



INDIA'S LIVESTOCK SECTOR TRADE: OPPORTUNITIES AND CHALLENGES UNDER WTO REGIME

Anjani Kumar



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OPPORTUNITIES AND CHALLENGES

Anjani Kumar

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New Delhi

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FOREWORD

The livestock sector has emerged as one of the important drivers of agricultural growth and diversification in India. The livestock sector in India has grown at an annual rate of 4-5 per cent during the past two decades. The rising global demand for livestock products, various global trade negotiations and reforming domestic markets in India, have substantially expanded international markets for livestock products. Such developments offer enormous opportunities to India to increase exports of its livestock products. However, apprehensions are being raised about the ability of Indian livestock farmers, a majority of whom are small and marginal, in sharing the benefits of emerging opportunities, under the liberalized trade era. In addition, non-tariff barriers like stringent sanitary and phytosanitary (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 products. Besides, concerns have also been expressed about the necessity to improve and expand the supply capacity to augment exports of livestock products from India. A deeper understanding of the determinants of export performance of livestock sector in India would contribute towards building the development strategy of this sector. This publication throws lights on these issues, and provides strategies to harness the potential of livestock sector in India.

This publication is one of the outcomes of the project on “Impact of Trade Policy Reforms and Food Safety Standards on Processed Food Exports from India”, awarded to Dr Anjani Kumar under Lal Bahadur Shastri Young Scientist Award by the Indian Council of Agricultural Research, New Delhi. I complement Dr Anjani Kumar for bringing out such a useful publication.

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I am sure this publication would be of interest to researchers and policymakers alike.

(P K Joshi)

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(Anjani Kumar)

LIST OF ABBREVIATIONS

AgGDP	Agricultural Gross Domestic Product
ASIDE	Assistance to States for Development of Export Infrastructure and Allied Activities
CAGR	Compound Annual Growth Rate
CIF	Cost, Insurance and Freight
CIS	Commonwealth of Independent States
CSO	Central Statistical Organization
DGCIS	Directorate General of Commerce and Industrial Statistics
EC	European Council
ECGC	Export Credit Guarantee Corporation
EIA	Export Inspection Agency
EIC	Export Inspection Council
EOU	Export Oriented Units
EPC	Export Promotion Council
EPZ	Export Processing Zone
EU	European Union
EXIM	Export Import
FAO	Food and Agriculture Organization
FOB	Free on Board
FSMSC	Food Safety Management Systems Based Certification
FSSA	Food Safety Standards Authority
GDP	Gross Domestic Product
GOI	Government of India
HACCP	Hazard Analysis Critical Control Point
IMF	International Monetary Fund
IPQC	In-Process Quality Control
ITPO	India Trade Promotion Organization
MAI	Market Assistance Initiative
MDA	Marketing Development Assistance
MEP	Minimum Export Price
MFPO	Meat Food Products Order

MMPO	Milk and Milk Products Order
NCAER	National Council of Applied Economic Research
NDDDB	National Dairy Development Board
NEIA	National Export Insurance Account
QRs	Quantitative Restrictions
RW	Rest of World
SAFTA	South Asia Free Trade Agreement
SAPTA	South Asia Preferential Trade Agreement
SEZ	Special Economic Zone
SMP	Skimmed Milk Powder
SPS	Sanitary and Phyto-sanitary Standards
TBT	Technical Barriers to Trade
TE	Triennium Ending
TRQ	Tariff Rate Quota
WMP	Whole Milk Powder
WTO	World Trade Organization

EXECUTIVE SUMMARY

- Sustained economic growth and rising incomes during the past two decades have been fuelling a rapid growth in the demand for livestock products. Consequently, the livestock sector has emerged as one of the important drivers of agricultural growth and diversification in India. The rising global demand for livestock products, various global trade negotiations and domestic reforms in India, have improved the access to international markets substantially, particularly during the post-WTO period. Such developments offer an opportunity to India to increase its exports, especially for livestock products like bovine meat, whose domestic demand is low. However, at the same time, apprehensions are being raised about the ability of Indian livestock farmers, a majority of whom are small and marginal, in taking the advantage of emerging opportunities, under the liberalized trade scenario. Thus, a deeper understanding of the dynamics of export performance of livestock sector in India would contribute towards the development strategy of this sector. Therefore, the study has been undertaken to (i) examine the performance of livestock sector trade, (ii) examine the trends and volatility of domestic and international prices of selected livestock products, (iii) assess the export competitiveness of India in livestock commodities, (iv) identify the determinants of export growth of Indian livestock products and, (v) highlight the food safety issues in the livestock trade along with their implications.
- The study is based on the data, compiled from various sources for the period 1980-81 to 2007-08. Several statistical methods have been applied to accomplish the objectives of the study. These include compound annual growth rate, diversity and instability indices, nominal protection coefficients and gravity model.

- Agricultural exports and imports (which encompass livestock products also) were regulated through quantitative restrictions, such as quotas and licenses or were channelled through a state trading organization or some combination of both till early-1990s. In a sequence of implementation of economic reform measures, the Government of India (GoI) introduced major trade policy reforms in April 1995 that encompassed livestock products. The policy measures introduced during this period include (i) Canalization of agricultural trade (including livestock) was almost dismantled. The role of canalizing agencies in livestock trade was made limited. (ii) Quantitative restrictions (QRs) on export and import of livestock products were removed. Licensing requirements for all the products, except those on the banned or restricted, were abolished. Even the list of prohibited/ restricted items was pruned considerably, and (iii) Decanalization of livestock trade was followed by rationalization in tariff structures. Minimum export price restrictions were also removed.
- Liberalization offers both opportunities and challenges to the policymakers and other stakeholders. For instance, the recent lifting of restrictions on dairy and poultry meat might have adversely affected producers if these were not coupled with structural changes in the processing and marketing sectors to reduce marketing costs and margins.
- The quantitative restrictions on import of agricultural products, including livestock commodities were abolished from April 2001. Tariffs on most of the milk products were brought down considerably, as consequent to domestic reforms and WTO agreements. The import tariff was 60 per cent for dairy products and hides & skins and 100 per cent for live animals, meat and eggs during the pre-reform period. It has been gradually reduced and brought down to 30 per cent for all the livestock products. The sanitary and phyto-sanitary (SPS) standards are governed and enforced through a number of laws and agencies in India. The Prevention of Food Adulteration Act, 1954 is the main law on food safety and food quality, and it takes account

of the livestock commodities also. The multiplicity of laws and regulations leads to overlapping and lack of coordination among implementing agencies. Therefore, to streamline SPS procedures and their enforcement, the Food Safety and Standards Act was passed by the Indian Parliament in August 2006, although it is yet to be enforced; this Act consolidates 13 laws and establishes a Food Safety and Standards Authority (FSSA). The regulations and rules to implement the Act are under formulation.

- The issues being raised in the WTO Committee on Sanitary and Phytosanitary Measures include maximum levels for certain aflatoxins, maximum residue limits (MRLs) in animal products for imports into the European countries, and geographical bovine spongiform encephalopathy (BSE) risk assessment requirements maintained by the European countries, import requirements on meat and eggs maintained by Switzerland, etc.
- The performance of livestock exports has been highly encouraging, while that of its imports has shown sharp declines. There has been a consistent improvement in the exports of livestock products in the post-reform period, indicating the positive impact of the liberalization policy initiated in 1991. However, India's contribution in world trade of livestock products is insignificant, and therefore, it cannot influence the world market in either prices or supplies. But, having the leverage of being one of the largest producer of most of the livestock products, coupled with adoption of trade liberalization policies, India has the potential to enhance its share in the global market of livestock products. However, rising domestic demands may preclude India in emerging as a major exporter of livestock products; bovine meat could be an exception.
- The bovine meat has been the most dominant component of the livestock products exported from India, especially since TE 1988. The contribution of bovine meat in the total foreign exchange earnings from the livestock sector was about 70.5 per cent, that is, nearly 9-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 0.13 per cent, 2.2 per cent and 0.14 per cent to the total earnings from the livestock exports, respectively in TE 2007.

- The total imports of livestock products over the period 1980-2007 fell drastically from US\$ 140 million in TE 1982 to US\$ 13 million in TE 1994 but showed a sign of little revival thereafter. In TE 2007, the total livestock imports were of about US\$ 22 million. During 1980 to 2007, the import of several livestock products like bovine meat, swine meat, sheep meat, poultry meat, eggs, and hides and skins, has increased but only marginally, despite liberalization of the import policy.
- The extent of diversification in the exports as commodity diversification and geographic diversification has shown a mixed trend. A moderate diversity among the exported livestock commodities appears to have occurred till TE 1994. But, after TE 1997, export seems to have been limited to only a fewer commodities. However, in terms of geographic spread, the diversity has been increasing almost consistently. The trend in geographic diversification shows that during the post-reform period the diversification in export destinations has increased.
- The growth of livestock exports has accentuated considerably during the 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.
- The export of livestock products was highly volatile during the study period. The exports of swine meat exhibited the highest volatility, followed by poultry meat. The volatility in the export of livestock products was pervasive in all the sub-periods. Again, no clear pattern of volatility emerged during either the post- or pre-reform period. In the post-reform period, the instability in

Executive Summary

the export of livestock products revealed mixed trends. The export of bovine meat, eggs and sheep meat became more stable, while instability in the exports of remaining products increased further.

- The inter-year variations in annual prices of livestock commodities were higher in international than domestic markets in the case of dairy products and instability trends for meat & poultry were similar for international as well as domestic prices. Further, variability was higher during the 1980s than 1990s. The international price variability in all the dairy products increased in the post-2000 period. It seems that instability and growth in international prices are positively related and move concurrently. The period which witnessed higher growth in prices, witnessed higher instability too.
- India has the competitive advantage in production of several livestock products. Indian dairy industry has been protected from the distorted world prices. The value of NPCs hovered around 1.02 - 1.25 for SMP and 1.15 - 1.27 for WMP. The NPCs for SMP and WMP were 0.72 and 0.83, respectively in 2007 due to high spurt in their international prices. The increase in domestic price of these commodities in 2007 was relatively less as compared to world market. However, these figures do not inspire much confidence for India to record significant export of these commodities under the existing world prices. India can emerge as a significant exporter by subsidizing its exports to compete with other world exporters or should negotiate in the WTO for substantial reduction in subsidies by the major exporters of WMP and SMP. But, the possibility of export of butter is limited. The NPCs values for meat products indicate a high export potential, but these have witnessed an increasing trend, especially after TE 1993, indicating erosion of its competitiveness. However, it still hovers around 0.50 and India has much leverage to expand its bovine export further. India is also competitive in pig export, though its competitiveness has deteriorated dramatically in recent years. India does not enjoy much competitiveness to emerge as

a significant exporter of mutton in the world market. Domestic demand for the mutton has also been increasing consistently, which may further preclude it to expand pork export. The NPCs for poultry meat indicate that India has protected poultry sub-sector heavily or the international prices have been depressed due to price distortion in the world market. These results suggest that India does not have enough potential to increase poultry export under the existing scenario.

- The gravity model results indicated that different factors influence the export of livestock products differently. The livestock GDP or production of the livestock commodities, which indicates the higher availability of domestic surplus, was observed to play a significant role in increasing the export of livestock products. The effect of domestic production was observed to have significant positive influence on the export of dairy and meat products, while its effect on export of eggs was not significant. The GDP of the importing countries had a significant positive influence on the overall exports of livestock products from India. This implies that India tended to export more livestock products with larger economies. The trade policy index, which represents the openness of the country or the foreign market access by considering tariff, non-tariff and other administrative policies of the countries, is significant only for the aggregate exports of livestock products.
- Food safety issues are assuming major concern in the export of food commodities from India, particularly to the developed countries. Progressively stricter food safety requirements, especially in major markets such as the EU, US and Japan are emerging as major challenges in the export of food commodities from the developing countries.
- India lacks access to developed country markets due to their stringent food safety and quality standards. To give a boost to livestock exports, compliance with various sanitary and phyto-sanitary measures should be taken up vigorously to ensure

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international hygiene standards and to harness the untapped potential of exporting to developed countries like USA, EU and Japan. Further, with the rise in world prices consequent to reduction in support, it can enhance its access to markets in the countries that have less stringent food safety and quality standards. Compliance with food safety measures (FSM) has become an important issue in the trading of livestock products. The emphasis on FSM is expected to increase further as a result of growing awareness about food safety, emerging diseases and increasing paying capacity of the consumers in both domestic and international markets. The cost of compliance, investment required, handling and processing and traceability of the products are some of the important issues that need to be addressed to enhance livestock exports.

Chapter 1

INTRODUCTION

1.1. Background

The Indian livestock sector is on a rising spree with its current contribution of about 26 per cent to the agricultural gross domestic product (Ag GDP) and providing employment to over 20 million people, particularly to women folk, in principal or subsidiary status. It possesses the largest livestock population (over 520 million) in the world and the biggest flock of cattle and buffaloes (16.1% and 57.9% of the world population, respectively), second largest flock of goats (16.7%), and third highest number of sheep (5.7%) in the world. The fast growing economy has resulted in changing pattern of food consumption, including creation of an unprecedented demand for livestock products, not only in the urban areas but among rural communities also. The thrust of livestock development strategy in India was on achieving self-reliance in livestock products through import substitution. Several initiatives were taken to develop the Indian livestock sector and India emerged as the largest milk producer and one of the biggest producers of other livestock commodities in the world.

The economic policy reforms triggered in 1991 were reoriented towards liberalization and integration with the world economy and widened the market opportunities for the livestock sector. Sustained economic growth and rising incomes during the past two decades have been fuelling a rapid growth in the demand for livestock products. Consequently, the livestock sector has emerged as one of the important drivers of agricultural growth and diversification in India. The livestock GDP in India has grown at an annual rate of 4-5 per cent during the past two decades. The rising global demand for livestock products, various global trade negotiations and domestic reforms in India, have improved the access to international markets substantially, particularly during the post-WTO period. Such

developments offer an opportunity to India to increase its exports, especially for livestock products like bovine meat whose domestic demand is low. With improved domestic production and marketing efficiency, India has the potential to better access the expanding world market, and augment export of livestock products. On the other side, apprehensions are being raised about the ability of Indian livestock farmers, a majority of whom are small and marginal, in taking the advantage of emerging opportunities, under the liberalized trade scenario. Also, 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. Besides, concerns have also been expressed about the necessity to improve and expand the supply capacity to augment livestock exports from India. Supply conditions are fundamental in defining the export potential of a sector or an economy (Fugazza, 2004). Thus, a deeper understanding of the determinants of export performance of livestock sector in India would contribute towards building the development strategy of this sector. Further, in recent years, the prices of livestock products, especially dairy products have registered a tremendous increase. The price trends of livestock products have significant implications on export competitiveness of livestock products and thus need a detailed study.

1.2. Objectives of the Study

This study has been undertaken with the following specific objectives:

- (i) To examine the performance of livestock sector trade,
- (ii) To examine the trends and volatility of domestic and international prices of selected livestock products,
- (iii) To assess the export competitiveness of India in livestock commodities,

- (iv) To identify the determinants of export growth of Indian livestock products and,
- (v) To consider the food safety issues in the livestock trade along with their implications.

1.3. Outlines of the Study

The report has been organized in six chapters. The next chapter provides a brief description of data collection and methods used for analysis. The livestock trade policy reforms have been discussed in Chapter 3. An overview of the performance of livestock sector in trade has been presented in Chapter 4. The issues pertaining to the opportunities and challenges in enhancing livestock export have been discussed in Chapter 5. Finally, conclusions and policy implications have been presented in Chapter 6.

