A STUDY ON THE PRODUCTION AND MARKETING TRENDS OF SHEEP AND MUTTON IN RAYALASEEMA REGION OF ANDHRA PRADESH

BY

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CERTIFICATE

Sri D.P.Venkataramana has satisfactorily prosecuted the course of research and that the thesis entitled "A STUDY ON THE PRODUCTION AND MARKETING TRENDS OF SHEEP AND MUTTON IN RAYALASEEMA REGION OF ANDHRA PRADESH", submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that the thesis or part thereof has not been previously submitted by him for a degree of any University.

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CERTIFICATE

This is to certify that the thesis entitled "A STUDY ON THE PRODUCTION AND MARKETING TRENDS OF SHEEP AND MUTTON IN RAYALASEEMA REGION OF ANDHRA PRADESH" submitted in partial fulfilment of the requirements for the degree of MASTER OF VETERINARY SCIENCE, of Andhra Pradesh Agricultural University, Hyderabad, is a record of the bonafide research work carried out by SRI D.P.VENKATARAMANA under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee.

No part of the thesis has been submitted for any other degree or diploma or has been published, published part has been fully acknowledged. All suggestions and help received during the investigation work have been duly acknowledged by him.

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ABSTRACT

The production and marketing trends of sheep and mutton with special reference to Rayalaseema districts of Andhra Pradesh were investigated.

In Rayalaseema Region the sheep population declined from 28.77 lakhs in 1961 to 19.62 lakhs in 1987. Of the four districts of Rayalaseema Region, Anantapur district had maximum sheep population with 5.6 lakhs during 1987 compared to 9.8 lakhs in 1961 followed by Chittoor, Kurnool and Cuddapah districts.

The over all flock size maintained by shepherds of Rayalaseema was 81.08 $\pm$ 10.39 with lambing per cent of 64.2. Per cent of animals sold 30.3 fetching an average net income of Rs.12.8 per animal.

The average flock size maintained by societies ranged from 212 to 310 with a mean income of Rs.8.46 per animal housed. Profit per animal housed increased from Rs.11.11 to Rs.20.32 (1977 to 1982).

The average number of sheep slaughtered per day by butchers was 8.6 on Sundays and 4.6 on Week days, with an average net income of Rs.50.5 per animal.

Of the total number of sheep slaughtered in Rayalaseema, 32.14% were slaughtered in Kurnool district, 30.38% in Cuddapah district, 21.04% in Chittoor district and least (16.44%) in Anantapur district.

CHAPTER I

INTRODUCTION

"Mutton for Millions" is not a distant dream and it will be a reality in the coming decade, if the production systems are suitably modified and adapted by sheep farmers.

In India sheep are mostly raised in the arid and semi arid regions of Rajasthan and dry regions of Andhra Pradesh, Karnataka, Tamilnadu and Maharashtra. India has 56.8 million sheep occupying sixth place among the largest sheep populated countries of the world, contributing Rs.200 crores per annum to the national income. Andhra Pradesh has 6.8 million sheep and 4.8 million goats contributing an annual income of Rs.42 crores ranking second only to Rajasthan.

Traditionally sheep farming is carried out by specific groups such as yadavas and kurubas in rural areas as a main occupation. The changing agricultural situation in dry land areas led the people to take up sheep raising as an important subsidiary occupation. In fact, sheep raising is a mobile enterprise inherited by nomadic people who are primitive and traditional by moving along with their flocks in search of good pasture and water. Sheep raising is a highly sensitive enterprise which

requires scientific knowledge of various animal husbandry practices like breeding, feeding, management and marketing as in any other livestock enterprise. For those who are unable to apply sound management principles and business methods this enterprise may not be very profitable. Since most of our farmers do not have adequate knowledge on sheep production programmes and also do not get reasonable price for their stock, middle men and butchers are making substantial profits with least effort and risks.

Keeping in view the present circumstances prevailing in the meat trade with reference to purchasing of sheep and pricing of mutton and the role of middle men in the sheep trading, it was desired to study the trends in production and marketing of sheep and mutton as no reliable and recorded information is available in literature and more over, no systematic survey had been carried out by any agency connected with either animal industry or meat industry.

Therefore an investigation was carried out with the following objectives:

1. To study the trends in sheep production and marketing of mutton.

2. To study the pattern of marketing of sheep and mutton in Rayalaseema region of Andhra Pradesh.

CHAPTER II

REVIEW OF LITERATURE

Sheep are raised mainly for the production of wool and mutton. The income derived from mutton is more important and is twice to that of wool, but this largely depends upon the relative price of meat and the type of breed raised. The review of literature is classified into two heads.
1. Production of sheep and mutton and 2. Marketing of sheep mutton.

2.1 PRODUCTION OF SHEEP AND MUTTON

During 1979 the sheep population was 7.0 millions and in 1985 21.3 millions (Narayana Rao, 1979). The production figures for mutton were 36,000 tonnes during 1979 in Andhra Pradesh as against 132,000 tonnes of mutton production in India.

The sheep population of Andhra Pradesh ranked second next to Rajasthan accounting for 20.65% of the country's population and produced 14700 tonnes of mutton and 27.16 lakh kgs of wool (Narayana Rao, 1980).

Andhra Pradesh has got 7.5 million sheep and 5.5 million goats contributing Rs.30 crores annually (A.P.A.U Workshop - 1986).

Sheep population in India was 48 millions (1982) with 22% lambing and 15% mortality and the available meat estimated as 1.74 lakh tonnes contributing to a tune of Rs.520 crores (Ramaswamy, 1987). Animal Husbandry Sector contributed the per cent about 20,000 crores to Gross National Income.

Meat production in India was about 1.2 million metric tonnes per year (Chatterjee, 1987) including mutton (135,000 metric tonnes) and Chevon (315,000 metric tonnes). The quantity of red meat exported was about 60,000 tonnes out of which one fourth was mutton. The value of export meat increased from Rs.10.0 millions in 1973-74 to Rs.760 millions in 1984-85.

Hira and Bawa (1955) quoted that the total production of mutton and Cheveon during 1949 was in the order of 2,67,788 tonnes of which 1,12,180 tonnes (41.9%) was from sheep and 1,55,638 tonnes (58.1%) from goats and the average yield of meat per sheep slaughtered was 8.98 kg and 9.03 kg per goat.

Export of meat during 1976-77 was valued at Rs.10.56 crores representing only a fraction of huge export potential of meat in India (Sexena, 1978).

Khot (1957) stated that India would need more and more wool and increased supply of mutton for domestic consumption as the living standards are improved.

Taneja (1974) opined that cross breeding was better for rapid improvement of wool and mutton production both qualitatively and quantitatively.

Ramanujam et al. (1976) recorded that 67.26% of sheep and goat slaughtered had carcass weights ranging from 5.00 to 8.9 Kg indicating the largest percentage slaughtered were young stock. The relatively small number of animals with carcass weights between 11 and 15 Kg indicated the number of mature animals slaughtered. They were also conducted that the mean carcass weight of sheep and goats slaughtered was around 8.3 Kg and 41% of them were slaughtered on Sundays and Saturdays.

Sehgal et al. (1983) reported that the yield of mutton out of a lamb carcass as 11 Kg and the wool 0.75 Kg on an average reared in intensive feeding system upto 90 days.

Sawant et al. (1985) indicated that Dorset half bred lambs weighed 4.8 Kg at birth which attained 30 Kg weight by 6 months of age and when slaughtered gave 15 Kg meat.

The percentage of sheep slaughtered was around 32.5% of the total number of different livestock used for purpose of meat (Panda, 1987). In terms of meat production, mutton and lamb form 13.64% of the total meat produced in the country.

Singh et al. (1987) studied the global meat production which was 104.09 million metric tonnes in 1970 which reached 146.90 million MT in 1985 registering an average increase of about 2.75%. The total world meat export per annum during the period 1980-82 amounted to US $ 21.09 billion.

Sathe (1982) stated that percentages of total meat production continent wise as 25% in Asia, 5% in Africa, 28% in Europe, 22% in America and 11% in USSR.

The production figures of mutton and goat meat produced 54.5 thousand tonnes of mutton and cheveon during 1983 and 58.6 thousand tonnes during 1984 in China (Anmin, 1986).

Potts (1953) suggested that farmers should select ewe flock and rams with special emphasis on their ability to produce lambs that growth fast and reach market weight from 3 to 5 months with high degree of finish.

Kammlade and Kammlade (1955) stated that lambs would make 75% of their mature weight when they attain one year age provided 50% of growth would takes place during the first 3 months, 25% in the next 3 months and 25% in the next 6 months.

Singh et al. (1973) opined that economics of sheep rearing was mainly dependent on attainment of maximum lamb weight in maximum time.

Jalihal (1977) mentioned that sheep normally attained full growth when they are about 2 years old and in India ewes were mated when they reach 9 months of age. He observed that in such condition ram could be used for 30 ewes and a lamb crop generally comprised of equal number of male and female lambs.

Singh and Moore (1978) mentioned that generally in India a flock owner maintains 50 to 60 sheep as a minimum economic unit and those who rear sheep as side occupation to farming have a flock of 20 to 30 ewes. They also stated that major portion of monetary income comes from mutton.

Dwivedi et al. (1978) stated that shearing was done 2 to 3 times a year during February/March, January/July and November/December. The average wool yield was 0.950 Kg/adult per year and 0.4 Kg per lamb. They observed that more than 75% flock owners sheared their animals personally and a few engaged hired shearers by paying Rs.0.30 per sheep in cah or kind.

Kantha Raju (1982) reported that each adult sheep produces around one quintal of manure and a young one half quintal. He further reported that sheep manure was superior because of its high nitrogen and potassium contents and is sold at Rs.150/- to 180/- per tonne.

In United States lambs were graded based on the amount of finish that a lamb would carry (Dehoach and William, 1957). For a lamb to be graded top within 4 to 5 months sound sheep production practices are required.

The effect of flushing increased the weight gain and increased lambing percentage but there was increased tendency for twinning. Later on in 1972 stated that flushing increased about 17 to 18% in lamb production (Mudaliar, 1972).

Devendra and Mcleroy (1982) opined that the ewes can be bred at any time of the year but main lambing season is November-February and 5% of births are twins.

Sastry & Thomas (1976) mentioned that sheep and goats were raised almost entirely on roughages and as such the cost of production was lower than that of poultry and pigs.

Mittal (1979) stated that grazing of sheep from January to June was one of the major problems in Western Rajasthan as no grazing was available except few shrubs and bushes in common grazing fields.

Sharma (1981) reported that about 22% flocks migrated to distances upto 20 K.m. during lean periods from April to June in Rajasthan and the average flock size as 48 sheep.

Das (1982) reported that improved pastures with rationally managed indigenous species of sheep could help in raising early marketable lambs even in low rain fall areas in India. When green pastures are abundant, necessity of supplementary feeding is least and the cost is lower in achieving higher animal body weight gain ensuring early market.

Raut and Sathe (1968) reported that the cost of production of mutton from Nellore sheep was Rs.1.11 per Kg when the flock size was 50. An increase in the flock size reduced the cost of production.

Reddy and Reddy (1981) reported that total cost of production of lamb from birth to slaughter at 6 months of age ranged from Rs.79.35 to 102.50. The total recovery from a lamb was estimated to be Rs.104.50 to 141.25.

Singh and Singh (1981) estimated that the net cost of rearing an ewe to produce a lamb was Rs.9.70.

Sehgal et al. (1983) estimated the production cost of a lamb on an average as Rs.78.77 in intensive rearing system upto 90 days.

Sawant et al. (1985) opined that the cost of raising the cross bred upto 6 months as Rs.75/- and that of local sheep Rs.50/- which means a higher income Rs.70/- to 80/- per cross bred sheep compared to local one within 6 months of time.

