High-Value Agriculture and Structural Changes in the Indian Meat Industry: Implications for Agribusiness and Small Farmers

Jabir Ali, Surendra P. Singh, and Safdar Muhammad

This paper analyzes temporal growth in high-value agriculture in India, with special focus on the emerging meat industry, and assesses the factors affecting it. Sustained economic growth, an increase in per-capita income, increasing urbanization, and increased awareness of health and nutrition are fueling rapid growth in demand for high-value food commodities like fruits, vegetables, milk, meat, eggs, and fish. The share of high-value commodities in the total agricultural output increased significantly from 1980–81 to 2003–04, and meat and meat products and eggs are becoming two of the most important segments in high-value agriculture, with comparatively higher growth potential. As most of the livestock for meat production is reared by landless, marginal, and small households in rural India, the growth in the meat industry gives an opportunity to enhance socio-economic conditions of these resource-poor households.

The agricultural-production system in India has undergone profound changes over recent decades. With the emergence of a market economy, sustained income growth, urbanization and globalization, high-value agriculture with commodities such as fruits, vegetables, milk, meat and eggs is growing faster than the rest of agriculture (Chand 2004; Rao, Birthal, and Joshi 2006). Among high-value agriculture, meat and meat products are considered to be one of the most important segments, with high growth potential. At present, the Indian meat industry is highly unorganized and operators operate with very little or no regulation or inspection. Generally, animals for meat are slaughtered in houses or unlicensed establishments. Therefore most of the meat produced in the country comes from traditional slaughterhouses catering to the domestic demand. Only a small quantity of meat is processed for value-addition or chilled. A number of socio-economic issues and constraints at different levels of meat production affect the growth and development of the meat-processing industry.

In India, the bulk of livestock resources is concentrated among poor landless, marginal, and small households. Small animals like sheep, goats, pigs, and poultry are largely kept by the land-scarce poor households for commercial purposes, particularly for meat, because of their low initial investment and operational costs (Birthal and Rao 2002). Therefore, the rising demand for meat and meat products and value-addition in the meat industry are expected to incur significant benefits for small farmers and the rural poor. These developments, however, imply a greater need for close linkages between farms, processors, traders, and retailers to coordinate supply and demand and to link small farmers with others in the supply chain.

In the context of the above observations, this paper examines shifts to high-value agriculture products in India and the reasons for these shifts; analyzes trends in the meat-production and -processing industry and its structure; discusses major factors that impact and limit the growth of the meat industry; and discusses implications of the growth of the meat industry on landless, marginal, and small farmers.

Shifts to High-Value Agriculture Products

In developing-country markets, higher incomes generally result in diet upgrades, with increased demand for meats, dairy products, and other higher-value products. Sustained economic growth and increasing urbanization in India are fueling rapid growth in the demand for high-value food commodities like fruits, vegetables, milk, meat, eggs, and fish (Kumar, Mruthyunjaya, and Birthal 2003; Pingali and Khwaja 2004; Rao, Birthal, and Joshi 2006). The growth in high-value commodities has been much higher than in food grains, pulses, and oilseeds in India from 1980 to 2004 (Table 1).

Ali is assistant professor, Agriculture Management Center, Indian Institute of Management, Lucknow. Singh is professor, Department of Agribusiness and Muhammad is research associate professor, Institute of Agricultural and Environmental Research, Tennessee State University, Nashville.

The share of high-value commodities (HVCs) in the total value of agricultural output significantly increased from 31 percent in 1980–82 to 42 percent in 2001–03. Fruits, vegetables, and milk products are the major components in HVCs, with a share of more than 85 percent (Table 2). It is also clear from the Table that the share of fruits and vegetables declined from 46 percent in 1980–82 to 43 percent in 2001–03, while the share of animal-based products increased during the same period.

The demand for high-value commodities in India has been influenced by income growth and other supply-side and demand-driven factors. The shifts in dietary patterns are attributed to various factors, including economic growth and a sustained rise in per-capita income; rapid population shift from rural

Table 1. Growth in Value of Output of High Value Commodities in India.

