A COMPARATIVE STUDY OF SELECTION INDICES FOR THE IMPROVEMENT OF POULTRY

By

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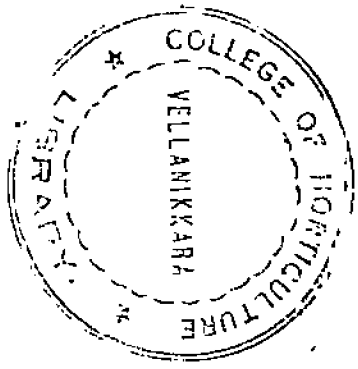

THESIS

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DECLARATION

I hereby declare that this thesis entitled "A COMPARATIVE STUDY OF SELECTION INDICES FOR THE IMPROVEMENT OF POULTRY" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship, or other similar title of any other University or Society.

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CERTIFICATE

Certified that this thesis entitled "A COMPARATIVE STUDY OF SELECTION INDICES FOR THE IMPROVEMENT OF POULTRY" is a record of research work done independently by Smt. Narayanikutty, U. under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

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C O N T E N T S

Introduction

INTRODUCTION

From the stand point of the producer, the main purpose of farm animal is to turn grasses and grains into meat, wool, milk and eggs. The more efficiently this is done, the more will be the profit for the livestock owner.

The livestock can be made profitable by changing gene frequency, thereby making genetic improvement in the population. Gene frequency, the proportion of loci in the population on which gene is present in its allelic series, can be changed by the method of mutation, migration and selection. Mutation is of little importance, as the rate of mutation is very small. The use of migration is of less relative importance. Most important method of changing gene frequency and making genetic improvement is selection.

In selection certain individuals are allowed to produce more frequently than the average of the population. As this is done generation after generation, the more desirable alleles become more frequent and the less alleles become rarer. As a result the overall genetic merit of the population increases.

Selection can be done for a single trait or for multiple traits. Selection for one trait is less effective because if such a selection programme is followed, other important traits might deteriorate to the point where little or no

progress would be made for yield. So selection must be based on multiple traits. Multiple trait selection can be accomplished in three different ways.

1. Tandem Method

Selection is done for one trait at a time until this is improved, then for the second trait and later for the third etc. Selection may therefore switch back to the first trait, then to the second etc. until each reaches a desired level. Because of the inter-relationship between the traits, the tandem method is likely to be wasteful, inefficient and result in little genetic improvement.

2. Independent culling level method

A minimum phenotypic value is set up for each trait and individuals which do not reach this minimum value are culled whether they reach the value required for the other traits or not.

3. Selection index method

In this method various traits are weighted so that selection on the basis of index gives the best possible economic results. By this method those animals or birds are chosen which have the highest scores based on all the traits for which they are being selected. Those with lowest scores are culled. The advantages of this method are (1) it accounts

for several important traits simultaneously (2) it accounts for the heritabilities of each trait (3) it includes the known genetic and phenotypic relationship among the traits (4) decisions are based on the relative economic importance of each trait.

Lush and Young (1961) studied the relative response under these three methods in detail. They concluded that in tandem method when selection is made for n independent and equally important traits, the average response per generation is only one n^{th} of the response obtained when selection is for only one trait. In selection index method average response per generation is $\sqrt{n}$. In independent culling level method, selection intensity for a single trait is reduced as the number of traits to be considered increases. Selection based on independent culling level method is more efficient than tandem method, but less efficient than selection index.

Young further extended the comparison of the three methods to cover the cases when the traits had unequal variances, heritabilities and economic values. In this case also he found that selection index method is superior to independent culling method, which in turn is superior to tandem method. The comparisons of these workers showed that the index method is essential for efficient selection when all the traits considered are not equally heritable and are not independent.

The various traits of a bird are also not equally heritable and are not independent. So by the adoption of index method poultry selection can be made more efficient. Many workers had attempted to construct selection indices for selection among plants, animals and birds.

In the present investigation it is aimed at to make a comparative study of selection indices for the improvement of poultry. The objectives of this study are :

(1) comparative study of indices which provide estimates of the breeding worth of individual birds based on Kerala Agricultural University Poultry Farm data.

(2) to study the relative efficiencies of the above mentioned indices based on the Kerala Agricultural University Poultry Farm data.

(3) based on the above studies suggest a suitable index which is appropriate to the Kerala conditions.

Review of Literature

REVIEW OF LITERATURE

The economic value of an individual depends upon several economically important characters. So consideration of more than one character at the time of selection is unavoidable. Simultaneous selection for several characters, when all characters considered are not equally important, is most efficiently accomplished by selection index.

A selection index is "the number proportional to the expected net breeding value of an individual and is constructed by combining credits, for the individual's merits and penalties for its defects". It takes into consideration all the above mentioned characteristics and thus brings about maximum genetic gain by giving an appropriate weightage to all the characters considered at selection.

The index is the best estimate of the individuals true breeding value by the following properties.

(1) It maximises the correlation between the true breeding value and the index.

(2) It maximises the probability of correctly ranking the individuals on their true breeding value.

(3) It maximises the genetic progress through selection.

(4) It minimises the mean square difference between the true breeding value and the index.

The purpose of index construction is to find out a function (I) of the Phenotypic values (P) weighted with their respective coefficients (b_i)

ie, $I = \sum b_i P_i$

where b_i is to be estimated in such a manner that the correlation between H and I becomes maximum.

An earliest attempt to construct such an index was made by Smith (1936) to plant breeding, who used the Fisher's concept of discriminant function to derive a linear equation based on observable characters as the best guide to the genetic value of each plant line.

Hazel and Lush (1942) showed through formulas that selection for an index which gives a proper weight to each trait is more efficient than selection for one trait or for several traits with an independent culling levels for each trait.

Hazel (1943) was the first to apply selection index for animal breeding. He developed a method of computation of linear selection index on the basis of Wright's path coefficients.

Panse (1946) compared straight selection with selection index constructed on the basis of discriminant function in poultry. The traits included in his study were rate of lay, egg weight, age and body weight at first egg. Based on this

study he concluded that selection index method is superior to straight selection.

Lerner et al. (1947) constructed selection indices for improving the Fryer's quality in New Hampshire. The characters under this study were 12 week body weight, shank length, keel length and breast width. He found that the use of such an index increased the efficiency in the rate of improvement by 10-14 per cent.

Selection indices were constructed by Lerner and Cruden (1948) based on production to January 1 of the pullet year and production for the balance of first laying year.

Morely (1950) showed that Smith's index and Hazel's index are identical.

Krueger et al (1952) constructed an index for greater efficiency of selection for higher egg production.

Wyatt (1954) developed an arbitrary index for giving equal economic weightage to egg production, egg weight and body weight. He advocated that even such an index may be useful to take care of negative genetic correlations for progress.

Effectiveness of a selection index for the improvement of breast width was tested by Abplanalp and Asmundson (1956). Two lines were derived from a single population by means of

mass selection. Parents of the first line were selected for increased breast width. Those of the second were selected on the basis of an index (I) by combining body weight, breast width, shank length and keel length. They found that index selection had been predicted to give 13 per cent more rapid gain in breast width than selection on the basis of breast width only.

Yamada (1958) constructed an index by incorporating the traits sexual maturity, egg production, egg weight and body weight for the use of Japanese condition.

Nogselt and Nordskog (1958) studied the application of selection indices to data from 15 lines of poultry in Iowa State University.

An index was constructed by Hussain and Singh (1959) for White Leghorn birds by combining the traits, age at first egg, body weight at maturity, egg production in 90 days and average egg weight according to Hazel (1943a). From this study he came to the conclusion that the total score is not only, the most efficient for maximum genetic gain in all the important characters considered, but also very convenient for breeder to make his decision at selection.

The introduction of "restricted selection indices" by Kempthorne and Nordskog (1959) which was further elaborated

by Rao (1962), Tallis (1962) and James (1968) made the indices more flexible. Through these modifications changes in some of the characters can be restricted without affecting the development in others.

Ahemed (1961) constructed three selection indices viz: 1, 2, 3 for Haryana cattle using data from the Veterinary Research Institute herd. The economic traits included in his study were : age at first calving, first calving interval, first lactation milk yield, body weight at first calving and butter fat percentage. The first index was prepared by combining all the five traits, the second involving only the first four traits and third involving only the first three traits. The third index was found to be the most efficient (RIH = 0.625).

Acharya (1966) also developed an index for Haryana cattle located at the Government Livestock Farm, Hissar, on the basis of age at first calving, first lactation milk yield and the first calving interval. The relative efficiency of this index was evaluated as 0.86.

Singh, Acharya and Sundaresan (1968) developed two series of selection indices incorporating six important economic traits, birth weight, weight at first calving, age at first calving, first lactation milk yield, first service period and first dry period for Haryana cattle. In the

first series the economic weightage assigned to all six traits was the same as has actually been calculated for each. In the second series equal economic weightage was given to service period and dry period whereas all the other traits remained the same as before. Selection indices were constructed by applying Henderson's modification of Hazel's (1943) method as described by Karam et al. (1953). In all, out of 63 possible different indices, 18 selection indices were constructed in each series. On comparison of relative efficiency (RIH values) of different indices, it was observed that the index incorporated all the six traits resulted in most efficient index for the both series. The second best is the index computed by omitting the birth weight in both series. They also observed a lot of similarities between the results of the both series indicating that no undue weightage has been given to the service period in preference to the dry period in the earlier series.

Saller and Rappaport (1971) showed that index selection is more efficient than mass selection for male fertility and progeny growth.

Marutiram, Jain and Gopalan (1972) modified the selection index for the improvement of poultry suggested by Osbornes (1957) based on the combined information of full-

sibs and half-sibs family by combining information on dam in addition to the full-sibs and half-sibs. According to them the breeding value of a bird is given by

$$I = \hat{G} = b_1P + b_2\bar{H} + b_3\bar{C} + b_4D$$

where P = own performance

$\bar{H}$ = mean of its paternal half-sibs

$\bar{C}$ = mean of its full-sibs

D = Dam's performance

b_i's are the appropriate weights to be estimated

For selection among females, two combinations with and without the use of record on dam were considered. Similar two combinations were considered for selection among males excepting that individuals performance which would not be available for sex limited characters. From the comparison of the indices it was observed that the inclusion of dam's record in addition to the information on sibs resulted in appreciable gain of 4 to 6 per cent in females and 6 to 33 per cent in males, when dam and sire families are small and heritability of the trait is low.

Kotaish and Renganathan (1980) constructed indices to measure the relative efficiency of part record of egg number and per cent production in multiple trait selection by combining the traits, age at sexual maturity, body weight, egg weight using different sets of economic values in a

White Leghorn flock. Restriction was imposed on egg weight in some indices. The genetic gain obtained by giving equal economic weightage were comparable to the gains that could be obtained by using carefully calculated economic values. The magnitude of direct and correlated response achieved due to reduction in age at sexual maturity was substantial in the total response for egg number, whereas per cent production seemed to be relatively independent from such an effect. The correlated negative response in egg weight was more when egg number was used as the selection criterion, compared to a situation when per cent production was used. This was true either when selection was direct on egg production or when both egg production and egg weight were used in an index. The restriction in genetic change of egg weight was effective. In the indexes with egg number, restriction was found to be advantageous both to prevent the loss of egg weight and also to minimise the total genetic gain. The advantage of reduction however was not found when per cent production was used.

Selection indices were constructed by Abuja et al. (1981) for improving the four week body weight of Japanese quail using one to four weeks body weights. Partial regression coefficient value was highest for body weight at two weeks and the same was lowest for four weeks body

weight. The per cent relative efficiency indicated that selection on the basis of indexes were nearly 40 per cent more efficient than mass selection for body weight at three or four weeks of age. In this study they concluded that the index consisting of two and four week body weight was better to improve the final body weight of Japanese quail.

Materials and Methods

MATERIALS AND METHODS

The data utilised for this study were collected on White Leghorn strain IWN from the Department of Animal Breeding and Genetics, Kerala Agricultural University, Mannuthy. The characters under this investigation were 20 week - body weight, 40 week - body weight, egg weight and egg production upto 280 days of age. Data pertaining to these four characters were collected from 776 progenies of 38 sires which were mated to 147 dams. Data for the same characters were collected in the case of dams also. The parents with progenies two and more than two were only considered.

Heritability coefficients for the four characters were estimated using full-sib analysis.

1. General selection indices

Indices for selection among females were constructed according to the formula presented by Marutiram *et al.* (1972). According to them the prediction equation for the breeding value of a bird was given by

$$I = \hat{G} = b_1P + b_2\bar{H} + b_3\bar{O} + b_4D$$

where P - own performance

$\bar{H}$ - mean of its 'n' paternal half-sibs

$\bar{O}$ - mean of its 'm' full-sibs

D - dam's performance

The 'b' values were calculated using the formulae

$$b_1 = h^2 \left(16-4h^2M - 4h^2 - h^2N\right) / D_1$$

$$b_2 = 2\ QN/D_1$$

$$b_3 = h^2M\ (1-h^2)\ (8-Nh^2 - 4h^2) / D_1$$

$$b_4 = 4\ Q/D_1$$

where

$$D_1 = 16-h^4 \left[\left(1 + M - h^2M\right)(4+N) + 4M\right]$$

$$Q = h^2\ (1-h^2)\ \ (2-h^2M)$$

$$N = \frac{n}{1 + (n-1)\ \ h^2/4}$$

$$M = \frac{m}{1 + (m-1)\ h^2\ /2}$$

where h^2 is the value of heritability

The multiple correlation coefficient between the index (I) and the breeding value (G) was obtained from

$$RGI = \sqrt{b_1 + \tfrac{1}{4} b_2 + \tfrac{1}{8} b_3 + \tfrac{1}{8} b_4}$$

Another set of indices for selection among females were constructed without the use of record on dam. In this case the index was constructed by

$$I_o = a_1P + a_2\bar{H} + a_3\ \bar{G}$$

To obtain the coefficients a_1, a_2, a_3, the following formulae were used.

$$a_1 = h^2 \left[16-h^2 (N + 4 M)\right] \Big/ D_2$$

$$a_2 = 2h^2 (1-h^2) N (2-h^2M) \Big/ D_2$$

$$a_3 = h^2 (1-h^2) M (8-h^2N) \Big/ D_2$$

where

$$D_2 = 16-h^4 \left[N (1 + M - h^2M)+ 4 M\right]$$

Multiple oorrelation coefficient between the index (I_o) and the breeding value (G) was calculated from

$$RGI_o = \sqrt{a_1 + \tfrac{1}{4} a_2 + \tfrac{1}{2} a_3}$$

The effioienoy of index I was tested against the index I_o by RGI/ RGI_o .

These indices were constructed for one offspring of each dam and for each character.

Indices for selection among males were also constructed according to the formula.

$$I^* = \hat{G} = b_1^* \overline{H} + b_2^* \overline{C} + b_3^* D$$

where $b_1^* = 2 Nh^2 (2-h^2M) \Big/ D_1^*$

$$b_2^* = h^2M (8-h^2M - 4h^2) \Big/ D_1^*$$

$$b_3^* = 4 h^2 (2-h^2 M) \Big/ D_1^*$$

where $D_1^* = 16 - h^4 M (4 + N)$

Multiple correlation coefficient between the index I* and the breeding value (G) was oalculated from

$$RGI^* = \sqrt{\tfrac{1}{4} b_1^* + \tfrac{1}{2} b_2^* + \tfrac{1}{2} b_3^*}$$

Another set of indices for selection among males constructed without the use of record on dam were as follows

$$I_{\delta} = \hat{G} = a_1^* \bar{H} + a_2^* \bar{C}$$

where $a_1^* = 2 Nh^2 (2-h^2M) / D_2^*$

$a_2^* = h^2 M (8-h^2 N) / D_2^*$

where $D_2^* = 16 - h^4MN$

Multiple correlation between this index I_o^* and the breeding value G was obtained from $RGI_o^* = \sqrt{\frac{1}{4} a_1^* + \frac{1}{8} a_2^*}$

The efficiency of the index I* was tested against the index I_o^* by $\frac{RGI^*}{RGI_o^*}$

These indices I* and I_o^* were also constructed for one offspring of each dam and for each character.

2. Simultaneous selection indices

Selection index was constructed by considering the characters 20 week body weight, 40 week body weight, egg weight and egg production according to the construction of Smith's discriminant function (1936). The economic values $a_1 = 2$, $a_2 = 3$, $a_3 = 5$, $a_4 = 8$ were assigned to the characters 20 week body weight, 40 week body weight, egg weight and egg production respectively on the basis of their importance.

As the most important economic trait in poultry is egg production, in this particular contest, it was given the highest economic value.

Normal simultaneous equations were set up using the four characters

$$\sum_{j=1}^{4} b_j P_{ij} = \sum_{j=1}^{4} a_j g_{ij} = A_i$$

or $bP = a G$

where $P = (P_{ij})$ is the phenotypic variance-covariance matrix.

$G = (g_{ij})$, the genotypic variance-covariance matrix.

b = the column vector of regression coefficients.

a = the column vector of economic values.

Solving the above set of equations 'b' values were obtained and the index combining the four characters was then constructed as

$$I = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

where b_1, b_2, b_3, b_4 are the weighting factors obtained and x_1, x_2, x_3, x_4 represent the characters 20 week body weight, 40 week body weight, egg weight and egg production respectively.

The expected genetic advance at five per cent intensity of selection was calculated using the formula

$$\frac{z}{q} \sqrt{\sum_{1}^{4} b_i A_i}$$

where q is the intensity of selection and Z is the ordinate at the point of selection.

The expected genetic advance due to straight selection was obtained by putting $b_i = a_i$ and using the formula

$$\frac{\frac{Z}{q} \sum_i \sum_j a_i a_j g_{ij}}{\sqrt{\sum_i \sum_j a_i a_j P_{ij}}}$$

for the same intensity of selection.

To obtain the per cent gain in efficiency in expected genetic advance due to selection index over that due to straight selection the following formula was used.

Per cent gain in efficiency

$$= \left[\frac{\text{Expected genetic advance due to selection index}}{\text{Expected genetic advance due to straight selection}} - 1 \right] x.100$$

3. Restricted selection indices

Restricted selection indices were constructed according to Kempthorne and Nordskog (1959).

The restricted selection index $I = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$ imposing restriction on egg weight (x_3) was constructed. In this case the transpose of the coefficient vector was taken as $C^1 = (0\ 0\ 1\ 0)$.

The estimates of b values which maximises the correlation

between the breeding value (H) of the individual and the index (I) and at the same time do not allow any change in x_3 was obtained by the following formula

$$b = \left[I - P^{-1} GC \left(C^1 G P^{-1} GC\right)^{-1} C^1 G \right] P^{-1} Ga$$

where I = 4 x 4 unit matrix

P^{-1} = inverse of the phenotypic variance-covariance matrix

G = genotypic variance - covariance matrix

a = column vector of economic values

The S.D. of b (restricted was obtained from S.D. $= \sqrt{a^1 G\ b}$

The genetic advance (Δx) in individual character was calculated using the formula

$$\Delta x_1 = \frac{G\ b}{\sqrt{a^1\ G\ b}}$$

Similar procedure was adopted for the construction of restricted selection index restricting the character 40 week body weight (x_2). The coefficient vector in this case was taken as $C^1 = (0\ 1\ 0\ 0)$.

Restricted selection index imposing restriction on both 40 week body weight and egg weight was also constructed. The coefficient vector taken in this case was

$$C^1 = \begin{pmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{pmatrix}$$

The 'b' values were estimated as estimated in the first case. The genetic advance in individual character was calculated by

$$\Delta x_1 = \frac{Z}{q} \frac{G\ b}{\sqrt{a\ G\ b}}$$

4. Phenotypic selection indices

Phenotypic indices for selection of the main trait egg production (y) was constructed acoording to Narain and Mishra (1975) by taking into consideration the auxiliary traits 20 week body weight (x_1), 40 week body weight (x_2) and egg weight (x_3).

The phenotypic index between the main trait egg production (y) and 20 week body weight (x_1) was given by

$$I_1 = y - b_1 x_1$$

b_1, the regression coefficient of y on x_1 was calculated from

$$b_1 = \rho_{yx_1} \frac{\sigma_y}{\sigma_{x_1}}$$

where ρ_{yx_1} = phenotypic correlation between egg production (y) and 20 week body weight (x_1).

σ_y = phenotypic S.D. of the main trait egg production (y).

σ_{x_1} = phenotypic S.D. of the trait 20 week body weight (x_1).

Efficiency of this index was estimated as

$$E = \frac{1 - \rho_{yx_1} (r_{yx_1} h_{x_1} / h_y)}{\sqrt{1 - \rho^2_{y x_1}}}$$

where γ_{yx_1} = genetic correlation between the traits egg production (y) and 20 week body weight (x_1).

h_{x1} = square root of the heritability coefficient for the trait, 20 week body weight (x_1).

h_y = square root of the heritability coefficient for the trait egg production (y).

The phenotypic index between the main trait egg production (y) and the auxiliary trait 40 week body weight (x_2) was constructed as $I_2 = y - b_2 x_2$

where b_2 = regression of y on x_2 = $\rho_{yx_2} \frac{\sigma_y}{\sigma_{x_2}}$

ρ_{yx_2} = phenotypic correlation between y and x_2

σ_{x_2} = phenotypic S.D. of x_2. Efficiency of this index was tested by

$$E = \frac{1 - \rho_{yx_2} (\gamma_{yx_2} \; h_{x2} / h_y)}{\sqrt{1 - \rho^2_{yx_2}}}$$

Phenotypic index between the main trait egg production (y) and the auxiliary trait egg weight (x_3) was fitted as

$I_3 = y - b_3 x_3$

where $b_3 = \rho_{yx_3} \frac{\sigma_y}{\sigma_{x_3}}$

where ρ_{yx_3} = phenotypic correlation between y and x_3

σ_{x_3} = phenotypic S.D. of x_3

Efficiency of I_3 was given by $E = \dfrac{1 - \rho_{yx_3}\left(\gamma_{yx_3}\ hx_3/h_y\right)}{\sqrt{1 - \rho^2_{yx_3}}}$

γ_{yx_3} = genetic correlation between y and x_3.

hx_3 = square root of the heritability coefficient for the trait x_3.

Phenotypic index between the main trait egg production (y) and the auxiliary traits 20 week body weight (x_1) and 40 week body weight (x_2) was constructed as

$$I_4 = y - b_1x_1 - b_2x_2.$$

where $b_1 = \dfrac{\sigma_y}{\sigma_{x_1}} \dfrac{\left(\rho_{yx_1} - \rho_{yx_2}\ \rho_{x_1x_2}\right)}{1 - \rho^2_{x_1x_2}}$

and $b_2 = \dfrac{\sigma_y}{\sigma_{x_2}} \dfrac{\left(\rho_{yx_2} - \rho_{yx_1}\ \rho_{x_1x_2}\right)}{\left(1 - \rho^2_{x_1x_2}\right)}$

where $\rho_{x_1x_2}$ = phenotypic correlation between x_1 and x_2

Efficiency of this index was given by

$$E = \frac{\left(1 - \rho^2_{x_1x_2}\right) - \rho_{yx_1}\left(\gamma_{yx_1}\ \frac{h_{x1}}{h_y} - \gamma_{yx_2}\ \frac{hx_2}{h_y}\ \rho_{x_1x_2}\right) + \rho_{yx_2}\left(\gamma_{yx_1}\ \frac{h_{x1}}{h_y}\ \rho_{x_1x_2} - \gamma_{yx_2}\ \frac{hx_2}{h_y}\right)}{\sqrt{\left(1 - \rho^2_{x_1x_2}\right)\left(1 - \rho^2_{yx_1} - \rho^2_{yx2} - \rho^2_{x_1x_2} + 2\ \rho_{yx_1}\rho_{yx_2}\ \rho_{x_1x_2}\right)}}$$

The phenotypic index between main trait egg production (y) and the auxiliary traits 20 week body weight and egg weight was fitted as

$$I_5 = y - b_1x_1 - b_3x_3$$

where $$b_1 = \frac{\sigma_y}{\sigma_{x_1}} \left(\frac{\rho_{yx_1} - \rho_{yx_3}\ \rho_{x_1x_3}}{1 - \rho^2_{x_1x_3}} \right)$$

$$b_3 = \frac{\sigma_y}{\sigma_{x_3}} \left(\frac{\rho_{yx_3} - \rho_{yx_1}\ \rho_{x_1x_3}}{1 - \rho^2_{x_1x_3}} \right)$$

where $\rho_{x_1x_3}$ = phenotypic correlation between x_1 and x_3.

To test the efficiency of this index the following formula was used.

$$E = \frac{\left(1 - \rho^2_{x_1x_3}\right) - \rho_{yx_1}\left(\gamma_{yx_1}\ \frac{hx_1}{h_y} - \gamma_{yx_3}\ \frac{hx_3}{h_y}\ \rho_{x_1x_3}\right) + \rho_{yx_3}\left(\gamma_{yx_1}\ \frac{hx_1}{h_y}\ \rho_{x_1x_3} - \gamma_{y_{x3}}\ \frac{hx_3}{h_y}\right)}{\sqrt{\left(1 - \rho^2_{x_1x_3}\right)\left(1 - \rho^2_{yx_1} - \rho^2_{yx_3} - \rho^2_{x_1x_3} + 2\,\rho_{yx_1}\rho_{yx_3}\rho_{x_1x_3}\right)}}$$

The phenotypic index between the main trait egg production and the auxiliary traits 40 week body weight (x_2) and egg weight (x_3) was given by $I_6 = y - b_2x_2 - b_3x_3$

where $$b_2 = \frac{\sigma_y}{\sigma_{x_2}} \left(\frac{\rho_{yx_2} - \rho_{yx_3}\ \rho_{x_2x_3}}{1 - \rho^2_{x_2x_3}} \right)$$

$$b_3 = \frac{\sigma_y}{\sigma_{x_3}} \left(\frac{\rho_{yx_3} - \rho_{yx_2} - \rho_{x_2x_3}}{1 - \rho^2_{x_2x_3}} \right)$$

where $\rho_{x_2x_3}$ = phenotypic correlation between x_2 and x_3.

Efficiency of this index was tested by

$$E = \frac{\left(1 - \rho^2_{x_2x_3}\right) - \rho_{yx_2}\left(\gamma_{yx_2}\ \frac{hx_2}{h_y} - \gamma_{yx_3}\ \frac{hx_3}{hy}\ \rho_{x_2x_3}\right) \rho_{yx_3}\left(\gamma_{yx_2}\ \frac{hx_2}{hy}\ \rho_{x_2x_3} - \gamma_{yx_3}\ \frac{hx_3}{hy}\right)}{\sqrt{\left(1 - \rho^2_{x_2x_3}\right)\left(1 - \rho^2_{yx_2} - \rho^2_{yx_3} - \rho^2_{x_2x_3} + 2\,\rho_{yx_2}\,\rho_{yx_3}\,\rho_{x_2x_3}\right)}}$$

The phenotypic index I_7 constructed between the main trait egg production (y) and the auxiliary traits, 20 week body weight (x_1) 40 week body weight (x_2) and egg weight (x_3) was given by

$$I_7 = y - b_1x_1 - b_2x_2 - b_3x_3$$

b_1, b_2, b_3 were evaluated by the following formulae

$$\frac{\sigma_y}{\sigma_{x_1}}\left[\rho_{yx_1}\left(1-\rho^2_{x_2x_3}\right) + \rho_{x_1x_2}\left(\rho_{yx_3}\,\rho_{x_2x_3} - \rho_{yx_2}\right) \rho_{x_1x_3}\left(\rho_{yx_2}\,\rho_{x_2x_3} - \rho_{yx_3}\right)\right]$$

$$b_1 = \frac{}{1 - \rho^2_{x_1x_2} - \rho^2_{x_1x_3} - \rho^2_{x_2x_3} + 2\rho_{x_1x_2}\,\rho_{x_1x_3}\,\rho_{x_2x_3}}$$

$$\frac{\sigma_y}{\sigma_{x_2}}\left[\rho_{yx2}\left(1 - \rho^2_{x_3x_1}\right) + \rho_{x_2x_3}\left(\rho_{yx_1}\,\rho_{x_3x_1} - \rho_{yx_3}\right) \rho_{x_2x_1}\left(\rho_{yx_3}\,\rho_{x_3x_1} - \rho_{yx_1}\right)\right]$$

$$b_2 = \frac{}{1 - \rho^2_{x_1x_2} - \rho^2_{x_1x_3} - \rho^2_{x_2x_3} + 2\,\rho_{x_1x_2}\,\rho_{x_1x_3}\,\rho_{x_2x_3}}$$

$$\frac{\sigma_y}{\sigma_{x_3}} \left[\rho_{yx_3} \left(1 - \rho^2_{x_1x_2}\right) + \rho_{x_3x_1} \left(\rho_{yx_2} \rho_{x_1x_2} - \rho_{yx_1} \right) \right.$$
$$\left. \rho_{x_3x_2} \left(\rho_{yx_1} \rho_{x_1x_2} - \rho_{yx_2} \right) \right]$$

$$b_3 = \frac{}{1 - \rho^2_{x_1x_2} - \rho^2_{x_3x_1} - \rho^2_{x_2x_3} + 2 \rho_{x_1x_2} \rho_{x_1x_3} \rho_{x_2x_3}}$$

Efficiency of this index was tested by

$$\left(1 - \rho^2_{x_1x_2}\right) \left(1 - \rho^2_{x_2x_3}\right) \left(1 - \rho^2_{x_1x_3}\right) +$$
$$\rho_{yx_1} \left(\gamma_{yx_2} \frac{h_{x2}}{h_y} \rho_{x_1x_2} - \gamma_{yx_1} \frac{h_{x1}}{h_y} \right)$$
$$\rho_{yx_2} \left(\gamma_{yx_3} \frac{h_{x3}}{h_y} \rho_{x_2x_3} - \gamma_{yx_2} \frac{h_{x2}}{h_y} \right)$$
$$\rho_{yx_3} \left(\gamma_{yx_1} \frac{h_{x1}}{h_y} \rho_{x_3x_1} - \gamma_{yx_3} \frac{h_{x3}}{h_y} \right)$$

$$E = \frac{}{\sqrt{\left(1 - \rho^2_{x_1x_2}\right)\left(1 - \rho^2_{x_1x_3}\right)\left(1 - \rho^2_{x_2x_3}\right)\left(1 - \rho^2_{yx_1} - \rho^2_{yx_2} - \rho^2_{yx_3} - \right.}}$$
$$\rho^2_{x_1x_2} - \rho^2_{x_1x_3} - \rho^2_{x_2x_3} + 2 \rho_{yx_1} \rho_{yx_2} \rho_{x_1x_2} +$$
$$\left. 2 \rho_{yx_2} \rho_{yx_3} \rho_{x_2x_3} + 2 \rho_{yx_1} \rho_{yx_3} \rho_{x_1x_3} \right)$$

5. Combined selection index

An optimum selection index for the selection of males for the four characters separately combining information on full-sib with those of half-sib families was also constructed according to Narain et al. (1973 a, b). An index of this type was given by

$$I_m = b_1 \left(P_{FS} - \bar{P}\right) + b_2 \left(P_{HS} - \bar{P}\right)$$

where $\bar{P}$ = flock average

P_{FS} = full-sib family average for a dam

P_{HS} = half-sib family average for a sire

$$b_1 = \frac{2\bar{n}_1 \ (1-h^2)}{4 + (\bar{n}_1 - 2)\ h^2}$$

$$b_2 = \frac{4\ \bar{n}_1\ \bar{d}\ (1-h^2)\ (2-h^2)}{\left[4 + (\bar{n}_1 - 2)\ h^2\right]\left[4 + \left\{\bar{n}_1\ (1 + \bar{d}) - 2\right\} h^2\right]}$$

where

$\bar{d}$ = Average number of dams per sire

$\bar{n}_i$ = Average number of daughters per dam family for the i^{th} sire

h^2 = heritability value for the trait

Expected response due to selection for males based on this index at five per cent intensity of selection was given by

$$R_m = \tfrac{1}{2}\, i_m\, \sigma_P\, h^2 \left[\frac{\bar{n}}{\bar{d}} \left\{\frac{(\bar{d} - 1)}{4 + (\bar{n}-2)\ h^2} + \frac{(\bar{d} + 1)^2}{4 + \left\{\bar{n}\ (\bar{d} + 1) - 2\right\} h^2}\right\}\right]^{\frac{1}{2}}$$

where $i_m = \frac{z}{q}$ where q is the intensity of selection and z is the ordinate at the point of selection

σ_P = phenotypic S.D. of the trait.

h^2 = heritability value

$\bar{d}$ = Average number of dams per sire.

$\bar{n}$ = Average number of daughters per dam family

RESULTS

Selection indices were constructed by different methods using the data collected on White Leghorn strain IWN to make a comparative study of these indices for the improvement of poultry.

General selection indices

Two sets of indices

$I = \hat{G} = b_1P + b_2\bar{H} + b_3\bar{C} + b_4 D$ and

$Io = \hat{G} = a_1P + a_2\bar{H} + a_3\bar{C}$ with and without the use of record on dam for selection among females were constructed for one offspring of each dam and for the four characters, 20 week body weight, 40 week body weight, egg weight and egg production. Multiple correlation RGI, RGIo, between the breeding value (G) and the indices I and Io were also calculated for each character.

The values of b_1, b_2, b_3, b_4, RGI and $\hat{G}$ for the character 20 week body weight were given in table 1. The values of a_1, a_2, a_3, RGIo and $\hat{G}$ for the same character were presented in table 2. The values of RGI and RGIo for this character ranged from 0.7384 to 0.7895 and 0.7208 to 0.7893 respectively.

The coefficients b_1, b_2, b_3, b_4, multiple correlation RGI and the index $I = \hat{G}$ for the character 40 week body weight were given in table 3. The values of a_1, a_2, a_3, RGIo and $\hat{G}$

for the same character were given in table 4. The values of RGI and RGIo varied from 0.7705 to 0.8080 and 0.7555 to 0.8074 respectively.

In tables 5 and 6 values of b_1, b_2, b_3, b_4, RGI, $\hat{G}$ and a_1, a_2, a_3, RGIo, $\hat{G}$ for the character egg weight were presented. In this case ranges of RGI and RGIo were 0.9181 to 0.9228 and 0.9157 to 0.9219 respectively.

The values of b_1, b_2, b_3, b_4, RGI and $\hat{G}$ and a_1, a_2, a_3, RGIo and $\hat{G}$ for the character egg production were presented in tables 7 and 8. The values of RGI and RGIo ranged from 0.6091 to 0.7191 and 0.5961 to 0.7138 respectively.

The ratios of expected progress in females from selection based on index I as contrasted to selection based on index I_o calculated for the four characters were presented in table 9. The ranges of this ratio for the four characters viz. 20 week and 40 week body weights, egg weight and egg production were respectively 1.0042 to 1.0302, 1.0031 to 1.0258, 1.0004 to 1.0050, 1.0083 to 1.0419. Since all the ratios are greater than one, it shows that the index with use of record on dam is most efficient than the one without the use of record on dam.

Similarly two indices

$I^* = b_1^* \bar{H} + b_2^* \bar{O} + b_3^* \bar{D}$ and $I_o^* = a_1^* \bar{H} + a_2^* \bar{O}$ for selection among males were constructed for one offspring of

each dam and for the four characters considered. Multiple correlation RGI*, RGI_o^*, viz., correlation between the breeding value $\hat{G}$ and the indices I* and I_o^* respectively were also calculated for the four characters.

