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CHANGING FACTOR SHARES AND FEEDING PATTERN IN LIVESTOCK PRODUCTION OF TAMIL NADU - AN ECONOMIC ANALYSIS

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ABSTRACT

A study was undertaken to assess the contribution of different inputs such as feed, fodder, labour etc. to the development of livestock sector including poultry and the feeding pattern of livestock in Tamil Nadu. To meet out the growing demand for livestock products, various technological interventions were introduced in the livestock sector of the Country and the State which resulted in significant improvements in production, productivity and per capita availability of livestock products. The factor shares of livestock sector was estimated based on the secondary data for 1980-81 to 2003-04, with two sub periods, Period I - 1980-81 to 1991-92 and Period II - 1992-93 to 2003-04 The factor shares of livestock production suggested that feed and fodder group is the major component in the livestock production over time. . For the period between 1980-81 to 1991-92, the share of feed and fodder group in total inputs was 53.50 per cent which had decreased to 47.50 per cent for the period between 1992-93 to 2003-04. The share of human labour which was 13.91 per cent for the period between 1980-81 to 1991-92 had increased to 23.14 percent with the overall average of 18.53 per cent. The component others share was almost stable during different periods. The share of population stock was also estimated to be stable and was 15.39, 12.90 and 14.14 percent for the periods 1980-81 to 1991-92, 1992-93 to 2003-04 and 1980-81 to 2003-04 respectively. The feeding pattern of livestock over time has changed from dry fodder and green fodder towards concentrate due to the increase in the number of cross bred cattle and hybrid fowls.

Key Words: Livestock Sector– Inputs share – Feed – Fodder-Labour-Livestock Capital

INTRODUCTION

Livestock play a vital role in rural economy. The combination of livestock and crop farming enables complementarity through productive utilisation of farm by-products and conservation of soil fertility, thus increasing rural farm income. Apart from providing food products like milk, egg and meat, livestock sector generates productive employment and valuable supplementary income to the vast majority of rural households, majority of who are small and marginal farmers and landless labourers. Livestock sector employs over 11 million rural poor and women in principal status and eight million in subsidiary status, which is about 5 per cent of total working force in the country. Livestock sector and fisheries sector contributed over 4.07 percent to the total GDP in 2008-09. It has contributed 29.7 percent to the total agricultural output in 2008-09 (Economic Survey of India, 2010-11). Its contribution to the total agricultural output has increased from 13.88 percent in 1980-81 to 29.7 per cent in 2008-09. According to the Central Statistical Organization, the value of output from livestock at current prices during 2008-09 was 2,61,000 crore of which 1,78,401 crore was contributed by milk and 15,650 crore was contributed by dung fuel and manure. During 2008-09, the gross value of output of livestock for Tamil Nadu was Rs.20,940 crore. Contribution of livestock sector to the gross state domestic product was 2.72 per cent and its contribution to the total agriculture and allied sector was 36.45 per cent. The state contributes 18.12 per cent of egg, 11.48 per cent of meat and 5.13 per cent of milk production of the country.
Various technological interventions introduced after the independence in the livestock sector of the Country and the State have been responsible for the significant improvements in production, productivity and per capita availability of livestock products. Although, it has been argued that technology has

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contributed to the growth and expansion of livestock sector, empirical evidence is still not available to support this contention. With the economic reforms ongoing, it is important concerning over sources of future livestock productivity growth to examine the contribution of technology to livestock productivity growth. In this context, it is essential to examine the answers relating to questions concerning livestock productivity growth: How much has productivity growth contributed to the growth of total output? What have been the sources of productivity growth? What are the shares of different inputs in different time periods to this growth? What are the different output shares in this growth. The estimation of the share of different inputs like feed, fodder, labour and investment in the total inputs cost in different decades would help to allocate rationally these scarce resources by formulating suitable farm plans. With the above objectives, the present study was carried out to find out the share of different inputs like feed, fodder, labour and investment in the total inputs cost in the livestock sector different decades.

