



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

SUBJECT II
TRADING IN LIVESTOCK AND LIVESTOCK PRODUCTS

**Livestock Sector Trade of India: Surging Momentum
in the New Liberalised Regime**

Anjani Kumar*, Steven J. Staal†, N.P. Singh‡ and Dhiraj K. Singh*

I

INTRODUCTION

The Indian livestock sector is on a high growth trajectory and currently contributes 27 per cent to the agricultural gross domestic product (AgGDP). It is of special importance as it has strong backward and forward linkages, which promote many industries like livestock-based food processing and leather industries. Thus, improving the emphasis on the development of livestock sector will not only increase its share in the agricultural and national GDP but will also assist the sector in becoming one of the major foreign exchange earners in the Indian economy in the near future. This is strengthened by the fact that India has 485 million livestock (largest), and 489 million poultry and produces annually approximately 91 million tonnes of milk (highest in the world) and 45,200 million eggs and is a leading producer of many of the livestock products (Dairy India, 2007). These advantages if leveraged optimally can push India to the position of a leading animal products supplier of the world. But, the major thrust of livestock development strategy in India has been on achieving self-sufficiency in livestock products through import substitution. However, the policy initiatives triggered in 1991 were reoriented towards improving growth and efficiency in livestock production and processing and integration with the world economy. The global demand for livestock products is on the rise and this offers an opportunity to India to increase exports, especially for products like bovine meats,¹ whose domestic demand is low. Nevertheless, there are apprehensions about the ability of livestock farmers in taking advantage of the emerging opportunities, particularly under the liberalised trade scenario. Further, non-tariff barriers like stringent sanitary and phyto-sanitary (SPS) standards, technical barriers to trade (TBT), anti-dumping duties, countervailing duties, etc., are emerging as the major constraints in tapping the benefits of export potential of the livestock sector.

*Senior Scientist and Research Associate, respectively, International Livestock Research Institute, Asia Office, New Delhi, †Director, Livestock Marketing Opportunities, International Livestock Research Institute, Nairobi and ‡Scientist, Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi – 110 012, respectively.

Against this background, the study has attempted to examine (i) the performance of livestock sector trade in terms of temporal and spatial changes in the export and import of various livestock products; (ii) growth trends in exports and imports of various livestock products, and (iii) international competitiveness and determinants of export growth of livestock products, followed by the food safety issues in the livestock trade. The paper has been divided into five sections. The following section provides a brief description of data and methods of analysis. Section III gives an overview of the performance of livestock sector trade. The factors influencing the export of various livestock products and the emerging food safety issues are discussed in Section IV. The last section contains the conclusions and policy implications.

II

DATA AND METHODOLOGY

The study is based on the data pertaining to the period 1979-80 to 2005-06. The data on exports and imports of livestock products, agricultural exports and imports and total merchandise exports and imports were compiled from *Monthly Statistics of Foreign Trade* published by DGCIS, Ministry of Commerce, Government of India. The data on GDP, AgGDP and livestock GDP, were taken from the national accounts statistics published by Central Statistical Organisation (CSO), Government of India. Data on world trade for different livestock products, producer prices of different countries, consumption of livestock products, etc. were collated from Food and Agricultural Organisation of the United Nations (FAO) database. The domestic wholesale price index of livestock products and subsidies was compiled from Index numbers of wholesale prices in India published by Office of the Economic Adviser, and Capital and Finance Accounts, Ministry of Commerce and Industry and Ministry of Finance, respectively.

All the values of exports and imports were converted into US dollars to net out the effect of fluctuations in the exchange rates. To analyse the performance of exports and imports of various livestock products, the triennium averages (TE) were computed to minimise the wide fluctuations. Compound Annual Growth Rates (CAGR) were estimated to examine the growth trends in exports and imports of various livestock products. Besides, double log linear regression was estimated to identify the factors influencing the export of different livestock products.

III

PERFORMANCE OF LIVESTOCK SECTOR TRADE

In order to have empirical resonance as the basis of the future trade dynamics in the livestock sector, the performance of country's livestock trade and the changing diversification pattern have been presented in the succeeding section; the growth rate in exports and imports during the period beginning 1980 has been analysed and

interpreted in seriatim. The destination of exports and the underlying liberalised market issues have been discussed. The opportunities and challenges in increasing the exports of livestock products have also been discussed.

Trade Indicators of Livestock Sector

The data on different indicators of livestock trade are presented in Table 1. A perusal of this table reveals that India was a net importer of livestock products till 1985. This scenario changed sharply after 1985 indicating the tremendous export potential of this sector as exports exceeded imports sizeably. The share of livestock exports in the agricultural exports increased from 3.22 per cent in TE 1982 to 3.59 per cent in TE 1985, which declined to 3.10 per cent in TE 1988 and again increased to 4.01 per cent in TE 1991. It declined again slightly to 3.77 per cent in TE 1994 but since then, there has been uninterrupted increase in its share. It reached 7.44 per cent in TE 2006, which is more than double its share in TE 1982. The share of livestock exports in total merchandise export fell from 0.97 per cent in TE 1982 to 0.69 per cent in TE 1994 followed by a reversal in downward trend post-1994. The share of livestock in total exports hovered around 0.7 to 0.8 per cent till TE 2006. The share of livestock exports in livestock GDP had declined to 0.65 per cent in 1988, followed by a reversal in the trend. There has been a healthy rise in its share, from 0.75 per cent in TE 1991 to 2.39 per cent in TE 2006; it is about three times more than its share in TE 1991. The share of livestock imports has consistently declined over time, from 13.5 per cent in TE 1982 to 0.71 per cent in TE 2006; it is negligible in total imports and livestock GDP.

