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The patterns of livestock products consumption in India: A recent trends and future prospects

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Abstract

This paper examines both consumption and production diversification towards livestock products in India. A clear structural shift in consumption from food grains, particularly cereals, to high-value commodities (HVCs) along with non-vegetarian comprising mainly livestock based foods is witnessed in both rural and urban India. Livestock sector contributes about 6 percent to the Gross Domestic Product and 25 percent to the Agricultural Gross Domestic Product. Over the last two decades livestock sector has grown at an annual rate of 5.6 percent, which is higher than the growth in the agricultural sector (4 percent). This suggests that livestock is likely to emerge as an engine of agricultural growth in the coming decades. It is also considered as one of the potential sector for export earnings. The study shows that there has been a rapid rise in the demand for livestock products in India. Within the livestock products group, milk and milk products hold the dominant share. Our analysis further suggests that India's rapid rise in the demand for livestock products may far outpace its domestic supply. Additionally, the structural changes in terms of development of markets, road network, irrigation, technology, urbanization and growing income levels have positively influenced agricultural diversification towards HVCs specially livestock based products.

Keywords: High-value commodities, structural shift, diversification, non-vegetarian

Introduction

Chicken meat production in India was ranked 6th in the world in 2011, using FAOSTAT rankings. (Source: Foreign Agricultural Service, Official USDA Estimates). India's per capita consumption of poultry meat is forecast at 2.2 kg per annum in 2014; chicken is India's preferred non-vegetarian protein source. Gandhi and Zhou (2010) [2] indicated a rapid rise demand for animal products in India. Milk demand may grow at about 10.6% per year, egg demand at 7.4% and meat demand at 8.4%. When incomes begin to rise in traditional low-income societies, one of the first things people do is diversify their diets, consuming more livestock products, (Brown *et al.*, 1999). Bennett's Law prediction in the economic theory of consumption also suggested that as income grows the dietary pattern becomes more diversified with better quality (higher price) of food staples. Urbanization is an important factor for estimating future food demand of the country as it affects food demand and change in consumption pattern in several ways by affecting caloric requirements, food availability, and female labor status impacts the structure of food consumption. Dyson and Hanchate (2000) suggest that urban dwellers have access to a wider variety of food basket and other goods and their lifestyle generates higher demand for processed foods. Urbanization, associated with economic development and income growth, has already largely occurred in developed countries, while continuing strongly in developing countries. Thus any attempt to make food demand projection without taking urbanization scenario into account would not give a correct picture.

Scenario of livestock products in India

The long term National Sample Survey (NSS) data on food consumption pattern suggests that there has been decline in per capita cereal consumption since early 1970s, (Chatterjee, *et al.* 2006, Bansil, 1999, Kumar, 1998, Kumar and Mathur, 1997, Radhakrishna and Ravi, 1992). Decline in per capita cereal consumption is partly explained by the wide selection of food items like milk and milk products, meat, fish and eggs, fruits and vegetables etc.

These trends indicate that the composition of nutritional intake in India is changing fast. Increasing income and urbanization demand more non-food grain products in the diet.

Table 1: Elasticities Comparison of Livestock Products in Rural and Urban India

| | Income elasticity | | Price Elasticity | |
|--------|---------------------------|---|------------------------|-------------------------------|
| | High elasticities (>1) | Inelastic | High elasticities (>1) | Inelastic |
| Rural | Milk, Chicken, Egg | Mutton and Goat Meat, Beef and Buffalo Meat | Milk, Egg | Chicken, Mutton and Goat Meat |
| Urban | Milk, Mutton, Egg | Beef and Buffalo Meat | Milk, Egg | Chicken |
| Pooled | Milk, Mutton, Chicken Egg | Beef and Buffalo Meat | Milk, Egg | Chicken |

Source: Dastagiri, 2004^[1].

The expenditure elasticities for livestock products are high, particularly in the rural areas than in the urban areas. It implies that increase in per capita income of rural population would accelerate the demand for livestock products. The expenditure elasticities of livestock products are higher than other food expenditure elasticities. This implies that there is a shift in the consumption pattern towards livestock products and this would lead to diversification of agriculture.

Increased expenditure of livestock products in India

This downward shift in demand for food grains can basically be attributed to changing consumer tastes and preferences as a result of increasing availability of a wide variety of food items other than food grains, (Rao *et al.* 1994). Data from National sample survey organization (Government of India) show that the upward trend in expenditure on livestock products is at the expense of reduction in expenditure on foodgrain.

