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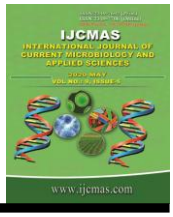

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Carcass Characteristics of New Zealand White Rabbits at Market Age

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A B S T R A C T

The present study was conducted to analyze the carcass characteristics of New Zealand White rabbits reared under tropical conditions of India. For this study, a total of 38 male rabbits of 4 – 5 months age selected randomly from Post Graduate Research Institute in Animal Sciences, TANUVAS, Tamil Nadu, which were fed with concentrate (16% CP) and Desmanthus fodder during the rearing period. The animals were slaughtered by cutting the jugular veins and carotid arteries, various carcass parameters and cut up parts weight were recorded and analyzed as per the standard methods. In the present study, the mean live weight at slaughter and carcass weight observed were 1772.63 ± 40.65 g and 911.92 ± 21.05 g respectively with a dressing percentage of 51.55 ± 0.56 and an edible to inedible ratio of 1.69 ± 0.04. The average value of various cut up parts such as fore limb weight, thorax weight, loin weight, abdominal flap weight, rump and hind limb weight and shank weight were 141.91 ± 4.37 g, 177.44 ± 4.96 g, 168.74 ± 4.98 g, 67.31 ± 2.05 g, 292.30 ± 6.95 g and 51.13 ± 1.29 g respectively which shows high correlation with live weight especially the prime cut up parts such as loin (0.805), rump and hind limb (0.908) with a significance level of 0.01. From the study, it is evident that among the various foragers like sheep, goat, cattle and rabbit, the dressing percentage of the rabbits seemed to be high with better meat to bone ratio.

Introduction

In the last decade, meat consumption of the world is increasing especially in the developing countries of Asia. In India, more than 71% of people over the age of 15 are non-vegetarians (sample registration system (SRS) baseline survey, 2014). The annual meat production of India is 7.4 MT with a growth rate of 5.21% for the year 2016-17 (BAHS, 2017). Even with steady growth of meat production, the average per capita availability of meat is around 6 kg/year against the Indian Council of Medical Research recommendation of 11kg/year. Dependence on food animals becomes higher

to satisfy the protein requirement of growing human population. The change in consumption pattern and admirable nutritional qualities paves a great demand for rabbit meat production in the recent years in India.

Rapid growth and technological innovations lead to the structural changes in the livestock sector, of which rabbitry is gaining popularity for meat production because of its least dependence on the concentrate diet. Rabbit meat has high nutritional qualities with outstanding dietetic properties.

The protein content of rabbit meat is around 21% and total mineral content is 1.5%. The sodium content of rabbit meat is relatively low (49 mg/100 g), whereas the phosphorus level is high (277 mg/100 g) and the cholesterol content is also in the beneficial range of 59 mg/100 g with a better omega 6/omega 3 ratio of 5.9, which makes the rabbit meat attractive for health purposes (Combes, 2004).

World rabbit population is around 316.69 million and meat production is approximately 1.43 million MT (FAOSTAT, 2016). The contribution of India is very meager in rabbit meat production. Researches about rabbits on meat production aspect under Indian climatic conditions are very scanty. The knowledge about dressing percentage, carcass yield and various cut up parts is essential to assess the meat production of rabbits.

Carcass presented in cut up parts provides a variety of options to purchasers for meat handling, packing and conformity assessment, which conform to good commercial practice for meat and meat products intended to be sold in international trade (UNECE Standard for Rabbit Meat- Carcasses and Cuts – 2013). Information on carcass characteristics is therefore helpful for the effective utilization of rabbit meat (Fernandez and Fraga, 1996).

Materials and Methods

The study was carried out at Post Graduate Research Institute in Animal Sciences, Kattupakkam which is located at 12º336'N latitude and 80°04'E longitude near Chennai, Tamil Nadu. The station is situated at 45 m above mean sea level and receives an average rainfall of around 1136 mm. The average temperature is 28.4°C ranging from 38°C to 19.4°C.