	Rs. (billion, 1993–94 prices)			Annual growth rate (%)		
Commodities	1980–82	1990–92	2001–03	1980–81 to 1990–91	1990–91 to 2003–04	1980–81 to 2003–04
Cereals	511	701	806	3.11	1.29	2.27
Pulses	102	116	118	1.74	−0.11	0.69
Food grains	613	817	923	2.89	1.10	2.04
Oilseeds	98	180	193	5.89	0.19	3.51
Fruit and vegetables	261	349	600	2.68	5.13	4.08
Sugar	112	152	174	3.47	1.43	2.64
Milk and milk products	241	400	616	5.22	3.94	4.40
Meat and meat products	52	96	151	6.26	3.77	4.79
Beef	8	13	15	4.82	1.45	2.96
Mutton	21	38	47	5.11	1.42	3.79
Pork	3	5	10	7.83	5.97	6.27
Poultry meat	20	40	79	7.61	5.81	5.87
Processed meat products	2	3	5	1.96	2.27	3.06
Eggs	10	20	35	7.35	4.80	5.52
Crop sector	1466	1931	2409	2.67	2.04	2.54
Livestock sector	388	612	930	4.72	3.72	4.04
High-value commodities	567	868	1406	4.25	4.43	4.31
Agriculture (crop and livestock)	1854	2543	3338	3.13	2.47	2.91

Source: National Accounts Statistics, CSO, Government of India.

Table 2. Share of HVCs in Agricultural Output (%).

Composition	1980–82	1990–92	2001–03
Share of HVCs in agricultural output	30.57	34.15	42.12
Composition of HVCs			
Fruits and vegetables	46.09	40.15	42.66
Milk and milk products	42.54	46.03	43.79
Meat and meat products	9.11	11.07	10.71
Eggs	1.82	2.35	2.51

Source: National Accounts Statistics, CSO, Government of India.

to urban areas; liberalized trade policies; less-restrictive foreign direct investment policies; growth of a cash-rich, time-poor adult urban populations; awareness and acceptance of other cultures and cuisines; consumer perceptions regarding quality and safety, especially among educated urban residents; and improvements in transportation and communications (Bhalla and Hazell 1998; Kumar 1998; Bhalla Hazell, and Kerr 1999; Delgado et al. 1999; Rao, Birthal, and Joshi 2006).

Structure of the Meat Industry

The meat industry in India is highly unorganized, and only a meager quantity of meat is processed for value-addition. Most of the meat produced in the country comes from about 10,000 traditional slaughterhouses, of which 60 percent are unregistered. Most of these slaughterhouses have poor hygiene and sanitation facilities, resulting in poor meat quality and causing health and environmental problems. In the last decade, emerging global market opportunities for the Indian meat industry have significantly induced private investment in meat processing through state-of-the-art integrated plants. These organized meat-processing units are mainly export-oriented enterprises producing specialized branded meat products for various segments of the export market.

Meat production in the country has significantly increased in all types of meat (Table 3), but there is structural change in favor of poultry and egg production. The export earnings of meat products mainly come from buffalo meat (Table 4). Changes in per-capita consumption of major livestock food products in India are given in Table 5. The consumption of meat and eggs depends on social beliefs—in India, about 59 percent of the population is non-vegetarian, excluding the egg-eating population (Kumar and Birthal 2004). The proportion of non-vegetarians is higher in urban areas than in rural areas.

The consumption of meat products in India is seasonal and irregular in nature (Landes, Persaud, and Dyck 2004). Apart from the social categorization of meat consumers, there is another segment that does not eat a specific variety of meat; even the process of meat production—i.e. *Halal*—hinders consumption of meat by a particular segment of the population. Among the non-vegetarian population, the consumption of goat meat/mutton and poultry meat is widely acceptable and constitutes 46.7 percent and 26.7 percent, respectively, of meat consumption in rural areas and 41.7 percent and 25.0 percent, respectively, in urban areas. The consumption of poultry-based products has significantly increased over time in both rural and urban areas due to a sharp decline in domestic prices. Due to integration in the poultry sector and availability of broilers throughout the year at urban locations, the market share of poultry has surpassed that of goat meat/mutton.