TABLE 1. PERFORMANCE OF LIVESTOCK EXPORTS AND IMPORTS IN INDIA, 1980-2006

TE (1)	Livestock export (million US\$) (2)	Livestock import (million US\$) (3)	Trade balance (4)	Share of livestock exports (per cent)			Share of livestock imports		
				Total exports (5)	Agricultural export (6)	Livestock GDP (7)	Total imports (8)	Agricultural imports (9)	Livestock GDP (10)
1982	81.4	140.3	-58.9	0.97	3.22	–	0.99	13.50	2.69
1985	84.2	111.2	-27.0	0.89	3.59	0.88	0.75	8.95	1.16
1988	81.2	66.8	14.4	0.79	3.10	0.65	0.41	7.43	0.53
1991	121.7	40.3	81.5	0.75	4.01	0.75	0.19	4.65	0.25
1994	135.0	12.9	122.1	0.69	3.77	0.89	0.06	2.62	0.08
1997	229.3	14.4	215.0	0.75	3.93	1.17	0.04	1.12	0.07
2000	255.4	28.0	227.3	0.73	4.07	1.17	0.06	1.16	0.13
2003	378.0	22.1	355.8	0.80	5.86	1.63	0.04	0.94	0.10
2006	676.0	25.3	650.7	0.81	7.44	2.39	0.03	0.71	0.09

Source: Directorate General of Commercial Intelligence and Statistics, *Monthly Statistics of the Foreign Trade of India*, Ministry of Commerce and Industry, Government of India; *National Accounts Statistics*, Central Statistical Organisation, Government of India.

It is evident from the trends in trade indicators that the performance of livestock exports has been noteworthy, while the reverse has been observed in imports of livestock products. The liberalisation policy initiated in 1991 seems to have further improved the performance of livestock exports.

Composition of Exports and Imports of Livestock Products and Their Growth Trends

The livestock exports have registered a commendable rise during the entire study span of twenty-seven years. The average annual livestock exports have increased remarkably from US \$ 82 million in TE 1982 to US \$ 674 million in TE 2006 (Table 2). The bovine meat, dairy products, eggs, other animal products and to some extent, hides and skins have shown promising signs during this period. The bovine meat has been the most dominant component of the livestock products exported from India, especially since TE 1988. The current contribution of bovine meat in the total foreign exchange earnings from the livestock sector is about 66 per cent, that is, nearly fifteen times of the exports in the TE 1982. It is followed by dairy products, eggs and other edible animal products (swine meat, sheep meat and poultry meat), which have contributed about 13 per cent, 9.2 per cent and 3.4 per cent to the total earnings from the livestock exports, respectively in TE 2006.

The export of dairy products and eggs gained momentum after 1991 due to a series of short and long-term strategies aimed at cushioning-up of the sector. These strategies resulted in a significant rise in milk and egg production and thus facilitated higher export of these products. In fact, the export of dairy products in TE 2006 was almost five times more than in TE 2000. The major impetus to exports of dairy products had come after the removal of quantitative restrictions and sincere attempts by government and exporters to comply with sanitary and phyto-sanitary standards (SPS). The export of eggs had fallen till 1988 but thereafter there has been a continuous upward trend due to the boost in commercialisation of poultry sector in India. Further, reduction in the excise duty on meat products from 16 per cent to 8 per cent seems to have a positive influence on their production and consequently, their exports.

Like-wise, some positive trends are apparent in the exports of non-edible livestock products such as hides and skins. The export of hides and skins was negligible in TE 1982 but accounted for 2.18 per cent of the total livestock exports in TE 2006. The current contribution of live animals, hides and skins has been meagre in the total export earnings from livestock sector. The share of other animal products (non-edible products) during TE 2006 was 5.4 per cent.

Some surprising trends have also been noticed. The export of live animals that rose until TE 1985, drastically fell thereafter and was less than one per cent of the total livestock export earnings during TE 2006. Similarly, the export of sheep meat, which grew to 26.6 per cent during TE 1985, started declining since then and has