The values of B_1^*, b_2^*, b_3^*, RGI* and $\hat{G}$ for the character 20 week body weight were given in table 10. The values of a_1^*, a_2^*, RGI_o^* and $\hat{G}$ for the same character were given in table 11. The RGI* and RGI_o^* values ranged from 0.5168 to 0.6569 and 0.4614 to 0.6485 respectively.

In table 12 the values of b_1^*, b_2^*, b_3^*, RGI* and $\hat{G}$ for the character 40 week body weight were presented. In table 13, the values of a_1^*, a_2^*, RGI_o^*, $\hat{G}$ for the same character were given. In this case the RGI* and RGI_o^* ranges from 0.5353 to 0.6571 and 0.4804 to 0.6552 respectively.

For the character egg weight, the values of b_1^*, b_2^*, b_3^*, RGI* and $\hat{G}$ were presented in table 14. The values of a_1^*, a_2^*, RGI* and $\hat{G}$ for the same character were given in table 15. RGI* and RGI_o^* values were ranging from 0.5973 to 0.6861 and 0.5500 to 0.6779 respectively.

In table 16, the values of b_1^*, b_2^*, b_3^*, RGI* and G for the character egg production were presented. The values of a_1^*, a_2^*, RGI_o^* and $\hat{G}$ for the same character were given in table 17. The ranges of RGI* and RGI_o^* were 0.4430 to 0.6262 and 0.3894 to 0.6170 respectively.

The ratios of expected progress in males from selection based on an index I* as contrasted to selection based on an index I_o* for the four characters were given in table 18. The ratios for the four characters ranged from 1.013 to 1.1199, 1.0123 to 1.1216, 1.0087 to 1.1333 and 1.0148 to 1.1167 respectively. From this study also it was found that the index with the use of record on dam was more efficient than the one without the use of record on dam.

Simultaneous selection index

Simultaneous selection index was constructed by considering all the four characters viz. 20 week and 40 week body weights, egg weight and egg production by assigning the economic values $a_1 = 2$, $a_2 = 3$, $a_3 = 5$ and $a_4 = 8$ respectively (The scores were assigned on the basis of the importance of each character, egg production being the most important character, it was given the maximum score, egg weight being the next important character, it was given the next maximum score etc).

The index

$$I = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

so constructed was given in table 19. The expected genetic advance due to selection by this index at five per cent intensity of selection was worked out to be 825.8615 and that

due to straight selection was found to be 727.0793. The per cent gain in efficiency in expected genetic advance due to selection index over that due to straight selection was found to be 13.5862 (Table 19). This showed that selection based on index was found to be more efficient than straight selection.

Restricted selection indices

Restricted selection index was constructed by imposing restriction on egg weight (being negatively correlated with egg production) was given in table 19. The expected genetic advance obtained in individual characters were also presented in the same table. The expected genetic advance for the character egg weight was found to be equal to zero. Hence it was a clear indication that the index constructed by restricting the character egg weight will maximise the genetic progress in the other three characters without any change in egg weight (vz. egg weight being kept constant).

Restricted selection index restricting the character 40 week body weight was given in table 19. The genetic advance obtained for the four characters were also presented in the same table. In this case the expected genetic advance for the character 40 week body weight was not equal to zero. Hence it was not able to maximise the genetic advance in the other three characters by imposing restriction on 40 week

body weight (viz. by keeping 40 week body weight constant).

Restricted selection index construded by imposing restriction on both egg weight and 40 week body weight was also construded and was presented in table 19. From the genetic advance calculated for the four characters, it was found that the genetic advance for both the characters egg weight and 40 week body weight were not equal to zero. Hence it was not possible to attain maximum genetic advance in 20 week body weight and egg production without any change in the characters 40 week body weight and egg weight.

Phenotypic selection indices

Seven phenotypic selection indices

$I_1 = y - b_1x_1$

$I_2 = y - b_2x_2$

$I_3 = y - b_3x_3$

$I_4 = y - b_1x_1 - b_2x_2$

$I_5 = y - b_1x_1 - b_3x_3$

$I_6 = y - b_2x_2 - b_3x_3$

$I_7 = y - b_1x_1 - b_2x_2 - b_3x_3$

construcoted between the main trait egg production (y) and the auxiliary traits 20 week body weight (x_1), 40 week body weight (x_2) and egg weight (x_3) and their relative efficiencies

caloulated were given in table 20. From the index $I_1 = y - 0.038592\ x_1$ for improving the main trait egg production by using 20 week body weight as auxiliary trait resulted in an increase in the efficiency of selective breeding by one per cent. The same result was obtained in

$$I_2 = y - 0.00864\ x_2$$

when 40 week body weight was used as auxiliary trait. But the efficiency was decreased by 18 per cent in $I_3 = y + 0.803383\ x_3$, when egg weight was used as auxiliary trait.

In the case of

$$I_4 = y - 0.044714\ x_1 + 0.013611\ x_2$$

when both 20 week and 40 week body weights were used as auxiliary traits simultaneously, the relative efficiency was increased by 32 per cent. There was six per cent decrease in efficiency in $I_5 = y - 1.257323\ x_1 - 0.043022\ x_3$

when both 20 week body weight and egg weight were used as auxiliary traits to correct variations in egg production

In $I_6 = y - 0.017693\ x_2 + 1.00777\ x_3$,

when both 40 week body weight and egg weight were used as auxiliary traits to correct variation in egg production, 20 per cent decrease was found in the relative efficiency. But the relative efficiency was increased by 24 per cent in $I_7 = y - 0.0449\ x_1 + 0.033731\ x_2 + 1.017817\ x_3$, when all the

three characters 20 week and 40 week body weights, egg weight were used as auxiliary traits to correct variations in egg production.

Combined selection indices

Optimum selection indices were constructed for males combining information from full-sib and half-sib family averages for individual characters. These indices in descending order were presented in table 21 to 24. Heritability estimates with their standard errors calculated for the four characters were as follows

h^2 for 20 week body weight = 0.1519 ± 0.0800
h^2 for 40 week body weight = 0.1824 ± 0.0800
h^2 for egg weight = 0.3380 ± 0.1132
h^2 for egg production = 0.0597 ± 0.0564

If five per cent best sire-dam pairs were to be selected as parents we have to choose the first seven families which are having the highest scores.

In the case of 20 week body weight the selected male parents had selection score between 526.8 to 587. For the character 40 week body weight it ranged from 456.6 to 637.4. The same for egg weight and egg production ranged from 8.9 to 14.2 and 78.2 to 114.2 respectively.

Expected response due to selection for males based on

an index combining information from full-sibs and half-sibs family averages for the intensity of selection 2.08 (5 per cent level) was also calculated for each character and were given in table 25. The expected improvement in 20 week body weight due to selection of male parents was found to be 166.23 per cent. Expected improvement in the other three characters, 40 week body weight, egg weight, egg production were found to be 182.46 per cent, 8.06 per cent and 8.64 per cent respectively.

Tables

Table 1. 20 week body weight: Values of b_1, b_2, b_3, b_4, multiple correlation coefficient (RGI) and index I = G

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
1	207	0.3805	0.3958	0.0691	0.1307	0.7611	1127.0817
2	155	0.3805	0.3958	0.0691	0.1307	0.7611	1038.7825
3	175	0.3805	0.3958	0.0691	0.1307	0.7611	1006.8510
4	1296	0.3594	0.2308	0.2875	0.0839	0.2764	1135.2257
5	1228	0.3660	0.2841	0.2181	0.0988	0.7716	1114.4579
6	1464	0.3748	0.3529	0.1268	0.1183	0.7653	1155.0144
7	78	0.3873	0.3317	0.0758	0.1275	0.7562	1080.6714
8	1060	0.3808	0.2868	0.1388	0.1141	0.7609	1075.3689
9	947	0.3637	0.1567	0.3135	0.0767	0.7733	1163.5360
10	690	0.3873	0.3317	0.0758	0.1275	0.7562	1098.5074
11	298	0.3629	0.2480	0.2575	0.0991	0.7738	1225.5994
12	1548	0.3629	0.2480	0.2575	0.0991	0.7738	1160.4283
13	308	0.3629	0.2480	0.2575	0.0901	0.7738	1113.7591
14	777	0.3813	0.3886	0.0698	0.1304	0.7606	1290.0096
15	185	0.3695	0.3231	0.1742	0.1084	0.7691	1173.9408
16	30	0.3482	0.1423	0.4039	0.0589	0.7843	1140.0078
17	592	0.3620	0.2633	0.2526	0.0915	0.7745	1230.8029
18	1423	0.3549	0.2416	0.3039	0.0810	0.7796	1163.5900
19	429	0.3676	0.3469	0.1685	0.1102	0.7705	1103.7155
20	496	0.3548	0.2416	0.3039	0.0810	0.7796	1151.9090
21	507	0.3604	0.2881	0.2447	0.0938	0.7756	1149.9286
22	350	0.3637	0.3156	0.2092	0.1014	0.7733	1186.2420
23	252	0.3549	0.2416	0.3039	0.0810	0.7796	1102.3514
24	1232	0.3574	0.2636	0.2760	0.0870	0.7777	1141.4348
25	220	0.3604	0.2881	0.2447	0.0938	0.7756	1196.6852
26	1435	0.3618	0.3426	0.2015	0.1037	0.7746	1212.5195
27	1161	0.3511	0.2505	0.3175	0.0787	0.7822	1194.3532
28	1502	0.3697	0.4090	0.1166	0.1220	0.7689	1122.2335
29	1050	0.3618	0.3426	0.2015	0.1037	0.7746	1214.5806
30	848	0.3618	0.3426	0.2015	0.1037	0.7746	1248.6213
31	714	0.3618	0.3426	0.2015	0.1037	0.7746	1239.8600
32	297	0.3449	0.2236	0.3676	0.0682	0.7866	1193.6608
33	1212	0.3639	0.3929	0.1575	0.1137	0.7731	1234.9590
34	361	0.3482	0.2539	0.3306	0.0763	0.7843	1164.1579
35	1183	0.3482	0.2539	0.3306	0.0763	0.7843	1226.2936
36	1239	0.3728	0.4692	0.0613	0.1344	0.7668	1222.7089
37	1226	0.3490	0.2369	0.3377	0.0744	0.7837	1083.9500
38	266	0.3652	0.3771	0.1612	0.1125	0.7722	1210.6359
39	1449	0.3531	0.2738	0.2918	0.0843	0.7808	1147.8464
40	1302	0.3652	0.3771	0.1612	0.1125	0.7722	1214.2806

(contd.....)

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
41	68	0.3556	0.2952	0.2649	0.0901	0.7790	1112.0590
42	523	0.3529	0.2158	0.3313	0.0750	0.7809	1133.2797
43	1421	0.3489	0.1805	0.3749	0.0656	0.7838	1090.7061
44	322	0.3780	0.4200	0.0665	0.1319	0.7630	1148.7494
45	1342	0.3726	0.3777	0.1223	0.1200	0.7669	1129.9168
46	1460	0.3712	0.3926	0.1196	0.1209	0.7679	1154.4645
47	535	0.3597	0.2983	0.2414	0.0947	0.7761	1126.9123
48	202	0.3500	0.2146	0.3470	0.0720	0.7830	965.6506
49	1561	0.3597	0.2983	0.2414	0.0947	0.7761	1116.1642
50	1105	0.3712	0.3926	0.1196	0.1209	0.7679	1124.6337
51	739	0.3581	0.2518	0.2801	0.0859	0.7772	1200.3446
52	285	0.3611	0.2765	0.2484	0.0927	0.7751	1090.7935
53	1461	0.3731	0.3721	0.1233	0.1196	0.7665	1182.1592
54	27	0.3731	0.3721	0.1233	0.1196	0.7665	1188.9589
55	1336	0.3645	0.3042	0.2124	0.1005	0.7727	1185.9875
56	147	0.3540	0.2570	0.2981	0.0826	0.7801	1275.3145
57	1440	0.3594	0.3029	0.2399	0.0951	0.7763	1253.1519
58	1582	0.3540	0.2570	0.2981	0.0826	0.7801	1239.2461
59	211	0.3760	0.4387	0.0645	0.1329	0.7635	1318.8110
60	1571	0.3708	0.3971	0.1188	0.1212	0.7681	1273.0105
61	1102	0.3760	0.4387	0.0645	0.1324	0.7644	1298.1936
62	1468	0.3791	0.2028	0.2029	0.0992	0.7623	898.6032
63	83	0.3918	0.2893	0.0803	0.1254	0.7530	850.6609
64	1493	0.3743	0.1673	0.2514	0.0889	0.7657	910.4174
65	204	0.3823	0.1631	0.2125	0.0962	0.7599	909.4187
66	442	0.3883	0.2047	0.1537	0.1088	0.7555	949.7653
67	1146	0.3957	0.2525	0.0842	0.1235	0.7501	1012.2059
68	160	0.3778	0.3198	0.1328	0.1162	0.7631	1025.6705
69	418	0.3615	0.1941	0.3004	0.0803	0.7749	1050.9991
70	268	0.3615	0.1941	0.3004	0.0803	0.7749	1019.9784
71	448	0.3667	0.1057	0.3314	0.0717	0.7711	1097.6486
72	1286	0.3791	0.2028	0.2030	0.0992	0.7622	1096.8948
73	1097	0.3508	0.1974	0.3541	0.0703	0.7825	1161.5195
74	233	0.3552	0.2358	0.3061	0.0804	0.7793	1181.2403
75	1254	0.3578	0.2579	0.2780	0.0865	0.7725	1154.6809
76	1233	0.3889	0.0804	0.2323	0.0899	0.7751	1038.4744
77	613	0.4037	0.1765	0.0922	0.1197	0.7442	963.6478
78	400	0.3778	0.2196	0.1990	0.1005	0.7632	1166.4654
79	543	0.3903	0.3049	0.0787	0.1262	0.7542	1194.2224
80	857	0.3690	0.1535	0.2879	0.0815	0.7695	1179.5769

(contd.....)

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
81	1354	0.3755	0.2482	0.1921	0.1027	0.7648	1192.0995
82	772	0.3808	0.2868	0.1388	0.1141	0.7609	1145.9975
83	1364	0.3808	0.2868	0.1388	0.1141	0.7609	1211.1507
84	1453	0.3755	0.2482	0.1921	0.1027	0.7648	1109.2133
85	573	0.3558	0.2914	0.2662	0.0897	0.7789	1272.4406
86	217	0.3586	0.3155	0.2359	0.0963	0.7769	1263.7554
87	919	0.3558	0.2914	0.2662	0.0897	0.7789	1234.8597
88	943	0.3697	0.4090	0.1166	0.1220	0.7689	1196.6568
89	1490	0.3558	0.2914	0.2662	0.0898	0.7789	1257.0979
90	827	0.3747	0.4505	0.0633	0.1335	0.7653	1257.6172
91	1138	0.3742	0.3597	0.1256	0.1188	0.7657	1133.9892
92	1390	0.3562	0.2158	0.3136	0.0784	0.7786	1144.1547
93	304	0.3655	0.2913	0.2161	0.0994	0.7720	1225.3055
94	1313	0.3620	0.2633	0.2526	0.0915	0.7745	1100.5818
95	347	0.3581	0.1809	0.3267	0.0748	0.7773	1065.9195
96	11	0.3830	0.3727	0.0715	0.1296	0.7593	1091.0848
97	58	0.3677	0.2591	0.2252	0.0967	0.7704	1043.3976
98	713	0.3770	0.3290	0.1311	0.1168	0.7637	1189.5162
99	1333	0.3587	0.1702	0.3307	0.0738	0.7768	1160.3542
100	1271	0.3615	0.1941	0.3004	0.0829	0.7748	1176.0339
101	5	0.3839	0.3637	0.0725	0.1291	0.7587	1027.4037
102	578	0.3715	0.1150	0.3002	0.0779	0.7677	1025.9547
103	560	0.3806	0.1842	0.2075	0.0978	0.7611	1071.3804
104	24	0.3655	0.2913	0.2161	0.0994	0.7720	1218.5221
105	1275	0.3499	0.1588	0.3842	0.0631	0.7831	1124.4452
106	1466	0.3620	0.2633	0.2526	0.0915	0.7745	1035.0492
107	1159	0.3702	0.1383	0.2937	0.0798	0.7686	973.5756
108	602	0.3743	0.1673	0.2514	0.0889	0.7657	994.1140
109	1235	0.3594	0.3029	0.2399	0.0952	0.7763	1217.7246
110	562	0.3448	0.1739	0.4006	0.0605	0.7867	1183.0977
111	640	0.3708	0.3971	0.1188	0.1212	0.7682	1278.6145
112	983	0.3566	0.2787	0.2707	0.0885	0.7784	1247.8340
113	986	0.3598	0.2267	0.2904	0.0831	0.7760	1037.3278
114	1298	0.3665	0.2764	0.2203	0.0981	0.7713	1072.2978
115	1363	0.3571	0.1997	0.3196	0.0768	0.7780	1008.2566
116	150	0.3820	0.2736	0.1412	0.1132	0.7600	1203.9620
117	1402	0.3680	0.1695	0.2827	0.0829	0.7702	1139.9732
118	395	0.3886	0.3190	0.7772	0.1268	0.7582	1229.3166
119	1567	0.3886	0.3190	0.7772	0.1268	0.7552	1144.8186
120	1238	0.3521	0.2932	0.2845	0.0863	0.7815	1188.2155

(contd.....)

Table 1. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
121	1507	0.3500	0.2741	0.3081	0.0820	0.7830	1180.3406
122	540	0.3408	0.1893	0.4113	0.0589	0.7895	1235.9227
123	118	0.3725	0.4718	0.0611	0.1345	0.7700	1203.3595
124	21	0.3725	0.4718	0.0611	0.1345	0.7700	1180.2475
125	1205	0.3678	0.4308	0.1126	0.1234	0.7704	1229.4979
126	56	0.3849	0.3539	0.0750	0.1286	0.7579	1106.8146
127	277	0.3568	0.1360	0.3630	0.0666	0.7782	1090.2613
128	668	0.3849	0.3539	0.0735	0.1286	0.7579	1117.2471
129	1095	0.3788	0.3098	0.1346	0.1156	0.7624	1132.2889
130	299	0.3585	0.2453	0.2824	0.0853	0.7770	1203.6628
131	49	0.3690	0.3297	0.1726	0.1089	0.7695	1173.7395
132	371	0.3792	0.4087	0.0677	0.1314	0.7621	1138.3437
133	492	0.3736	0.3661	0.1244	0.1192	0.7661	1176.9247
134	1034	0.3690	0.3297	0.1726	0.1089	0.7695	1152.9811
135	960	0.3736	0.3661	0.1244	0.1192	0.7661	1179.2173
136	574	0.3582	0.1077	0.3742	0.0635	0.7772	1113.4829
137	709	0.3808	0.2868	0.1388	0.1141	0.7609	1176.9099
138	691	0.3873	0.3317	0.0758	0.1275	0.7562	1139.5795
139	689	0.3560	0.2874	0.2676	0.0894	0.7787	1206.7251
140	930	0.3658	0.3696	0.1630	0.1119	0.7718	1138.1117
141	1059	0.3560	0.2874	0.2676	0.0894	0.7787	1166.3524
142	1257	0.3621	0.3387	0.2026	0.1034	0.7743	1243.6055
143	533	0.3536	0.2659	0.2948	0.0835	0.7805	1129.0193
144	242	0.3577	0.0480	0.4161	0.0537	0.7776	987.8919
145	549	0.3901	0.3049	0.0787	0.1261	0.7542	1023.5837
146	404	0.4190	0.1037	0.0999	0.1161	0.7384	865.2248
147	597	0.4114	0.1037	0.0999	0.1161	0.7384	839.7663

Table 2. 20 week body weight: Values of a_1, a_2, a_3, multiple correlation coefficient (RGI_o) and index I = G

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
1	207	0.4096	0.3539	0.0982	0.7397	1010.6023
2	155	0.4096	0.3539	0.0982	0.7397	893.3057
3	175	0.4096	0.3539	0.0982	0.7397	883.7600
4	1296	0.3699	0.1824	0.3510	0.7688	1068.8862
5	1228	0.3811	0.2322	0.2789	0.7607	1040.3939
6	1464	0.3978	0.3040	0.1728	0.7485	1038.0542
7	78	0.4150	0.2974	0.1036	0.7357	943.3395
8	1060	0.4023	0.2484	0.1817	0.7452	961.1879
9	947	0.3727	0.1261	0.3676	0.7668	1098.7308
10	690	0.4150	0.2974	0.1036	0.7357	969.0812
11	298	0.3754	0.1993	0.3197	0.7639	1129.8802
12	1548	0.3754	0.1993	0.3197	0.7649	1062.5896
13	308	0.3754	0.1993	0.3197	0.7649	1030.0186
14	777	0.4102	0.3476	0.0988	0.7893	1160.6308
15	185	0.3882	0.2701	0.2303	0.7556	1057.8593
16	30	0.3532	0.1078	0.4589	0.7808	1100.2596
17	592	0.3747	0.2109	0.3165	0.7653	1159.9656
18	1423	0.3645	0.1868	0.3716	0.7727	1074.0647
19	429	0.3869	0.2893	0.2263	0.7565	1006.4711
20	496	0.3645	0.1868	0.3716	0.7727	1076.2049
21	507	0.3737	0.2296	0.3114	0.7661	1049.0700
22	350	0.3797	0.2567	0.2729	0.7618	1081.2316
23	252	0.3645	0.1868	0.3716	0.7727	1034.3622
24	1232	0.3688	0.2066	0.3439	0.7697	1073.5348
25	220	0.3737	0.2296	0.3115	0.7661	1119.1102
26	1435	0.3784	0.2775	0.2679	0.7627	1100.9453
27	1161	0.3601	0.1898	0.3890	0.7759	1132.2002
28	1502	0.3941	0.3509	0.1652	0.7513	1077.2426
29	1050	0.3784	0.2775	0.2679	0.7627	1107.1874
30	848	0.3784	0.2775	0.2679	0.7627	1116.2505
31	714	0.3784	0.2775	0.2679	0.7627	1129.5617
32	297	0.3513	0.1631	0.4390	0.7820	1134.6713
33	1212	0.3843	0.3259	0.2187	0.7584	1114.7347
34	361	0.3564	0.1888	0.4048	0.7785	1092.3370
35	1183	0.3564	0.1888	0.4048	0.7785	1160.1052
36	1239	0.4034	0.4183	0.0920	0.7443	1056.4814
37	1226	0.3569	0.1772	0.4087	0.7782	1018.2066
38	266	0.3852	0.3133	0.2213	0.7577	1073.2825
39	1449	0.3635	0.2098	0.3644	0.7734	1079.2745
40	1302	0.3852	0.3133	0.2213	0.7577	1100.0866

(contd.....)

Table 2. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
41	68	0.3676	0.2297	0.3371	0.7705	1021.3262
42	523	0.3611	0.1653	0.3970	0.7752	1072.1712
43	1421	0.3551	0.1361	0.4366	0.7794	1037.2811
44	322	0.4076	0.3752	0.0961	0.7412	1010.2142
45	1342	0.3961	0.3248	0.1694	0.7497	1027.5475
46	1460	0.3952	0.3373	0.1674	0.7505	1023.2850
47	535	0.3733	0.2373	0.3094	0.7664	1038.6278
48	202	0.3574	0.1619	0.4139	0.7777	916.1281
49	1561	0.3733	0.2373	0.3094	0.7664	1025.0153
50	1105	0.3952	0.3373	0.1674	0.7505	1019.4350
51	739	0.3692	0.1980	0.3464	0.7693	1125.9248
52	285	0.3742	0.2209	0.3138	0.7657	953.6111
53	1461	0.3965	0.3201	0.1702	0.7494	1060.3494
54	27	0.3965	0.3201	0.1702	0.7494	1049.9871
55	1336	0.3802	0.2479	0.2751	0.7614	1106.1981
56	147	0.3640	0.1979	0.3682	0.7730	1186.0245
57	1440	0.3731	0.2408	0.3084	0.7665	1181.8816
58	1582	0.3640	0.1979	0.3682	0.7730	1183.7430
59	211	0.4060	0.3918	0.0945	0.7424	1192.6153
60	1571	0.3949	0.3410	0.1668	0.7507	1136.4551
61	1102	0.4060	0.3918	0.0945	0.7424	1170.7273
62	1468	0.3950	0.1720	0.2507	0.7506	806.0819
63	83	0.4186	0.2599	0.1072	0.7329	737.4553
64	1493	0.3868	0.1393	0.0315	0.7566	837.9609
65	204	0.3973	0.1389	0.2576	0.7489	826.0134
66	442	0.4079	0.1784	0.1930	0.7410	861.5513
67	1146	0.4218	0.2271	0.1103	0.7306	894.0746
68	160	0.4001	0.2762	0.1772	0.7468	909.8472
69	418	0.3713	0.1547	0.3591	0.7678	983.9404
70	268	0.3713	0.1547	0.3591	0.7678	952.5146
71	448	0.3747	0.0862	0.3793	0.7654	1056.4726
72	1286	0.3950	0.1720	0.2507	0.7506	1035.4740
73	1097	0.3579	0.1499	0.4180	0.7773	1111.4969
74	233	0.3647	0.1826	0.3729	0.7725	1111.0314
75	1254	0.3690	0.2024	0.3451	0.7695	1077.8002
76	1233	0.4021	0.0692	0.2721	0.7453	976.3050
77	613	0.4283	0.1593	0.1168	0.7256	855.7436
78	400	0.3940	0.1858	0.2478	0.7513	1064.6019
79	543	0.4173	0.2737	0.1059	0.7339	1047.1044
80	857	0.3794	0.1256	0.3397	0.7620	1124.1438

(contd.....)

Table 2. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
81	1354	0.3924	0.2093	0.2429	0.7525	1088.1711
82	772	0.4023	0.2484	0.1817	0.7452	1031.4792
83	1364	0.4023	0.2484	0.1817	0.7452	1107.2908
84	1453	0.3924	0.2093	0.2429	0.7525	1028.2816
85	573	0.3678	0.2269	0.3379	0.7704	1175.0235
86	217	0.3726	0.2501	0.3059	0.7669	1143.3971
87	919	0.3678	0.2269	0.3379	0.7704	1146.8540
88	943	0.3941	0.3509	0.1652	0.7513	1073.9018
89	1490	0.3678	0.2269	0.3379	0.7704	1163.2402
90	827	0.4050	0.4020	0.0936	0.7432	1110.6360
91	1138	0.3974	0.3098	0.1718	0.7488	996.4138
92	1390	0.3654	0.1681	0.3775	0.7721	1073.2002
93	304	0.3808	0.2378	0.2775	0.7609	1151.9451
94	1313	0.3747	0.2109	0.3165	0.7653	1012.4725
95	347	0.3665	0.1423	0.3355	0.7713	1011.0427
96	11	0.4116	0.3336	0.1001	0.7383	975.2658
97	58	0.3824	0.2126	0.2836	0.7598	966.5752
98	713	0.3994	0.2840	0.1760	0.7473	1070.2383
99	1333	0.3669	0.1344	0.3880	0.7710	1122.9275
100	1271	0.3713	0.1547	0.3591	0.7678	1111.3717
101	5	0.4123	0.3256	0.1009	0.7377	874.6217
102	578	0.3810	0.0949	0.3480	0.7608	969.5100
103	560	0.3961	0.1565	0.2539	0.7498	982.0763
104	24	0.3808	0.2378	0.2775	0.7609	1110.6373
105	1275	0.3556	0.1208	0.4420	0.7790	1064.6227
106	1466	0.3747	0.2109	0.3165	0.7653	965.7544
107	1159	0.3801	0.1119	0.3486	0.7614	908.5244
108	602	0.3868	0.1393	0.3015	0.7566	939.4581
109	1235	0.3731	0.2408	0.3084	0.7665	1122.7990
110	562	0.3200	0.1283	0.4622	0.7830	1140.1339
111	640	0.3949	0.3410	0.1668	0.7507	1132.6637
112	983	0.3682	0.2177	0.3406	0.7700	1181.1885
113	986	0.3702	0.1763	0.3528	0.7686	962.0782
114	1298	0.3815	0.2262	0.2803	0.7604	990.5212
115	1363	0.3659	0.1563	0.3811	0.7717	930.6949
116	150	0.4032	0.2372	0.1835	0.7450	1099.7515
117	1402	0.3787	0.1384	0.5362	0.7625	1053.2398
118	395	0.4161	0.2861	0.1047	0.7348	1092.4828
119	1567	0.4161	0.2816	0.1047	0.7348	1008.2316
120	1238	0.3629	0.2234	0.3602	0.7738	1087.5280

(contd.....)

Table 2. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
121	1507	0.3594	0.2060	0.3836	0.7763	1114.6338
122	540	0.3455	0.1353	0.4773	0.7861	1174.8108
123	118	0.4032	0.4206	0.0918	0.7450	1024.6031
124	21	0.4032	0.4206	0.0918	0.7450	1008.5211
125	1205	0.3926	0.3690	0.1623	0.7523	1092.5016
126	56	0.4132	0.3170	0.1017	0.7371	954.1622
127	277	0.3634	0.1070	0.4161	0.7735	1029.9681
128	668	0.4132	0.3170	0.1017	0.7371	1003.0729
129	1095	0.4007	0.2678	0.1786	0.7463	1009.5392
130	299	0.3694	0.1931	0.3479	0.7692	1134.4315
131	49	0.3878	0.2754	0.2292	0.7558	1059.2296
132	371	0.4085	0.3653	0.0971	0.7405	978.3361
133	492	0.3969	0.3151	0.1710	0.7491	1056.9606
134	1034	0.3878	0.2754	0.2292	0.7558	1018.8989
135	960	0.3969	0.3151	0.1709	0.7491	1072.2077
136	574	0.3643	0.0856	0.4231	0.7728	1077.5077
137	709	0.4023	0.2484	0.1817	0.7452	1048.6768
138	691	0.4150	0.2974	0.1036	0.7357	1024.6604
139	689	0.3679	0.2240	0.3388	0.7703	1138.6643
140	930	0.3856	0.3074	0.2225	0.7574	1043.6752
141	1059	0.3679	0.2240	0.3388	0.7703	1078.2906
142	1257	0.3786	0.2745	0.2686	0.7626	1159.0644
143	533	0.3638	0.2042	0.3662	0.7732	1058.5730
144	242	0.3621	0.0386	0.4559	0.7744	972.3961
145	549	0.4173	0.2737	0.1059	0.7339	920.7464
146	404	0.4346	0.0939	0.1231	0.7208	781.5948
147	597	0.4346	0.0939	0.1231	0.7208	759.5470

Table 3. 40 week body weight: Values of b_1, b_2, b_3, b_4, multiple correlation coefficient (RGI) and the index I = G

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
1	207	0.4277	0.3765	0.0663	0.1343	0.7888	1455.3137
2	155	0.4277	0.3765	0.0663	0.1343	0.7888	1287.9961
3	175	0.4277	0.3765	0.0663	0.1343	0.7888	1405.7203
4	1296	0.4070	0.2181	0.2731	0.0849	0.8003	1436.4735
5	1228	0.4133	0.2690	0.2078	0.1006	0.7967	1400.7941
6	1464	0.4221	0.3350	0.1213	0.1212	0.7919	1433.1205
7	78	0.4345	0.3188	0.0731	0.1307	0.7849	1287.0045
8	1060	0.4281	0.2751	0.1334	0.1164	0.7885	1264.7754
9	947	0.4113	0.1498	0.2990	0.0769	0.7979	1234.8116
10	690	0.4345	0.3188	0.0731	0.1307	0.7849	1255.5354
11	298	0.4104	0.2349	0.2451	0.0915	0.7984	1491.0342
12	1548	0.4104	0.2349	0.2451	0.0915	0.7984	1370.8797
13	308	0.4104	0.2349	0.2451	0.0915	0.7984	1368.9457
14	777	0.4285	0.3701	0.0670	0.1339	0.7883	1561.2032
15	185	0.4168	0.3059	0.1662	0.1107	0.7948	1369.2155
16	30	0.3961	0.1344	0.3817	0.0590	0.8063	1467.5854
17	592	0.4095	0.2487	0.2402	0.0930	0.7989	1470.4486
18	1423	0.4026	0.2271	0.2879	0.0822	0.8027	1446.9700
19	429	0.4150	0.3272	0.1606	0.1127	0.7959	1382.6454
20	496	0.4026	0.2271	0.2879	0.0822	0.8027	1449.6225
21	507	0.4079	0.2711	0.2324	0.0955	0.7998	1449.7793
22	350	0.4112	0.2973	0.1990	0.1035	0.7980	1406.3670
23	252	0.4026	0.2271	0.2879	0.0822	0.8027	1347.1654
24	1232	0.4051	0.2479	0.2618	0.0884	0.8014	1397.2828
25	220	0.4079	0.2711	0.2324	0.0955	0.7998	1379.0271
26	1435	0.4093	0.3214	0.1915	0.1060	0.7990	1520.2478
27	1161	0.3990	0.2343	0.3002	0.0799	0.8047	1476.3903
28	1502	0.4171	0.3849	0.1113	0.1252	0.7947	1587.2444
29	1050	0.4093	0.3214	0.1915	0.1060	0.7990	1473.2080
30	848	0.4093	0.3214	0.1915	0.1060	0.7990	1514.2554
31	714	0.4093	0.3214	0.1915	0.1060	0.7990	1521.4244
32	297	0.3930	0.2081	0.3467	0.0691	0.8080	1404.8240
33	1212	0.4114	0.3680	0.1499	0.1165	0.7979	1490.7783
34	361	0.3961	0.2365	0.3122	0.0774	0.8063	1457.1717
35	1183	0.3961	0.2365	0.3122	0.0774	0.8063	1496.8586
36	1239	0.4201	0.4412	0.0587	0.1384	0.7930	1484.0786
37	1226	0.3969	0.2213	0.3190	0.0754	0.8059	1393.3207
38	266	0.4126	0.3541	0.1536	0.1152	0.7972	1458.3512
39	1449	0.4009	0.2560	0.2762	0.0857	0.8037	1445.6823
40	1302	0.4126	0.3541	0.1536	0.1152	0.7972	1460.2782

(contd.....)

