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## **Changing pattern of food consumption and the emerging relevance of livestock products in India**

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### **Abstract**

Economic growth is typically accompanied by improvements in a country's food consumption. Food consumption pattern in India is changing due to income induced diet diversification, impact of globalization, increasing urbanization and changing lifestyle of people. This paper examines the changing food consumption pattern in India over the past three decades. There is an increase in the consumption of livestock products in India. The article aims to reveal the emerging trends in consumption and nutrition from various food items in India. The trend in macro nutrient (calorie, protein, and fat) intake are analysed by using FAOSTAT data. The study compares the consumption and the nutritional intake from livestock products and other food items. The article showed that Indians are spending more on livestock products. Animal based products have emerged to be the very important source of nutrition in India. The implication is that in the coming years with rising per capita income and urbanization and globalisation, India's demand for various superior food products like animal based food products will continue to increase necessitating a possible change in the food production system and agricultural trade.

**+Key words:** Consumption, food items, cereals, livestock products, nutrition.

## **1. Introduction**

The consumption pattern in India is experiencing significant changes due to increase in per capita income, changes in life styles and urbanization (Kumar, 1998; Bhalla et al, 1999; Chand, 2004). In recent times the importance of livestock products in providing food and nutrition to Indians is growing more than the traditional food items. Livestock products are an important source of food security as they provide meat, milk and other dairy products, which are rich in nutrients (Rollefson, 2001)

The micro-nutritive value of animal based food products is higher than crop-based foods. They are rich in energy and makes an excellent source of high-quality and readily digested protein (Allen, 2003; Bender, 1992). Livestock products provide high quality protein and essential micronutrients such as zinc iron, vitamin A and calcium, which are either deficient or not available in many developing country diets predominantly comprised of cereals (Catelo, 2006). Staple foods like rice and maize provide calories but are not so dense in providing micronutrients or protein (Delgado, 1999). Even quite small amounts of animal source foods work for the improvement in the nutritional status of low-income households. Livestock Products provide proteins with a wide range of amino acids that match human needs as well as bio-available micro-nutrients in which many malnourished people lack (FAO, 2011).

The demand for livestock products has increased tremendously at global levels because of increasing urbanisation, expanding middle-class population and improvement in the level of income and socioeconomic transformation. (Brithal and Taneza, 2006; Padamkumar, 2007). Several empirical studies suggest that food consumption in India is taking a structural shift towards the animal based products which will continue and intensify with the rise in urbanisation and per capita income (Huang and Bouis, 1996; Kumar, 1996). Expenditure elasticities of livestock products are much higher than other food expenditure elasticities means there is a shift in consumption behaviour of Indians towards livestock products. The demand for staples has stagnated. The consumption patterns have diversified towards high-value agricultural commodities (HVA) like fruits, vegetables, dairy, poultry, fish, and processed food (Ravi and Roy, 2006). The article aims to reveal the emerging trends in the consumption and nutrition from food items in India. The study compares the consumption and the nutritional intake from livestock products and the other traditional food items like cereals, pulses, fruits, vegetables etc. It also throws light on the share of expenditure incurred on various food items.

## **2. Data and methods**

The paper is based on the secondary data. The FAO Food Balance Sheet is used to analyze the trends in macro nutrients (calorie, protein, and fat) intake in India while the data on the expenditure of food items have been collected from NSSO surveys. Simple analytical techniques such as trend analyses, triennium ending averages, percentage change and annual growth rates have been used.

