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Predicting performance of Phanrang sheep in North Vietnamese conditions

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Summary

The study was carried out at the Goat and Rabbit Research Centre (GRRC) and on 5 smallholdings in the hilly and mountainous area of Bavi district from 1998 to 2003. After 5 years with 2 generations of Phanrang sheep it was noted that Phanrang sheep have a good adaptation to conditions of intensive feeding on station and also to extensive feeding in smallholder situations, showing good growth and development. Furthermore they had satisfactory reproduction and resistance against common diseases and can withstand hard conditions.

The sheep reached a body weight of 18.1 to 24.6 kg (males), and 16.5 to 22.7 kg (females) at 6 to 9 months of age. Feed consumption up to 6 to 9 months of age was 6.31 to 6.84 kg DM and 0.59 to 0.62 kg crude protein/kg weight gain and the carcass rate was 39.4% and 40.7% for females and males, respectively. Average reproductive performance was 1.4 to 1.7 kids/kidding with 92.7 to 93.4% survival rate up to weaning. After 5 years the total herd of sheep in GRRC had increased to 500 head from 34 females and 5 males at the beginning. The Phanrang sheep should be recognised as a good producer of meat and be increased in number in order to use the available and cheap food resources in North Vietnam more efficiently.

Keywords: growth rates, carcass characteristics, milk production.

Introduction

Sheep were imported from Mongolia and China to North Vietnam in the 1960's. They could not, however, adjust to the harsh conditions (hot and wet) in this area and it was commonly believed that sheep could not be raised in North Vietnam. The local Phanrang sheep (short, thin tailed), which also originally came from Mongolia and China, has, however, existed and developed well in a dry hot climate and with feed of low nutritive value in Ninhthuan province for a hundred years, and been used for meat production (Mai et al., 1994). However, the introduction of this breed to other parts of the country has not been tried, therefore it has been questioned if local Phanrang sheep can adapt and develop in North Vietnam.

In December 1998, GRRC brought 39 Phanrang sheep to the station, which is located in the hilly and mountainous area of Bavi district, to study their adaptation, production and reproductive abilities under the conditions of Northern Vietnam.

Materials and methods

Location and climate of the study area

The study was conducted at GRRC and at some households in Bavi district during the period 1998 to 2003. The climate in Bavi is extremely different to the climate in Ninhthuan. Ninhthuan is located in the south-central part of Vietnam, with hot climate the whole year, and mean temperature is 27.5°C and annual rainfall is 717 mm. However, Bavi is a hilly and mountainous area in the North; mean temperature is 25°C with four distinct seasons. In the winter, there is a cold wind from northeast and the annual rainfall is 1800 mm.

Experimental animals, feeds, management and measurements

The 39 original sheep were selected from farms at different locations in Ninhthuan province (Phanrang town, Ninhchu district, Ninh phuoc district) in 1998 and the experimental animals were these sheep (parents) and their 50 offsprings born at GRRC.

The sheep were kept in houses with wooden floors with 4 animals per pen. They were grazed 3 to 4 hours per day in the winter and 6 to 8 hours in the summer. They were also supplemented with 3 to 4 kg fresh foliage, grasses and 150g (for growing sheep) or 200g dried cassava root or concentrate (for mature sheep). Water was available all times. The animals were ear tagged. Females were naturally bred and all animals were weighed in the morning before feeding. For recording milk yield, the lambs were weighed before and after each suckling. The lambs were allowed to suckle five times per day in the first two weeks and thereafter three times per day until weaning at 90 days of age. The sheep were sheared once a year at the end of May. The data were statistically analysed by Excel software.

Results and discussion

Reproductive performance of the Phanrang sheep is reported in Table 1. Phanrang sheep raised at GRRC, both parent and offspring generations, had similar results compared to the sheep raised at Phanrang. The duration of gestation (at Bavi) was 146 and 147 days for parent and offspring generations respectively, while it was 150 days for sheep raised at Phanrang. Litter size was 1.36 to 1.45 at Bavi and 1.45 at Phanrang.

Table 1. Characteristics of the buck and some reproduction parameters of Phanrang sheep

Parameter	Parent		Offspring		Ninh thuan*
	n	Mean and SE	n	Mean and SE	
<i>Males</i>					
Copulation reflex, d	12	153±14.5	16	149±14.1	150
Utilization for mating, d	6	295±25.4	4	308±19.8	300
<i>Females</i>					
Age at puberty, d	28	181±13.5	23	185±15.7	180
Age at first mating, d	25	295±35.1	20	309±37.8	270-300
Interval between oestrus, d	50	19±4.5	22	18±4.25	16.17
Length of gestation, d	48	146±2.9	20	147±2.1	150
Litter size (heads)	109	1.36	58	1.45	1.35
Interval between births, d	50	246±24.7	6	252±27.3	250
No of kids/doe/year	40	1.69	7	1.67	1.7
Survival rate (0-3 months of age)	48	93.4	13	92.7	
%					

Ly et al. (1994)

Body weight changes and daily weight gains of lambs are shown in Tables 2 and 3. The body weight of male lambs in both generations was higher than that of female lambs (Table 2). The highest daily weight gain was obtained in the period from 0 to 3 months of age, and thereafter the growth rate gradually decreased (Table 3). In general, body weights of sheep born in Ninhthuan (parentstock) were similar to those obtained in sheep born in GRRC. The growth rate was also similar for both generations.