Table 3. Structural Changes in Meat Production in India.

	Quantity (000 tons)			Composition (%)		
Meat type	1980–82	1990–92	2001–03	1980–82	1990–92	2001–03
Buffalo meat	871	1186	1450	25.8	22.4	18.2
Beef and veal	885	1277	1462	26.3	24.1	18.3
Goat meat	313	433	471	9.3	8.2	5.9
Sheep meat	168	185	233	5.0	3.5	2.9
Pigment	279	432	486	8.3	8.2	6.1
Poultry meat	143	438	1481	4.2	8.3	18.6
Processed meat	107	129	140	3.2	2.4	1.8
Eggs	604	1211	2246	17.9	22.9	28.2
Total	3370	5290	7970	100.0	100.0	100.0

Source: FAO STATS.

Table 4. Structural Changes in Meat Export from India.

Meat type	Value (000 US$)			Composition (%)		
	1980–82	1990–92	2001–03	1980–82	1990–92	2001–03
Beef and veal	836	8840	13364	1.1	9.8	4.4
Buffalo meat	46223	64082	271105	61.4	70.8	89.5
Mutton and lamb	10543	15477	12610	14.0	17.1	4.2
Goat meat	1	136	211	0.0	0.1	0.1
Pig meat	5	2	123	0.0	0.0	0.0
Chicken meat	40	69	1618	0.1	0.1	0.5
Processed meat	17597	1878	3819	23.4	2.1	1.3
Meat and meat products	75244	90484	302850	100.0	100.0	100.0

Source: FAO STATS.

Table 5. Per-capita Consumption of Livestock Products in India (kg/year).

Products	1987–88	1993–94	1999–2000	% change 1987–88 to 1993–94	% change 1993–94 to 1999–2000
Rural					
Milk (liter)	38.4	47.16	45.48	18.6	−3.7
Ghee	0.24	0.12	0.36	−100.0	66.7
Beef/ buffalo meat	0.36	0.48	0.48	25.0	0.0
Goat meat/ mutton	0.72	0.72	0.84	0.0	14.3
Poultry meat	0.24	0.24	0.48	0.0	50.0
Eggs (no.)	6.24	7.68	13.08	18.8	41.3
Fish	1.92	2.16	2.52	11.1	14.3
Urban					
Milk (liter)	51.12	58.68	61.2	12.9	4.1
Ghee	0.48	0.6	0.84	20.0	28.6
Beef/ buffalo meat	0.84	0.72	0.96	−16.7	25.0
Goat meat/ mutton	1.56	1.32	1.2	−18.2	−10.0
Poultry meat	0.24	0.36	0.72	33.3	50.0
Eggs (no.)	17.16	17.76	24.72	3.4	28.2
Fish	2.04	2.4	2.64	15.0	9.1

Source: Consumption of Some Important Commodities in India, National Sample Survey Organization, Govt. of India.

Factors Affecting the Meat Industry

India has a huge livestock population of different species that can be gainfully utilized for meat production. The feed and fodder shortage is the most important yield-limiting factor (Singh and Muzumdar 1992; World Bank 1999; Birthal et al. 2005). Livestock is reared mainly by small landholders who have no agricultural land or only small parcels on which to grow fodder, and they largely depend on common grazing lands for green fodder. Common grazing lands have been deteriorating quantitatively as well qualitatively due to excess pressure of the livestock population and distributive policies of the government (Jodha 1986; Iyengar 1989; Chopra, Kadekodi, and Murtry 1990; Jodha 1992; Karanth 1992). The research in this area has yielded a number of nutritional technologies to improve feed efficiency, but their adoption is lagging.

Slaughter rates of large ruminants are much below the potential off-take rate (World Bank 1999). These animals are reared mainly for milk; only old, fragile, and unproductive animals are used for meat production. Male buffalo are slaughtered at a very young age, resulting in a waste of potential production. Cattle are considered to be sacred, and their slaughter is banned in most Indian states.