Dastagiri (1987) estimated the production cost of rearing of indigenous sheep flocks under field conditions as 20.30% and also observed that the returns from sale of sheep were nearly similar on all the three flock sizes viz., small 40, medium 40 to 80 and large 80,

2.2 MARKETING OF SHEEP AND MUTTON

Literature on scientific investigation of marketing sheep and mutton in India is scant.

Hira and Bawa (1955) reported that various market charges like Octroi charges during early fifties ranged from one pice to 1.5 pice per seer of mutton, market fee from 3 pice to 2 annas per sheep, slaughter house fee 12 annas per sheep, flaying or mulla fee from 3 pice and anna per sheep. Charity fee is one pice per sheep and the rent of mutton stall from Rs.5 to 30 per month and licence fee on the trade from Rs.1 to 2 per annum. Though mutton and chev_on are generally grouped in one category in meat trade, the former on account of its being tender and rich in fat, fatches little higher price and these two types are in great demand all over India and they command comparitively a higher price ranging from Rs.10 to 12/- or even more. The price margin between the butcher and consumer depends mainly on various slaughtering expenditure, maintenance of meat stall and any spoilage in its marketing process and it also varies from place to place.

Ramanujam and Ramamurthy (1982) stated that butchers profit accounts for Rs.8.65 of inputs and also opined that commission agents charge 4% commission on the actual sale price of livestock. The income of the producer is taken away by about Rs.3.36 on each animal.

The producer's share in the consumer's price is relatively high, when meat is sold by him direct to the consumer. A butcher's share in the price paid diminishes every time the food animal carcass changes hands from wholesaler to retailer, since each seller must have his own margin of profit before he sells out his goods to another. Another factor determining the profit margin is the ruling prices for hides and skins. It was observed that the butcher's share in the profit ranges from 6 to 20% of the selling price (Hira and Bawa, 1955).

Adam and Coopersmith (1963) observed that it was difficult for a producer to market lambs of uniform weight and quality at the proper time, hence suggested combined marketing practice which allow toping out at proper weight and the quality by combining lambs owned by several producers.

Jooste (1964) from a study in the Eastern Karoo in South Africa reported that the average expenditure per 100 sheep was found to be Rs.18,384/- per annum and the net income as Rs.22,635/-

Dutche (1965) estimated in east Scotland that the average cost per head per 57 lots was Rs.35.40 leaving an average range profit of Rs.7.38 for each animal fattened.

Gangwar and George (1973) calculated the cost and returns of 30 to 50 sheep units in comparison to flocks of 100 sheep. The profit per sheep in the Ist case was found to be Rs.4.27 and in the later case Rs.10.23.

Mittu et al. (1975) conducted benchmark survey in Rajasthan and showed an average income of Rs.620/- per annum from a flock of 72 sheep.

Dwivedi and Jain (1977) reported from their survey work an estimated income of Rs.720/- per year from a flock of 100 ewes in Rajasthan.

Srivastava and Sexena (1977) worked a net monthly income of Rs.246.66 to 268.20 from a sheep unit consisting of 50 adult sheep besides gaining a flock of 74 sheep of the value of about Rs.6,880/- as personal property at the end of fifth year after repaying loan and interest.

Dwivedi et al. (1978) observed that there were no organised agencies to market sheep and wool in Rajasthan and the flock owners sell about 80% of wool produced to the middle men or brokers against cash at a very low price (The average wool price was Rs.18/- per Kg) and that they retain, the remaining 20% for home consumption.

Singh and Moore (1978) stated that price per Kg paid for slaughter sheep would depend largely upon the value of dressed animal age, well finished lambs fetching higher price per Kg than old sheep. They observed that the quality and quantity of mutton was judged by feeling rump, loins, legs and shoulder.

Mittal (1979) observed that there were no specifc marketing facilities for disposal of wool and sheep in Western Rajasthan and the rams aged 1 to 3 years were sold to visiting traders who go about collecting them for slaughter houses in the big cities.

Narayana Rao (1979) observed that there was no well organised marketing system for livestock and meat in Andhra Pradesh. Further he noted that the cattle and sheep were marketed through weekly livestock markets and agents procured the animals from middle men on cheap bargaining price. He mentioned that the price of mutton increased from Rs.6.00 Kg (1973-74) to Rs.10/- per Kg (1976-77), Rs.13/- per Kg (1978-79) and Rs.16/- (1979-80) and increase in price of sheep and goat skins from Rs.22/- per piece (1976-77) to Rs.37/- per piece (1978-79).

Raman and Venkatasubramanaiah (1980) expressed that the assessment of age at the time of installing a sheep farm would be beneficial for culling the old animals and for age grouping of animals. They also considered it for disposal of the animal.

Mudaliar (1980) estimated a net profit of Rs.6,250/- per annum from a sheep unit of 10 ewes and 3 rams with a total non-recurring investment of Rs.25,000/- and a bank interest rate of 10%.

Major et al. (1975) reported that per cent dressing in male Bannur sheep was more compared to females and so in lambs compared to yearling and mature sheep.

Kantha Raju (1982) stated that with 45% dressing yield each animal yielded 7 Kg of meat fetching Rs.126/- (at the rate of Rs.18/- per Kg) and other products contributing to Rs.16/-

Devendra and Mcleroy (1982) stated that for fat tailed sheep, dressing percentages were found to be 45.7% and 47.8% in docked tail and non-docked tail sheep respectively but deposition of fat, finish and quanlity were superior in tail docked. After slaughter docked animals are harder to flay than non-docked because the tail fat is dispersed over the body instead of being concentrated on the tail itself and are easier to shear. Average weights of ewes at 18 months of age in docked and non docked are 48.2 Kg and 49.1 Kg respectively.

Sehgal et al. (1983) recorded that the per cent dressing as 50 on an average in a weaner lamb reared in intensive feeding system.

In synthetic Mandya sheep, the preslaughter weight was 20 Kg, hot carcass weight 9.9 Kg and the dressing percentage based on preslaughter weight was 48.99 (AICRP - Annual report - 1984).

Kapoor (1983) reported from a study in Gujarat that the gross income from a flock of 56 was Rs.4900/- of which 48% came from milk, 30% by sale of ram lambs and 22% from manure and miscellaneous sources. He further reported that the average income from sheep was Rs.8.92.

Sehgal et al. (1983) estimated the net profit per lamb upto 90 days as Rs.63.15 on an average reared on intensive feeding system and also suggested that maintaining lambs with a ration containing pala leaves and concentrates upto 6 months, a farmer can be benefited by maximum returns.

Sundersan (1984) gave economics of sheep flock (100+2) as Rs.19,079 towards the expenditure with a net income of Rs.12,121 and it was also calculated as an income of Rs.52.60 on every Rs.100.00 investment of sheep flock.

Sawant et al. (1985) stated that approximately 28% of the total sheep produced were slaughtered every year for meat. Seventy per cent of the total income comes from the sale of surplus stock for meat.

Memoria and Memoria (1985) revealed that the production of sheep skin was in the order of 160 lakh pieces, of which 80% of the total production are obtained from animals killed for human consumption and the balance 20% from fallen sheep. The production of sheep skins was 42% of the total sheep and goat skin supplied in India. The cost of flaying varied from 2 annas 6 paise to 3 annas during the year 1947.

Marketing costs and margins for livestock and meat amounted to 20 to 45% of consumer price for meat (Mittendorf et al. 1982). In the lower income countries, the retail costs amounted to 1/4 of the total gross margin as related to retailing in the countries with higher income level. Assembly costs varied from 20 to 50% of the gross margin. Slaughtering costs amounted to 1 to 3% of consumer meat price which is negligible.

CHAPTER III

MATERIALS AND METHODS

The four districts of Rayalaseema region namely Anantapur, Chittoor, Cuddapah and Kurnool with relatively large sheep population in Andhra Pradesh were selected for the study, covering various sheep production and marketing units including individual shepherds, government sheep farms, sheep growers' co-operative societies, Municipal and Panchayat slaughter houses and butchers in order to elicit information and gather knowledge about the sheep production and marketing trends in this region.

Thirty shepherds and thirty seven butchers were selected at random in the four districts. Four primary sheep growers co-operative societies and four sheep growers co-operative societies with marketing facilities were selected in Anantapur district for survey. All the Municipal slaughter houses located in the four district head quarters and in addition the Municipal slaughter house at Tirupati and a few other Municipal slaughter houses in other districts were covered under the study.

Sheep production and slaughtering data pertaining to Rayalaseema districts obtained from various sources were compared in relation to Andhra Pradesh and the national figures obtained from various sources.

Shepherds and butchers were given questionnaires designed to elicit information such as flock size, production performance, transaction and disposal of sheep and also the problems encountered in their trade. The questionnaire to the butchers was designed to draw information about source of animals purchased, mode of purchase, price evaluation, transportation, slaughtering, retailing, disposal of offals and skins and other aspects such as fees etc., in order to arrive at the net income.

Questionnaire for the societies was simplified in order to elicit pertinent details regarding levels of operation and income.

The study was completed in three phases:

1. Field investigation in selected areas involving shepherds, sheep growers' co-operative societies, butchers and other retail agencies.

2. Desk research.

3. Analysis and compilation of the report.

All the pertinent data obtained from the above sources have been analysed, compiled and tabulated as well as graphically presented and discussed.

RESULTS

Sheep population over a period of two decades pertaining to India, Andhra Pradesh state and the districts of Rayalaseema namely: Anantapur, Chittoor, Cuddapah and Kurnool, have been presented in Table 1 and Figs.1 and 2.

The sheep population in the country remained almost stationary around 40 millions throughout the two decades from 1961-82. However it has been projected to increase to 57 million in 1987 (FAO). In Andhra Pradesh state the sheep population was 83.63 lakhs in 1961, whereas it was 68.71 lakhs in 1987. In Rayalaseema region, the sheep population was 28.77 lakhs in 1961 compared to 19.62 lakhs in 1987. Among the four districts of Rayalaseema, Anantapur had maximum sheep population with 5.61 lakhs during 1987 compared to 9.8 lakhs in 1961, followed by Chittoor with 5.01 lakhs in 1987 compared to 8.29 lakhs in 1961, Cuddapah had 3.97 lakhs and Kurnool 5.0 lakhs during 1987 compared to 5.12 and 5.56 lakhs respectively in 1961. Sheep population in Rayalaseema region constituted 34.4% of state population during 1961, whereas it was 28.55% during 1987.

Particulars obtained from shepherds of the four districts of Rayalaseema region have been presented in Table 2 and Fig.3. The overall flock size in Rayalaseema region was 81.08 ± 10.39. Shepherds of Cuddapah district maintained on an average larger flocks of 106.4 followed by Kurnool district shepherds who maintained a flock size of 89.8. In Chittoor the mean flock size was 64.7 and in Anantapur district, 63.4. Number of lambs born per flock ranged from 57.2 in Kurnool to 40.3 in Chittoor district with overall mean of 50.85. However, per cent lambing was highest in Anantapur (77.29) and least in Cuddapah (56.9), with regional overall mean of 64.2 per cent mortality was maximum in Anantapur district (10.13) and least in Cuddapah district (2.7) with an overall mean of 6.53 for the Rayalaseema region. Number of animals sold per flock by the shepherd was maximum in Kurnool district (37.2) followed by Cuddapah (25.6), Anantapur (16.9) and least in Chittoor (15.6) with an overall mean of 23.82 per flock for Rayalaseema region. Per cent of animals sold was maximum in Kurnool (41.2) and least in Cuddapah (24.8) with overall mean value of 30.32 of Rayalaseema region. Average age at disposal ranged from 5.8 to 9.3 months. Net income per animal was Rs.359/- in Kurnool district, followed by Rs.295/- in Cuddapah district, Rs.267.5 in Chittoor district and Rs.243/- in Anantapur district.

