RESEARCH AND DEVELOPMENT OF RABBIT PRODUCTION IN NORTH EASTERN HILLS REGION OF INDIA

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Abstract - Four breeds of rabbit, New Zealand White (NZW), Soviet Chinchilla (SC), Grey Giant (GG) and Russian Angora (RA) were introduced for the first time in Eastern Himalayan region of India. Based on the performance, NZW and SC were recommended for meat production. Litter size at birth and weaning did not differ significantly in two breeds. Highly significant differences due to litter weight ($P<0.01$) at birth and significant difference due to litter weight at weaning ($P<0.05$) was observed with NZW recording a litter weight at birth and weaning of 401.09 ± 47.61 g and 3.82 ± 0.09 k, respectively against 362.72 ± 7.84 and 3.51 ± 0.11 in SC. Body weight at 96, 120 and 180 days also differed significantly ($P<0.01$). While age at first kindling and interkindling interval differed highly significantly ($P<0.01$), difference in gestation period was significant ($P<0.05$). With a body weight of 1.93 ± 0.11 kg at slaughter age (96 days), NZW rabbits were found to be more economical for meat production. 91.50 per cent of the population accepted rabbit meat in the region. Out of a total of 180 educated youths trained on rabbit production, 139 persons took up rabbitry with success. Following training of ten Government officers, 7 rabbit production farms were established to cater to the needs of different states of the region.

INTRODUCTION

North Eastern Hills (NEH) region of India covering seven states constitutes 8 percent of India's geographical area representing 3.70 per cent of country's population (NEC report, 1992). More that 79 per cent of the population are tribal people engaged mostly in agricultural activities. Animal husbandry is an integral part of their operation as almost 100 per cent of the people are non vegetarian in their dietary habit with preference for meat and meat products. Although the choicest meat are pork, beef, chicken and mutton, meats from a wide variety of other semi domesticated (like MITHUN and YAK) and wild (like wild pigs, fowl, deer and rabbits) animals are also taken. The region spends around Rs. 1000 crores annually on procuring meat and meat products from other parts of the country as the demand surpasses local production.

The region is also a cold climatic area having an altitudinal variation from foot hills to alpine zone. The highest rainfall area of the world, Mawsynram near Cherrapunjee is also a part of this region. The region, therefore offers an excellent climate for Angora rabbits.

Considering the heavy demand for meat in the region and absence of any taboo among the local tribal people regarding the consumption of different types of meat (beef, pork, etc. are not the common meat in the plain area of the country), the Institute introduced rabbit in the region in the year 1983 and studied their different parameters ranging from adaptability and acceptability to economic viability. The study was followed by an extension programme in the farmer's field and other government agencies with a view to propagating rabbits as an alternate source of livestock for the people of the region. Results obtained over a decade are communicated.

MATERIALS AND METHODS

Twenty four breedable females and six males from each of New Zealand White (NZW), Soviet Chinchilla (SC), Grey Giant (GG) and Russian Angora (RA) rabbits constituted the base population initially. RA was, however. replaced with German Angora (GA) recently due to poor wool yield of RA. Similarly, GG was also eliminated later on as the number of services needed per conception in this breed was found to be high (4.5 Services) under the climatic condition of the region. Angora rabbits have not been covered in the present communication.

The animals were reared under cage system. For the purpose of breeding and kindling, open yard hutch made of wood and 16 gauges wire mesh was used. Some hutches were made with a delivery quarter while the nest boxes

were used in others. In general rabbits were fed pellet feed with a protein per cent that varied from 16 to 20 depending on the stages of growth and production. Quantity of feed given were : 50-70 g per weaner, 75-100 g per grower and 100-130 g per adult and lactating doe. Young rabbits were weaned at 45 days of age and slaughtering for meat purpose was done at 96 days. Different trials on the rabbit nutrition (GUPTA et al., 1992 and GUPTA et al., 1993) and disease aspects (RAJKHOWA et al., 1995 ; GHOSH et al., 1987 ; GHOSH and BUJARBARUAH, 1989) were conducted in the Department's rabbit research farm.

After ascertaining the adaptability and other parameters, the evolved technologies were passed on to the state Veterinary Departments and farmers on the region through organised training programmes.

RESULTS AND DISCUSSION

Production and reproduction

Table 1 : Production and reproduction traits of NZW and SC rabbits in Eastern Himalayan Region of India

Traits	Breeds	
	NZW	SC
Litter size at birth	6.38 ± 0.11 (116)	6.45 ± 0.14 (116)
Litter weight at birth (g)	401.09 ± 47.61 (110)	362.72 ± 7.84 (110)
Litter size at weaning	4.89 ± 0.08 (116)	4.99 ± 0.09 (116)
Litter weight at weaning (kg)	3.82 ± 0.09 (110)	3.51 ± 0.11 (110)
Body weight at 96 days (kg)	1.93 ± 0.11 (96)	1.82 ± 0.07 (96)
Body weight at 120 days (kg)	2.34 ± 0.09 (96)	2.17 ± 0.13 (96)
Body weight at 180 days (kg)	2.68 ± 0.16 (96)	2.59 ± 0.08 (96)
Age at first kindling (days)	206.88 ± 1.44 (118)	211.25 ± 0.82 (118)
Gestation period (days)	30.28 ± 0.09 (96)	30.66 ± 0.10 (96)
Interkindling interval (days)	90.55 ± 0.67 (96)	95.68 ± 0.67 (96)

(Figures in parentheses indicate number of observations)

Mean and Standard Error recorded for some of the productive and reproductive traits in NZW and SC rabbits are presented in Table 1. Analysis of variance for the traits reported are depicted in Table 2 and Table 3.