## **3. Results and discussion**

### **3.1 Consumption of food products**

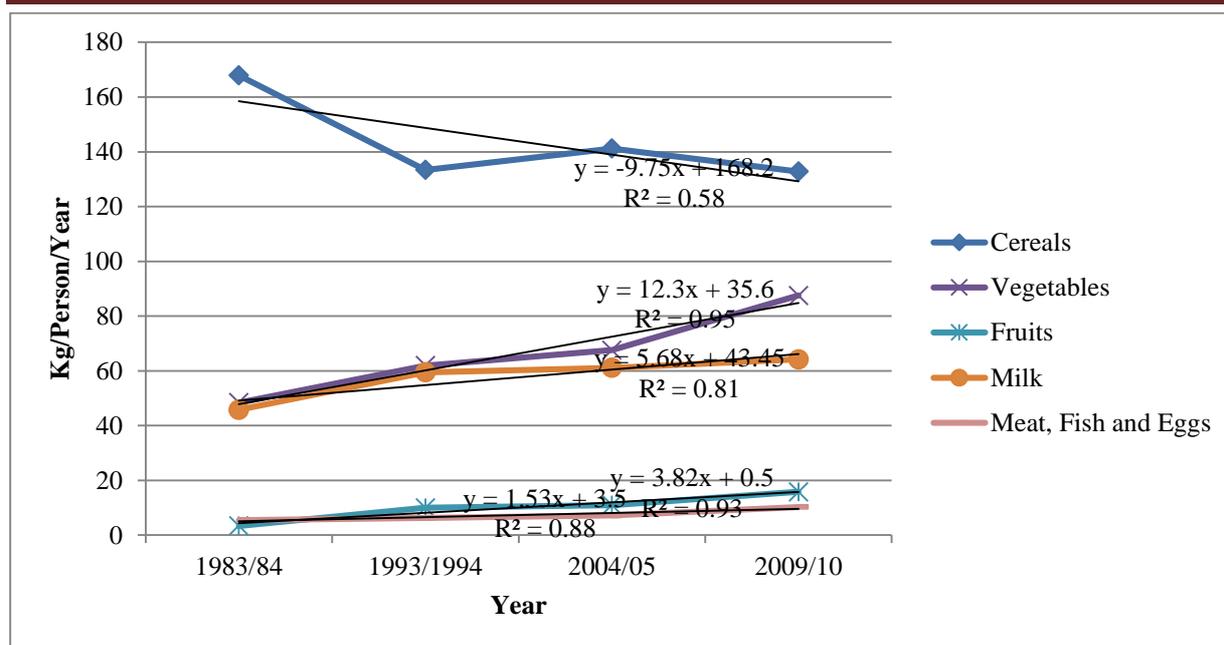
A rapid rise can be seen in the consumption of livestock products. Milk consumption increased from 45.8 kg/person/year to 64.2 kg/per/year while meat, fish and eggs consumption increased almost double i.e. from 5.5 kg/person/year to 10.3 kg/person/year during 1983/84 to 2009/10. Similarly, consumption of vegetables increased from 48.4 kg/person/year to 87.5 kg/person/year while that of fruits increased from 3.4 kg/person/year to 15.81 kg/person/year during the same period Consumption of cereals declined from 167.9 kg/ person/year to 132.8 kg/person /year from 1983/84 to 2009/10. Similar is the case with pulses and sugar whose consumption declined from 11.9 kg/person /year and 11.5 kg/person /year kg/person /year to 8.5 kg/person /year and 9.2 kg/capita/year respectively during the same period. (Table 1). This shows Indians have begun to consume lesser of traditional food items by substituting a wider variety of high-value foods. Figure 1, shows that there is a rising trend in the consumption of milk, meat eggs, fruits and vegetables while the declining trend is witnessed in the case of cereals. It should be noted that these levels of consumption relate to household consumption and do not include indirect consumption (home-away consumption and other uses), which constitute 41% of the total consumption of milk and 39% of meat, eggs and fish (GoI, 2011).

There is a favourable environment for the growth of livestock sector as suggested by the high-income elasticities of livestock products. As the production of livestock products is largely demand-driven, so this shift in consumption pattern would enhance the demand for livestock products which in turn will give a boost to the livestock sector (Dastagiri, 2004). Depending on the development of dietary patterns in India, even China could be replaced by India as a locomotive for livestock sector growth.

