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STUDY ON THE FACTORS AFFECTING CARCASS TRAITS OF BROILER RABBITS IN EASTERN HIMALAYAN REGION OF INDIA

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Abstract: Two hundred and ten adult rabbits of both sexes and belonging to four breeds: New Zealand White (NZW), Soviet Chinchilla (SC), Local (LC) and crossbred (CB) were used for this experiment. Rabbits were kept individually in cages under hutch housing conditions. Concentrate mash feed was fed at 100 g/head/d and green roughage *ad libitum* as per availability in different seasons. Rabbit slaughtering data were grouped in 4 categories: 3-5; 6-8; 9-11 and > above 11 m of age. All the data were classified by preslaughter weight, age at slaughter, breed and sex prior to statistical analysis. Slaughter weight, slaughter age, breed and sex had highly significant (P<0.01) effects on carcass weight of rabbits. The overall carcass weight was 854 g and SC was significantly (P<0.05) higher to NZW and CB. Also females' carcass weight was significantly higher than males (875 and 723 g, respectively). Dressed meat weight (including the edible organs) was significantly (P<0.01) affected by slaughter age, breed and sex. Dressing yield amounted on average 54.8% and sex, breed or slaughter age did not have a significant effect. Only preslaughter weight had a significant (P<0.05) effect on dressing %, with the highest value for the heaviest rabbits. Inedible offal weight amounted on average 679 g and all the 4 studied factors had a significant (P<0.01) effect on this part.

Key words: Broiler rabbit, slaughter age, breed, sex, carcass traits.

INTRODUCTION

Rabbit was introduced in India in the last decade as an alternative source of meat production. Rabbit meat is wholesome, tasty with appreciable juiciness and tenderness. It contains a high amount of protein and low amounts of fat and cholesterol (Lebas *et al*, 1986; Das and Bujarbarua, 2005). Thus people in India showed great acceptance of consumption of rabbit meat. In addition, rabbit has a quite high dressing percentage when compared to ruminants, ranging between 50 - 65% (Lebas *et al*, 1986; Roiron *et al* 1992). The heritability of different carcass traits is medium to high, and therefore carcass traits might be considered in rabbit selection and breeding. It has been reported that different factors, such as age at slaughter, weight at slaughter, breed, and sex, have an influence on different carcass traits (Parigi Bini *et al*, 1992; Bianospino *et al*., 2006; Gašperlin *et al*., 2006; Metzger *et al.*, 2006). However, this type of study in India is very limited with the breeds available, in particular in the NEH Region. Hence, an effort was made to find the effects of different factors on the carcass traits of rabbits for obtaining maximum dressed meat and dressing yield.

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MATERIALS AND METHODS

Two hundred and ten adult rabbits belonging to four breeds - New Zealand White (NZW), Soviet Chinchilla (SC), Indigenous Local (LC) and Crossbreeds of Soviet Chinchilla and Indigenous Local (CB) - were slaughtered according to Arrington and Kelly (1976). Rabbits were kept individually at the Division of Animal Production, ICAR Research Complex for NEH Region, Umium, Meghalaya in a cage and hutch system of housing. Concentrate mash feed was fed at 100 g/head/d and green roughage *ad libitum* as per availability in different seasons. Available green roughage in summer was Congo signal grass and rice bean fodder. In the rainy season, soybean leaves, sweet potato stems and leaves and guinea grass were fed, besides the Congo signal grass and rice bean fodder. In the winter season, cabbage, carrots, radishes and sweet potato leaves and stems were available. Other management conditions remained the same.

Carcass weight was considered as the weight of forelimbs, chest, loin and hind limbs. The weight of additional edible parts included the weight of the liver, heart and kidneys. Dressed meat weight was obtained as the sum of the carcass weight and the weight of the edible parts. Inedible offal weight (IOW) was considered as the weight of the skin, head, fore feet, hind feet, tail, lungs, stomach, gall bladder, intestine, urinary bladder and reproductive organs. Dressing yield was calculated by dividing the dressed meat weight by preslaughter weight and expressed as a percentage.