Chapter 2

DATA AND METHODOLOGY

2.1. Data

The study is based on the data, compiled from various sources, for the period from 1980-81 to 2007-08. The data on exports and imports of livestock products, agricultural products and total merchandise trade were compiled from the *Monthly Statistics of Foreign Trade* published by DGCIS, Ministry of Commerce, Government of India. The data on GDP, AgGDP and livestock GDP were culled from the *National Accounts Statistics*, published by Central Statistics Organization (CSO), Government of India. Data on world trade for different livestock products, producer prices in different countries, consumption of livestock products, etc. were collated from the database of Food and Agriculture Organization (FAO). The domestic wholesale prices of livestock products were compiled from *Agricultural Prices in India*, published by the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India and data on the international prices of livestock products prior to 1991 were taken from *International Financial Statistics* of IMF. The data on international prices since 1991 were downloaded from the FAO website. The data on geographical distances were set by the 'Distance Calculator' accessible via <http://www.indo.com/distance/>.

Data on domestic transportation costs of various agricultural commodities were compiled from different sources, namely the *Economic Times*, Container Corporation of India, and Truckers Association of India. Personal discussions with the exporters and freight agents supplemented this information. The international freight rates were compiled from the freight agents. The Port charges which included cost of loading, unloading, custom clearing, transportation within international container depo, etc. were compiled from different port authorities.

2.2. Analytical Framework

2.2.1. Composition, Growth and Diversity

All the values of exports and imports were converted into US dollars to net out the effect of fluctuations in exchange rates. To analyze the performance of exports and imports of various livestock products, the triennium ending (TE) averages were computed to minimize wide fluctuations. Compound Annual Growth Rates (CAGR) were estimated to examine the growth trends in exports and imports of various livestock products.

The commodity and geographic concentration indices of livestock exports were calculated by the widely-used Gini-Hirschman Coefficient of concentration. The commodity and geographic concentration of livestock trade was calculated using formulae (1) and (2), respectively:

$$C_{xt} = 100 - 100 \sqrt{\sum_{i=1}^n (X_{it} / X_t)^2} \quad (1)$$

where, C_{xt} is the diversification coefficient for export in the year t ; X_{it} is the value of exports of commodity i in the year t ; and X_t is the total livestock exports in the year t .

$$\text{and } G_{xt} = 100 - 100 \sqrt{\sum_{i=1}^n (X_{it} / X_t)^2} \quad (2)$$

where, G_{xt} is the index of geographic diversification in the year t . The values of C_{xt} and G_{xt} would vary from 0 to 100, higher values of C_{xt} and G_{xt} would indicate higher diversification of livestock export.

2.2.2. Measurement of Export and Price Instability

Various statistical measures have been suggested to calculate instability index in the literature on economics. Each of these methods has its relative strengths and weaknesses and there is no consensus as to what constitutes the most appropriate method for measurement of

instability. The naïve approach treats all the movements as indicative of instability by calculating standard deviation of price or export index. Coefficient of variation is also widely used as a measure of instability. However, this approach does not take cognizance of the predictable components like trends and thus often overestimates the instability. Another measure of instability is the ratio method, which estimates standard deviation in the ratio. This method has been employed in this study.

The export instability was calculated as follows:

$$\text{Instability Index of Export } (I_x) = \text{Standard Deviation of } \log (X_t/X_{t-1}) * 100$$

where, X_t is the export value in the year t and X_{t-1} is the export value in the year $t-1$.

It is the unit free measure of instability and represents deviations from the trend growth line.

Similarly, the price instability was estimated as:

$$\text{Price Instability Index } (I_p) = \text{Standard Deviation of } \log (P_t/P_{t-1}) * 100$$

where, P is the price and t and $t-1$ denote the years.

2.2.3. Measurement of Export Competitiveness of Indian Livestock Sector

Several methods are used to measure the competitiveness, in which Nominal Protection Coefficient (NPC) is the most widely used measure (Corden, 1971; Balassa and Schydrowsky, 1972; Gulati *et al.*, 1990; Taylor and Philips, 1991; Chand 1999; Kumar *et al.* 2001; Rakotoarisoa and Gulati, 2006). NPC is defined as the ratio of a commodity's domestic price (p_i^d) to its international reference price (p_i^b) and is computed as follows:

$$NPC_i = \frac{P_i^d}{P_i^b} * ER$$

The NPC basically helps in measuring divergence in domestic price from international price and thus determines the degree of export competitiveness of a commodity. A ratio of less than unity implies a competitive advantage and of greater than unity conveys lack of competitive advantage.

The NPC under an importable hypothesis assumes that the imported commodity competes with the domestic commodity on Indian port or city. Under importable hypothesis, the reference price is CIF price, which is the sum of the FOB price of the exporting country, and freight, insurance and port handling charges. The transportation cost from the producing zone to the port (e.g. in the case of Punjab, transportation from Chandigarh to Mumbai Port) would be added to the domestic price.

Under exportable hypothesis, the exported commodity competes with domestic commodity at the foreign port or city. Therefore, in this case the reference price is CIF price, which is FOB price of a major exporter plus freight and insurance, at the importing country's port minus the freight and insurance from Indian port to the importing country's port.

2.2.4. Determinants of Export Performance of Livestock Products

There is a growing and diverse empirical literature on the determinants of export performance. This literature includes cost or price competitiveness analyses through the use of real effective exchange rates, reveals comparative advantage studies, shift share analysis of the composition of exports and econometric estimates of export supply and demand functions. The export of a commodity is influenced by a number of demand and supply-side factors. The gravity model has been widely used to assess the influence of these demand and supply-side factors in exports. The gravity model was first applied to the international trade by Tinbergen (1962) and Poyhonen (1963), but it has a long history in social science studies. Since the latter half of the nineteenth century, it has been used to explain social flows, primarily migrations, in terms of the

gravitational forces of human interaction. The simplest form of the gravity model for international trade conjectures that the volume of exports between any two trading partners is an increasing function of their national incomes, and a decreasing function of the distance between them (Wall, 1999). Specifically, the model can be expressed as follows:

$$\ln X_{ij} = \alpha + \beta \ln Y_i + \gamma \ln Y_j - \delta \ln D_{ij}$$

where, Y_i and Y_j denote the national incomes of trading countries and D_{ij} is the distance between two countries. This baseline model, provided relatively good results, though there were other factors that influence trade levels. It is a common practice to use dummy variables to capture contiguity effects, cultural and historical similarities, and regional integration and trade preference agreements, trade policies and so on. Therefore, assuming that we wish to test p distinct effects, the model then becomes:

$$\ln X_{ij} = \alpha + \beta \ln Y_i + \gamma \ln Y_j - \delta \ln D_{ij} + \sum_{s=1}^p \lambda_s G$$

With regard to the gravity model of India's export of livestock products, the following model was estimated by generalized least square (GLS) method with random effects:

$$\ln X_i = \alpha + \beta \ln Y_i + \beta_2 \ln Y_{ipc} + \beta_3 \ln Y_{in} + \beta_4 \ln Y_{inpc} + \beta_5 \ln Y_{pp} + \beta_6 \ln TP_i - \beta_7 \ln D_{ij} + \mu_i$$

where, X is the export, i denotes the livestock sector, dairy products, meat and eggs; Y_i is the GDP of the importing country; Y_{ipc} is the GDP per capita of the importing country; Y_{in} is the livestock GDP or production of the respective livestock commodities; Y_{inpc} is the per capita GDP of India; Y_{pp} is the ratio of the producer price of livestock commodities; TP_i is the trade policy rank of the importing country; D_{ij} is the distance between India and the importing country; β_s are the coefficients of the explanatory variables; and μ_i are the error-terms.

Chapter 3

LIFESTOCK TRADE POLICIES

3.1. Evolution of Livestock Trade Policy

Trade policy plays an important role in the economic development of a country. India's trade policies have witnessed several changes after independence. Till the early-1980s, India pursued highly regulated trade regimes. In 1991, it introduced a new Economic Policy in the wake of an alarming increase in its external debt, rapidly deteriorating BOP position, high rate of inflation, mounting fiscal deficits and deceleration in GDP growth. The economic reforms initiated in 1991 were aimed at restructuring the Indian economy, and facilitating greater integration with the world economy. Trade liberalization was directed at quick resumption of export growth and increased exposure of domestic products to external competition. During the initial years, the economic reforms were mainly focused on the industrial sector and agricultural sector reforms were not attempted seriously. However, reduction in the industrial production entailed a deliberate attempt to improve the incentive structure of agriculture (Storm, 1997).

The liberal trade policy regime was triggered both as an outcome of external developments such as the WTO-UR agreements and endorsement of liberal policy regime internally. India signed the Uruguay Round of Agreement on 15 April, 1994 at Marrakesh (Morocco). This Treaty introduced agricultural trade in the WTO for the first time. The WTO and Agreement on Agriculture came into effect from 1 January, 1995. This marked a paradigm shift in the agricultural trade policy of India. The subsequent trade policy reforms addressed the agricultural sector explicitly and most of the restrictions on both exports and imports of agricultural produce were gradually relaxed.

Agricultural exports and imports (which encompass livestock products also) were regulated through quantitative restrictions, such as quotas and licenses or were channelled through a state trading organization or some combination of both till early-1990s (Nayyar and Sen, 1994; Kumar *et al.*, 2001). In a sequence of implementation of economic reform measures, the Government of India (GoI) introduced major trade policy reforms in April 1995 that encompassed livestock products. The policy measures introduced during this period can be summarized as follows:

1. Canalization of agricultural trade (including livestock) was almost dismantled. The role of canalizing agencies in livestock trade was made limited.
2. Quantitative restrictions (QRs) on export and import of livestock products were removed. Licensing requirements for all the products, except those on the banned or restricted list, were abolished. Even the list of prohibited/ restricted items was pruned considerably.
3. Decanalization of livestock trade was followed by rationalization in tariff structures.
4. Minimum export price restrictions were also removed.

3.2. Livestock Export Policies

The trade reforms introduced by India relaxed most of the restrictions on export of livestock products, and initiated some export promotional schemes. However, exports of non-breedable or culled buffaloes, and sheeps and goats were subjected to quantitative restrictions and minimum export prices. These restrictions continued during the initial phase of liberalization and were removed only in 1994 (NCAER, 1996). The export of bovine meat was free from any restriction since the early-1980s. The exports of sheep and goat meat were restricted by quotas and minimum export prices (MEPs). But today, the export of these items has been permitted

without a license and the associated terms and conditions have also been abolished. By and large, the exports of hides and skins were prohibited till late-1990s, with the exceptions of skins of stray dogs and lambs. Now, the hides and skins are freely exportable. Exports of milk and milk products were totally prohibited earlier, but today, the exports of milk, baby milk and sterilized milk are permissible, subject to the licensing requirements. The export of powdered milk, prohibited earlier, was canalized through the NDDDB, Anand, and was decanalized subsequently. Restrictions on butter exports have been similar to those for powdered milk and quota restrictions were removed from March 2002. The export of ghee was subjected to quantitative restrictions in the 1980s, followed by canalization through NDDDB and finally, decanalized. Presently no minimum export price restriction exists for the export of livestock products. The quantitative restrictions on the above items were removed from 1 April, 2001. Export prohibitions, which are maintained under the Foreign Trade Policy, are in place for environmental, food security, marketing, pricing, and domestic supply reasons, and have been used time and again to comply with international treaties (Box 1). Sometimes, India issues ad-hoc prohibitions also on exports of sensitive products; for example, recently export prohibitions have been issued for export of milk powders where exports were banned in February 2007, but were lifted in October 2007. Similarly, the export of mutton was banned to ensure its availability to the domestic consumers in August 2006 but this ban was lifted later due to legal intervention by the High Court of Delhi. The status of export prohibition for livestock and livestock products as on 1 March, 2008 has been given in Box 1.

The exports of livestock products were subjected to 0.5 per cent export tax (ad valorem) under Agriculture & Processed Food Products Cess Act, 1985 and 0.5 per cent tax under Agriculture Produce Cess Act, 1940. The taxes on account of both these Acts were exempted, except on tanned hides and skins. Further, the excise duty on processed meat and dairy products was reduced from 16 per cent to 8 per cent and finally waived off in 2006-07, which could be helpful in making it more competitive. Now only the hides and skins

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India's Livestock Sector Trade: Opportunities and Challenges Under WTO Regime

Box 1: Status of Export Prohibition, March 2008	
Particulars	Reasons for prohibition
All wild animals, animal articles including their products and derivatives, excluding those for which ownership certificates have been granted and those required for transactions for education, scientific research, and management.	Protection of wildlife under the Wild Life (Protection) Act, 1972.
Live exotic birds, except albino budgerigars, budgerigars, Bengali finches, white finches, and zebra finches, which may be exported subject to pre-shipment inspection, and java sparrows, which are subject to export restrictions.	Protection of wildlife under the Wild Life (Protection) Act, 1972.
Beef and offal of cows, oxen and calves.	Social and religious reasons.
Peacock tail feathers, including handicrafts and articles of peacock tail feathers.	Control of poaching and illegal trade in wildlife and its products.
Shavings and manufactured items of shed antlers of Chital and Sambhar.	Control of poaching and illegal trade in wildlife and its products.
Tallow, fat and/or oils of any animal origin, excluding fish oil.	Social and religious reasons.

Source: WTO (2002 & 2006), Trade Policy Review: India; and Ministry of Commerce and Industry, Government of India.

among livestock products attract an excise duty of 16 per cent. Some other export promotional schemes are also in operation. For instance, firms classified as export-oriented units (EOUs) and those within the export processing zones (EPZs) and special economic zones (SEZs) may import, duty free, any goods including capital goods, required for the manufacturing, production or processing activities, provided that the goods are not prohibited under the negative lists of imports. In the case of animal husbandry and poultry, an EOU or EPZ unit

may sell up to 50 per cent of its production domestically (World Bank, 1999, Department of Commerce, GoI). EPZs have been established in Delhi, Mumbai, Kolkatta, Chennai, Visakhapatnam, Kandla and Cochin. These firms also enjoy tax breaks and other benefits.¹ Establishment of SEZs was proposed in different parts of the country on the lines of highly successful Chinese experiments, in the Exim Policy announced on 31 March, 2000 and now several SEZs have become operational. The idea behind the establishment of SEZs is that in these areas production for export can be undertaken free from the plethora of rules and regulations governing import and export. The government is willing to permit 100 per cent fully foreign-owned units in these zones, provided that the entire output is exported. The existing EPZs have been converted into SEZs. Also, automatic approval for foreign equity up to 100 per cent is available for most of the processed livestock products. The opening up and liberalization have enabled higher private investment in the livestock processing sector. Consequent to the opening up of the Indian Dairy Sector, a number of processing facilities have taken a quantum jump. Out of 678 processing units, 403 are under the private sector, which are processing about 55 per cent of the total milk processed in India. To maintain production and ensure quality of milk and milk products, the government had brought Milk and Milk Products Order in 1992. This order was perceived as a measure to protect dairy co-operatives from the emerging private sector in dairying and lacked consensus from the beginning. It was amended in 2002 to make the sector more liberal. Similarly, in the meat processing, facilities have been increased mostly by the private sector in recent years.

The export finance is provided primarily by the Export-Import Bank of India (Exim Bank²) and through the mandatory annual lending targets of commercial banks. The Exim Bank provides a range of financing products, support programmes, and value-added services

¹ Other benefits include concessional rents, exemption from sales tax, excise duty on capital goods, components and raw materials, income tax for a block of five years, etc.

² The Exim Bank was established in 1982 under the Export Import Bank of India Act, 1981. Its primary responsibility is to finance, facilitate, and promote India's exports.

to promote two-way trade and investment. The bank usually lends on a cost-plus basis at market related interest rates. In certain cases, it may (at the behest and on behalf of the Government) extend a line of credit to an overseas government or institution. Under the current guidelines on lending to the priority sector, 12 per cent of the net bank credit (within the overall target of 32 per cent of net bank credit stipulated for priority sector lending) must be loaned to the export sector by foreign banks having offices in India. The loans are to be provided, in the domestic or foreign currency, at concessional rates of interest. As on 31 March, 2006, 19.4 per cent of the net bank credit by foreign banks had gone to the export sector; and out of 29 foreign banks, 26 had achieved the target of 32 per cent.