Table 3. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
41	68	0.4033	0.2762	0.2511	0.0918	0.8023	1435.3806
42	523	0.4006	0.2029	0.3136	0.0759	0.8038	1446.5564
43	1421	0.3968	0.1697	0.3542	0.0661	0.8059	1360.2070
44	322	0.4252	0.3980	0.0638	0.1357	0.7902	1460.7493
45	1342	0.4199	0.3572	0.1169	0.1230	0.7931	1499.4410
46	1460	0.4065	0.2921	0.2251	0.0979	0.8006	1396.6813
47	535	0.4073	0.2802	0.2292	0.0965	0.8001	1338.7699
48	202	0.3979	0.20212	0.3279	0.0728	0.8053	1398.6018
49	1561	0.4073	0.2802	0.2292	0.0965	0.8001	1338.6669
50	1105	0.4185	0.3704	0.1142	0.1240	0.7939	1368.4658
51	739	0.4057	0.2372	0.2659	0.0872	0.8009	1434.0606
52	285	0.4086	0.2607	0.2361	0.0943	0.7994	1372.7018
53	1461	0.4204	0.3522	0.1179	0.1226	0.7929	1470.1607
54	27	0.4204	0.3522	0.1179	0.1226	0.7929	1400.8551
55	1336	0.4120	0.2871	0.2022	0.1024	0.7975	0.14.2823
56	147	0.4018	0.2410	0.2823	0.0839	0.8032	1483.9442
57	1440	0.4070	0.2844	0.2278	0.0970	0.8003	1548.6931
58	1582	0.4018	0.2410	0.2823	0.0839	0.8032	1500.4270
59	211	0.4232	0.4146	0.0618	0.1367	0.7913	1607.5302
60	1571	0.4181	0.3744	0.1134	0.1244	0.7941	1588.2332
61	1102	0.4232	0.4146	0.0618	0.1367	0.7913	1546.8035
62	1468	0.4265	0.1957	0.1952	0.1004	0.7895	1234.2604
63	83	0.4391	0.2800	0.0777	0.1283	0.7824	1315.7322
64	1493	0.4217	0.1613	0.2413	0.0895	0.7921	1230.5985
65	204	0.4298	0.1583	0.2050	0.0969	0.7876	1154.0806
66	442	0.4358	01989	0.1487	0.1103	0.7842	1187.4865
67	1146	0.4432	0.2457	0.0817	0.1261	0.7801	1245.5888
68	160	0.4251	0.3051	0.1273	0.1188	0.7902	1276.5602
69	418	0.4091	0.1845	0.2859	0.0810	0.7991	1214.4203
70	268	0.4091	0.1845	0.2859	0.0810	0.7991	1222.3023
71	448	0.4143	0.1020	0.3172	0.0713	0.7963	1336.2876
72	1286	0.4265	0.1957	0.1952	0.1004	0.7895	1303.7577
73	1097	0.3986	0.1856	0.3348	0.0706	0.8049	1461.6363
74	233	0.4029	0.2218	0.2903	0.0815	0.8026	1471.9205
75	1254	0.4054	0.2427	0.2638	0.0878	0.8012	1438.9471
76	1233	0.4367	0.0791	0.2259	0.0896	0.7837	1202.5861
77	613	0.4516	0.1740	0.0902	0.1216	0.7753	1177.8322
78	400	0.4251	0.2112	0.1911	0.1019	0.7902	1405.2064
79	543	0.4374	0.2943	0.0760	0.1292	0.7833	1320.4647
80	857	0.4165	0.1474	0.2755	0.0817	0.7950	1343.9807

(contd.....)

Table 3. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
81	1354	0.4228	0.2377	0.1841	0.1043	0.7915	1372.8540
82	772	0.4281	0.2751	0.1334	0.1164	0.7885	1297.1676
83	1364	0.4281	0.2751	0.1334	0.1164	0.7885	1405.0405
84	1453	0.4228	0.2377	0.1841	0.1043	0.7915	1339.5880
85	573	0.4035	0.2729	0.2524	0.0914	0.8022	1524.6217
86	217	0.4062	0.2956	0.2239	0.0982	0.8007	1506.7051
87	919	0.4035	0.2729	0.2524	0.0914	0.8022	1549.9795
88	943	0.4171	0.3849	0.1113	0.1252	0.7947	1497.6554
89	1490	0.4035	0.2729	0.2523	0.0914	0.8022	1598.0104
90	827	0.4220	0.4239	0.0606	0.1374	0.7920	1547.4320
91	1138	0.4215	0.3411	0.1201	0.1217	0.7922	1448.8009
92	1390	0.4039	0.2036	0.2974	0.0793	0.8020	1439.3981
93	304	0.4129	0.2754	0.2058	0.1012	0.7970	1476.9391
94	1313	0.4095	0.2487	0.2402	0.0930	0.7989	1360.5521
95	347	0.4058	0.1717	0.3103	0.0754	0.8010	1348.6820
96	11	0.4302	0.3558	0.0687	0.1330	0.7874	1394.5416
97	58	0.4152	0.2462	0.2149	0.0982	0.7958	1300.5224
98	713	0.4243	0.3135	0.1257	0.1195	0.7907	1413.2319
99	1333	0.4063	0.1618	0.3143	0.0742	0.8007	1377.1072
100	1271	0.4091	0.1845	0.2859	0.0810	0.7991	1439.8269
101	5	0.4311	0.3477	0.0697	0.1325	0.7869	1374.3094
102	578	0.4191	0.1112	0.2882	0.7772	0.7936	1215.5363
103	560	0.4280	0.1782	0.1998	0.988	0.7836	1388.1677
104	24	0.4129	0.2754	0.2058	0.1012	0.7970	1363.9149
105	1275	0.3978	0.1499	0.3633	0.0634	0.8054	1364.0301
106	1466	0.4095	0.2487	0.2402	0.0930	0.7989	1212.2905
107	1159	0.4177	0.1304	0.2815	0.0799	0.7943	1334.4530
108	602	0.4217	0.1613	0.2413	0.0895	0.7921	1293.2528
109	1235	0.4070	0.2844	0.2280	0.0970	0.8003	1433.2406
110	562	0.3929	0.1629	0.3076	0.0609	0.8080	1428.8224
111	640	0.4181	0.3744	0.1134	0.1244	0.7941	1564.0771
112	983	0.4042	0.2615	0.2567	0.0900	0.8018	1450.6377
113	986	0.4074	0.2108	0.2759	0.0841	0.8001	1339.7340
114	1298	0.4139	0.2620	0.2100	0.0998	0.7965	1266.4054
115	1363	0.4048	0.1890	0.3033	0.0775	0.8015	1271.7266
116	150	0.4293	0.2630	0.1358	0.1154	0.7879	1473.3421
117	1402	0.4155	0.1625	0.2703	0.0834	0.7956	1319.1278
118	395	0.4359	0.3072	0.0745	0.1300	0.7842	1449.5038
119	1567	0.4359	0.3072	0.0745	0.1300	0.7842	1426.2822
120	1238	0.3999	0.2733	0.2692	0.0878	0.8042	1412.3149

(contd.....)

Table 3. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
121	1507	0.3978	0.2553	0.2912	0.0825	0.8053	1406.5581
122	540	0.3891	0.1760	0.3870	0.0595	0.8101	1386.8362
123	118	0.4198	0.4435	0.0584	0.1385	0.7932	1441.0196
124	21	0.4198	0.4435	0.0584	0.1385	0.7932	1408.6744
125	1205	0.4151	0.4041	0.1074	0.1267	0.7958	1473.8853
126	56	0.4322	0.3389	0.0707	0.1320	0.7863	2307.7060
127	277	0.4045	0.1296	0.3449	0.0665	0.8016	1335.0807
128	668	0.4322	0.3389	0.0707	0.1320	0.7863	1284.8767
129	1095	0.4260	0.2960	0.1292	0.1181	0.7897	1828.7946
130	299	0.4061	0.2313	0.2681	0.0865	0.8008	1330.1983
131	49	0.4163	0.3118	0.1647	0.1112	0.7952	1385.8550
132	371	0.4264	0.3880	0.0649	0.1350	0.7895	1317.5391
133	492	0.4209	0.3468	0.1190	0.1222	0.7926	1393.9379
134	1034	0.4163	0.3118	0.1648	0.1112	0.7952	1828.7911
135	960	0.4209	0.3468	0.1190	0.1222	0.7926	1347.3176
136	574	0.4060	0.1031	0.3562	0.0632	0.8009	1246.5947
137	709	0.4281	0.2751	0.1334	0.1164	0.7885	1494.6962
138	691	0.4346	0.3188	0.0731	0.1307	0.7849	1327.6655
139	689	0.4037	0.2693	0.2537	0.0909	0.8021	1495.8741
140	930	0.4132	0.3474	0.1553	0.1145	0.7969	1378.6036
141	1059	0.4037	0.2693	0.2537	0.0909	0.8021	1435.9539
142	1257	0.4096	0.3179	0.1926	0.1056	0.7989	1532.0146
143	533	0.4013	0.2489	0.2791	0.0849	0.8034	1320.5057
144	242	0.4055	0.0463	0.3969	0.0525	0.8011	1157.0362
145	549	0.4374	0.2943	0.0760	0.1292	0.7833	1260.2771
146	404	0.4600	0.1035	0.0985	0.1172	0.7705	1099.9754
147	597	0.4600	0.1035	0.0985	0.1172	0.7705	1045.4118

Table 4. 40 week body weight: Values of a_1, a_2, a_3, multiple correlation coefficient (RGI_o) and the index I = G

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
1	207	0.4611	0.3268	0.0997	0.7698	1254.0070
2	155	0.4611	0.3268	0.0997	0.7698	1112.5850
3	175	0.4611	0.3268	0.0997	0.7698	1237.5110
4	1296	0.4185	0.1632	0.3422	0.7939	1341.6156
5	1228	0.4302	0.2094	0.2750	0.7874	1295.4535
6	1464	0.4481	0.2778	0.1733	0.7773	1261.6127
7	78	0.4663	0.2777	0.1048	0.7669	1123.5762
8	1060	0.4523	0.2297	0.1816	0.7749	1125.3235
9	947	0.4209	0.1149	0.3570	0.7926	1139.2577
10	690	0.4663	0.2777	0.1048	0.7669	1084.1652
11	298	0.4241	0.1792	0.3131	0.7908	1363.5026
12	1548	0.4241	0.1792	0.3131	0.7908	1251.0872
13	308	0.4241	0.1792	0.3131	0.7908	1248.0983
14	777	0.4616	0.3214	0.1002	0.7695	1357.3477
15	185	0.4377	0.2446	0.2289	0.7831	1212.8876
16	30	0.4014	0.0959	0.4399	0.8034	1410.1364
17	592	0.4235	0.1890	0.3103	0.7911	1355.0635
18	1423	0.4131	0.1655	0.3614	0.7969	1334.4440
19	429	0.4365	0.2609	0.2253	0.7838	1237.6231
20	496	0.4131	0.1655	0.3614	0.7969	1357.4346
21	507	0.4226	0.2047	0.3058	0.7916	1320.7549
22	350	0.4288	0.2300	0.2697	0.7881	1277.3508
23	252	0.4131	0.1655	0.3614	0.7969	1258.3250
24	1232	0.4171	0.1836	0.3359	0.7745	1294.0948
25	220	0.4226	0.2047	0.3058	0.7916	1267.1636
26	1435	0.4277	0.2472	0.2652	0.7888	1390.3540
27	1161	0.4086	0.1665	0.3775	0.7993	1392.2126
28	1502	0.4436	0.3174	0.1664	0.7792	1375.7646
29	1050	0.4277	0.2472	0.2652	0.7868	1311.7522
30	848	0.4277	0.2472	0.2652	0.7868	1334.7813
31	714	0.4277	0.2472	0.2652	0.7868	1383.8970
32	297	0.3999	0.1416	0.4229	0.8042	1317.3264
33	1212	0.4343	0.2912	0.2186	0.7851	1319.8846
34	361	0.4050	0.1644	0.3922	0.8014	1348.4282
35	1183	0.4050	0.1644	0.3922	0.8014	1400.7855
36	1239	0.4554	0.3814	0.0939	0.7731	1297.3669
37	1226	0.4054	0.1551	0.3951	0.8012	1291.5822
38	266	0.4351	0.2808	0.2208	0.7847	1237.5701
39	1449	0.4122	0.1844	0.3552	0.7974	1315.7288
40	1302	0.4351	0.2808	0.2209	0.7847	1298.3486

(contd.....)

Table 4. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
41	68	0.4164	0.2026	0.3301	0.7951	1275.8771
42	523	0.4095	0.1466	0.3844	0.7989	1345.6381
43	1421	0.4035	0.1203	0.4202	0.8022	1285.3044
44	322	0.4592	0.3450	0.0978	0.7709	1262.7796
45	1342	0.4465	0.2955	0.1702	0.7782	1314.8143
46	1460	0.4218	0.2193	0.3017	0.7921	1234.4011
47	535	0.4223	0.2111	0.3040	0.7918	1218.9254
48	202	0.4059	0.1425	0.3999	0.8009	1327.3210
49	1561	0.4222	0.2111	0.3040	0.7918	1229.7385
50	1105	0.4456	0.3060	0.1684	0.7787	1211.6823
51	739	0.4178	0.1763	0.3381	0.7943	1325.7655
52	285	0.4230	0.1974	0.3079	0.7914	1201.4394
53	1461	0.4469	0.2915	0.1709	0.7780	1301.9567
54	27	0.4469	0.2915	0.1709	0.7780	1213.9231
55	1336	0.4293	0.2225	0.2716	0.7879	1348.1003
56	147	0.4126	0.1746	0.3584	0.7972	1359.3285
57	1440	0.4221	0.2140	0.3032	0.7919	1439.2932
58	1582	0.4126	0.1746	0.3584	0.7972	1391.1836
59	211	0.4577	0.3591	0.0963	0.7718	1417.0863
60	1571	0.4484	0.3091	0.1679	0.7788	1399.1600
61	1102	0.4577	0.3591	0.0963	0.7718	1363.0135
62	1468	0.4440	0.1594	0.2478	0.7796	1116.7032
63	83	0.4698	0.2445	0.1083	0.7649	1158.9323
64	1493	0.4354	0.1287	0.2957	0.7845	1135.5547
65	204	0.4462	0.1298	0.2543	0.7783	1028.9643
66	442	0.4576	0.1675	0.1924	0.7718	1053.2325
67	1146	0.4728	0.2150	0.1114	0.7631	1088.2824
68	160	0.4501	0.2539	0.1774	0.7761	1090.0306
69	418	0.4197	0.1397	0.3494	0.7933	1129.1408
70	268	0.4197	0.1397	0.3494	0.7933	1141.0914
71	448	0.4227	0.0795	0.3679	0.7916	1284.5412
72	1286	0.4440	0.1594	0.2478	0.2796	1198.6944
73	1097	0.4063	0.1326	0.4034	0.8006	1373.2365
74	233	0.4132	0.1620	0.3624	0.7968	1376.2477
75	1254	0.4176	0.1801	0.3370	0.7944	1333.5760
76	1233	0.4509	0.0657	0.2685	0.7757	1129.7169
77	613	0.4794	0.1529	0.1179	0.7593	1028.1445
78	400	0.4431	0.1716	0.2451	0.7801	1243.5502
79	543	0.4635	0.2567	0.1070	0.7656	1135.1613
80	857	0.4277	0.1154	0.3313	0.7888	1271.8276

(contd.....)

Table 4. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
81	1354	0.4416	0.1923	0.2405	0.7810	1223.8352
82	772	0.4523	0.2297	0.1816	0.7749	1332.5477
83	1364	0.4523	0.2297	0.1816	0.7749	1298.5664
84	1453	0.4416	0.1923	0.2405	0.7810	1225.1367
85	573	0.4166	0.2003	0.3308	0.7950	1373.7029
86	217	0.4216	0.2217	0.3010	0.7922	1363.8783
87	919	0.4166	0.2003	0.3308	0.7950	1404.6496
88	943	0.4446	0.3174	0.1664	0.7792	1310.0854
89	1490	0.4166	0.2003	0.3308	0.7950	1432.1367
90	827	0.4568	0.3677	0.0954	0.7723	1337.5741
91	1138	0.4477	0.2827	0.1724	0.7775	1280.3458
92	1390	0.4138	0.1498	0.3665	0.7965	1350.8848
93	304	0.4299	0.2141	0.2737	0.7876	1346.0313
94	1313	0.4235	0.1890	0.3103	0.7911	1231.7044
95	347	0.4148	0.1280	0.3735	0.7960	1268.1797
96	11	0.4630	0.3092	0.1015	0.7688	1220.2227
97	58	0.4312	0.1927	0.2793	0.7868	1177.9047
98	713	0.4496	0.2606	0.1763	0.7764	1263.8399
99	1333	0.4151	0.1811	0.3758	0.7958	1306.8603
100	1271	0.4198	0.1397	0.3494	0.7933	1353.5994
101	5	0.4637	0.3024	0.1022	0.7684	1172.8756
102	578	0.4293	0.0880	0.3391	0.7879	1157.5772
103	560	0.4450	0.1456	0.2508	0.7790	1265.0634
104	24	0.4299	0.2141	0.2737	0.7876	1228.4275
105	1275	0.4039	0.1074	0.4248	0.8020	1281.1790
106	1466	0.4235	0.1890	0.3103	0.7911	1117.4311
107	1159	0.4254	0.1026	0.3349	0.7884	1243.8919
108	602	0.4354	0.1287	0.2957	0.7845	1212.5926
109	1235	0.4221	0.2140	0.3032	0.7919	1298.2835
110	562	0.3984	0.1129	0.4432	0.8050	1367.6269
111	640	0.4454	0.3091	0.1679	0.7788	1380.1982
112	983	0.4169	0.1927	0.3331	0.7948	1341.8750
113	986	0.4187	0.1581	0.3437	0.7938	1246.5948
114	1298	0.4305	0.2043	0.2763	0.7872	1164.4483
115	1363	0.4142	0.1399	0.3697	0.7963	1182.4884
116	150	0.4531	0.2199	0.1837	0.7744	1310.5966
117	1402	0.4270	0.1267	0.3281	0.7891	1211.5175
118	395	0.4673	0.2678	0.1059	0.7664	1255.2969
119	1567	0.4673	0.2678	0.1059	0.7663	1248.7743
120	1238	0.4117	0.1955	0.3516	0.7977	1301.8172

(contd.....)

Table 4. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
121	1507	0.4081	0.1797	0.3730	0.7997	1291.8972
122	540	0.3941	0.1170	0.4571	0.8074	1322.8514
123	118	0.4552	0.3834	0.0937	0.7732	1234.6322
124	21	0.4552	0.3834	0.0937	0.7732	1226.2934
125	1205	0.4433	0.3325	0.1638	0.7800	1274.0721
126	56	0.4645	0.2949	0.1030	0.7679	2535.6902
127	277	0.4116	0.0968	0.4012	0.7978	1260.0948
128	668	0.4645	0.2949	0.1030	0.7679	1116.8527
129	1095	0.4508	0.2466	0.1787	0.7757	1177.1376
130	299	0.4180	0.1723	0.3394	0.7942	1230.7585
131	49	0.4374	0.2491	0.2279	0.7833	1231.6551
132	371	0.4601	0.3365	0.0987	0.7704	1156.2994
133	492	0.4473	0.2872	0.1717	0.7778	1227.6889
134	1034	0.4374	0.2491	0.2279	0.7833	1202.1123
135	960	0.4473	0.2873	0.1716	0.7778	1184.7281
136	574	0.4126	0.780	0.4076	0.7973	1188.8825
137	709	0.4523	0.2297	0.1816	0.7749	1308.9010
138	691	0.4663	0.2777	0.1048	0.7669	1174.0693
139	689	0.4167	0.1979	0.3315	0.7949	1333.6966
140	930	0.4354	0.2759	0.2220	0.7844	1235.3793
141	1059	0.4167	0.1979	0.3315	0.7949	1318.9959
142	1257	0.4279	0.2448	0.2658	0.7887	1391.7081
143	533	0.4124	0.1798	0.3567	0.7973	1224.2555
144	242	0.4101	0.0357	0.4375	0.7956	1126.4935
145	549	0.4685	0.2568	0.1070	0.7656	1101.1861
146	404	0.4858	0.0914	0.1244	0.7555	954.3935
147	597	0.4858	0.0914	0.1244	0.7555	909.5596

Table 5. Egg weight: Values of b_1, b_2, b_3, b_4, multiple correlation coefficient (RGI) and the index I = G

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
1	207	0.7362	0.1961	0.0282	0.0976	0.9210	52.9358
2	155	0.7362	0.1961	0.0282	0.0976	0.9210	44.5496
3	175	0.7362	0.1961	0.0282	0.0976	0.9210	55.0832
4	1296	0.7283	0.1173	0.1223	0.0619	0.9219	56.3802
5	1228	0.7309	0.1434	0.0915	0.0736	0.9216	53.8820
6	1464	0.7341	0.1761	0.0523	0.0885	0.9212	55.6775
7	78	0.7410	0.1714	0.0330	0.0937	0.9204	50.2259
8	1060	0.7384	0.1487	0.0609	0.0832	0.9207	54.0369
9	947	0.7315	0.0821	0.1414	0.0526	0.9215	41.2392
10	690	0.7410	0.1714	0.0330	0.0937	0.9204	54.1793
11	298	0.7299	0.1261	0.1095	0.0666	0.9217	52.3003
12	1548	0.7299	0.1261	0.1095	0.0666	0.9217	54.3169
13	308	0.7299	0.1261	0.1095	0.0666	0.9217	53.4550
14	777	0.7367	0.1934	0.0287	0.0972	0.9209	54.0862
15	185	0.7320	0.1616	0.0720	0.0812	0.9214	57.0024
16	30	0.7239	0.0728	0.1754	0.0417	0.9223	52.0288
17	592	0.7292	0.1329	0.1061	0.0683	0.9217	54.6727
18	1423	0.7260	0.1216	0.1265	0.0611	0.9221	53.4687
19	429	0.7307	0.1714	0.0682	0.0834	0.9216	50.4130
20	496	0.7260	0.1216	0.1265	0.0611	0.9221	57.5423
21	507	0.7281	0.1439	0.1006	0.0710	0.9219	53.2864
22	350	0.7293	0.1568	0.0853	0.0768	0.9217	56.5170
23	252	0.7260	0.1216	0.1265	0.0611	0.9221	53.0245
24	1232	0.7270	0.1322	0.1142	0.0658	0.9220	51.9821
25	220	0.7281	0.1439	0.1005	0.0710	0.9219	54.0169
26	1435	0.7280	0.1680	0.0802	0.0795	0.9219	57.1463
27	1161	0.7242	0.1253	0.1297	0.0606	0.9223	57.4722
28	1502	0.7307	0.1977	0.0455	0.0927	0.9216	62.6950
29	1050	0.7280	0.1680	0.0802	0.0795	0.9219	52.7830
30	848	0.7280	0.1680	0.0802	0.0795	0.9219	60.3238
31	714	0.7280	0.1680	0.0802	0.0795	0.9219	55.5675
32	297	0.7216	0.1121	0.1498	0.0533	0.9226	53.0417
33	1212	0.7283	0.1895	0.0609	0.0874	0.9218	54.4439
34	361	0.7228	0.1265	0.1834	0.0596	0.9224	56.8276
35	1183	0.7228	0.1265	0.1334	0.0596	0.9224	51.9618
36	1239	0.7312	0.2220	0.0232	0.1018	0.9215	56.0536
37	1226	0.7233	0.1187	0.1383	0.0574	0.9224	51.0917
38	266	0.7291	0.1834	0.0644	0.0860	0.9217	53.3005
39	1449	0.7248	0.1362	0.1181	0.0651	0.9222	51.2987
40	1302	0.7291	0.1384	0.0634	0.0860	0.9218	53.1308

(contd....)

Table 5. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
41	68	0.7257	0.1462	0.1066	0.0695	0.9221	51.5805
42	523	0.7254	0.1091	0.1394	0.0561	0.9222	54.5662
43	1421	0.7239	0.0917	0.1593	0.0484	0.09223	53.0196
44	322	0.7345	0.2049	0.0265	0.0990	0.9211	56.6682
45	1342	0.7326	0.1858	0.0493	0.0904	0.9214	59.0157
46	1460	0.7317	0.1915	0.0475	0.0915	0.9214	53.9026
47	535	0.7276	0.1485	0.0983	0.0722	0.9219	58.1830
48	202	0.7241	0.1082	0.1447	0.0544	0.09223	55.3904
49	1561	0.7276	0.1485	0.0983	0.0722	0.9219	53.1771
50	1105	0.7317	0.1915	0.0475	0.0915	0.9215	56.3658
51	739	0.7275	0.1269	0.1171	0.0644	0.9219	54.3222
52	285	0.7286	0.1388	0.1031	0.0697	0.9218	52.8070
53	1461	0.7330	0.1836	0.0500	0.0899	0.9213	59.8471
54	27	0.7330	0.1836	0.0500	0.0899	0.9213	51.4413
55	1336	0.7298	0.1520	0.0875	0.0757	0.9217	56.2855
56	147	0.7255	0.1286	0.1225	0.0630	0.9222	55.4771
57	1440	0.7274	0.1503	0.0973	0.0727	0.9213	57.1554
58	1582	0.7255	0.1286	0.1225	0.0630	0.9222	56.0602
59	211	0.7332	0.2116	0.0252	0.1001	0.9213	56.8090
60	1571	0.7314	0.1932	0.0469	0.0919	0.9215	55.6264
61	1102	0.7332	0.2116	0.0252	0.1001	0.9213	55.2213
62	1468	0.7391	0.1084	0.0933	0.0695	0.9206	52.1073
63	83	0.7444	0.1538	0.0364	0.0986	0.9200	51.5003
64	1493	0.7371	0.0895	0.1163	0.0608	0.9209	49.0666
65	204	0.7416	0.0892	0.1010	0.0652	0.9203	51.8313
66	442	0.7443	0.1118	0.0726	0.0759	0.9200	52.7530
67	1146	0.7475	0.1377	0.0395	0.0883	0.9197	50.8455
68	160	0.7362	0.1627	0.0566	0.0859	0.9209	50.7791
69	418	0.7299	0.1001	0.1316	0.0574	0.9217	51.5909
70	268	0.7299	0.1001	0.1316	0.0574	0.9217	54.1243
71	448	0.3738	0.0567	0.1553	0.0459	0.9212	527275
72	1286	0.7391	0.1084	0.0933	0.0695	0.9206	54.1931
73	1097	0.7246	0.1001	0.1498	0.0521	0.9222	50.2527
74	233	0.7263	0.1189	0.1280	0.0604	0.9221	56.2136
75	1254	0.7272	0.1296	0.1156	0.0652	0.9220	50.9373
76	1233	0.7474	0.0462	0.1182	0.0557	0.9197	50.3010
77	613	0.7545	0.1017	0.0465	0.0825	0.9187	53.1116
78	400	0.7380	0.1162	0.0902	0.0712	0.9207	57.0424
79	543	0.7431	0.1604	0.0351	0.0919	0.9202	53.4914
80	857	0.7344	0.0814	0.1322	0.0553	0.9212	53.3372

(contd....)

Table 5. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
81	1354	0.7363	0.1293	0.0850	0.0741	0.9209	50.2100
82	772	0.7384	0.1489	0.0609	0.0832	0.9207	54.8613
83	1364	0.7384	0.1489	0.0609	0.0832	0.9207	53.3959
84	1453	0.7363	0.1293	0.0850	0.0741	0.9209	52.7139
85	573	0.7259	0.1445	0.1074	0.0691	0.9221	54.9903
86	217	0.7269	0.1557	0.0946	0.0740	0.9220	58.1086
87	919	0.7259	0.1445	0.1075	0.0691	0.9221	58.4000
88	943	0.7307	0.1977	0.0455	0.0927	0.9216	57.7640
89	1490	0.7259	0.1445	0.1075	0.0691	0.9221	56.7100
90	827	0.3724	0.2156	0.0244	0.1008	0.9214	55.7459
91	1138	0.7337	0.1788	0.0515	0.0890	0.9212	53.0629
92	1390	0.7270	0.1096	0.1334	0.0579	0.9220	52.2407
93	304	0.7305	0.1464	0.0901	0.0744	0.9216	51.4688
94	1313	0.7292	0.1329	0.1061	0.0683	0.9217	52.1299
95	347	0.7283	0.0931	0.1428	0.0534	0.9218	52.2601
96	11	0.7379	0.1874	0.0299	0.0963	0.9208	59.5691
97	58	0.7321	0.1323	0.0966	0.0710	0.9214	53.3044
98	713	0.7357	0.1665	0.0554	0.0866	0.9210	53.5016
99	1333	0.7288	0.0880	0.1458	0.0520	0.9218	50.2206
100	1271	0.7299	0.1001	0.1316	0.0574	0.9217	53.6919
101	5	0.7384	0.1840	0.0306	0.0957	0.9207	49.7137
102	578	0.7364	0.0622	0.1420	0.0504	0.9209	48.2666
103	560	0.7403	0.0994	0.0969	0.0675	0.9205	52.4351
104	24	0.7305	0.1465	0.0901	0.0744	0.9216	52.6355
105	1275	0.7246	0.0811	0.1661	0.0453	0.9222	48.4738
106	1466	0.7292	0.1329	0.1061	0.0683	0.9217	51.2964
107	1159	0.7353	0.0725	0.1368	0.0503	0.9210	54.2348
108	602	0.7370	0.0895	0.1163	0.0608	0.9209	50.4095
109	1235	0.7274	0.1503	0.0973	0.0727	0.9219	54.0736
110	562	0.7220	0.0881	0.1688	0.0453	0.9225	55.9831
111	640	0.7314	0.1932	0.0469	0.0919	0.9215	58.9651
112	983	0.7264	0.1389	0.1105	0.0676	0.9221	50.9602
113	986	0.7287	0.1136	0.1243	0.0609	0.9218	52.7340
114	1298	0.7312	0.1408	0.0931	0.0728	0.9215	53.9650
115	1363	0.7276	0.1021	0.1377	0.0558	0.9219	52.9966
116	150	0.7393	0.1432	0.0627	0.0820	0.9206	56.5159
117	1402	0.7336	0.0893	0.1282	0.0573	0.9212	55.9025
118	395	0.7420	0.1662	0.0340	0.0928	0.9203	53.3171
119	1567	0.7420	0.1662	0.0340	0.0928	0.9203	57.9687
120	1238	0.7241	0.1448	0.1132	0.0674	0.9223	50.7481

(contd.....)

Table 5. Contd.....

Sl No	Bird No	B_1	b_2	b_3	b_4	RGI	G
121	1507	0.7234	0.1360	0.1233	0.0635	0.9224	51.4821
122	540	0.7201	0.0955	0.1692	0.0459	0.9228	49.1680
123	118	0.7310	0.2229	0.0230	0.1019	0.9215	53.7118
124	21	0.7310	0.2229	0.0230	0.1019	0.9215	50.9218
125	1205	0.7295	0.2057	0.0430	0.0943	0.9217	50.7059
126	56	0.7393	0.1802	0.0313	0.0951	0.9206	49.5359
127	277	0.7283	0.0707	0.1624	0.0453	0.9218	51.5717
128	668	0.7393	0.1802	0.0313	0.0951	0.9206	51.9813
129	1095	0.7369	0.1586	0.0579	0.0851	0.9209	50.7388
130	299	0.7278	0.1239	0.1187	0.0637	0.9219	53.0254
131	49	0.7316	0.1643	0.0710	0.0818	0.9215	56.5323
132	371	0.7353	0.2008	0.0273	0.0984	0.9211	56.9764
133	492	0.7333	0.1813	0.0507	0.0895	0.9213	53.7119
134	1034	0.7316	0.1643	0.0710	0.0818	0.9215	53.6546
135	960	0.7333	0.1813	0.0507	0.0895	0.9213	53.7713
136	574	0.7293	0.0566	0.1708	0.0414	0.9217	47.3008
137	709	0.7384	0.1487	0.0609	0.0832	0.9207	56.2561
138	691	0.7410	0.1714	0.0330	0.0937	0.9204	56.8734
139	689	0.7260	0.1428	0.1084	0.0686	0.9221	57.9759
140	930	0.7295	0.1804	0.0645	0.0854	0.9217	51.1774
141	1059	0.7260	0.1428	0.1084	0.0686	0.9221	50.9491
142	1257	0.7282	0.1664	0.0809	0.0791	0.9219	56.8237
143	533	0.7251	0.1326	0.1202	0.0641	0.9222	50.5850
144	242	0.7297	0.0255	0.1959	0.0308	0.9217	43.2163
145	549	0.7431	0.1604	0.0351	0.0919	0.9202	50.9078
146	404	0.7619	0.0632	0.0539	0.0763	0.9181	53.2261
147	597	0.7619	0.0632	0.0539	0.0763	0.9181	48.4883

Table 6. Egg weight : Values of a_1, a_2, a_3, multiple correlation coefficient (RGI_o) and the index I = G

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
21	207	0.7740	0.1331	0.0661	0.9167	48.1796
2	155	0.7740	0.1331	0.0661	0.9167	39.5535
3	175	0.7740	0.1331	0.0661	0.9167	51.4899
4	1296	0.7394	0.0572	0.1879	0.9206	52.8521
5	1228	0.7476	0.0757	0.1585	0.9197	48.4081
6	1464	0.7620	0.1071	0.1081	0.9181	51.4995
7	78	0.7763	0.1178	0.0683	0.9165	46.3629
8	1060	0.7636	0.0928	0.1113	0.9179	49.1594
9	947	0.7401	0.0434	0.1928	0.9205	39.6122
10	690	0.7763	0.1178	0.0683	0.9165	49.7634
11	298	0.7430	0.0641	0.1754	0.9202	49.3633
12	1548	0.7430	0.0641	0.1754	0.9202	51.8270
13	308	0.7430	0.0641	0.1754	0.9202	51.1056
14	777	0.7743	0.1315	0.0663	0.9167	49.6225
15	185	0.7536	0.0904	0.1368	0.9190	53.5318
16	30	0.7285	0.0329	0.2260	0.9218	50.5891
17	592	0.7429	0.0667	0.1744	0.9202	52.4901
18	1423	0.7360	0.0556	0.1965	0.9210	50.7869
19	429	0.7532	0.0947	0.1356	0.9191	46.1026
20	496	0.7360	0.0556	0.1965	0.9210	54.7849
21	507	0.7426	0.0708	0.1731	0.9202	50.5596
22	350	0.7472	0.0812	0.1568	0.9197	53.1288
23	252	0.7360	0.0556	0.1965	0.9210	51.5001
24	1232	0.7390	0.0624	0.1860	0.9206	48.9719
25	220	0.7426	0.0708	0.1732	0.9202	51.2735
26	1435	0.7468	0.0856	0.1555	0.9198	53.4818
27	1161	0.7334	0.0540	0.2036	0.9213	54.9688
28	1502	0.7608	0.1180	0.1056	0.9182	58.1579
29	1050	0.7468	0.0856	0.1555	0.9198	49.1412
30	848	0.7468	0.0856	0.1555	0.9198	57.0759
31	714	0.7468	0.0856	0.1555	0.9198	51.9439
32	297	0.7281	0.0439	0.2215	0.9219	50.7423
33	1212	0.7325	0.1026	0.1334	0.9191	50.5376
34	361	0.7313	0.0517	0.0210	0.9215	54.3797
35	1183	0.7313	0.0517	0.0210	0.9215	49.2282
36	1239	0.7718	0.1486	0.0638	0.9170	51.1457
37	1226	0.7314	0.0496	0.2107	0.9215	48.5288
38	266	0.7527	0.1000	0.1342	0.9191	49.8817
39	1449	0.7358	0.0602	0.1948	0.9210	48.7228
40	1302	0.7527	0.0999	0.1342	0.9191	49.2950

(contd.....)