**Table 1: Food consumption in India**

<b>(Kg/ person/year)</b>				
<b>Items</b>	<b>1983/84</b>	<b>1993/1994</b>	<b>2004/05</b>	<b>2009/10</b>
Cereals	167.9	133.4	141.2	132.8
Pulses	11.9	7.9	9.1	8.5
Edible Oils	4.6	5.6	6.7	8.5
Vegetables	48.4	61.9	67.6	87.5
Fruits	3.4	10.0	11.0	15.8
Milk	45.8	59.5	61.1	64.2
Sugar	11.5	10.8	9.6	9.2
Meat, Fish and Eggs	5.5	6.3	7.2	10.3

Source: Joshi and Kumar (2011)



Source: Joshi and Kumar (2011)

**Figure 1: Trends in food consumption of India**

Data from the National Sample Survey Organization (GoI) shows that there is a continuous upward trend in the expenditure on livestock products which is at the expense of the reduction in expenditure on food grains. Between 1983 and 2011, the share of milk and milk’s products in total food expenditure increased from 13.7% to 19%, while that of cereals declined from 42.7% to 21.16% (Table 2).

**Table 2: Share of livestock products in food expenditure**

(%)										
Area	Cereals		Milk and milk products		Meat eggs and fish		Vegetables		Fruits	
	1983	2011	1983	2011	1983	2011	1983	2011	1983	2011
Rural	48.7	24.64	11.9	18.67	5.3	7.3	7.6	9.94	1.8	3.08
Urban	34.0	18.83	16.2	19.0	7.0	10.0	8.8	13.18	2.9	7.53
India	42.7	21.16	13.7	19.0	6	9.0	8.1	11.88	2.3	5.74

**Source:** NSSO (various issues), Ministry of Statistics and Program Implementation, GoI.

The share of food expenditure on meat, eggs and fish increased from 6% to 9% while that of vegetables and fruits increased from 8.1% and 2.3% to 11.88% and 5.74% respectively during the same period (Table 2). Compared to urban consumers, the share of food expenditure on animal food products by rural consumers has remained low, but the increase was much larger among rural consumers in case of milk and milk’s products. Both in urban and rural areas, the share of

food expenditure on high-value commodities like animal products, fruits and vegetables are increasing while the same is decreasing for cereals. The expenditure data, supported by consumption data for India (Table 1 and 2), clearly confirm that the Livestock products have become very important in the diet of Indians.

Demand for food grains will be rising at CAGR of 1.75 %, while that of milk and meat fish and eggs, will be rising at the rate of 2.76% and 2.91% respectively in India by 2020. The future growth rate in demand for high-value products like livestock, fruits and vegetables is going to be higher than that of food grains. By 2020, the demand for milk is estimated to be 143 million tonnes while that of meat, egg and fish is estimated to be 20 million tonnes (Table 3).

**Table 3: Demand for food by 2020**

Million Tonnes						
Year	Food gains	Edible oils	Fruits	Vegetables	Milk	Meat, fish, eggs
2004	212	12	55	108	95	13
2020	275	17	81	155	143	20
CAGR (%)	1.75	2.35	2.61	2.44	2.76	2.91

Source: Birthal (2014)

In comparison to other foods, the demand for animal food products is more responsive to income changes (Kumar et al., 2011; Gandhi and Zhou, 2010).