Particulars of primary sheep growers co-operative societies of Anantapur district over a period of 5 years have been presented in Table 3. As seen from the Table average size of the flock ranged from 212 to 310 with an overall mean of 261.8 per society. No. of lambs born ranged from 60 to 70 with a lambing percentage ranging from 22 to 28 with an overall mean of 25.3. Number of animals disposed on an average ranged from 41.5 to 126 with an overall mean of 76.76 percentage disposed ranged from 19.5 to 50.72 with an overall mean of 29.3%. Mortality ranged from 4% in one society to 7.38 in another. The amount realised through sale of animals ranged from Rs.2004 to 5686, through sale of skins the amount realised ranged from Rs.19.66 to Rs.71.4, through wool from Rs.355/- to Rs.468/- and through manure from Rs.374 to Rs.785 and the total income per society ranged from Rs.2776 to Rs.6800. Expenditure by the societies varied from Rs.1349 to 4190, yielding a net income of as low as Rs.1251 per year in one society and 3137 for another society. In this survey it is revealed that rate per animal sold greatly varied from as low as Rs.29.34 per animal to 82.53 with an average value of Rs.53.87 per animal sold. The net income per animal housed again ranged from Rs.5.96 to 12.65 with a mean of 8.46 per animal housed per society.

The year-wise particulars of the primary sheep growers co-operative societies of Anantapur from 1977 to 1982 are presented in Table 4 and figs. 4 and 5. It can be seen from the Table, the flock size increased gradually from 220 in 1977 to 285 in 1982. Number of animals disposed from society and per cent of animals disposed also did not show any specific trend eventhough there was increase of number of animals sold during 1982 (103) compared to 31.7 in 1981. Similarly the per cent of animals disposed was higher in 1982 (36.28) compared to 11.04% in 1981 whereas per cent lambing was more or less steady at 22% from 1977 to 1980. Per cent mortality remained almost stationary at around 5% during these years. Rate per animal sold increased significantly during 1981-82 compared to (1977 to 80) earlier years, eventhough there has been a drop from 52.9 in 1979 to 34.2 in 1980. Profit per animal housed steadily increased from Rs.11.11 during 1977 to Rs.20.32 during 1982 (Fig.5).

Society wise and year-wise particulars of primary sheep growers cooperative societies with marketing system for the years 1981 to '84 are presented in Table 5 and figure 6. Average number of sheep slaughtered ranged from 45.5 $\pm$ 5.5 in one society to 121.75 $\pm$ 33.1 in another society. The average live weight at slaughter ranged between 19 to 21.75 Kg. The value per animal realised ranged from Rs.97.56 to Rs.162.68. After deducting expenditure

and repayments, net profit per animal slaughtered ranged from Rs.11.70 in one society to Rs.15.18 in another society (Table 5).

Table 6 reveals that number of sheep slaughtered decreased from 89.25 (1981) to 47.75 (1984). Average slaughter weight remained constant around 20 Kg. The total value of animals realised decreased gradually from Rs.12,836 (1981) to Rs.7,339 (1984). But the value of animal increased from Rs.143.8 to 153.7. Net profit after repayments decreased from Rs.1293 (1981) to 620 (1984). Net profit per animal was Rs.13.5 in 1981 which decreased to Rs.11.85 in 1982 and increased to Rs.16.9 in 1983 and then decreased to Rs.12.55 (1984).

Particulars regarding procurement of sheep and retailing of mutton by butchers of Rayalaseema districts are presented in Tables 7 and 8. It is seen from Table 7 that all the butchers purchased their requirement of sheep from villages and shandies through middle men and 95% directly from shepherds. On an average 30% of butchers based their purchase on live weight and 80 to 85% on physical conditions and conformation, whereas almost all butchers purchased their sheep on the basis of expected yield. Almost all the butchers (97.3%) transport their sheep on foot and 56.8% of butchers transport by vehicles.

Meat trade is the main occupation for 18.9% of the butchers and for 81% of the butchers it is a subsidiary occupation. Butchers who buy sheep in lots on weekly basis

comprised 73% and on daily basis 5.4% and 95% of the butchers purchase sheep in pairs weekly and 67.6% daily; 40.5% of the butchers hold their stock till slaughter. 62.2% of butchers utilised Municipal slaughter house facility and 45.9% used private places.

From the Table 8 it can be seen that an overall no. of sheep slaughtered is around 4.59 on week days and 8.59 on Sundays in all the districts. Selling price of mutton ranged from Rs.30 to 36 per Kg; higher in Cuddapah and Chittoor compared to Anantapur and Kurnool districts. Cost of head and feet ranged from Rs.26 to Rs.28.5 present with an overall average of Rs.27. Cost of pluck ranged from Rs.22 to 29 with a mean cost of Rs.26.25. Stomach and intestines ranged from Rs.9 to 12 with a mean of Rs.10.75. Net income per animal slaughtered ranged from Rs.43.75 in Chittoor district to Rs.58.5 in Anantapur district.

Particulars of sheep slaughtered in Andhra Pradesh from 1972 to 1986 in relation to total number of animals slaughtered are presented in Table 9 and Fig.6. The total number of animals slaughtered of all species in Andhra Pradesh increased from 19 lakhs (1972) to 40 lakhs (1986). Similarly number of sheep slaughtered in Andhra Pradesh increased from 9.93 lakhs in 1972 to 21.5 lakhs in 1986.

On per centage basis sheep slaughtered constituted 51% during early seventies (1972-1975) which decreased to 48% in 1980 and then increased to 53.45% in 1986 (Fig.5).

Particulars of sheep slaughtered (district-wise) in Rayalaseema region for the year 1986-87 are presented in Table 10. In Chittoor district a total number of 70,114 sheep were slaughtered in 16 slaughter houses constituting 3.26% of sheep slaughtered in the state. In Cuddapah district 1,13,934 sheep were slaughtered in 8 slaughter houses constituting 5.29% of the state. In Anantapur district 55,319 sheep slaughtered in 14 slaughter houses comprising 2.57% of the state. In Kurnool district 1,03,110 sheep were slaughtered in 35 slaughter houses which constitute 4.79% of the sheep slaughtered in Andhra Pradesh. Thus in Rayalaseema region 3,42,477 sheep were slaughtered which comes to 15.9% of state total during the year.

In Chittoor district less than 1/4 (23.79%) of the sheep were slaughtered in the district headquarters. In Cuddapah about 1/3 (34.26%) of sheep were slaughtered in the district headquarters whereas in Anantapur and Kurnool more than 50% (57.9% and 56.85% respectively) were slaughtered at the district headquarters.

Particulars of sheep slaughtered year-wise in Rayalaseema region for years 1981-82 to 1986-87 are presented in Table 11. In Chittoor district the number of sheep slaughtered during 1981-82 was 53,527 which increased to 70,114 in 1986-87, in Cuddapah the number of sheep slaughtered increased from 1,01,627 in 1981-82 to 1,13,934 and in Kurnool the number of sheep slaughtered

increased from 88,896 (81-82) to 1,03,110 (86-87) and from 49,956 (1981-82) to 55,319 (1986-87) in Anantapur. The total number of sheep slaughtered in Rayalaseema districts increased from 2,94,006 (1981-82) to 3,42,477 (1986-87). There was an increase of 30.99% in number of sheep slaughtered in Chittoor district followed by 21.68% in Anantapur district, 15.99% in Kurnool district, 12.11% in Cuddapah district with an overall increase of 18.5% in number of sheep slaughtered in Rayalaseema region during last 5 years.

Of the total number of sheep slaughtered in Rayalaseema 32.14% were slaughtered in Kurnool district, 30.38% in Cuddapah district, 21.04% in Chittoor district and least (16.44%) in Anantapur district.

Particulars of sheep slaughtered month-wise in Tirupati Municipal slaughter house during 1988 are presented in Table 12 and figs.7 and 8. Data revealed that total number of sheep slaughtered month-wise did not show any specific trend or effect of season except during the month of December when the sheep slaughtered were significantly less (about 50%) than in other months. But as expected number of sheep slaughter on Sundays was 3 times greater than on week days. Within the week days there was no significant difference in the number of animals slaughtered. Hence the number of sheep slaughtered during week days were pooled for computation. Maximum number of

males (59%) were slaughtered during the month of January followed by November (56%) and December (54%) and more number of females were slaughtered during April and May.

The sheep population in relation to Human population in the country, Andhra Pradesh state and in Rayalaseema districts over a period of 2 decades, covering (1961-81) is presented in Table 13. It can be seen from the Table that number of sheep per 100 people in the country was 9.15 in 1965, came down to 6.03 in 1981 over a period of 2 decades, whereas in Andhra Pradesh state number of sheep per 100 persons was 23.22 in 1961 and 14.04 in 1981. In Rayalaseema region, number of sheep per 100 persons was 41.50 in 1961 which came down to 22.33 in 1981. Country's Human population increased at the rate of 2.5% per annum whereas in Andhra Pradesh state the growth was 2.2%, and in Rayalaseema it was 1.9% per annum.

	1961	1966	1972	1977	1982	1987	Per cent increase (+) or decrease (-)		
							1961-72	1972-82	1982-87
India:	402.23	420.20	399.9	409.1	413.3	569.8[a]	(-) 0.58	(+) 3.35	(+)37.86[a]
A.P.State:									
No.	83.63	80.04	83.43	70.70	75.07	68.71	(-) 0.24	(-)10.02	(-) 8.47
%	22.71	19.05	20.86	17.28	18.16	12.06	-	-	-
Rayalaseema Districts:									
Anantapur	9.80	8.38	8.89	5.83	7.55	5.61	(-) 9.28	(-)15.07	(-)25.69
Chittoor	8.29	6.12	6.26	4.44	5.06	5.01	(-)24.49	(-)19.17	(-) 0.99
Cuddapah	5.12	4.73	4.94	3.74	4.88	3.97	(-) 3.51)	(-) 1.21	(+)18.65
Kurnool	5.56	5.49	4.45	3.69	4.06	5.00	(-)19.96	(-) 8.76	(+)23.15
Total	28.77	24.72	24.54	17.70	21.55	19.62	(-)14.70	(-)12.18	(-) 8.95
Per cent of state population	34.40	30.88	29.42	25.03	28.71	28.55	-	-	-

*Source: Statistical abstract of Andhra Pradesh 1965 to 1988. Issued by Bureau of Economics and Statistics.

a. Projected figures (FAO)

Table 2. Particulars of flocks maintained by shepherds in Rayalaseema Districts (1988)

	Anantapur	Chittoor	Cuddapah	Kurnool	Overall
Flock size:	63.42 ± 11.46	64.7 ± 9.44	106.40±17.73	89.80±8.89	81.08±10.39
Lambs born:					
No.	49.5 ± 8.10	40.3 ± 8.13	56.40± 4.45	57.2 ±5.79	50.85± 3.91
%	77.29 ± 3.37	58.63 ± 5.17	56.9 ± 6.94	63.66±4.82	64.2 ± 4.61
Mortality: %	10.13 ± 3.27	5.10 ± 0.67	2.7 ± 0.30	8.2 ±0.62	6.53± 1.64
Animals sold:					
No.	16.91 ± 3.46	15.60 ± 2.64	25.6 ± 4.37	37.2 ±5.81	23.82± 4.97
%	29.97 ± 5.42	25.23 ± 2.16	24.81± 3.36	41.27±4.15	30.32± 3.83
Average age at sales (Months)	5.83 ± 0.52	8.11 ± 0.39	8.0 ± 0.63	9.3 ±0.37	7.81± 0.72
Net income (Rs.) per animal	243.07 ± 8.52	267.50 ± 22.38	295.0 ±22.91	359.0 ±9.14	312.87±19.99

Table 3. Society-wise particulars of primary sheep growers' Co-operative Societies of Anantapur District (1977-82)

	S_1	S_2	S_3	S_4	Overall
Stock size	248 ±14.52	310 ±29.92	276 ±10.15	212 ±1.86	261.87±20.82
Births:					
No.	70.5± 8.29	70.0± 7.94	62.33±11.39	60.16±5.32	65.74± 2.63
%	28.35±	22.58	22.00	28.37	25.33
Disposal:					
No.	126.14	62.4	77.00	41.50	76.76
%	50.72	20.00	27.00	19.53	29.31
Mortality:					
No.	14.66	12.40	15.66	15.66	14.59
%	5.91	4.00	5.65	7.38	5.72
Amount realised from:					
Animals Rs.	3,701.66 (29.34)*	5,150.00 (82.53)*	5,686.33 (73.85)*	2,004.16 (48.29)*	4,135.54 (53.87)*
Skins Rs.	19.66	71.40	46.16	40.83	44.51
Wool Rs.	391.80	468.33	388.50	355.00	400.90
Manure Rs.	374.16	785.00	680.00	376.66	553.95
Total Income Rs.	4486.78	6410.73	6800.99	2776.65	5118.78
Experditure Rs.	1349.18	3868.00	4910.25	1525.50	2913.23
Net Income Rs.	3137.60	2542.73	1890.74	1251.15	2205.65
Net Income per Animal housed Rs.	12.65	8.20	6.83	5.96	8.46

*Values in the parantheses are rate/animal.