All the data were classified according to preslaughter weight, age at slaughter, breed and sex prior to statistical analysis. Preslaughter weights were grouped into four categories: rabbits having preslaughter weight of less than 1.4, 1.4 to 1.8, 1.9 to 2.3 and above 2.3 kg. Age at slaughter was also grouped in four categories: slaughter age of rabbit 3 to 5, 6 to 8, 9 to 11 and above 11 m. The experiment was conducted in a completely random design. Data were analysed using a one-way factorial analysis of variance as described in Snedecor and Cochran (1967) using the SPSS computer programme. Interactions were not considered.

RESULTS AND DISCUSSION

Slaughter weight, slaughter age, breed and sex had highly significant ($P<0.01$) effects on the carcass weight of rabbits. Carcass weight increased significantly with the increase of slaughter weight and slaughter age (Table 1). Deb and Gaur (1996) also reported significant ($P<0.05$) effects of slaughter weight on carcass weight of rabbits. Our results indicate a significantly ($P<0.05$) higher value when preslaughter weight was above 2.3 kg and slaughter age was above 11 m. Carcass weight was highest in the SC breed (851 g), compared to NZW (746 g) and LC (748 g). Hernandez *et al.* (2000) also reported higher carcass weights in older animals, i.e., rabbits slaughtered at 13 wk of age, than in rabbits slaughtered at 9 wk of age like in our study. Similar to the present findings, Luzi *et al.* (2000) also indicated that slaughter age had a significant effect on rabbit carcass weight, with higher values in animals slaughtered at 120 d of age. In an earlier study by Das and Bujarbarua (2005), highest carcass weights were observed in NZW rabbits in contrast to the present results. There was an no significant difference in carcass weight between SC and CB rabbits and between NZW and LC rabbits. The carcass weight of females (875 g) was significantly ($P<0.05$) higher than in males (723 g). The overall carcass weight was 854 g. In a study by Das and Bujarbarua (2005), higher carcass weight was observed in NZW, in contrast to the present findings.

Dressed meat weight (including edible organs) was significantly ($P<0.01$) affected by slaughter age, breed and sex (Table 1). It increased significantly ($P<0.05$) with the increase of slaughter age. Highest dressed meat weight was found for SC rabbits. In contrast to the present findings, Das and Bujarbarua (2005) indicated a higher dressed meat weight for NZW than for SC rabbits. Dressed meat weight was significantly for SC respect to the other three breeds ($P<0.01$), showing NWZ, LC and CB rabbits similar

Table 1: Effects of slaughter weight and age, breed and sex on carcass traits (mean±SE).

	No	Carcass weight (g)	Dressed meat weight (g)	Inedible offal parts (g)	Dressing yield (%)
overall	210	854±11	910±9	680±5	54.84±0.63
Preslaughter weight (kg)					
<1.4	56	632±9^{a}	852±22	550±9^{a}	54.97±0.62^{ab}
1.4-1.8	115	782±10^{b}	866±12	655±9^{b}	53.43±0.44^{a}
1.9-2.3	25	1005±25^{c}	1163±32	760±28^{c}	54.73±1.07^{ab}
>2.3	14	1195±18^{d}	971±39	789±20^{c}	56.06±0.79^{b}
Significance		**	NS	**	*
Slaughter age (m)					
3-5	120	680±7^{a}	744±8^{a}	588±7^{a}	54.62±0.39
6-8	53	855±16^{b}	918±19^{b}	691±12^{b}	55.16±0.73
9-11	17	944±18^{c}	988±26^{c}	710±31^{b}	54.69±1.08
>11	20	1107±30^{d}	1164±37^{d}	788±26^{c}	55.08±1.13
Significance		**	**	**	NS
Breed					
NZW	104	746±14^{a}	819±15^{a}	625±11^{a}	54.73±0.47
SC	59	851±24^{b}	919±26^{b}	689±15^{b}	55.43±0.50
LC	25	748±36^{a}	838±35^{a}	660±31^{ab}	55.43±0.77
CB	22	817±40^{ab}	864±45^{a}	661±20^{ab}	54.71±1.16
Significance		**	**	**	NS
Sex					
Male	127	723±12^{a}	786±12^{a}	641±10^{a}	54.35±0.43
Female	83	875±20^{b}	951±21^{b}	715±14^{b}	55.60±0.47
Significance		**	**	**	NS