Table 2: Per capita monthly consumption expenditure on broad groups of items (in Rs.)

| Period | Rural/ | Milk and | Meat, Egg, | | Total | |
|-----------------|--------|----------|------------|------------|----------|------------|
| | Urban | Milk | Fish | Total Food | Non-Food | Total Exp. |
| Products | | | | | | |
| 1970-1971 | Rural | 3.03 | 1.02 | 25.98 | 9.33 | 35.31 |
| | Urban | 5.01 | 1.90 | 34.04 | 18.81 | 52.85 |
| 1977-1978 | Rural | 5.29 | 1.84 | 44.33 | 24.56 | 68.89 |
| | Urban | 9.16 | 3.33 | 57.67 | 38.48 | 96.15 |
| 1986-1987 | Rural | 13.48 | 5.25 | 92.55 | 48.38 | 140.93 |
| | Urban | 23.32 | 9.25 | 128.99 | 93.66 | 222.65 |
| 1989-1990 | Rural | 18.35 | 6.84 | 121.78 | 67.68 | 189.46 |
| | Urban | 29.53 | 11.42 | 165.46 | 132.54 | 298.00 |
| 1990-1991 | Rural | 19.04 | 7.08 | 133.34 | 68.78 | 202.12 |
| | Urban | 32.37 | 12.27 | 185.77 | 140.00 | 326.75 |
| 2000-2001 | Rural | 42.97 | 17.78 | 278.57 | 216.34 | 494.90 |
| | Urban | 75.90 | 27.71 | 400.57 | 514.01 | 914.57 |
| 2011-2012 | Rural | 116.38 | 46.04 | 621.56 | 657.38 | 1278.94 |
| | Urban | 187.14 | 67.18 | 923.71 | 1475.53 | 2399.24 |

Source: Author's calculation from various NSS rounds

These trends suggest that as far as consumption of foods of animal origin is concerned the consumption patterns of rural and urban people will be heading towards a convergence.

Prospects of Supply of Livestock in India With a population of more than one billion, India is the second most populous

country in the world after China, (UN, 1996). Furthermore, population growth in India continues to be high and India's population is likely to exceed China's by 2020. Like China more than a decade ago, India is in the midst of major economic reform.

Table 3: Production/Per Capita Availability of Milk in India (1960-1961 to 2016-2017)

| Years | Milk Production (In Million Tonne) | Per Capita Availability (In Gram/Day) |
|-----------|------------------------------------|---------------------------------------|
| 1960-1961 | 20.00 | 126 |
| 1970-1971 | 22.00 | 112 |
| 1980-1981 | 31.60 | 128 |
| 1990-1991 | 53.90 | 176 |
| 2000-2001 | 80.60 | 217 |
| 2010-2011 | 121.80 | 281 |
| 2011-2012 | 127.90 | 290 |
| 2012-2013 | 132.40 | 299 |
| 2013-2014 | 137.70 | 307 |
| 2014-2015 | 146.30 | 322 |
| 2015-2016 | 155.50 | 337 |
| 2016-2017 | 163.70 | 352 |

Source: NDDB reports, GOI, 2016-17.

India is the largest producer of milk producing more than 160 million tons of milk per annum. Yet, her per capita milk consumption is around 350 g per day. India has a population of more than 1 billion with diverse food habits, cultures,

traditions and religions. Regional variations within the country can be mind boggling. On one hand, the country has plains with long tradition of milk production and consumption.