MATERIALS AND METHODS
The factor shares in livestock production was estimated based on the secondary data for 1980-81 to 2003-04, with two sub periods, Period I - 1980-81 to 1991-92 and Period II - 1992-93 to 2003-04. The input index included feed and fodder, human labour, animal capital and animal husbandry department expenditures. In livestock sector, the major constraint in estimation of total factor productivity is the availability of data. There are no continuous data available on input and output areas and their value. Data on livestock population and human labour force available do not co – exist for the same period. Likewise data on feed availability and their prices over time were not available. To overcome these shortfalls, several assumptions were considered for generation of data on inputs and outputs and their prices over time series in livestock sector in consultation with the experts. Growth projections were made and extrapolated to construct the data. Secondary data relevant for the study were collected from the Directorate of Animal Husbandry and Veterinary Services and the Directorate of Economics and Statistics of Government of Tamilnadu. The data relating to agriculture viz., labourer population, livestock population, milk production, number of veterinary institutions, land utilization pattern, total cropped area, area under permanent pasture, cropping pattern, production particulars of various crops were gathered from various secondary sources like, Statistical Information, Animal Husbandry Department, Annual Statistical Abstracts of Tamil Nadu, Tamil Nadu – An Economic Appraisal, Report on Input Survey – Tamil Nadu, Reports on Integrated Sample Survey for Estimation of Production of Milk, Egg and Meat, Hand Book of Economics and Statistics, and various other publications of Government of Tamil Nadu.

Inputs Data
*Dry fodder:*The data on dry fodder in the state were estimated by following estimated crop-residues using grain to straw ratios.
Green fodder: For the estimation of green fodder in southern states, Pandey (1995) has assumed 1/6th of Cholam, Cumbu and Maize, 1/5th of Lucern crop, 1/7th of Oats, half of Cowpea, ¼th of Sugarcane and 1/10th of Rapeseed and Mustard produced as green fodder produced and the same was also followed in this study too.
Concentrate feed: The concentrate feeds in the state were estimated by following the methodology adopted by Pandey (1995).
Poultry feed: The estimates of concentrates/cakes for livestock also included a part of poultry feed. From the crop production data, 50 per cent of maize, 25 per cent each of bajra and jowar were considered as poultry feed (Elumalai and Pandey, 2004). The prices of dry fodder, green fodder and concentrates were generated and compiled from past studies on cost of production of milk.
Human labour: The population census data about the cultivators and agricultural labourer were collected for the periods 1981, 1991 and 2001 and growth projections were made during the inter census period. Then 1/4th of male and 3/4th of female in each category were considered to be employed for livestock rearing and maintenance. And it was assumed that three women labourers were equivalent to two men

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labourers. The wages for labourers were gathered from various issues of Annual Statistical Abstracts of Government of Tamil Nadu and Statistical Information Handbooks of Animal Husbandry Department, Government of Tamil Nadu.

Others

The medicine cost, vaccine cost and deworming cost, along with the other expenses incurred by the Animal Husbandry Department over the time period were collected from various issues of Statistical Information Handbooks of the state Animal Husbandry Department and used.

Livestock capital: For the calculation of animal capital, all the animals were converted into average cattle unit and these were multiplied by prices. The livestock capital prices were compiled and generated from past studies on cost of production of milk [Ramalingam (1980), Prabaharan (1986), Ramaradj (1992), Palanichamy (1996), Prabu (1997) and Ganeshkumar (2001)].

The data collected were tabulated and analysed with a view to achieve the objectives of the study. Average and percentage analyses, were used to analyse the data.