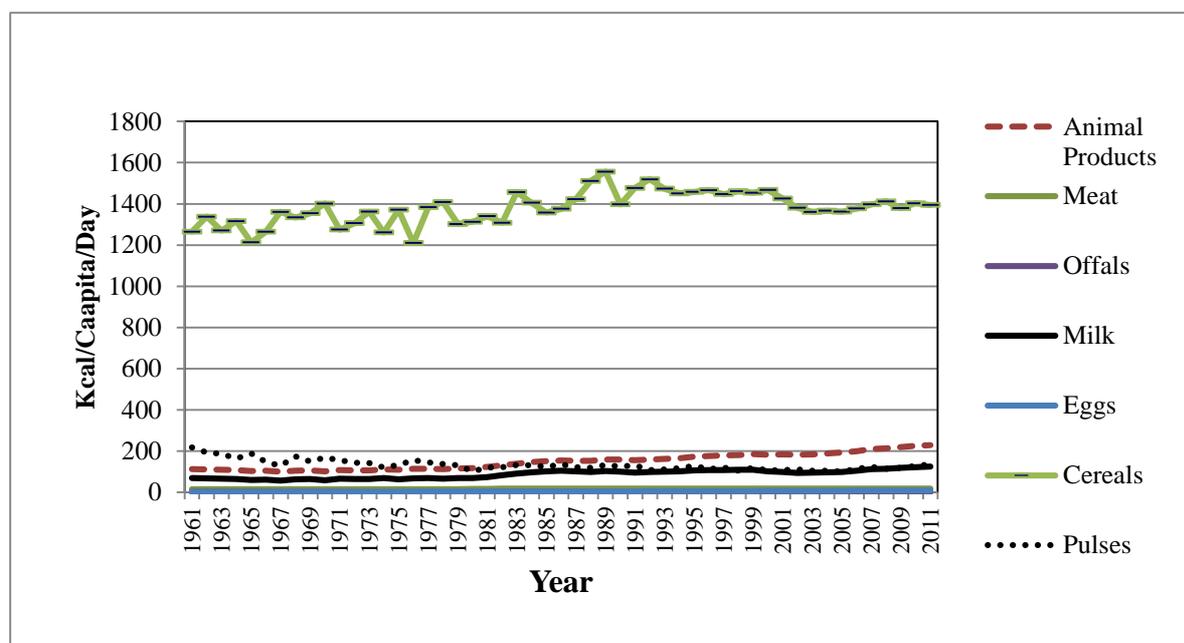
### 3.2 Nutrition from food items

The intake of calories from cereals is far greater than that of animal products, but a swift rise can be seen in the caloric intake from animal products in India (Figure 2). The per capita caloric intake from animal products increased from 157.33 Kcal/day to 224.33 Kcal/day from TE 1992 to TE 2012 at the annual growth rate of 4.26% while caloric intake from cereals witnessed a negative growth rate of -0.49% during the same period. The caloric intake from cereals declined from 1464.33 Kcal /day to 1392 Kcal/day. Per capita intake from milk increased from 74.67 Kcal/ day in TE 1982 to 121.67 Kcal/day during TE 2011 (Table 4). Caloric intake from milk increased by 11.68% annually from TE 1992 to TE 2012. This is again the reflection of the fact that Indians now prefer more livestock products in their diet than cereals.

**Table 4: Caloric intake from food items**

(Kcal/capita/day)					
Year	Animal Products	Animal fats	Milk	Cereals	Fruits
TE 1982	123.33	22.67	74.67	1320.3	30.33
TE 1992	157.33	29.67	97.33	1464.33	35.00
TE 2012	224.33	64.33	121.67	1392	65.33
Annual growth rate, TE 1992 to TE 2012 (%)	4.26	11.68	2.50	-0.49	8.66