The export insurance is provided by the Export Credit Guarantee Corporation of India Limited (ECGC), which is under the administrative control of the Ministry of Commerce and Industry, GoI. It provides: (i) credit risk insurance for exporters of goods and services; (ii) pre- and post-shipment cover to banks and financial institutions, to enable exporters to obtain adequate and need-based financing; and (iii) overseas investment insurance to Indian companies investing in joint ventures abroad through either equity or loans on a "liberal basis". In addition, in March 2006, the Government approved the establishment of a National Export Insurance Account (NEIA), to provide credit-risk cover for medium and long-term exports, which are commercially viable and are in the national interest.

In addition to the tariff concessions, exemptions and export programmes mentioned above, the Ministry of Commerce, GoI, encourages exports indirectly through its several schemes, viz. 'Assistance to States for Development of Export Infrastructure and Allied Activities' (ASIDE) scheme, which provides assistance for setting-up new export promotion parks and zones and complementary infrastructure such as road links to ports, container depots, and power supply; the 'Marketing Development Assistance' (MDA) scheme, which supports efforts of the Export Promotion Councils (EPCs) in their export promotion activities; 'Market Access Initiative' (MAI) scheme, which provides assistance for research on potential export markets; besides other incentives to

improve quality, infrastructure, etc. related to agriculture through the commodity boards and councils. India's EPCs and commodity boards also continue to promote exports of specific products. The India Trade Promotion Organization (ITPO) aims at promoting Indian trade and its activities include organization of trade fairs and exhibitions in India and abroad.

The policy of trade liberalization seems to have provided impetus to livestock exports, which had registered a remarkable growth during the 1990s. Liberalization offers both opportunities and challenges to the policymakers and other stakeholders. For instance, the recent lifting of restrictions on dairy and poultry meat might have adversely affected producers if these were not coupled with structural changes in the processing and marketing sectors to reduce marketing costs and margins. Diversity of livestock farming systems in India and the existing differentials in actual and potential yields augur well for export of livestock commodities. However, India has to be cautious and develop appropriate infrastructure for compliance with sanitary and phyto-sanitary measures and IPR issues.

3.3. Livestock Import Policies

The quantitative restrictions on import of agricultural products, including livestock commodities were abolished from April 2001.

Box 2: Bound Tariffs on Livestock Products	
	Bound Tariffs (per cent)
Meat Products	
Chicken leg (processed); sausages	150
Chicken leg (raw)	100
Meat of poultry not cut in pieces, fresh or chilled	100
Raw hams, pig fat; meat of bovine animals	100
Dairy Products	
Fresh milk and cream	100
Butter, dairy spreads, etc.	40/60
Cheese	40
Milk powder	60

Tariffs on most of the milk products were brought down considerably, as consequent to domestic reforms and WTO agreements. The import tariff³ was 60 per cent for dairy products and hides & skins and 100 per cent for live animals, meat and eggs during the pre-reform period (Table 1). It has been gradually reduced and brought down to 30 per cent for all the livestock products. However, the surge in import of milk products, especially skimmed milk powder (SMP) in the subsequent years, forced the government to renegotiate at WTO during 2000-01 and fixed Tariff Rate Quota (TRQ) for SMP and whole milk powder (WMP). The tariff on imports up to 10,000 Mt of SMP and WMP is 15 per cent under TRQ and attracts 30 per cent duty outside TRQ. It may be mentioned here that for SMP and WMP, the import duty was nil at one time. However, there is still a substantial gap between applied and bound tariffs for almost all livestock commodities (Box 2). The gaps indicate the extent of leverage available to the government for upward adjustment of the tariff rates to manage imports as per domestic needs. This degree of freedom will also help to prevent sudden surge in imports of sensitive products and to some extent will offset the dumping of produce by the exporting countries. However, frequent changes in the tariff rates may create an environment of uncertainty for the importers as well as exporters.

Import prohibitions or restrictions are maintained under Section 11 of the Customs Act, 1962. In recent years, India has prohibited the import of domestic and wild birds, meat and meat products from avian species, and live pigs and pig meat products except processed pig products⁴ (Box 3). Some contingency measures pertaining to anti-dumping, countervailing and safeguards are also in operation

³ In addition to tariffs, additional duty, in lieu of excise (a central tax on domestic manufactures) and a 4 per cent special additional duty to partly compensate for internal taxes such as value added tax, municipal tax, market committee fees, etc., are charged to provide national treatment to the imported good. And education cess @ 3 per cent is also charged.

⁴ Import of domestic and wild birds including captive birds (excluding poultry); processed meat and meat products from avian species including wild birds (except poultry), and semen of domestic and wild birds was prohibited with effect from 11 August 2005. This measure was taken in view of the reported outbreak of Highly Pathogenic Avian Influenza (HPAI).

Table 1: Import Duties on Livestock Products: 1984-2006

Year	Live animals	Meat and meat products	Poultry meats	All milk products (except SMP and WMP)	Skimmed milk	Whole milk	Eggs	Hides & skins
1984	100	100	100	60	60	60	100	60
1985	100	100	100	60	60	60	100	60
1988	100	100	100	60	60	60	100	60
1990	55	100	55	55	55	55	100	55
1991	100	100	100	55	55	55	100	55
1992	60	10	60	60	60	60	65	60
1993	60	10	60	60	60	60	65	60
1994	60	10	60	65	65	65	65	65
1995	40	10	40	40	0	0	40	40
1996	40	10	40	40	0	0	40	40
1997	40	10	40	30	30	30	30	10
1998	40	10	40	35	35	35	30	35
1999	40	15	40	35	35	35	35	15
2000	35	35	35	44	0	0	44	44
2001	35	35	35	35	35	35	30	35
2002	35	35	35	35	60	60	30	35
2003	35	35	35	35	60	60	30	35
2004	30	30	30	30	30	30	30	30
2005	30	30	30	30	30	30	30	30
2006	30	30	30	30	30	30	30	30

and India has been one of the principal users of anti-dumping duties in the world.

India monitors imports of around 300 sensitive products. Dairy products and poultry meat figure in the list of sensitive commodities. Besides, India also offers tariff preferences to selected countries under its regional trade agreements. The agreements in force are:

Box 3: Status of Import Prohibitions, March 2008

- (i) Poultry fats, rendered or solvent extracted;
- (ii) Fats and oils of fish/marine origin, whether or not refined, excluding cod liver oil, squid oil containing eicosapentaenoic acid and de-cosahexaenoic acid;
- (iii) Margarine, imitation lard and other prepared edible fats of animal origin;
- (iv) Degras (residues from the treatment of fatty substances or animal or vegetable waxes);
- (v) Animal rennet;
- (vi) Wild animals, including their parts and products and ivory;
- (vii) Beef and products containing beef in any form;
- (viii) Domestic and wild birds, including captive birds;
- (ix) Live pig and pig meat products (except processed pig products);
- (x) Meat and meat products from avian species, including wild birds (except processed poultry meat and poultry meat products);
- (xi) Semen of domestic and wild birds; and
- (xii) Products of animal origin from birds intended for use in animal feed or for agricultural or industrial use.

Imports of the following products from countries reporting the outbreak of highly pathogenic avian influenza:

- (i) Day-old chicks, ducks, turkey and other newly hatched avian species;
- (ii) Hatching eggs;
- (iii) Eggs and egg products;
- (iv) Meat and meat products from avian species, including wild birds;
- (v) Feathers;
- (vi) Pig meat products; and
- (vii) Pathological material and biological products from birds.

Source: Ministry of Commerce and Industry (2006), Department of Commerce, Foreign Trade Policy 2004-2009; and information provided by the authorities.

SAFTA (which replaced SAPTA), Asia Pacific Trade Agreement (previously the Bangkok Agreement), preferential areas tariff (Seychelles, Mauritius, and Tonga) and agreements with Sri Lanka and Singapore.

3.4. Sanitary and Phyto-sanitary Standards

The sanitary and phyto-sanitary (SPS) standards are governed and enforced through a number of laws and agencies in India. The Prevention of Food Adulteration Act, 1954 is the main law on food safety and food quality, and it takes account of the livestock commodities also. Imports and quarantine are regulated through other additional legislations too. Implementation of these Acts and subordinate legislation is carried out by different central government ministries, making the system a relatively complex (Box 4). India's enquiry points under the SPS Agreement are: Ministry of Health and Family Welfare for human-health-related issues; and Departments of Animal Husbandry, Dairying and Fisheries, and Agriculture and Cooperation in the Ministry of Agriculture, for animal health and plant health issues.

Box 4: SPS Legislation and Implementing Agencies		
Legislation	Subject	Implementing agencies
Prevention of Food Adulteration Act, 1954	Food safety and quality	Ministry of Agriculture, Ministry of Food Processing, and Ministry of Health
Meat Food Products Order, 1973	Quality of processed meat products	Ministry of Food Processing (up to 2004 Department of Agriculture and Cooperation, Ministry of Agriculture)
Milk and Milk Products Order, 1973 (last amended in 2002)	Quality of milk and milk products	Department of Animal Husbandry, Dairying and Fishing, Ministry of Agriculture
Essential Commodities Act, 1955	C o n s u m e r protection	State government agencies
Livestock Importation Act, 1898 (amended in 2001)	P r o c e d u r e s for import of livestock	Department of Animal Husbandry, Dairying and Fishing, Ministry of Agriculture
Export (Quality Control and Inspection) Act, 1963	Regulation of quality control for exports	Exports Inspection Council, Ministry of Commerce and Industry

Source: Government of India online information.

The multiplicity of laws and regulations leads to overlapping and lack of coordination among implementing agencies. Therefore, to streamline SPS procedures and their enforcement, the Food Safety and Standards Act was passed by the Indian Parliament in August 2006, although it is yet to be enforced; this Act consolidates 13 laws and establishes a Food Safety and Standards Authority (FSSA). The regulations and rules to implement the Act are under formulation. Imports of livestock and meat products are regulated, respectively, under the Livestock Importation Act, 1898 (amended last in 2001) and the Meat Food Products Order (MFPO), 1973 and require an import permit issued by the Department of Animal Husbandry, Ministry of Agriculture. The livestock permit is valid for a period of six months and is usable for multiple consignments. All imports of livestock must enter through the designated port only.

In the WTO Committee on SPS measures, some member countries have raised several questions regarding India's policy, *inter alia*, restrictions on imports of live birds, fresh poultry meat, and meat products, due to avian influenza. According to the authorities, this has been resolved amicably. Non-notification of various SPS measures was also raised by several members.⁵

To ensure quality and safety of food commodities, India has been following quality control and pre-shipment inspection measures prior to their export. Under the Export (Quality Control and Inspection) Act, 1963, the Export Inspection Council of India (EIC) carries out quality control and pre-shipment inspection to ensure the minimum standards for exports. The Act empowers the Central Government to notify commodities along with minimum standards for their export. Although more than 1,000 products have been notified for export certification, it is mandatory only for fish and fish products, dairy, poultry, egg, meat and meat products, and honey. The EIC has five export inspection agencies (EIAs) located across major cities in India, supported by 38 sub-offices and laboratories to carry out the pre-shipment inspection and certification. They also issue preferential certificates of origin for exports, as required. The

⁵ WTO documents G/SPS/GEN/204/Rev.2 to Rev.6.

EIC's main systems of export inspection and certification include: consignment-wise inspection (CWI), a systems-based approach for in-process quality control (IPQC), self certification (SC) and food safety management systems based certification (FSMSC). Residue monitoring plants (RMPs) are being set up in various sectors which include dairy, poultry, marine, egg products, and honey. Over 98 per cent of the certified exports, by value, were covered in 2005-06 by mandatory export certification under the FSMSC system.⁶ The FSMSC is based on international standards for food safety management, such as HACCP/GMP/GHP, and involves approval and surveillance of food processing units. The EIC's certification has been recognized for a range of food and non-food products. Most of the major importing countries, particularly for dairy products and eggs, insist on food safety system such as HACCP/GMP/GAP and therefore, milk processing plants, egg powder manufacturing units and meat processing plants are approved on the basis of compliance with HACCP standards. EIC levies a charge of 0.2 per cent of f.o.b. for inspection and approval of the processing plants. About 55 milk processing plants, 10 poultry meat plants and 12 meat processing plants and several egg powder plants have been approved for compliance with HACCP standards.

To strengthen infrastructure for processing of meat & meat products and to ensure availability of hygienic and safe meat and dairy products in domestic as well as export markets, the Ministry of Food Processing (GoI), provides financial assistance by way of grant-in-aid, which covers 25 per cent of the capital cost. However, several SPS measures being followed by importing countries are acting as a barrier to exports from India. India has identified a number of SPS restrictions maintained by member countries as potential barriers to its exports of livestock products. The issues being raised by India in the WTO Committee on SPS Standard include maximum levels for certain aflatoxins, MRLs in animal products for imports into the European Countries, and geographical BSE risk assessment requirements maintained by the European Countries, and import requirements on meat and eggs maintained by Switzerland.

⁶ Export Inspection Council, Ministry of Commerce and Industry, GoI.

Chapter 4**PERFORMANCE OF LIVESTOCK
SECTOR TRADE**

In order to have empirical underpinnings as the basis of future trade dynamics in the livestock sector, the performance of country's livestock trade and the changing diversification pattern have been presented in this chapter. The growth rates in exports and imports for the period beginning 1980 have been analysed and interpreted in seriatim. The destination of exports and the underlying liberalized market issues have also been discussed.

4.1. Trade Indicators of Livestock Sector

The data on export and import of livestock products along with different indicators of livestock trade performance have been presented in Table 2. 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 remarkably and the trade surplus for the livestock sector has been increasing continuously thereafter. The share of livestock in the agricultural exports increased from 3.2 per cent in TE 1982 to 3.6 per cent in TE 1985, but declined to 3.1 per cent in TE 1988 and again increased to 4.0 per cent in TE 1991. It declined again slightly to 3.8 per cent in TE 1994 but since then, there has been an uninterrupted increase in its share. It reached 7.4 per cent in TE 2007, which is more than double of its share in TE 1982. In the total merchandise export, the share of livestock was maximum at 1.0 per cent in TE 1982 and hovered around 0.7 - 0.8 per cent till TE 2007. The share of livestock exports in the livestock GDP had declined from 0.9 per cent in TE 1982 to 0.7 per cent in TE 1988 but subsequently, there has been a healthy rise in its share and it reached 2.4 per cent in TE 2007, which is about three-times its share in TE 1991. This reveals the extent of internationalization of the livestock sector, and could be partly attributed to trade policy reforms. The share of livestock imports in total agricultural imports has

Performance of Livestock Sector Trade

declined consistently over time, from 13.5 per cent in TE 1982 to 0.7 per cent in TE 2007; it is negligible in total imports and livestock GDP.

It is evident from the trends in trade indicators that the performance of livestock exports has been highly encouraging, while that of its imports has shown sharp declines. There has been a consistent improvement in the exports of livestock products in the post-reform period, indicating the positive impact of the liberalization policy initiated in 1991.

