

Characterisation of Salem Black goats in their home tract

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Summary

The Salem Black is an important meat goat breed in the north-western part of Tamil Nadu, India. The native tract of this breed is the Salem, Dharmapuri, Krishnagiri, Erode, Karur and Namakkal districts of Tamil Nadu. Salem Black goats are tall animals, completely black in colour and reared mainly for meat. The average herd size of Salem Black goats was 31, of which there were 1 buck, 23 does and 7 kids. The chest girth, body length and height at withers of Salem Black goats at full mouth age were 79.6±1.1 cm, 75.0±1.5 cm and 86.0±1.6 cm, respectively in males and 73.1±0.6 cm, 69.8±0.5 cm and 75.5±0.8 cm, respectively in females. The body weight of Salem Black goats at full mouth age was 38.5±1.0 kg in males and 29.5±0.6 kg in females. The average age at first mating was 9.5±0.4 months in males and 9.7±0.2 months in females, and the average age at first kidding was 14.8±0.2 months. The percentage of animals producing singles, twins, triplets and quadruplets was 54.1, 40.0, 8.2 and 0.4, respectively. Salem Black goats are allowed to browse extensively as a herded group for about seven to eight hours per day and are housed mostly (80%) during the night. Farmers kept breeding bucks, when available, in the herds at all times and exercised no controlled mating. The mortality rate in kids and adults was 7.5% and 2.3% respectively.

Resumen

La raza caprina Salem Black es una importante raza de carne de la zona noroeste de Tamil Nadu en la India. Las zonas de origen de esta raza se encuentran en Salem, Dharmapuri, Krishnagiri, Erode, Karur y Namakkal, en la región de Tamil Nadu. Estos animales son altos, de manto totalmente negros y se crían principalmente para carne. La media de los rebaños de Salem Black era de 31 cabezas, de las cuales había un macho, 23 hembras y 7 cabritos. La circunferencia torácica, longitud corporal, y altura al garrote de esta raza en edad adulta es de 79,6±1,1 cm, 75,0±1,5 cm y 86,0±1,6 cm en machos y de 73,1±0,6 cm, 69,8±0,5 cm y 75,5±0,8 cm en hembras. El peso corporal de la Salem Black en edad adulta es de 38,5±1,0 para los machos y de 29,5±0,6 kg en las hembras. La edad media al primer celo es de 9,5±0,4 meses en los machos y de 9,7±0,2 meses en las hembras, y la media de edad al primer parto de 14,8 xx meses. El porcentaje de partos simples, dobles o triples y cuádruples es de 54,1; 40,0; 8,2 y 0,4, respectivamente. La raza Salem Black está capacitada para el pasto extensivo en rebaño durante siete u ocho horas diarias, y la mayoría pasan la noche a cubierto (80%). Los ganaderos mantienen al macho dentro del rebaño siempre que pueden sin ejercer ningún tipo de control sobre las montas. La mortalidad media de las crías y adultos es de 7,5% y 2,3% respectivamente.

Keywords: *Geographic distribution, Morphological characteristics, Reproductive*

performance, Breeding, Husbandry, Disease prevalence, Marketing.

Introduction

Goats contribute meat, milk, skin and fibre, as well as manure and serve as the sole or subsidiary livelihood for a large number of small and marginal farmers and landless labourers in India (Anon., 1994). Tamil Nadu is situated in the southern part of India and has a goat population (as per 1998 census) of 5.39 million (Report, 1998). Annually, goats provide 17.32 thousand tonnes of meat, representing 35% of the total meat obtained from food animals in the state (Sastry, 1995). In addition 4 880 000 pieces of skin are obtained as by-products every year (Report, 1992). In spite of the substantial contribution of goats to the rural economy no serious attempt has been made to document their genetic diversity and production potential in their breeding tract. Tamil Nadu has two recognized goat breeds, the Kanni Adu (Acharya, 1982; Thiruvankadan *et al.*, 2000a; Thiruvankadan *et al.*, 2000b) and the Kodi Adu (Jain *et al.*, 2000). Apart from these breeds of goat, Tamil Nadu has another goat breed, the Salem Black goat, which needs characterization and recognition. The earlier study (Mariadas, 1996) on Salem Black goats is not comprehensive and the physical and production traits are not reported. Hence, this study has been made in the Salem Black goat breeding tract to document the distribution, morphological, physical, production and reproduction traits of Salem Black goats.

