



Livestock component as a source in reduction of nutritional poverty— An evidence from rural Tamil Nadu

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The number of undernourished people is estimated to be 821 millions (around one out of every nine people) in the world in the year 2017 (FAO, IFAD, UNICEF, WFP and WHO 2018). According to Rangarajan committee of Planning Commission (2014), about 363 million Indians (29.5% of the total population) were below poverty line. Among various criteria used to fix the poverty line, income / expenditure status is widely used. However, importance is not given for nutritional intake/ status for deciding the poverty line. Planning Commission (2014) recommended the poverty line in India based on the Monthly per capita Consumption Expenditure (MPCE) of ₹972 in rural areas and ₹1407 in urban areas (Rangarajan committee). Further, the committee also recommended minimum per capita energy requirement of 2155 kcal per day in rural India. Similarly, the minimum standard for per capita protein and fat requirement per day was fixed at 48 g and 28 g in rural India. With this background, an attempt was made to compare the incidence of nutritional poverty with that of economic poverty in order to explore the role of livestock component in reduction of nutritional poverty among various occupational groups in rural Tamil Nadu.

Based on previous studies (Srivastava *et al.* 2010, Shanmugam 2012, State Planning Commission 2012–2017), composite poverty indices were worked out to select six poverty prone districts (Ramanathapuram, Dharmapuri, Villupuram, Ariyalur, Thiruvannamalai and Pudukottai) of Tamil Nadu. Multi-stage random sampling method was employed to select 90 sample households in each selected district, comprising different occupational groups leading to the total sample size of 540 households comprising 2,500 persons.

The data pertaining to the objectives of the study were collected through personal interview using structured pre-tested interview schedule. The data on food consumption by the households were collected using 7 days recall method as used by Bashir *et al.* 2012^a. The quantities of food

recorded as consumed by the household were converted into equivalent amount of energy, protein and fat on the basis of Indian Council of Medical Research (ICMR) nutrition charts (Gopalan *et al.* 1991, Manual of Animal Husbandry Statistics 2011 and NSS 68th round 2014). The nutritional poverty line was fixed as 2154.91 kcal/day/capita of energy, 48.17 g/day/capita of protein and 27.61 g/day/capita of fat, based on recommendations of the Planning Commission (2014).

The per capita consumption pattern of food products by sample respondents of various occupational groups is presented in Table 1 and were compared with the Indian Council of Medical Research (ICMR) recommendations of daily intake (RDI) for moderately active persons (Planning Commission 2002–07, National Institute of Nutrition 2011, and Varadharajan *et al.* 2013). The average cereal intake per capita per day was worked out to be 300 g and it was found to be the highest among the crop cultivators (335 g) and the lowest among agricultural labourers (240 g). It is evident that the per capita consumption of cereals per day by all the occupational groups was less than the recommended level of 400 g. Only crop cultivators (335 g) and crop + livestock farmer (315 g) consumed above the average level of consumption of sample respondents. The sample respondents consumed 27.523 g of pulses per capita per day against recommended daily intake (RDI) of 80 g per day.

The per capita consumption of milk was calculated to be 179.73 g/day, which was significantly lower than the ICMR recommendations of 300 g. The per capita consumption of milk by the livestock farmers was calculated to be 219.78 g/day, which was remarkably higher when compared to other occupational groups. The consumption of eggs was found to be one-twelfth of ICMR recommendations. The total meat including fish was consumed at the rate of 0.708 kg, which was lower than that of the ICMR recommendations of 0.913 kg per month. However, it should be noted that the meat consumption by the fishermen was found to be remarkably higher (3.586 kg). The milk and meat consumption levels were extremely low

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Table 1. Occupation-wise per capita consumption pattern of food products by sample respondents