Table 2: Performance of Livestock Exports and Imports of India: 1980-2007

Year/ (TE)	Livestock export (million US\$)	Livestock import (million US\$)	Trade balance (million US\$)	Share of livestock exports (%)			Share of livestock imports (%)		
				Total exports	Agricultural export	Livestock GDP	Total imports	Agricultural imports	Livestock GDP
1982	81	140	-59	1.0	3.2	0.9	1.0	13.5	2.7
1985	84	111	-27	0.9	3.6	0.9	0.8	9.0	1.2
1988	81	67	15	0.8	3.1	0.7	0.4	7.4	0.5
1991	122	40	81	0.8	1.0	0.8	0.2	4.7	0.3
1994	135	13	122	0.7	3.8	0.9	0.1	2.6	0.1
1997	229	14	215	0.8	3.9	1.2	0.0	1.1	0.1
2000	255	28	227	0.7	4.1	1.2	0.1	1.2	0.1
2003	378	22	356	0.8	5.9	1.6	0.0	0.9	0.1
2007	828	22	806	0.9	7.4	2.4	0.0	0.7	0.1

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 Organization, Government of India.

4.2. India's Share in Global Export of Livestock Products

The contribution of India to the global livestock trade has been presented in Table 3. A perusal of this table reveals that India is still a small player in the global market of livestock products, though India ranks in the top tier of producers of livestock commodities. Except bovine meat and eggs, none of the livestock products from India contributes even 1 per cent to the world export (Table 3). 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 2007

from the negligible shares in TE 1982. In fact, India is now the fifth largest exporter of bovine meat in the world. 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 world import of dairy products, but has depicted a sharp decline thereafter, reaching to a negligible share of 0.4 per cent in TE 2007.

Table 3: India's Share in World Trade of Livestock Products: 1980-2007

(in per cent)

Year (TE)	Live animals	Bovine meat	Dairy products	Goat meat	Sheep meat	Eggs	Hides and skins
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
2007	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
2007	0.1	0.0	0.4	0.0	0.0	0.4	0.1

Source: FAO Database

Note: The values shown as '0' include negligibly small values also.

It is evident that in world trade of livestock products, India's contribution is insignificant, and therefore, it cannot influence the world market in

either prices or supplies. But, having the leverage of being one of the largest producers of most of the livestock products, coupled with adoption of trade liberalization policies, India has the potential to enhance its share in the global market of livestock products. However, rising domestic demands may preclude India in emerging as a major exporter of livestock products; bovine meat could be an exception.

4.3. Composition of Exports and Imports of Livestock Products

The livestock exports have registered a commendable rise during the entire study span of twenty-eight years (1980-2007). The average annual livestock exports have increased remarkably from US \$ 81 million in TE 1982 to US \$ 828 million in TE 2007 (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 (Table 4). The contribution of bovine meat in the total foreign exchange earnings from the livestock sector was about 70.5 per cent, that is, nearly 9-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 0.13 per cent, 2.2 per cent and 0.14 per cent to the total earnings from the livestock exports, respectively in TE 2007. Bovine meat in India is largely a by-product of the main livestock production system. Buffaloes that constitute about 60 per cent of total meat production in the country are reared primarily for milk production and draught purposes. However, of late, the use of animals for draught purposes has considerably reduced because of large-scale mechanization of Indian agriculture.

The export of beef (cattle meat) has not been explored due to socio-cultural and religious factors. All the Indian states (except two) have imposed a ban on cattle slaughtering. The export of bovine meat has increased tremendously and several initiatives have been taken to boost the export of bovine meat. However, the allocation of land for meat processing plants is still a big issue even in this liberal economic regime in India.

Table 4: Average Annual Value and Composition of Exports of Livestock Products: 1980-2007

Items	Period	Annual value and composition of exports (US \$ million)									
		1982	1985	1988	1991	1994	1997	2000	2003	2007	
1. Live animals		6.60 (8.11)	7.40 (8.79)	1.26 (1.55)	0.51 (0.42)	0.80 (0.59)	1.40 (0.61)	0.83 (0.33)	1.62 (0.43)	7.49 (0.89)	
2. Bovine meat		60.4 (74.2)	51.5 (61.2)	49.2 (60.5)	73.2 (60.4)	82.6 (61.2)	150.5 (65.8)	178.1 (69.8)	272.8 (72.2)	595.58 (70.50)	
3. Swine meat		0.01 (0.01)	0.00 (0.00)	0.62 (0.76)	0.00 (0.00)	0.01 (0.01)	2.85 (1.24)	0.26 (0.10)	0.38 (0.10)	1.12 (0.13)	
4. Sheep meat		9.53 (11.70)	22.18 (26.34)	18.63 (22.87)	15.99 (13.15)	15.51 (11.49)	18.71 (8.16)	18.54 (7.26)	10.58 (2.80)	17.05 (2.02)	
5. Goat meat		0.00 (0.00)	0.00 (0.00)	0.04 (0.05)	0.06 (0.05)	0.18 (0.14)	0.66 (0.29)	0.37 (0.15)	0.32 (0.09)	0.55 (0.07)	
6. Poultry meat		0.01 (0.02)	0.04 (0.05)	0.02 (0.03)	0.00 (0.00)	0.11 (0.08)	0.02 (0.01)	0.02 (0.01)	0.20 (0.05)	1.20 (0.14)	
7. Eggs		3.37 (4.14)	0.80 (0.94)	0.30 (0.37)	0.70 (0.57)	3.93 (2.91)	12.07 (5.26)	18.81 (7.37)	29.42 (7.78)	69.51 (8.23)	
8. Dairy products		1.49 (1.83)	2.25 (2.67)	3.19 (3.92)	1.50 (1.24)	3.53 (2.62)	7.85 (3.42)	6.40 (2.51)	29.39 (7.78)	115.68 (13.69)	

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8.1. WMP	0.00 (0.03)	0.00 (0.22)	0.00 (0.10)	0.09 (5.82)	0.78 (22.03)	1.01 (12.90)	0.37 (5.72)	2.54 (8.62)	13.73 (11.87)
8.2. SMP	0.05 (3.07)	0.02 (0.87)	0.21 (6.72)	0.15 (9.93)	0.90 (25.43)	4.54 (57.81)	2.73 (42.59)	16.30 (55.47)	64.14 (55.45)
8.3. Butter & other fats	1.04 (70.11)	1.67 (74.33)	2.21 (69.20)	0.93 (61.65)	1.19 (33.57)	1.95 (24.89)	2.76 (43.17)	7.52 (25.59)	18.11 (15.66)
8.4. Cheese & curd	0.03 (1.70)	0.01 (0.23)	0.00 (0.01)	0.07 (4.92)	0.01 (0.23)	0.06 (0.80)	0.23 (3.65)	0.57 (1.94)	4.98 (4.31)
8.5. Baby foods	0.37 (25.09)	0.55 (24.34)	0.73 (22.76)	0.10 (6.95)	0.63 (17.80)	0.19 (2.45)	0.09 (1.35)	1.25 (4.25)	2.67 (2.31)
8.6. Other (milk items)	0.00 (0.00)	0.00 (0.02)	0.04 (1.24)	0.16 (10.72)	0.03 (0.93)	0.09 (1.15)	0.23 (3.52)	1.22 (4.13)	12.04 (10.41)
9. Hides & skins	0.00 (0.00)	0.00 (0.00)	8.07 (9.91)	29.30 (24.09)	28.18 (20.87)	34.85 (15.20)	31.78 (12.45)	32.95 (8.72)	36.32 (4.30)
10. Bristles & hairs	0.00 (0.00)	0.00 (0.00)	0.09 (0.11)	0.38 (0.31)	0.18 (0.13)	0.16 (0.07)	0.27 (0.10)	0.24 (0.06)	0.32 (0.04)

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 within the parentheses are percentages to the total.

The dairy products include whole milk powder, skimmed milk powder, butter, cheese, curd and whey along with some other milk products. Earlier, butter, ghee and other fats and baby foods constituted the major share in exports of dairy products. Though, India was a net importer of dairy products till 2000, it has turned out to be a net exporter in the subsequent period. The export of dairy products gained momentum after 1991 due to adoption of a series of short- and long-term strategies. These strategies resulted in significant rise in milk processing and thus facilitated higher export of dairy products. In fact, the export of dairy products in TE 2007 was almost five-times of that in TE 2000. Skimmed milk powder has emerged as the largest constituent of dairy products exports. The processed cheese products are also slowly finding their way into the export markets. The major impetus to exports of dairy products had come after the removal of quantitative restrictions, which motivated the exporters to tap the emerging opportunities in the global market. Sincere efforts by the government and exporters to comply with the SPS standards also seemed to have promoted the export of these commodities. The export of eggs had fallen till 1988, but thereafter there has been a continuous upward trend due to the boost in commercialization of poultry sector in India. Further, reduction in the excise duty on meat products from 16 per cent to 8 per cent and complete waiving of the excise duty subsequently seem to have a positive influence on their production and consequently, their exports. The Indian poultry industry has come a long way from a backyard activity to an organized, science based and vibrant industry. The poultry and egg production has witnessed a tremendous growth in India. The consumption of poultry has also increased at a very high rate which has precluded the higher growth in export of poultry meat. Poultry meat production in India is also not very competitive, which can be partly attributed to the distortive international market because of heavy subsidies given by the developed countries (Singh, 2004).

Some positive trends are apparent in the exports of non-edible livestock products such as hides and skins. Their export has increased from a negligible level in TE 1982 to 4.30 per cent of the

total livestock exports in TE 2007. The export of live animals that rose until TE 1985 fell drastically thereafter till 2003, but recovered to almost the same level in TE 2007. The export of sheep meat, more than doubled between TE 1982 and TE 1985, (from US \$ 9.5 million to US \$ 22.2 million). Its export declined afterwards and fluctuated between 15 and 19 million US \$, except during TE 2003. Its share in livestock export declined continuously after TE 1985, mainly because of tremendous growth in the export of bovine meat. The export of swine and goat meats has although improved in absolute terms, they together made a negligible contribution of 0.12 per cent to livestock export earnings in the TE 2007.

The total imports of livestock products over the period 1980-2007 have been depicted in Table 2. These fell drastically from US\$ 140 million in TE 1982 to US\$ 13 million in TE 1994, but showed a sign of little revival thereafter. In TE 2007, the total livestock imports were of about US\$ 22 million. The analysis of Table 5 revealed that during 1980 to 2007, the import of several livestock products like bovine meat, swine meat, sheep meat, poultry meat, eggs, and hides and skins, etc. has increased but only marginally, despite liberalization of the import policy.

During post-1997 period, some occasional rises can be seen in the import of dairy products. Although it had fallen sharply by about 30 per cent during the period 1980 to 1997, it depicted a rise in TE 2000 but a fall again in TE 2003. The decline in import of dairy products could be attributed to the success of 'operation flood' program initiated during the late-1960s to achieve self-sufficiency in milk production and canalization of dairy industry. The commitment of India under WTO to eliminate the non-tariff barrier on imports of dairy products, hundred per cent de-canalization of the dairy sector in 1992, and removal of quantitative restrictions and permission to import skimmed milk powder at zero import duty, led to an increase in the import of milk, butter and butter oil during late-1990s (Rakotoarisoa and Gulati, 2006). However, GoI 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 liberalization of the import policy.

Table 5: Average Annual Value and Composition of Imports of Livestock Products: 1980-2007

Items	Annual value and composition of imports (US \$ million)										
	Year	1982	1985	1988	1991	1994	1997	2000	2003	2007	
1. Live animals	0.37 (0.27)	0.52 (0.47)	1.41 (2.12)	0.75 (1.86)	0.92 (7.15)	0.96 (6.66)	0.51 (1.82)	0.46 (2.11)	2.13 (9.40)		
2. Bovine meat	0.00 (0.00)	0.00 (0.00)	0.01 (0.02)	0.00 (0.01)	0.00 (0.02)	0.00 (0.02)	0.00 (0.01)	0.00 (0.01)	0.04 (0.18)		
3. Swine meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.04)	0.00 (0.00)	0.02 (0.10)	0.17 (0.74)		
4. Sheep meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.01 (0.05)	0.01 (0.05)	0.08 (0.35)		
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)	0.00 (0.00)	0.01 (0.04)		
6. Poultry meat	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.01)	0.02 (0.11)	0.04 (0.18)		
7. Eggs	0.03 (0.02)	0.04 (0.04)	0.02 (0.03)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.06 (0.21)	0.38 (1.74)	0.85 (3.72)		
8. Dairy products	139.58 (99.52)	110.59 (99.44)	64.70 (96.90)	37.67 (93.62)	10.98 (85.06)	10.00 (69.56)	19.85 (70.71)	9.68 (43.85)	10.40 (45.57)		

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8.1. WMP	1.51 (1.08)	0.42 (0.38)	0.15 (0.23)	0.12 (0.31)	0.08 (0.69)	0.26 (2.62)	0.12 (0.62)	0.10 (0.99)	0.19 (1.83)
8.2. SMIP	68.07 (48.77)	70.14 (63.42)	26.44 (40.87)	28.64 (76.02)	6.58 (59.93)	1.41 (14.14)	8.63 (43.46)	0.30 (3.12)	0.01 (0.10)
8.3. Butter & other fats	69.06 (49.48)	38.85 (35.13)	37.70 (58.27)	7.73 (20.53)	3.44 (31.32)	7.75 (77.53)	9.85 (49.64)	7.09 (73.18)	3.60 (34.62)
8.4. Cheese & curd	0.10 (0.07)	1.04 (0.94)	0.09 (0.14)	0.13 (0.33)	0.07 (0.63)	0.25 (2.54)	0.47 (2.35)	1.86 (19.17)	5.38 (51.73)
8.5. Baby foods	0.83 (0.60)	0.14 (0.12)	0.19 (0.29)	0.27 (0.71)	0.17 (1.53)	0.07 (0.68)	0.57 (2.85)	0.31 (3.17)	0.13 (1.25)
8.6. Other (milk items)	0.00 (0.00)	0.00 (0.00)	0.14 (0.21)	0.79 (2.09)	0.65 (5.90)	0.25 (2.49)	0.21 (1.07)	0.04 (0.38)	1.09 (10.48)
9. Hides & skins	0.3 (.0.2)	0.1 (0.1)	0.6 (0.9)	1.2 (3.0)	0.1 (1.0)	0.2 (1.3)	2.3 (8.1)	5.1 (23.0)	2.5 (10.96)
10. Bristles & hairs	0.00 (0.00)	0.00 (0.00)	0.05 (0.07)	0.63 (1.56)	0.87 (6.75)	3.23 (22.49)	5.37 (19.12)	6.44 (29.18)	6.6 (28.92)

Source: Same as in Table 4. Data refer to triennium ending average

Note: Figures within the parentheses are percentages to the total.

Table 6: Diversification in Export of Livestock Products: 1980-2007

Year (TE)	Geographic Diversification Index	Commodity Diversification Index
1982	56.6	28.6
1985	53.5	34.0
1988	60.5	38.7
1991	55.2	37.3
1994	62.1	36.1
1997	64.4	33.2
2000	65.0	29.7
2003	69.2	27.3
2006	75.8	32.7
2007	76.7	29.4

Source: Same as in Table 4.

The extent of diversification in the exports as commodity diversification and geographic diversification has shown a mixed trend (Table 6). The commodity export diversification index fluctuated between low of 27.3 per cent (in TE 2003) and high of 38.7 per cent in TE 1988. A moderate diversity among the exported livestock commodities appears to have occurred till TE 1994. But, after TE 1997, export seems to have been limited to only a few commodities. However, in terms of geographic spread, the diversity has been increasing almost consistently. The geographic index of diversification, which was 56.6 per cent in TE 1982, increased to 76.7 per cent in TE 2007. The trend in geographic diversification shows that during the post-reform period the diversification in export destinations has increased. It is evident from the analysis that the trade in livestock products is concentrated within a few commodities only and has shown a tendency of getting specialized over time, but was reaching newer destinations.

4.4. Growth Trends in the Trade of Livestock Products

The compound growth rates of different livestock products have exhibited mixed trends. The export of bovine meat has registered the highest annual growth of about 27 per cent, followed by eggs (21.4 %), swine meat (23.0 %), dairy products (15.3 %) and poultry meat

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(13.9 %). Although the share of swine and poultry meats in the total export earnings of the livestock sector is skimpy, there is enough potential to increase their export by ensuring their safety and quality by adopting SPS standards and by reducing their production cost.