Source: Calculations based on the data collected from FAOSTAT



Source: FAOSTAT

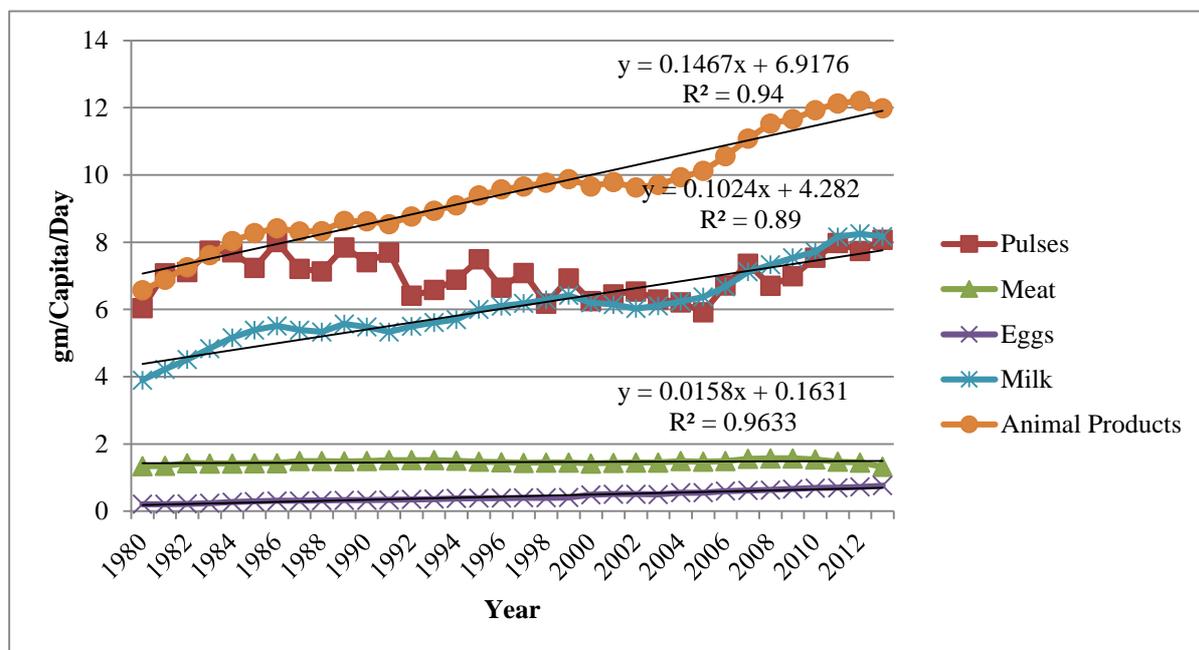
**Figure 2: Trends in caloric intake from food items**

Indians per capita intake of protein from pulses has always been greater than that of milk but in TE 2012, per capita protein intake from milk surpassed that of pulses. In TE 2012 per capita protein intake was 7.93 g/day from pulses while it was 8.19g/day from milk. The per capita protein intake from milk increased approximately two times from TE 1982 to TE 2012. It grew at the rate of 5.07% annually from TE 1992 to TE 2012. A noticeable rise can be seen in the protein intake from animal products in India (Figure 3), which increased from 6.91g/day to 12.11g/day from TE 1982 to TE 2012 (Table 5). The per capita protein intake from eggs increased at a robust growth rate of 11.37% annually from TE 1992 to TE 2012. This again reflects that Indians nutritional intake from livestock products is rising rapidly

Table 5: Protein intake from food items

(g/capita/day)				
Year	Pulses	Eggs	Milk	Animal Products
TE 1982	6.74	0.21	4.21	6.91
TE1992	7.17	0.34	5.44	8.64
TE 2012	7.93	0.73	8.19	12.11
Annual growth rate, TE 1992-TE 2012 (%)	1.06	11.37	5.07	4.06

