here -

1. **Simple daughter avg. index:**

proposed by → Edwards in 1932

$$I_1 = \bar{D}$$

$\bar{D}$ = mean avg. of all daughter of under a sire.

This index is the simplest measure in a single herd under same envi

Limitation: It doesn't take into account the prod^{n} level of the mates of the bulls & hence it is subjected to the biase when prod^{n} level of mates alloted to diff. sires are diff.

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2. Equiparent/ Intermediate Index : Given by Hansson in 1963
→ Also Kla yapp's index. or Mount hope index b/c it was 1st use at mount hope farm in 1928.

$I_2 = 2\bar{D} - \bar{M}$ $\bar{M}$ = Mean of the mates/ Dams avg.

→ This Index makes adjustment for the variation in prod" level of the dams. However, it over corrects the prod" level of mates allotted to diff. sires. If Inferior dams are allotted to a sire there is over estimation of sires B.V. But in case superior dams are allotted than avg., it under estimate the sires B.V. This Index

Rice index :-

Tomar Index : 1965 by Tomar.
It depends on dam daughter comparision with simultaneous use of their Contemporarie herd avgs.

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(v) Corrected daughter avg. index :- Given by Krishan (1956)

It corrects the daughter avg. for the influence of differential prodn level of dams mated by bulls on the basis of regression of daughters records on dams and it is 4 times as efficient as the intermediate index

$$I_5 = \bar{D} - b(\bar{M} - \bar{H})$$

b = regression coefficient whose value is $b = 0.5 h^2$

$\bar{H}$ = Herd avg.

The term $b(\bar{M} - \bar{H})$ appearing in the index is the correction for the genetic superiority or inferiority of the set of dams allotted to the sire over the herd avg.

(vi) Contemporary daughter avg. index : Given by Jain and Malhotra

It takes into account the variation in no. of daughters in progeny grps & also corrects for period variation in envo condn to which the record might have been subjected.

$$I_6 = \bar{H} + bQ(\bar{D} - C_D)$$

n = no. of progeny of sire under test

(vii) Corrected contemporary daughter avg. index :-

for the differences in the progeny no. & period to period variation adjust for the unequal prodn level of dam mated to diff. sires.

$$I_7 = \bar{H} + bQ(\bar{D} - C_D) - b(\bar{M} - C_M)$$

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(viii) Dairy search index: Sunderasan (1965)

$$I = \bar{A} + \frac{n}{n+12}(\bar{D} - C_D) - b(\bar{M} - C_M)$$

(ix) Least square constants.

(x) Maximum Likelihood method

(xi) Restricted maximum likelihood method [REML]

(xii) BLUP (Best linear unbiased prediction method)

Inbreeding Coefficient :-

- It is the probability that 2 alleles in a genotype are identical by descent.
- It is denoted by 'F' & it's value ranges from 0-1
- It is also expressed in terms of %age (0-100%)
- Inbreeding coefficient tells about the relative % in homozygosity in comparision to the base popn.
- 'F' is an individual property means it has to be calculated for each individual seperately.

To calculate 'F'

1. Path diagram method :

$$F_X = \frac{1}{2}\sum\left(\frac{1}{2}\right)^n (1+F_A)$$

'F' of common ancestor.

n = no. of arrows (path) connecting the sire & dam of individual through common ancestor

Σ = Sum of all the paths.

* The 'F' will be 'zero' in following cases :

(i) When both parents are unknown for an individual.

(ii) The individual whose only one parent is known.

(iii) When both parents are known but they are not related by ancestory means they don't have any common ancestor in that case 'F' will be zero.

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Correlated Response to selection :-

When selection is applied on a trait for eg 'X' Then there will be change in the mean genotypic level of the genetically correlated trait for eg 'y' & this is K/a Correlated response to selection.

The Response to selection in character 'X' which is directly selected is = $R_X = i_x h_y \cdot \sigma_A(x)$

Here the character 'X' is like independent variable & character y is dependable variable therefore, the change in y due to change in X can be estimated by simple linear regression.

$$b_{yx} = r_A \cdot \frac{\sigma_A(y)}{\sigma_A(x)} \cdot R_x$$

$$CR_y = b_{yx} \cdot R_x$$

$$CR_y = r_A \cdot \frac{\sigma_A(y)}{\sigma_A(x)} \cdot R_x$$

⇒ Thus the term h_x, h_y, r_A is called as co-heritability b/c it is equivalent to h^2 in response to direct selection. Hence, the correlated Response can be estimated if the 'h^2' is of both characters - genetic correlation & S.D. of character y are known.

Sometimes it becomes necessary to improve character X indirectly by applying selection to some correlated character 'y' This procedure of selection is K/a Indirect selection. In other words the selection applied to some characters other than the one it is desired to improve is K/a Indirect selection. The character on which selection is applied is K/a Secondary or Auxiliary character. The Indirect selection is applied in following situation -

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(i) If the desired character is difficult to measure with precision.

(ii) If the desired character is measurable in one sex only but the secondary character is measurable in both sexes. So, then the high intensity of selection will be possible by indirect selection.

(iii) The desired character may be costly to measure for eg the FCE (feed conversion efficiency) than it may be economically better to select for an easily measured character such as growth rate.

(iv) When the desired character is manifested at a later stage in life of an individual but the auxiliary character is measurable at an early stage.

The cond^{n} under which indirect selection would be advantageous can be deduced by following steps—

The merit of indirect selection relative to that of direct selection may be expressed as the ratio of expected responses

$$\frac{CR_x}{R_x} = \frac{i_y h_y r_a}{i_x h_x} \qquad \frac{r_a h_y}{h_x} \text{ (if } i_y = i_x \text{)}$$

$$CR_x > R_x = r_a h_y > h_x$$

= so when the 'h^2' of secondary character & genetic correlation is higher then the indirect selection is advantageous over direct selection.

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