After the weaning period of 42 days of age, the rabbits were reared as a pair in galvanized battery cages of 2 x 1.5 ft size under standard farm conditions. The animals were fed with concentrate of around 40 g / kg live body weight in the forenoon and Desmanthus fodder of around 200 g/animal in the afternoon hours during the rearing period. The concentrate (16% CP) was usually presented as wet mash to the animals.

A total of 38 male New Zealand White rabbits aged 4 to 5 months were selected randomly and slaughtered after an overnight feed withdrawal. Slaughtering is conducted by cutting the jugular veins and carotid arteries (Deltoro and Lopez, 1985). Parameters like live weight, weight after blood loss to estimate the blood loss, head weight, dressed head weight, carcass weight, various organ weights, pelt weight and cut up parts weight viz. fore limb, thorax, loin, abdominal flap, shank and rump with hind limb were recorded and analyzed as per the standard methods (Snedecor and Cochran, 1967). Degree of associations was considered between variables by Pearson Correlation Coefficient using IBM SPSS statistics data editor.

Results and Discussion

The data pertaining to the live weight, blood loss, carcass weight, edible and inedible visceral weight are expressed in mean values

and percentage in Table 1. The mean live weight at slaughter, blood loss and carcass weight were 1772.63 ± 40.65 g, 57.47 ± 2.99 g, 911.92 ± 21.05 g. The dressing percentage of New Zealand white rabbits obtained in this study was 51.44 ± 0.56 which was higher compared to other studies (Yalçın *et al.*, 2006; Murshed *et al.*, 2014; Ghosh and Mandal, 2007 and Bianospino *et al.*, 2004.)

The overall dressed carcass weight with giblet and dressed head was 1081.2 ± 23.60 g with a percentage of 60.99 ± 0.63 which was higher compared to Yalcin *et al.*, (2006) who studied the meat characteristics of New Zealand White rabbits at Turkey. The overall mean organ weights were heart 6.53 ± 0.44 g, liver 51.05 ± 1.77 g, kidney 11.34 ± 0.46 g, abdominal fat 23.74 ± 2.43 g and lungs with trachea 11.97 ± 0.70 g which was 0.37 ± 0.03 %, 2.88 ± 0.08 %, 0.64 ± 0.03 %, 1.34 ± 0.13 % and 0.68 ± 0.04 % of live body weight respectively. The values were in resemblance with Yalcin *et al.*, (2006) and slightly higher compared to indigenous rabbits of Bangladesh (Murshed *et al.*, 2014)

Table.1 Carcass characteristics of rabbits (Mean ± S.E. and percentage in proportion to the live weight ± S.E.)

Parameters	Mean value (g)	Mean value (Percentage of live weight)
Live weight	1772.63 ± 40.65	
Head weight	168.84 ± 4.27	9.52 ± 0.21
Dressed head weight	100.32 ± 2.48	5.66 ± 0.10
Carcass weight	911.92 ± 21.05	51.44 ± 0.56
Carcass weight with giblet	980.84±21.66	55.48±0.48
Carcass weight with head	1012.24 ± 23.04	57.10 ± 0.06
Carcass weight with giblet and dressed head	1081.2 ± 23.60	60.99 ± 0.63
Edible parts weight		
Heart weight	6.53 ± 0.44	0.37 ± 0.03
Liver weight	51.05 ± 1.77	2.88 ± 0.08
Kidney weight	11.34 ± 0.46	0.64 ± 0.03
Abdominal fat weight	23.74 ± 2.43	1.34 ± 0.13
Inedible parts weight		
Blood loss	57.47 ± 2.99	3.24 ± 0.14
Pelt weight (with feet)	290.11 ± 12.7	16.37 ± 0.43
Lungs weight	11.97 ± 0.70	0.68 ± 0.04
Intestine weight	304.05 ± 11.04	17.15 ± 0.58
Overall edibles weight	1104.94 ± 24.97	62.33 ± 0.68
Overall inedibles weight	663.61 ± 18.84	37.44 ± 0.56
Edibles : inedibles ratio	1.66 ± 0.04	

Table.2 Cut Up parts of rabbit carcass (Mean ± S.E. and percentage in proportion to the dressed carcass weight ± S.E.)