Materials and Methods

A study was undertaken in 57 herds belonging to 12 villages in the breeding tract. Particulars on physical measurements and body weights of Salem Black goats were recorded for 187 males and 461 females. Data on the reproduction performance of

males (n=36) and females (n=96) were collected from the yearlings and does present in the herd by questioning the owner about each animal specifically. In addition the data on husbandry practices was collected. For analysis the kids were classified as birth, three, six, nine and twelve months and adult animals were classified as two tooth, four tooth, six tooth and full mouth age groups. The data collected were subject to standard statistical analysis as per Snedecor and Cochran (1989).

Results and Discussion

Habitat and geographic distribution

The name Salem Black has been derived from the goat's place of origin and coat colour. The name Salem has been derived from the place Salem (i.e., Salem district in Tamil Nadu) in which this breed actually originated. Since this breed is completely black in colour it has been given the name Salem Black. It is also known as *Karuppuadu*. The breed is distributed in Salem, Dharmapuri, Krishnagiri, Erode, Namakkal and Karur districts of Tamil Nadu (Figure 1) which lie approximately between 10° 35' and 13° 01' N latitude and 76° 5' and 78° 5' E longitude. The elevation of the tract ranged between approximately 150 m and 700 m above mean sea level. The approximate total area of the breeding tract is 29 24 531 km². In the majority of the areas the farmers were rearing only the Salem Black breed of goat, in some places farmers were also rearing Tellicherry and Tellicherry crossbreds in addition to Salem Black goats. The breeding tract of the Salem Black lies in the north-western agro-climatic zone of Tamil Nadu and the climate is generally hot, semi-arid and tropical in nature. Mean annual maximum and minimum temperatures were 34.3° C and 21.9° C, respectively. The mean annual relative humidities recorded at 08.30 h and 17.30 h were 77.2% and 55.1%, respectively. The average annual rainfall was 1 112 mm.

Herd size

The herd size of the Salem Black goat in its breeding tract varied from a few animals (two to five) to relatively large herds (50 to 70) with an average of 31, composed of 23 does, 1 buck and 7 kids. The majority of the farmers had a herd size of 10 to 30 goats. The percentage of farmers having a herd size of 0-10, >10 - 20, > 20 - 30, > 30 - 40 and above 40 was 1.8%, 24.6%, 43.8%, 10.5% and 19.3%, respectively.

Morphological characteristics

Salem Black goats are tall animals with a lean body and a completely black coat (Figure 2 and 3). The head is medium in length with a medium to broad forehead. The profile of the head is straight. The ears are medium-long, leaf like and semi-pendulous. The mean values of ear

length in adult males and females were 17.2 ± 0.3 cm and 16.0 ± 0.1 cm, respectively. The eyelashes are black in colour and the goats have a grey coloured tapering muzzle. In adults, both males and females have horns which are ash grey to grey in colour with no typical horn pattern. The mean values of horn length in adult males and females were 20.0 ± 0.9 cm and 13.7 ± 0.5 cm, respectively. The top line was almost straight. The flank was moderate in size and not too wide. The thigh was lean and not well developed. They have long, lean and straight legs squarely set under the body. The hooves and dewclaws are grey in colour. The tail is thin, medium in length and curled upwards. The mean values of tail length in adult males and females were 20.4 ± 0.4 (32) cm and 17.6 ± 0.1 (46) cm, respectively. The udder is not well developed. It is small and round and tightly attached to the belly with small conical teats placed laterally.

Physical measurements

In kids, the mean (\pm SE) chest girth, body length and height at withers of Salem Black goats pooled over sexes at six months of age were 52.3 ± 0.5 (60) cm, 51.6 ± 0.5 cm and 58.8 ± 0.5 cm, respectively and at 12 months of age were 61.8 ± 0.6 (46) cm, 59.5 ± 0.5 cm and 67.4 ± 1.1 cm, respectively. These body measurements increased progressively as the age advanced and at full mouth age they were 79.6 ± 1.1 (7) cm, 75.0 ± 1.5 cm and 86.0 ± 1.6 cm, respectively in males and 73.1 ± 0.6 (44) cm, 69.8 ± 0.5 cm and 75.5 ± 0.8 cm, respectively in females. Based on height at withers, goats are classified as large (>65 cm), small (51-65 cm) and dwarf (<50 cm) (Devendra and Burns, 1983). Accordingly Salem Black goats can be grouped under large breeds. In general, the males had greater body measurements than females. The coefficient of variation for the body measurement at different age groups ranged from 5.5% to 10.8 %.