Market infrastructure for live animals is poor and unorganized. There are a number of intermediaries acting between the producers and slaughterhouses/ processors. The price realization by producers is low. Slaughterhouses are often located in urban areas far from the point of production and the transportation cost of live animals is therefore high. The meat-processing industry has not taken much initiative to strengthen backward linkages with farmers/producers and largely depends on intermediaries for its raw materials.

Although per-capita meat consumption in India has increased, its level remains low because of economic and socio-cultural factors. Meat does not constitute a regular food item even for the non-vegetarian Indian population. This irregular consumption is due to the high price of meat, which the average consumer cannot afford. Furthermore, rural consumers are restricted by the lack of local availability of meat, as most of the slaughtering takes place in urban areas.

The poor sanitary and phyto-sanitary conditions are also considered to be major constraints in realizing export potential. These standards vary by country, imposing many constraints on strengthening the meat export from the country.

High-Value Agriculture, the Meat Industry, and Smallholders

High-value agriculture has comparative advantage in production and labor absorption over staples, and so adopting a diversification strategy toward high-value agricultural products helps smallholders augment income and employment (Pingali and Rosegrant 1995; Radhakrishna 2002; Barghouti, Kane, and Sorby 2003; Joshi et al. 2004; Mellor 2004). A shift in production from highly cereal-based agriculture to high-value agriculture and value-addition, however, implies a greater need for close linkages between farms, processors, traders, and retailers. The development of close linkages is necessary to coordinate supply and demand and to link small farmers to share the benefits.

Distribution of land and livestock assets plotted on the Lorenz curve indicate that livestock is more equitably distributed than land (Figure 1). This implies that livestock has greater potential to provide livelihood for resource-scarce households. Several empirical studies indicate that livestock rearing has a significant positive impact on equity in terms of income and employment and poverty reduction in rural areas (Singh and Hazell 1993; Birthal and Singh 1995; Thornton et al. 2002; Birthal and Ali 2005).

Between 1991–92 and 2002–03, the percentage of landless households significantly increased but their share of livestock holdings declined for all types of livestock (Tables 6 and 7). Moreover, marginal and small households still control the major share of the livestock population. The shrinking of common resources as well as a fodder shortage accounted for the drop in livestock holdings (Rao et al. 2003). With the emergence of a market economy and increased demand for livestock products, the livestock production system in India is moving toward specialization where big farmers and investors are getting involved in livestock production and processing. Small dairy herds are losing share to large dairy farms with capital-intensive production technologies. Similarly, backyard poultry is converging toward integrated capital-intensive