TABLE 2. AVERAGE ANNUAL VALUE AND COMPOSITION OF EXPORTS OF LIVESTOCK PRODUCTS AND THEIR GROWTH RATES

Items (1)	Annual value and composition of exports (US \$ million)														CAGR (per cent)		
	1982 (2)	1985 (3)	1988 (4)	1991 (5)	1994 (6)	1997 (7)	2000 (8)	2003 (9)	2006 (10)	1980-90 (11)	1991-2000 (12)	2001-2006 (13)	1980-2006 (14)				
1. Live animals	6.52 (7.95)	7.15 (8.55)	1.25 (1.54)	0.50 (0.41)	0.84 (0.62)	1.42 (0.61)	0.86 (0.34)	1.62 (0.43)	5.56 (0.83)	-24.99* (-5.29)	13.05 (3.34)	37.67** (3.34)	-2.41				
2. Bovine meat	3.65 (4.45)	1.34 (1.61)	18.14 (22.25)	67.36 (55.87)	80.13 (59.24)	149.09 (64.46)	173.65 (68.39)	270.17 (71.53)	441.39 (65.53)	38.62** (2.43)	14.07* (6.29)	15.80** (3.17)	26.70* (9.90)				
3. Swine meat	0.01 (0.01)	0.00 (0.00)	0.63 (0.78)	0.00 (0.00)	0.02 (0.01)	2.71 (1.17)	0.26 (0.10)	0.39 (0.10)	0.61 (0.09)	46.79 (8.34)	40.60 (2.71)	122.35 (13.40)	23.04* (3.91)				
4. Sheep meat	9.77 (11.92)	22.23 (26.60)	18.59 (22.80)	16.13 (13.38)	15.65 (11.57)	18.68 (8.08)	18.64 (7.34)	10.48 (2.78)	20.06 (2.98)	8.34 (-44.73)	2.71 (23.07)	13.40 (-21.26)	0.92 (3.53)				
5. Goat meat	0.00 (0.00)	0.00 (0.00)	0.04 (0.05)	0.06 (0.05)	0.18 (0.14)	0.68 (0.29)	0.38 (0.15)	0.31 (0.08)	0.22 (0.03)	-44.73 (2.16)	23.07 (-25.43)	-21.26 (106.04)	3.53				
6. Poultry meat	0.01 (0.02)	0.04 (0.05)	0.02 (0.02)	0.00 (0.00)	0.10 (0.07)	0.02 (0.01)	0.02 (0.01)	0.21 (0.05)	2.93 (0.44)	2.16 (-19.93**)	-25.43 (34.15*)	106.04 (27.38*)	13.91* (3.38)				
7. Eggs	3.38 (4.13)	0.75 (0.90)	0.30 (0.37)	0.72 (0.60)	3.94 (2.91)	12.61 (5.45)	18.44 (7.26)	29.57 (7.83)	61.96 (9.20)	-19.93** (-2.70)	34.15* (3.89)	27.38* (11.49)	21.37* (6.99)				
8. Dairy products	1.50 (1.83)	2.31 (2.77)	3.20 (3.92)	1.49 (1.23)	3.46 (2.55)	7.67 (3.32)	6.56 (2.58)	29.48 (7.80)	85.73 (12.73)	4.87 (11.62**)	12.78 (0.00)	39.73 (27.83*)	15.33* (8.17)				
9. Hides and skins	0.00 (0.00)	0.00 (0.00)	1.93 (2.36)	6.20 (5.15)	5.90 (4.36)	7.13 (3.08)	5.43 (2.14)	6.40 (1.70)	14.71 (2.18)	11.62** (13.50)	0.00 (5.96)	27.83* (5.96)	3.90* (3.11)				

Source: Directorate General of Commercial Intelligence and Statistics, *Monthly Statistics of the Foreign Trade of India*, Ministry of Commerce and Industry, Government of India; Data refer to triennium ending average.

Note: Figures in parentheses are percentages to the total.

contributed merely about three per cent in TE 2006. The export of swine and goat meats has marginally improved, but these together contributed about 0.12 per cent, a negligible contribution to livestock export earnings in the TE 2006.

The compound growth rates of different livestock products have exhibited mixed trends. During the span of twenty-seven years, 7 out of 9 livestock products have depicted significant and positive growth rates. The export of bovine meat has registered the highest annual growth of about 27 per cent, followed by eggs (21.37 per cent), swine meat (23.04 per cent), dairy products (15.33 per cent) and poultry meat (13.91 per cent). Although the share of swine and poultry meats in the total export earnings of the livestock sector is skimpy, there is a potential to increase the export of these products if due attention is given to ensure their safety and quality by adopting sanitary and phyto-sanitary standards and to reduce their production cost, which otherwise is making our poultry export uncompetitive.

The export of hides and skins has grown at the rate of 3.90 per cent while that of quantum of live animals has decelerated by 2.41 per cent. The export of five livestock products has grown in double digits, signifying that focus on these commodities can help in earning more foreign exchange and strengthen the global standing of India in the livestock trade.

The growth of livestock exports has accentuated considerably during post-WTO period and has been strengthened with reforms in the EXIM policies, mainly removal of quantitative restrictions on exports of most of the livestock products and the concentrated focus of the government on the development of the livestock sector. During 2001-2006, the export of poultry meat has registered the highest growth rate of 106.4 per cent, followed by dairy products (39.73 per cent), eggs (27.38 per cent), and bovine meat (15.80 per cent). The reduction in excise duty on meat from 16 per cent to 8 per cent could have positive influence on their production and export (Government of India, 2004). The improvement in eggs export, primarily to the Middle East, seems to be influenced by the cold storage and airfreight subsidies provided by Agricultural and Processed Food Products Export Development Authority (APEDA), a government exports promotion agency. The negative growth rate in export of goat meat has led to a significant fall in its export during this period. Table 2 shows that the rate of growth of bovine meat exports has been significant at all points of time, indicating the growing demand for this meat abroad, especially in the Middle East, CIS and Southeast Asian countries.

The total imports of livestock products over the period 1980-2006 have been depicted in Table 3. These fell drastically from US\$ 1426 million in TE 1982 to US\$ 129 million in TE 1994 but showed a sign of little revival thereafter. In TE 2006, the total livestock imports were of about US\$ 254 million. The analysis of Table 3 reveals that during 1980 to 2006, the import of most of the livestock products like bovine meat, swine meat, sheep meat, poultry meat, eggs, and hides and skins, has increased only marginally, despite liberalisation of the import policy.