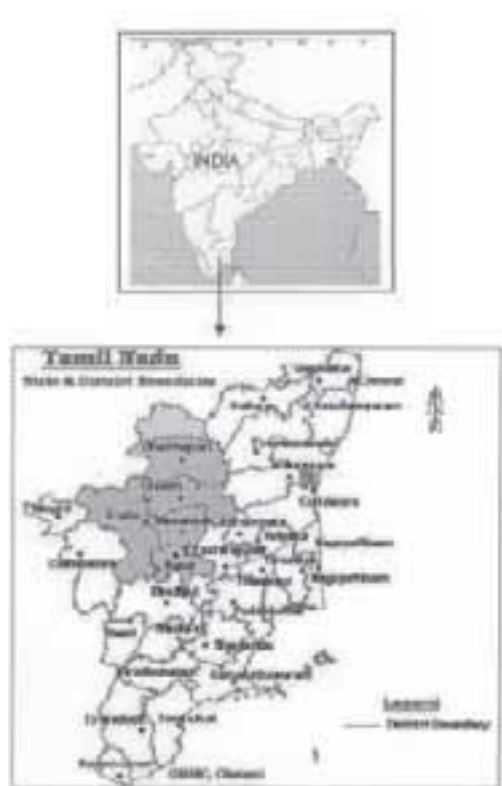


Figure 1. Breeding tract of Salem Black goat in Tamil Nadu, India.



Figure 2. Salem Black goat: a buck.



Figure 3. Salem Black goat: a doe.

Body weight

The mean (\pm SE) body weight of Salem Black kids at birth, three, six, nine and 12 months of age was 2.6 ± 0.3 (22) kg, 8.6 ± 0.2 (58) kg, 12.1 ± 0.4 (14) kg, 14.4 ± 0.5 (14) kg and 22.6 ± 1.5 (14) kg, respectively for males and 2.4 ± 0.1 (23) kg, 8.5 ± 0.2 (75) kg, 12.1 ± 0.3 (50) kg, 13.9 ± 0.3 (14) kg and 18.6 ± 0.3 (14) kg, respectively for females. In adults, the body weight at two tooth, four tooth, six tooth and full mouth age was 25.8 ± 0.8 (30) kg, 28.5 ± 0.8 (8) kg, 36.4 ± 1.4 (12) kg and 38.5 ± 1.0 (15) kg, respectively for males and 22.5 ± 0.5 (54) kg, 24.7 ± 0.6 (65) kg, 26.4 ± 0.5 (45) kg and 29.5 ± 0.6 (53) kg, respectively for females. The coefficient of variation for body weight ranged between 14.2% and 21.2%. In general, the body measurements and body weight of Salem Black goats were lower than those reported for the Kanni Adu and Kodi Adu breeds (Thiruvankadan, *et al.*, 2000b; Jain *et al.*, 2000).

Reproductive performance

The Salem Black goat seems to have good reproduction potential in terms of early sexual maturity and prolificacy. The reproduction performance of Salem Black

goats is presented in table 1. The majority (81%) of females attained sexual maturity between nine and twelve months of age. Maintaining bucks all the time in the herds resulted in the mating of most of the females in the first oestrus. The age at first kidding varied from 11 to 18 months and 75% of the does in the herds studied were reported to have kidded well before the eruption of the first pair of permanent incisors. The multiple birth percentage accounted for 48.6%. On the contrary, Mariadas (1996) reported that the incidence of twin birth was rare in Salem Black goats. The multiple birth percentages observed were lower than those reported for the Kanni Adu and Kodi Adu breeds (Thiruvankadan, *et al.*, 2000a; Jain *et al.*, 2000).