Table 4. Year-wise particulars of primary sheep growers co-operative societies of Anantapur District (1977-82)

	1977	1978	1979	1980	1981	1982
Stock size	220 ±11.90	246.50±13.99	276.25±22.66	259.00±16.18	287.50±37.26	285 ±45.
Lambs born						
No.	61.5 ± 5.31	77 ±10.04	59.25±10.00	77.75± 8.06	61.75± 7.87	73.5±13.
%	27.95	31.30	24.47	30.02	21.48	25.79
Animals disposed:						
No.	49.00±14.00	43.25± 7.77	65.75± 3.96	58.75± 6.42	31.75± 5.77	103.25±36
%	22.27	17.54	23.80	22.68	11.04	36.28
Mortality:						
No.	11.00± 1.52	9.75± 1.93	17.00± 4.37	13.75± 4.58	19.00± 3.16	15.5± 1.!
%	5.0	3.95	6.15	5.31	6.61	5.44
Rate per Animal sold Rs.	38.11	54.66	52.91	34.21	92.56	83.35
Profit per Animal housed Rs.	11.11	12.82	12.60	13.10	14.87	20.32

Table 5. Society-wise particulars of Primary Sheep Growers Co-operative Societies of Anantapur District with Marketing Facilities (1981 to 1984)

	S_1	S_2	S_3	S_4
No. of sheep slaughtered	51.4±3.38	45.5±7.55	48.25±6.00	121.75±33.10
Live weight (Kg)	21.12	21.75	19.75	19.00
Total value)Rs.)	77866	7402	7162	11882
Value per animal (Rs.)	151.68	162.68	148.43	97.56
Gross receipts (Rs.)	9255	8366	8695	1943
Expenditure (Rs.)	434.50	420.25	891.50	1036.75
Net Profit (Rs.)	783.75	542.25	641.50	10693
Net Profit per Animal (Rs.)	15.18±1.29	11.70±2.15	13.71±1.98	14.29±1.58

Table 6. Year-wise particulars of Primary Sheep Growers' Co-operative Societies of Anantapur District with Marketing Facility

	1981	1982	1983	1984
Number of sheep slaughtered	89.25	74	56	47.75
Live weight (Kg)	20.60	20.02	20.25	20.75
Total value (Rs.)	12836.75	10832.50	8226.50	7339.25
Value per animal (Rs.)	143.82	146.38	146.90	153.70
Net profit after repayments (Rs.)	1293.25	678	929.25	620.00
Net profit per Animal (Rs.)	13.50	11.85	16.90	12.55

Table 7. Particulars* of procurement of sheep by butchers of Rayalaseema Districts (1987)

	Anantapur	Chittoor	Cuddapah	Kurnool	Overall	Per cent
Source of purchase:						
a)Villages	10/10	10/10	7/7	10/10	37/37	100.00
b)Shandies	10/10	10/10	7/7	8/10	35/37	94.60
Purchase through						
a)Middlemen	10/10	10/10	7/7	10/10	37/37	100.00
b)Shepherds	10/10	8/10	7/7	10/10	35/37	94.60
Basis of Purchase:						
a)Live weight	2/10	1/10	5/7	3/10	11/37	29.70
b)Expected yield	10/10	10/10	7/7	9/10	36/37	97.30
c)Physical condition	9/10	5/10	7/7	9/10	30/37	81.10
d)Conformation	9/10	8/10	6/7	9/10	32/37	86.50

Contd....

Contd....Table 7

Transport of live Animals:						
a)On foot	10/10	10/10	7/7	9/10	36/37	97.30
b)Vehicle	5/10	6/10	5/7	5/10	21/37	56.80
Occupation:						
a)Main	0/10	4/10	0/10	1/10	5/37	18.92
b)Subsidiary	10/10	6/10	7/7	9/10	32/37	81.08
Purchase in:						
1.Lots a)Weekly	8/10	5/10	6/7	8/10	27/37	73.00
b)Daily	0/10	0/10	0/7	2/10	2/37	5.4
2.Pairs a)Weekly	9/10	9/10	7/7	10/10	35/37	94.60
b)Daily	9/10	2/10	7/7	7/10	25/37	67.60
Holding of purchased stock:	5/10	4/10	4/7	2/10	15/37	40.50
Place of slaughter:						
a)Municipal slaughter house	2/10	4/10	4/7	10/10	23/37	62.20
b)Private place	4/10	7/10	2/7	1/10	17/37	45.90

*Number of butchers responding to the questionnaire.

Table 8. Particulars of retailing by butchers of Rayalaseema Districts (1987)

	Anantapur	Chittoor	Cuddapah	Kurnool	Overall
Average number of sheep slaughter:					
a) On week days	5.4	3.8	4.86	4.40	4.59
b) On Sundays	10.1	8.5	8.10	8.30	8.59
Selling Price:					
a) Mutton Rs./Kg	30-34	32-34	32-36	30-32	32-50
b) Head and feet Rs./piece	28.50	26.00	27.40	26.30	27.12
c) Pluck Rs./Unit	27.00	29.00	22.00	27.00	26.25
d) Stomach & intestines Rs.	11.00	11.00	9.00	12.00	10.75
e) Blood (Animal) Rs.	1.40	1.13	1.60	0.50	1.15
Average rent of meat stall Rs.	195.00	220.00	209.28	230.00	213.57
Net income per animal Rs.	58.50	43.75	45.70	54.00	50.48

Table 9. Particulars of Animals slaughtered in Andhra Pradesh (in lakhs)

	Total no. of all species of animals slaughtered	No. of sheep slaughtered	% of total animal slaughtered
1972	19.12	9.93	51.93 (11.90)*
1973	21.55	11.03	51.18
1974	18.16	9.35	51.48
1975	21.06	10.72	50.19
1976	20.78	10.43	50.19
1977	21.85	10.85	49.65 (15.35)*
1978	24.30	12.13	49.91
1979	23.60	11.50	48.72
1980	25.04	12.10	48.32
1981	28.38	13.28	46.79
1982	33.62	16.90	50.26
1983	32.78	16.17	49.32 (21.54)*
1984	34.51	17.49	50.68
1985	37.15	19.66	52.92
1986	40.26	21.52	53.45
(Mean annual increase 8.3%)			

* % of total sheep population of state.

Table 10. Number of sheep slaughtered in Rayalaseema districts (1986-87)

		Number of slaughter houses	Number slaughtered	% of district slaughter	Daily average number slaughtered
Anantapur:	District Headquarters.	5	32035	57.91	88
	Municipal & other approved slaughter houses	9	23284	42.09	64
	Total	14	55319	(2.57)*	152
Chittoor :	District Headquarters	1	16682	23.79	46
	Municipal & other approved slaughter houses	15	23213	76.21	146
	Total	16	70114	(3.26)*	192
Cuddapah :	District Headquarters.	2	39033	34.26	107
	Municipal & other approved slaughter houses	6	74901	65.74	205
	Total	8	113934	(5.29)*	312
Kurnool :	District Headquarters	2	58617	56.85	160
	Municipal & other approved slaughter houses	33	44493	43.15	122
	Total	35	103110	(4.79)*	282
Total for Rayalaseema		73	342477	15.91	938

*Figures in parentheses are percentage of animals slaughtered in Andhra Pradesh state.

Table 11. No. of sheep slaughtered year-wise in approved slaughter houses in Rayalaseema districts

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	Total for the period	% increase in number of animals slaughtered over a period of 5 years
Anantapur:								
No.	49956	50229	48986	46537	51989	55319	303016	21.68
%	15.56	16.52	15.35	14.19	15.85	16.15	15.82	
Chittoor:								
No.	53527	59272	62520	69952	64823	70114	380218	30.99
%	18.52	19.50	19.64	21.33	20.25	20.47	19.86	
Cuddapah:								
No.	101627	1 6	109895	111576	110895	113934	650053	12.11
%	35.16	6	34.52	34.02	33.81	33.27	33.99	
Kurnool:								
No.	88896	91526	96927	99952	100297	103110	580708	21.68
%	30.76	30.11	30.45	30.47	30.57	30.11	30.33	
Total:								
No.	294006	303953	318328	328017	328004	342477	1914795	18.50
% of A.P. State	22.13	17.99	19.67	18.75	16.88	15.89		

Table 12. Month-wise particulars of sheep slaughter in Tirupati Municipal slaughter house (1988)

	Jan.	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Overal
On Sundays:													
Total	346	278	270	435	319	375	493	482	425	462	312	258	371.25 ±24.76
Average	86.5	69.5	67.5	108.75	79.75	93.75	123.25	120.50	106.25	115.5	78.0	64.50	92.81 ±6.19
On week days:													
Total	688	435	500	618	648	546	692	548	563	556	550	331	556.25 ±29.75
Average	34.4	21.75	25	30.90	32.40	42.00	34.60	27.40	28.15	27.80	27.50	16.55	29.04 ±1.89
Males:													
No.	612	345	335	421	376	370	537	544	445	475	485	318	538.58 ±27.15
%	59	47	43.5	40.3	38.9	44	50	52.8	45	46.6	56	54	48.09 ±1.82
Females:													
No.	422	368	435	622	591	470	527	486	543	543	377	271	471.25 ±29.39
%	40.81	51.61	56.49	59.63	61.12	55.95	49.53	47.18	54.95	53.33	43.73	46.01	51.69 ±1.83

Table 13. Trends in sheep population in relation to Human population (in lakhs)

	1961			1971			1981			Per cent increase(+) or decrease (-)	
	Population		Ratio of sheep/ 100 persons	Population		Ratio of sheep/ 100 persons	Population		Ratio of sheep/ 100 persons	Human	Sheep
	Human	Sheep		Human	Sheep		Human	Sheep			
ndia:	4392	402	9.15	5481	400	7.29	6851	413	6.03	(+) 2.79	(+)0.14
ndhra radesh:	360	83.6	23.22	435	83.4	19.17	535	75.1	14.04	(+) 2.43	(-)0.51
ayalaseema istricts:											
Anantapur	17.7	9.8	55.37	21.1	8.9	42.18	25.5	7.6	29.80	(+) 2.21	(-)1.12
Chittoor	19.15	8.3	43.34	22.8	6.3	27.63	27.4	5.1	18.61	(+) 2.15	(-)1.93
Cuddapah	13.42	5.12	38.15	15.8	4.9	31.01	19.3	4.9	25.39	(+) 2.19	(-)0.21
Kurnool	19.09	5.6	29.33	19.8	4.4	22.22	24.1	4.1	17.01	(+) 1.31	(-)1.34
Total	69.36	28.8	41.52	79.6	24.5	30.78	96.3	21.5	22.33	(+) 1.94	(-)1.26