Parameters	Mean value (g)	Mean value (Percentage of the dressed carcass weight)
Fore limb weight	141.91 ± 4.37	15.78 ± 0.26
Thorax weight	177.44 ± 4.96	19.74 ± 0.30
Loin weight	168.74 ± 4.98	18.73 ± 0.24
Abdominal flap weight	67.31 ± 2.05	7.51 ± 0.16
Rump + hind limb weight	292.30 ± 6.95	32.54 ± 0.21
Shank weight	51.13 ± 1.29	5.71 ± 0.09

Table.3 Correlation coefficients among various carcass traits

	LW	DW	FLW	TW	LOW	AFW	RHLW	SW
LW	1	.897**	.773**	.662**	.805**	.628**	.908**	.735**
DW	.897**	1	.818**	.835**	.898**	.679**	.958**	.777**
FLW	.773**	.818**	1	.463**	.807**	.411**	.768**	.552**
TW	.662**	.835**	.463**	1	.625**	.640**	.771**	.672**
LOW	.805**	.898**	.807**	.625**	1	.565**	.820**	.582**
AFW	.628**	.679**	.411**	.640**	.565**	1	.574**	.558**
RHLW	.908**	.958**	.768**	.771**	.820**	.574**	1	.756**
SW	.735**	.777**	.552**	.672**	.582**	.558**	.756**	1

**. Correlation is significant at the 0.01 level (2-tailed)

LW – Live weight, DW – Dressed weight, FLW – Fore limb weight, TW – Thorax weight, LOW –Loin weight, AFW – Abdominal flap weight, RHLW – Rump and Hind limb weight and SW – Shank weight

The mean value of edibles (dressed carcass with head, giblet and fat) and inedibles were 1104.94 ± 24.97 g and 663.61 ± 18.84 g which contributes 62.33 ± 0.68 % and 37.44 ± 0.56 % of live body weight respectively with an edible and inedible ratio of 1.66 ± 0.04. Whereas in soviet chinchilla males, Ghosh and Mandal (2007) observed lower values of inedibles weight and better ratio of edibles: inedibles. The average value of various cut up parts such as fore limb weight, thorax weight, loin weight, abdominal flap weight, rump and hind limb weight and shank weight were 141.91 ± 4.37 g, 177.44 ± 4.96 g, 168.74 ± 4.98 g, 67.31 ± 2.05 g, 292.30 ± 6.95 g and 51.13 ± 1.29 g respectively. The percentage of various cut up parts in relation to the dressed carcass weight is expressed in Table 2.

The correlations among various carcass traits are given in Table 3. In the present study, significantly high association observed between the live weight and various carcass traits. The correlation observed between the live weight and dressed weight in this study was similar to Murshed *et al.*, (2014). Of the various cut up parts, loin, rump and hind limb were considered as the prime cut up parts because of its high meat to bone yield.

In the present study, the prime portions of cut up parts such as loin, rump and hind limb showed a high correlation with live weight and dressed weight which was in accordance with the previous studies of Metzger *et al.*, (2011) and Michalik *et al.*, (2006) but lower compared to Nwagu *et al.*, (2009) and higher

compared to Murshed *et al.,* (2014). In the dressed carcass yield about 50 % is contributed by the loin, rump and hind limp. These are the prime portions of the carcass with high meat yield. Significant correlation of the portions with live weight suggests that the live weight of rabbit is highly correlated with meat yield and high meat to bone ratio.

The dressing percentage of various animals like beef cattle, sheep / goat, swine, turkey and chicken were 57-64, 49-52, 68-72, 77-81 and 70-72 respectively (Aberle *et al.*, 2001). In general among the foragers reared under tropical conditions, rabbit has a better feed conversion ratio of around 3.3 – 5.0 (Gupta *et al.,* 2000) and the dressing percentage of the rabbits also seemed to be high with better edible to inedible ratio which is very evident in this study. In future, rabbitry will definitely serve the nutritional requirements of the world with a minimal input.

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