TABLE 3. AVERAGE ANNUAL VALUE AND COMPOSITION OF IMPORTS OF LIVESTOCK PRODUCTS AND THEIR GROWTH RATES

Items (1)	Annual value and composition of imports (US \$ million)														CAGR (per cent)			
	1982 (2)	1985 (3)	1988 (4)	1991 (5)	1994 (6)	1997 (7)	2000 (8)	2003 (9)	2006 (10)	1980-90 (11)	1991-2000 (12)	2001-2006 (13)	1980-2006 (14)					
1. Live animals	3.83 (0.27)	5.28 (0.47)	14.17 (2.11)	7.30 (1.95)	9.21 (7.12)	9.55 (6.73)	5.00 (1.74)	4.69 (2.12)	12.09 (4.76)	15.07	-9.11* (-3.34)	42.89* (6.01)	0.14					
2. Bovine meat	0.00 (0.00)	0.00 (0.00)	0.12 (0.02)	0.03 (0.01)	0.02 (0.02)	0.03 (0.02)	0.02 (0.01)	0.03 (0.01)	0.36 (0.14)	0.00	-1.93	231.66	-5.82					
3. Swine meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.06 (0.05)	0.01 (0.00)	0.22 (0.10)	1.22 (0.48)	0.00	-43.28	115.41* (4.61)	25.03* (3.80)					
4. Sheep meat	0.00 (0.00)	0.00 (0.00)	0.02 (0.00)	0.04 (0.01)	0.00 (0.00)	0.02 (0.01)	0.15 (0.05)	0.11 (0.05)	0.52 (0.21)	94.71	109.74	45.08	10.98					
5. Goat meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.26 (0.12)	0.01 (0.00)	0.00	0.00	-40.16	-40.16					
6. Poultry meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.02 (0.01)	0.00 (0.00)	0.02 (0.01)	0.02 (0.01)	0.24 (0.11)	0.29 (0.12)	0.00	-6.50	20.04	9.30					
7. Eggs	0.29 (0.02)	0.46 (0.04)	0.22 (0.03)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.61 (0.21)	3.92 (1.77)	6.83 (2.69)	0.21	124.81	114.60	9.48** (2.79)					
8. Dairy products	1419.28 (99.51)	1117.92 (99.44)	650.66 (96.90)	349.38 (93.3)	109.72 (84.78)	98.34 (69.31)	204.97 (71.07)	96.76 (43.71)	151.66 (59.72)	-10.34	12.54	2.53	-10.24					
9. Hides and skins	0.00 (0.00)	0.00 (0.00)	0.44 (0.07)	3.87 (1.03)	0.00 (0.00)	0.00 (0.00)	3.53 (1.22)	3.24 (1.47)	4.50 (1.77)	112.14	61.78	-1.16	-0.18					

Source: Same as in Table 2. Data refer to triennium ending average.

Note: Figures in parentheses are percentages to the total.

In the post-1997 period, some rise can be seen in the import of dairy products. It had fallen sharply by about 30 per cent during the 1980 to 1997, and depicted a rise till TE 2000 and a fall in TE 2003. The decline in import of dairy products could be attributed to the success of 'Operation Flood' programme initiated during late 1960s to achieve self-sufficiency in milk production and canalisation of dairy industry till 1992. However the rise in import of dairy products could be attributed to the commitment of India under WTO to eliminate the non-tariff barrier on imports of dairy products. Thus, as a result of hundred per cent de-canalisation of the dairy sector in 1992, coupled with removal of quantitative restrictions and permission to import skim milk powder at zero import duty, the import of milk, butter and butter oil increased substantially during late-1990s (Rakotoarisoa and Gulati, 2006). However, the Government of India had to resort to high tariff walls for dairy products such as milk powder to allay the fears of their large-scale dumping in the domestic market in view of liberalisation of import policy. The import of live animals has shown a fluctuating trend over the period. The import of goat meat has almost not taken place. Only the import of swine meat and eggs registered significant growth during the period 1980 to 2006. Even their growth rates should be read cautiously as these indicate growth from a very low base.

Destinations of Trade

Destinations for trade are determined by several factors including geographical and political proximity, differences in comparative advantage, and degree of trade barriers. To identify major trading partners of India in the trade of livestock products, top five importers and exporters of livestock products have been listed in Annexure Table 1 and 2. About three-fourth of the exports of livestock products are concentrated in these five countries, indicating higher geographical concentration of exports in a few countries (Annexure Table 1). The pattern of commodity/group wise trade destinations for the Indian livestock is revealing. Country wise trade has revealed year to year variations in the volume of trade with India's trading partners. For instance UAE imported 50 per cent of bovine meat from India in TE 1982, but later Malaysia emerged as its top importer of bovine meat followed by Philippines. This trend is pervasive for all the major livestock products. One of the disquieting features of export destinations of livestock export is that India has not been able to make a dent in export to the developed countries, where it can realise higher per unit value. Its exports mainly have been confined to the neighbouring South Asian, East Asian and Middle East countries. The import of livestock products in India is negligible apart from dairy products. Its major trading partners for import of dairy products have been changing from time to time but France, New Zealand, USA, Australia, Germany and Belgium have remained the major exporters of dairy products to India, with their varying shares in different time periods.