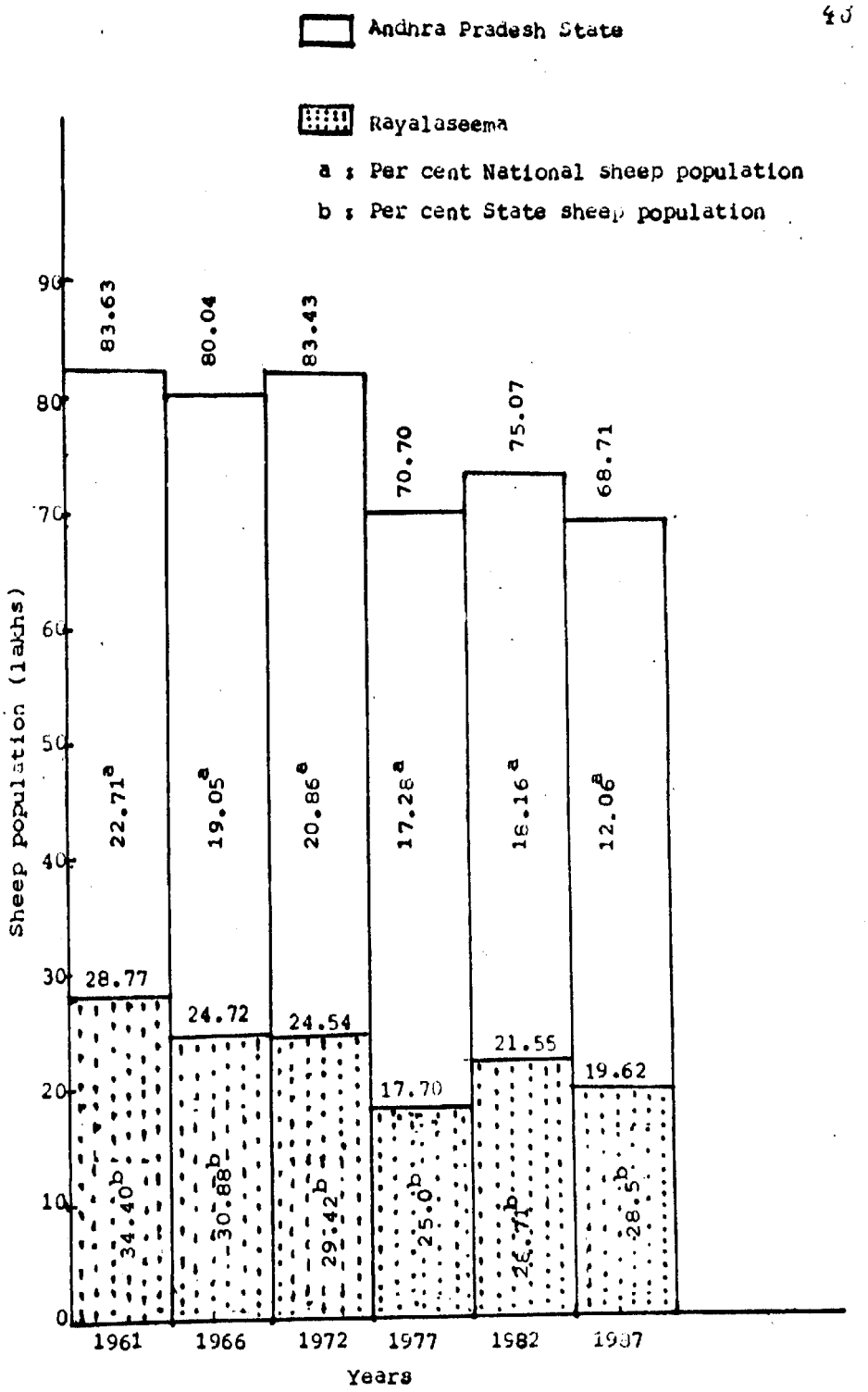

Fig.2. SHEEP POPULATION IN RAYALASEEMA DISTRICTS AND ANDHRA PRADESH

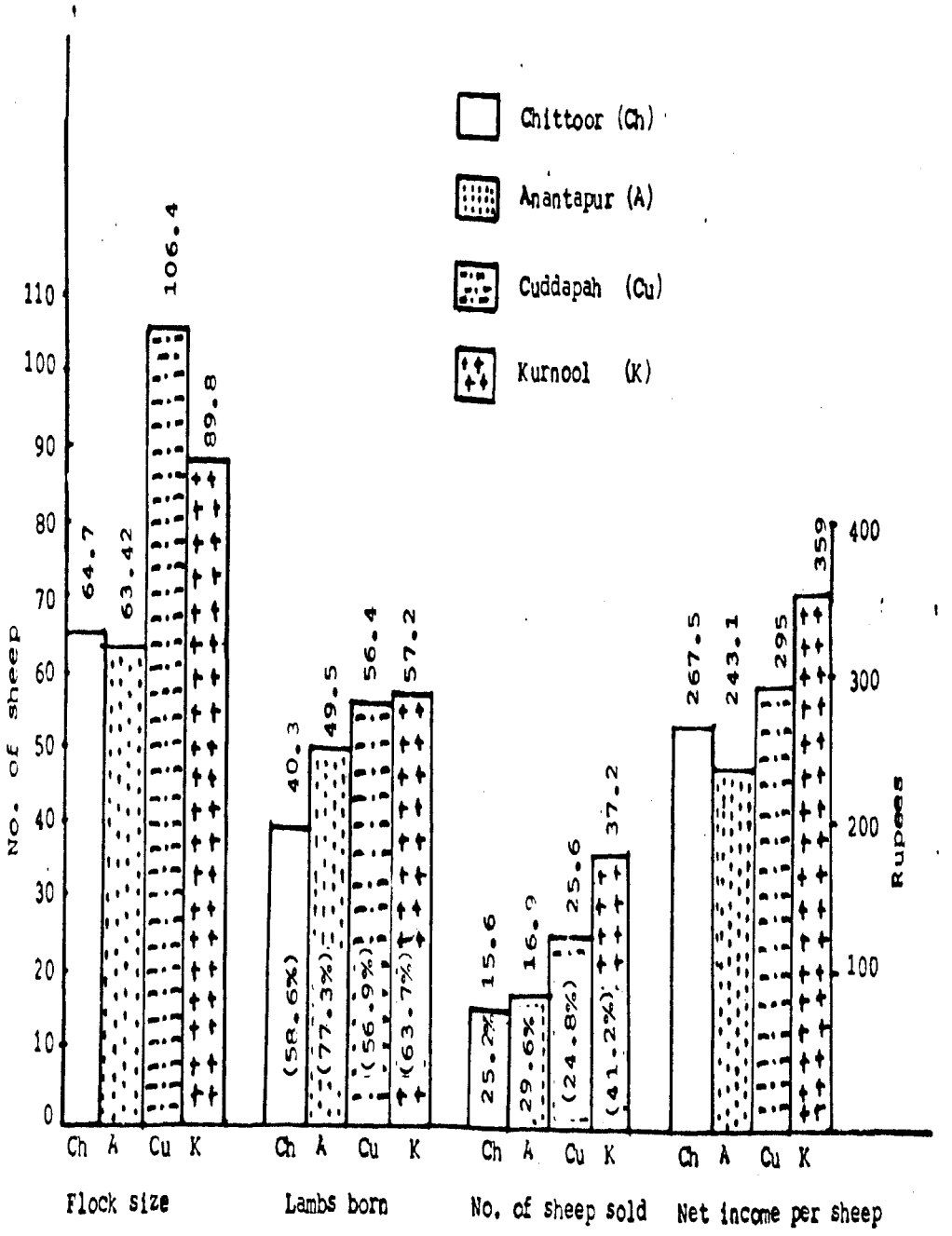

Fig.3. SIZE OF FLOCK, LAMBS BORN, SHEEP SOLD AND NET INCOME OF SHEPHERDS OF RAYALASEEMA DISTRICTS.

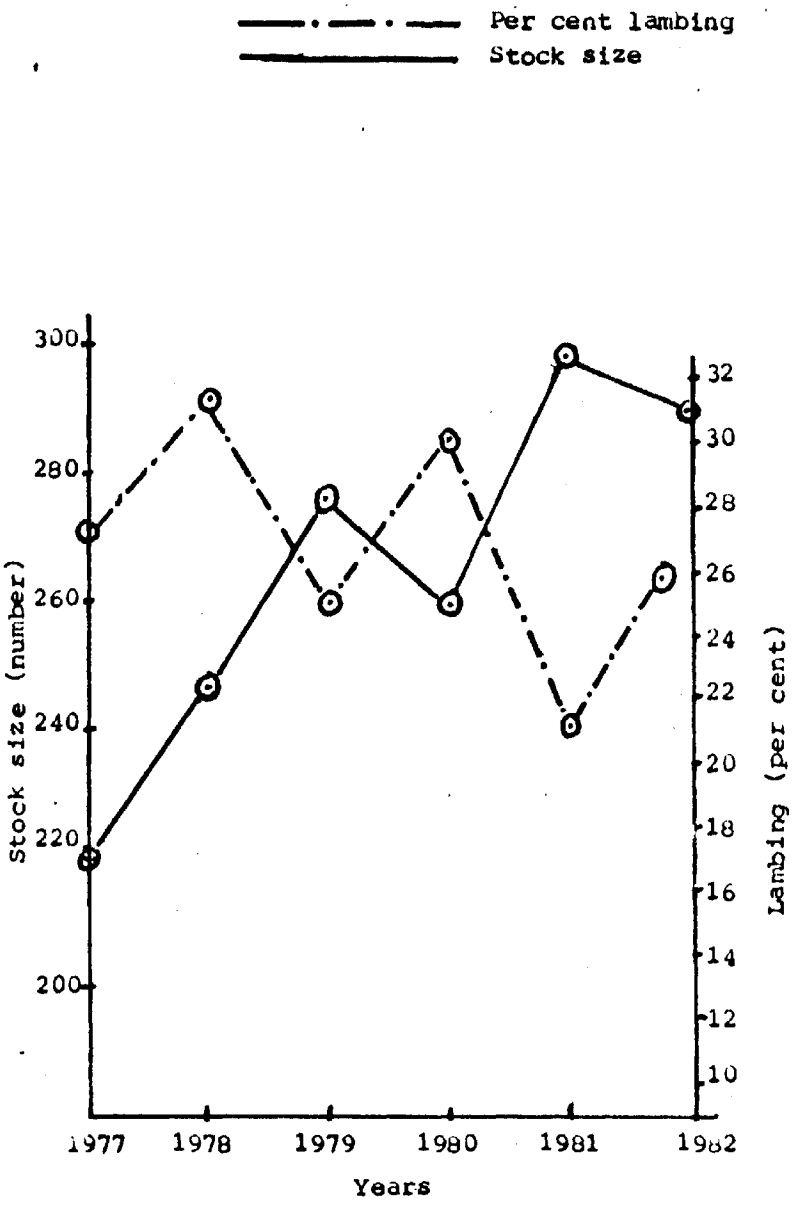

Fig.4. YEAR WISE STOCK SIZE AND PER CENT LAMBING IN SHEEP GROWERS' CO-OPERATIVE SOCIETIES.