Litter size at birth and weaning in NZW and SC breeds varied between 3 and 9 and 3 and 6 ; and 10 and 3 and 7 with an average of 6.38 ± 0.11 and 4.89 ± 0.08 and 6.45 ± 0.14 and 4.99 ± 0.09 (Table 1),respectively. Difference in litter size at birth and weaning in the two breeds was not significant (Table 2). Such difference due to breeds was reported by HATTENHAUER et al (1977) and LAHIRI and MAHAJAN (1984). Similar findings in the litter sizes of the two breeds were indicated by PATIAL et al. (1991). NZW, however, recorded significantly higher ($P < 0.01$) litter weight at birth (Table 3) which ranged from 200 to 550 g against a range of 150 to 500 g in SC. NZW also had significantly higher litter weight ($P < 0.05$) at weaning (Table 3) that varied from 2.20 to 6.76 kg. Although LAHIRI and MAHAJAN (1984) recorded higher litter weight in SC, the findings were similar to CSWRI report (1993).

NZW rabbits were also significantly heavier than SC at slaughter age (96 days), 120 and 180 ($P < 0.01$) days of age (Table 2). OMLE (1977), ESCHIETT et al. (1972) and BUJARBARUAH and DAS (1993) also reported similar trend in the growth of NZW rabbits.

Table 2 : Analysis of variance for litter sizes and body weight at 90, 120 and 180 days

	df	Mean Sum of Squares				
Source		LSB	LSW	90 days	120 days	180 days
Between breeds	1	0.28	0.62	587418.75**	1296918.75**	396487.63*
Error	In	2.01	0.86	53852.00	36271.65	63178.22
	parenthesis	(230)	(230)	(190)	(190)	(190)

** Significant at ($p < 0.01$) ; * Significant at ($p < 0.05$) ; LSB : Litter size at birth ; LSW : Litter size at weaning.

The age at first kindling, gestation period and interkindling interval in NZW varied from 188 to 235, 29 to 31 and 79 to 106 with an average of 206.88 ± 1.44, 30.28 ± 0.09 and 90.55 ± 0.67 days, respectively (Table 1).

Corresponding figures for SC were 189 to 232, 29 to 32 and 80 to 109 and 211.25 ·0.82, 30.66 0.10 and 95.68 0.67. Highly significant variation ($P < 0.01$) between the breeds was observed for all the three characters (Table 3). Similar trend in the three characters were reported by BUJARBARUAH et al. (1989). The findings revealed that with an interkindling interval of 90.55 ± 0.67 days, a total of four crops per NZW doe could be obtained per year. Performance record of the two breeds also indicated their adaptability in the region.

Table 3 : Analysis of variance for the other traits mentioned in Table 1

Source	df	Mean Sum of Squares				
		Litter Wt. at birth	Litter Wt. at weaning	Age at first kindling	Gestation period	Interkindling interval
Between breeds	1	1559047**	5511056.36*	1128.20**	6.75**	1253.39**
Error	In	128265.14	1090692.27	161.17	0.79	42.51
	parenthesis	(218)	(218)	(234)	(190)	(218)

**Significant at ($p < 0.01$) ; * Significant at ($p < 0.05$)

Acceptability of rabbit meat

Well dressed rabbit meat was made available to the general public through the sale counter of the Veterinary Department, Shillong, Meghalaya. Feedback information received from 80 respondents indicated that the meat was acceptable to 91.50 per cent of the population. Dressing percentage recorded at the institute level was 62.50.

Production economics

As the rabbit was a new introduction in the region its production economics was calculated at the institute level. For the purpose of calculating the economics, expenditure components on cage/hutches, feed (pellet), labour and veterinary medicines were taken into consideration from weaning to 96 days of age. Results are presented in Table 4. It was found that a profit of Rs. 20.45 and 17.30 per NZW and SC rabbit could be obtained to which the value of fur skin @ Rs. 15 per skin would also be added.

Table 4 : Economics of NZW and SC rabbits

Breeds	Body wt. at 96 days (kg)	Dressed meat (kg)	Rate per kg (Rs)	Receipt (Rs)	Expenditure (Rs)	Profit (Rs)
NZW	1.93	1.21	45.00	54.45	34.00	20.45
SC	1.82	1.14	45.00	51.30	34.00	17.30

Development of rabbit raising

Table 5 : Number of persons trained on rabbit production

Category of trainees	State belonged to	Number of persons trained	Number of trainees took up rabbit production
1. Private	Manipur	90	74
	Nagaland	70	50
	Meghalaya	20	15
2. Government	Meghalaya	4	Established two farms, one at Shillong and the other at Tura.
	Manipur	2	Established one farm under Manipur Agricultural college, Imphal.
	Nagaland	2	Established two farms, one under North Eastern Council and the other at Jharnapani.
	Mizoram	2	Established two farms, one at Kolasib and the other at Lunglei.

After ascertaining the adaptability through production and reproduction parameters, acceptability of meat and economic viability of rabbit, attempts were initiated to propagate rabbit raising as an alternate source of livestock in the region through organised training programmes. Number of persons (from veterinary department, agricultural universities and farmers) trained and rabbitry established are presented in Table 5.

Considering the potentialities of the rabbits in the region, Directorate of Science, Technology and Environment (A Government of India Department) units in the states of Manipur and Nagaland sponsored a number of educated youths for the training

most of whom (Table 5) subsequently took up rabbit farming. Initial training on rabbit production and management was followed up with a training on fur skin processing and utilisation (BUJARBARUAH et al., 1995). The impact of training and subsequent growth of rabbitry was such that industrial agencies of the region are now approaching the Institute for joint industrial venture.

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