12 lambs were slaughtered at 6 to 7 months of age after 24 hours of fast. The results showed that the carcass rates were 39.4% and 40.7% for females and males respectively (Table 4). This less than the value reported by Chacon et al. (1970; cited in Combellas, 1980) for lambs of tropical breeds, 44.9%. However, it is in the range of values reported by Lopez et al. (1979; cited in Combellas, 1980) for the sheep of mixed tropical breeds up to 5 years of age (39.1% to 46.9%).

Table 2. Body weight changes of lambs (kg/head)

Month of age	Parent				Offspring			
	Male		Female		Male		Female	
	n	Average	n	Average	n	Average	n	Average
At birth	22	2.6±0.8	24	2.3±0.1	22	2.6±0.5	28	2.3±0.2
3	17	14.5±3.2	24	13.4±2.4	18	14.7±1.3	27	13.9±1.3
6	16	21.5±5.8	23	21.0±3.8	16	21.4±1.9	26	20.8±2.1
9	14	27.1±3.4	21	24.6±1.3	15	27.4±2.2	24	24.8±1.5
12	12	28.1±4.1	20	26.6±1.8	14	28.1±1.9	23	26.8±1.9
18	5	36.1±1.1	20	28.3±4.5	12	36.5±1.2	22	29.0±3.4
24	5	49.5±1.8	20	31.9±2.8	5	48.9±1.9	21	32.8±1.8

Table 3. Daily live-weight changes in lambs (g/day)

Period (months)	Parent		Offspring	
	Male	Female	Male	Female
0-3	122	109	123	110
0-6	108	104	109	105
0-9	93	83	93	84
0-12	72	68	73	69

Table 4. Carcass characteristic of lambs (mean and SE) at 6 to 7 month of age

Parameters	Male (n=6)	Female (n=6)
Average body weight (kg)	20.2±1.5	17.8±1.7
Carcass (%)	40.7±2.1	39.4±1.8
Muscle (%)	29.7±1.3	29.3±1.2
Bone (%)	11.3±0.8	10.1±0.9
Head (%)	6.4±0.7	7.3±0.8
Viscera (%)	37.4±2.9	35.0±2.3
Hooves (%)	3.4±0.2	2.9±0.3
Skin and wool (%)	7.2±0.5	10.7±0.5
Blood (%)	4.9±0.2	4.3±0.3

Milk production is presented in Table 5. The highest milk yield was recorded in the first month of the lactation period for both generations and thereafter it declined slightly. This finding is consistent with Combellas (1980) who reported that the lactation peak in tropical sheep was reached in the first week after parturition and thereafter production decreased rapidly, being very low after 8 weeks of lactation.

Table 5. Milk production in Phanrang sheep (kg/day)

Month	Parent		Offspring	
	n	Mean and SE	n	Mean and SE
1	40	0.57±0.17	15	0.72±0.18
2	38	0.52±0.08	14	0.52±0.07
3	38	0.40±0.04	14	0.42±0.05

The results of the recording of feed consumption showed that the feed conversion ratio (FCR, Table 6) was similar for both generations.

The original sheep (parent stock) were transferred to GRRC after a very long journey by road. There were no serious diseases due to changes in environmental conditions. After 3 years at GRRC, with its harsh climatic conditions (hot and wet), the sheep were still in a good condition without serious diseases. Some of common diseases such Pneumonia, Pasteurellosis, Enterotoxemia occurred but were easy to treat.

Table 6. Feed conversion ratio of Phanrang sheep

Parameter	Parent		Offspring	
	n	Mean and SE	n	Mean and SE
kg milk/kg weight gain (0-3 months)	34	4.2±0.7	32	4.1±1.2
kg DM/ kg weight gain				
3-6 months of age	25	6.0	28	5.8
6-9 months of age	20	6.3	22	6.2
9-12 months of age	16	6.8	18	6.7
kg CP/ kg weight gain				
3-6 months of age	25	0.6	28	0.6
6-9 months of age	20	0.6	22	0.6
9-12 months of age	16	0.7	18	0.6

Conclusions

After five years at GRRC, the Phanrang sheep were shown to adjust and develop well in the harsh environment in Northern Vietnam. The productive and reproductive parameters of the sheep were similar or higher compared to those obtained in Ninhthuan province.

The number of sheep in the North has been increasing yearly from 34 heads at the beginning to more than 500 heads in 2003.

The sheep born in Bavi had a better ability to resist common diseases compared to their parents. During 2001 to 2003 there was no mortality, which means that the Phanrang sheep have adjusted well to the environmental conditions and management systems of Northern Vietnam.

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