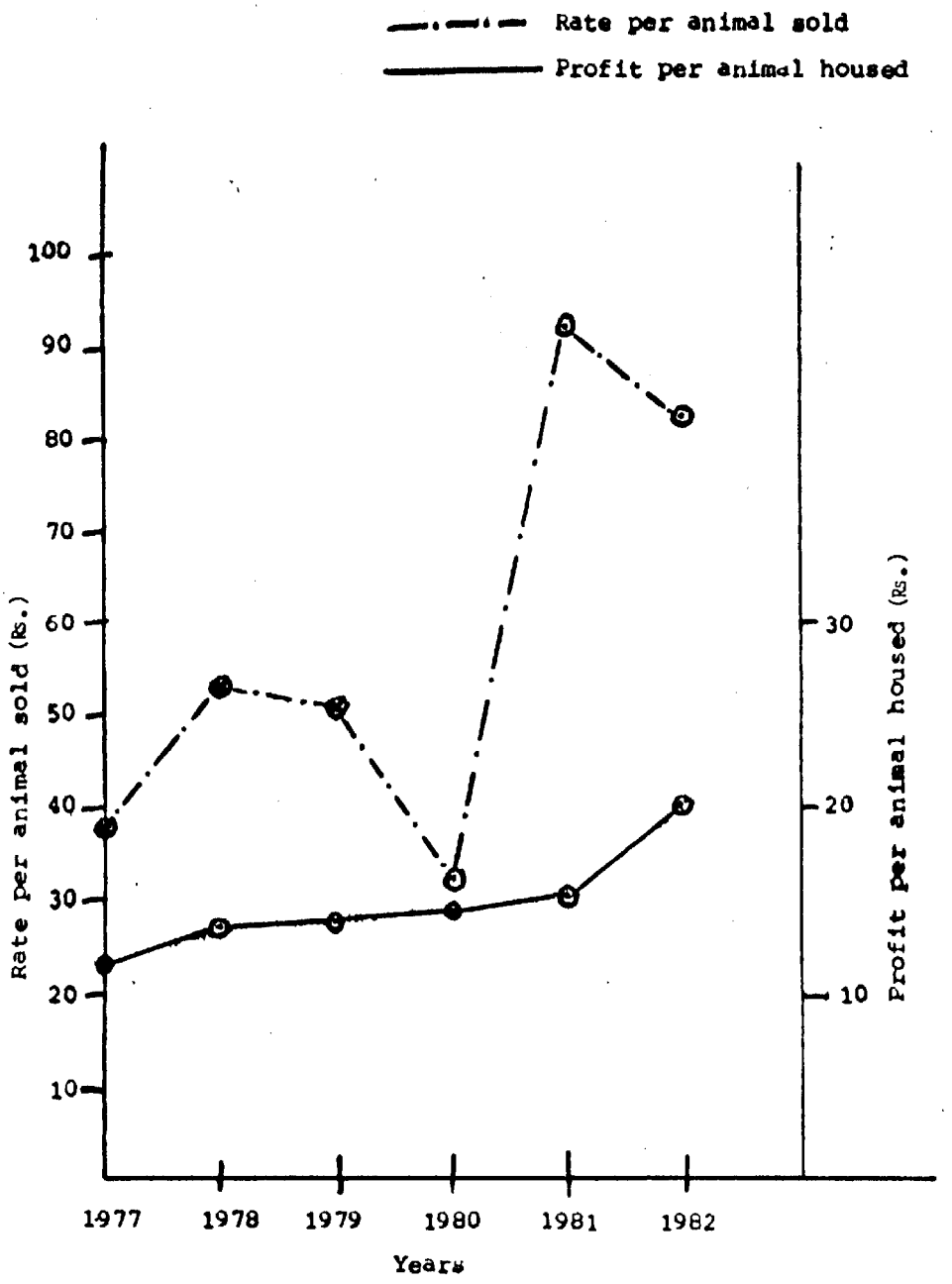

Fig.5. YEAR-WISE RATE PER ANIMAL SOLD AND PROFIT PER ANIMAL HOUSED IN SHEEP GROWERS' CO-OPERATIVE SOCIETIES

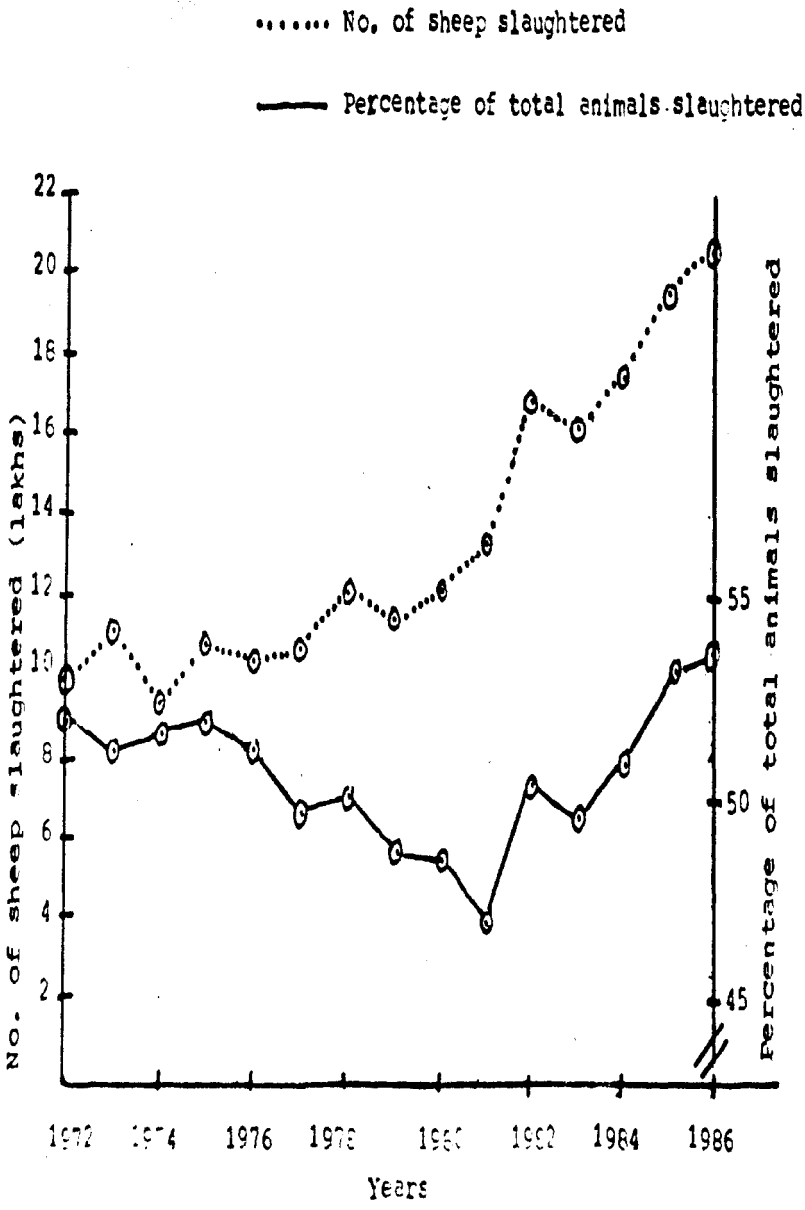

Fig.1. No. OF SHEEP SLAUGHTERED AND PERCENT SLAUGHTERED IN ANDHRA PRADESH

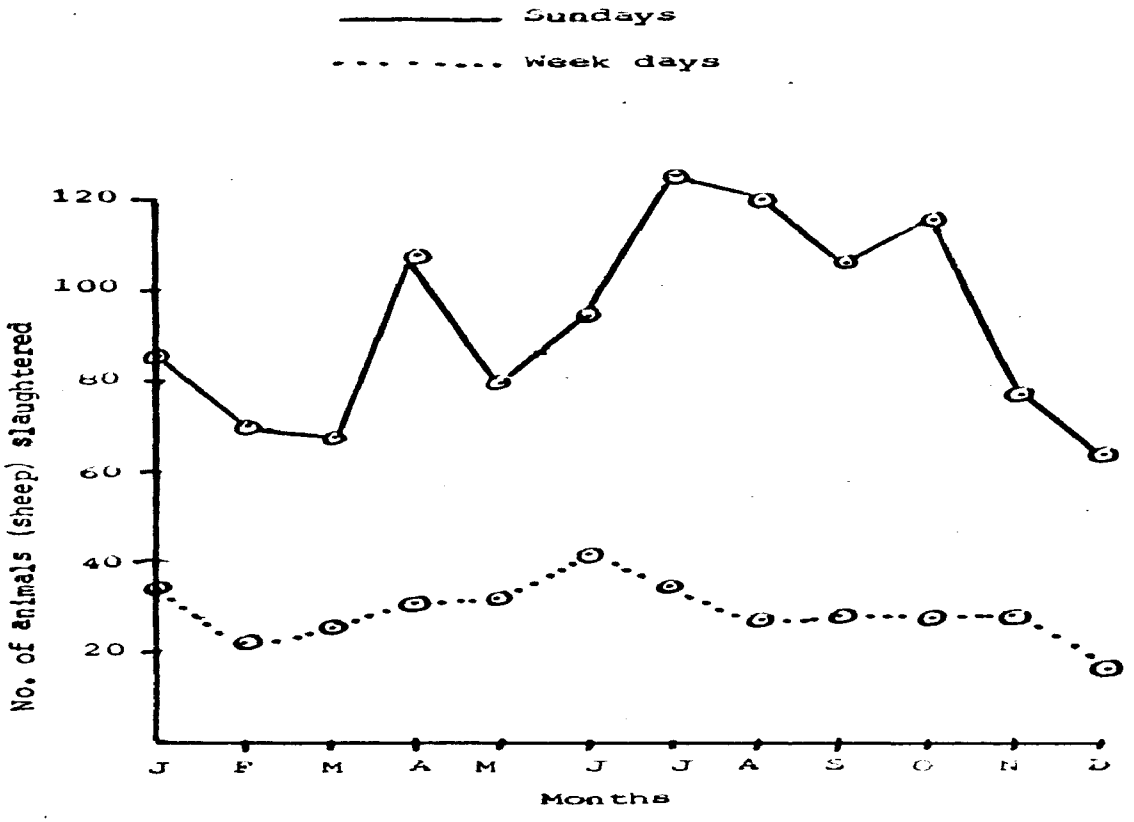

Fig.7. NO. OF ANIMALS SLAUGHTERED MONTH WISE AT TIRUPATI MUNICIPAL SLAUGHTERED HOUSE DURING 1988.