Occupational category	Cereals	Pulses	Livestock products					Fish	
			Milk	Egg	Mutton/ Chevon	Chicken	Beef/ Carabeef		Pork
Crop cultivator	335	29.403	139.67	17.196	0.131	0.195	0.007	–	0.137
Livestock farmer	295	27.861	219.78	27.360	0.153	0.206	0.012	0.002	0.221
Crop + livestock farmer	315	28.868	202.32	23.304	0.131	0.213	–	0.017	0.170
Fishermen	283	23.357	101.67	35.004	0.114	0.151	–	–	3.321
Agricultural labourer	240	21.694	30.81	10.140	0.062	0.103	–	–	0.106
Non-farm worker	271	24.841	124.27	16.836	0.111	0.179	–	0.018	0.322
Overall	300	27.523	179.73	23.484	0.133	0.195	0.006	0.007	0.367

Cereals, Pulses, Milk, g/ day; Mutton/ Chevon, Chicken, Beef/ Carabeef, Pork, Fish, kg/ month; Egg , Numbers/ annum.

among the agricultural labourers. As meat is highly income elastic, the agricultural labourers might have constrained their level of meat consumption. Among various occupational groups, the consumption level of mutton was lower than that of chicken, which might be due to the price effect. Overall, it could be concluded that the cereals and pulses consumption was comparatively higher among crop cultivators. Similarly milk consumption was higher among livestock farmers and fish consumption among fishermen.

The consumption of all the food products was extremely low among agricultural labourers.

Calorie intake: It is evident from the Table 2 that the sample respondents were found to receive 1,846 kcal per day, which was lower than the State average of 2,560 kcal per day (NSS 68th round 2014). Among various occupational groups, crop cultivators (1976 kcal) and crop + livestock farmers (1962 kcal) consumed more calories, when compared to the livestock farmers (1870 kcal),

Table 2. Per capita nutritional intake by sample respondents among various occupational groups

Occupational category	Cereals	Pulses	Livestock products				Fish	Others	Total	Households [#]		Head counts [#]	
			Milk	Meat	Egg	Total				BCL	Total	BCL	Total
<i>Calorie intake (kcal/day/capita)</i>										BCL	Total	BCL	Total
Crop cultivator	1,164	98	143	13	5	161	5	548	1,976	50	72	260	358
Livestock farmer	1,038	98	233	13	8	254	8	472	1,870	149	213	690	940
Crop + Livestock farmer	1,112	107	211	14	6	231	6	506	1,962	108	156	571	756
Fishermen	979	42	113	21	10	144	116	378	1,659	28	30	128	136
Agricultural labourer	833	73	37	6	3	46	4	326	1,282	34	34	155	155
Non-farm worker	949	82	129	11	5	145	11	436	1,623	31	35	143	155
<i>Overall calorie intake</i>	1,054	95	189	13	7	209	13	475	1,846	400	540	72	2,500
<i>Protein intake (g/day)</i>										BPL	Total	BPL	Total
Crop cultivator	25.09	7.20	5.45	2.69	0.38	8.52	0.64	1.31	42.76	56	72	296	358
Livestock farmer	22.10	6.83	8.56	2.96	0.61	12.14	1.03	2.18	44.27	133	213	624	940
Crop + livestock farmer	23.65	7.07	7.90	2.88	0.52	11.30	0.80	1.20	44.00	111	156	574	756
Fishermen	21.22	5.72	3.98	2.12	0.78	6.87	15.50	10.56	59.86	4	30	32	136
Agricultural labourer	17.98	5.31	1.20	1.33	0.23	2.75	0.49	1.21	27.75	33	34	153	155
Non-farm worker	20.29	6.09	4.86	2.45	0.37	7.68	1.50	1.29	36.85	30	35	139	155
<i>Overall protein intake</i>	22.52	6.74	7.00	2.72	0.52	10.24	1.71	2.13	43.34	367	540	1818	2500
<i>Fat intake (g/day)</i>										BFL	Total	BFL	Total
Crop cultivator	1.67	0.35	9.54	0.21	0.38	10.13	0.09	1.49	13.73	66	72	333	358
Livestock farmer	1.67	0.37	16.65	0.24	0.59	17.48	0.12	1.49	21.13	150	213	654	940
Crop + livestock farmer	1.58	0.35	13.82	0.22	0.52	14.56	0.11	1.49	18.09	139	156	694	756
Fishermen	1.41	0.28	6.96	0.17	0.78	7.91	2.21	1.49	13.30	30	30	136	136
Agricultural labourer	1.20	0.26	2.09	0.09	0.23	2.41	0.07	1.49	5.43	34	34	155	155
Non-farm worker	1.35	0.30	8.50	0.20	0.37	9.07	0.21	1.49	12.42	33	35	149	155
<i>Overall Fat intake</i>	1.50	0.33	12.25	0.21	0.52	12.98	0.24	1.49	16.54	452	540	2121	2500