India's Share in Global Export of Livestock Products

Several livestock products have registered a significant export growth, particularly in recent years. However, India is still a small player in global market of livestock trade. Except bovine meat and eggs, none of the livestock products even contributes 1 per cent of the world export (Table 4). The shares of bovine meat and eggs in the world export have, by and large, increased consistently and have reached 2 per cent and 3 per cent, respectively in TE 2006 from the negligible share in TE 1982. The share of India in world imports of bovine meat, goat meat, sheep meat and swine meat has been negligible. India was a major importer of dairy products till TE 1982, when it accounted for more than 11 per cent in the world imports of dairy products, but has depicted a sharp decline thereafter, reaching a negligible share of 0.39 per cent in TE 2006.

TABLE 4. INDIA'S SHARE IN WORLD TRADE OF LIVESTOCK PRODUCTS

TE (1)	Live animals (2)	Bovine meat (3)	Dairy products (4)	Goat meat (5)	Sheep meat (6)	Eggs (7)	Hides and skins (8)
Exports							
1982	0.1	0.0	0.0	0.0	0.6	0.3	0.0
1985	0.1	0.0	0.0	0.0	1.5	0.1	0.0
1988	0.0	0.2	0.0	0.6	1.4	0.0	0.0
1991	0.0	0.5	0.0	0.2	1.0	0.1	0.1
1994	0.0	0.5	0.0	0.4	0.9	0.3	0.1
1997	0.0	0.9	0.0	1.6	0.9	0.9	0.1
2000	0.0	1.1	0.0	0.8	0.9	1.3	0.1
2003	0.0	1.7	0.1	0.6	0.5	2.3	0.1
2006	0.1	2.1	0.2	0.2	0.6	3.3	0.2
Imports							
1982	0.1	0.0	11.3	0.0	0.0	0.0	0.0
1985	0.1	0.0	8.9	0.0	0.0	0.1	0.0
1988	0.2	0.0	4.7	0.0	0.0	0.0	0.0
1991	0.1	0.0	1.7	0.0	0.0	0.0	0.1
1994	0.1	0.0	0.5	0.0	0.0	0.0	0.0
1997	0.1	0.0	0.4	0.0	0.0	0.0	0.0
2000	0.1	0.0	0.8	0.0	0.0	0.0	0.1
2003	0.1	0.0	0.4	0.4	0.0	0.3	0.1
2006	0.1	0.0	0.4	0.0	0.0	0.4	0.1

Source: FAO Database.

It is evident that in the world trade of livestock products, India's contribution is insignificant, and therefore, it cannot influence the world market either in prices or supplies. But, having the leverage of being one of the largest producers of most of the livestock products, coupled with adoption of export promotion strategy and with focus on compliance with sanitary and phyto-sanitary standards, India has the potential to enhance its share in the global markets of livestock products in the future.

International Competitiveness

India has the competitive advantage in production of different livestock products. Producer prices of buffalo meat in India are lower than the international prices. A comparison of the producer prices (Table 5) has revealed that India has been a competitive country for most of the livestock products except poultry meat. India has the price advantage in bovine meat, mutton, pork and eggs; in bovine meat production it is highly competitive.

The producer price of poultry meat has been found significantly higher in India than the major exporters in the world market. Similar observations have been made by Kumar *et al.* (2001) and Birthal and Taneja (2006). In the case of milk, though the producer price of milk gives some leverage to India, the cost of milk processing erodes its advantage, as dairy products are exported mainly in the processed form.

TABLE 5. PRODUCER PRICES OF LIVESTOCK PRODUCTS IN INDIA VIS-A-VIS MAJOR EXPORTING COUNTRIES OF THE WORLD

Items (1)	Country (2)	(US\$/tonnes)			
		TE 1993 (3)	TE 1996 (4)	TE 2000 (5)	TE 2003 (6)
1. Bovine meat	India	580	457	331	316
	US	3061	2646	2708	3074
	Denmark	3187	2926	2281	1838
	Australia	1557	1597	1295	1678
2. Poultry meat	India	1316	2099	1401	1381
	US	994	1090	1107	1505
	Denmark	922	1090	835	845
	Australia	1427	1458	1053	948
3. Pig meat	India	556	456	407	394
	US	1609	1430	1107	1189
	Denmark	1826	1915	1295	1303
	Australia	1488	1320	1236	1299
4. Mutton	India	1704	1825	2114	2088
	US	2589	3565	3543	3681
	Denmark	1624	3264	2392	2644
	Australia	810	847	839	1335
5. Eggs	India	393	558	529	506
	US	885	933	897	911
	Denmark	1061	1265	1145	1197
	Australia	2324	1805	1664	1409
6. Milk whole, fresh	India	228	239	242	245
	Germany	383	387	320	308
	France	359	390	326	319
	New Zealand	139	188	147	182

Source: FAO Database.

IV

DETERMINANTS OF LIVESTOCK EXPORTS

The export of a commodity is influenced by a number of demand and supply side factors. A double log-linear regression analysis has been carried out to understand the role of different factors. The livestock export function was specified as follows:

$$\text{LnXQ}_t = \beta_0 + \beta_1 \text{LnDPC}_t + \beta_2 \text{LnDIP}_t + \beta_3 \text{LnWEO}_t + \beta_4 \text{LnER}_t + \beta_5 (\text{QR})_t + U_{it}$$

where, XQ_t is the quantity of livestock products exported, DPC_t is the ratio of domestic production and consumption of the livestock products, DIP_t is the ratio of international and domestic prices of livestock products, WEO_t is the ratio of world exports to world output of livestock products, ER_t is the exchange rate, and QR_t is the dummy for removal of quantitative restrictions with the establishment of WTO in 1995.