RESULTS AND DISCUSSION

Factor shares of livestock sector

The results of factor shares in livestock production system are presented in Table 1. Feed and fodder, human labour, livestock population and others (health care expenses like medicines, vaccines, deworming along with the Animal Husbandry Department expenses) were considered to estimate the input index. Among the different components that constituted the total inputs, the share of feed and fodder group ranked first, having almost half of the total inputs share. For the entire period between 1980-81 to 2003-04, the share of feed and fodder group was estimated to be 50.50 per cent. For the period between 1980-81 to 1991-92, the share of feed and fodder group in total inputs was 53.50 per cent which had decreased to 47.50 per cent for the period between 1992-93 to 2003-04. The share of labour for livestock sector for the period 1980-81 to 2003-04 was 18.53 per cent and the same was estimated to be 13.91 per cent for the period between 1980-81 to 1991-92 whereas between the period 1992-93 to 2003-04 it's share had increased to 23.14 percent. The reasons for the increase in the share of human labour might be due to the increase in the number of crossbred cattle population and hybrid poultry. Further, added with the increase in labour force, the shortage of agricultural labour's has escalated the demand for livestock labour and their wages. The component others share was almost stable during different periods. The share of population stock was also estimated to be stable and was 15.39, 12.90 and 14.14 per cent for the periods 1980-81 to 1991-92, 1992-93 to 2003-04 and 1980-81 to 2003-04 respectively. The individual year wise estimation details are depicted in Figure 5.1. The individual year wise estimation results showed that the share of feed and fodder group was 51.75 per cent in the year 1980–81 and had decreased to 50.50 per cent in 1992–93 and was 55.50 per cent in 2003–04. On the whole, there has not been much change in the value of share of feed and fodder which indicates the importance of this group. The share of labour for livestock which was 14.45 per cent in 1980–81 and slightly increased to 15.50 per cent in 1992–93 because of the increase in labour population requirement to rear cross bred animals during this period. During the year 2003–04 the share of labour was 13.50 per cent and the reason for the decrease might be because of automation happening in the livestock sector. Similarly, there has not been much change in the value of others, while, the value of population stock had increased from 17.30 per cent in 1980-81 to 20.50 per cent in 1992–93 and again decreased to 18.50 per cent in 2003–04. The reasons for the decrease in the year 2003–04 might be due to the overall decrease in the animal population. Akin results were obtained by Kumar and Pandey (1999) and Elumalai and Pandey (2004).

Feeding pattern of livestock sector

The feeding pattern of livestock during different time periods is presented in Table 2. The share of dry fodder in total feed cost was found to be 24.47 per cent for the period of 1980-81 to 2003-04 and was 25.23 per cent for the period between 1980-81 to 1991-92, which had decreased to 23.62 per cent for the period between 1992-93 to 2003-04. The share of green fodder also revealed the same pattern. It's

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Table 1: Factor Shares in Livestock Production

(per cent)

Period	Feed and Fodder	Labour	Others*	Population Stock	Total
1980-81 to 2003-04	50.50	18.53	16.83	14.14	100.00
Period - I (1980-81 to 1991-92)	53.50	13.91	17.20	15.39	100.00
Period - II (1992-93 to 2003-04)	47.50	23.14	16.46	12.90	100.00
1980-81	51.75	14.45	16.50	17.30	100.00
1992-93	50.50	15.50	13.50	20.50	100.00
2003-04	55.50	13.50	12.50	18.50	100.00

* Includes animal healthcare expenses (medicines, vaccines, deworming drugs, etc.) and expenses on establishment of the Animal Husbandry Department.

Table 2: Livestock Feeding Pattern

(per cent)

Period	Dry Fodder	Green Fodder	Concentrate	Total
1980-81 to 2003-04	24.47	26.78	48.75	100.00
Period - I (1980-81 to 1991-92)	25.23	27.91	46.86	100.00
Period - II (1992-93 to 2003-04)	23.62	25.51	50.87	100.00
1980-81	20.27	31.63	48.10	100.00
1992-93	27.68	24.94	47.38	100.00
2003-04	14.79	17.83	67.38	100.00

average share for the period 1980-81 to 1991-92 was 27.91 per cent, and for the period 1992-93 to 2003-04 was 25.51 and the overall average share was 26.78 per cent. While, both the shares of dry fodder and green fodder has reduced in the second period the average share of concentrates has increased from 46.86 per cent in the period between 1980-81 to 1991-92 to 50.87 per cent in 1992-93 to 2003-04 with the

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overall average of 48.75 per cent. The reasons for the increase in the share of concentrate might be because of increase in the number of crossbreed cattle and hybrid poultry which warranted better feeding with concentrate to improve the production and this in turn resulted in improved productivity. The individual year wise feeding pattern also revealed the same trend with the share of concentrate feed in the total feed cost increasing gradually while that of dry fodder and green fodder declining. The possible reason for this change is the replacement of indigenous cows by crossbred cows which need higher level of concentrate feeding to maintain their productivity. Similarly Kumar and Pandey (1999) and Elumalai and Pandey (2004), reported the increase in the share of concentrates in the feeding pattern over the time.

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