Table 6. contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
41	68	0.7387	0.0671	0.1844	0.9207	48.6546
42	523	0.7336	0.0491	0.2055	0.9212	52.1915
43	1421	0.7299	0.0400	0.2191	0.9217	51.2790
44	322	0.7733	0.1384	0.0653	0.9168	51.7407
45	1342	0.7615	0.1121	0.1070	0.9181	54.8628
46	1460	0.7611	0.1150	0.1063	0.9182	49.4073
47	535	0.7425	0.0723	0.1726	0.9203	55.3074
48	202	0.7315	0.0467	0.2119	0.9215	53.4794
49	1561	0.7425	0.0724	0.1726	0.9202	50.2258
50	1105	0.7611	0.1150	0.1063	0.9182	51.9932
51	739	0.7391	0.0606	0.1867	0.9206	51.5668
52	285	0.7427	0.0689	0.1738	0.9202	50.1515
53	1461	0.7616	0.1110	0.1072	0.9181	55.5011
54	27	0.7616	0.1110	0.1072	0.9181	47.3527
55	1336	0.7473	0.0793	0.1575	0.9197	53.1601
56	147	0.7359	0.0579	0.1957	0.9210	52.5192
57	1440	0.7424	0.0731	0.1723	0.9202	54.7197
58	1582	0.7359	0.0579	0.1956	0.9210	53.2088
59	211	0.7727	0.1424	0.0647	0.9169	53.2302
60	1571	0.7610	0.1158	0.1061	0.9182	51.2745
61	1102	0.7727	0.1424	0.0647	0.9169	50.3730
62	1468	0.7559	0.0648	0.1439	0.9187	49.9361
63	83	0.7779	0.1068	0.0699	0.9163	47.7862
64	1493	0.7495	0.0516	0.1661	0.9195	47.4038
65	204	0.7569	0.0546	0.1467	0.9186	49.3142
66	442	0.7660	0.0720	0.1160	0.9176	50.1408
67	1146	0.7794	0.0964	0.0714	0.9161	47.2739
68	160	0.7628	0.1001	0.1097	0.9178	47.0093
69	418	0.7397	0.0507	0.1901	0.9206	49.4973
70	268	0.7397	0.0507	0.1901	0.9206	52.3500
71	448	0.7408	0.0318	0.1969	0.9204	51.5812
72	1286	0.7569	0.0648	0.1439	0.9187	52.1949
73	1097	0.7316	0.0442	0.2129	0.9215	48.1226
74	233	0.7361	0.0548	0.1968	0.9210	53.9821
75	1254	0.7390	0.0616	0.1863	0.9206	48.4214
76	1233	0.7592	0.0300	0.1536	0.9184	48.8719
77	613	0.7829	0.0727	0.0749	0.9157	50.5930
78	400	0.7556	0.0687	0.1428	0.9188	54.4715
79	543	0.7773	0.1110	0.0693	0.9163	49.9122
80	857	0.7443	0.0451	0.1818	0.9200	51.6802

(contd.....)

Table 6. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
81	1354	0.7550	0.0752	0.1410	0.9189	47.5470
82	772	0.7636	0.0928	0.1113	0.9179	51.4845
83	1364	0.7636	0.0928	0.1113	0.9179	50.4373
84	1453	0.7550	0.0752	0.1410	0.9188	49.9483
85	573	0.7387	0.0665	0.1846	0.9207	51.4761
86	217	0.7423	0.0750	0.1717	0.9203	54.6834
87	919	0.7387	0.0665	0.1846	0.9207	55.5953
88	943	0.7608	0.1180	0.1056	0.9282	53.4805
89	1490	0.7387	0.0665	0.1846	0.9207	53.5164
90	827	0.7723	0.1449	0.0643	0.9169	51.0678
91	1138	0.7618	0.1085	0.1077	0.9181	49.1168
92	1390	0.7362	0.0517	0.1980	0.9210	50.0189
93	304	0.7475	0.0770	0.1581	0.9197	48.7609
94	1313	0.7429	0.0667	0.1745	0.9202	49.5004
95	347	0.7366	0.0458	0.2002	0.9209	50.4834
96	11	0.7748	0.1278	0.0669	0.9166	54.6236
97	58	0.7479	0.0711	0.1600	0.9196	50.4251
98	713	0.7626	0.1021	0.1092	0.9180	50.1027
99	1333	0.7367	0.0438	0.2009	0.9209	48.6530
100	1271	0.7397	0.0573	0.1902	0.9206	51.7479
101	5	0.7751	0.1256	0.0671	0.9166	45.6779
102	578	0.7449	0.0387	0.1849	0.9200	46.9275
103	560	0.7564	0.0601	0.1452	0.9187	50.6604
104	24	0.7475	0.0770	0.1581	0.9197	49.6961
105	1275	0.7300	0.0367	0.2205	0.9216	47.0337
106	1466	0.7429	0.0667	0.1745	0.9202	48.4170
107	1159	0.7446	0.0409	0.1832	0.9200	52.6135
108	602	0.7495	0.0516	0.1661	0.9195	48.5145
109	1235	0.7424	0.0731	0.1723	0.9203	50.9981
110	562	0.7270	0.0363	0.2280	0.9220	54.2226
111	640	0.7610	0.1158	0.1061	0.9182	54.9295
112	983	0.7388	0.0647	0.1852	0.9207	47.7547
113	986	0.7394	0.0558	0.1884	0.9206	50.4114
114	1298	0.7477	0.0743	0.1590	0.9197	51.1389
115	1363	0.7364	0.0490	0.1989	0.9209	51.0835
116	150	0.7640	0.0897	0.1120	0.9178	52.8254
117	1402	0.7441	0.0487	0.1805	0.9201	54.4077
118	395	0.7767	0.1146	0.0688	0.9164	49.5748
119	1567	0.7768	0.1146	0.0688	0.9164	54.8859
120	1238	0.7357	0.0627	0.1938	0.9210	47.9801

(contd.....)

Table 6. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
121	1507	0.7333	0.0570	0.2025	0.9213	48.6425
122	540	0.7247	0.0358	0.2338	0.9222	46.9442
123	118	0.7717	0.1492	0.0637	0.9170	49.0093
124	21	0.7717	0.1492	0.0637	0.9170	46.6944
125	1205	0.7603	0.1220	0.1047	0.9182	46.4557
126	56	0.7755	0.1233	0.0675	0.9165	45.1509
127	277	0.7343	0.0356	0.2107	0.9212	50.0604
128	668	0.7755	0.1233	0.0675	0.9165	48.2594
129	1095	0.7631	0.0980	0.1101	0.9179	47.4469
130	299	0.7391	0.0596	0.1870	0.9206	50.4823
131	49	0.7535	0.0916	0.1365	0.9190	53.2304
132	371	0.7736	0.1360	0.0657	0.9168	52.8662
133	492	0.7617	0.1098	0.1075	0.9181	50.1933
134	1034	0.7535	0.0916	0.1365	0.9190	50.6566
135	960	0.7617	0.1098	0.1075	0.9181	49.9650
136	574	0.7346	0.0297	0.2130	0.9211	46.0703
137	709	0.7636	0.0928	0.1113	0.9179	54.4174
138	691	0.7763	0.1178	0.0683	0.9165	53.0799
139	689	0.7388	0.0660	0.1848	0.9207	54.7600
140	930	0.7528	0.0987	0.1345	0.9191	47.4316
141	1059	0.7388	0.0660	0.1848	0.9207	48.3013
142	1257	0.7469	0.0849	0.1557	0.9198	53.4341
143	533	0.7359	0.0591	0.1952	0.9210	48.1551
144	242	0.7329	0.0146	0.2245	0.9213	42.7319
145	549	0.7773	0.1110	0.0693	0.9163	47.6275
146	404	0.7868	0.0461	0.0788	0.9153	51.2027
147	597	0.7868	0.0461	0.0788	0.9153	45.8957

Table 7. Egg Production : Values of b_1, b_2, b_3, b_4, multiple correlation coefficient (RGI) and the index I = G

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
1	207	0.2465	0.4190	0.0669	0.1045	0.6610	65.3847
2	155	0.2465	0.4190	0.0669	0.1045	0.6610	56.3494
3	175	0.2465	0.4190	0.0669	0.1045	0.6610	64.6220
4	1296	0.2290	0.2542	0.2965	0.0722	0.6906	63.6893
5	1228	0.2347	0.3098	0.2205	0.0829	0.6811	62.5892
6	1464	0.2420	0.3781	0.1249	0.0964	0.6687	62.8611
7	78	0.2522	0.3356	0.0726	0.1028	0.6510	59.4484
8	1060	0.2472	0.2936	0.1353	0.0940	0.6597	64.4447
9	947	0.2329	0.1635	0.3202	0.0680	0.6840	67.8990
10	690	0.2522	0.3356	0.0726	0.1028	0.6510	55.4033
11	298	0.2321	0.2705	0.2629	0.0769	0.6853	61.0487
12	1548	0.2321	0.2705	0.2629	0.0769	0.6853	58.4082
13	308	0.2321	0.2705	0.2629	0.0769	0.6853	56.0128
14	777	0.2471	0.4093	0.0676	0.1043	0.6599	61.7512
15	185	0.2376	0.3514	0.1741	0.0896	0.6762	60.6819
16	30	0.2187	0.1584	0.4307	0.0534	0.7073	60.3036
17	592	0.2312	0.2903	0.2583	0.0777	0.6869	62.6024
18	1423	0.2248	0.2739	0.3166	0.0698	0.6975	69.9971
19	429	0.2358	0.3838	0.1686	0.0907	0.6792	67.0060
20	496	0.2248	0.2739	0.3166	0.0698	0.6975	70.6004
21	507	0.2297	0.3235	0.2505	0.0791	0.6895	72.9304
22	350	0.2325	0.3521	0.2119	0.0846	0.6847	70.8667
23	252	0.2248	0.2739	0.3166	0.0698	0.6979	66.0709
24	1232	0.2271	0.2976	0.2852	0.0742	0.6937	0,67.3646
25	220	0.2297	0.3235	0.2505	0.0791	0.6895	69.9604
26	1435	0.2306	0.3899	0.2041	0.0860	0.6879	0,68.2776
27	1161	0.2212	0.2917	0.3332	0.0678	0.7033	68.7332
28	1502	0.2372	0.4565	0.1152	0.0986	0.6769	64.0232
29	1050	0.2306	0.3899	0.2041	0.0860	0.6879	66.6571
30	848	0.2306	0.3899	0.2041	0.0860	0.6879	67.1457
31	714	0.2306	0.3899	0.2041	0.0860	0.6879	69.7589
32	297	0.2153	0.2673	0.3926	0.0597	0.7129	72.3405
33	1212	0.2321	0.4498	0.1576	0.0929	0.6854	69.2108
34	361	0.2183	0.3019	0.3489	0.0659	0.7080	72.6935
35	1183	0.2183	0.3019	0.3489	0.0659	0.7080	70.0700
36	1239	0.2392	0.5243	0.0596	0.1067	0.6734	67.6562
37	1226	0.2192	0.2776	0.3567	0.0646	0.0077	71.2246
38	266	0.2334	0.4266	0.1615	0.0921	0.6832	73.2814
39	1449	0.2230	0.3184	0.3040	0.0720	0.7004	76.2920
40	1302	0.2333	0.4266	0.1615	0.0921	0.6832	73.9397

(contd....)

Table 7. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
41	68	0.2252	0.3416	0.2737	0.0862	0.6968	73.2916
42	523	0.2230	0.2441	0.3476	0.0654	0.7004	62.9473
43	1421	0.2194	0.2048	0.3982	0.0582	0.7063	60.7369
44	322	0.2442	0.4525	0.6460	0.1052	0.6650	64.4868
45	1342	0.2399	0.4121	0.1207	0.0973	0.6723	61.2984
46	1460	0.2386	0.4330	0.1181	0.9793	0.6744	59.5009
47	535	0.2290	0.3376	0.2472	0.0797	0.6905	59.6006
48	202	0.2203	0.2467	0.3666	0.0629	0.7048	66.9941
49	1561	0.2290	0.3376	0.2472	0.0797	0.6905	68.3625
50	1105	0.2386	0.4330	0.1181	0.0993	0.6744	59.2705
51	739	0.2278	0.2817	0.2893	0.0735	0.6926	67.4377
52	285	0.2304	0.3079	0.2541	0.0785	0.6882	66.2071
53	1461	0.2404	0.4043	0.1216	0.0971	0.6714	63.5325
54	27	0.2404	0.4043	0.1216	0.0971	0.6714	67.6896
55	1336	0.2333	0.3366	0.2150	0.0834	0.6834	66.5639
56	147	0.2239	0.2950	0.3106	0.0709	0.6989	68.0485
57	1440	0. 2287	0.3441	0.2456	0.0800	0.6910	66.6353
58	1582	0.2239	0.2950	0.3106	0.0709	0.6989	63.4058
59	211	0.2423	0.4794	0.0627	0.1058	0.6682	58.0404
60	1571	0.2382	0.4393	0.1173	0.0981	0.6751	63.5571
61	1102	0.2423	0.4794	0.0627	0.1058	0.6682	68.5739
62	1468	0.2459	0.2031	0.1989	0.0842	0.6621	51.3522
63	83	0.2557	0.2845	0.0761	0.1017	0.6448	46.2430
64	1493	0. 2419	0.1683	0.2493	0.0774	0.6689	51.5418
65	204	0.2483	0.1591	0.2062	0.0830	0.6578	50.2121
66	442	0.2531	0.1984	0.1470	0.0913	0.6495	46.2588
67	1146	0.2586	0.2422	0.0790	0.1008	0.6396	49.9246
68	160	0.2447	0.3348	0.1302	0.0952	0.6641	66.6430
69	418	0.2310	0.2080	0.3085	0.0701	0.6872	64.6992
70	268	0.2310	0.2080	0.3085	0.0701	0.6872	65.7746
71	448	0.2354	0.1065	0.3350	0.0654	0.6799	62.4614
72	1286	0.2459	0.2031	0.1989	0.0845	0.6624	58.8083
73	1097	0.2211	0.2238	0.3739	0.0616	0.7035	76.9117
74	233	0.2251	0.2661	0.3188	0.0694	0.6970	76.2109
75	1254	0.2274	0.2899	0.2872	0.0739	0.6931	75.7478
76	1233	0.2530	0.0745	0.2204	0.0802	0.6496	48.6692
77	613	0.2642	0.1614	0.0846	0.0991	0.6296	44.3714
78	400	0.2448	0.2223	0.1957	0.0852	0.6639	64.5694
79	543	0.2545	0.3029	0.0749	0.1021	0.6471	63.6869
80	857	0.2375	0.1564	0.2897	0.0720	0.6763	62.1226

(contd....)

Table 7. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
81	1354	0.2429	0.2562	0.1900	0.0863	0.6672	67.6168
82	772	0.2472	0.2936	0.1353	0.0940	0.6597	61.7901
83	1364	0.2472	0.2936	0.1353	0.0940	0.6597	58.7658
84	1453	0.2429	0.2562	0.1900	0.0863	0.6672	57.0834
85	573	0.2254	0.3362	0.2751	0.0760	0.6964	74.0055
86	217	0.2279	0.3618	0.2414	0.0878	0.6924	76.4134
87	919	0.2254	0.3362	0.2751	0.0760	0.6964	76.2753
88	919	0.2372	0.4565	0.1152	0.0986	0.6769	66.5133
89	1490	0.2254	0.3362	0.2751	0.0760	0.6964	77.5019
90	827	0.2411	0.4964	0.0616	0.1061	0.6701	72.6637
91	1138	0.2414	0.3874	0.1237	0.0966	0.6697	68.3115
92	1390	0.2262	0.2397	0.3263	0.0681	0.6952	68.0642
93	304	0.2342	0.3193	0.2186	0.0833	0.6819	73.9689
94	1313	0.2312	0.2903	0.2583	0.0772	0.6869	65.2230
95	347	0.2280	0.1957	0.3387	0.0660	0.6923	62.1770
96	11	0.2486	0.3880	0.0690	0.1039	0.6573	61.2551
97	58	0.2363	0.2775	0.2271	0.0817	0.6783	57.7862
98	713	0.2439	0.3467	0.1287	0.0955	0.6654	62.7798
99	1333	0.2285	0.1827	0.3424	0.0653	0.6914	68.3757
100	1271	0.2310	0.2080	0.3085	0.0701	0.6872	64.2783
101	5	0.2494	0.3763	0.0698	0.1036	0.6559	62.8266
102	578	0.2395	0.1142	0.2996	0.0702	0.6730	66.3194
103	560	0.2470	0.1821	0.2024	0.0838	0.6600	60.5210
104	24	0.2342	0.3193	0.2186	0.0833	0.6819	75.4278
105	1275	0.2203	0.1769	0.4076	0.0566	0.7047	74.8676
106	1466	0.2312	0.2903	0.2583	0.0772	0.6869	69.7607
107	1159	0.2384	0.1363	0.2944	0.0711	0.6747	54.7603
108	602	0.2419	0.1683	0.2493	0.0745	0.6689	61.6085
109	1235	0.2287	0.3441	0.2456	0.0800	0.6910	71.9790
110	562	0.2154	0.2015	0.4302	0.0539	0.7126	65.5239
111	640	0.2382	0.4393	0.1173	0.0981	0.6751	69.2264
112	983	0.2262	0.3184	0.2797	0.0752	0.6952	69.7114
113	986	0.2294	0.2438	0.2992	0.0718	0.6898	67.2455
114	1298	0.2352	0.2997	0.2225	0.0825	0.6802	64.7652
115	1363	0.2270	0.2192	0.3321	0.0671	0.6938	66.4105
116	150	0.2482	0.2776	0.1373	0.0936	0.6580	58.2134
117	1402	0.2366	0.1748	0.2854	0.0728	0.6778	60.5417
118	395	0.2533	0.3199	0.0737	0.1024	0.6491	70.1237
119	1567	0.2533	0.3199	0.0737	0.1024	0.6491	54.2848
120	1238	0.2219	0.3465	0.2960	0.0734	0.7023	79.6502

(contd....)

Table 7. Contd.....

Sl No	Bird No	b_1	b_2	b_3	b_4	RGI	G
121	1507	0.2199	0.3254	0.3229	0.0696	0.7054	79.8594
122	540	0.2114	0.2281	0.4452	0.0523	0.7191	80.1510
123	118	0.2389	0.5283	0.0594	0.1068	0.6739	76.3161
124	21	0.2389	0.5283	0.0594	0.1068	0.6739	72.3269
125	1205	0.2352	0.4888	0.1112	0.0995	0.6802	80.3529
126	56	0.2503	0.3637	0.0707	0.1034	0.6544	65.3434
127	277	02268	0.1446	0.3777	0.0620	0.6942	61.6516
128	668	0.2503	0.3637	0.0707	0.1034	0.6544	67.5990
129	1095	0.2454	0.3221	0.1318	0.0948	0.6628	60.8030
130	299	0.2282	0.2731	0.2916	0.0731	0.6919	68.1553
131	49	0.2371	0.3602	0.1726	0.0809	0.6770	63.2761
132	371	0.2453	0.4367	0.0657	0.1049	0.6631	67.9998
133	492	0.2409	0.3961	0.1227	0.0969	0.6706	55.9743
134	1034	0.2371	0.3602	0.1726	0.0898	0.6770	60.7971
135	960	0.2409	0.3961	0.1227	0.0969	0.6706	63.3842
136	574	0.2280	0.1121	0.3876	0.0585	0.6922	62.6025
137	709	0.2472	0.2936	0.1353	0.0940	0.6597	55.7365
138	691	0.2522	0.3356	0.0726	0.1028	0.6510	52.4341
139	689	0.2257	0.3306	0.2766	0.0758	0.6960	70.4661
140	930	0.2340	0.4158	0.1633	0.0918	0.6822	76.1554
141	1059	0.2257	0.3306	0.2766	0.0758	0.6960	72.6300
142	1257	0.2309	0.3844	0.2053	0.0858	0.6874	75.0740
143	533	0.2234	0.3073	0.3071	0.7146	0.6997	77.6222
144	242	0.2274	0.0484	0.4301	0.0521	0.6932	61.8027
145	549	0.2545	0.3029	0.0749	0.1021	0.6471	61.4113
146	404	0.2691	0.0907	0.0895	0.0976	0.6207	34.1682
147	597	0.2691	0.0907	0.0895	0.0976	0.6207	41.6919

Table 8. Egg Production : Values of a_1, a_2, a_3, multiple correlation coefficient RGIo and index Io = G

Sl No	Bird No	a_1	a_2	a_3	RGIo	G
1	207	0.2615	0.4006	0.0819	0.6345	60.4985
2	155	0.2615	0.4006	0.0819	0.6345	51.6035
3	175	0.2615	0.4006	0.0819	0.6345	59.5280
4	1296	0.2357	0.2288	0.3370	0.6793	60.0985
5	1228	0.2438	0.2840	0.2568	0.6657	57.0581
6	1464	0.2546	0.3556	0.1500	0.6469	58.0714
7	78	0.2667	0.3212	0.0872	0.6250	54.2985
8	1060	0.2592	0.2765	0.1592	0.6387	58.8567
9	914	0.2390	0.1480	0.3563	0.6739	65.0535
10	690	0.2667	0.3212	0.0872	0.6250	49.8665
11	298	0.2399	0.2456	0.3015	0.6723	57.2658
12	1548	0.2399	0.2456	0.3015	0.6723	54.4355
13	308	0.2399	0.2456	0.3015	0.6723	53.4351
14	777	0.2621	0.3914	0.0825	0.6334	54.4114
15	185	0.2483	0.3259	0.2061	0.6579	57.6393
16	30	0.2223	0.1389	0.4702	0.7015	57.3057
17	592	0.2391	0.2634	0.2977	0.6736	58.6656
18	1423	0.2310	0.2441	0.3603	0.6872	65.7132
19	429	0.2467	0.3566	0.2015	0.6606	62.7434
20	496	0.2310	0.2441	0.3603	0.6872	68.0157
21	507	0.2378	0.2931	0.2913	0.6758	68.7333
22	350	0.2419	0.3223	0.2495	0.6688	64.8791
23	252	0.2310	0.2441	0.3603	0.6872	63.6790
24	1232	0.2342	0.2672	0.3279	0.6819	63.7857
25	220	0.2378	0.2931	0.2913	0.6758	65.2332
26	1435	0.2403	0.3564	0.2431	0.6715	63.8029
27	1161	0.2270	0.2573	0.3799	0.6938	65.6168
28	1502	0.2503	0.4288	0.1414	0.6544	58.5355
29	1050	0.2403	0.3564	0.2431	0.6715	60.2259
30	848	0.2403	0.3564	0.2431	0.6715	60.7491
31	714	0.2403	0.3564	0.2431	0.6715	65.0075
32	297	0.2197	0.2311	0.4413	0.7058	69.9294
33	1212	0.2436	0.4159	0.1920	0.6660	63.0616
34	361	0.2238	0.2638	0.3980	0.6991	69.3430
35	1183	0.2238	0.2638	0.3980	0.6991	68.1778
36	1239	0.2549	0.5009	0.0753	0.6463	60.0332
37	1226	0.2244	0.2432	0.4040	0.6980	68.2492
38	266	0.2447	0.3948	0.1953	0.6641	68.1287
39	1449	0.2296	0.2828	0.3503	0.6895	73.8111
40	1302	0.2447	0.3948	0.1953	0.6641	68.5671

(Contd.....)

Table 8. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
41	68	0.2327	0.3059	0.3186	0.6844	70.7602
42	523	0.2285	0.2163	0.3911	0.6914	59.2175
43	1421	0.2237	0.1796	0.4409	0.6993	58.5247
44	322	0.2594	0.4325	0.0798	0.6383	57.4504
45	1342	0.2527	0.3873	0.1463	0.6501	56.8685
46	1460	0.2516	0.4069	0.1440	0.6521	54.4637
47	535	0.2373	0.3056	0.2885	0.6767	55.0054
48	202	0.2253	0.2169	0.4116	0.6966	65.4039
49	1561	0.2373	0.3056	0.2885	0.6767	63.8595
50	1105	0.2516	0.4069	0.1440	0.6521	54.1355
51	739	0.2348	0.2532	0.3312	0.6809	64.4448
52	285	0.2384	0.2791	0.2943	0.6748	60.3092
53	1461	0.2531	0.3801	0.1471	0.6494	57.6643
54	27	0.2531	0.3801	0.1471	0.6494	60.3795
55	1336	0.2426	0.3083	0.2522	0.6676	62.5358
56	147	0.2304	0.2624	0.3556	0.6883	66.0514
57	1440	0.2370	0.3133	0.2873	0.6771	62.0577
58	1582	0.2304	0.2624	0.3556	0.6883	62.0872
59	211	0.2577	0.4582	0.0781	0.6413	48.3304
60	1571	0.2512	0.4128	0.1433	0.6527	58.8036
61	1102	0.2577	0.4582	0.0781	0.6413	62.0554
62	1468	0.2554	0.1891	0.2276	0.6454	46.3062
63	83	0.2700	0.2723	0.0940	0.6191	40.0254
64	1493	0.2499	0.1551	0.2811	0.6551	45.9658
65	204	0.2576	0.1484	0.2380	0.6416	47.1587
66	442	0.2644	0.1872	0.1696	0.6293	42.4848
67	1146	0.2726	0.2320	0.0931	0.6141	42.8294
68	160	0.2569	0.3151	0.1547	0.6430	59.5742
69	418	0.2374	0.1878	0.3468	0.6766	60.4082
70	268	0.2374	0.1878	0.3468	0.6766	62.2342
71	448	0.2410	0.0968	0.3685	0.6704	59.4430
72	1286	0.2554	0.1891	0.2276	0.6453	55.4416
73	1097	0.2259	0.1972	0.4173	0.6956	74.4351
74	233	0.2313	0.2373	0.3620	0.6867	73.1296
75	1254	0.2345	0.2604	0.3295	0.6814	71.7000
76	1233	0.2617	0.0696	0.2463	0.6342	44.9480
77	613	0.2777	0.1547	0.0982	0.6046	39.3196
78	400	0.2545	0.2069	0.2248	0.6470	59.9616
79	543	0.2688	0.2900	0.0892	0.6212	57.8245
80	857	0.2443	0.1429	0.3237	0.6647	60.0810

(contd....)

Table 8. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI o	G
81	1354	0.2529	0.2382	0.2199	0.6499	64.0648
82	772	0.2592	0.2765	0.1592	0.6387	57.4507
83	1364	0.2592	0.2765	0.1592	0.6387	53.3893
84	1453	0.2528	0.2382	0.2199	0.6499	53.3949
85	573	0.2326	0.3012	0.3198	0.6841	68.8133
86	217	0.2363	0.3271	0.2839	0.6782	71.5651
87	919	0.2329	0.3012	0.3198	0.6841	73.8263
88	943	0.2503	0.4288	0.1414	0.6544	64.2790
89	1490	0.2329	0.3016	0.3198	0.6841	74.0326
90	827	0.2566	0.4744	0.0706	0.6432	66.4167
91	1138	0.2541	0.3643	0.1490	0.6478	60.1697
92	1390	0.2321	0.2142	0.3680	0.6853	64.3472
93	304	0.2433	0.2926	0.2551	0.6664	68.5737
94	1313	0.2391	0.2634	0.2977	0.6736	60.9110
95	347	0.2336	0.1755	0.3780	0.6830	60.5398
96	11	0.2634	0.3711	0.0839	0.6310	54.6609
97	58	0.2451	0.2547	0.2623	0.6630	54.5150
98	713	0.2563	0.3263	0.1534	0.6439	57.1026
99	1333	0.2340	0.1639	0.3810	0.6822	66.5251
100	1271	0.2374	0.1878	0.3468	0.6766	62.4599
101	5	0.2642	0.3599	0.0846	0.6297	57.3131
102	578	0.2460	0.1046	0.3320	0.6619	62.9079
103	560	0.2564	0.1697	0.2306	0.6436	56.8566
104	24	0.2433	0.2926	0.2551	0.6664	70.2400
105	1275	0.2244	0.1557	0.4482	0.6981	71.3674
106	1466	0.2391	0.2634	0.2977	0.6736	65.6475
107	1159	0.2451	0.1247	0.3276	0.6634	52.7297
108	602	0.2499	0.1551	0.2811	0.6551	58.7942
109	1235	0.2370	0.3114	0.2873	0.6771	68.2055
110	562	0.2190	0.1747	0.4738	0.7068	64.6459
111	640	0.2512	0.4128	0.1433	0.6527	63.7541
112	983	0.2335	0.2855	0.3235	0.6831	66.5818
113	986	0.2361	0.2196	0.3392	0.6787	62.0611
114	1298	0.2442	0.2749	0.2585	0.6649	60.2044
115	1363	0.2328	0.1961	0.3727	0.6842	61.4782
116	150	0.2600	0.2615	0.1610	0.6371	52.8334
117	1402	0.2436	0.1596	0.3201	0.6660	56.6687
118	395	0.2677	0.3062	0.0882	0.6232	61.8927
119	1567	0.2677	0.3062	0.0882	0.6232	47.2563
120	1238	0.2287	0.3070	0.3441	0.6910	76.0084

(contd....)

Table 8. Contd.....

Sl No	Bird No	a_1	a_2	a_3	RGI_o	G
121	1507	0.2261	0.2862	0.3719	0.6954	76.1974
122	540	0.2147	0.1947	0.4922	0.7138	77.0916
123	118	0.2546	0.5047	0.0750	0.6468	69.5070
124	21	0.2546	0.5047	0.0750	0.6468	66.5166
125	1205	0.2485	0.4588	0.1379	0.6574	72.6183
126	56	0.2650	0.3479	0.0854	0.6282	59.1976
127	277	0.2314	0.1293	0.4150	0.6865	58.5470
128	668	0.2650	0.3479	0.0854	0.6282	62.3402
129	1095	0.2576	0.3032	0.1561	0.6415	56.1477
130	299	0.2351	0.2456	0.3330	0.6804	64.9293
131	49	0.2479	0.3339	0.2049	0.6586	58.2620
132	371	0.2604	0.4175	0.0808	0.6365	61.2794
133	492	0.2536	0.3724	0.1480	0.6486	50.4949
134	1034	0.2479	0.3339	0.2049	0.6586	55.9990
135	960	0.2536	0.3724	0.1480	0.6486	57.9066
136	574	0.2324	0.1006	0.4229	0.6848	61.7180
137	709	0.2592	0.2765	0.1592	0.6387	51.4830
138	691	0.2667	0.3212	0.0872	0.6250	46.6937
139	689	0.2331	0.2962	0.3210	0.6838	67.7172
140	930	0.2452	0.3849	0.1969	0.6632	72.1433
141	1059	0.2331	0.2962	0.3210	0.6838	68.0542
142	1257	0.2406	0.3514	0.2440	0.6711	71.6639
143	533	0.2300	0.2731	0.3528	0.6889	74.9257
144	242	0.2309	0.0435	0.4617	0.6875	61.0519
145	549	0.2688	0.2900	0.0892	0.6212	57.7643
146	404	0.2822	0.0870	0.1026	0.5961	29.8525
147	597	0.2822	0.0870	0.1026	0.5961	36.7071

Table 9. Ratios of expected progress in females from selection based on index I as contrasted to selection based on index I_o

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
1	207	1.0290	1.0246	1.0046	1.0417
2	155	1.0290	1.0246	1.0046	1.0417
3	175	1.0290	1.0246	1.0046	1.0417
4	1296	1.0098	1.0080	1.0013	1.0166
5	1228	1.0144	1.0119	1.0020	1.0231
6	1464	1.0224	1.0188	1.0034	1.0337
7	78	1.0280	1.0236	1.0043	1.0416
8	1060	1.0211	1.0176	1.0030	1.0330
9	947	1.0084	1.0068	1.0010	1.0150
10	690	1.0280	1.0236	1.0043	1.0416
11	298	1.0117	1.0096	1.0016	1.0193
12	1548	1.0117	1.0096	1.0016	1.0193
13	308	1.0117	1.0096	1.0016	1.0193
14	777	1.0289	1.0245	1.0046	1.0417
15	185	1.0179	1.0149	1.0026	1.0278
16	30	1.0045	1.0036	1.0006	1.0083
17	592	1.0120	1.0098	1.0017	1.0196
18	1423	1.0089	1.0073	1.0012	1.0150
19	429	1.0184	1.0154	1.0027	1.0283
20	496	1.0089	1.0073	1.0012	1.0150
21	507	1.0125	1.0113	1.0018	1.0202
22	350	1.0151	1.0125	1.0025	1.0238
23	252	1.0089	1.0073	1.0012	1.0150
24	1232	1.0105	1.0086	1.0015	1.0173
25	220	1.0125	1.0130	1.0018	1.0202
26	1435	1.0156	1.0067	1.0023	1.0243
27	1161	1.0082	1.0199	1.0011	1.0138
28	1502	1.0235	1.0130	1.0037	1.0344
29	1050	1.0156	1.0130	1.0023	1.0243
30	848	1.0156	1.0130	1.0023	1.0243
31	714	1.0156	1.0130	1.0023	1.0243
32	297	1.0058	1.0047	1.0007	1.0101
33	1212	1.0194	1.0163	1.0029	1.0291
34	361	1.0075	1.0061	1.0010	1.0127
35	1183	1.0075	1.0061	1.0010	1.0127
36	1239	1.0301	1.0258	1.0050	1.0419
37	1226	1.0072	1.0058	1.0010	1.0122
38	266	1.0191	1.0160	1.0029	1.0288
39	1449	1.0095	1.0078	1.0013	1.0158
40	1302	1.0191	1.0160	1.0029	1.0288

(contd...)

Table 9. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
41	68	1.0111	1.0092	1.0016	1.0181
42	523	1.0075	1.0061	1.0010	1.0129
43	1421	1.0056	1.0045	1.0007	1.0099
44	322	1.0293	1.0250	1.0047	1.0418
45	1342	1.0229	1.0193	1.0035	1.0340
46	1460	1.0232	1.0107	1.0036	1.0342
47	535	1.0127	1.0105	1.0018	1.0204
48	202	1.0068	1.0055	1.0009	1.0117
49	1561	1.0127	1.0105	1.0018	1.0204
50	1105	1.0232	1.0195	1.0036	1.0342
51	739	1.0103	1.0084	1.0014	1.0171
52	285	1.0123	1.0101	1.0017	1.0199
53	1461	1.0228	1.0192	1.0035	1.0340
54	27	1.0228	1.0192	1.0035	1.0340
55	1336	1.0148	1.0123	1.0021	1.0235
56	147	1.0092	1.0075	1.0013	1.0154
57	1440	1.0128	1.0106	1.0018	1.0205
58	1582	1.0092	1.0075	1.0013	1.0154
59	211	1.0297	1.0253	1.0048	1.0418
60	1571	1.0233	1.0196	1.0036	1.0343
61	1102	1.0297	1.0253	1.0048	1.0418
62	1468	1.0154	1.0123	1.0020	1.0259
63	83	1.0273	1.0229	1.0041	1.0416
64	1493	1.0120	1.0097	1.0015	1.0209
65	204	1.0147	1.0119	1.0018	1.0253
66	442	1.0196	1.0160	1.0027	1.0321
67	1146	1.0267	1.0223	1.0039	1.0415
68	160	1.0218	1.0182	1.0032	1.0333
69	418	1.0091	1.0074	1.0012	1.0158
70	268	1.0091	1.0074	1.0012	1.0158
71	448	1.0075	1.0059	1.0008	1.0141
72	1286	1.0155	1.0127	1.0020	1.0259
73	1097	1.0065	1.0052	1.0009	1.0113
74	233	1.0088	1.0072	1.0012	1.0149
75	1254	1.0104	1.0085	1.0014	1.0172
76	1233	1.0131	1.0104	1.0014	1.0242
77	613	1.0255	1.0210	1.0035	1.0414
78	400	1.0158	1.0130	1.0021	1.0261
79	543	1.0275	1.0231	1.0042	1.0416
80	857	1.0098	1.0079	1.0012	1.0174

(contd....)