NZW: New Zealand White, SC: Soviet Chinchilla, LC: Indigenous Local, CB: Crossbreeding of Soviet Chinchilla and Indigenous Local.
Significance: *P<0.05, **P<0.001 and NS P>0.5
Means within column and factor with different superscripts were significantly different (P<0.05).

values. Dressed meat weight was significantly higher in females than in males. The overall dressed meat weight was 910 g.

Data analysis revealed that slaughter weight, slaughter age, breed and sex had a highly significant (P<0.01) effect on the IOW of rabbits (Table 1). IOW was significantly higher in rabbits slaughtered at over 11 m of age, which belonged to the highest preslaughter weight group. Therefore, obviously, IOW was significantly lower in the youngest slaughter age group and belonged to lowest slaughter weight group. It was significantly higher in SC than NZW rabbits. In contrast to the present findings, Das and Bujarbarua (2005) indicated a higher IOW in NZW than SC breeds of rabbit. IOW was significantly (P<0.05) affected by sex and it was significantly higher in females than in males. The present findings were supported by Luzi *et al*. (2000), who reported that intestine weight was significantly higher in females. However, these

findings contrast with the fact that skin and forefeet weights were significantly higher in males than in females. The overall value of inedible offal weight was 679 g.

Only the preslaughter weight of rabbits had a significant ($P<0.05$) effect on dressing yield (Table 1). This is in agreement with the findings by Deb and Gaur (1996). Milisits *et al*. (2000) corroborated with the present findings and indicated that dressing yield was found to be higher in heavier rabbits of the same age. In our comparative trial, it was significantly higher in rabbits slaughtered from highest preslaughter weight group and dressing yield was significantly lower in rabbits belonging to the group having a preslaughter weight of 1.4 to 1.8 kg instead of the lowest preslaughter weight group.

Preslaughter age had no significant influence on dressing yield. In contrast to the present findings, Deb and Gaur (1996) found a significant effect of slaughter age on dressing yield. Milisits *et al*. (2000) also contrasted with the present findings, as they have observed a higher dressing yield in older rabbits than younger ones of the same weight. Luzi *et al*. (2000) corroborated with the present findings in that the dressing percentage was not affected by the animal's slaughter age. However, Hernandez *et al*. (2004) reported that younger rabbits have lower dressing yield. Milisits *et al*. (2000) also indicated that the effect of slaughter weight was more pronounced than slaughter age on the dressing yield. Breed did not have a significant effect on dressing yield. Sex had also an insignificant effect on dressing yield. The overall value was recorded to be 54.85%. Das and Buzarbarua (2005) reported a much lower dressing percentage for SC, 53.02% and NZW rabbits, 52.50%, in comparison to the present findings. Roiron *et al*. (1992) indicated a higher dressing yield, 56.40%, in crossbred rabbits, and Salroo *et al*. (1989) indicated much lower dressing yield, 45.09%, in crossbred rabbits than in the present experiment. However, the aforementioned differences could be partly explained by the differences in methodology used to determine slaughter yield.

It is concluded that preslaughter weight influences the carcass weight, which is logical, but also dressing yield. Slaughter age, on the other hand, did not have a significant effect on dressing yield. Both sex and breed were found to affect carcass weight and dressed meat weight.

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