The export of hides and skins and live animals has declined at the rate of 3.0 per cent and 0.9 per cent, respectively. The export of five livestock products has grown in double digits, which indicates that focus on these commodities can help in earning more foreign exchange and strengthen the global standing of India in the livestock trade.

Table 7: Compound Annual Growth Rates (CAGR) in Export of Livestock Products: 1980-2007

Items	CAGR (%)			
	1980-90	1991-00	2001-07	1980-07
1. Live animals	-24.99	13.05	39.44	-0.86
2. Bovine meat	38.64	14.07	20.01	26.34
3. Swine meat	46.79	40.60	111.46	164.97
4. Sheep meat	8.34	2.71	8.88	0.80
5. Goat meat	NA	23.07	9.25	6.37
6. Poultry meat	3.51	-25.43	71.99	135.34
7. Eggs	-19.93	34.15	24.04	21.59
8. Dairy products	4.87	12.78	36.02	16.19
8.1. WMP	0.00	0.00	38.74	0.00
8.2. SMP	44.97	26.10	44.79	40.42
8.3. Butter & other fats	5.15	14.69	19.75	10.02
8.4. Cheese & curd	0.00	0.00	70.64	0.00
8.5. Baby foods	-5.56	-14.11	21.56	5.21
8.6. Other (milk items)	0.00	0.00	39.14	0.00
9. Hides & skins	NA	1.41	-24.61	-3.02
10. Bristles & hairs	NA	-0.91	-2.44	-0.86

Source: Same as in Table 4.

NA = Not available

The growth of livestock exports has accentuated considerably during the 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 2001-2007, the export of swine meat has registered the highest growth rate of 111.4 per cent, followed by poultry meat (71.9 %), live animals (39.4%), and dairy products (36.0 %). The reduction in excise duty on meat from 16 per cent to 8 per cent in 2004 and waving-off the same in 2006 could have a positive influence on their production and export (Union Budget, 2004-05 & 2006-07). The improvement in eggs export, primarily to the Middle East, seems to be influenced by the cold storage and airfreight subsidies provided by the Agricultural and Processed Food Products Export Development Authority (APEDA), a government exports promotion agency. Table 8 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.

Table 8: Compound Annual Growth Rates (CAGR) of Imports of Livestock Products: 1980-2007

Items	CAGR (%)			
	1980-90	1991-00	2001-07	1980-07
1. Live animals	0.0	-9.1	48.83	0.0
2. Bovine meat	0.0	0.0	0.0	0.0
3. Swine meat	0.0	0.0	93.2	0.0
4. Sheep meat	0.0	0.0	51.04	0.0
5. Goat meat	0.0	0.0	0.0	0.0
6. Poultry meat	0.0	0.0	18.2	0.0
7. Eggs	0.0	0.0	84.4	0.0
8. Dairy products	-10.3	12.6	2.7	-9.61
8.1. WMP	-29.8	0	15.4	0
8.2. SMP	-7.0	7.3	-37.3	-23.8
8.3. Butter & other fats	-29.2	45.7	-19.1	-8.19
8.4. Cheese & curd	5.4	39.3	35.07	15.7
8.5. Baby foods	-4.0	9.6	-70.2	-16.6
8.6. Other (milk items)	0	0	126.2	0
9. Hides & skins	0.0	0.0	-14.8	0.0
10. Bristles & hairs	0.0	33.0	0.5	0.0

Source: Same as in Table 4.

The import of live animals has shown a fluctuating trend over the period of study. The import of goat meat had almost not taken place, while the import of swine meat and eggs registered a significant growth. Even their growth rates should be read cautiously as these indicate growth from a very low base.

4.5. Export Instability

The estimated export instability indices for the livestock products have been given in Table 9. The volatility in export market of any commodity discourages investment in its production, alters the planning horizon and destroys the sense of security, which is necessary for any concrete policy measure. On the basis of indication provided by the instability index of a product, appropriate policy on its export promotion and investment planning can be formulated.

Table 9: Export Instability Indices for Livestock Products: 1980-2007

Item	1980-90	1991-00	2001-07	1980-07
1. Live animals	62.1	89.6	50.8	71.3
2. Bovine meat	34.6	18.9	25.8	27.2
3. Swine meat	193.4	207.9	313.0	225.2
4. Sheep meat	81.9	19.7	59.6	57.4
5. Goat meat	40.5	105.0	214.9	123.9
6. Poultry meat	113.8	126.5	168.7	132.0
7. Eggs	92.6	78.4	17.2	73.9
8. Dairy products	44.4	74.5	70.8	62.6
9. Hides & skins	4.6	15.1	154.5	77.6
10. Bristles, hairs & feathers	33.0	59.9	119.0	71.6
Total Livestock Export	25.5	14.3	21.5	20.8

In general, the export of livestock products was highly volatile during the study period. The exports of swine meat exhibited the highest volatility, followed by poultry meat. The volatility in the export of livestock products was pervasive in all the sub-periods. Again, no clear pattern of volatility emerged during either the post or pre-reform period. In the post-reform period, the instability in the export of

livestock products revealed mixed trends. The export of bovine meat, eggs and sheep meat became more stable, while instability in the exports of remaining products increased further. The *ad hocism* adopted in the trade of livestock products may be partly attributed for the observed volatility in their export, besides other factors. The statistical analysis showed that there was no significant association between growth in exports and instability of livestock commodities.

4.6. 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 fifteen importers and exporters of livestock products have been listed in Tables 10 and 11, respectively.

4.6.1. Export Destinations

It is revealed from Table 10 that 15 countries accounted for 92 per cent of total livestock exports of India in TE 1982, 97 per cent in TE 1985 and 87 - 90 per cent till TE 1994. After TE 1994, their shares started declining and in TE 2007, these accounted for only 54 per cent of the total livestock exports of India. It indicates a diversification in export destinations, reduction in market concentration, and growing economic power of other importing countries. The diversification in export destinations seems to have been strengthened by the improved market access as a result of liberal trade policies adopted by several importing countries in the post-WTO period. The share of individual countries in total export of livestock products from India underwent a sea change. For instance UAE was the biggest importer of livestock products of India, accounting for 34 - 40 per cent till TE 1985, but thereafter its share started declining and in TE 2007 it reached a level of 9 per cent only. Similarly, Malaysia was not a significant importer of Indian livestock products during early-1980s, but emerged as its largest importer in the late-1980s and continued to retain its position till TE 2007, though its share too has declined in recent years.

Table 10: Country-wise Share of Exports of Livestock Products from India: 1980-2007

(in per cent)

Country Year	1982	1985	1988	1991	1994	1997	2000	2003	2007
UAE	33.64	40.29	25.33	19.86	18.72	18.50	21.71	13.10	8.60
Kuwait	17.76	12.85	5.57	2.06	2.67	2.16	2.49	1.95	6.42
Saudi Arabia	14.78	9.04	4.25	2.59	5.53	4.17	4.20	1.38	7.43
Netherlands	5.81	2.41	1.41	0.86	0.41	0.95	0.69	0.35	0.00
Iran	5.33	3.47	4.62	3.59	1.08	1.56	4.16	2.71	2.37
France	3.54	1.19	0.42	0.81	0.99	1.76	0.75	0.61	0.65
US	3.18	2.91	2.58	0.15	0.22	1.45	0.59	1.24	1.89
Oman	2.92	6.00	8.15	3.56	5.24	4.81	2.83	4.05	3.26
Nigeria	2.43	2.00	0.05	0.07	0.10	0.00	0.01	0.04	0.07
Egypt	1.87	1.79	0.74	0.00	0.06	0.04	0.42	9.68	2.08
Malaysia	0.00	11.35	22.26	34.77	27.18	24.75	20.63	20.66	12.24
Japan	0.18	0.31	7.11	17.46	14.19	9.75	9.28	5.36	2.94
Jordan	0.29	0.11	0.07	1.49	5.13	1.69	2.61	3.86	5.00
UK	0.00	0.18	0.96	1.82	2.58	2.00	1.01	0.71	0.37
Bahrain	0.00	3.12	3.33	1.78	2.39	1.23	1.01	0.94	0.76
RW	8.26	2.99	13.15	9.13	13.51	25.19	27.61	33.37	45.91

Note: Data relates to the triennium ending averages.

4.6.2. Import Destinations

A perusal of list of top 15 countries exporting livestock products to India given in Table 11 reveals that though their share has declined over the years, they still account for about 90 per cent of India's livestock import. It may be mentioned that import of livestock products has basically declined substantially.

The pattern of commodity/group - wise trade destinations for the Indian livestock products is more revealing (Annexure I). Country-wise trade has revealed year-to-year variations in the volume of trade with India. For instance, UAE imported about 50 per cent of bovine meat from India in TE 1982, but later Malaysia emerged as its top importer,

Table 11: Country-wise Share of Imports of Livestock Products to India: 1980-2007

Country/Year	(in per cent)								
	1982	1985	1988	1991	1994	1997	2000	2003	2007
Germany	34.50	30.45	49.48	21.42	30.29	12.52	5.24	0.75	3.47
Belgium	22.88	26.44	18.19	13.70	5.91	5.37	4.33	2.99	5.82
Netherlands	14.06	11.04	3.42	8.05	7.49	1.89	8.20	1.19	4.78
France	13.21	7.73	1.11	0.66	0.00	0.31	1.14	4.66	11.41
Ireland	5.38	2.81	6.26	0.00	9.89	0.00	7.26	0.18	0.09
UK	4.67	8.45	5.76	0.27	1.24	4.03	2.12	2.60	5.82
US	2.96	6.04	9.48	46.87	16.62	12.33	4.47	6.95	5.50
Nepal	1.03	0.90	2.13	2.78	11.40	8.18	3.06	7.92	8.48
Switzerland	0.61	0.30	0.37	1.86	0.41	0.00	0.03	0.22	0.59
Australia	0.22	0.87	0.40	0.29	0.21	2.20	10.41	6.82	1.04
China	0.00	0.00	0.46	1.25	4.40	16.67	17.43	29.70	31.94
Denmark	0.19	3.23	0.38	0.55	1.30	0.24	1.18	1.67	5.23
New Zealand	0.05	0.02	0.31	0.00	0.00	18.62	24.45	23.23	1.53
Finland	0.00	0.01	0.00	0.00	6.25	6.96	0.91	0.00	0.00
Hong Kong	0.00	0.00	0.07	0.70	1.03	1.40	0.40	0.57	0.63
Italy	0.02	0.46	0.06	0.14	0.00	0.06	0.00	0.13	2.39
RW	0.21	1.25	2.13	1.47	3.57	9.22	9.37	10.43	11.28

Note: Data relates to the triennium ending averages.

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 significant dent in export to the developed countries, where it can realize a higher per unit value. Its exports have been confined largely to the neighbouring South Asian, East Asian and Middle East countries. The import of livestock products into India is negligible, except dairy products. Its major trading partners for importing 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 (Annexure II), with their varying shares in different time periods.

Chapter 5

OPPORTUNITIES AND CHALLENGES IN EXPORT OF LIVESTOCK PRODUCTS

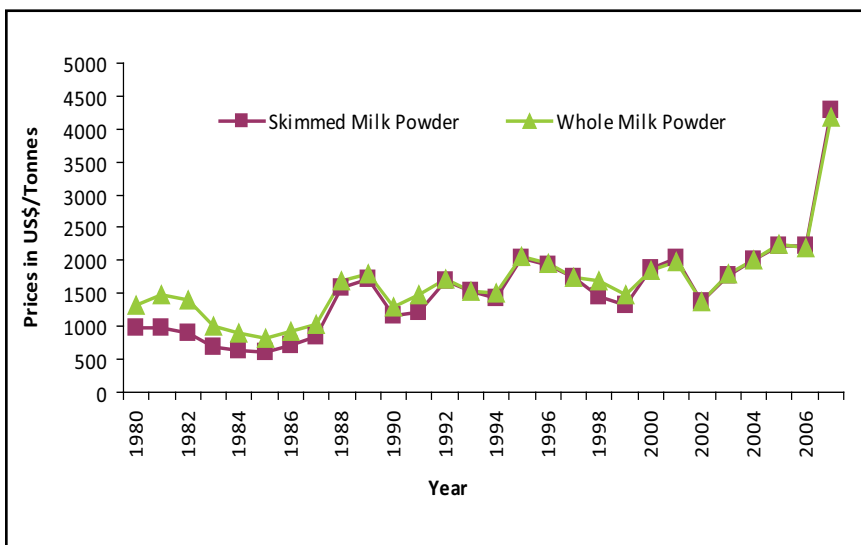
5.1. Trends and Volatility in International and Domestic Prices

The trend in international prices is one of the most important factors in determining competitiveness, export, import and choice of tariffs by any country (Chand, 2002). The world prices are perceived as efficiency benchmark in determining the optimal use of domestic resources. Therefore, analysis of trends in international prices and the extent of transmission to the domestic market assume importance in formulating effective trade policy and domestic production policy. Trends in prices of different livestock products have been plotted in Figures 1 to 5 and the detailed analysis of the price variability patterns for domestic and international markets has been presented in the following sections.

The international price trends in dairy and meat products exhibited large variations. While the prices of all dairy products have increased substantially during the past 28 years, the prices of meat and poultry, by and large, have shown stagnation or marginal increase. However, the prices of all livestock products in the post-2000 period swelled considerably, though with a varying magnitude. The price of whole milk powder was US \$1243/t in TE 1982, which shot up to US \$2880/t in TE 2007, an increase of nearly 2.5-times. The price of SMP increased from US \$837/t in TE 1982 to US\$ 2911/t in TE 2007, registering a 3.5-fold increase in 28 years. Similarly, the price of butter has increased substantially, from US\$1300/t in TE 1991 to US\$2287/t in TE 2007. The trends in prices of whole and skimmed milk powder depicted in the Figures 1 and 2, respectively indicate that the international prices of milk also moved up along the rising trend, showing the annual growth rate of 3.1 per cent in whole milk powder and 4.6 per cent in skimmed milk powder. Further, the annual growth in WMP prices was only 1.2 per cent during the 1980s and 1990s; the annual growth in SMP prices was

5.01 per cent during 1980s and 1.4 per cent during 1990s. But, during post-2000 period, both the products registered a tremendous annual growth of 13 per cent. Similar seems to be the case of butter. In the 1990s, there was a stagnation or slight decline in the prices of butter but during the post- 2000 period, it registered a whopping annual growth rate of 15 per cent. The upward and downward movements in the international prices may be attributed to the cyclical world economic growth and movements in production of these commodities, since dairy products are believed to be income elastic. For instance, the rising trends in milk powder prices after 2001 may be explained by their increased demand from the importing countries like China and South East Asia due to the high economic growth registered in these countries. Further, the increased income realized from the higher oil prices fostered strong import demand in the Middle East and North African countries (Elumalai and Sharma, 2008).