Table 9. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
81	1354	1.0164	1.0135	1.0023	1.0266
82	772	1.0211	1.0176	1.0031	1.0330
83	1364	1.0211	1.0176	1.0031	1.0330
84	1453	1.0164	1.0135	1.0023	1.0266
85	573	1.0111	1.0091	1.0016	1.0180
86	217	1.0131	1.0108	1.0019	1.0208
87	919	1.0111	1.0091	1.0016	1.0180
88	943	1.0235	1.0199	1.0037	1.0344
89	1490	1.0111	1.0091	1.0016	1.0180
90	827	1.0298	1.0255	1.0049	1.0419
91	1138	1.0226	1.0189	1.0034	1.0338
92	1390	1.0084	1.0068	1.0011	1.0144
93	304	1.0146	1.0120	1.0021	1.0233
94	1313	1.0120	1.0098	1.0017	1.0196
95	347	1.0078	1.0063	1.0010	1.0136
96	11	1.0286	1.0242	1.0045	1.0417
97	58	1.0139	1.0114	1.0019	1.0226
98	713	1.0220	1.0184	1.0033	1.0334
99	1333	1.0076	1.0061	1.0009	1.0134
100	1271	1.0091	1.0074	1.0012	1.0158
101	5	1.0285	1.0241	1.0045	1.0417
102	578	1.0091	1.0072	1.0010	1.0168
103	560	1.0151	1.0123	1.0020	1.0256
104	24	1.0146	1.0120	1.0021	1.0232
105	1275	1.0052	1.0042	1.0007	1.0095
106	1466	1.0120	1.0098	1.0017	1.0196
107	1159	1.0095	1.0076	1.0011	1.0171
108	602	1.0120	1.0097	1.0015	1.0229
109	1235	1.0128	1.0106	1.0018	1.0205
110	562	1.0046	1.0037	1.0006	1.0082
111	640	1.0233	1.0196	1.0036	1.0343
112	983	1.0108	1.0089	1.0015	1.0177
113	986	1.0097	1.0079	1.0013	1.0164
114	1298	1.0142	1.0117	1.0020	1.0229
115	1363	1.0081	1.0066	1.0011	1.0140
116	150	1.0209	1.0173	1.0030	1.0328
117	1402	1.0101	1.0082	1.0013	1.0177
118	395	1.0278	1.0233	1.0043	1.0416
119	1567	1.0278	1.0233	1.0043	1.0416
120	1238	1.0099	1.0081	1.0014	1.0144

(contd.....)

Table 9. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
121	1507	1.0086	1.0070	1.0012	1.0075
122	540	1.0042	1.0034	1.0006	1.0419
123	118	1.0302	1.0258	1.0050	1.0419
124	21	1.0302	1.0258	1.0050	1.0347
125	1205	1.0240	1.0203	1.0038	1.0417
126	56	1.0283	1.0239	1.0044	1.0112
127	277	1.0061	1.0049	1.0007	1.0417
128	668	1.0283	1.0239	1.0044	1.0232
129	1095	1.0216	1.0180	1.0032	1.0169
130	299	1.0101	1.0083	1.0014	1.0279
131	49	1.0181	1.0151	1.0027	1.0418
132	371	1.0292	1.0248	1.0047	1.0339
133	492	1.0227	1.0197	1.0035	1.0279
134	1034	1.0181	1.0151	1.0027	1.0339
135	960	1.0227	1.0191	1.0035	1.0107
136	574	1.0056	1.0045	1.0006	1.0330
137	709	1.0211	1.0176	1.0031	1.0416
138	691	1.0280	1.0236	1.0043	1.0179
139	689	1.0110	1.0090	1.0015	1.0287
140	930	1.0189	1.0158	1.0028	1.0179
141	1059	1.0110	1.0090	1.0015	1.0243
142	1257	1.0156	1.0129	1.0023	1.0156
143	533	1.0094	1.0077	1.0013	1.0084
144	242	1.0041	1.0031	1.0004	1.0416
145	549	1.0275	1.0231	1.0042	1.0414
146	404	1.0244	1.0198	1.0031	1.0414
147	597	1.0244	1.0198	1.0031	1.0414

Table 10. 20 week body weight: Values of b_1^*, b_2^*, b_3^*, multiple correlation coefficient (RGI*) and the index I = G

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
1	207	0.5748	0.2006	0.1898	0.5822	1094.1001
2	155	0.5748	0.2006	0.1898	0.5822	1101.5549
3	175	0.5748	0.2006	0.1898	0.5822	1055.1806
4	1296	0.3382	0.4873	0.1218	0.6231	1105.9278
5	1228	0.4126	0.3960	0.1434	0.6106	1084.8126
6	1464	0.5125	0.2762	0.1719	0.5934	1116.5747
7	78	0.4817	0.2203	0.1883	0.5685	1071.9289
8	1060	0.4166	0.3024	0.1657	0.5815	1046.1357
9	947	0.2275	0.5312	0.1113	0.6149	1101.8121
10	690	0.4818	0.2203	0.1852	0.5685	1066.1706
11	298	0.3602	0.4488	0.1309	0.6164	1164.8089
12	1548	0.3602	0.4488	0.1309	0.6164	1174.7144
13	308	0.3602	0.4488	0.1309	0.6164	1118.1813
14	777	0.5644	0.2028	0.1893	0.5807	1199.5523
15	185	0.4693	0.3373	0.1574	0.6039	1207.3848
16	30	0.2067	0.6399	0.0855	0.6437	1155.7550
17	592	0.3824	0.4403	0.1329	0.6182	1194.9814
18	1423	0.3509	0.5044	0.1177	0.6315	1219.4909
19	429	0.5038	0.3262	0.1600	0.6075	1150.6269
20	496	0.3509	0.5044	0.1177	0.6315	1148.2493
21	507	0.4183	0.4264	0.1362	0.6212	1217.7425
22	350	0.4583	0.3797	0.1473	0.6149	1234.0669
23	252	0.3509	0.5044	0.1177	0.6315	1103.4150
24	1232	0.3828	0.4677	0.1264	0.6267	1151.1299
25	220	0.4183	0.4264	0.1362	0.6212	1149.9550
26	1435	0.4975	0.3658	0.1506	0.6185	1218.1822
27	1161	0.3639	0.5187	0.1143	0.6383	1191.7991
28	1502	0.5940	0.2540	0.1772	0.6034	1241.3361
29	1050	0.4975	0.3657	0.1506	0.6185	1230.2217
30	848	0.4975	0.3658	0.1506	0.6185	1270.6131
31	714	0.4975	0.3657	0.1506	0.1685	1244.3197
32	297	0.3247	0.5827	0.0991	0.6497	1181.7473
33	1212	0.5706	0.3049	0.1651	0.6145	1205.5404
34	361	0.3687	0.5336	0.1108	0.6437	1215.7925
35	1183	0.3687	0.5336	0.1108	0.6437	1192.9556
36	1239	0.6814	0.1781	0.1952	0.5975	1260.1189
37	1226	0.3440	0.5449	0.1081	0.6423	1130.9675
38	266	0.5476	0.3122	0.1633	0.6121	1233.5389
39	1449	0.3976	0.4843	0.1225	0.6347	1169.4877
40	1302	0.5476	0.3122	0.1633	0.6112	1202.6475

(contd.....)

Table 10. Contd.....

Sl No	Bird No	b^*_1	b^*_2	b^*_3	RGI*	G
41	68	0.4288	0.4488	0.1309	0.6301	1207.9751
42	523	0.3134	0.5413	0.1089	0.6352	1125.7170
43	1421	0.2622	0.5988	0.0953	0.6423	1104.5947
44	322	0.6099	0.1932	0.1916	0.5873	1125.5683
45	1342	0.5486	0.2664	0.1742	0.5979	1098.2176
46	1460	0.5702	0.2605	0.1756	0.6005	1133.8684
47	535	0.4332	0.4207	0.1376	0.6224	1132.3004
48	202	0.3116	0.5599	0.1045	0.6404	1058.0538
49	1561	0.4332	0.4207	0.1376	0.6224	1123.4753
50	1105	0.5702	0.2605	0.1756	0.6005	1126.7296
51	739	0.3657	0.4747	0.1248	0.6254	1137.1773
52	285	0.4015	0.4329	0.1347	0.6198	1186.1371
53	1461	0.5404	0.2686	0.1737	0.5969	1155.9973
54	27	0.5404	0.2686	0.1737	0.5969	1183.9649
55	1336	0.4418	0.3856	0.1459	0.6134	1143.4648
56	147	0.3733	0.4948	0.1200	0.6330	1264.1490
57	1440	0.4399	0.4181	0.1382	0.6300	1259.1007
58	1582	0.3733	0.4948	0.1200	0.6330	1238.9051
59	211	0.6374	0.1874	0.1930	0.5912	1282.0886
60	1571	0.5767	0.2587	0.1760	0.6013	1306.0338
61	1102	0.6374	0.1874	0.1930	0.5912	1279.2841
62	1468	0.2946	0.3931	0.1441	0.5850	861.7861
63	83	0.4202	0.2333	0.1821	0.5592	828.3444
64	1493	0.2430	0.4563	0.1291	0.5945	869.8985
65	204	0.2369	0.4115	0.1398	0.5787	868.4480
66	442	0.2973	0.3349	0.1579	0.5664	845.6282
67	1146	0.3667	0.2446	0.1794	0.5511	900.1265
68	160	0.4644	0.2893	0.1688	0.5875	1037.2815
69	418	0.2818	0.5090	0.1166	0.6191	1010.7317
70	268	0.2818	0.5090	0.1166	0.6191	1047.1072
71	448	0.1536	0.5615	0.1041	0.6093	1024.2158
72	1286	0.2946	0.3931	0.1441	0.5880	1023.1209
73	1097	0.2867	0.5714	0.1018	0.6390	1144.1144
74	233	0.3425	0.5080	0.1168	0.6309	1181.8013
75	1254	0.3745	0.4711	0.1256	0.6261	1170.3673
76	1233	0.1168	0.4499	0.1306	0.5652	883.9996
77	613	0.2564	0.2679	0.1739	0.5338	852. 2206
78	400	0.3189	0.3853	0.1460	0.5877	1115.1127
79	543	0.4428	0.2285	0.1832	0.5626	1128.2860
80	857	0.2227	0.5018	0.1183	0.6048	1095.7080

(contd.....)

Table 10. Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
81	1354	0.3605	0.3720	0.1491	0.5922	1143.2952
82	772	0.4166	0.3024	0.1657	0.5815	1126.0948
83	1364	0.4166	0.3024	0.1657	0.5815	1107.6402
84	1453	0.3605	0.3720	0.1491	0.5922	1077.1959
85	573	0.4232	0.4511	0.1304	0.6297	1262.2367
86	217	0.4581	0.4111	0.1399	0.6245	1292.5925
87	919	0.4232	0.4511	0.1304	0.6297	1250.6270
88	943	0.5940	0.2540	0.1772	0.6034	1231.3293
89	1490	0.4232	0.4511	0.1304	0.6297	1273.8776
90	827	0.6543	0.1839	0.1938	0.5936	1270.1087
91	1138	0.5224	0.2735	0.1725	0.5927	1131.2705
92	1390	0.3133	0.5205	0.1139	0.6289	1118.8955
93	304	0.4231	0.3923	0.1443	0.6116	1128.1974
94	1313	0.3824	0.4493	0.1329	0.6182	1091.7988
95	347	0.2627	0.5423	0.1087	0.6254	1068.5970
96	11	0.5412	0.2077	0.1881	0.5773	1087.0001
97	58	0.3763	0.4089	0.1404	0.6072	1017.7958
98	713	0.4779	0.2857	0.1696	0.5892	1121.4512
99	1383	0.2472	0.5490	0.1071	0.6244	1079.0989
100	1271	0.2818	0.5090	0.1166	0.6191	1092.8245
101	5	0.5282	0.2105	0.1875	0.5754	1085.0295
102	578	0.1670	0.5233	0.1132	0.6000	956.2787
103	560	0.2675	0.4017	0.1421	0.5820	958.9277
104	24	0.4231	0.3922	0.1443	0.6116	1181.5690
105	1275	0.2306	0.6138	0.0917	0.6406	1103.8403
106	1466	0.3824	0.4403	0.1329	0.6182	1068.9946
107	1159	0.1965	0.5119	0.1159	0.6025	961.6237
108	602	0.2430	0.4563	0.1291	0.5945	959.7901
109	1235	0.4399	0.4181	0.1382	0.6230	1189.5569
110	562	0.2526	0.6302	0.0878	0.6497	1157.3603
111	640	0.5767	0.2587	0.1760	0.6013	1268.9416
112	983	0.4048	0.4587	0.1286	0.6283	1206.1465
113	986	0.3234	0.4920	0.1206	0.6222	1084.2114
114	1298	0.4014	0.3999	0.1425	0.6096	1023.5832
115	1363	0.2901	0.5305	0.1115	0.6273	1030.0835
116	150	0.3974	0.3076	0.1644	0.5791	1115.2923
117	1402	0.2462	0.4927	0.1205	0.6068	1112.8225
118	395	0.4632	0.2242	0.1842	0.5657	1143.0689
119	1567	0.4632	0.2242	0.1842	0.5657	1119.8596
120	1238	0.4258	0.4722	0.1253	0.6366	1246.2085

(contd.....)

Table 10. Contd.....

Sl No	Bird No	b^*_1	b^*_2	b^*_3	RGI*	G
121	1507	0.3981	0.5034	0.1179	0.6405	1216.6793
122	540	0.2749	0.6400	0.0855	0.6569	1215.9861
123	118	0.6852	0.1773	0.1954	0.5980	1295.3407
124	21	0.6852	0.1773	0.1954	0.5980	1261.7750
125	1205	0.6247	0.2454	0.1792	0.6072	1242.8401
126	56	0.5140	0.2135	0.1868	0.5733	1109.8968
127	277	0.1975	0.5930	0.0967	0.6279	1076.8103
128	668	0.5140	0.2135	0.1868	0.5733	1077.5558
129	1095	0.4499	0.2933	0.1678	0.5857	1097.1395
130	299	0.3563	0.4785	0.1238	0.6247	1205.3195
131	49	0.4788	0.3342	0.1581	0.6049	1207.0925
132	371	0.5935	0.1967	0.1908	0.5849	1200.9178
133	492	0.5317	0.2710	0.1731	0.5958	1193.6261
134	1034	0.4788	0.3342	0.1581	0.6049	1199.5604
135	960	0.5317	0.2710	0.1731	0.5958	1178.8632
136	574	0.1564	0.6114	0.0923	0.6252	1047.2119
137	709	0.4166	0.3024	0.1657	0.5815	1107.6660
138	691	0.4817	0.2203	0.1852	0.5685	1057.9739
139	689	0.4474	0.4535	0.1298	0.6293	1175.8438
140	930	0.5368	0.3157	0.1625	0.6110	1164.3962
141	1059	0.4174	0.4535	0.1298	0.6293	1173.7487
142	1257	0.4918	0.3678	0.1501	0.6180	1204.5285
143	533	0.3861	0.4893	0.1213	0.6339	1162.4989
144	242	0.6973	0.6715	0.0790	0.6263	910.0459
145	549	0.4428	0.2285	0.1832	0.5676	957.3584
146	404	0.1507	0.2902	0.1686	0.5168	704.7570
147	597	0.1507	0.2902	0.1686	0.5168	690.3988

Table 11. 20 week body weight: Values of a_1^*, a_2^*, multiple correlation coefficient (RGI_o^*) and the index $I = G$

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
1	207	0.5140	0.2852	0.5207	924.9360
2	155	0.5140	0.2852	0.5207	890.2778
3	175	0.5140	0.2852	0.5207	876.4145
4	1296	0.2648	0.5948	0.6030	1009.5823
5	1228	0.3373	0.5062	0.5809	977.2488
6	1464	0.4416	0.3764	0.5464	946.7124
7	78	0.4319	0.3009	0.5084	872.4806
8	1060	0.3607	0.3959	0.5368	880.3097
9	947	0.1831	0.6228	0.5976	1007.6951
10	690	0.4319	0.3009	0.5084	878.2039
11	298	0.2894	0.5571	0.5924	1025.7951
12	1548	0.2894	0.5571	0.5924	1036.6224
13	308	0.2894	0.5571	0.5924	996.9186
14	777	0.5049	0.2869	0.5193	1011.6544
15	184	0.3923	0.4459	0.5666	1038.7987
16	30	0.1566	0.7271	0.6346	1098.5972
17	592	0.3063	0.5516	0.5936	1092.1038
18	1423	0.2713	0.6168	0.6134	1089.4725
19	429	0.4200	0.4382	0.5693	1009.3980
20	496	0.2713	0.6168	0.6134	1038.3037
21	507	0.3335	0.5428	0.5956	1071.2648
22	350	0.3728	0.4954	0.5839	1081.6022
23	252	0.2713	0.6168	0.6134	1004.6737
24	1232	0.3001	0.5827	0.6053	1052.5182
25	220	0.3335	0.5428	0.5956	1037.2923
26	1435	0.4030	0.4863	0.5864	1056.1421
27	1161	0.2756	0.6355	0.6218	1101.5337
28	1502	0.5096	0.3599	0.5544	1030.7631
29	1050	0.4030	0.4863	0.5864	1074.2536
30	848	0.4030	0.4863	0.5864	1078.3699
31	714	0.4030	0.4863	0.5864	1084.1327
32	297	0.2369	0.6955	0.6379	1096.0764
33	1212	0.4732	0.4235	0.5745	1030.9377
34	361	0.2741	0.6532	0.6286	1111.4863
35	1183	0.2741	0.6532	0.6286	1096.8296
36	1239	0.6075	0.2672	0.5343	1018.7053
37	1226	0.2574	0.6595	0.6278	1035.4878
38	266	0.4550	0.4285	0.5727	1034.0595
39	1449	0.3047	0.6049	0.6153	1069.9002
40	1302	0.4550	0.4285	0.5727	1036.8025

(contd.....).

Table 11. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
41	68	0.3336	0.5712	0.6075	1076.2031
42	523	0.2401	0.6426	0.6999	1036.9686
43	1421	0.1977	0.6976	0.6310	1027.0051
44	322	0.5449	0.2792	0.5252	924.3725
45	1342	0.4718	0.3691	0.5500	949.5458
46	1460	0.4899	0.3647	0.5521	943.3553
47	535	0.3446	0.5392	0.5964	1004.0839
48	202	0.2351	0.6680	0.6267	998.2363
49	1561	0.3346	0.5392	0.5964	991.0991
50	1105	0.4899	0.3647	0.5521	973.9486
51	739	0.2875	0.5870	0.6045	1029.0968
52	285	0.3208	0.5469	0.5946	986.9060
53	1461	0.4649	0.3707	0.5492	979.0919
54	27	0.4649	0.3707	0.5492	982.1350
55	1336	0.3600	0.4993	0.5828	1027.5861
56	147	0.2874	0.6110	0.6143	1134.4725
57	1440	0.3497	0.5375	0.5968	1155.5942
58	1582	0.2874	0.6111	0.6143	1158.2975
59	211	0.5690	0.2746	0.5287	1098.8134
60	1571	0.4952	0.3634	0.5527	1107.7132
61	1102	0.5690	0.2746	0.5287	1094.1639
62	1468	0.2498	0.4854	0.5524	727.4173
63	83	0.3774	0.3114	0.5000	663.9351
64	1493	0.2024	0.5473	0.5694	764.6692
65	204	0.2018	0.4988	0.5476	747.3179
66	442	0.2591	0.4205	0.5244	717.5143
67	1146	0.3298	0.3204	0.4927	728.5634
68	160	0.4012	0.3861	0.5416	869.0704
69	418	0.2247	0.6085	0.6004	913.3533
70	268	0.2247	0.6085	0.6004	949.1289
71	448	0.1251	0.6426	0.5938	964.4155
72	1286	0.2498	0.4854	0.5524	933.9190
73	1097	0.2177	0.6745	0.6259	1071.4662
74	233	0.2652	0.6170	0.6130	1079.8364
75	1254	0.2940	0.5848	0.6049	1058.7129
76	1233	0.1004	0.5269	0.5372	793.7104
77	613	0.2313	0.3394	0.4770	695.5104
78	400	0.2698	0.4799	0.5544	967.1755
79	543	0.3975	0.3075	0.5031	914.6253
80	857	0.1824	0.5920	0.5845	1015.2025

(contd.....)

Table 11. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI o*	G
81	1354	0.3040	0.4704	0.5579	992.3591
82	772	0.3607	0.3959	0.5368	959.7789
83	1364	0.3607	0.3959	0.5368	956.8036
84	1453	0.3040	0.4704	0.5579	959.6582
85	573	0.3296	0.5726	0.6072	1120.7572
86	217	0.3632	0.5331	0.5978	1117.7951
87	919	0.3296	0.5726	0.6072	1122.8156
88	943	0.5096	0.3599	0.5544	1053.0512
89	1490	0.3296	0.5726	0.6072	1137.5672
90	827	0.5838	0.2718	0.5309	1056.6467
91	1138	0.4499	0.3744	0.5474	931.4686
92	1390	0.2441	0.6265	0.6118	1015.6554
93	304	0.3454	0.5038	0.5816	1021.6554
94	1313	0.3063	0.5516	0.5936	963.8369
95	847	0.2067	0.6398	0.6096	1068.5970
96	11	0.4844	0.2908	0.5163	918.8476
97	58	0.3088	0.5149	0.5785	906.2261
98	713	0.4125	0.3834	0.5430	948.2229
99	1333	0.1951	0.6440	0.6089	1024.7438
100	1271	0.2247	0.6085	0.6004	998.9150
101	5	0.4729	0.2931	0.5145	863.1429
102	578	0.1378	0.6065	0.5811	874.3036
103	560	0.2272	0.4917	0.5501	829.2306
104	24	0.3454	0.5038	0.5816	1024.9870
105	1275	0.1755	0.7069	0.6300	1016.9597
106	1466	0.3063	0.5516	0.5936	968.3571
107	1159	0.1615	0.5988	0.5829	867.1492
108	602	0.2024	0.5473	0.5693	880.4129
109	1235	0.3497	0.5375	0.5968	1051.6956
110	562	0.1863	0.7272	0.6405	1094.9637
111	640	0.4952	0.3634	0.5527	1056.9761
112	983	0.3162	0.5762	0.6063	1109.3567
113	986	0.2560	0.5978	0.6024	944.9258
114	1298	0.3285	0.5089	0.5802	904.8183
115	1363	0.2270	0.6326	0.6108	917.4400
116	150	0.3445	0.3998	0.5348	963.9466
117	1402	0.2010	0.5859	0.5858	986.8589
118	395	0.4156	0.3041	0.5059	944.3440
119	1567	0.4156	0.3041	0.5059	921.4931
120	1238	0.3245	0.5978	0.6165	1099.9791

(contd.....)

Table 11. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
121	1507	0.2992	0.6268	0.6231	1121.2528
122	540	0.1965	0.7428	0.6485	1127.2329
123	118	0.6109	0.2666	0.5348	1035.7312
124	21	0.6109	0.2666	0.5348	1012.3753
125	1205	0.5359	0.3536	0.5575	1043.8792
126	56	0.4605	0.2954	0.5127	888.1985
127	227	0.1554	0.6798	0.6154	989.2459
128	668	0.4605	0.2954	0.5127	911.7391
129	1095	0.3889	0.3891	0.5402	918.8691
130	299	0.2805	0.5894	0.6040	1104.7743
131	49	0.4000	0.4438	0.5673	1040.7889
132	371	0.5305	0.2820	0.5231	968.5373
133	492	0.4577	0.3725	0.5483	1019.4011
134	1034	0.4000	0.4438	0.5673	1004.8316
135	960	0.4577	0.3725	0.5483	1023.4523
136	574	0.1243	0.6912	0.6138	994.9648
137	709	0.3607	0.3959	0.5168	921.4319
138	691	0.4319	0.3009	0.5084	891.0758
139	689	0.3254	0.5740	0.6069	1076.9985
140	930	0.4464	0.4309	0.5719	1027.2452
141	1059	0.3254	0.5740	0.6069	1045.8558
142	1257	0.3986	0.4876	0.5860	1081.7487
143	533	0.2965	0.6078	0.6148	1060.1890
144	242	0.0561	0.7357	0.6180	887.5413
145	549	0.3975	0.3075	0.5031	808.0070
146	404	0.1364	0.3576	0.4614	583.3004
147	597	0.1364	0.3576	0.4614	573.8956

Table 12. 40 week body weight: Values of b_1^*, b_2^*, b_3^*, multiple correlation coefficient (RGI*) and the index I = G

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
1	207	0.5896	0.2076	0.2104	0.5970	1486.6216
2	155	0.5896	0.2076	0.2104	0.5970	1394.4033
3	175	0.5896	0.2076	0.2104	0.5970	1408.9580
4	1296	0.3416	0.4990	0.1330	0.6336	1411.8371
5	1228	0.4212	0.4068	0.1575	0.6225	1389.9234
6	1464	0.5246	0.2859	0.1898	0.6071	1451.8670
7	78	0.4992	0.2290	0.2047	0.5845	1279.6490
8	1060	0.4308	0.3133	0.1823	0.5962	1278.7985
9	947	0.2347	0.5463	0.1205	0.6261	1311.1160
10	690	0.4992	0.2289	0.2047	0.5845	1286.9688
11	298	0.3678	0.4605	0.1432	0.6275	1429.3588
12	1548	0.3678	0.4605	0.1432	0.6275	1410.9982
13	308	0.3678	0.4605	0.1432	0.6275	1407.9695
14	777	0.5796	0.2100	0.2097	0.5956	1493.9634
15	185	0.4790	0.3471	0.1733	0.6164	1464.9926
16	30	0.2104	0.6521	0.0924	0.6518	1449.2385
17	592	0.3895	0.4514	0.1456	0.6292	1465.0424
18	1423	0.3556	0.5153	0.1287	0.6410	1473.5554
19	429	0.5125	0.3354	0.1764	0.6197	1429.4233
20	496	0.3556	0.5153	0.1287	0.6410	1421.1085
21	507	0.4245	0.4368	0.1495	0.6319	1477.9547
22	350	0.4656	0.3896	0.1621	0.6263	1466.5715
23	252	0.3556	0.5153	0.1287	0.6410	1373.8613
24	1232	0.3882	0.4784	0.1385	0.6368	1407.0650
25	220	0.4245	0.4368	0.1495	0.6319	1423.7570
26	1435	0.5033	0.3749	0.1659	0.6295	1531.7082
27	1161	0.3669	0.5289	0.1251	0.6471	1474.3472
28	1502	0.6028	0.2614	0.1961	0.6160	1636.6253
29	1050	0.5033	0.3749	0.1659	0.6295	1537.2845
30	848	0.5033	0.3749	0.1659	0.6295	1578.9248
31	714	0.5033	0.3749	0.1659	0.6295	1541.1932
32	297	0.3258	0.5923	0.1082	0.6571	1464.1551
33	1212	0.5763	0.3130	0.1824	0.6259	1530.8393
34	361	0.3703	0.5433	0.1212	0.6518	1489.5312
35	1183	0.3703	0.5433	0.1212	0.6518	1495.0806
36	1239	0.6909	0.1837	0.2167	0.6107	1542.9878
37	1226	0.3465	0.5550	0.1181	0.6506	1446.1408
38	266	0.5544	0.3206	0.1804	0.6238	1604.5798
39	1449	0.4009	0.4943	0.1342	0.6438	1471.5388
40	1302	0.5544	0.3206	0.1804	0.6238	1494.3960

(contd.....)

Table 12. Contd.....

Sl No	Bird No	b^*_1	b^*_2	b^*_3	RGI*	G
41	68	0.4326	0.4587	0.1437	0.6398	1512.0070
42	523	0.3178	0.5525	0.1188	0.6443	1450.2674
43	1421	0.2658	0.6101	0.1035	0.6506	1394.2846
44	322	0.6233	0.1997	0.2145	0.6016	1495.1338
45	1342	0.5593	0.2745	0.1926	0.6111	1499.1246
46	1460	0.5801	0.2683	0.1943	0.6134	1489.3376
47	535	0.4389	0.4308	0.1511	0.6330	1372.0340
48	202	0.3150	0.5706	0.1140	0.6489	1341.2097
49	1561	0.4389	0.4308	0.1511	0.6330	1360.5526
50	1105	0.5801	0.2683	0.1943	0.6134	1407.2179
51	739	0.3715	0.4857	0.1365	0.6356	1396.7384
52	285	0.4082	0.4436	0.1477	0.6306	1470.4522
53	1461	0.5515	0.2769	0.1920	0.6102	1453.2714
54	27	0.5515	0.2769	0.1920	0.6102	1457.9298
55	1336	0.4496	0.3958	0.1604	0.6249	1429.6137
56	147	0.3774	0.5052	0.1313	0.6424	1531.4572
57	1440	0.4454	0.4281	0.1518	0.6335	1519.6530
58	1582	0.3774	0.5052	0.1313	0.6424	1500.6688
59	211	0.6494	0.1935	0.2141	0.6051	1611.7925
60	1571	0.5863	0.2664	0.1948	0.6141	1638.1739
61	1102	0.6494	0.1935	0.2141	0.6051	1573.4355
62	1468	0.3064	0.4076	0.1573	0.5992	1118.4153
63	83	0.4384	0.2433	0.2009	0.5759	1211.4353
64	1493	0.2526	0.4723	0.1401	0.6077	1191.3167
65	204	0.2479	0.4281	0.1518	0.5932	1128.0899
66	442	0.3115	0.3493	0.1727	0.5822	1123.8030
67	1146	0.3848	0.2600	0.1975	0.5683	1158.1909
68	160	0.4779	0.2991	0.1861	0.6017	1319.8939
69	418	0.2889	0.5223	0.1268	0.6299	1222.5823
70	268	0.2889	0.5223	0.1268	0.6299	1234.9255
71	448	0.1597	0.5795	0.1116	0.6209	1243.6252
72	1286	0.3064	0.4076	0.1573	0.5992	1260.6040
73	1097	0.2907	0.5826	0.1108	0.6476	1439.9222
74	233	0.3474	0.5191	0.1277	0.6405	1399.4266
75	1254	0.3801	0.4819	0.1375	0.6362	1449.6713
76	1233	0.1238	0.4716	0.1403	0.5804	1034.2476
77	613	0.2725	0.2825	0.1905	0.5519	1063.4038
78	400	0.3308	0.3990	0.1595	0.6017	1408.1532
79	543	0.4609	0.2380	0.2023	0.5791	1332.0486
80	857	0.2308	0.5178	0.1280	0.6169	1278.3130

(contd....)

Table 12. Contd.....

Sl No	Bird No	b^*_1	b^*_2	b^*_3	RGI*	G
81	1354	0.3723	0.3845	0.1634	0.6058	1346.1690
82	772	0.4308	0.3133	0.1823	0.5962	1340.8450
83	1364	0.4308	0.3133	0.1823	0.5962	1294.6919
84	1453	0.3723	0.3745	0.1634	0.6058	1305.3943
85	573	0.4273	0.4610	0.1431	0.6394	1572.5181
86	217	0.4629	0.4207	0.1538	0.6348	1567.1000
87	919	0.4273	0.4610	0.1431	0.6394	1589.5884
88	943	0.6028	0.2614	0.1961	0.6160	1620.8499
89	1490	0.4273	0.4610	0.1431	0.6394	1653.4849
90	827	0.6654	0.1897	0.2151	0.6073	1619.5594
91	1138	0.5342	0.2821	0.1906	0.6082	1448.1222
92	1390	0.3189	0.5323	0.1242	0.6387	1405.0970
93	304	0.4313	0.4029	0.1585	0.6233	1463.8865
94	1313	0.3895	0.4514	0.1456	0.6292	1394.8280
95	547	0.2689	0.5554	0.1180	0.6356	1319.6357
96	11	0.5572	0.2153	0.2083	0.5925	1391.4522
97	58	0.3856	0.4206	0.1538	0.6194	1300.8181
98	713	0.4910	0.2952	0.1871	0.6032	1398.0809
99	1333	0.2534	0.5676	0.1161	0.6346	1318.8691
100	1271	0.2889	0.5223	0.1268	0.6299	1349.1677
101	5	0.4545	0.2182	0.2075	0.5908	1416.3691
102	578	0.1741	0.5415	0.1217	0.6125	1179.0494
103	560	0.2790	0.4172	0.1547	0.5964	1279.5892
104	24	0.4314	0.4029	0.1585	0.6233	1400.0911
105	1275	0.2347	0.6259	0.0993	0.6491	1354.9911
106	1466	0.3895	0.4514	0.1456	0.6292	1275.8477
107	1159	0.2042	0.5289	0.1251	0.6148	1274.7127
108	602	0.2526	0.4722	0.1401	0.6077	1232.8332
109	1235	0.4454	0.4281	0.1518	0.6335	1452.0550
110	562	0.2551	0.6407	0.0954	0.6571	1401.3190
111	640	0.5863	0.2664	0.1948	0.6141	1543.7445
112	983	0.4095	0.4689	0.1410	0.6382	1465.6683
113	986	0.3300	0.5041	0.1317	0.6328	1305.6230
114	1298	0.4102	0.4111	0.1564	0.6215	1247.3906
115	1363	0.2960	0.5429	0.1213	0.6373	1255.7237
116	150	0.4119	0.3190	0.1808	0.5940	1401.6529
117	1402	0.2545	0.5079	0.1306	0.6188	1329.9543
118	395	0.4810	0.2332	0.2036	0.5819	1420.9225
119	1567	0.4810	0.2332	0.2036	0.5819	1384.5575
120	1238	0.4280	0.4818	0.1376	0.6455	1419.2852

(contd.....)

Table 12. Contd.....