Since domestic price is determined by the factors of supply and demand, joint inclusion of domestic and international prices, domestic production and consumption, world exports and outputs may lead to multi-collinearity and therefore, these variables were taken as ratios. *A priori* a positive relationship was expected between the quantity of livestock products exported and the domestic output-consumption ratio, exchange rate, while the price ratio and world export-output ratio were expected to have negative signs. The results of the functional analysis have been presented in Table 6. The included explanatory variables could explain 77 to 97 per cent of the total variation in the exports of different livestock products. The coefficients for most of the variables indicate that different factors influence the export of livestock products differently. The coefficients have expected signs with a few exceptions. The ratio of domestic production to consumption, which indicates the higher availability of domestic surplus, has been observed to play a significant role in increasing the export of bovine meat, poultry meat and muttons. The ratio of international and domestic price did not influence the export of livestock products, except dairy

TABLE 6. ESTIMATES OF EXPORT FUNCTIONS FOR LIVESTOCK PRODUCTS

Explanatory variables	Eggs	Bovine Meat	Poultry Meat	Dairy products	Pig Meat	Muttons
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	10.3134 (1.25)	11.3351*** (9.21)	698.0938*** (3.50)	18.4750 (1.51)	88.6826 (0.75)	85.7985*** (16.30)
DPC_t						
	-0.2879 (-1.04)	-0.1139 (-0.78)	-0.8068 (-0.95)	-2.2317* (-2.15)	-0.8801 (-1.07)	0.1821 (1.20)
DIP_t						
	4.6932** (2.42)	-0.2363 (-0.58)	-3.2860 (-0.84)	3.8969 (0.68)	4.1337 (0.81)	0.6178 (1.51)
WEO_t						
	2.8532*** (3.50)	0.4940*** (3.67)	0.3564 (0.21)	2.7634*** (3.44)	1.9414 (0.97)	0.0737 (0.44)
ER_t						
QR_t removed=1, otherwise=0	1.1581** (2.90)	0.1976* (2.12)	1.7737 (1.33)	-0.2979 (-0.70)	0.9529 (0.66)	0.1310* (1.84)
Constant	7.6345 (1.29)	2.0304** (2.54)	-11.5523 (-0.80)	0.0887 (0.01)	2.8888 (0.17)	2.1386** (2.50)
R2	0.9053	0.9912	0.7742	0.9246	0.7787	0.9765
No. of observations	27	27	27	27	27	27

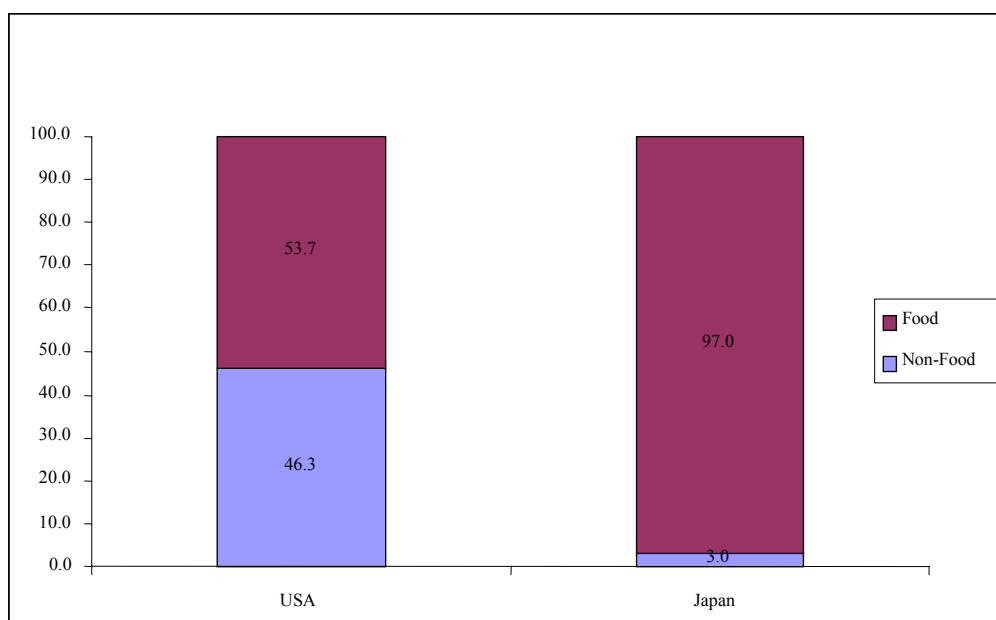
Source: Directorate General of Commercial Intelligence and Statistics, Monthly Statistics of the Foreign Trade of India, Ministry of Commerce and Industry, Government of India; and FAO Database.

Note: ***, ** and * indicates level of significance; at 1, 5 and 10 per cent level, respectively.

products. The expanding world export market is expected to play a significant role only in the export of eggs. The coefficient of exchange rate is positive for all the products and is significant for eggs, bovine meat and dairy products. A high exchange rate indicates lower purchasing power of domestic currencies in relation to standard international currencies. In other words, devaluation lowers the export price of the commodity for the importers and pushes up the domestic price of exportable and importable commodities and therefore encourages exports. The estimate for the exchange rate indicates that the devaluation of domestic currency in India during 1990s and its management in post liberalisation period played an important role in the export of livestock products. The removal of quantitative restrictions in post WTO seems to have also played a significant and positive role in the export of eggs, bovine meat and muttons. The coefficient of QR_t is not significant but positive for poultry meat and pigs, while it is negative for the export of dairy products.