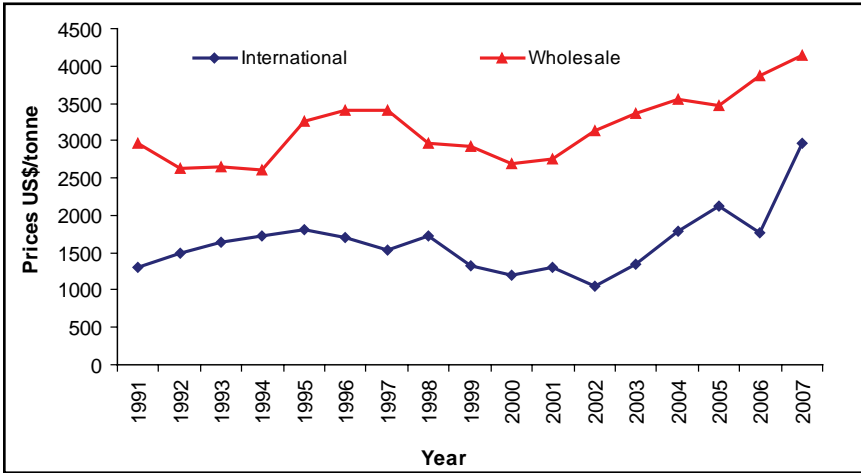
Figure 1: Movement in International Prices of WMP and SMP: 1980-2007



The domestic prices of dairy products in India displayed a behaviour similar to one witnessed in the international prices (Table 13). However, variation was less in the case of domestic prices. The domestic prices of milk hovered around US\$ 390-400/t during 1980s, but declined

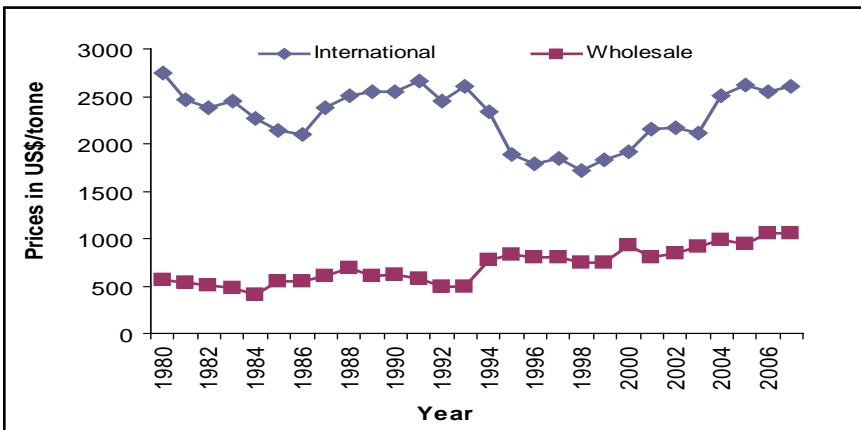
considerably during 1990s touching US\$325/t in TE 2001. The domestic milk prices registered a modest increase of 5 per cent per annum during the period 2001 to 2007. The domestic price of butter registered an annual growth rate of 2.9 per cent during the 1980s and increased from US \$2743/t in TE 1981 to 3397/t in TE 1991.

Figure 2: Trends in International and Domestic Prices of Butter: 1991-2007



The domestic prices of butter depicted a variable trend; it started declining from 1991 and continued till 1994. It increased till 1997 and declined again till 2000. After 2000, it again depicted an increasing trend which continued till 2007. The annual growth in domestic butter price during post-2000 period was registered as 6.2 per cent.

Figure 3: Trends in International and Domestic Prices of Beef: 1980-2007



The international price of beef was US \$2702/t in TE 1982 and remained almost stagnant during 1980s with a decline of 0.2 per cent per annum, but during the 1990s, it declined considerably, at the rate of 4.6 per cent per annum. The trends depicted in the Figure 3 suggest that the price of beef started firming up since 1998 and increased thereafter continuously. The annual growth in the price of beef during the post-2000 period was 4.1 per cent per annum.

Figure 4: Trends in International and Domestic Prices of Pork: 1980-2007

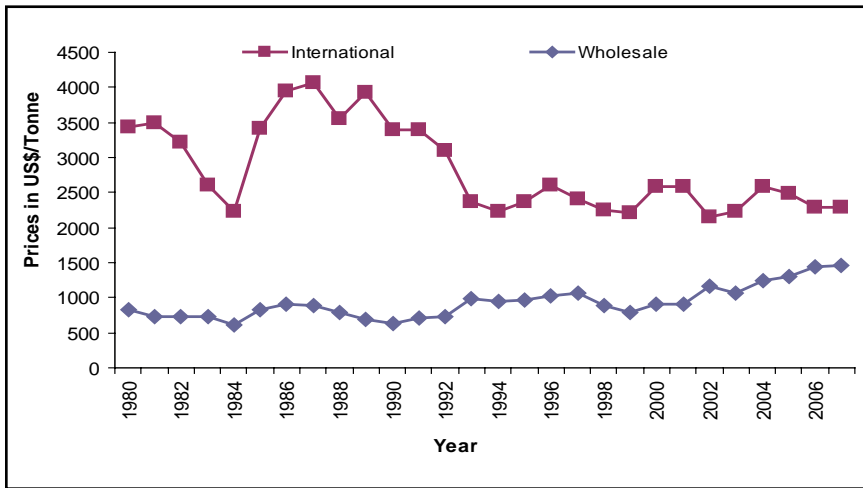
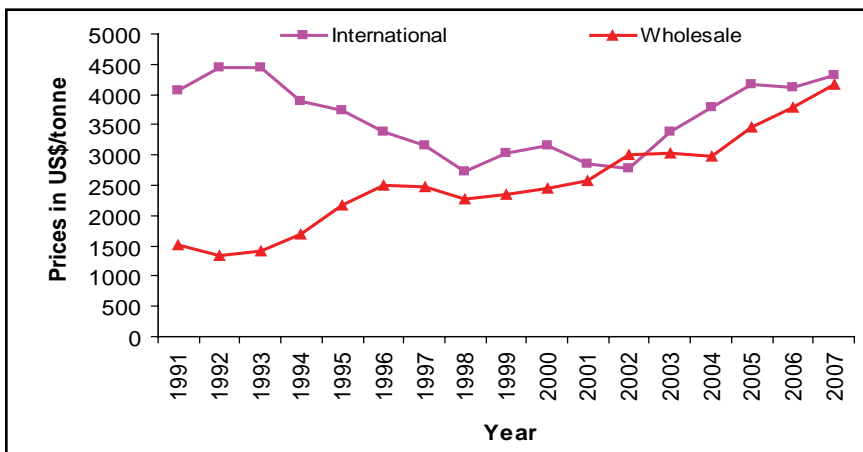
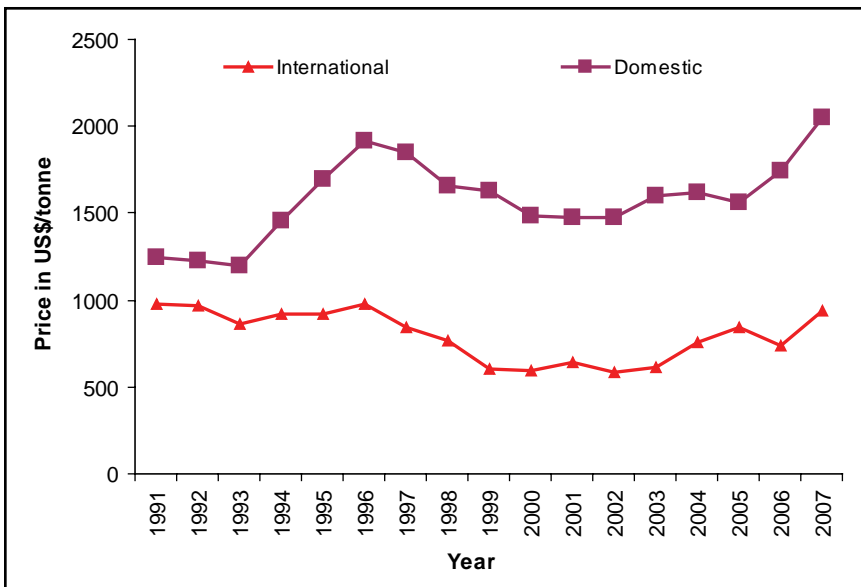


Figure 5: Trends in International and Domestic Prices of Ovine Meat: 1991-2007



The international price of pork increased at the annual growth rate of 2 per cent during the 1980s but declined significantly during the 1990s at an annual rate of 4.6 per cent (Figure 4). During the post-2000 period, the prices started firming up, but were not as apparent as in the case of beef. The price of ovine meat was US\$ 4060/t in TE 1991, which declined at the rate of 4.8 per cent per annum and dropped to US\$ 3013/t in TE 2001 (Table 12). The declining trend continued till 2002, but since 2003 an increasing trend had started which continued till 2007.

Figure 6: Trends in International and Domestic Prices of Poultry Meat: 1988-2007



The prices of poultry meat depicted a mixed trend over the study period. Its price which was around US \$600/t in early-1980s went above US \$700/t by late-1980s and further to US \$980/t in 1991. It remained above US \$900/t till 1996, except in 1993. After 1996, the price of poultry meat started declining and continued till 2002, and thereafter it again increased to US \$935/t in 2007.

Table 12: International Prices of Livestock Products and their Annual Growth Rates:1980-2007

(US\$/tonne)							
Year	WMP (NZ)	SMP (NZ)	Butter (NZ)	Beef (USA)	Pork (USA)	Ovine meat (NZ)	Chicken (USA)
TE 1982	1243	837		2702	3456		600
TE 1991	1523	1374	1300	2592	3569	4060	823
TE 2001	1767	1744	1276	1964	2065	3013	614
TE 2007	2880	2911	2287	2592	2088	4209	839
CAGR (in per cent)							
1980-90	1.2	5.1		-0.2	2.0		2.4
1991-00	1.2	1.4	-1.0	-4.6	-5.2	-4.8	-5.1
2001-07	12.9	12.9	15.2	4.1	1.4	8.4	7.0
1980-07	3.1	4.6	1.5	-0.4	-2.4	-0.4	0.5

The domestic prices of mutton and beef remained almost stagnated during the 1980s. During post-2000 period, the mutton registered an annual growth rate of 7.0 per cent, and beef depicted an annual growth of 4.7 per cent and 3.0 per cent during 1991-200 and 2001-07, respectively (Table 13). The domestic price of pork increased consistently and in TE 2007, it was almost double of that in TE 1981. The price of eggs declined from US\$49/1000 in TE 1981 to US\$ 41/1000 in TE 2007. The domestic prices of egg declined during the 1980s and 1990s, but increased at annual rate of 14 per cent during 2001-07. The domestic price of poultry increased moderately during the 1990s but during 2001-07 showed an annual growth rate of 2.5 per cent.

A comparative picture of instability in the international and domestic prices of livestock products has been presented in Table 14. The inter-year variations in annual prices of livestock commodities were higher in international than domestic prices in the case of dairy products and instability trends for meat & poultry were similar for international as well as domestic prices. The international prices were more volatile for dairy products than meat and poultry products. Further, variability was higher during the 1980s than

Table 13: Whole Sale Prices of Livestock Products in India: 1980-2007

(US \$/tonne)

Year	Wholesale prices in India						
	Milk	Butter	Mutton	Beef	Pork	Eggs+	Poultry
TE 1982	396	2743	1776	545	779	49	
TE 1994	390	3397	1641	598	680	41	1416
TE 2001	325	2794	2459	830	874	22	1530
TE 2007	411	3631	3413	996	1326	41	1643
CAGR (in per cent)							
1980-90	0.9	2.9	-0.2	2.4	0.6	-0.3	
1991-00	-1.2	0.3	6.8	4.7	3.4	-3.8	3.9
2001-07	5.4	6.2	7.0	3.0	7.9	14.0	2.5
1980-07	-0.8	0.1	2.6	2.9	2.1	-2.0	1.1

1990s. The international price variability in all the dairy products increased during the post-2000 period. It seems that instability and growth in international prices are positively related and move concurrently. The period which witnessed higher growth in prices, witnessed higher instability too. Several studies have also shown that international prices of agricultural and livestock commodities were more unstable as compared to the domestic prices (Nayyar and Sen, 1994; Chand, 2002).

It has also been argued that lower volatility in the domestic prices as compared to that in international prices is not because of less instability in domestic demand and supply factors but because of government intervention in the domestic market to maintain price stability. Therefore, apprehensions were raised during the early phase of liberalization that free trade would trigger a high instability in the domestic prices, which would be detrimental to small and marginal farmers and poor consumers. However, the empirical evidence did not support this contention. The international prices of butter were more volatile than the domestic prices. But, in the case of meat products, a mixed pattern was observed. The domestic prices of beef were more volatile than the international prices, while the reverse was observed for poultry. The beef and mutton

witnessed almost the same level of volatility in the domestic as well as international markets.

Table 14: Instability in International and Domestic Prices of Livestock Products: 1980-2007

(US \$/tonne)

Commodity	1980s	1990s	1980-07	1979-06
Milk				
International Price				
WMP	23.3	18.1	28.2	23.1
SMP	28.2	22.5	30.1	27.0
Domestic Price	5.5	7.7	27.0	14.4
Butter				
International Price		13.2	25.1	20.0
Domestic Price	7.1	11.4	7.0	9.0
Mutton				
International Price		9.8	9.5	10.2
Domestic Price	7.1	9.4	13.0	9.4
Beef				
International Price	7.0	8.9	6.9	8.1
Domestic Price	13.7	29.4	19.1	21.3
Pig Meat				
International Price		9.5	8.0	13.4
Domestic Price	14.6	10.5	8.2	11.6
Poultry Meat				
International Price	12.0	16.0	13.9	14.0
Domestic Price		12.0	5.5	9.5
Egg				
International Price				
Domestic Price	6.8	16.3	13.2	13.8

5.2. International Competitiveness

India has the competitive advantage in production of several livestock products. Producer prices of bovine meat are lower in India than international prices. A comparison of the producer prices

(Table 15) 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 meat and eggs. It is highly competitive in bovine meat production, and its farm gate price is even lower than the neighbouring countries like Pakistan, Bangladesh, China, Bhutan and Sri Lanka.

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

Table 15: Producer Prices of Livestock Products in India vis-a-vis Major Exporters of the World: 1991-2005

(US\$/tonne)

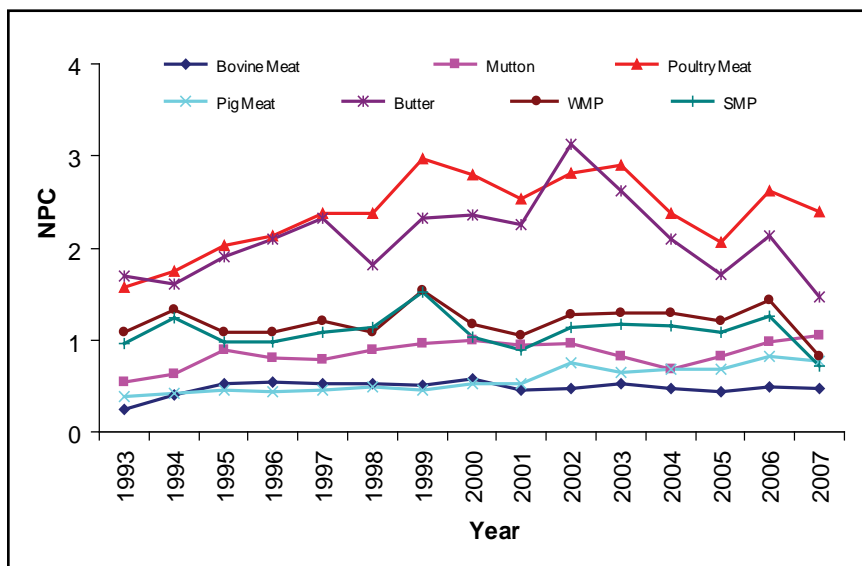
Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
Bovine meat					
India	580	457	364	314	343
Australia	1557	1597	1277	1517	2236
US	3061	2654	2633	2914	3612
Malaysia	3413	3720	3475	2904	2700
Germany	3072	3178	2500	1835	3090
Poultry meat					
India	1316	2099	1800	1354	1518
Australia	1427	1458	1184	885	1263
US	994	1090	1149	1038	1247
Germany	1367	1333	1106	913	1236
Malaysia	1741	1754	1106	1095	1236
Turkey	5658	3986	3317	2787	3968
Pig meat					
India	556	456	429	391	435
Australia	1488	1320	1380	1251	1593

US	1609	1445	1208	1245	1433
Germany	1670	1777	1395	1280	1502
Mutton					
India	1809	1934	2248	2126	2366
Australia	687	717	940	953	1703
US	2589	3567	3713	3458	4809
Malaysia	4525	3989	3620	3082	3393
Germany	3303	3959	3778	3431	4021
France	4100	4470	4222	4304	5633
Eggs					
India	393	558	555	505	552
Denmark	1061	1265	1208	1079	1404
France	1026	983	875	790	982
Germany	1493	1682	1182	997	1324
US	885	933	937	867	931
Milk: Whole or fresh					
India	227	237	241	240	269
France	358	389	345	297	376
Germany	383	387	335	299	336
Australia	210	226	194	156	206
Denmark	415	420	364	312	382
US	283	301	317	290	322
New Zealand	139	189	166	171	225

A comparison of producer prices does not reveal the status of competitiveness as these do not account for several expenditures like freight charges, insurance cost, and port handling charges. To account for these expenditures, Nominal Protection Coefficients (NPCs) were computed under exportable hypothesis. The estimates of NPCs for livestock commodities under exportable hypothesis have been presented in Table 16 and the trends over time have been depicted in Figures 7 and 8.