Sl No	Bird No.	b^*_1	b^*_2	b^*_3	RGI*	G
121	1507	0.3998	0.5131	0.1293	0.6489	1410.2700
122	540	0.2756	0.6493	0.0931	0.6634	1390.7056
123	118	0.6945	0.1829	0.2169	0.6112	1520.8378
124	21	0.6945	0.1829	0.2169	0.6112	1470.1849
125	1205	0.6328	0.2524	0.1985	0.6194	1515.7048
126	56	0.5308	0.2215	0.2067	0.5889	1381.6887
127	277	0.2030	0.6075	0.1042	0.6377	1298.3359
128	668	0.5308	0.2215	0.2067	0.5889	1287.6370
129	1095	0.4636	0.3034	0.1849	0.6001	1322.4523
130	299	0.3622	0.4898	0.1354	0.6350	1347.2908
131	49	0.4883	0.3438	0.1742	0.6173	1434.4495
132	371	0.6076	0.2034	0.2115	0.5994	1355.7667
133	492	0.5431	0.2794	0.1913	0.6092	1447.1074
134	1034	0.4883	0.3438	0.1742	0.6173	1367.7274
135	960	0.5431	0.2794	0.1913	0.6092	1385.4199
136	574	0.1615	0.6275	0.0989	0.6353	1261.6474
137	709	0.4308	0.3133	0.1823	0.5962	1435.0935
138	691	0.4992	0.2289	0.2047	0.5845	1309.3639
139	689	0.4217	0.4635	0.1424	0.6391	1482.2187
140	930	0.5441	0.3243	0.1794	0.6228	1445.7340
141	1059	0.4217	0.4635	0.1424	0.6391	1467.6242
142	1257	0.4978	0.3770	0.1654	0.6290	1493.5344
143	533	0.3898	0.4995	0.1329	0.6431	1411.3531
144	242	0.0725	0.6905	0.0822	0.6360	1132.7183
145	549	0.4609	0.2380	0.2023	0.5791	1237.7936
146	404	0.1621	0.3086	0.1836	0.5353	907.2587
147	597	0.1621	0.3086	0.1836	0.5353	912.6332

Table 13. 40 week body weight : Values of a_1^*, a_2^*, multiple correlation coefficient (RGI_o^*) and the index I = G

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
1	207	0.5118	0.3122	0.5330	1171.3739
2	155	0.5118	0.3122	0.5330	1119.9081
3	175	0.5118	0.3122	0.5330	1145.5410
4	1296	0.2556	0.6251	0.6136	1263.2891
5	1228	0.3279	0.5382	0.5925	1224.9592
6	1464	0.4350	0.4071	0.5588	1183.2845
7	78	0.4349	0.3283	0.5224	1023.7191
8	1060	0.3597	0.4267	0.5507	1057.2837
9	947	0.1799	0.6523	0.6092	1161.4778
10	690	0.4349	0.3283	0.5224	1018.6019
11	298	0.2807	0.5884	0.6036	1229.6433
12	1548	0.2807	0.5884	0.6036	1223.4023
13	308	0.2807	0.5884	0.6036	1218.7215
14	777	0.5033	0.3140	0.5318	1174.7242
15	185	0.3830	0.4779	0.5785	1220.1820
16	30	0.1502	0.7516	0.6429	1359.2729
17	592	0.2960	0.5831	0.6046	1284.3486
18	1423	0.2592	0.6467	0.6230	1297.3389
19	429	0.4083	0.4704	0.5808	1202.3177
20	496	0.2592	0.6467	0.6230	1276.7416
21	507	0.3206	0.5747	0.6062	1275.9016
22	350	0.3601	0.5279	0.5949	1264.5312
23	252	0.2592	0.6467	0.6230	1234.7366
24	1232	0.2874	0.6137	0.6154	1245.4718
25	220	0.3206	0.5747	0.6062	1248.5780
26	1435	0.3872	0.5191	0.5970	1328.2936
27	1161	0.2608	0.6651	0.6307	1342.5244
28	1502	0.4971	0.3909	0.5655	1305.4465
29	1050	0.3872	0.5191	0.5970	1284.4436
30	848	0.3872	0.5191	0.5970	1297.8671
31	714	0.3872	0.5191	0.5970	1320.0563
32	297	0.2217	0.7225	0.6455	1327.1333
33	1212	0.4560	0.4563	0.5950	1263.2185
34	361	0.2575	0.6824	0.6369	1319.2383
35	1183	0.2575	0.6824	0.6369	1344.6294
36	1239	0.5973	0.2943	0.5445	1250.5960
37	1226	0.2428	0.6882	0.6362	1286.9177
38	266	0.4398	0.4611	0.5835	1258.8350
39	1449	0.2888	0.6357	0.6246	1268.6307
40	1302	0.4398	0.4611	0.5835	1240.9133

(contd.....)

Table 13. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI δ^*	G
41	68	0.3173	0.6030	0.6171	1262.2233
42	523	0.2292	0.6772	0.6292	1292.2287
43	1421	0.1883	0.7238	0.6395	1277.2996
44	322	0.5403	0.3062	0.5368	1185.1118
45	1342	0.4627	0.3999	0.5618	1209 .9978
46	1460	0.4792	0.3956	0.5635	1152.6785
47	535	0.3305	0.5713	0.6069	1184.3567
48	202	0.2231	0.6959	0.6354	1229.5834
49	1561	0.3305	0.5713	0.6069	1189.9700
50	1105	0.4792	0.3956	0.5635	1161.6939
51	739	0.2761	0.6178	0.6147	1227.1475
52	285	0.3092	0.5786	0.6055	1202.2542
53	1461	0.4565	0.4015	0.5611	1189.8626
54	27	0.4565	0.4015	0.5611	1165.2030
55	1336	0.3486	0.5316	0.5941	1250.8035
56	147	0.2735	0.6414	0.6238	1336.3082
57	1440	0.3351	0.5697	0.6072	1348.3320
58	1582	0.2735	0.6414	0.6238	1329.5928
59	211	0.5623	0.3016	0.5398	1313.5559
60	1571	0.4840	0.3943	0.5641	1342.0838
61	1102	0.5623	0.3016	0.5398	1285.4782
62	1468	0.2496	0.5173	0.5666	1012.9559
63	83	0.3825	0.3393	0.5151	965.8856
64	1493	0.2016	0.5789	0.5830	1042.4775
65	204	0.2033	0.5510	0.5624	932.1568
66	442	0.2623	0.4520	0.5400	913.5603
67	1146	0.3368	0.3459	0.5086	911.8480
68	160	0.3976	0.4168	0.5548	1027.7873
69	418	0.2188	0.6383	0.6114	1089.0339
70	268	0.2188	0.6383	0.6114	1107.7487
71	448	0.1245	0.6721	0.6060	1162.5900
72	1286	0.2496	0.5173	0.5666	1096.0741
73	1097	0.2076	0.70202	0.6347	1301.4874
74	233	0.2537	0.6488	0.6227	1249.6023
75	1254	0.2820	0.6157	0.6151	1284.6594
76	1233	0.1030	0.5607	0.5533	920.1341
77	613	0.2395	0.3693	0.4945	828.9918
78	400	0.2688	0.5117	0.5684	1154.9985
79	543	0.4021	0.3352	0.5178	1041.8614
80	857	0.1807	0.6226	0.5970	1165.3206

(contd.....)

Table 13. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI$_o$*	G
81	1354	0.3011	0.5021	0.5712	1112.8045
82	772	0.3597	0.4267	0.5507	1083.0492
83	1364	0.3597	0.4267	0.5507	1127.9528
84	1453	0.3011	0.5021	0.5713	1126.1629
85	573	0.3137	0.6043	0.6169	1336.1782
86	217	0.3472	0.5656	0.6079	1343.4325
87	919	0.3137	0.6043	0.6169	1362.0008
88	943	0.4971	0.3909	0.5654	1327.1140
89	1490	0.3137	0.6043	0.6169	1393.7256
90	827	0.5758	0.2988	0.5414	1290.9204
91	1138	0.4427	0.4051	0.5596	1184.3203
92	1390	0.2346	0.6558	0.6218	1266.4845
93	304	0.3353	0.5358	0.5931	1258.8839
94	1313	0.2960	0.5831	0.6046	1193.0486
95	347	0.2005	0.6685	0.6200	1193.5685
96	11	0.4843	0.3180	0.5292	1118.4675
97	58	0.3017	0.5467	0.5906	1108.7979
98	713	0.4082	0.4141	0.5559	1164.1320
99	1333	0.1897	0.6725	0.6194	1208.8620
100	1271	0.2187	0.6383	0.6114	1214.1349
101	5	0.4735	0.3202	0.5277	1100.9223
102	578	0.1377	0.6373	0.5942	1088.2850
103	560	0.2280	0.5237	0.5647	1086.8071
104	24	0.3353	0.5358	0.5931	1187.9170
105	1275	0.1683	0.7318	0.6387	1225.2456
106	1466	0.2960	0.5831	0.6046	1127.2973
107	1159	0.1606	0.6293	0.5957	1132.8932
108	602	0.2016	0.5789	0.5830	1106.5187
109	1235	0.3351	0.5697	0.6072	1240.7113
110	562	0.1762	0.7519	0.6481	1303.7755
111	640	0.4840	0.3943	0.5641	1255.7888
112	983	0.3018	0.6086	0.6162	1296.3424
113	986	0.2476	0.6280	0.6131	1159.7664
114	1298	0.3199	0.5408	0.5919	1087.7251
115	1363	0.2191	0.6616	0.6210	1115.9760
116	150	0.3444	0.4307	0.5490	1146.7922
117	1402	0.1983	0.6165	0.5982	1161.4357
118	395	0.4193	0.3316	0.5202	1116.7932
119	1567	0.4193	0.3316	0.5202	1106.5788
120	1238	0.3062	0.6293	0.6254	1246.2450

(contd....)

Table 13. Contd....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
121	1507	0.2815	0.6572	0.6314	1230.7102
122	540	0.1832	0.7669	0.6552	1290.5048
123	118	0.6004	0.2936	0.5449	1197.6335
124	21	0.6004	0.2936	0.5449	1184.5749
125	1205	0.5207	0.3848	0.5680	1202.7060
126	56	0.4618	0.3227	0.5261	1080.9893
127	277	0.1516	0.7069	0.6256	1180.9075
128	668	0.4618	0.3227	0.5261	1024.5102
129	1095	0.3861	0.4198	0.5536	1084.9563
130	299	0.2698	0.6200	0.6144	1191.5673
131	49	0.3900	0.4758	0.5792	1192.9715
132	371	0.5270	0.3090	0.5350	1103.2642
133	492	0.4498	0.4032	0.5604	1186.7603
134	1034	0.3900	0.4758	0.5792	1169.3475
135	960	0.4498	0.4032	0.5604	1130.8036
136	574	0.1222	0.7181	0.6242	1171.2698
137	709	0.3597	0.4267	0.5509	1144.1368
138	691	0.4349	0.3283	0.5224	1068.8312
139	689	0.3090	0.6086	0.6167	1306.5480
140	930	0.4320	0.4634	0.5828	1221.4437
141	1059	0.3100	0.6056	0.6167	1284.4671
142	1257	0.3833	0.5204	0.5967	1273.8134
143	533	0.2816	0.6384	0.6242	1260.6246
144	242	0.0559	0.7614	0.6282	1084.8883
145	549	0.4021	0.3352	0.5178	988.6560
146	404	0.1431	0.3896	0.4803	680.6940
147	597	0.1431	0.3896	0.4803	699.8877

Table 14. Egg Weight : Values of b_1^* , b_2^* , b_3^*, multiple correlation coefficient (RGI^*) and the index I = G

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI^*	G
1	207	0.6715	0.1933	0.3344	0.6571	60.7470
2	155	0.6715	0.1933	0.3344	0.6571	60.9127
3	175	0.6715	0.1933	0.3344	0.6571	59.1640
4	1296	0.4017	0.4886	0.2200	0.6713	56.4564
5	1228	0.4909	0.3918	0.2521	0.6668	56.6413
6	1464	0.6030	0.2688	0.3031	0.6608	62.6534
7	78	0.5868	0.2261	0.3208	0.6482	54.8950
8	1060	0.5098	0.3130	0.2848	0.6529	60.1872
9	947	0.2812	0.5651	0.1803	0.6656	49.5768
10	690	0.5868	0.2261	0.3208	0.6482	58.2503
11	298	0.4318	0.4502	0.2279	0.6686	58.8467
12	1548	0.4318	0.4502	0.2279	0.6686	57.9945
13	308	0.4318	0.4502	0.2279	0.6686	57.9522
14	777	0.6624	0.1969	0.3329	0.6561	62.7802
15	185	0.5534	0.3290	0.2781	0.6648	61.8569
16	30	0.2493	0.6554	0.1429	0.6793	55.9673
17	592	0.4552	0.4360	0.2338	0.6698	57.7581
18	1423	0.4164	0.4951	0.2093	0.6755	58.2415
19	429	0.5868	0.3112	0.2855	0.6671	62.0812
20	496	0.4164	0.4951	0.2093	0.6755	57.6447
21	507	0.4926	0.4132	0.6718	0.6718	57.3746
22	350	0.5370	0.3652	0.2631	0.6696	62.3767
23	252	0.4164	0.4951	0.2093	0.6755	58.6900
24	1232	0.4527	0.4562	0.2254	0.6738	57.9995
25	220	0.4926	0.4132	0.2432	0.6718	59.1490
26	1435	0.5754	0.3431	0.2723	0.6720	64.7739
27	1161	0.4289	0.4997	0.2074	0.6788	62.2533
28	1502	0.6768	0.2339	0.3176	0.6670	68.5013
29	1050	0.5754	0.3431	0.2723	0.6720	64.3786
30	848	0.5754	0.3431	0.2723	0.6720	65.2300
31	714	0.5754	0.3431	0.2723	0.6720	63.9738
32	297	0.3838	0.5597	0.1825	0.6834	57.7491
33	1212	0.6489	0.2781	0.2992	0.6715	63.2779
34	361	0.4333	0.5076	0.2041	0.6813	60.0454
35	1183	0.4333	0.5076	0.2041	0.6813	59.1422
36	1239	0.7602	0.1590	0.3486	0.6662	66.1027
37	1226	0.4064	0.5261	0.1965	0.6803	55.9204
38	266	0.6278	0.2893	0.2946	0.6700	61.0596
39	1449	0.4663	0.4624	0.2229	0.6776	56.8714
40	1302	0.6279	0.2893	0.2946	0.6700	60.7207

(contd...)

Table 14. Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
41	68	0.5006	0.4258	0.2380	0.6760	58.8063
42	523	0.3737	0.5369	0.1920	0.6767	58.8480
43	1421	0.3140	0.6002	0.1657	0.6793	57.6732
44	322	0.7016	0.1817	0.3392	0.6602	65.5613
45	1342	0.6363	0.2531	0.3096	0.6636	63.6601
46	1460	0.6558	0.2438	0.3134	0.6653	63.3641
47	535	0.5078	0.4040	0.2471	0.6726	61.5359
48	202	0.3706	0.5507	0.1862	0.6790	57.3064
49	1561	0.5078	0.4040	0.2471	0.6726	59.6672
50	1105	0.6558	0.2438	0.3134	0.6653	64.0408
51	739	0.4345	0.4677	0.2206	0.6729	58.7396
52	285	0.4752	0.4238	0.2389	0.6709	58.8849
53	1461	0.6288	0.2566	0.3081	0.6630	63.3554
54	27	0.6288	0.2566	0.3081	0.6630	61.4812
55	1336	0.5205	0.3747	0.2592	0.6686	60.6140
56	147	0.4405	0.4793	0.2158	0.6765	60.7551
57	1440	0.5146	0.3997	0.2488	0.6730	63.5929
58	1582	0.4405	0.4793	0.2158	0.6765	61.0549
59	211	0.7246	0.1728	0.3429	0.6626	63.1338
60	1571	0.6615	0.2411	0.3146	0.6658	65.3877
61	1102	0.7246	0.1728	0.3429	0.6626	66.6673
62	1468	0.3711	0.4261	0.2379	0.6517	51.6401
63	83	0.5268	0.2494	0.3111	0.6418	54.1677
64	1493	0.3066	0.4979	0.2081	0.6555	49.2282
65	204	0.3053	0.4611	0.2234	0.6470	51.6646
66	442	0.3829	0.3730	0.2599	0.6420	52.3967
67	1146	0.4716	0.2707	0.3023	0.6359	53.6225
68	160	0.5572	0.2905	0.2941	0.6570	57.7588
69	418	0.3429	0.5259	0.1965	0.6685	54.2355
70	268	0.3429	0.5259	0.1965	0.6685	53.6985
71	448	0.1940	0.6205	0.1573	0.6614	50.6124
72	1286	0.3711	0.4261	0.2379	0.6517	53.4491
73	1097	0.3428	0.5698	0.1783	0.6781	54.0170
74	233	0.4073	0.5011	0.2068	0.6751	56.2465
75	1254	0.4439	0.4618	0.2231	0.6734	55.6339
76	1233	0.1581	0.5396	0.6362	0.6362	47.1519
77	613	0.3484	0.3184	0.2825	0.6225	48.5335
78	400	0.3979	0.4118	0.2438	0.6537	56.6604
79	543	0.5493	0.2406	0.3148	0.6442	57.1072
80	857	0.2788	0.5434	0.1893	0.6603	54.1546

(contd...)

Table 14. Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
81	1354	0.4427	0.3879	0.2537	0.6569	53.1436
82	772	0.5098	0.3130	0.2848	0.6529	56.4646
83	1364	0.5098	0.3130	0.2848	0.6529	57.2648
84	1453	0.4427	0.3879	0.2537	0.6569	55.4144
85	573	0.4949	0.4294	0.2365	0.6758	63.6944
86	217	0.5330	0.3886	0.2534	0.6739	64.1903
87	919	0.4949	0.4294	0.2365	0.6758	61.7941
88	943	0.6768	0.2339	0.3176	0.6670	66.1619
89	1490	0.4949	0.4294	0.2365	0.6758	63.2798
90	827	0.7384	0.1674	0.3451	0.6640	66.0393
91	1138	0.6123	0.2645	0.3049	0.6616	59.0338
92	1370	0.3755	0.5220	0.1982	0.6737	55.0062
93	304	0.5015	0.3856	0.2547	0.6675	57.4539
94	1313	0.4552	0.4360	0.2338	0.6698	55.3542
95	347	0.3190	0.5590	0.1828	0.6713	54.3454
96	11	0.6417	0.2049	0.3296	0.6540	64.5853
97	58	0.4532	0.4135	0.2431	0.6645	56.7091
98	713	0.5702	0.2844	0.2966	0.6581	59.5663
99	1333	0.3013	0.5706	0.1780	0.6705	51.9675
100	1271	0.3429	0.5259	0.1965	0.6685	534299
101	5	0.6299	0.2094	0.3277	0.6527	57.7471
102	578	0.2129	0.5836	0.1726	0.6567	49.3980
103	560	0.3405	0.4424	0.2311	0.6495	50.0958
104	24	0.5015	0.3856	0.2546	0.6675	56.5996
105	1275	0.2779	0.6255	0.1552	0.6781	51.3197
106	1466	0.4552	0.4360	0.2338	0.6698	54.6816
107	1159	0.2481	0.5671	0.1815	0.6587	51.6525
108	602	0.3066	0.4979	0.2081	0.6555	50.6749
109	1235	0.5146	0.3998	0.2488	0.6730	60.5558
110	562	0.3017	0.6261	0.1550	0.6826	56.4269
111	640	0.6615	0.2411	0.3146	0.6658	64.9413
112	983	0.4757	0.4416	0.2315	0.6749	59.5912
113	986	0.3889	0.4967	0.2086	0.6707	54.9983
114	1298	0.4794	0.3984	0.2494	0.6661	56.5467
115	1363	0.3497	0.5389	0.1911	0.6726	54.6855
116	150	0.4903	0.3222	0.2809	0.6513	58.9787
117	1402	0.3059	0.5269	0.1961	0.6618	54.2117
118	395	0.5691	0.2330	0.3179	0.6463	57.4798
119	1567	0.5691	0.2330	0.3179	0.6463	56.6806
120	1238	0.4958	0.4430	0.2309	0.6789	56.4407

(contd...)

Table 14. Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
121	1507	0.4656	0.4751	0.2176	0.6802	57.9684
122	540	0.3270	0.6209	0.1571	0.6861	55.6362
123	118	0.7633	0.1578	0.3491	0.6665	62.4680
124	21	0.7633	0.1578	0.3491	0.6665	60.1870
125	1205	0.7043	0.2209	0.3229	0.6693	60.9023
126	56	0.1232	0.4056	0.2464	0.5973	38.1745
127	227	0.2421	0.6255	0.1552	0.6715	52.2305
128	668	0.6170	0.2144	0.3256	0.6514	56.2997
129	1095	0.5430	0.2973	0.2913	0.6557	56.6510
130	299	0.4244	0.4742	0.2180	0.6724	57.2085
131	49	0.5627	0.3240	0.2802	0.6654	60.2472
132	371	0.6877	0.1871	0.3370	0.6587	61.7679
133	492	0.6209	0.2604	0.3066	0.6623	60.2864
134	1034	0.5627	0.3240	0.2802	0.6654	58.6355
135	960	0.6209	0.2604	0.3066	0.6623	60.2473
136	574	0.1937	0.6582	0.1417	0.6696	50.6969
137	709	0.5098	0.3130	0.2848	0.6529	59.3618
138	691	0.5868	0.2261	0.3208	0.6482	58.0210
139	689	0.4889	0.4332	0.2349	0.6755	61.3115
140	930	0.6178	0.2947	0.2924	0.6693	60.8201
141	1059	0.4889	0.4332	0.2349	0.6755	58.5984
142	1257	0.5699	0.3462	0.2710	0.6716	62.2148
143	533	0.4541	0.4703	0.2196	0.6771	58.0644
144	242	0.0874	0.7455	0.1055	0.6688	45.6800
145	549	0.5493	0.2406	0.3148	0.6442	53.5934
146	404	0.2165	0.3695	0.2614	0.6079	44.0770
147	597	0.2165	0.3695	0.2614	0.6079	44.8278

Table 15. Egg Weight : Values of a_1^*, a_2^*, multiple correlation coefficient (RGI_o^*) and the index I = G

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
1	207	0.4557	0.4525	0.5833	45.4634
2	155	0.4557	0.4525	0.5833	43.8046
3	175	0.4557	0.4525	0.5833	46.8591
4	1296	0.1959	0.7506	0.6514	48.6146
5	1228	0.2594	0.6786	0.6357	46.9732
6	1464	0.3669	0.5552	0.6077	48.3467
7	78	0.4045	0.4678	0.5786	41.6669
8	1060	0.3176	0.5719	0.6044	43.4851
9	947	0.1485	0.7703	0.6498	44.0055
10	690	0.4035	0.4678	0.5786	43.1290
11	298	0.2194	0.7206	0.6443	48.7894
12	1548	0.2194	0.7206	0.6443	49.4683
13	308	0.2194	0.7206	0.6443	49.9069
14	777	0.4502	0.4542	0.5828	47.4953
15	185	0.3096	0.6246	0.6243	49.9725
16	30	0.1126	0.8443	0.6710	51.0475
17	592	0.2284	0.7170	0.6447	50.2841
18	1423	0.1906	0.7689	0.6574	49.0581
19	429	0.3244	0.6191	0.6250	47.3211
20	496	0.1906	0.7690	0.6574	48.2028
21	507	0.2423	0.7114	0.6452	48.0372
22	350	0.2780	0.6713	0.6365	50.7742
23	252	0.1906	0.7690	0.6574	50.0456
24	1232	0.2138	0.7431	0.6519	47.6917
25	220	0.2423	0.7114	0.6452	49.7547
26	1435	0.2940	0.6655	0.6372	52.2257
27	1161	0.1848	0.7845	0.6621	53.6811
28	1502	0.4042	0.5425	0.6102	52.9649
29	1050	0.2930	0.6655	0.6372	51.9078
30	848	0.2930	0.6655	0.6372	54.1083
31	714	0.2930	0.6655	0.6372	51.5655
32	297	0.1505	0.8274	0.6718	49.8750
33	1212	0.3512	0.6092	0.6264	49.9015
34	361	0.1772	0.7986	0.6660	51.6637
35	1183	0.1772	0.7986	0.6660	49.7813
36	1239	0.5090	0.4369	0.5890	49.3032
37	1226	0.1700	0.8018	0.6659	47.1441
38	266	0.3423	0.6125	0.6260	49.3524
39	1449	0.2061	0.7623	0.6578	48.0508
40	1302	0.3423	0.6125	0.6260	47.5857

(contd.....)

Table 15. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
41	68	0.2297	0.7365	0.6524	48.7868
42	523	0.1681	0.7917	0.6617	50.7164
43	1421	0.1371	0.8255	0.6686	51.7128
44	322	0.4740	0.4472	0.5849	48.6879
45	1342	0.3839	0.5494	0.6088	49.4393
46	1460	0.3837	0.5460	0.6095	47.9703
47	535	0.2478	0.7091	0.6454	51.6889
48	202	0.1598	0.8062	0.6656	50.7628
49	1561	0.2477	0.7092	0.6454	49.5609
50	1105	0.3937	0.5460	0.6095	49.0676
51	739	0.2076	0.7457	0.6517	49.3045
52	285	0.2359	0.7140	0.6449	49.7915
53	1461	0.3801	0.5507	0.6086	48.4732
54	27	0.3801	0.5507	0.6086	47.4804
55	1336	0.2715	0.6739	0.6362	49.9119
56	147	0.1982	0.7657	0.6576	50.6264
57	1440	0.2502	0.7082	0.6455	55.2522
58	1582	0.1982	0.7657	0.6576	51.2907
59	211	0.4878	0.4432	0.5861	50.8791
60	1571	0.3966	0.5451	0.6097	50.4854
61	1102	0.4878	0.4432	0.5861	50.0651
62	1468	0.2217	0.6571	0.6197	44.2051
63	83	0.3657	0.4789	0.5752	41.4495
64	1493	0.1766	0.7109	0.6321	43.5341
65	204	0.1870	0.6699	0.6178	43.0455
66	442	0.2467	0.5960	0.5997	43.4517
67	1146	0.3302	0.4893	0.5720	41.3923
68	160	0.3430	0.5633	0.6061	44.8500
69	418	0.1737	0.7598	0.6506	47.0664
70	268	0.1737	0.7598	0.6506	47.6226
71	448	0.1090	0.7867	0.6486	46.6870
72	1286	0.2217	0.6571	0.6197	46.6067
73	1097	0.1515	0.8098	0.6654	46.7228
74	233	0.1876	0.7702	0.6573	48.6051
75	1254	0.2108	0.7744	0.6518	47.0188
76	1233	0.1026	0.7011	0.6134	42.2580
77	613	0.2489	0.5132	0.5646	39.9090
78	400	0.2354	0.6520	0.6204	47.8569
79	543	0.3799	0.4747	0.5765	44.8508
80	857	0.1546	0.7469	0.6419	48.4805

(contd....)

Table 15. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
81	1354	0.2576	0.6438	0.6215	44.0243
82	772	0.3176	0.5719	0.6044	44.9014
83	1364	0.3176	0.5719	0.6044	47.1337
84	1453	0.2576	0.6438	0.6215	45.9441
85	573	0.2278	0.7373	0.6524	51.6607
86	217	0.2567	0.7056	0.6457	52.4615
87	919	0.2278	0.7373	0.6524	52.1899
88	943	0.4042	0.5425	0.6102	51.4939
89	1490	0.2278	0.7373	0.6524	52.3439
90	827	0.4960	0.4407	0.5868	50.0202
91	1138	0.3716	0.5536	0.6080	45.5212
92	1390	0.1769	0.7747	0.6570	47.3980
93	304	0.2638	0.6769	0.6359	48.1813
94	1313	0.2284	0.7170	0.6447	46.3499
95	347	0.1567	0.7833	0.6564	48.2613
96	11	0.4375	0.4579	0.5816	47.6505
97	58	0.2436	0.6848	0.6350	46.8494
98	713	0.3498	0.5610	0.6066	47.9275
99	1333	0.1501	0.7862	0.6562	46.5997
100	1271	0.1737	0.7598	0.6506	46.7729
101	5	0.4303	0.4600	0.5810	43.9274
102	578	0.1228	0.7597	0.6408	44.8223
103	560	0.2058	0.6630	0.6188	44.0187
104	24	0.2638	0.6769	0.6359	46.5350
105	1275	0.1258	0.8305	0.6683	46.3882
106	1466	0.2284	0.7170	0.6447	44.8218
107	1159	0.1401	0.7527	0.6414	46.1007
108	602	0.1766	0.7109	0.6321	44.1858
109	1235	0.2502	0.7082	0.6455	50.0237
110	562	0.1244	0.0846	0.6738	50.3986
111	640	0.3966	0.5451	0.6097	51.1222
112	983	0.2216	0.7399	0.6522	48.6148
113	986	0.1912	0.7526	0.6512	47.0450
114	1298	0.2546	0.6805	0.6355	46.8454
115	1363	0.1679	0.7786	0.6567	48.1344
116	150	0.3070	0.5755	0.6038	46.3412
117	1402	0.1669	0.7419	0.6424	49.0928
118	395	0.3925	0.4711	0.5776	44.6651
119	1567	0.3925	0.4711	0.5776	46.1241
120	1238	0.2149	0.7586	0.6580	46.9622

(contd....

Table 15. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
121	1507	0.1951	0.7800	0.6624	48.2346
122	540	0.1225	0.8579	0.6779	48.0209
123	118	0.5108	0.4364	0.5881	46.3651
124	21	0.5108	0.4364	0.5881	45.7110
125	1205	0.4177	0.5379	0.6110	46.3484
126	56	0.0913	0.5593	0.5500	31.0232
127	277	0.1217	0.8117	0.6605	47.0550
128	668	0.4223	0.4623	0.5803	43.5548
129	1095	0.3354	0.5659	0.6056	45.3786
130	299	0.2040	0.7472	0.6516	48.4998
131	49	0.3137	0.6231	0.6245	48.9405
132	371	0.4655	0.4497	0.5841	47.6932
133	492	0.3760	0.5521	0.6083	48.2377
134	1034	0.3137	0.6231	0.6245	48.3695
135	960	03760	0.5521	0.6083	47.2133
136	574	0.1018	0.8204	0.6600	46.4830
137	709	0.3176	0.5719	0.6044	46.2168
138	691	0.4035	0.4676	0.5786	45.0308
139	689	0.2259	0.7381	0.6523	50.2992
140	930	0.3380	0.6141	0.6258	47.9930
141	1059	0.2259	0.7381	0.6523	50.0015
142	1257	0.2909	0.6663	0.6371	50.6076
143	533	0.2024	0.7639	0.6577	49.7434
144	242	0.0500	0.8543	0.6631	44.0213
145	549	0.3799	0.4747	0.5765	42.3605
146	404	0.1580	0.5398	0.5562	37.1483
147	597	0.1580	0.5398	0.5562	35.6628

Table 16. Egg Production : Values of b_1^*, b_2^*, b_3^*, multiple correlation coefficient (RGI*) and the index I = G

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
1	207	0.5107	0.1631	0.1274	0.5224	59.1218
2	155	0.5107	0.1631	0.1274	0.5224	56.2071
3	175	0.5107	0.1631	0.1274	0.5224	58.4111
4	1296	0.3098	0.4216	0.0880	0.5764	61.2138
5	1228	0.3776	0.3359	0.1011	0.5594	62.0616
6	1464	0.4609	0.2283	0.1175	0.5368	59.3288
7	78	0.4091	0.1771	0.1253	0.5034	54.5126
8	1060	0.3578	0.2474	0.1146	0.5200	58.4138
9	947	0.1992	0.4553	0.0829	0.5647	61.7486
10	690	0.4091	0.1771	0.1253	0.5034	54.6162
11	298	0.3296	0.3846	0.0937	0.5670	57.5575
12	1548	0.3296	0.3846	0.0937	0.5670	56.7466
13	308	0.3296	0.3846	0.0937	0.5670	54.2646
14	777	0.4989	0.1647	0.1272	0.5202	56.8817
15	185	0.4283	0.2829	0.1092	0.5505	56.8916
16	30	0.1930	0.5727	0.0651	0.6059	58.6191
17	592	0.3538	0.3777	0.0947	0.5698	60.1298
18	1423	0.3339	0.4410	0.0851	0.5887	67.3701
19	429	0.4678	0.2740	0.1105	0.5561	65.2564
20	496	0.3339	0.4410	0.0851	0.5887	67.9965
21	507	0.3943	0.3663	0.0965	0.5744	69.6322
22	350	0.4492	0.3228	0.1031	0.5659	69.3056
23	252	0.3339	0.4410	0.0851	0.5887	63.2347
24	1232	0.3627	0.4055	0.0905	0.5820	65.6935
25	220	0.3943	0.3663	0.0965	0.5744	67.5442
26	1435	0.4753	0.3110	0.1049	0.5716	66.1497
27	1161	0.3555	0.4569	0.0827	0.5989	66.7050
28	1502	0.5565	0.2106	0.1202	0.5518	63.5905
29	1050	0.4753	0.3110	0.1049	0.5716	65.9254
30	848	0.4753	0.3110	0.1049	0.5716	66.5210
31	714	0.4753	0.3110	0.1049	0.5716	67.2986
32	297	0.3258	0.5220	0.0728	0.6155	71.1019
33	1212	0.5482	0.2561	0.1132	0.5676	69.2570
34	361	0.3679	0.4726	0.0803	0.6070	71.3133
35	1183	0.3679	0.4726	0.0803	0.6070	68.7722
36	1239	0.6391	0.1454	0.1301	0.5455	69.1130
37	1226	0.3383	0.4831	0.0787	0.6045	69.5228
38	266	0.5200	0.2624	0.1123	0.5633	71.3732
39	1449	0.3881	0.4234	0.0878	0.5938	74.1672
40	1302	0.5200	0.2624	0.1123	0.5633	72.3944

(contd....)

Table 16: Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
41	68	0.4164	0.3892	0.0930	0.5875	71.6045
42	523	0.2976	0.4766	0.0797	0.5938	61.8414
43	1421	0.2496	0.5339	0.0795	0.6040	59.3662
44	322	0.5515	0.1575	0.1283	0.5298	60.4348
45	1342	0.5022	0.2206	0.1186	0.5433	58.7373
46	1460	0.5278	0.2159	0.1194	0.5474	57.8596
47	535	0.4115	0.3615	0.0972	0.5764	59.7321
48	202	0.3007	0.4965	0.0766	0.6015	63.4909
49	1561	0.4115	0.3615	0.0972	0.5764	65.8155
50	1105	0.5278	0.2159	0.1194	0.5474	58.4543
51	739	0.3434	0.4114	0.0896	0.5800	64.4696
52	285	0.3752	0.3717	0.0956	0.5723	63.8449
53	1461	0.4928	0.2224	0.1184	0.5418	61.8982
54	27	0.4928	0.2224	0.1184	0.5418	66.0896
55	1336	0.4103	0.3276	0.1024	0.5635	63.6232
56	147	0.3595	0.4327	0.0864	0.5911	65.2139
57	1440	0.4194	0.3593	0.0975	0.5773	64.5857
58	1582	0.3595	0.4327	0.0864	0.5911	61.3060
59	211	0.5843	0.1530	0.1289	0.5358	63.5209
60	1571	0.5355	0.2145	0.1196	0.5486	61.9282
61	1102	0.5843	0.1530	0.1289	0.5358	64.1033
62	1468	0.2475	0.3232	0.1030	0.5244	47.4897
63	83	0.3467	0.1857	0.1240	0.4914	43.8886
64	1493	0.2051	0.3799	0.0944	0.5371	48.3774
65	204	0.1940	0.3352	0.1022	0.5164	44.3492
66	442	0.2419	0.2688	0.1113	0.5005	41.5003
67	1146	0.2953	0.1928	0.1229	0.4813	43.5610
68	160	0.4081	0.2381	0.1160	0.5282	62.6253
69	418	0.2535	0.4387	0.0854	0.5705	62.2259
70	268	0.2535	0.4387	0.0854	0.5705	63.9743
71	448	0.1297	0.4764	0.0797	0.5572	56.3502
72	1286	0.2475	0.3232	0.1030	0.5244	53.9513
73	1097	0.2728	0.5064	0.0751	0.5991	73.6094
74	233	0.3243	0.4441	0.0846	0.5877	73.8496
75	1254	0.3534	0.4084	0.0901	0.5810	74.3794
76	1233	0.0908	0.3582	0.0977	0.5006	40.4988
77	613	0.1967	0.2063	0.1208	0.4612	36.3546
78	400	0.2709	0.3180	0.1038	0.5279	59.4412
79	543	0.3692	0.1826	0.1244	0.4958	57.0524
80	857	0.1906	0.4237	0.0877	0.5508	57.5532

(contd....)