Food Safety Issues in Livestock in New International Trade Regime

Food safety issues are becoming a major concern in the export of food commodities from India to developed countries. India has been facing increasing number of non-tariff measures (mainly SPS and TBTs) in its major importing countries. The food products refusal during April 2006-March-2007 accounted for 54 and 97 per cent, respectively of the total imports refusal by US and Japan (Figure 1) and Indian consignments had the dubious distinction of being second highest refusals by US during this period. India has faced the highest number of refusals of its food exports consignments after Mexico and it accounts for more than 13 per cent of the import consignments refused by US. The major reasons for the refusal of Indian consignments were microbiological contamination, filthiness in the consignment, in-sanitary conditions, inadequate labeling/inappropriate information, and unsafe additives (Table 7). Thus, a majority of rejections are attributable to the lack of basic hygiene and microbial contamination. However, the share of meat and meat products including poultry products and dairy products is around 5 per cent of the total refusals of food products exports from India to these countries, though the exports of these category of products had only a little share in the pie of total exports from India to US and Japan. India's exports of livestock products are concentrated mainly on Middle East and East Asian countries where the norms are not very stringent. Hence, adhering to the SPS standards are important challenges for the livestock exports from India wherein compliance of food safety regulations is a dire necessity for expanding its trade wings and to realise a higher per unit value.



Source: <http://www.fda.gov.oasis> and <http://www.mhlw.go.jp>

Figure 1. Share of Food and Non-Food Products in Total Refusal

TABLE 7. SHARE OF DIFFERENT REASONS IN TOTAL NUMBER OF REFUSALS BY USA AND JAPAN DURING APRIL 2006-MARCH 2007

Reasons (1)	USA		Japan	
	Number (2)	Share of each reason in total no. of causes (per cent) (3)	Number (4)	Share of each cause in total no. of causes (per cent) (5)
Microbiological contamination	248	19.1	6	25.0
Filthy	220	17.0	0	0.0
In-sanitary	7	0.5	0	0.0
Inadequate labeling/ inappropriate information	412	31.7	1	4.2
Unsafe additives	179	13.8	17	70.8
Miscellaneous	232	17.9	0	0.0
Total Reasons	1298	100.0	24	100.0

Source: <http://www.fda.gov.oasis> and <http://www.mhlw.go.jp>.

V

CONCLUSIONS AND POLICY IMPLICATIONS

The paper has explicitly demonstrated that the livestock exports have registered a commendable rise and liberalisation policies seem to have further augmented their

growth. The exports of bovine meat, dairy products, and eggs, have shown promising signs during this period. On the other hand, imports of most of the livestock products have been insignificant. India from being a net importer of livestock products till 1985, became a net exporter post-1985, indicating the tremendous export potential of this sector. In the world trade of livestock products, India is still a very small player. But being one of the largest producers of most of the livestock products, India has the potential to significantly increase and expand the export of livestock products. Further, it seems that domestic policy initiatives and increased production and productivity are the important factors in increasing the export of livestock products. To give a boost to livestock exports, compliance with various sanitary and phytosanitary measures should be taken up vigorously to ensure international hygiene standards and to harness the untapped potential of exporting to developed countries like U.S.A., EU and Japan. Within livestock products, India is highly competitive in bovine meat and it should try to exploit this strength. However, in some instances over emphasis on trade in livestock products may lead to increased food insecurity for certain group of people whose livelihoods largely depend on livestock rearing. To reduce the negative externalities of international trade in livestock products, incentives and support services should be structured to allow subsistence farmers and landless livestock keepers to participate in the livestock trade.

NOTE

1. Bovine meat refers to only buffalo meat as there is a ban on slaughtering and export of cattle meat.

REFERENCES

- Birthal, P.S. and V.K. Taneja (2006), "Livestock Sector in India: Opportunities and Challenges for Smallholders" in Proceedings of an ICAR-ILRI International Workshop, National Centre for Agricultural Economics and Policy Research, New Delhi and International Livestock Research Institute, Nairobi.
- Government of India (2004), *Union Budget (2004-05)*, Budget speech delivered by Minister of Finance, July 4.
- Dairy India* (2007), Published by Dairy India Yearbook, New Delhi.
- Directorate General of Commercial Intelligence and Statistics, *Monthly Statistics of the Foreign Trade of India*, Ministry of Commerce and Industry, Government of India (various issues).
- FAO (Food and Agriculture Organisation of the United Nations), *FAO Database*, Rome, Italy.
- Kumar, Anjani; Jabir Ali and Harbir Singh (2001), "Trade in Livestock Products in India: Trends, Performance and Competitiveness", *Indian Journal of Agricultural Economics*, Vol. 56, No. 4, October-December, pp. 653-667.
- Rakotoarisoa Manitra, and Ashok Gulati (2006), "Competitiveness and Trade Potential of India's Dairy Industry", *Food Policy*, Volume 31, No. 3, pp. 216-227.
- Central Statistical Organisation, *National Accounts Statistics*, Government of India (various issues).