Table 4: Demand projections for livestock products in India in different years

| Livestock product | Rural/ Urban | 1993 | Year 2000 | 2010 | 2020 | Growth rates (%) | | |
|---------------------|--------------|-------|-----------|-------|--------|------------------|-----------|-----------|
| | | | | | | 1993-2020 | 1993-2000 | 2000-2020 |
| Milk | Rural | 31.13 | 37.96 | 49.78 | 64.16 | 2.71 | 2.87 | 2.66 |
| | Urban | 13.89 | 19.74 | 32.23 | 51.45 | 4.97 | 5.15 | 4.91 |
| | Total | 45.02 | 57.70 | 82.01 | 115.61 | 3.71 | 3.65 | 3.66 |
| Mutton & Goat meat | Rural | 0.47 | 0.54 | 0.64 | 0.74 | 1.68 | 1.84 | 1.63 |
| | Urban | 0.31 | 0.61 | 1.54 | 3.83 | 9.73 | 9.91 | 9.66 |
| | Total | 0.78 | 1.15 | 2.18 | 4.57 | 8.42 | 6.12 | 8.36 |
| Beef & Buffalo meat | Rural | 0.32 | 0.37 | 0.45 | 0.53 | 1.96 | 2.12 | 1.90 |
| | Urban | 0.17 | 0.22 | 0.33 | 0.47 | 3.85 | 4.03 | 3.79 |
| | Total | 0.49 | 0.59 | 0.78 | 1.00 | 2.88 | 2.83 | 2.79 |
| Chicken | Rural | 0.16 | 0.20 | 0.26 | 0.35 | 2.97 | 3.13 | 2.91 |
| | Urban | 0.09 | 0.12 | 0.19 | 0.29 | 4.69 | 4.86 | 4.62 |
| | Total | 0.25 | 0.32 | 0.45 | 0.64 | 3.75 | 3.78 | 3.68 |
| Egg | Rural | 5.10 | 6.69 | 9.87 | 14.29 | 392 | 4.08 | 3.87 |
| | Urban | 4.20 | 6.13 | 10.38 | 17.18 | 535 | 5.53 | 5.29 |
| | Total | 9.30 | 12.82 | 20.25 | 31.47 | 4.70 | 4.77 | 4.64 |

In the year 2020, the total demand for fresh milk is likely to be 115.61 million tonnes, 4.57 million tonnes for mutton and goat meat, 1.00 million tonnes for beef and buffalo meat, 0.64 million tonnes for chicken, and 31.47 billion for eggs. During 1993-2020, the demand will grow at the annual

compound growth rate of 3.71 per cent for milk, 8.42 per cent for mutton and goat meat, 2.85 per cent for beef and buffalo meat, 3.75 per cent for chicken, and 4.70 per cent for eggs. The demand for mutton and goat meat will grow much faster among livestock products followed by eggs.

Table 5: Projections of supply, demand and surplus/deficit in 2020

| Livestock products | 2020 | | Growth products rate % (2000-2020) |
|--------------------|--------|--------|------------------------------------|
| | Demand | Supply | |
| Milk | Demand | 147.26 | 4.82 |
| | Supply | 218.8 | 5.00 |
| Meat/Mutton | Demand | 12.72 | 13.62 |
| | Supply | 14.57 | 14.70 |
| Chicken | Demand | 0.81 | 4.72 |
| | Supply | 4.20 | 9.50 |
| Egg | Demand | 44 | 8.10 |
| | Supply | 175.50 | 6.12 |
| Beef | Demand | 1.15 | 3.39 |
| | Supply | 7.79 | 4.70 |

Note: Milk, Mutton & goat meat, Beef & buffalo meat & chicken (million tones) and billion numbers in case of egg.

To that extent, the surplus in milk production projected in future would be an overestimation. Even methodological innovations along with data refinements are necessary since such demand-supply projections are sensitive to derived elasticity estimates as observed in the literature covering food grain projections.

Major constraints on the growth and development of India's livestock industries

1. The area and fertility levels of common grazing lands have declined due to over stocking and soil erosion. The production of coarse grains has been on the decline in India (Nair 1995).
2. The knowledge and methods of diagnosis and treatment of animal disease at farm level is not well developed in India.
3. Marketing and processing: Inadequate market infrastructure, unorganized markets for livestock and its products inhibit the systematic development of livestock industries in India.
4. The agricultural budget for education and research tends to neglect livestock in India.
5. There is no central market that can iron out the price irregularities in the market. In some states, governments subsidises milk production and prices are regulated which inhibits marketing efficiency.

Conclusion

The results of supply analysis of livestock products have indicated that the technological progress would be crucial to usher in livestock revolution. High expenditure elasticities suggest favourable environment for the growth of livestock sector and diversification of Indian agriculture. Further growth in per capita income and shift in consumption behaviour towards livestock products would lead to acceleration in demand for livestock products and thus is expected to give a jump to this sector. Policies towards increasing fodder supply, remunerative prices to livestock products, and above all investments in technology improvements in livestock sector, particularly in processing and value-addition are important and need to be given due attention.

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