It has been found that the Indian dairy industry has been protected from the distorted world prices. The value of NPCs hovered around 1.02 - 1.25 for SMP and 1.15 - 1.27 for WMP. The NPCs for SMP

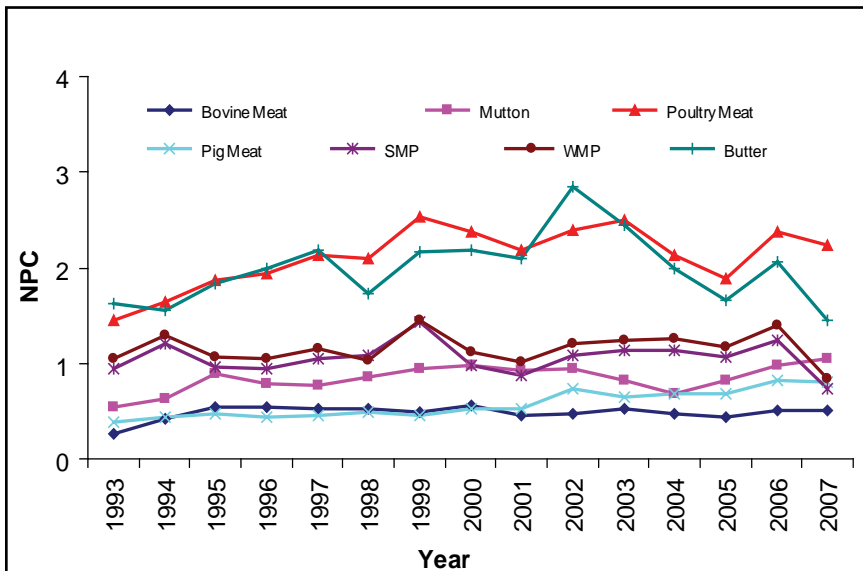
Figure 7: Nominal Protection Coefficients (NPCs) of Livestock Products under Exportable Hypothesis: 1993-2007



and WMP were 0.72 and 0.83, respectively in 2007 due to high spurt in their international prices. The increase in domestic prices of these commodities in 2007 was relatively less as compared to world market. However, these figures do not inspire much confidence for India to record significant export of these commodities under the existing world prices. India can emerge as a significant exporter by subsidizing its exports to compete with other world exporters or should negotiate in the WTO for substantial reduction in subsidies by the major exporters of WMP and SMP (Rakotoarisoa and Gulati, 2006). But, the possibility of export of butter is limited. The NPC for butter, which was 1.98 in TE 1993, reached 2.59 in TE 2002 and then depicted a declining trend going down to 1.77 in TE 2007. This implies that prices have possibly been more protected for butter than SMP and WMP and international prices of butter have been heavily subsidized.

The values of NPCs for meat products are quite different from those of dairy products. The NPC values for bovine meat indicate a

Figure 8: Nominal Protection Coefficients (NPCs) of Livestock Products under Importable Hypothesis: 1993-2007



high export potential, but these have witnessed an increasing trend, especially after TE 1993, indicating erosion of its competitiveness. However, it still hovers around 0.50 and India has much leverage to expand its bovine meat export further. India is also competitive in pig meat export, though its competitiveness has deteriorated dramatically in recent years. The NPC of pig meat was 0.30 in TE 1993, which rose to 0.76 in TE 2007.

The increasing domestic demand devoid of commensurate supply seems to have fuelled the domestic pork prices. Besides, the international prices of pig remained relatively stagnant. These developments may be attributed to the successive erosion in the competitiveness in pig export. In the case of mutton, India does not enjoy much competitiveness to emerge as a significant exporter in the world market. Domestic demand for the mutton has also been increasing consistently, which may further preclude it to expand mutton export. The NPCs for poultry meat indicate that India has protected poultry sub-sector heavily or the international prices have been depressed due to price distortion in the world market. These

Table 16: Nominal Protection Coefficients of Livestock Products: 1993-2007

Year	Butter	WMP	SMP	Bovine meat	Mutton	Poultry meat	Pig meat
Exportable Hypothesis							
TE 1993	1.98	1.08	0.96	0.26	0.61	1.47	0.30
TE 1996	1.87	1.16	1.06	0.49	0.77	1.96	0.44
TE 1999	2.15	1.27	1.25	0.52	0.88	2.58	0.47
TE 2002	2.59	1.16	1.02	0.50	0.97	2.71	0.60
TE 2005	2.14	1.26	1.14	0.47	0.78	2.44	0.67
TE 2007	1.77	1.15	1.02	0.46	0.95	2.36	0.76
Importable Hypothesis							
TE 1993	1.88	1.05	0.94	0.27	0.60	1.36	0.31
TE 1996	1.79	1.13	1.04	0.50	0.77	1.82	0.45
TE 1999	2.02	1.21	1.18	0.51	0.86	2.26	0.47
TE 2002	2.37	1.11	0.98	0.49	0.94	2.32	0.59
TE 2005	2.03	1.23	1.11	0.48	0.77	2.17	0.67
TE 2007	1.72	1.14	1.01	0.49	0.95	2.17	0.77

results suggest that India does not have enough potential to increase poultry export under the existing scenario.

5.3. Determinants of Livestock Exports

In this section, the empirical analyses on the export of livestock commodities have been presented. Also, the GDP or production of the commodity of India, GDP of the destination countries, GDP per capita of the importing and exporting countries, distance between origin and destination countries, and the trade policy index of the destination countries have been included to explain the determinants of exports of livestock products.

Since domestic price is determined by the factors of supply and demand, joint inclusion of domestic and international prices, may lead to multi-colinearity and therefore, the ratio of exporting and importing countries was included. *A priori* a negative relationship was expected between the value of livestock products exported and the price ratio. The GDP of an importing country describes the size of its economy and therefore correlation should be positive. However, sometimes it could be negative, characterizing greater self-reliance of a bigger economy (Sevela, 2002). The GDP of exporter or production of a particular commodity in the gravity model framework essentially denotes the supply capacity of the exporting country and is expected to have a positive sign. On the other hand, the geographical distance characterizes the obstacles to trade; its higher value leads to decrease in bilateral international trade, indicating an inverse relationship with the export. The GDP per capita may be interpreted as the level of economic development and influences the consumption of a commodity. Generally, it is expected to have a positive relationship with the exports from origin country. Besides the above variables, the extensive use of non-tariff (e.g. SPS measures, TBT) and other administrative barriers are also believed to influence the export of food commodities, including livestock products significantly. It is difficult to quantify the impact of average level of protection (tariff and non-tariff) on the export of a commodity or sectors. Information available even for average tariff is inadequate. Trade Policy Index developed by Heritage Foundation, as a part of Index of Economic Freedom, has been used to take into account the effect of these factors on the export of livestock products from India.

Different regression models were tried and the least squares regression results of the best fitted models have been summarized in Table 17. The gravity model results indicated that the estimated coefficients had the expected signs with a few exceptions. The coefficients for most of the variables indicated that different factors influence the export of livestock products differently. The livestock GDP or production of the livestock commodities, which indicates the higher availability of domestic surplus, was observed to play a

Table 17: Gravity Model Results of Indian Livestock Exports

Explanatory variables	Total livestock products	Dairy products	Meat products	Eggs
GDP livestock (India)	2.482*** (3.67)	-	-	-
Production (million tonne)	-	3.644*** (3.74)	2.225*** (3.34)	0.564 (1.06)
Producers price ratio	-	0.050 (0.22)	-	0.306 (1.31)
Importer GDP per capita (US\$)	0.224*** (3.28)	-0.183* (-1.82)	0.348*** (4.01)	0.166* (1.79)
Importer GDP (US\$)	0.205*** (4.27)	0.322*** (4.56)	-0.142*** (-2.47)	0.275*** (3.99)
India GDP per capita (US\$)	-0.575 (-0.47)	2.862** (2.18)	2.106 (1.55)	1.261 (0.90)
Trade policy index (No.)	-0.006*** (-2.68)	-0.003 (-0.95)	-0.003 (-1.10)	-0.001 (-0.26)
Distance (km)	-1.186*** (-11.46)	-0.742*** (-6.76)	-0.898*** (-7.36)	-0.282** (-2.39)
Constant	-16.060** (-2.25)	-30.041*** (-3.77)	-9.327 (-1.20)	-12.123 (-1.52)
log likelihood	-1601	-446	-1263	-502
Wald chi ²	281	85	97	61
Number of observations	764	247	578	275

Note: *** significant at 1 per cent level; ** significant at 5 per cent level; * significant at 10 per cent level.

significant role in increasing the export of livestock products. The effect of domestic production was observed to have a significant positive influence on the export of dairy and meat products, while its effect on export of eggs was not significant. The GDP of the importing countries had a significant positive influence on the overall exports of livestock products from India. India's export will increase by 0.21 per cent as a result of one per cent increase in the GDP of the destination countries.

For dairy products and eggs, India has the propensity to increase export of dairy products and eggs by 0.32 per cent and 0.28 per cent, respectively with one per cent increase in the GDP of the destination countries. However, its effect on exports of meat products was negative, implying that the importing countries tend to import less of meat products with the increase in the size of their economy. The bigger economies tend to be self-reliant in the case of meat products. The coefficient of GDP per capita of destination countries, which characterizes the levels of development and consumption, was also positive and significant for the overall India's livestock exports, and meat and eggs exports. With one per cent increase in the GDP per capita in the destination countries, India tends to enhance livestock exports by 0.22 per cent, while its exports of meat and eggs would be increased by 0.32 per cent and 0.28 per cent, respectively. The GDP per capita of destination countries had negative influence on the export of dairy products from India.

The distance variable was significant at 1 per cent level for the overall livestock exports, dairy products and meat products, while it is significant at 5 per cent level for egg products. The distance variable had the expected negative sign in all cases, indicating that India could be inclined to export livestock products more to its neighbouring countries. The coefficient value for livestock export has been found as -1.186, which indicates that as distance between India and destination countries increases by 1 per cent, the export of livestock products to the importing countries decreases by 1.19 per cent. Fortunately, India's neighbouring countries are deficit in most of the livestock products which offers opportunities for expanding export of livestock commodities. Further, with the 1 per cent increase in distance between India and the importing countries, India tends to decrease exports of dairy products, meat products and eggs by 0.74 per cent, 0.90 per cent and 0.28 per cent, respectively. It seems that the effect of distance variable is less on the export of eggs. The ratio of international and domestic prices did not influence the export of livestock products, implying that other factors are more important in influencing the export of livestock commodities from India. It

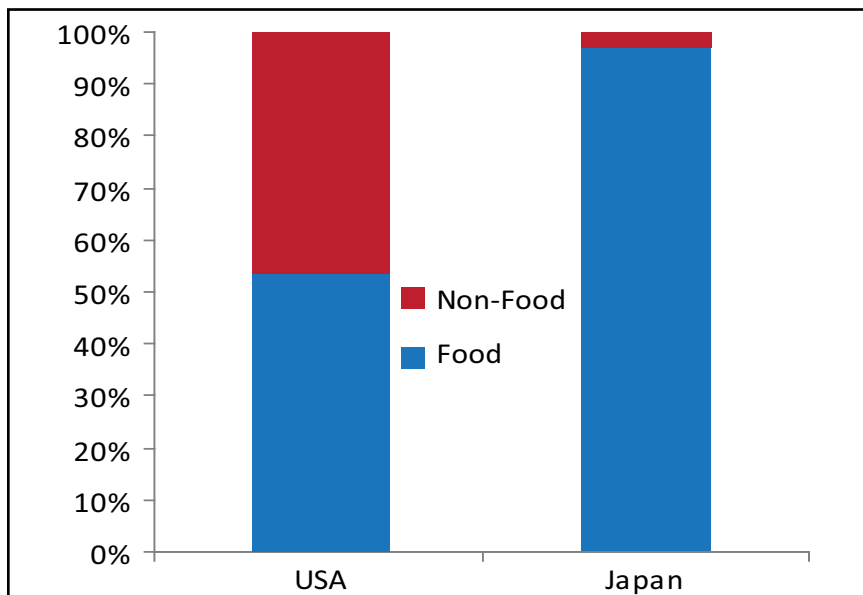
further suggests that the issue of cost competitiveness might have been captured in the distance variable.

The trade policy index, which represents the openness of the country or the foreign market access by considering tariff, non-tariff and other administrative policies of the countries, was significant only for the aggregate exports of livestock products. For export of individual commodities, its effect was not significant, though it had the expected signs for each product. These results indicate that strengthening of export supply capacity domestically holds the key for enhancing export of livestock products, rather than expanding world market. The generation of adequate exportable surplus accompanied with demand creation for specific products would enable India to tap the benefit of expanding global livestock trade.

5.4. Food Safety Issues in Livestock Trade

Food safety issues are assuming major concern in the export of food commodities from India, particularly to the developed countries. Progressively stricter food safety requirements, especially in major markets such as the EU, US and Japan, are emerging as major challenges in the export of food commodities from the developing countries. Fresh food categories like livestock products are subject to greater food safety risks and are more likely to be affected by the health safety and related regulatory measures. During the past decade or so, there has been proliferation and strengthening of food safety measures, particularly by the industrialized countries in both public and private sectors. These standards continue to evolve nationally, internationally and in individual supply chains. India has been facing increasing number of non-tariff measures (mainly SPS and TBTs) in its main importing countries. The food products refusal during April 2006-March-2007 accounted for 54 per cent and 97 per cent, of the total imports refusal by the US and Japan, respectively (Figure 9) and Indian consignments had the dubious distinction of being second highest refusals by the US during this period. India has faced the highest number

Figure 9: Share of Food and Non-Food Products in Total Export Consignment Refusals



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

Table 18: Share of Different Reasons in Total Number of Export Consignment Refusals by USA and Japan during April 2006-March 2007

Reasons	USA		Japan	
	Number	Share of each reason in total No. (%)	Number	Share of each reason in total No. (%)
Microbiological contamination	248	19.1	6	25.0
Filthiness	220	17.0	0	0.0
In sanitary conditions	7	0.5	0	0.0
Inadequate labelling/ 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> & <http://www.mhlw.go.jp>

of refusals of its food exports consignments after Mexico and it accounted for more than 13 per cent of the import consignments refused by the US. The major reasons for the refusal of Indian consignments were ‘microbiological contamination’, ‘filthiness in the consignment’, ‘in-sanitary conditions’, ‘inadequate labelling/inappropriate information’, and ‘unsafe additives’ (Table 18). 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 and dairy products was around 5 per cent in the total refusals of food products exports from India to these countries, though the exports of these categories 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 towards Middle East and East Asian countries, where 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 realize a higher per unit value.