Table 16. Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
81	1354	0.3122	0.3088	0.1052	0.5339	61.4047
82	772	0.3578	0.2474	0.1146	0.5200	57.3669
83	1364	0.3578	0.2474	0.1146	0.5200	56.3071
84	1453	0.3122	0.3088	0.1052	0.5339	56.4451
85	573	0.4098	0.3912	0.0927	0.5868	73.1313
86	217	0.4409	0.3532	0.0985	0.5797	74.3152
87	919	0.4098	0.3912	0.0927	0.5868	73.7092
88	943	0.5565	0.2106	0.1202	0.5518	66.6257
89	1490	0.4098	0.3912	0.0927	0.5868	75.2042
90	827	0.6051	0.1501	0.1294	0.5395	71.4957
91	1138	0.4722	0.2262	0.1178	0.5386	66.6287
92	1390	0.2922	0.4545	0.0830	0.5846	65.8897
93	304	0.3892	0.3330	0.1015	0.5609	70.2414
94	1313	0.3538	0.3777	0.0947	0.5698	63.5208
95	347	0.2386	0.4718	0.0804	0.5795	58.0572
96	11	0.4729	0.1683	0.1266	0.5154	58.4656
97	58	0.3382	0.3460	0.0996	0.5544	55.3318
98	713	0.4226	0.2354	0.1164	0.5306	58.5732
99	1333	0.2227	0.4770	0.0796	0.5779	64.2994
100	1271	0.2535	0.4387	0.0854	0.5705	61.0562
101	5	0.4586	0.1703	0.1263	0.5128	59.9434
102	578	0.1393	0.4382	0.0855	0.5446	59.6045
103	560	0.2220	0.3289	0.1022	0.5206	55.1634
104	24	0.3892	0.3330	0.1015	0.5608	70.9252
105	1275	0.2156	0.5465	0.0690	0.6014	72.4311
106	1466	0.3538	0.3777	0.0947	0.5698	67.7386
107	1159	0.1661	0.4306	0.0867	0.5479	52.7380
108	602	0.2051	0.3799	0.0944	0.5371	56.0511
109	1235	0.4194	0.3593	0.0975	0.5773	68.2538
110	562	0.2456	0.5681	0.0657	0.6151	64.3253
111	640	0.5355	0.2145	0.1196	0.5486	65.5552
112	983	0.3881	0.3978	0.0917	0.5846	67.0218
113	986	0.2971	0.4255	0.0875	0.5751	65.5483
114	1298	0.3653	0.3391	0.1006	0.5578	62.9628
115	1363	0.2672	0.4626	0.0818	0.5822	64.7494
116	150	0.3384	0.2509	0.1140	0.5168	54.3205
117	1402	0.2131	0.4174	0.0887	0.5535	56.9396
118	395	0.3900	0.1797	0.1249	0.4998	60.0830
119	1567	0.3900	0.1797	0.1249	0.4998	53.6805
120	1238	0.4223	0.4123	0.0895	0.5971	77.8228

(contd....)

Table 16; Contd.....

Sl No	Bird No	b_1^*	b_2^*	b_3^*	RGI*	G
121	1507	0.3967	0.4428	0.0848	0.6025	78.0777
122	540	0.2800	0.5814	0.6372	0.6262	79.0897
123	118	0.6440	0.1447	0.1302	0.5463	76.3853
124	21	0.6440	0.1447	0.1302	0.5463	72.3985
125	1205	0.5958	0.2033	0.1213	0.5579	78.8981
126	56	0.4433	0.1724	0.1260	0.5099	58.6338
127	277	0.1763	0.5180	0.0734	0.5829	61.4917
128	668	0.4433	0.1724	0.1260	0.5099	60.7264
129	1095	0.3925	0.2409	0.1155	0.5257	57.2580
130	299	0.3329	0.4146	0.0891	0.5789	64.4686
131	49	0.4391	0.2805	0.1095	0.5521	61.5856
132	371	0.5322	0.1601	0.1278	0.5264	62.9658
133	492	0.4828	0.2242	0.1181	0.5402	57.2818
134	1034	0.4391	0.2805	0.1095	0.5521	59.2206
135	960	0.4828	0.2242	0.1181	0.5402	61.0608
136	574	0.1367	0.5315	0.0713	0.5792	57.7004
137	709	0.3578	0.2474	0.1146	0.5200	51.0826
138	691	0.4091	0.1771	0.1252	0.5034	52.3103
139	689	0.4029	0.3933	0.0924	0.5861	68.5984
140	930	0.5068	0.2653	0.1118	0.5615	73.1254
141	1059	0.4029	0.3933	0.0924	0.5861	71.2358
142	1257	0.4685	0.3128	0.1046	0.5708	73.1203
143	533	0.3745	0.4278	0.0871	0.5925	74.9132
144	242	0.0591	0.5825	0.0635	0.5812	56.6088
145	549	0.3692	0.1826	0.1244	0.4958	53.4033
146	404	0.1106	0.2182	0.1190	0.4430	29.8277
147	597	0.1106	0.2182	0.1190	0.4430	26.5012

Table 17. Egg Production : Values of a_1^*, a_2^*, multiple correlation coefficient (RGI_o^*) and the index I = G

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
1	207	0.4883	0.1997	0.4711	53.1662
2	155	0.4883	0.1997	0.4711	50.4224
3	175	0.4883	0.1997	0.4711	52.2022
4	1296	0.2789	0.4793	0.5562	56.8371
5	1228	0.3462	0.3912	0.5312	55.3199
6	1464	0.4335	0.2742	0.4955	53.4908
7	78	0.3915	0.2125	0.4518	48.2356
8	1060	0.3370	0.2911	0.4794	51.6028
9	947	0.1804	0.5067	0.5463	58.2803
10	690	0.3915	0.2125	0.4518	47.8674
11	298	0.2994	0.4410	0.5434	52.9466
12	1548	0.2994	0.4410	0.5434	51.9044
13	308	0.2994	0.4410	0.5434	51.1228
14	777	0.4771	0.2012	0.4689	47.9355
15	185	0.3972	0.3350	0.5165	53.1830
16	30	0.1693	0.6252	0.5958	54.9651
17	592	0.3211	0.4354	0.5458	55.3094
18	1423	0.2975	0.5019	0.5704	62.1485
19	429	0.4334	0.3274	0.5216	60.0609
20	496	0.2975	0.5019	0.5704	64.7361
21	507	0.3572	0.4260	0.5498	64.5165
22	350	0.3928	0.3802	0.5369	62.0075
23	252	0.2975	0.5019	0.5704	60.3564
24	1232	0.3257	0.4662	0.5608	61.3312
25	220	0.3572	0.4260	0.5498	61.7824
26	1435	0.4344	0.3703	0.5420	60.6957
27	1161	0.3136	0.5209	0.5821	62.9065
28	1502	0.5226	0.2586	0.5099	56.9017
29	1050	0.4344	0.3703	0.5420	58.0867
30	848	0.4344	0.3703	0.5420	58.7244
31	714	0.4344	0.3703	0.5420	61.5074
32	297	0.2817	0.5868	0.6032	68.1630
33	1212	0.5070	0.3121	0.5318	61.7619
34	361	0.3216	0.5390	0.5915	67.2294
35	1183	0.3216	0.5390	0.5915	66.4658
36	1239	0.6106	0.1836	0.4944	59.8216
37	1226	0.2965	0.5471	0.5896	65.8962
38	266	0.4812	0.3174	0.5282	65.0928
39	1449	0.3447	0.4880	0.5746	71.1433
40	1302	0.4812	0.3174	0.5282	65.8460

(contd.....)

Table 17. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
41	68	0.3728	0.4531	0.5655	68.5191
42	523	0.2637	0.5363	0.5780	57.2953
43	1421	0.2190	0.5912	0.5919	56.6697
44	322	0.5272	0.1946	0.4786	51.8585
45	1342	0.4721	0.2675	0.5017	53.3379
46	1460	0.4959	0.2633	0.5056	51.7199
47	535	0.3725	0.4220	0.5515	54.1312
48	202	0.2643	0.5574	0.5872	61.5527
49	1561	0.3725	0.4220	0.5515	60.3268
50	1105	0.4959	0.2633	0.5056	52.1954
51	739	0.3084	0.4710	0.5591	60.8215
52	285	0.3402	0.4304	0.5480	56.6562
53	1461	0.4632	0.2690	0.5003	54.7456
54	27	0.4632	0.2690	0.5003	57.1795
55	1336	0.3758	0.3842	0.5348	58.7135
56	147	0.3198	0.4953	0.5724	62.7797
57	1440	0.3795	0.4202	0.5523	59.0062
58	1582	0.3198	0.4953	0.5724	59.6987
59	211	0.5585	0.1905	0.4846	51.6857
60	1571	0.5031	0.2620	0.5067	56.1342
61	1102	0.5585	0.1905	0.4846	56.1581
62	1468	0.2305	0.3698	0.4925	41.3394
63	83	0.3319	0.2204	0.4395	36.3103
64	1493	0.1891	0.4284	0.5113	41.5810
65	204	0.1808	0.3802	0.4851	40.6275
66	442	0.2282	0.3101	0.4606	36.9004
67	1146	0.2828	0.2269	0.4291	34.9129
68	160	0.3841	0.2829	0.4873	54.0094
69	418	0.2289	0.4932	0.5512	56.9957
70	268	0.2289	0.4932	0.5512	59.6591
71	448	0.1180	0.5241	0.5399	52.6987
72	1286	0.2305	0.3698	0.4925	49.8478
73	1097	0.2404	0.5651	0.5854	70.5908
74	233	0.2892	0.5043	0.5696	70.0938
75	1254	0.3174	0.4685	0.5600	69.4457
76	1233	0.0848	0.4003	0.4705	35.9632
77	613	0.1885	0.2393	0.4084	30.1972
78	400	0.2521	0.3652	0.4957	53.8250
79	543	0.3534	0.2175	0.4440	49.9070
80	857	0.1742	0.4735	0.5294	55.0648

(contd....)

Table 17. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
81	1354	0.2903	0.3573	0.5012	57.0753
82	772	0.3370	0.2911	0.4794	52.0777
83	1364	0.3370	0.2911	0.4794	49.7538
84	1453	0.2903	0.3573	0.5012	51.9493
85	573	0.3671	0.4747	0.5649	66.8027
86	217	0.3986	0.4153	0.5543	68.4058
87	919	0.3671	0.4547	0.5649	70.7242
88	943	0.5226	0.2586	0.5099	63.9023
89	1490	0.3671	0.4547	0.5649	70.9756
90	827	0.5782	0.1878	0.4883	63.8815
91	1138	0.4440	0.2724	0.4972	56.7050
92	1390	0.2610	0.5126	0.5671	61.3591
93	304	0.3566	0.3887	0.5325	63.6653
94	1313	0.3211	0.4354	0.5458	58.2651
95	347	0.2139	0.5265	0.5628	56.0617
96	11	0.4524	0.2045	0.4640	50.4282
97	58	0.3105	0.3996	0.5267	51.3447
98	713	0.3977	0.1805	0.4896	51.6534
99	1333	0.1998	0.5307	0.5615	62.0439
100	1271	0.2289	0.4932	0.5512	58.8398
101	5	0.4387	0.2063	0.4613	53.2232
102	578	0.1275	0.4856	0.5241	55.4463
103	560	0.2068	0.3748	0.4890	50.6967
104	24	0.3566	0.3887	0.5325	64.6020
105	1275	0.1897	0.6009	0.5898	68.1648
106	1466	0.3211	0.4354	0.5458	62.7250
107	1159	0.1519	0.4792	0.5269	50.2630
108	602	0.1891	0.4284	0.5113	52.6209
109	1235	0.3795	0.4202	0.5522	63.6543
110	562	0.2129	0.6256	0.6050	63.2551
111	640	0.5031	0.2620	0.5067	58.8852
112	983	0.3480	0.4600	0.5630	63.2073
113	986	0.2677	0.4824	0.5551	59.2293
114	1298	0.3350	0.3938	0.5298	57.4038
115	1363	0.2391	0.5191	0.5651	58.7376
116	150	0.3188	0.2943	0.4763	47.7630
117	1402	0.1945	0.4682	0.5317	52.2189
118	395	0.3732	0.2149	0.4481	50.0504
119	1567	0.3732	0.2149	0.4481	45.1237
120	1238	0.3742	0.4793	0.5772	73.3838

(contd.....)

Table 17. Contd.....

Sl No	Bird No	a_1^*	a_2^*	RGI_o^*	G
121	1507	0.3489	0.5100	0.5850	73.6142
122	540	0.2373	0.6427	0.6170	75.3607
123	118	0.6152	0.1830	0.4953	68.0859
124	21	0.6152	0.1830	0.4953	65.3165
125	1205	0.5592	0.2522	0.5156	69.4707
126	56	0.4241	0.2082	0.4584	51.1428
127	277	0.1576	0.5691	0.5691	58.0880
128	668	0.4241	0.2082	0.4584	54.3167
129	1095	0.3695	0.2854	0.4849	51.5839
130	299	0.2993	0.4736	0.5582	60.5365
131	49	0.4070	0.3329	0.5179	55.4740
132	371	0.5089	0.1970	0.4751	54.7746
133	492	0.4539	0.2706	0.4988	50.6032
134	1034	0.4070	0.3329	0.5179	53.3724
135	960	0.4539	0.2706	0.4988	54.3844
136	574	0.1226	0.5799	0.5662	56.6224
137	709	0.3370	0.2911	0.4794	45.8982
138	691	0.3915	0.2125	0.4518	45.3135
139	689	0.3610	0.4564	0.5643	65.2478
140	930	0.4691	0.3200	0.5265	68.2351
141	1059	0.3610	0.4564	0.5643	65.6586
142	1257	0.4283	0.3718	0.5413	68.9640
143	533	0.3329	0.4915	0.5735	71.6265
144	242	0.0530	0.6253	0.5709	55.7505
145	549	0.3534	0.2175	0.4440	48.9581
146	404	0.1061	0.2502	0.3894	24.5674
147	597	0.1061	0.2502	0.3894	19.3934

Table 18. Ratios of expected progress in males from selection based on index I* as contrasted to selection based on index Io*

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
1	207	1.1182	1.1201	1.1265	1.1089
2	155	1.1182	1.1201	1.1265	1.1089
3	175	1.1182	1.1201	1.1265	1.1089
4	1296	1.0334	1.0326	1.0307	1.0364
5	1228	1.0512	1.0505	1.0489	1.0531
6	1464	1.0860	1.0864	1.0874	1.0834
7	78	1.1182	1.1189	1.1202	1.1143
8	1060	1.0834	1.0827	1.0802	1.0848
9	947	1.0290	1.0278	1.0242	1.0337
10	690	1.1182	1.1189	1.1202	1.1143
11	298	1.0405	1.0397	1.0376	1.0434
12	1548	1.0405	1.0397	1.0376	1.0434
13	308	1.0405	1.0397	1.0376	1.0434
14	777	1.1182	1.1200	1.1258	1.1095
15	185	1.0658	1.0655	1.0649	1.0659
16	30	1.0144	1.0138	1.0123	1.0170
17	592	1.0414	1.0407	1.0390	1.0439
18	1423	1.0295	1.0289	1.0276	1.0321
19	429	1.0671	1.0670	1.0673	1.0661
20	496	1.0295	1.0289	1.0276	1.0321
21	507	1.0430	1.0424	1.0413	1.0448
22	350	1.0531	1.0526	1.0520	1.0321
23	252	1.0295	1.0230	1.0276	1.0321
24	1232	1.0354	1.0347	1.0335	1.0377
25	220	1.0430	1.0424	1.0413	1.0448
26	1435	1.0548	1.0545	1.0546	1.0547
27	1161	1.0266	1.0260	1.0252	1.0288
28	1502	1.0883	1.0894	1.0932	1.0823
29	1050	1.0548	1.0545	1.0546	1.0547
30	848	1.0548	1.0545	1.0546	1.0547
31	714	1.0548	1.0545	1.0546	1.0547
32	297	1.0184	1.0178	1.0173	1.0204
33	1212	1.0697	1.0700	1.0719	1.0667
34	361	1.0240	1.0235	1.0229	1.0261
35	1183	1.0240	1.0235	1.0229	1.0261
36	1239	1.1182	1.1216	1.1331	1.1033
37	1226	1.0231	1.0225	1.0217	1.0253
38	266	1.0688	1.0690	1.0703	1.0665
39	1449	1.0315	1.0309	1.0301	1.0335
40	1302	1.0688	1.0690	1.0703	1.0665

(contd....)

Table 18. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
41	68	1.0373	1.0368	1.0362	1.0390
42	523	1.0264	1.0239	1.0226	1.0273
43	1421	1.0179	1.0173	1.0160	1.0205
44	322	1.1182	1.1206	1.1288	1.1070
45	1342	1.0871	1.0877	1.0900	1.0829
46	1460	1.0877	1.0885	1.0916	1.0826
47	535	1.0436	1.0430	1.0422	1.0452
48	202	1.0218	1.0212	1.0202	1.0243
49	1561	1.0436	1.0430	1.0422	1.0452
50	1105	1.0877	1.0885	1.0916	1.0826
51	739	1.0347	1.0339	1.0325	1.0372
52	285	1.0422	1.0416	1.0403	1.0444
53	1461	1.0868	1.0874	1.0895	1.0830
54	27	1.0868	1.0874	1.0895	1.0830
55	1336	1.0524	1.0519	1.0509	1.0537
56	147	1.0305	1.0298	1.0288	1.0327
57	1440	1.0439	1.0434	1.0427	1.0453
58	1582	1.0304	1.0298	1.0288	1.0327
59	211	1.1182	1.1210	1.1304	1.0156
60	1571	1.0878	1.0887	1.0920	1.0825
61	1102	1.1182	1.1210	1.1304	1.0156
62	1468	1.0590	1.0575	1.0518	1.0648
63	83	1.1184	1.1181	1.1158	1.1181
64	1493	1.0441	1.0425	1.0370	1.0503
65	204	1.0568	1.0548	1.0472	1.0646
66	442	1.0800	1.0781	1.0705	1.0867
67	1146	1.1185	1.1174	1.1117	1.1216
68	160	1.0847	1.0846	1.0839	1.0840
69	418	1.0312	1.0302	1.0275	1.0350
70	268	1.0312	1.0302	1.0275	1.0350
71	448	1.0260	1.0246	1.0197	1.0320
72	1286	1.0590	1.0575	1.0518	1.0648
73	1097	1.0209	1.0203	1.0190	1.0236
74	233	1.0292	1.0285	1.0271	1.0318
75	1254	1.0350	1.0343	1.0330	1.0375
76	1233	1.0522	1.0491	1.0572	1.0641
77	613	1.1191	1.1161	1.1026	1.1294
78	400	1.0600	1.0586	1.0537	1.0649
79	543	1.1183	1.1184	1.1175	1.1167
80	857	1.0347	1.0333	1.0286	1.0404

(contd....)

Table 18. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
81	1354	1.0616	1.0605	1.0569	1.0652
82	772	1.0834	1.0827	1.0802	1.0848
83	1364	1.0834	1.0827	1.0802	1.0848
84	1453	1.0616	1.0605	1.0569	1.0652
85	573	1.0371	1.0365	1.0358	1.0388
86	217	1.0447	1.0442	1.0438	1.0458
87	919	1.0371	1.0365	1.0358	1.0388
88	943	1.0883	1.0894	1.0932	1.0823
89	1490	1.0371	1.0365	1.0358	1.0388
90	827	1.1182	1.1212	1.1315	1.1047
91	1138	1.0863	1.0867	1.0882	1.0832
92	1390	1.0280	1.0273	1.0255	1.0310
93	304	1.0516	1.0510	1.0496	1.0533
94	1313	1.0414	1.0407	1.0390	1.0439
95	347	1.0260	1.0251	1.0227	1.0296
96	11	1.1182	1.1197	1.1243	1.1108
97	58	1.0496	1.0488	1.0464	1.0525
98	1333	1.0254	1.0245	1.0219	1.0292
99	713	1.0851	1.0851	1.0849	1.0838
100	1271	1.0312	1.0302	1.0275	1.0350
101	5	1.1182	1.1195	1.1234	1.1116
102	578	1.0325	1.0308	1.0249	1.0393
103	560	1.0168	1.0562	1.0496	1.0647
104	24	1.0516	1.0510	1.0496	1.0533
105	1275	1.0168	1.0162	1.0146	1.0196
106	1466	1.0414	1.0407	1.0390	1.0439
107	1159	1.0336	1.0321	1.0269	1.0399
108	602	1.0441	1.0425	1.0370	1.0503
109	1235	1.0439	1.0434	1.0427	1.0453
110	562	1.0145	1.0140	1.0131	1.0167
111	640	1.0878	1.0887	1.0920	1.0825
112	983	1.0363	1.0357	1.0348	1.0383
113	986	1.0329	1.0321	1.0300	1.0361
114	1298	1.0507	1.0500	1.0482	1.0529
115	1363	1.0271	1.0263	1.0242	1.0303
116	150	1.0828	1.0820	1.0787	1.0851
117	1402	1.0357	1.0344	1.0302	1.0409
118	395	1.1183	1.1186	1.1189	1.1154
119	1567	1.1183	1.1186	1.1189	1.1154
120	1238	1.0326	1.0321	1.0317	1.0344

(contd.....)

Table 18. Contd.....

Sl No	Bird No	20 week body weight	40 week body weight	Egg weight	Egg Production in 280 days
121	1507	1.0280	1.0274	1.0269	1.0299
122	540	1.0130	1.0126	1.0121	1.0148
123	118	1.1183	1.1216	1.1333	1.1031
124	21	1.1183	1.1216	1.1333	1.1031
125	1205	1.0892	1.0905	1.0954	1.0819
126	56	1.1182	1.1193	1.0860	1.1124
127	277	1.0202	1.0193	1.0166	1.0241
128	668	1.1182	1.1193	1.1225	1.1124
129	1095	1.0843	1.0840	1.0828	1.0843
130	299	1.0343	1.0336	1.0319	1.0370
131	49	1.0661	1.0659	1.0655	1.0659
132	371	1.1182	1.1204	1.1277	1.1079
133	492	1.0866	1.0871	1.0888	1.0831
134	1034	1.0661	1.0659	1.0655	1.0659
135	960	1.0866	1.0870	1.0888	1.0831
136	574	1.0187	1.0177	1.0145	1.0231
137	709	1.0834	1.0827	1.0802	1.0848
138	691	1.1182	1.1189	1.1202	1.1143
139	689	1.0368	1.0363	1.0355	1.0387
140	930	1.0684	1.0684	1.0696	1.0664
141	1059	1.0368	1.0363	1.0355	1.0387
142	1257	1.0545	1.0542	1.0542	1.0546
143	533	1.0310	1.0304	1.0295	1.0331
144	242	1.0134	1.0123	1.0087	1.0181
145	549	1.1183	1.1184	1.1175	1.1167
146	404	1.1199	1.1149	1.0929	1.1376
147	597	1.1199	1.1149	1.0929	1.1376

Table 19. Simultaneous and restricted selection indices and their expected genetic gain

Sl No	Type of selection	Expected genetic gain in % (over straight selection	Selection Index
1	Simultaneous selection	13.5862	$I=1.452171x_1 + 1.438011x_2 + 50.678066x_3 - 0.628547x_4$
2	Restricted selection Restricted the character egg weight	$x_1=44.128020$ $x_2=36.276815$ $x_3=0.000033$ $x_4=3.654345$	$I=0.799204x_1 + 0.943410x_2 - 21.929930x_3 + 6.043995x_4$
3	Restricted selection Restricted the character 40 week body weight	$x_1=49.672919$ $x_2=-1.754774$ $x_3=1.301821$ $x_4=5.011851$	$I=0.389137x_1 - 0.056787x_2 - 10.015594x_3 + 1.829876x_4$
4	Restricted selection Restricted the characters 40 week body weight and egg weight	$x_1=42.106118$ $x_2=-5.953938$ $x_3=-0.213832$ $x_4=1.337544$	$I=0.345704x_1 - 0.319091x_2 + 0.864911x_3 - 0.140384x_4$

x_1 = 20 week body weight

x_2 = 40 week body weight

x_3 = Egg weight

x_4 = Egg Production in 280 days

Table 20. Phenotypic selection indices and their relative efficiencies

Phenotypic indices	Relative efficiency(%)
$I_1 = y - 0.038592x_1$	101
$I_2 = y - 0.00864x_2$	101
$I_3 = y + 0.803383x_3$	82
$I_4 = y - 0.044714x_1 + 0.013611x_2$	132
$I_5 = y - 1.257323x_1 - 0.043022x_3$	94
$I_6 = y - 0.017693x_2 + 1.00777x_3$	80
$I_7 = y - 0.0449x_1 + 0.033731x_2 + 1.017817x_3$	124
Selection on y alone	100

Table 21. 20 week body weight : Combined selection index for males combining information from full-sib and half-sib family averages

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
1	179	1525	207.0556	379.9884	587.0440
2	602	1452	280.0532	299.7831	579.8363
3	1602	185	449.8535	104.3224	554.1759
4	602	825	243.0437	299.7831	542.8269
5	179	1112	159.7615	379.9884	539.7499
6	603	1526	251.7494	284.0901	535.8396
7	127	1313	270.6846	256.0879	526.7726
8	179	1412	140.0557	379.9884	520.0441
9	602	135	193.6978	299.7831	493.4810
10	602	1263	187.5296	299.7831	487.3127
11	789	221	188.0405	277.3867	465.4272
12	603	187	168.4213	284.0901	452.5114
13	789	877	129.2219	277.3867	406.6085
14	603	1262	120.1787	284.0901	404.2688
15	464	1421	161.6102	238.1911	399.8013
16	602	17	99.6322	299.7831	399.4153
17	127	1311	134.9219	256.0879	391.0098
188	602	912	82.6695	299.7831	382.4526
19	709	1588	177.6311	202.2787	379.9097
20	464	1426	123.5800	238.1911	361.7712
21	464	1346	109.5382	238.1911	347.7293
22	127	1207	87.5127	256.0879	343.6006
23	603	1007	54.3933	284.0901	338.4834
24	709	958	126.4880	202.2787	328.7666
25	709	1137	115.9726	202.2787	318.2512
26	1634	86	177.8921	133.2099	311.1020
27	709	901	107.3691	202.2787	309.6477
28	485	80	204.8422	91.2411	296.0833
29	485	30	199.9597	91.2411	291.2008
30	704	1427	115.0128	171.8678	286.8804
31	177	13	299.7680	-17.5272	282.2408
32	464	1518	29.9675	238.1911	268.1586
33	709	1144	52.8802	202.2787	255.1588
34	1634	930	78.6247	133.2099	211.2346
35	1634	1194	78.0249	133.2099	211.2346
36	1849	981	121.3274	82.3870	203.7144
37	1598	150	135.2816	64.7589	200.0405
38	1634	1172	57.7618	133.2099	190.9717
39	1602	936	81.8619	104.3224	186.1843
40	125	125	139.9870	43.3728	183.3598

(contd....)

Table 21. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
41	125	889	132.6306	43.3728	176.0034
42	722	23	58.3151	107.5325	165.8476
43	722	1157	50.3287	107.5325	157.8612
44	1505	1063	95.0374	60.2198	155.2572
45	704	1189	-16.7400	171.8678	155.1277
46	630	1551	168.5665	-18.1120	150.4545
47	722	1528	38.3492	107.5325	145.8817
48	1602	91	34.2768	104.3224	138.5992
49	1664	221	113.5654	20.8758	134.4411
50	709	1321	-70.9148	202.2787	131.3639
51	1505	1552	66.9326	60.2198	127.1524
52	1849	1353	36.3772	82.3870	118.7642
53	1505	1356	47.3038	60.2198	107.5236
54	1505	1557	46.8577	60.2198	107.0775
55	1849	159	19.4889	82.3870	101.8759
56	485	1442	6.3964	91.2411	97.6375
57	1776	250	85.5496	10.7913	96.3409
58	560	233	100.6440	-9.2173	91.4267
59	264	57	181.9001	-115.2776	66.6225
60	1634	1565	-73.9473	133.2099	59.2625
61	1664	1068	29.9485	20.8758	50.8243
62	1776	865	37.6840	10.7913	48.4753
63	1598	1141	-19.1791	64.7589	45.5798
64	475	838	58.0462	-32.0959	25.9503
65	630	223	46.7714	-18.1120	23.6594
66	1776	97	11.6914	10.7913	22.4827
67	1505	6	-41.4717	60.2198	18.7481
68	1602	1118	-86.2721	104.3224	18.0502
69	485	251	-73.4608	91.2411	17.7803
70	1676	164	134.5155	-118.9999	15.5156
71	1598	175	-54.2838	64.7589	10.4750
72	177	862	25.0170	-17.5272	7.4898
73	475	850	39.4429	-32.0959	7.3471
74	1777	1069	65.0217	-65.4716	-0.4499
75	1634	1092	-134.7362	133.2099	-1.5263
76	1663	180	106.9042	-109.5549	-2.6507
77	1663	965	101.0949	-109.5549	-8.4600
78	1505	1387	-77.6064	60.2198	-17.3866
79	560	1558	-8.3950	-9.2173	-17.6123
80	177	911	-12.5357	-17.5272	-30.0629

(contd....)

Table 21. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_1 HS -	Im
81	560	1115	-24.1596	-9.2173	-33.3769
82	9000	269	3.2580	-40.7914	-37.5334
83	924	1359	52.5487	-92.7647	-40.2160
84	125	229	-102.7742	43.3728	-59.4014
85	125	158	-105.7168	43.3728	-62.3440
86	1598	1271	-133.8545	64.7589	-69.0956
87	560	102	-60.9439	-9.2173	-70.1612
88	9000	1371	-32.7863	-40.7914	-73.5777
89	475	9	-42.9430	-32.0959	-75.0389
90	1777	1432	-9.7973	-65.4716	-75.2689
91	630	1598	-57.8962	-18.1120	-76.0082
92	1777	65	-11.9876	-65.4716	-77.4592
93	1776	1047	-91.0040	10.7913	-80.2127
94	1777	219	-28.1954	-65.4716	-93.6670
95	1671	835	-11.7221	-85.2443	-96.9664
96	630	237	-81.9880	-18.1120	-100.1000
97	924	1259	-8.7165	-92.7647	-101.4812
98	924	1302	-8.7165	-92.7647	-101.4812
99	1776	1178	-114.5444	10.7913	-103.7531
100	263	1252	6.8790	-122.4468	115.5678
101	1597	1523	11.9136	-129.5917	-117.6781
102	630	1000	-100.6136	-18.1120	-118.7256
103	924	977	-26.5855	-92.7647	-119.3502
104	1663	69	-21.6252	-109.5549	-131.1801
105	1597	1146	-12.1582	-129.5917	₹141.7499
106	1676	137	-29.4048	-118.9999	-148.4047
107	1597	179	-21.5194	-129.5917	-151.1111
108	1597	1534	-26.2001	-129.5917	-155.7918
109	721	154	-32.4366	-125.7543	-158.1909
110	1671	1331	-92.6168	-85.2443	-177.8611
111	721	1503	-53.9889	-125.7543	-179.7432
112	721	14	-65.3990	-125.7543	-191.1533
113	475	973	-182.4677	-32.0959	-214.5636
114	264	266	-102.3201	-115.2776	-217.5977
115	1777	115	-153.9160	-65.4716	-219.3876
116	721	1470	-112.0765	-125.7543	-237.8308
117	723	1590	-8.0808	-237.4838	-245.5646
118	263	859	-127.6197	-122.4468	-250.0665
119	177	60	-233.7181	-17.5272	-251.2453
120	475	28	-222.3319	-32.0959	-254.4278

(contd....)

Table 21. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
121	1665	190	-45.9427	-243.9802	-289.9229
122	924	262	-199.3194	-92.7647	-292.0841
123	807	122	13.9002	-328.5194	-314.6192
124	1776	1560	-326.4087	10.7913	-315.6174
125	1676	950	-201.3882	-118.9999	-320.3881
126	1665	222	-85.9835	-243.9802	-329.9637
127	1676	1024	-216.8281	-118.9999	-335.8280
128	1748	1010	-60.4481	-283.9200	-344.3681
129	264	1303	-233.5770	-115.2776	-348.8546
130	1597	1414	-222.7865	-129.5917	-352.3782
131	1663	852	-262.5632	-109.5549	-372.1181
132	1665	951	-144.4778	-243.9802	-388.4580
133	1665	1066	-146.9150	-243.9802	-390.8952
134	723	1126	-160.4870	-237.4838	-397.9708
135	1597	1589	-307.0378	-129.5917	-436.6295
136	1664	1081	-461.2063	20.8758	-440.3305
137	807	124	-163.8129	-328.5194	-492.3323
138	1665	7	-254.8509	-243.9802	-498.8311
139	1748	271	-215.1267	-283.9200	-499.0467
140	1748	872	-227.6818	-283.9200	-511.6018
141	807	893	-198.5384	-328.5194	-527.0579
142	855	824	-151.1559	-414.6001	-565.7560
143	855	116	-270.5412	-414.6001	-685.1413
144	855	129	-323.9729	-414.6001	-738.5730
145	806	1533	-211.5339	-630.4285	-841.9625
146	806	63	-301.4653	-630.4285	-931.8939
147	806	120	-422.1050	-630.4285	-1052.5335

Table 22. 40 week body weight : Combined selection index for males combining information from full-sib family and half-sib family averages.

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
1	602	1452	360.9851	276.4474	637.4325
2	602	135	360.9851	276.4474	637.4325
3	127	1011	320.6411	267.1406	587.7817
4	709	1588	287.7040	283.3202	571.0243
5	709	1321	226.4201	283.3202	509.7403
6	602	825	186.0057	276.4474	462.4531
7	602	912	180.1781	276.4474	456.6205
8	709	1137	171.4448	283.3202	454.7650
9	709	1144	125.4818	283.3202	408.8021
10	127	1313	135.7662	267.1406	402.9068
11	709	958	119.1732	283.3202	402.4934
12	1505	1063	216.3263	183.9671	400.2934
13	1505	1387	201.1855	183.9671	385.1526
14	602	17	89.7671	176.4474	366.2145
15	603	1526	183.8942	179.7122	363.6064
16	709	901	76.8151	283.3202	360.1354
17	1505	6	163.3337	183.9671	347.3008
18	602	1263	67.8947	276.4474	344.3421
19	179	1412	174.2818	169.9647	344.2465
20	603	187	141.9958	179.7122	321.7080
21	789	877	145.1745	171.4687	316.6433
22	603	1262	133.6161	179.7122	313.3283
23	1505	1356	104.4530	183.9671	288.4201
24	722	1157	209.1571	52.3191	261.4761
25	179	1525	84.3698	169.9647	254.3345
26	1602	185	173.1530	60.4363	233.5893
27	1671	1331	137.1924	88.6167	225.8092
28	1505	1552	34.6373	183.9671	218.6045
29	485	30	158.5481	56.7226	215.2707
30	1676	164	175.0897	39.0811	214.1708
31	1849	1353	129.9405	75.1209	205.0614
32	789	221	31.6078	171.4687	203.0765
33	1849	159	122.3882	75.1209	197.5091
34	263	859	89.7761	104.5475	194.3236
35	603	1007	3.7309	179.7122	183.4431
36	125	125	115.8646	60.0655	175.9301
37	475	850	124.4909	47.5804	172.0713
38	1505	1557	-22.1404	183.9671	161.8267
39	127	1207	-105.3749	267.1406	161.7657
40	125	889	94.7354	60.0655	154.8010

(contd.....)

