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CORRELATION ESTIMATES AMONG CARCASS TRAITS OF NEW ZEALAND WHITE AND DUTCH RABBIT BREEDS

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Abstract

This investigation was performed to analyze the correlation estimates among different carcass traits of New Zealand White and Dutch rabbit breeds kept at Sindh Agriculture University, Tandojam. For this purpose, a total of ten rabbits, with 8 breeder females and 2 males, were obtained from the local market in the district of Badin, Taluka Talhar. After obtaining their offspring, forty healthy rabbits, with 20 from each breed (10 males and 10 females), were randomly selected and divided into four different groups: A, B, C and D. Groups A and C consisted of males, while groups B and D consisted of females. At the age of eighty days, the rabbits were slaughtered, and data were collected to estimate correlation coefficient among carcass traits of rabbit breeds. This study revealed that the correlation estimates between weaning weight, live weight, carcass weight, boneless weight, bone weight and dressing percentage of New Zealand White and Dutch male breeds were observed to be positive and higher compared to female rabbits in both breeds 0.3265, 0.2049*, 0.4370*, 0.1272*, 0.6316*, 0.5994* and 0.2505* for New Zealand White male and 0.0704*, 0.0385*, 0.6316*, 0.0135*, 0.0033*, 0.8319* and 0.5456* for Dutch male rabbit, respectively. It is concluded that male rabbit's produce more meat compared to female rabbits and could be a better choice for meat preference and economics.*

Keywords: *Carcass, Correlation, Dutch rabbit, New Zealand white*

INTRODUCTION

Rabbits are a good source of meat and are characterized by a fast growth rate, high reproduction rate, early sexual maturity, and the ability to rebreed shortly after kindling. Domestic rabbits are a major source of animal protein in developing countries because rabbit meat contains low fat, cholesterol, and a higher protein percentage (1, 2). The characteristics of the carcass and quality of meat are important aspects to analyze in the fattening production of rabbits due to their significance (3). These species are associated with the production of the best quality nutrition of rabbit meat (4). Examining the relationship between body measurements is also used in selection and breeding. It has been reported that the magnitude of the relationship between live weight and raw meat production in turkeys is an important factor in the selection of nutritional value (5, 6). Rabbit production involves low input or cost and offers a very profitable enterprise due to the size, efficiency and simplicity of management of the animals. The prolific nature of the rabbit coupled with its short generation interval makes it an animal of choice for a rapid increase in animal

protein production for human consumption. Well over 40 breeds of rabbit have been reported in the United States but only a few of these have been imported into Nigeria (1). Canonical correlation analysis is a useful tool for estimating the effectiveness of various practices, as demonstrated by (5). Similar to large animals, it is desirable for farmers to be able to determine whether the animal is suitable for slaughter through pre-slaughter measurements. Studies predicting the best nutrition standards for other animal species have been reported by (3) for rabbit. The aim of this study is to determine the characteristics of rabbits and to identify the best values that can predict their body characteristics.

MATERIALS AND METHODS

In this study, 2 male and 8 female breeder rabbits from New Zealand White and Dutch breeds were purchased from a local farmer, Mr. Muhammad Ilyas Buriro, from the village of Muhammad Yousuf Buriro, Tehsil Talhar District Badin, and brought to House No. A-23, Sindh Agriculture University, Tandojam, for breeding purpose. They were randomly selected in a 1:2 male to female ratio and housed in different cages. Forty healthy rabbits will be selected from the New Zealand White and Dutch breeds, respectively. After parturition, the weaning (21-25th day) was performed and kindler was placed in separate cage until maturity age. A new generation of rabbit was selected based on physical characters, health and age (6) and were tagged (7), mortality was noted (8). The selection was made from the first generation of the breeding stock. The rabbits were divided in A, B, C and D groups with A and C groups containing males and B and D containing female rabbit. On the 80th day, the live weight of each animal will be measured. All rabbits will be slaughtered using the method described by (11) to estimate correlation coefficient among carcass traits of rabbit breeds.

Simple correlation was worked out using formula as suggested by (12).

$$r_{xy=} \frac{1\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\sum x^2 - \frac{(\sum x)^2}{n} \quad \sum y^2 - \frac{(\sum y)^2}{n}}}$$

Where,

n= total number of observation

∑= Greek sign of "Sum of"

$r_{xy=}$ correlation between x (independent) and (dependent) variable

RESULTS

ESTIMATES OF CORRELATIONS BETWEEN NEW ZEALAND WHITE MALE CARCASS TRAITS

The results regarding the correlation between different New Zealand White male carcass traits are shown (Table I). Correlation estimates among carcass traits of New Zealand White rabbit breed such as weaning weight, live weight, slaughter weight, carcass weight, boneless weight, bone weight and dressing percentage were observed to be moderately to highly positive in our study. This indicates a strong relationship between one trait and another.

Table I. The results for correlation estimates among carcass traits of New Zealand White male rabbit

	Birth weight	**Weaning weight**	**Live weight**	**Slaughter weight**	**Carcass weight**	**Boneless weight**	**Bone weight**
Weaning weight	0.3265*	-	-	-	-	-	-
Live weight	0.9276*	0.2049*	-	-	-	-	-
Slaughter weight	0.3706**	0.4031**	0.4370*	-	-	-	-
Carcass weight	0.5221*	0.3412*	0.4914*	0.1272*	-	-	-

Boneless weight	0.4660*	0.6521*	0.3622*	0.2682*	0.6316*	-	-
Bones weight	0.0440*	0.4637*	0.0541*	0.2045*	0.2420*	0.5994*	-
Dressing percentage	0.1700*	0.2957**	0.1010*	0.0567**	0.9161*	0.5556**	0.2505*

THE RESULTS FOR CORRELATION COEFFICIENT AMONG NEW ZEALAND WHITE FEMALE CARCASS TRAITS

The results regarding correlation among carcass traits of New Zealand White female rabbits are (Table II). The correlation among carcass characteristics, such as weaning weight, live weight, slaughter weight, carcass weight, boneless weight, bone weight and dressing percentage, were observed to be moderately to highly positive in our study. This indicates a strong relationship between one trait and another.