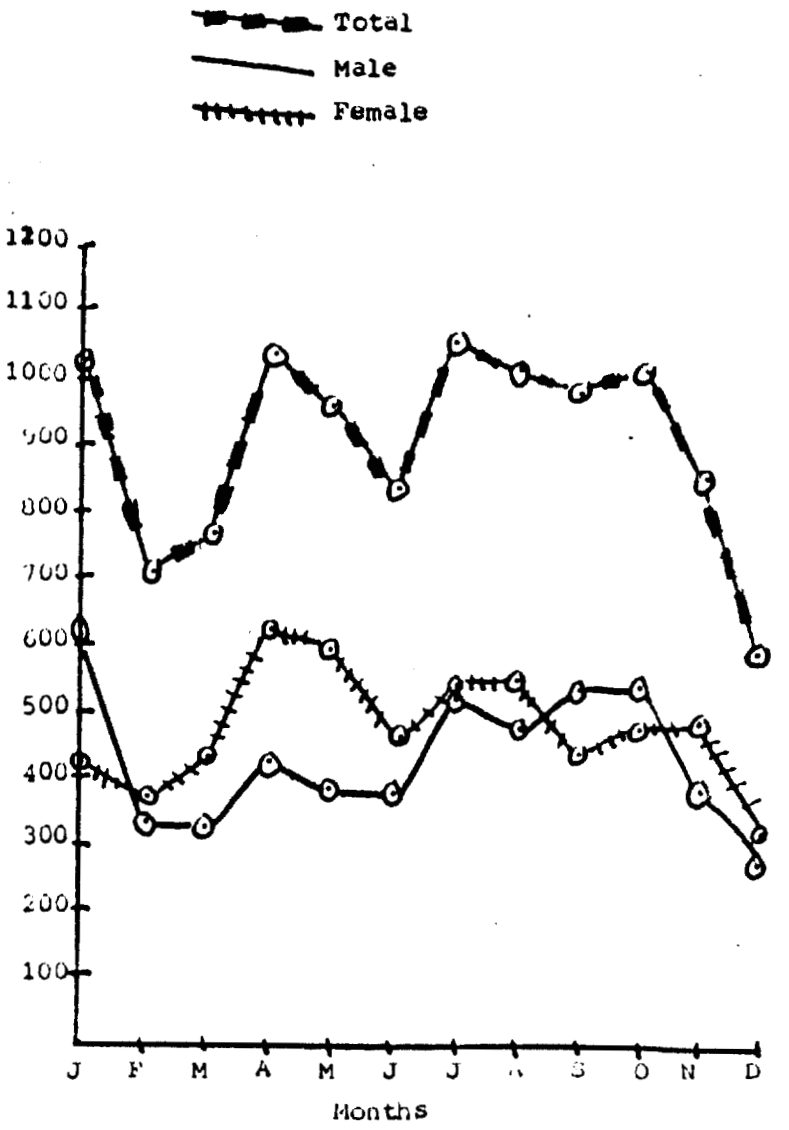

Fig. No. NO. OF SHEEP SLAUGHTERED SEX WISE AT TIRUPATI MUNICIPAL SLAUGHTERED HOUSE 1988.

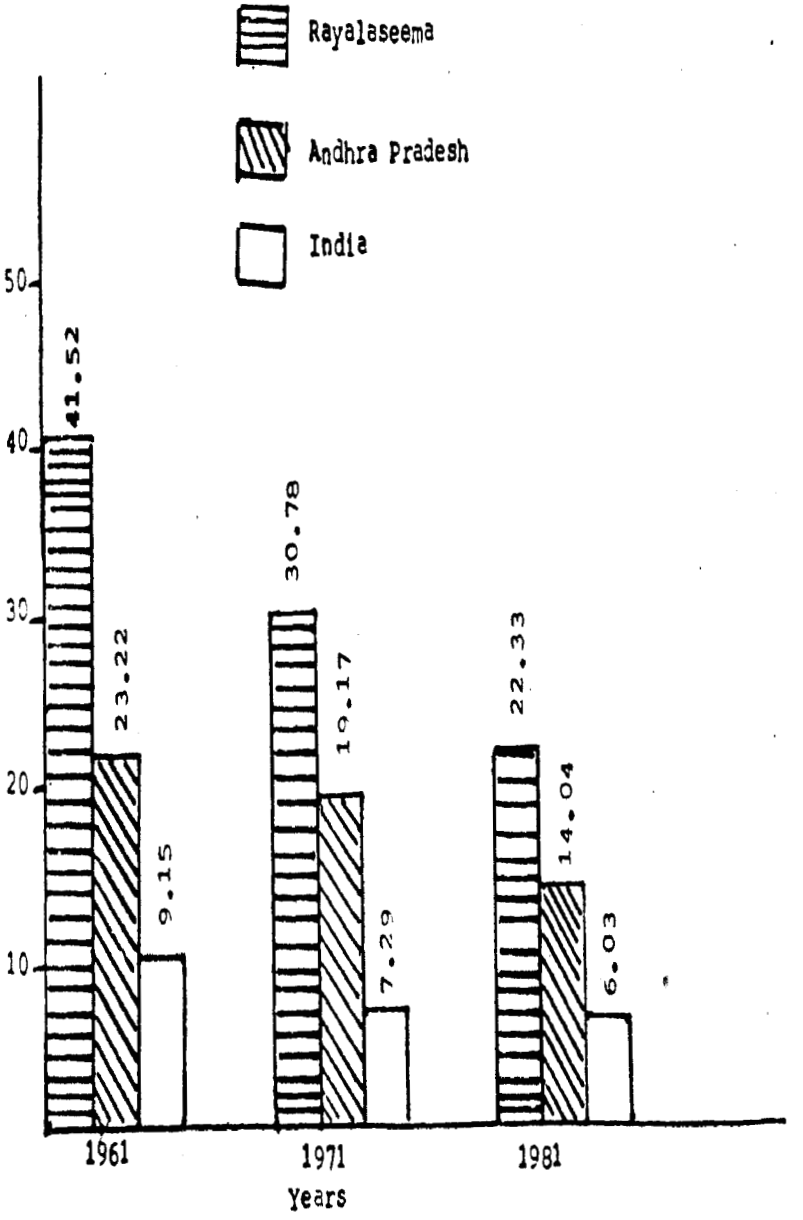

Fig.9. RATIO OF AVAILABLE SHEEP PER 100 PERSONS IN THE COUNTRY, STATE AND RAYALASEEMA REGION

DISCUSSION

The present study was taken up to study sheep production and marketing trends with special reference to Rayalaseema districts of Andhra Pradesh which have been identified as relatively larger sheep populated districts. Investigation was carried out through questionnaires to the shepherds, sheep growers' co-operative societies, officers in-charge of slaughter houses and butchers. Besides statistical data was obtained through various sources pertaining to sheep population, sheep slaughter in the country, in Andhra Pradesh state and in Rayalaseema region in order to relate to the levels of operation. Finally, desk research was carried out to compile, analyse, tabulate and interpret the data that had been generated/obtained from the above surveys. Information had been presented in tabular form year-wise and district-wise in relation to the country's and state figures. Information was also graphically represented to show the typical trends observed, both with regard to sheep population and sheep slaughtered.

Country's sheep population even though remained stationary around 40 million for two decades from 1961 to 82, has been predicted to increase during the last 5 years to 57 million in 1987 (FAO). This expected increase was

almost 37.9% over 1982 figures. Whereas, in Andhra Pradesh the population remained around 80 to 83 lakhs during 1st decade (1961-72) thereafter decreased significantly by about 10% during next decade to 75 lakhs in 1982 and further 8.5% decrease was observed during the five year-period (1982-87) to about 68.7 lakhs. In Rayalaseema region also, there was a significant decrease in sheep population by 14.7% during 1st decade (1961-72) and 12.2% during next decade (1972-82) and a further decrease of almost 9% in 5 years period (1982-87). Whereas in the districts of Rayalaseema the decrease in sheep population was more than 20% during 1st and 2nd decades (1962-82), in Cuddapah district the decrease was only 3.5% and 1.2% during 1st and 2nd decades. During the 5 year period (1982-87) the decrease was almost 26% in Anantapur district and less than 1% in Chittoor district. On the contrary, in the districts of Cuddapah and Kurnool there had been a substantial increase of 18.7% and 23.2% respectively.

The availability of sheep in the country has been declining steadily over the two decades (1961-81) from 9.15 per 100 persons in 1961 to 7.29 in 1971 and to 6.03 in 1981. In Andhra Pradesh the availability of sheep even though twice to that of national average is also steadily declining from 23.2 per 100 persons in 1961 to 19.17 in (1971) and to 14.04 in 1981. In Rayalaseema region the availability of sheep which is almost twice that of State average is also coming down steadily from

41.52 per 100 persons in 1961 to 30.78 (1971) and to 23.33 in 1981. Among the districts of Rayalaseema, Anantapur has maximum (29.8) followed by Cuddapah (25.4), and Chittoor (18.6) and Kurnool (17) during 1981. This trend explains the reason for the steady increase in the cost of sheep and mutton thereof.

Investigation of shepherds of Rayalaseema districts showed that shepherds of Cuddapah and Kurnool are maintaining larger flocks compared to those of Anantapur and Chittoor district. Perhaps because of larger off take by the butchers in these two districts as reflected by a larger number of animals sold and slaughtered compared to Anantapur and Chittoor districts. Shepherds from Cuddapah and Kurnool compared to those from Anantapur and Chittoor, because of prevailing demand were able to realise greater net income compared to shepherds of Anantapur and Chittoor. During interrogation with shepherds, they put forth certain problems faced by them in successful sheep rearing. These problems were almost similar such as

1. Insufficient grazing area and lack of sufficient drinking water in summer months.
2. Labour problem for grazing sheep and management of young stock upto weaning is more difficult as they are very susceptible to diseases.

3. Migratory difficulties regarding supervision of stock while grazing in the fields, during nights and objections by the local shepherds.

4. Finance problem to maintain the flock in famines in addition to domestic needs, to purchase deworming drugs and required medicines for aild animals.

5. Unexpected deaths/loss due to attack by diseases by wild animals in forest area, stray dogs in the hearvested fields and thefting either in grazing or at foldings during nights or at home and occasional missings.

6. Fear of attack by Enterotoximia especially after onset of rain during June/July.

7. No commensurate sale price for both wool and sheep produced by shepherd when he wants to sell at his interest/need.

Information elicited from the societies revealed a very poor performance as far as net income is concerned perhaps due to managemental and organisational lacunae. The production performance, product disposal and income generated varied from society to society and from year to year. However the rate per animal sold increased substantially from Rs.38.1 in 1977 to 83.3 in 1982. Rate per animal sold varied from Rs.29.3 to 82.5 among the societies. Net income per animal housed, after repayments

by the society, varied from Rs.6.00 to 12.00. It was observed that income from sale of animals constituted about 80% from sale of wool 7.8% through sale of manure 10.8% and through sale of skins (from dead animals) less than 1%. It was seen that stock size and per cent lambing were some what negatively correlated.

It was also observed that during 1981-84, there had been steady decline in number of sheep slaughtered by co-operative societies, with a result an decrease in net profit and this may perhaps be due to nonreplenishing the stock and maintaining the flock size. This aspect may have to be looked into, make these co-operative societies more economically viable. Similarly, Dastagiri (1987) had indicated that the size of the farm had a significant effect on the net profits from sheep reared, larger the farm/flock size greater would be the amount realised. Involvement of more number of shepherds interested in the trade is necessary to revamp and activate the societies.

Summary of the questionnaires turned in by the butchers of Rayalaseema districts from Table 7 showed that majority of butchers purchase their required sheep from both middle men and directly from shepherds at village shandies basing their purchase on the expected yield which is again based on the condition and conformation of animal. Less than 30% of the butchers buy the sheep on live weight basis. Mutton trade is the main occupation of less than

20% of the butchers whereas for majority of the butchers (81%) this is a subsidiary occupation. It also revealed that butchers buy the sheep either in pairs (94.6%) or in lots (73%), 62% of butchers responded that they used the Municipal slaughter house facilities and 46% said they slaughter their sheep in private. 40.5% of the butchers were found to hold the stock from the time of purchase to the time they slaughter during the week. In Rayalaseema districts, it was observed that the cost of meat per kg ranged from Rs.30 to 36 and the cost of by-products such as head and feet and pluck also fetched equally good price during 1987. Butchers on an average make Rs.50/- per animal slaughtered.

The retail meat business differs from other lines of retailing in that much of the goods handled must be divided by the retailer into smaller units before being sold to consumers and the different units thus obtained are sometimes sold at somewhat different prices, because of differences in the demand for them. In other words, the various retail cuts obtained from carcass do not sell at the same price per pound because of differences in the relative demand for various cuts due to difference in quality or suitability for consumer's use. The shrinkage and wastage resulting from the cutting, trimming and handling must also be taken into account and this makes the pricing process all the more complicated. Butchers

and others engaged in the trade, being mostly illiterate, do not maintain any records of prices for different types of meat. So far as rural areas are concerned, no statistics what so ever, are available. It is, therefore, difficult to show an accurate trend of prices as data are either very unreliable or wholly lacking. The figures merely give a general indication of the price ranges. Prices are often governed by so many variable factors that a strict comparison is not always possible.