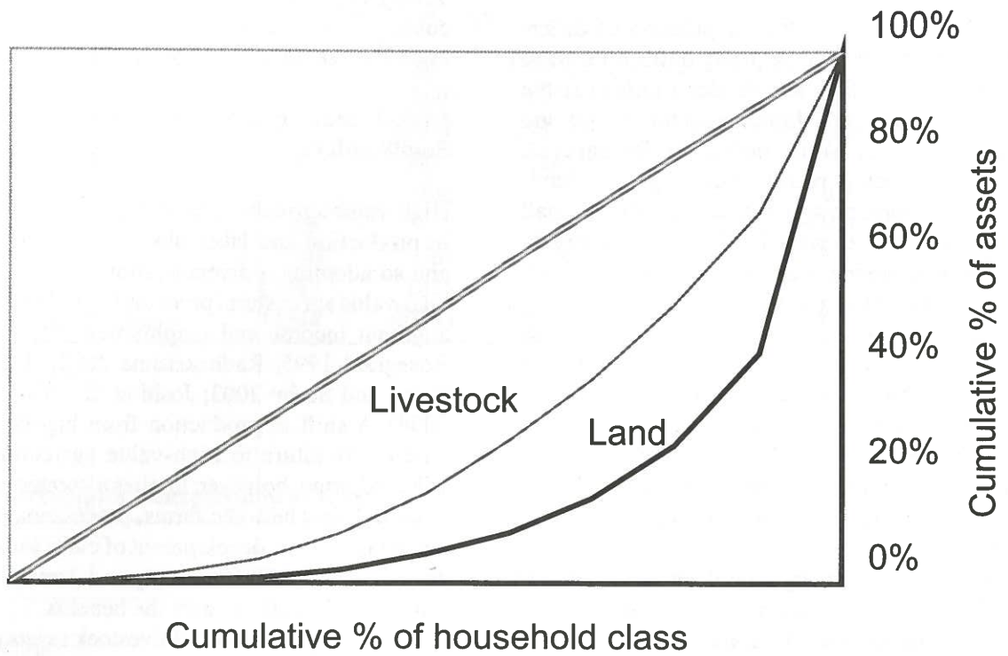

Figure 1. Lorenz Curve for Distribution of Land and Livestock Assets by Household Classes, 2002–2003.

Source: NSS Report No. 500, Household Assets and Liabilities in India, 2002–03, National Sample Survey Organization, Ministry of Statistics and Program Implementation, Govt. of India.

Table 6. Distribution of Livestock Holdings in India, 1991–92.

Category	Landless (<0.002ha)	Marginal (0.002–1.0 ha)	Small (1.0–2.0 ha)	Medium (2.0–4.0 ha)	Large (>4.0 ha)	All
% households	21.8	48.3	14.2	9.7	6.0	100.0
Distribution of livestock (%)						
Bovine	2.5	43.8	23.3	17.7	12.7	100.0
Ovine	5.1	46.2	19.3	15.0	14.4	100.0
Poultry	6.4	54.9	19.0	14.4	5.3	100.0
Pigs	7.7	49.9	20.4	13.9	8.1	100.0
Size of livestock holdings (% of households)						
Bovine	23	180	324	361	418	198
Ovine	20	81	115	131	203	85
Poultry	49	190	223	247	147	166
Pigs	2	4	6	6	5	4

Source: NSS Report No. 408, Livestock and Agricultural Implements in Household Operational Holdings, 1991-92, Ministry of Statistics and Program Implementation, Govt. of India.

Table 7. Distribution of Livestock Holdings in India, 2002-03.

Category	Landless (<0.002ha)	Marginal (0.002-1.0 ha)	Small (1.0-2.0 ha)	Medium (2.0-4.0 ha)	Large (>4.0 ha)	All
% households	31.9	47.1	11.2	6.2	3.4	100.0
Distribution of livestock (%)						
Bovine	0.6	51.3	21.2	15.0	11.9	100.0
Ovine	2.1	61.5	15.7	9.6	11.0	100.0
Poultry	4.4	62.7	17.4	6.8	8.6	100.0
Pigs	3.2	76.2	12.0	5.5	3.0	100.0
Size of livestock holdings (% of households)						
Bovine	3	169	293	374	535	156
Ovine	4	84	90	99	203	64
Poultry	17	164	191	136	306	123
Pigs	0.3	5.3	3.5	2.9	2.9	3.3

Source: NSS Report No. 493, Livestock Ownership Across Operational Land Holding Classes in India, 2002-03, Ministry of Statistics and Program Implementation, Govt. of India.

poultry farms. Therefore, the recent phase of livestock sector development does not favor landless and smallholder producers.

Summary and Conclusions

The share of high-value agriculture in total agricultural output has significantly increased in India over the last two-and-one-half decades due to sustained growth in per-capita income, increasing urbanization, and increased awareness of health and nutrition. In this process, the production, consumption and trade in meat and meat products and eggs are becoming one of the most important segments in high-value agriculture, with comparatively high growth potential. Though a majority of meat production takes place in the unorganized sector, emerging global opportunities have induced private investment in the organized meat-processing sector to reap the benefits.

There are various social, economic, and operational issues which hinder growth and development of the meat industry in India. Most of the policy initiatives of the government are general in nature and focus on the food industry as a whole. Specific schemes for promoting and strengthening the meat industry are seriously lacking. As a majority of livestock for meat production is reared by landless, marginal, and small households in rural India, the growth of the meat industry provides an opportunity to enhance the socio-economic conditions of these resource-poor households, but the lack of feed and fodder and of an organized live-animals market prevent these farmers from receiving full remuneration for their livestock. Backward integration in the meat industry is a viable option for solving this problem.

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