Figures in parentheses indicate percentages to total, # in numbers. BCL, Below calorie line (less than 2154.91 kcal/day/capita); BPL, Below protein line (less than 48.17 g/day/capita); BFL, Below fat line (less than 27.61 g/day/capita).

fishermen (1,659 kcal), non-farm workers (1,623 kcal) and agricultural labourers (1,282 kcal). Out of the total calories received by the sample respondents, 57% was from the cereals consumed, followed by livestock products (11%) and pulses (5%). It is obvious that the cereals occupied major share of calories supply to agricultural labourers (64.98%). As the agricultural labourers availed rice through Public Distribution System (PDS) at free of cost, they could reach the calorie intake to this extent. On comparison with the Calorie line recommended by the Planning commission (2014), it is evident that about 70% of households of crop cultivators, crop + livestock farmers and livestock farmers positioned below calorie line. It is peculiar to note all the agricultural labourer households fell below the calorie line. However, about 93% and 89% of the households from fishermen and non-farm workers fell below the calorie line respectively. On the basis of persons, it could be inferred that all the persons belonging to agricultural labourer category fell below calorie line, followed by 94% of fishermen and 92% of non-farm workers. About three-fourth of the population of crop cultivators, livestock farmers and crop + livestock farmers stood below calorie line, which was far better than other occupational groups. As a whole, it could be concluded that 400 out of 540 households (74.07%) and 1,947 out of 2,500 persons (77.88%) had calorie intake below the recommended level, which indicated the level of severity of nutritional poverty among the sample respondents.

Protein intake: The average protein intake by the sample respondents was found to be 43.34 g per day, which was far below the state average of 53.3 g (NSS 68th round). Among various occupational groups, the protein consumption in grams per day was found to be the highest among fishermen (59.86), followed by livestock farmer (44.27), crop + livestock farmer (44) and crop cultivator (42.76). The quantity of protein consumption per capita per day was the least among the agricultural labourers (27.75 g) and it was moderate among non-farm workers (36.85 g). As the crop cultivators, crop + livestock farmers, livestock farmers and fishermen had more access to the food products, viz. cereals, pulses, milk, meat and egg, they were found to consume more protein when compared to other occupational groups. It could be concluded that 367 out of 540 sample households (67.96%) and 1,818 out of 2,500 persons (72.72%) had the per capita protein intake of less than 48.17 g per day, which implied the incidence of nutritional poverty based on protein intake. Among livestock farmers, the prevalence of nutritional poverty due to less calorie intake was remarkably more (73.40%), when compared to nutritional poverty due to less protein intake (66.38%) and it is vice-versa for crop cultivators. This might be due to the fact of greater accessibility to protein rich livestock products among livestock farmers and calorie rich cereals among crop cultivators. Further, it is distinctive to note that only 13% of fishermen households and 23% of fishermen persons were positioned below protein line, whereas 93% of households and 94% of head counts from fishermen

category stood below calorie line.