Particulars of animals slaughtered in Andhra Pradesh with special reference to sheep for the period from 1972 to 1986 reveal that sheep slaughtered in Andhra Pradesh state constitute about 50% of the total number of animals slaughtered. The number of sheep slaughtered increased from 9.9 lakhs in 1972 to 21.5 lakhs in 1986. This increase was of the magnitude of 116.7%. The increase during the period from 1972 to 1977 was 9.3% whereas the number of sheep slaughtered from 1977 to '82 in the state increased by 55.8%. Further increase upto 1986 was of the order of 27.3%. The number of sheep slaughtered as a per cent of the total sheep population of state was 11.9%. This percentage increased to 15.35% in 1977 and to 21.54% in 1983. This trend of increasing percentage of sheep slaughtered in the state of Andhra Pradesh was of the order of 8.3% per annum.

Pertaining to the year 1986-87, regarding number of sheep slaughtered with special reference to district head quarters and Municipal slaughter houses of Rayalaseema districts, showed that number of sheep slaughtered were larger in Cuddapah and Kurnool districts being more than one lakh per annum. Whereas in Anantapur it was only 55,000 and in Chittoor, 70,000 giving an average daily figure for the districts as 312, 192 and 152 in Cuddapah, Kurnool, Anantapur and Chittoor districts respectively. The overall figure for Rayalaseema was 3.42 lakhs per annum constituting 15.91% of the number of sheep slaughtered in the state.

Number of sheep slaughtered in district head quarters of Anantapur and Kurnool were more (57.9% and 56.85% respectively) whereas in Cuddapah it was 34.26% (1986-87) and in Chittoor 23.79% revealing that in Chittoor district mutton consumption is spread over the district unlike other districts where it is concentrated in the urban areas.

Year-wise distribution of sheep slaughtered in Rayalaseema over a 5 years period from 1981-82 to 1986-87 showed increased trend in all the districts with over all percentage increase of 18.5 in Rayalaseema region. Among the districts of Rayalaseema, Cuddapah ranked first with 6.5 lakhs sheep slaughtered during the period (1982-87) constituting 33.99% of regional total followed by Kurnool with 5.8 lakhs (30.33%) Chittoor with 3.8 lakhs (19.86%)

and Anantapur with 3.0 lakhs (15.82%). The number of sheep slaughtered in Rayalaseema region which constituted 22.13% of state figure in 1981-82, decreased to 15.89% during 1986-87. This shows that eventhough Rayalaseema contains about 30% of the sheep population of the state, the number of sheep slaughtered and consumed gradually declined indicating regional imbalances in the sheep trade and mutton consumption.

The information obtained from the municipal slaughter house at Tirupati for the year 1988 to study the consumption pattern of mutton revealed that there was no significant variation among the months. However during winter month of December, there had been a reduced slaughter of sheep. This may perhaps be due to the observance of "Ayyappa" Cult in this locality. Sex-wise distribution of sheep slaughtend indicated that larger percentage of females are slaughtered during summer months compared to winter months. This perhaps reflects the seasonal variation in production/reproduction cycles in sheep. Average number of sheep slaughtered was 29 on week days whereas on Sundays it was three times more (93).

Comparison of trends in population growth showed that the human population was increasing at the rate of about 2.5% per annum in the country, 2.2% in the state and 2.1% in Rayalaseema region over a period of 2 decades (1961 to 1982). Sheep population increased insignificantly

by only 0.14% per annum in the country. Whereas in Andhra Pradesh state, there was significant decrease by about 0.5% per annum. In Rayalaseema region the annual decrease in sheep population was much greater (1.34% per annum). In Anantapur district decrease was 1.22%, in Chittoor 2.18%, in Kurnool 1.44% and in Cuddapah decrease was only 0.24%. This negative trend only points to a situation in near future where per capita availability of mutton would be fearfully low which perhaps might result in an escalation of mutton cost enormously even beyond the reach of middle class consumer leave alone the poorer section of the society.

CHAPTER VI

SUMMARY

Primary sheep growers cooperative societies, shepherds, municipal slaughter houses and butchers were selected at random for the purpose of the study on production and marketing trends of sheep and mutton in the four districts of Rayalaseema of Andhra Pradesh. Statistics published by various agencies were also used in this study.

The sheep population in the country remained around 40 millions during the period from 1961 to 1982 which increased to 57 millions in 1987. In Andhra Pradesh state, the sheep population decreased from 83 lakhs in 1961 to 68.7 lakhs in 1987.

In Rayalaseema Region the sheep population declined from 28.77 lakhs in 1961 to 19.62 lakhs in 1987. Of the four districts of Rayalaseema Region, Anantapur district had maximum sheep population with 5.6 lakhs during 1987 compared to 9.8 lakhs in 1961 followed by Chittoor, Kurnool and Cuddapah districts.

The over all flock size maintained by the shepherds of Rayalaseema was 81.08 $\pm$ 10.39 with larger flocks in Cuddapah followed by Kurnool, Chittoor and Anantapur districts. Animals sold by the shephereds of Kurnool district was maximum (41.2%) with a net

income of Rs.315-00 per animal.

The average size of flocks maintained by sheep growers co-operative societies ranged from 212 to 310 and the number of animals disposed on an average was 77. The net income ranged from Rs.1251 per year in one society to Rs.3137 in another society. The mean overall net income per year per animal housed was Rs.8.46. Profit per animal housed steadily increased from Rs.11.11 during 1977 to Rs.20.32 during 1982.

The average number of sheep slaughtered ranged from 45.5 ± 5.5 to 121.75 ± 33.1 in sheep growers' cooperative societies with marketing facility with a net profit per animal ranging from Rs.11.70 to Rs.15.18.

Almost all the butchers of Rayalaseema districts purchased their sheep on the basis of expected yield. Butchering is a subsidiary occupation for 81% of the butchers in the meat trade. The over all mean number of sheep slaughtered is around 4.6 on week days and 8.6 on Sundays in the four districts. Selling price of mutton was higher in Cuddapah and Chittoor compared to Anantapur and Kurnool districts. Net income per animal slaughtered ranged from Rs.43.75 in Chittoor district to Rs.58.5 in Anantapur district. In Andhra Pradesh state, sheep slaughtered on percentage basis decreased from 51%

during the period 1972-75 to 48% in 1980 and then increased to 53% in 1986.

In Chittoor district 23.79% and in Cuddapah about 34.26% of sheep were slaughtered in the district headquarters, whereas in Anantapur and Kurnool more than 50% (57.9% and 56.85% respectively) were slaughtered in the district headquarters.

Of the total number of sheep slaughtered in Rayalaseema, 32.14% were slaughtered in Kurnool district, 30.38% in Cuddapah district, 21.04% in Chittoor district and least (16.44%) in Anantapur district.

In Tirupati Municipal slaughter house maximum number of males were slaughtered during the month of January (59%) followed by November (56%) and December (54%). More number of females were slaughtered during April (59.6%) and May (61.1%). Number of sheep slaughtered on Sundays was 3 times greater than on week days with no significant difference among the week days.

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APPENDIX I

PARTICULARS FROM SHEPHERDS

1. Flock size
2. Breeds
3. Breeding policy (a) Local germ plasm (b) crossbreed/exotic
4. Peak season of production
5. Production from parent stock/annum
6. (a) Kind of disposal (a) Butches (b) Individual
   (b) To whom disposed: (1) on the farm (2) shandy
   (a) Middle men (b) Butchers (c) breeding
   (d) self consumption.
7. Grazing area (a) Forest, (b) Private farm
8. Rearing system
9. Expenditure for grazing
10. Diseases
11. Mortality
12. Preventive measures
13. Age at sales
14. Assessment of weight of animals
15. Rate of sale (a) Fixed price (b) Auction price
16. Net income per animal per annum
17. Number of animals sold per annum
18. Marketing system
19. Fate of dead animals and skin
20. Interaction with other shepherds cooperation and corporation
21. Problems in production and marketing.

APPENDIX II

PARTICULARS FROM SHEEP FARMS

1. Stock position
2. Number of Animals produced/Annum
3. Maintained Breeds
4. Breeding systems
5. Lambing season
6. Lambing percentage
7. Feeding systems (a) concontrates (b) Roughages
   (c) Grazing
8. Feed efficiency
9. Average cost of production
10. Rearing systems (a) Intensive (b) Extensive
11. Mortality (a) preweaning (b) post weaning
12. Common diseases encountered
13. Disposal of Animals
14. Mode of disposal
    (a) Farmers (b) Shandies (c) Retail sale
    (d) disposal for skins (whether rams or ewes sold)
15. Sheep breeding areas (From local shepherds)
16. Marketing system.

APPENDIX III

PARTICULARS FROM BUTCHERS AND RETAILERS

1. Source of purchase of animals

   (a) Near by villages (b) Shandies (c) Sheep farms

2. Purchase through

   (a) Middlemen (b) Sheep growers

3. Basis of purchase

   (a) Live weight (b) Expected yield (c) Physical condition (d) Muscling

4. Transportation to slaughter house

   (a) On foot (b) vehicle

5. Shrinkage loss: If any,

6. Purchase: (1) Weekly (2) Daily

   (a) Groups or lots (b) Pairs (c) Individuals

7. Maintenance of purchased stock and charges

8. Place of slaughter

   (1) Home slaughter (2) M.S.H. (3) Private yard

   (4) Other places

9. Price of different items of carcass

   (a) Mutton (b) Head and feet (c) pluck (d) Stomach and Intestines

10. Whether Retail or wholesaling is beneficial - Why?

11. Transportation from S.H. to meat stall and fees
    (a) Cycle (b) carts (c) Rickshaw (d) provision
    by municipality
12. Net yield of meat out of carcass-weightage of bone
    out of a carcass.
13. Rent of meat stall
14. Parcelling charges/month/per day
15. Various fees in the purchase of live stock at shandies
16. Various fee in the S.H. per animal
    (a) Gate fee (b) Mullah fee (c) cleaning and dressing
    and flaying fee (d) trading licence
17. Net income per animal per month
18. Since how long in the trade
19. Butchering is main/subsidiary occupation
20. Any meat inspection programme
21. Fate of left over meet and its price
22. Supply of meat
23. Any problems in the purchase of livestock
24. Any bottlenecks in marketing practices
25. Name and address

APPENDIX IV

PARTICULARS FROM SHEEP GROWERS CO-OPERATIVE SOCIETY

1. Name of the society
2. Membership (a) Previously (b) present
3. Date of starting
4. Year-wise strength of sheep
5. Year-wise no. of lambs born
6. Total sheep disposed per year: (a) For breeding
   (b) For slaughter
7. To whom sold (a) Sheep breeder (b) Butcher (c) Middle men
8. Method of marketing (a) Auction (b) Conformation
   (c) Live weight
   (a) Auction: (1) Lots (2) Individual
   (b) Live weight basis: (1) Lots (2) Groups (3) Individual
   (c) Conformation: (1): Lots (2) Groups (3) Individuals
9. Gross receipts (a) Sheep (b) Manure (c) Wool
   (d) Miscellaneous
10. Total net receipts
11. Profit share to each member
12. No. of deaths (a) Young (b) Adults
13. Causes of death
14. Method of rearing (a) Free range (b) Semi-range
    (c) Stall feeding
15. Feeds used (a) Cost of feed (b) Quantity of feed/Animal
16. Whether the society functioning
17. Reasons for closure if so
18. Any bottlenecks for running the society.