Husbandry practices

Feeding

Salem Black goats are allowed to browse extensively as a herd (Figure 4). They are taken out for browsing up to a distance of three to six kilometres for a period of seven to eight hours daily in the bushes along road sides, uncultivable lands, forest areas and harvested fields. The main sources of fodder are local weeds on the banks of dry and wet

Table 1. Reproductive performance of Salem Black goats.

| Character | Number of observations | Mean \pm S.E. | Range | Coefficient of variation (%) |
|-------------------------------|------------------------|-----------------|----------|------------------------------|
| <i>Males</i> | | | | |
| Age at first mating (months) | 36 | 9.5 \pm 0.40 | 7 to 12 | 24.1 |
| <i>Females</i> | | | | |
| Age at first mating (months) | 96 | 9.7 \pm 0.20 | 6 to 13 | 17.1 |
| Age at first kidding (months) | 82 | 14.8 \pm 0.20 | 11 to 18 | 11.4 |
| Kidding intervals (months) | 62 | 7.1 \pm 0.80 | 6 to 9 | 10.8 |
| Mean litter size | 440 | 1.6 \pm 0.03 | 1 to 4 | 41.9 |
| Litter size (%) | | | | |
| Singles | 440 | 51.4 | | |
| Twins | 440 | 40.0 | | |
| Triplets | 440 | 8.2 | | |
| Quadruplets | 440 | 0.4 | | |



Figure 4. A herd of Salem Black goats grazing in its natural environment.



Figure 5. An open pen, placed in the harvested field.

lands, leaves from harvested crops and lopped tree leaves. The major fodder trees noticed were *Azadirachta indica*, *Tamarindus indica*, *Ficus benghalensis*, *Albizia lebbek*, *Acacia nilotica*, *Prosopis juliflora*, *Ziziphus mauritiana* and *Acacia leucophloea*. The predominant vegetation seen in the pasture was *Cenchrus ciliaris*, *Cenchrus setigerus*, *Cynodon dactylon* and *Digitaria ciliaris*. During summer months due to the scarcity of fodder the goats are fed with Acacia pods, tapioca leaves, rind and thippy and dry fodders like groundnut hay, paddy straw and horse gram hay. Feeding of animals with concentrates was practiced in 33% of the herds studied. The kids are maintained with does milk, local weeds, grasses, tree leaves and harvested crops up to three months of age, after which time they are allowed to browse.

Housing

Salem Black goats are mainly housed during the night. The percentage of animals housed only at night and during both the day and

night was 89% and 11%, respectively. The housing structures consist of open, half open and closed type pens, which are well ventilated. The percentage of farmers with open, half-open and closed type sheds was 75%, 13% and 12% respectively. In open pens, the structure consists of a half walled enclosure made up of bamboo sticks, a night watchman shelter and a special enclosure for kids (Figure 5). In general, the goats are housed in open pens in the harvested fields for manuring purposes and the housing structure is shifted to the nearest place once a day in order to eventually cover the entire field (Figure 6). Generally, the night watchman shelter is placed inside the enclosure and provides a closed area for the animals, and also protects the goats from rain and extreme winter. The kids are housed in special enclosures made of bamboo and palmyra leaves (Figure 7) and they are placed either inside the pens or nearer to the pens. In some of the half open and closed type sheds a small partition is made to accommodate the kids.



Figure 6. Shifting of open pen to nearby place for manuring.



Figure 7. A kid enclosure, made up of bamboo stick and palmyra leaves.

Breeding

When the bucks are kept in the herds, they are with the does at all times and the owner exercises no control over mating. Among the herds studied, 88% of the herds owned males for breeding. The farmers exchange breeding bucks from one herd to another. A few male kids were selected for breeding, others are disposed of at an early age, and almost all the females are retained. Only old does are sold for meat purpose. Bucks are retained for mating up to five years of age and the does are used for breeding until five to seven years of age.

Disease prevalence and survivability

The study revealed the occurrence of enterotoxaemia, *peste des petits ruminants* and foot and mouth diseases for which vaccinations are administered in the face of out breaks. Deworming of the animals is practiced at regular intervals. Salem Black

goats are considered as hardy with low overall mortality. The mortality rate in kids and adults was 7.5% and 2.3% respectively. This indicated its innate resistance to the harsh climatic conditions prevailing in its original habitat.

Marketing

The marketing of live animals was disorganized and involved middlemen and commission agents. The percentage of farmers who sold Salem Black goats in weekly markets or through a broker was 74% and 26%, respectively. In most of the markets trading and pricing is based on muscle thickness at loin and thigh areas. In general, the price of the meat was steady or in an upward trend irrespective of the market price of the live animals.

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