Table II. The results for correlation among carcass traits of New Zealand White female rabbit

	Birth weight	Weaning weight	Live weight	Slaughter weight	Carcass weight	Boneless weight	Bones weight
Weaning weight	0.2065*	-	-	-	-	-	-
Live weight	0.7951*	0.2210*	-	-	-	-	-
Slaughter weight	0.6986**	0.4519**	0.8442*	-	-	-	-
Carcass weight	0.4362*	-0.0872*	0.5374*	0.5361*	-	-	-
Boneless weight	0.0459*	-0.2090*	0.1179*	0.0178*	0.5404*	-	-
Bones weight	0.3806*	0.1418*	0.4021*	0.5487*	0.3984*	-0.5565*	-
Dressing percentage	0.0852*	-0.2207*	0.0935*	0.1770*	0.8899*	0.5756**	0.2512*

THE RESULTS FOR CORRELATION COEFFICIENT AMONG DUTCH MALE RABBIT CARCASS TRAITS

The results regarding correlation coefficient among Dutch male Rabbit carcass traits are in (Table III). The correlation among carcass characteristics of Dutch male rabbits, including weaning weight, live weight, slaughter weight, carcass weight, boneless weight, bone weight and dressing percentage, were observed to be moderately to highly positive in our study. This indicates a strong relationship between one trait and another.

Table III. Correlations among different carcass traits Dutch Breed Male

	Birth weight	Weaning weight	Live weight	Slaughter weight	Carcass weight	Boneless weight	Bones weight
Weaning weight	0.0704*	-	-	-	-	-	-
Live weight	0.8292*	0.0385*	-	-	-	-	-
Slaughter weight	0.5684**	0.0503**	0.6316*	-	-	-	-
Carcass weight	0.2534*	0.1508*	0.2964*	0.0135*	-	-	-
Boneless weight	0.0891*	0.3721*	0.0866*	0.5285*	0.0033*	-	-
Bones weight	0.2145*	0.2252*	0.2363*	0.4312*	0.5577*	0.8319*	-
Dressing percentage	0.5262*	0.1389*	0.6268*	0.2332**	0.9299*	0.0356**	0.5456*

THE RESULTS FOR CORRELATION COEFFICIENT AMONG CARCASS TRAITS OF DUTCH FEMALE RABBIT

The results for correlation among carcass characteristics of Dutch female rabbits are in (Table-4). The correlation among various carcass characteristics, such as weaning weight, live weight , slaughter weight, carcass weight, boneless weight, bone weight, and dressing percentage, were observed to be moderately to highly positive in our study. This indicates a strong relationship between one trait and another.

Table IV. The results for correlation among carcass traits of Dutch female rabbit

	Birth weight	Weaning weight	Live weight	Slaughter weight	Carcass weight	Boneless weight	Bone weight
Weaning weight	0.0795*	-	-	-	-	-	-
Live weight	0.8807*	0.1168*	-	-	-	-	-
Slaughter weight	0.6040**	0.1800**	0.7712*	-	-	-	-
Carcass weight	0.4818*	0.0546*	0.5142*	0.4953*	-	-	-
Boneless weight	0.3146*	0.0664*	0.1062*	0.0857*	0.2869*	-	-
Bones weight	0.0732*	0.0955*	0.1555*	0.3411*	0.2202*	0.8713*	-
Dressing percentage	0.3509*	0.0571*	0.4327*	0.2299**	0.5507*	0.1975**	0.0809*

DISCUSSION

The results regarding the correlation between carcass traits of New Zealand White and Dutch male and female rabbit breeds showed moderate to high positive correlations. In our study, the correlation estimates between various carcass traits for male New Zealand and Dutch rabbits were recorded as positive and high compared to both female breeds. These findings are consistent with the results reported by (1, 13, 14, 15), who found higher and positive correlation values for male rabbit carcass characteristics compared to female carcass traits in different rabbit breeds. The variation in values is a natural phenomenon as males generally have higher body weight compared to females, but in some breeds, it was noted that female rabbits have higher body weight after parturition than male rabbits.

In our study, the correlation estimates between weaning weight and dressing percentage were positively higher, which contradicts the findings of (4, 16). Similar investigations was carried (2, 17) also reported moderate to low correlation estimates between weaning weight and dressing percentage. The variation in findings may be attributed to differences in bone size, breed variations, low body height, and poor feeding, which could be major factors contributing to the differences in results.

Our study is supported by the results of (15, 19), stated higher positive correlation coefficient among dressing percentage and weaning weight. In our study, the results for carcass traits and bone weight showed low to positive correlations. These findings were not consistent with (4), suggested higher and positive correlation coefficient among bone weight and carcass weight. The differences in values may be due to structural changes in bones, as it is a natural phenomenon that animals with higher bone weight will produce less carcass weight. However, the study by (7) suggested that the positive and strong correlation values indicate the effect of higher bone weight on carcass weight, which is directly proportional to each other.

CONCLUSION

It is concluded that correlation estimates between carcass traits of New Zealand White and Dutch rabbit breeds showed a high and strong positive correlation for male rabbits, producing a greater amount of carcass compared to female rabbits of both breeds.

Conflict of Interest:

The authors have no conflict of interest.

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