ANNEXURE

TABLE 1. TOP 5 IMPORTERS OF INDIAN LIVESTOCK PRODUCTS

Items (1)	TE 1982 (2)	TE 1991 (3)	TE 2000 (4)	TE 2006 (5)
1. Live animals	Kuwait (38), Saudi Arabia (19), Oman (13), Nepal (9), UAE (8)	Oman (23), Bangladesh (22), UAE (14), Saudi Arabia (12), Maldives (9)	Bangladesh (38), Srilanka (27), Nepal (8), Korea (7), Myanmar (7)	Nepal (25), Thailand (18), Bangladesh (16), U.S.A. (8), Srilanka (6)
2. Bovine meat	UAE (50), Kuwait (15), Saudi Arab (14), Netherlands (13), Lebanon (3)	Malaysia (51), U.A.E. (22), Oman (5), Kuwait (4), Iran (2)	Malaysia (30), UAE (24), Philippines (17), Iran (7), Jordan (4)	Malaysia (21), Philippines (12), Jordan (9), Angola (8), UAE (7)
3. Swine meat	Nepal (45), U.A.E. (44), Maldives (5), Qatar (5)	-	Malaysia (17), Iran (17), UK (14), UAE (11), Angola (8)	Myanmar (26), Angola (17), Saudi Arab (12), Hong-Kong (11), Vietnam (9)
4. Sheep meat	UAE (80), Oman (8), Bahrain (5), Kuwait (4), Saudi Arab (2)	UAE (72), Saudi Arab (13), Oman (10), Bahrain (4), Kuwait (0)	UAE (45), Saudi Arab (41), Oman (7), Bahrain (2), USA (1)	Saudi Arab (30), UAE (26), Qatar (9), Malaysia (7), Oman (7)
5. Goat meat	-	UAE (93), Oman (6), U.S.A. (1)	Saudi Arab (57), UAE (32), Oman (8), Srilanka (3)	UAE (62), Saudi Arab (15), Germany (7), Nepal (6), Oman (5)
6. Poultry meat	Saudi Arab (63), Maldives (14), UAE (14), Syria (6), Oman (3)	Maldives (100)	Kuwait (49), Srilanka (33), UAE (14), South Africa (3), Mauritius (1)	Saudi Arab (77), Bahrain (7), Oman (6), UAE (4), Jordan (2)
7. Eggs	U.A.E. (79), Saudi Arab (5), Qatar (4), Kuwait (3), Oman (3)	Oman (43), U.A.E. (25), Maldives (24), Nepal (3), Kuwait (2)	UAE (44), Oman (16), Saudi Arab (6), Bangladesh (5), Kuwait (5)	UAE (38), Kuwait (19), Oman (17), Angola (6), Qatar (5)
8. Dairy products	Nepal (41), UAE (34), Sri Lanka (8), Kuwait (8), Bahrain (3)	U.A.E. (38), Nepal (14), Indonesia (9), Bangladesh (7), Bahrain (6)	Bangladesh (34), UAE (15), U.S.A. (7), Belgium (6), Philippines (4)	Bangladesh (21), U.A.E. (10), Algeria (7), Egypt A Rp (7), Nepal (5)
9. Hides and skin	-	Japan (35), Germany (30), U.K. (18), Czechoslovk (6), France (5)	Germany (28), UK (19), Japan (17), Italy (10), France (10)	Germany (25), Belgium (25), UK (19), Japan (13), France (12)

Source: FAO Database; figures in parentheses indicate percentage share of the respective country.

TABLE 2. TOP 5 EXPORTERS OF LIVESTOCK PRODUCTS TO INDIA

Items (1)	TE 1982 (2)	TE 1991 (3)	TE 2000 (4)	TE 2006 (5)
1. Live animals	USA (46), Nepal (33), UK (4), Netherlands (3)	Nepal (100)	Nepal (88), USA (10), Germany (1)	UK (57), Nepal (27), USA (7), France (5), Germany (2)
2. Bovine meat	-	Australia (100)	Singapore (81), New Zealand (19)	Germany (100)
3. Swine meat	Singapore (63), Nepal (38)	-	Nepal (80), Germany (20)	Germany (46), Ireland (12), Canada (11), Israel (5), Netherland (5)
4. Sheep meat	-	Australia (100)	Netherland (49), Singapore (42), New Zealand (7), UAE (2), Switzerland (1)	New Zealand (44), Australia (22), Italy (13), Canada (9), USA (5)
5. Goat meat	-	-	-	Australia (100)
6. Poultry meat	-	Netherland (100)	Netherland (71), Singapore (29)	Thailand (58), USA (20), Nepal (17), France (2), Italy (1)
7. Eggs	USA (65), Netherland (31), Germany (4), Nepal (1)	-	Netherland (97), Switzerland (2), USA (1)	UK (47), Germany (47), Italy (2), Unspecified (2), Korea (1)
8. Dairy products	Germany (38), Belgium (20), Netherland (16), France (7), Ireland (6)	USA (41), Germany (29), Belgium (15), Netherland (10)	New Zealand (34), Australia (14), Netherland (12), Germany (9), Ireland (8)	France (18), Belgium (14), Australia (13), Nepal (9), UK (7)
9. Hides and skins	-	Hong-Kong (73), Zimbabwe (13), Somalia (8), Zaire Rep (3), Germany (2)	Srilanka (41), U.S.A. (19), Somalia (12), Ethiopia (10), Australia (9)	Bangladesh (61), Australia (17), Srilanka (11), Nepal (9), U.A.E. (1)

Source: FAO Database; Figures in parentheses indicate percentage share of the respective country.