Fat intake: The average per capita fat intake among the respondents was found to be 16.54 g per day, which was far below the national rural average (56.80 g) and state rural average (55.6 g) as per report of NSS 68th round. Among various occupational groups, the fat consumption per day was found to be the highest among livestock farmers (21.13 g), followed by crop + livestock farmer (18.09 g). The quantity of fat consumption per capita per day was the least among the agricultural labourers (5.43 g), which might be due to the reason of less affordability for fat rich and high priced food products. Among various sources of food products, livestock products acted as a source of 80% of total fat intake among livestock farmers. Further, it is evident that 452 out of 540 households (83.70%) and 2121 out of 2500 persons (84.84%) had consumed less than 27.61 g of fat per day. Among various occupational groups, livestock farmers were in the better position, due their accessibility to fat rich livestock products like butter, ghee, etc.

Incidence of nutritional poverty and economic poverty: Among the 540 sample households, 400 households were below nutritional poverty line (calorie intake) and 319 households were below economic poverty line. The incidence of nutritional poverty was noticed to be higher than the economic poverty irrespective of occupational categories (Fig. 1).

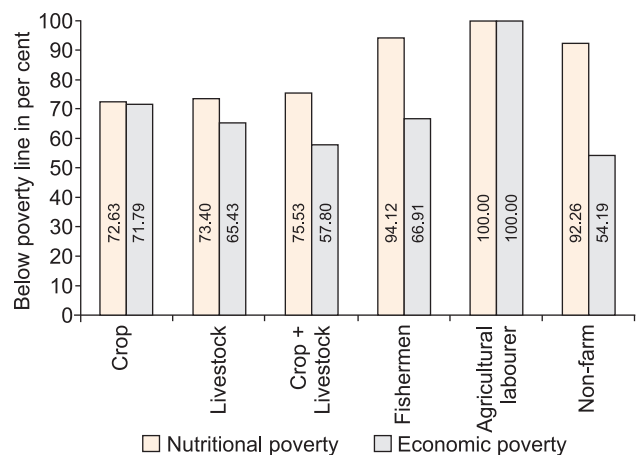


Fig. 1. Incidence of nutritional and economic poverty among various occupational groups.

It could be concluded that the crop cultivation among crop cultivators and crop + livestock farmers favoured for more calorie intake, whereas livestock farmers consumed comparatively more quantity of protein and fat. The fishermen were found to be positioned below calorie and fat intake, but overwhelmingly higher in the case of protein consumption. Non-farm workers had moderate consumption of all the three macro-nutrients. The food security could be achieved through the dimensions of food availability, access, utilization and stability. As the food products like cereals and pulses were immediately available for crop cultivators, milk, meat and egg for livestock farmers, fish for fishermen, they had more chances of

moving towards the nutritional security due to the element of availability. The higher per capita income and expenditure made the nutrients accessible and affordable to households of the sample respondents. Despite monsoon failure, livestock farming provides regular food supply (milk, meat and egg) throughout the year, thereby rendering the livestock farmers nutritionally secured. The results of the present study are in concurrence with the studies undertaken by Okali (2011), Bashir *et al.* (2012^a), Bashir *et al.* (2012^b), Bashir *et al.* (2012^c) and Ngambi *et al.* (2013).

SUMMARY

The average per capita intake of cereals, pulses, milk and egg and meat (including fish) were estimated to be 300 g/day, 80 g/day, 179.73 g/day, 23.484 numbers per annum and 0.708 kg/month, respectively which were found to be lower than Indian Council of Medical Research recommendations. The daily per capita intake of calorie, protein and fat were estimated to be 1,846 kcal, 43.34 g and 20.21 g which were lesser than the recommendations of the Planning commission. The prevalence of nutritional poverty was noticed to be higher than the economic poverty irrespective of occupational category. Further, the incidence of nutritional poverty was the highest among agricultural labourers (100%), followed by fishermen (94.12%) and non-farm workers (92.26%). However, it was comparatively lesser among crop cultivator (72.63%), livestock farmer (73.40%) and crop + livestock farmers (75.53%). Crop cultivators, livestock farmers and crop + livestock farmers were found to receive considerable macro-nutrients and thus there was lesser incidence of nutritional poverty when compared to other occupational groups.

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