Table 22. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
41	485	80	97.0571	56.7226	153.7797
42	721	154	91.9616	49.4828	141.4444
43	263	1252	31.6078	104.5475	136.1553
44	464	1346	120.0389	15.6041	135.6431
45	177	13	146.1803	-17.2601	128.9202
46	630	223	122.8015	5.8428	128.6443
47	1597	1146	81.1384	41.5374	122.6757
48	485	1442	64.7348	56.7226	121.4574
49	1597	1146	75.3990	41.5374	116.9363
50	1676	137	77.6577	39.0811	116.7388
51	1602	91	41.2975	60.4363	101.7338
52	1664	1068	63.5416	35.4456	98.9872
53	125	229	30.4294	60.0655	90.4949
54	179	1112	-80.4689	169.9647	89.4958
55	1671	835	-6.6499	88.6167	81.9668
56	1602	936	17.3238	60.4363	77.7601
57	1597	1534	35.2230	41.5374	76.7609
58	1777	1069	122.3295	-47.6068	74.7227
59	1663	965	153.5227	-78.8776	74.6451
60	475	9	25.9077	47.5804	73.4881
61	630	1551	64.4564	5.8428	70.2992
62	475	838	18.0705	47.5804	65.6509
63	1602	1118	-0.6565	60.4363	59.7798
64	721	1470	3.7584	49.4828	53.2412
65	1597	179	8.4390	41.5374	49.9764
66	721	14	-0.7814	49.4828	48.7014
67	1664	221	12.5066	35.4456	47.9522
68	475	973	-9.1533	47.5804	38.4271
69	630	1000	31.6373	5.8428	37.4800
70	722	23	-19.5200	52.3191	32.7991
71	464	1518	15.1350	15.6041	30.7392
72	722	1528	-23.2997	52.3191	29.0193
73	721	1503	-29.3178	49.4828	20.1650
74	1676	1024	-20.0974	39.0811	18.9887
75	1663	183	92.9734	-78.8776	14.0958
76	924	977	58.6593	-48.2452	10.4141
77	177	911	13.8935	-17.2601	-3.3665
78	1849	981	-82.4664	75.1209	-7.3455
79	464	1421	-31.7369	15.6041	-16.1328
80	1597	1589	-58.5209	41.5374	-16.9835

(contd....)

Table 22. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I m
81	1777	219	10.9651	-47.6068	-36.6417
82	1634	1172	86.2420	-123.7454	-37.4934
83	704	1427	1.5266	-44.5968	-43.0702
84	464	1426	-62.9849	15.6041	-47.3808
85	475	28	-95.7744	47.5804	-48.1940
86	1598	150	37.1361	-88.1287	-50.9926
87	1664	1081	-86.7280	35.4456	-51.2824
88	177	862	-36.5014	-17.2601	-53.7615
89	560	102	39.4138	-106.1351	-66.7213
90	924	262	-21.6301	-48.2452	-69.8753
91	485	251	-136.3812	56.7226	-79.6586
92	630	1598	-87.6359	5.8428	-81.7931
93	924	1302	-41.7024	-48.2452	-89.9476
94	1777	65	-43.7227	-47.6068	-91.3295
95	1634	930	23.5748	-123.7354	-100.1607
96	1663	69	-26.7493	-78.8776	-105.6269
97	704	1189	-62.9837	-44.5968	-107.5805
98	924	1259	-61.2172	-48.2452	-109.4624
99	924	1359	-62.4120	-48.2452	-110.6572
100	125	158	-173.5127	60.0655	-113.4472
101	1676	950	-152.5919	39.0811	-113.5108
102	560	1558	-8.8723	-106.1351	-115.0074
103	177	60	-107.3693	-17.2601	-124.6294
104	630	237	-146.1330	5.8428	-140.2902
105	1597	1414	-192.4408	41.5374	4450.9034
106	1777	115	-105.0394	-47.6068	-152.6462
107	1777	1432	-116.6399	-47.6068	-164.2467
108	1598	1271	-98.6969	-88.1287	-186.8256
109	1634	1565	-63.1953	-123.7354	-186.9307
110	264	57	-13.7413	-182.4903	-196.2316
111	560	1115	-95.4543	-106.1251	-201.5893
112	1598	175	-125.4808	-88.1287	-213.6096
113	1634	86	-92.1186	-123.7354	-215.8540
114	9000	269	-56.1679	-161.9032	-218.0711
115	264	266	-46.1858	-182.4903	-228.6761
116	9000	1371	-68.4319	-161.9032	-230.3351
117	806	120	-60.8746	-168.4939	-239.3685
118	1598	1149	-152.2648	-88.1287	-240.3936
119	1776	865	-55.1896	-192.1934	-247.3830
120	806	1533	-74.8052	-178.4839	-253.2991

(contd.....)

Table 22. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I m
121	807	122	7.3912	-274.4379	-267.0468
122	723	1590	-69.9049	-204.6004	-274.5053
123	1634	1194	-154.7858	-123.7354	-278.5213
124	1776	1047	-96.3454	-192.1934	-288.5388
125	806	63	-116.5970	-178.4939	-295.0909
126	1665	951	-93.7973	-221.8426	-315.6399
127	1663	852	-240.5986	-78.8776	-319.4762
128	1634	1092	-207.8120	-123.7354	-331.6474
129	1776	97	-140.4410	-192.1934	-332.6344
130	1665	190	-118.7059	-221.8426	-340.5485
131	723	1126	-142.5098	-204.6004	-347.1102
132	1776	1178	-169.8381	-192.1934	-362.0315
133	1665	1066	-154.7578	-221.6426	-376.6003
134	1665	7	-171.1450	-221.8426	-392.9816
135	560	233	-290.2837	-106.1551	-396.3988
136	1776	1560	-206.5844	-192.1934	-398.7778
137	1665	222	-177.6999	-221.8426	-399.5424
138	1776	250	-216.3834	-192.1934	-408.5768
139	807	893	-148.9975	-274.4379	-423.4354
140	807	124	-168.5461	-274.4379	-442.9840
141	855	824	-88.5660	-356.1740	-44447400
142	1748	1010	-177.4568	-375.5975	-553.0543
143	264	1303	-386.7063	-182.4903	-569.1966
144	1748	872	-254.0092	-375.5975	-629.6067
145	855	129	-314.4840	-356.1740	-670.6580
146	1748	271	-305.0442	-375.5975	-680.6417
147	855	116	-340.8879	-356.1740	-697.0619

Table 23. Egg weight : Combined selection index for males combining from full-sib family and half-sib family averages

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
1	602	922	10.2614	4.0300	14.2194
2	1505	1552	8.0480	5.2994	13.3473
3	1505	1387	7.3685	5.2994	12.6678
4	1505	1356	5.6850	5.2994	10.9844
5	1505	6	3.8056	5.2994	9.1050
6	602	1452	5.0121	4.0300	9.0421
7	485	30	8.1724	0.7928	8.9652
8	709	958	4.5908	3.8539	8.4447
9	1505	1557	3.0894	5.2994	8.3888
10	709	1321	4.5219	3.8539	8.3758
11	709	1588	3.9906	3.8539	7.8446
12	1505	1063	2.3181	5.2994	7.6175
13	709	1137	3.6758	3.8539	7.5297
14	602	825	2.4305	4.0300	6.4605
15	709	901	2.5936	3.8539	6.4475
16	721	1470	3.7794	2.5816	6.3610
17	127	1207	3.6527	2.6768	6.3295
18	1665	222	4.7844	1.5108	6.2952
19	179	1412	3.1237	3.1358	6.2595
20	602	135	2.2154	4.0300	6.2454
21	179	1525	2.8122	3.1358	5.9481
22	127	1311	3.2344	2.6768	5.9113
23	602	1263	1.8336	4.0300	5.8635
24	127	1313	2.8443	2.6768	5.5207
25	603	1007	2.9835	2.4614	5.4448
26	709	1144	1.5605	3.8539	5.4145
27	177	13	4.6810	0.5970	5.2780
28	1663	183	4.5905	0.3188	4.9094
29	603	1262	2.2699	2.4614	4.7313
30	721	14	2.0543	2.5816	4.6360
31	602	17	0.5912	4.0300	4.6212
32	721	154	1.9529	2.5816	4.5345
33	789	221	2.7861	1.5413	4.3274
34	1602	1118	2.5741	1.6431	4.2172
35	721	1503	1.4962	2.5816	4.0778
36	475	838	3.3007	0.4035	3.7042
37	630	1551	3.1247	0.5468	3.6715
38	1602	936	1.6499	1.6431	3.2930
39	1777	1069	2.3165	0.9381	3.2545
40	1665	951	1.6529	1.5108	3.1637

(contd.....)

Table 23. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	Im
41	1602	185	1.4299	1.6431	3.0730
42	603	187	0.5673	2.4614	3.0286
43	179	1112	-0.1892	3.1358	2.9467
44	9000	269	1.6768	1.2328	2.9096
45	1663	963	2.5205	0.0388	2.8393
46	704	1427	1.1060	1.5436	2.6496
47	475	973	2.1908	0.4035	2.5943
48	464	1346	3.5468	-1.0020	2.5448
49	1777	115	1.5199	0.9380	2.4579
50	1665	190	0.8286	1.5108	2.3394
51	704	1189	0.7627	1.5436	2.3063
52	789	877	0.7388	1.5413	2.2803
53	485	251	1.4678	0.7928	2.2606
54	177	911	1.5842	0.5970	2.1813
55	177	60	1.3569	0.5970	1.9539
56	630	223	1.4023	0.5468	1.9492
57	1602	91	0.2196	1.6431	1.8627
58	1777	219	0.8775	0.9380	1.8155
59	1634	1092	1.5194	0.2174	1.7368
60	485	1442	0.8540	0.7928	1.6468
61	1634	930	1.4095	0.2374	1.6269
62	475	28	1.2089	0.4035	1.6124
63	1665	1066	0.0757	1.5108	1.5814
64	1597	179	2.5530	-0.9812	1.5718
65	630	1000	0.7316	0.5468	1.2784
66	1634	1172	1.0067	0.2174	1.2241
67	603	1526	-1.2814	2.4614	1.1790
68	1777	65	0.1984	0.9380	1.1364
69	722	1157	1.6594	-0.5828	1.0766
70	9000	1371	-0.4085	1.2328	0.8243
71	722	1128	1.3022	-0.5828	0.7194
72	1634	1565	0.2834	0.2174	0.5008
73	630	1598	-0.1015	0.5468	0.4453
74	1597	1589	1.2677	-0.9812	0.2865
75	924	977	2.4509	-2.2844	0.1665
76	1663	69	-02915	0.3188	0.0673
77	263	559	0.9362	-0.9274	0.0088
78	807	893	0.7169	-0.9586	-0.2417
79	1634	86	-0.7563	0.2174	-0.5390
80	475	9	-1.0536	0.4035	-0.6501

(contd....)

Table 23. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
81	475	850	-1.0707	0.4035	-0.6672
82	1597	1523	0.2322	-0.9812	-0.7490
83	1777	1432	-1.6921	0.9380	-0.7541
84	1665	7	-2.2982	1.5108	-0.7874
85	1634	1194	-1.2638	0.2174	-1.0464
86	464	1518	-0.3002	-1.0020	-1.3022
87	125	125	-0.0665	-1.2890	-1.3545
88	1676	164	0.8472	-2.3342	-1.4870
89	1748	1010	-0.2085	-1.4035	-1.6119
90	485	80	-2.4505	0.7928	-1.6577
91	1663	852	-1.9885	0.3188	-1.6696
92	1671	835	-0.8346	-1.0097	-1.8243
93	807	122	-1.0685	-0.9586	-2.0272
94	1671	1331	-1.0457	-1.0097	-2.0554
95	885	129	-0.5215	-1.5831	-2.3146
96	464	1426	-1.1827	-1.0020	-2.1848
97	722	23	-1.6182	-0.5828	-2.2009
98	807	124	-1.3890	-0.9586	-2.3476
99	630	237	-2.9793	0.5468	-2.4325
100	1597	1534	-1.7654	-0.9812	-2.7466
101	1748	872	-1.4563	-1.4035	-2.8598
102	1849	981	-0.2776	-2.6377	-2.9153
103	560	1115	-0.8121	-2.1843	-2.9964
104	125	889	-1.7412	-1.2890	-3.0302
105	560	1558	-0.9128	-2.1843	-3.0971
106	177	862	-3.8344	0.5970	-3.2373
107	1597	1146	-2.2795	-0.9812	-3.2607
108	924	1359	-0.9931	-2.2844	-3.2775
109	125	229	-2.0140	-1.2890	-3.3030
110	806	63	-0.6298	-2.8024	-3.4322
125	125	158	-2.3647	-1.2890	-3.6537
112	855	116	-2.2742	-1.5831	-3.8571
113	1664	1068	-1.7018	-2.3112	-4.0130
114	263	1252	-3.0867	-0.9274	-4.0141
115	855	824	-2.8078	-1.5831	-4.3909
116	1676	137	-2.2719	-2.3342	-4.6061
117	1664	221	-2.3871	-2.3112	-4.6983
118	924	1302	-2.4651	-2.2844	-4.7495
119	464	1421	-3.9503	-1.0020	-4.9523
120	1598	1141	-0.6344	-4.4121	-5.0465

(contd.....)

Table 23. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
121	924	1259	-2.9567	-2.2844	-5.2410
122	723	1590	-1.5838	-3.6763	-5.2601
123	1748	271	-3.9385	-1.4035	-5.3419
124	806	1533	-2.7841	-2.8024	-5.5865
125	560	233	-3.4170	-2.1843	-5.6014
126	806	120	-2.9968	-2.8024	-5.7992
127	1664	1081	-3.8191	-2.3112	-6.1303
128	1676	1024	-3.8642	-2.3342	-6.1984
129	1676	950	-3.9813	-2.3342	-6.3155
130	1776	250	-2.6418	-3.6901	-6.3319
131	264	57	-2.2706	-4.2303	-6.5009
132	1598	1271	-2.1767	-4.4121	-6.5888
133	1849	1353	-4.1374	-2.6377	-6.7751
134	560	102	-4.7195	-2.1843	-6.9038
135	1776	1047	-3,6117	-3.6901	-7.3018
136	1776	865	-3.7468	-3.6901	-7.4369
137	1597	1414	-6.4950	-0.9812	-7.4763
138	924	262	-5.2495	-2.2844	-7.5339
139	723	1126	-4.2110	-3.6763	-7.8873
140	1849	159	-5.6185	-2.6377	-8.2562
141	1598	150	-3.8658	-4.4121	-8.2779
142	1776	1178	-5.0146	-3.6901	-8.7047
143	1598	175	-4.3872	-4.4121	-8.7994
144	1776	97	-5.3069	-3.6901	-8.9970
145	264	266	-4.8200	-4.2303	-9.0503
146	1776	1560	-6.1057	-3.6901	-9.7958
147	264	1303	-7.8369	-4.2303	-12.0672

Table 24. Egg Production : Combined selection index for males combining information from full-sib family and half-sib family averages

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
1	1849	1353	35.3679	78.8324	114.2003
2	1849	981	35.0483	78.9324	113.8807
3	1849	159	29.9474	78.8324	108.7798
4	1671	835	29.6241	64.3781	94.0022
5	264	57	31.8278	52.0707	83.8985
6	630	1598	36.1148	45.1492	81.2640
7	264	266	26.0794	52.0707	78.1501
8	1671	1331	12.7491	64.3781	77.1271
9	630	237	29.2573	45.1492	74.4065
10	1776	97	23.0273	47.8526	70.8797
11	630	1551	25.6914	45.1492	70.8406
12	1776	1178	22.4306	47.8526	70.2833
13	1776	250	21.1579	47.8526	69.0105
14	723	1590	33.7173	34.9292	68.6465
15	1776	865	20.3307	47.8526	68.1832
16	1776	1047	19.0897	47.8526	66.9424
17	179	1112	21.3036	40.7650	62.0686
18	709	1588	25.6483	33.9051	59.5534
19	179	1412	17.6514	40.7650	58.4164
20	709	1137	23.9422	33.9051	57.8473
21	924	1259	31.3339	23.5722	54.9061
22	264	1303	2.1277	52.0707	54.1984
23	560	233	42.3037	11.7749	54.0786
24	1664	221	20.3118	29.3873	49.6991
25	179	1525	8.5210	40.7650	49.2859
26	464	1421	29.6408	19.1428	48.7836
27	630	223	3.5908	45.1492	48.7400
28	263	1256	24.9831	23.1544	48.1374
29	709	958	12.7383	33.9051	46.6434
30	1676	164	37.2703	8.7703	46.0407
31	723	1126	8.9609	34.9292	43.8901
32	630	1000	-4.2464	45.1492	40.9029
33	924	1359	15.8305	23.5722	39.4027
34	709	1144	5.1743	33.9051	39.0794
35	789	221	11.4671	26.2148	37.6819
36	603	1526	34.7494	2.9296	37.6790
37	924	1302	13.5491	23.5722	37.1213
38	789	877	8.4830	26.2148	34.6978
39	1664	1081	4.2088	29.3873	33.5961
40	1664	1068	1.8633	29.3873	31.2506

(contd.....)

Table 24. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
41	709	901	-2.6740	33.9051	31.2111
42	1598	150	14.5231	15.9716	30.4946
43	125	889	20.0443	8.6892	28.7335
44	1748	1010	14.8539	13.6497	28.5036
45	924	977	4.3382	23.5722	28.4104
46	464	1426	7.2420	19.1428	26.3848
47	709	1321	-7.5650	33.9051	26.3401
48	1598	1271	5.6325	15.9716	21.6041
49	1748	271	6.3138	13.6497	19.9635
50	125	229	9.4249	8.6892	18.1141
51	263	859	-5.3255	23.1544	17.8288
52	560	102	3.0427	17.7749	14.8176
53	464	1518	-4.5609	19.1428	14.5819
54	1776	1560	-33.8877	47.8526	13.9649
55	560	1558	0.1007	11.7749	11.6756
56	924	262	-13.4548	23.5722	10.1174
57	177	13	13.0767	-3.6330	9.4431
58	1748	872	-5.3537	13.6497	8.2960
59	1176	137	-1.1274	8.7703	7.6430
60	464	1346	-11.5354	19.1428	7.6074
61	1598	175	-9.3894	15.9716	6.5822
62	1676	1024	-5.3255	8.7703	3.4448
63	125	158	-5.9672	8.6892	2.7220
64	1598	1141	-13.4131	15.9716	2.5585
65	560	1115	-9.4356	11.7749	2.3393
66	603	1007	-1.2506	2.9296	1.6790
67	485	252	13.1691	-12.0725	1.0966
68	722	23	10.4321	-9.3634	1.0688
69	855	824	2.5801	-3.6574	-1.0773
70	177	911	2.3851	-3.6330	-1.2478
71	125	125	-10.6206	-8.6892	-1.9314
72	855	116	1.6592	-3.6574	-1.9982
73	603	187	-6.2506	2.9296	-3.3210
74	1634	1092	16.0798	-21.1301	-5.0503
75	1676	950	-15.1554	8.7703	-6.3850
76	1777	1432	8.3028	-15.4122	-7.1094
77	1597	1146	9.1198	-17.5027	-8.3829
78	485	80	1.8801	-12.0725	-10.1924
79	475	9	2.4717	-12.7675	-10.2958
80	855	129	-6.8385	-3.6574	-10.4959

(contd.....)

Table 24. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
81	177	862	-7.2967	-3.6330	-10.9297
82	177	60	-8.1149	-3.6330	-11.7479
83	475	838	0.5482	-12.7675	-12.2193
84	603	1262	-15.5007	2.9296	-12.5710
85	1777	65	2.8358	-15.4122	-12.5765
86	1634	86	6.8074	-21.1301	-14.3227
87	1663	183	7.4776	-21.9776	-14.4900
88	9000	1371	3.9175	-18.4556	-14.5381
89	1777	1069	-0.0731	-15.4122	-15.4854
90	475	850	-5.3874	-12.7675	-18.1549
91	1597	1589	-1.3419	-17.5027	-18.8446
92	485	30	-8.9573	-12.0725	-21.0298
93	1597	179	-4.0244	-17.5027	-21.5271
94	1663	965	-0.3408	-21.9676	-22.3084
95	1597	1534	-6.8142	-17.5027	-24.3169
96	1597	1523	-6.8602	-17.5027	-24.3629
97	1505	1063	-3.2634	-29.8528	-26.5894
98	602	17	-4.1778	-30.7862	-26.6084
99	1634	1194	-5.5558	-21.1301	-26.6860
100	1663	69	-5.0148	-21.9676	-26.9824
101	1634	930	-6.2868	-21.1301	-27.4169
102	485	1442	-15.7654	-12.0725	-27.8379
103	602	825	1.4525	-30.7862	-29.3337
104	704	1427	-4.2855	-27.0715	-31.3570
105	722	1528	-22.8598	-9.3634	-32.2232
106	1777	219	-17.6915	-15.4122	-33.1037
107	1505	6	-3.4247	-29.8528	-33.2776
108	9000	269	-14.8885	-18.4556	-33.3441
109	1505	1356	-5.4418	-29.8528	-35.2946
110	1777	115	-20.2187	-15.4122	-35.6310
111	475	28	-25.0077	-12.7675	-37.7752
112	1597	1414	-20.6558	-17.5027	-38.1585
113	1665	1066	8.3276	-48.4803	-40.1527
114	722	1157	-31.3000	-9.3634	-40.6634
115	602	912	-11.2653	-30.7862	-42.0515
116	1634	1565	-21.1978	-21.1301	-42.3279
117	807	124	-4.2855	-38.7772	-43.0628
118	1663	852	-22.0963	-21.9676	-44.0638
119	704	1189	-17.1403	-27.0715	-44.2118
120	602	1263	-13.8088	-30.7862	-44.5951

(contd.....)

Table 24. Contd.....

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
121	602	135	-14.8989	-30.7862	-45.6852
122	1505	1552	-19.6674	-29.8528	-49.5202
123	1665	951	- 1.8334	-48.4803	-50.3107
124	475	973	-39.0222	-12.7675	-51.7897
125	1505	1387	-24.2855	-29.8528	-54.1383
126	1505	1557	-24.9224	-29.8528	-54.7752
127	807	893	-17.8352	-38.7772	-56.6124
128	807	122	-19.9198	-38.7772	-58.6970
129	1634	1172	-38.3017	-21.1301	-59.4318
130	1602	91	-12.7510	-54.0404	-66.7914
131	721	14	-11.5144	-55.8717	-67.3861
132	721	1503	-11.9749	-55.8717	-67.8466
133	1602	185	-15.3760	-54.0404	-69.4164
134	127	1313	-9.5820	-61.0184	-70.6005
135	806	63	-13.1763	-58.0900	-71.2668
136	127	1207	-10.6466	-61.0184	-71.6650
137	1602	936	-20.2510	-54.0404	-74.2914
138	721	154	-18.5758	-55.8717	-74.4475
139	806	1533	-19.5685	-58.0900	-77.6585
140	1602	1118	-25.8760	-54.0404	-79.9164
141	721	1470	-27.6747	-55.8717	-83.5464
142	806	120	-29.9971	-58.0900	-88.0871
143	1665	222	-39.9785	-48.4803	-88.4588
144	1665	190	-45.3921	-48.4803	-93.8724
145	602	1452	-63.9534	-30.7862	-94.7396
146	127	1311	-36.4612	-61.0184	-97.4796
147	1665	7	-51.2222	-48.4803	-99.7025

Table 25. Selected sire - dam pairs in the four characters under study

20 week body weight

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
1	179	1525	207.0556	379.9884	587.0440
2	602	1452	280.0532	299.7831	579.8363
3	1602	185	449.8535	104.3224	554.1759
4	602	825	243.0437	299.7831	542.8269
5	179	1112	159.7615	379.9884	539.7499
6	603	1526	251.7494	284.0901	535.8396
7	127	1313	270.6846	256.0879	526.7726

40 week body weight

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
1	602	1452	360.9851	276.4474	637.4325
2	602	135	360.9851	276.4474	637.4325
3	127	1311	320.6411	267.1406	587.7817
4	709	1588	287.7040	283.3202	571.0243
5	709	1321	226.4201	283.3202	509.7403
6	602	825	186.0057	276.4474	462.4531
7	602	912	180.1781	276.4474	462.4531

Table 25. Contd.....

Egg Weight

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
1	602	912	10.2614	4.0300	14.2194
2	1505	1552	8.0480	5.2994	13.3473
3	1505	1387	7.3685	5.2994	12.6678
4	1505	1356	5.6850	5.2994	10.9844
5	1505	6	3.8056	5.2994	9.1050
6	602	1452	5.0121	4.0300	9.0421

Egg Production

Sl No	Sire No	Dam No	b_1 FS -	b_2 HS -	I_m
1	1849	1353	35.3679	78.8324	114.2003
2	1849	981	35.0483	78.8324	113.8807
3	1849	159	29.9474	78.8324	108.7798
4	1671	835	29.6241	64.3781	94.0022
5	264	57	31.8278	52.0707	83.8985
6	630	1598	36.1148	45.1492	81.2640
7	264	266	26.0794	52.0707	78.1501

Table 25. Contd.....

Heritability estimates with S.E. and the expected response due to combined selection

Traits	Heritability with S.E.	Expected response(%)
1. 20 week body weight	0.1519 ± 0.0800	166.23
2. 40 week body weight	0.1824 ± 0.0800	182.45
3. Egg weight	0.3380 ± 0.1132	8.06
4. Egg Production	0.0597 ± 0.0564	8.64

Discussion

DISCUSSION

To make a comparative study of selection indices for the improvement of poultry, selection indices were constructed by employing different methods.

Two sets of general selection indices I and Io for selection among females were constructed with and without the use of record on dam for one offspring of each dam and for each character under study. The multiple correlation between the estimated breeding value (G) and the indices I and Io were also worked out for each character.

The ranges of multiple correlation RGI, between the index I and the corresponding breeding value G for the four characters viz. 20 week and 40 week body weights, egg weight and egg production were 0.7384 to 0.7895, 0.7705 to 0.8080, 0.9181 to 0.9228, 0.6091 to 0.7191 respectively. The values of RGIo, correlation between the index Io and the corresponding breeding value (G) for the four character ranged from 0.7208 to 0.7893, 0.7555 to 0.8074, 0.9157 to 0.9219, 0.5961 to 0.7138 respectively (Table 1 to 8).

The ratios of expected progress in females from selection based on an index I as contrasted to selection based on an index Io for the four characters ranged from 1.0042 to 1.0302, 1.0031 to 1.0258, 1.0004 to 1.0050 and 1.0083 to 1.0419 respectively (Table 9).

For all the four characters, the correlation between the index I and the corresponding breeding value G was more than that between I_o and the corresponding breeding value G. As a result, the ratios of the expected improvement was found to be greater than one in each individual case. Thus it was concluded that the index I, with the use of record on dam was more efficient than the one without the use of record on dam.

For selection among males, two sets of indices I^* and I_o^*, excluding individuals own performance, were constructed with and without the use of record on dam. Multiple correlation RGI^* and RGI_o^* were also calculated for each individual.

The ranges of RGI^* for the four characters viz. 20 week and 40 week body weights, egg weight and egg production were 0.5168 to 0.6569, 0.5353 to 0.6571, 0.5973 to 0.6861, 0.4430 to 0.6262 respectively. The ranges of RGI_o^* for the same four characters were 0.4614 to 0.6485, 0.4804 to 0.6552, 0.5500 to 0.6779, 0.3894 to 0.6170 respectively (Table 10 to 17).

The ratios of expected progress ranged from 1.0130 to 1.1199, 1.0123 to 1.1216, 1.0087 to 1.1333, 1.0148 to 1.1167 respectively (Table 18).

In this case also, the correlation between the index I^*

and the corresponding breeding value G was found to be more than that between I_o^* and its corresponding breeding value G. Hence the ratio of expected progress for each individual was greater than one. Thus it was concluded that in selection among males also the index I^*, with the use of record on dam was found to be more efficient than the one I_o^*, without the use of record on dam.

Marutiram et al. (1972) reported that the index with the use of record on dam was more efficient than the one without the use of record on dam for selection among females as well as selection among males. The results of the present study were also in perfect agreement with this report.

A selection index was constructed by considering all the four characters under study by assigning economic values on the basis of the importance of each trait (Table 19). The expected genetic advance due to this index as well as due to straight selection calculated were found to be 825.8615 per cent and 727.0793 per cent respectively. The per cent gain in efficiency in expected genetic advance due to selection index over that due to straight selection was calculated as 13.5862 (Table 19).

Hence from this study it could be conluded that seleotion based on an index was more efficient than straight selection, when all the four characters having unequal variances and

heritabilities, were considered simultaneously. Workers like Hazel and Lush (1942), Young (1961) and Panse (1946) showed that selection based on an index was more efficient than any other methods of selection. The present study also corraborated the results shown by Hazel and Lush (1942), Young (1961) and Panse (1946).

Three restricted indices were constructed. In the first index, egg weight was restricted, in the second index 40 week body weight was restricted and in the third index both egg weight and 40 week body weight were restricted (Table 19). The expected genetic improvement in individual characters were also calculated in each case (Table 19). In the first case, the expected genetic advance for the character egg weight was found to be equal to zero. But in the other two cases, the expected genetic advance for the restricted characters were not equal to zero (Table 19).

From the study of restricted selection indices it could be concluded that imposing restriction on the character egg weight (keeping egg weight constant) gave maximum genetic advance in the other three characters and imposition of restriction on other characters was found to be of no use with reference to this particular study.

Seven phenotypic selection indices were developed between the main trait egg production (Y) and the auxiliary

traits, 20 week and 40 week body weights and egg weight. Their relative efficiencies were also calculated (Table 20). The increase in efficiency was the same (1 per cent for both I_1, index between egg production and 20 week body weight, and I_2, index between egg production and 40 week body weight. A decrease in 18 per cent was noticed in I_3, the index between egg production and egg weight. But in the case of I_4, index between egg production and 20 week and 40 week body weights, 32 per cent increase was noticed in the relative efficiency. In I_5 index between egg production and 20 week body weight and egg weight, the relative efficiency was decreased by six per cent. Similarly 20 per cent decrease was also noticed in I_6, index between egg production and 40 week body weight and egg weight. Efficiency was increased by 24 per cent in I_7, index between egg production and the auxiliary traits 20 week and 40 week body weights and egg weight.

Hence from the study of phenotypic selection indices, the index I_4, constructed between the main trait egg production and the auxiliary traits 20 week and 40 week body weight was found to be the best. The next best was the index I_7, constructed between egg production and 20 week and 40 week body weights and egg weight.

Selection indices were also constructed for males combining information from full-sib and half-sib family

averages for each character (Table 21 to 24). Five per cent best sire-dam pairs were selected as parents (Table 25). The ranges of selection score between the selected male parents for the characters 20 week and 40 week body weight, egg weight and egg production were 526.8 to 587, 456.6 to 637.4, 8.9 to 14.2 and 78.2 to 114.2 respectively.

Expected response due to selection of males based on this index for the characters 20 week and 40 week body weights, egg weight and egg production at five per cent intensity of selection were 166.23 per cent, 182.46 per cent, 8.06 per cent and 8.64 per cent respectively. Heritability estimates with their standard errors were as shown h^2 for 20 week body weight = 0.1519 $\pm$ 0.08.

h^2 for 40 week body weight = 0.1824 $\pm$ 0.0800
h^2 for egg weight = 0.3380 $\pm$ 0.1132
h^2 for egg production = 0.5970 $\pm$ 0.0564

Reddy *et al.* (1978) reported the heritability estimates for 20 week body weight among four White Leghorn strains ranged from 0.24 to 0.53. The heritability for egg production upto 280 days of age was considerably higher among all the four strains ranged from 0.36 to 0.75. A number of reports concerning the inheritance of egg production indicated that heritability of this trait is low ranging from 0.05 to 0.34 with an average of about 0.20. In this study heritability

estimate for 20 week body weight was slightly less than the values of Reddy *et al.* (981). But heritability estimate for the character egg production was found to be in the range of 0.05 to 0.34.

From the study of general selection indices, it was found that the inclusion of dam's record in the index increases the efficiency of selection. Study of simultaneous selection index showed that selection based on an index was more efficient than any other selection methods when several characters, having unequal variances and heritabilities were considered simultaneously. From the restricted selection indices constructed, it was found that the imposition of restriction on egg weight increased the genetic advance in the unrestricted characters. When the phenotypic selection indices were constructed, it was noticed that index, between egg production and 20 week and 40 week body weights was the best in improving the main trait egg production. For the selection of best male parents, selection indices combining information from full-sib and half-sib family averages were constructed. Expected improvements due to this index were also calculated for each character.

Summary

SUMMARY

The data for this study were collected from 776 progenies of 38 sires which were mated to 147 dams of White Leghorn strain IWN. The characters under study were 20 week and 40 week body weights, egg weight and egg production in 280 days. Various selection indices were constructed to make a comparative study of the indices for this data.

Two sets of general selection indices were constructed for selection among females as well as selection among males, with and without the use of record on dam for one offspring of each dam and for the four characters under study. On comparison of these two indices, the index with the use of record on dam was found to be more efficient than the one without the use of record on dam for selection among both males and females.

Simultaneous selection index considering all the four characters assigning economic values on the basis of the importance of each trait was also constructed. Expected genetic advances due to this index as well as due to straight selection were also calculated. The per cent gain in efficiency due to selection based on this index over that due to straight selection was also calculated. This study showed that selection based on index was more efficient than straight selection.

Restricted selection indices, by restricting the characters

egg weight and 40 week body weight separately and also restricting egg weight and 40 week body weight simultaneously were also constructed. The restriction on egg weight was only found to be effective. In the other two cases restriction was of no use in improving the genetic advance in the unrestricted characters.

Seven phenotypic indices were constructed between the main trait egg production and the auxiliary traits 20 week and 40 week body weights and egg weight. Relative efficiency was more for the index, constructed between main trait egg production and the auxiliary traits 20 week and 40 week body weight (32%).

The next higher relative efficiency (24%) was noticed in the index, constructed between egg production and the auxiliary traits 20 week and 40 week body weights and egg weight. There was a general decrease in efficiency when egg weight was incorporated as an auxiliary trait in the index. Thus the index between egg production and 20 week and 40 week body weight was found to be the best for improving the main trait egg production.

Selection indices for males combining information from full-sib and half-sib family averages were also constructed for individual characters and these indices were arranged in descending order. While selecting the best five per cent parents, the first seven families having the highest score were selected as the best parents. Expected response due to the selection of male parents were also calculated for each character.

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A COMPARATIVE STUDY OF SELECTION INDICES FOR THE IMPROVEMENT OF POULTRY

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ABSTRACT OF A THESIS

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ABSTRACT

Data collected on White Leghorn strain N were utilised for the construction of selection indices. The characters under this study were 20 week and 40 week body weights, egg weight and egg production.

From the study of general indices constructed for selection among males and females with and without the use of record on dam, the index with the use of record on dam was found to be more efficient than the one without the use of record on dam.

Simultaneous selection index considering all the four characters was constructed. The efficiency of this index was tested by finding the per cent gain in efficiency due to this index over that due to straight selection. This comparison showed that the index selection was more efficient than straight selection.

From the three restricted selection indices constructed by restricting egg weight, 40 week body weight independently and egg weight and 40 week body weight combinedly, only the restriction on egg weight was found to be effective.

Out of the seven phenotypic indices constructed, the index between the main trait egg production and the auxiliary traits 20 week and 40 week body weights, was found to be the

best in improving the main trait egg production. The next best was the index between egg production and the auxiliary traits 20 week and 40 week body weights and egg weight.

Combined selection indices for males combining information from full-sib and half-sib family averages were also constructed for each character and these indices were arranged in descending order to choose the best parents. The expected response due to this index was also calculated for each character.