Source: Calculations based on the data collected from FAOSTAT



Source: FAOSTAT

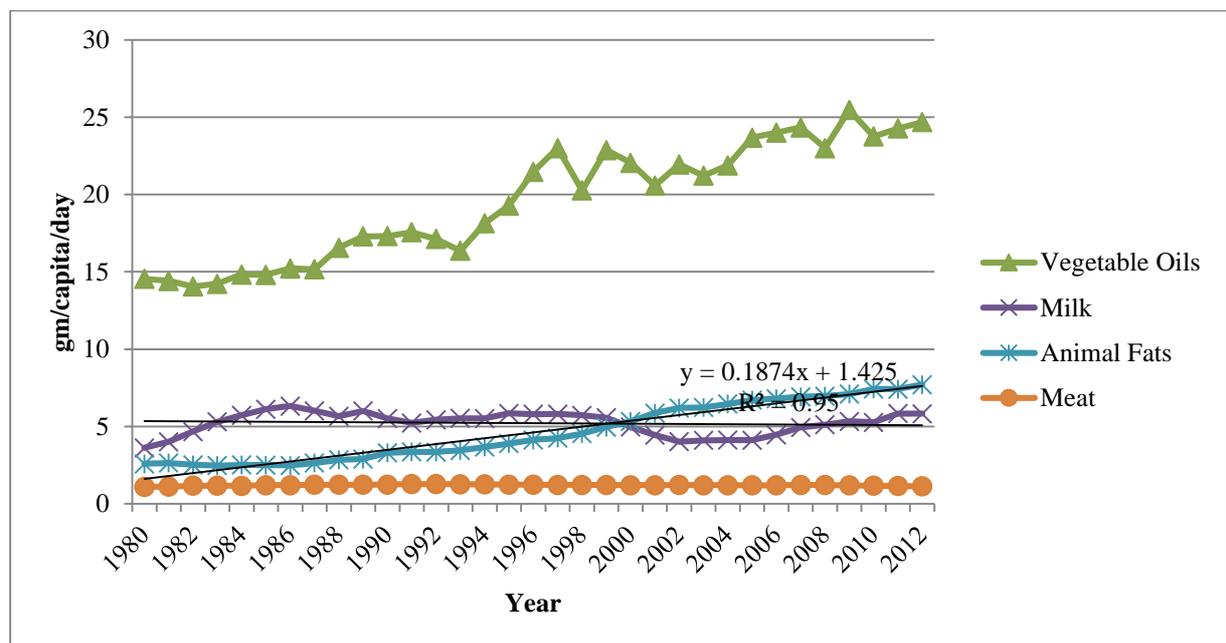
Figure 3: Trends in protein intake from food items

**Table 5: Fat intake from food items**

(g/capita/day)			
Year	Animal products	Milk	Vegetable oils
TE 1982	8.21	4.10	14.34
TE 1992	10.56	5.40	17.34
TE 2012	15.33	5.65	24.24
Annual growth rate TE 1992-TE 2012, (%)	4.51	0.46	3.98

Source: Calculations based on the data collected from FAOSTAT

Similar to the noteworthy rise in the intake of protein from animal products, fat intake from animal products has also been rising. Although, Indians per capita intake of fat from vegetable oil has always been greater than that of animal products. Vegetable oils are the primary source of fat for Indians. The per capita fat intake from animal products was 8.21g/day in TE 1982 which increased to 15.33 g/day in TE 2012. It grew at the rate of 4.51% annually from TE 1992 to TE 2012, while per capita fat intake from vegetable oils saw a somewhat lower growth rate of 3.98% during the same period (Table 5). A continuous rise can also be seen in fat intake from meat from TE1982 to TE 2012 (Figure 4).



Source: FAOSTAT

**Figure 4: Trends in fat intake from food items**

#### 4. Conclusion

The article reveals that consumption of cereals declined over time and consumption of high value commodities like fruits and vegetables, milk, meat and eggs increased significantly in the recent years. There is a continuous upward trend in expenditure on livestock products which is at the

expense of a reduction in expenditure on food grains. The consumption level of animal based products in urban, as well as rural areas is rising. The consumption patterns have diversified towards high-value agricultural commodities. Livestock have now become the important source for providing nutrition to Indians. Nutritional intake from livestock products in India is also showing a sharp rising trend. The caloric intake from cereals witnessed a negative growth rate of -0.49% during TE 1992-TE 2012. In TE 2012, per capita protein intake from milk surpassed that of pulses. The per capita protein intake from milk increased approximately two times from TE 1982 to TE 2012. The per capita protein intake from eggs increased at a robust growth rate. A continuous rise can also be seen in fat intake from meat. A gradual substitution of cereals and other basic foods with livestock products by Indian consumers is revealed. Farmers and agripreneurs can get benefit by involving themselves in livestock business as there is a strong growth in the demand for animal based food products in India. The implication is that in the coming years with rising per capita income and urbanization and globalisation, India's demand for various superior food products like animal based food products will continue to increase necessitating a possible change in the food production system and agricultural trade.

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