Chapter 6**CONCLUSIONS AND POLICY
IMPLICATIONS**

The study has explicitly deciphered that livestock exports have registered a commendable rise and the liberalization policies seem to have further augmented their growth. The exports of bovine meat, dairy products, and eggs, have shown promising signs during the study period, 1980-2007. On the other hand, imports of most of the livestock products have been insignificant. India from a net importer of livestock products till 1985, has become a net exporter post-1985, indicating the export potential of Indian livestock sector.

The price behaviour in the international markets does not seem to have a significant effect on the domestic prices of livestock products. In general, the international prices of dairy products have been more volatile than their domestic prices and in the case of meat products, the level of instability has been similar in the domestic and international markets. The international and domestic prices have both followed downward and upward trends intermittently. In general, the prices of livestock products were suppressed during the 1990s and started firming up particularly after 2000. During the past two years, the dairy prices have witnessed a tremendous increase.

India has been found competitive in the export of meat products, except poultry. The export of bovine meat has been increasing consistently and the lack of domestic demand has further fuelled its export. But, the export of mutton does not seem to have much prospects in the short-run, as even the domestic demand is not met by the domestic production. In fact, domestic production could not keep pace with the rise in domestic demand for this commodity and thus India may not be able to export it significantly in spite being competitive. In milk and milk products, India has some advantage at the farm level, but is not competitive in the export of

milk and milk products at the prevailing world market situation. The improvement in efficiency of the processing of dairy products along with reduction in support to dairy industry in the developed countries only can increase the prospects of dairy exports from India. By and large, India has become self-reliant in milk production and is able to generate some export surpluses. In the world trade of livestock products, it is still a very small player. But being one of the largest producer 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. Strengthening of export supply capacity domestically holds the key for enhancing export of livestock products rather than expanding world market. The generation of adequate exportable surplus accompanied with demand creation for specific products would enable India to tap the benefits of expanding global livestock trade. India is surrounded by the countries which are deficit in production of livestock commodities to meet their domestic demand and thus has the opportunity to export livestock products to these countries. A long-term outlook for export of livestock products should be developed, which can provide a continuum to the policy thrust. Tendency of *ad hocism*, which affects the long-term prospects of livestock exports, should be done away with. Besides, concerted efforts and lobbying are needed at the global fora to reduce support for production and export of livestock, especially by the developed countries.

India lacks access to developed country markets due to their stringent food safety and quality standards. To give a boost to livestock exports, compliance with various SPS measures should be taken up vigorously to ensure international hygiene standards and to harness the untapped potential of exporting to developed countries like USA, EU and Japan. Further, with the rise in world prices consequent to reduction in support, it can enhance its access to markets in the countries that have less stringent food safety and quality standards. Compliance with food safety measures (FSM) has become an important issue in the trading of livestock products.

The emphasis on FSM is expected to increase further as a result of growing awareness about food safety, emerging diseases and increasing paying capacity of the consumers in both domestic and international markets. The cost of compliance, investment required, handling and processing and traceability of the products are some of the important issues that need to be addressed to enhance livestock exports. However, the domestic market would be the core market for most of the livestock products and in some instances, over-emphasis on trade in livestock products may lead to increased food insecurity for certain groups 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 farmers to participate in the livestock trade and reap the benefits of emerging opportunities.

REFERENCES

- Balassa B. and D.M. Schydlosky (1972). Domestic resource costs and effective protection once again. *Journal of Political Economy* 80, 63-69
- 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.
- Birthal P. S., Anjani Kumar and T. N. Datta (2008). Trading in livestock and livestock products (Rapporteur's Report). *Indian Journal of Agricultural Economics* 63(1):58-63
- Chand Ramesh (1999). *Effect of Trade Liberalization on Agriculture in India: Commodity Aspects*, The CGPRT Centre, Working Paper Series 45.
- Chand Ramesh (2002). *Trade Liberalisation, WTO and Indian Agriculture*, Mittal Publication, New Delhi.
- Corden W. M. (1971). *The Theory of Protection*. Oxford University Press, London.
- Dairy India*, (2007). Published by Dairy India Yearbook, New Delhi.
- Devadoss S. and W. Meyers (1990). Variability in Wheat Export Demand Elasticity: Policy Implications. *Agricultural Economics*. Vol. 4. Page 381-394.
- Directorate General of Commercial Intelligence and Statistics, *Monthly Statistics of the Foreign Trade of India*, various issues, Ministry of Commerce and Industry, Government of India.
- Elumalai K. and R.K., Sharma (2008). Trade Protection of India's Milk Products: Structure and policy Implications, *Indian Journal of Agricultural Economics*, 63(1): 67-83.
- FAO (Food and Agriculture Organisation of the United Nations), *FAO Database*, Rome, Italy.

Fugazza Marco (2004). *Export Performance and Its Determinants: Supply and Demand Constraints*, United Nations Conference on Trade and Development, Geneva, Switzerland.

Gulati A., J., Hansen and G. Pursell (1990). *Effective Incentives and India's Agriculture: Cotton, Groundnuts, Wheat and Rice*. Planning and Research Working Paper No. 332, The World Bank, Washington, DC.

Kumar Anjani, Jabir Ali and Harbir Singh (2001). Trade in Livestock Products in India: Trends, Performance and Competitiveness *Indian Journal of Agricultural Economics*, 56 (4): 653-667.

Kumar Anjani, Steven J. Stall, N.P. Singh and Dhiraj K. Singh (2007). Livestock sector trade of India: Surging momentum in the new liberalised regime. *Indian Journal of Agricultural Economics*, 62(3): 395-410

Rakotoarisoa, Manitra and Ashok Gulati (2006). Competitiveness and trade potential of India's Dairy Industry *Food Policy*, 31(3): 216-227.

National Accounts Statistics (various issues), Central Statistical Organisation, Government of India.

Nayyar Deepak and Abhijit Sen (1994). International Trade and Agriculture Sector in India in G.S. Bhalla (ed.) *Economic Liberalisation and Indian Agriculture*, Institute for Studies in Industrial Development, New Delhi.

NCAER (1996). *India's Agricultural Exports in the Post-Uruguay Round Set Up: Implications, Prospects and Policies*. Project Report, National Council of Applied Economic Research, New Delhi-2.

Poyhonen Pentti (1963). A Tentative model for the volume of trade between countries, *Weltwirtschaftliches Archive*, 90: 93-100

Sevela M. (2002). Gravity type model of Czech agricultural export. *Agricultural Economics*, 48 (10): 463-466.

Singh S. P. (2004). *Post WTO Era: Impact on Export Prospects of Livestock Products*, Occasional Paper 32, Department of Economic Analysis and Research, NABARD, Mumbai.

References

- Storm, Servass (1997). Agriculture under Trade Policy Reform: A Quantitative Assessment for India, *World Development* 25(3): 425-436.
- Taylor D. S. and P. T. Philips (1991). Food-pricing policy in developing countries: Further evidence on cereal producer prices. *American Journal of Agricultural Economics*, 73: 1036-1043.
- Tinbergen Jan (1962). *Shaping the World Economy- Suggestions for an International Economic Policy*, The Twentieth Century Fund.
- Tongeren Van F., Van H. Meijl and Y. Surry (2001). Global Models Applied to Agricultural and Trade Policies: A Review and Assessment. *Agricultural Economics*, 26: 149-172.
- Tyers R. and K. Anderson (1988). Imperfect price transmission and implied trade elasticities in a Multi-Commodity World; In C.A. Carter and W.H. Gardiner eds. *Elasticities in International Agricultural Trade*. London. Westview Press. Page 225-295.
- Union Budget (2004-05 & 2006-07). Minister of Finance, Government of India, New Delhi.
- Valenzuela Ernesto, Thomas W. Hertel Roaman Keeney and Jeffrey J. Reimer (2005). Asswsing Global CGE Model Validity using Agricultural Price Volatility. GTAP Working Paper No. 33. September.
- Van Tongeren F., H. Van Meijl and Y. Surry (2001). Global models applied to agricultural and trade policies: A review and Assessment. *Agricultural Economics*. 26: 149-172.
- Wall, J. Harward (1999). *Using the Gravity Model to Estimate the Costs of Protection Review*, Federal Reserve Bank of St. Louis. pp. 33-40.
- World Bank (1999). *India Livestock Sector Review: Enhancing Growth and Development*, Rural Development Sector Unit, South Asia Region, World Bank, Allied Publishers, New Delhi.

Annexure I: Top 10 Importers of Indian Livestock Products: 1980-2007

Items	TE 1982	TE 1991	TE 2000	TE 2007
Live Animals	Kuwait (54), Saudi Arabia (27), Oman (10), UAE (9), Nepal (1), Qatar (1), Bangladesh (1), Afghanistan (1), Bahrain (1), Singapore (1)	Bangladesh (21), UAE (16), Oman (11), Netherlands (10), Italy (7), Japan (7), Saudi Arabia (6), France (4), Malaysia (3), Germany (3)	Sri Lanka (33), Bangladesh (30), Canada (8), Korea (6), Myanmar (5), Saudi Arabia (4), Nepal (3), USA (3), Philippines (3), UAE (3)	Nepal (79), Nigeria (2), UAE (2), Israel (2), Italy (1), Iran (1), Pakistan (1), Bangladesh (1), Malaysia (1), Thailand (1)
Bovine Meat	UAE (49), Saudi Arabia (16), Netherlands (14), Kuwait (14), Lebanon (4), Sri Lanka (2), Bahrain (2), Iraq (2), Germany (1), Nepal (1)	Malaysia (53), UAE (21), Oman (6), Jordan (5), Kuwait (4), Yemen REP (4), Bahrain (3), Central African Republic (1), Mauritius (1), Singapore (1)	Malaysia (30), UAE (24), Philippines (18), Iran, Islamic Republic (6), Jordan (4), Kuwait (3), Mauritius (2), Oman (2), Lebanon (1), Gabon (1)	Malaysia (18), Philippines (10), Angola (9), Saudi Arabia (8), Kuwait (8), UAE (7), Jordan (7), Iran (3), Vietnam (3), Oman (3)
Swine Meat	Nepal (45), UAE (44), Qatar (5), Maldives (5)		Iran, Islamic Republic (18), Malaysia (15), UK (13), UAE (12), Philippines (8), Germany (8), Poland (6), Angola (5), Mauritius (4), Qatar (4)	Yemen (15), Jordan (11), Italy (10), Angola (10), Vietnam (9), Pakistan (9), Saudi Arabia (8), Oman (7), UAE (5), Qatar (4)
Sheep Meat	UAE (79), Oman (11), Bahrain (5), Kuwait (4), Saudi Arabia (2), Qatar (1), UK (1), Netherlands (1), Japan (1), Hong Kong (1)	UAE (64), Saudi Arabia (23), Oman (6), Bahrain (5)	Saudi Arabia (45), UAE (43), Oman (6), Bahrain (2), USA (1), Qatar (1), Kuwait (1)	Saudi Arabia (54), UAE (27), Qatar (10), Oman (3), Kuwait (2), Bahrain (1), Nepal (1)
Goat Meat		UAE (92), Oman (4), Bahrain (4)	Saudi Arabia (65), UAE (25), Oman (9), Sri Lanka (1)	UAE (51), Bahrain (11), Saudi Arabia (9), Iraq (9), Lebanon (5), Syrian Arab Republic (5), Algeria (5), Qatar (1), Bosnia and Herzegovina (1), Nepal (1)

References

Items	TE 1982	TE 1991	TE 2000	TE 2007
Poultry Meat	UAE (34), Saudi Arabia (34), Canada (34)	Oman (63), Italy (37)	Kuwait (60), UAE (20), Sri Lanka (20)	Saudi Arabia (43), Oman (24), UAE (7), Bahrain (6), USA (3), Georgia (3), Russia (2), UK (2), Vietnam (2), Australia (1)
Eggs	UAE (75), Saudi Arabia (6), Qatar (6), Yemen (4), Oman (4), Kuwait (3), Nepal (3), Bahrain (2), Maldives (1), Lebanon (1)	UAE (46), Oman (34), Maldives (8), Bahrain (6), Saudi Arabia (2), Kuwait (1), Bangladesh (1), USA (1)	UAE (22), Oman (14), Bangladesh (10), Saudi Arabia (8), Japan (7), Germany (6), Netherlands (4), Yemen REP (4), Austria (4), Kuwait (3)	UAE (18), Kuwait (13), Oman (12), Japan (11), Germany (10), Denmark (6), Angola (5), Saudi Arabia (3), Qatar (3), Indonesia (3)
Dairy Products	Nepal (40), UAE (39), Kuwait (8), Sri Lanka (6), German F REP (3), Oman (3), Bahrain (3), Nigeria (1), Singapore (1), Saudi Arabia (1)	Bangladesh (37), UAE (35), Nepal (6), Bahrain (5), Sri Lanka (4), Indonesia (4), Bhutan (3), Oman (2), Kuwait (2), Netherlands (1)	Bangladesh (32), UAE (28), USA (9), Nepal (6), Belgium (4), Philippines (4), Ghana (3), Sri Lanka (2), Kuwait (2), Singapore (2)	Bangladesh (15), UAE (12), Egypt (9), Algeria (7), Nepal (4), USA (4), Yemen REP (4), Morocco (4), Pakistan (4), China (3)
Hides and Skin		Japan (67), UK (8), Germany (5), Korea (5), Hong Kong (4), France (3), China (3), USSR (1), Italy (1), Germany (1)	Japan (69), Germany (8), UK (7), Hong Kong (3), France (2), Italy (2), Poland (1), USA (1), Netherlands (1), UAE (1)	Japan (30), USA (20), Germany (14), France (9), Belgium (7), UK (5), Saudi Arabia (3), Hong Kong (3), Italy (2), China (1)

Source: DGCIS, Government of India.

Note: Figures within the parentheses indicate percentage shares of the respective country.

Annexure II: Top 10 Exporters of Livestock Products to India

Items	TE 1982	TE 1991	TE 2000	TE 2007
Live Animals	USA (40), Nepal (28), Netherlands (17), UK (16), France (2)	Nepal (97), Israel (2), Germany (1)	Nepal (91), USA (8), Germany (1),	USA (28), Netherlands (23), UK (17), Nepal (7), France (7), Germany (4), China (2), Belgium (2), Japan (1)
Bovine Meat		Australia (50), New Zealand (50)		Germany (85), New Zealand (15)
Swine Meat				Italy (35), Singapore (19), Spain (15), Ireland (10), Nepal (8), France (2), Korea (2), UAE (2), Korea RP (2), Honduras (2), Israel (2)
Sheep Meat			Singapore (50), Netherlands (50)	New Zealand (52), Italy (13), Australia (13), Netherlands (9), Singapore (4), UAE (4), USA (4)
Goat Meat				Germany (100)
Poultry Meat				Thailand (40), France (30), USA (20), Italy (10)
Eggs	USA (67), Netherlands (34)		Netherlands (94), Switzerland (6)	Germany (39), UK (38), USA (15), Belgium (4)
Dairy Products	Germany (35), Belgium (23), Netherlands (15), France (14), Ireland (6), UK (5)	USA (40), Germany (25), Belgium (14), Netherlands (13), Switzerland (6), Denmark (2), Canada (1)	New Zealand (37), Australia (15), Netherlands (11), Germany (8), Ireland (7), Belgium (6), UK (3), Nepal (2), Denmark (2), France (2)	France (23), Nepal (17), Belgium (12), Denmark (12), Netherlands (6), UK (5), Italy (4), USA (4), Poland (3), New Zealand (2), Australia (2)

References

Items	TE 1982	TE 1991	TE 2000	TE 2007
Hides and Skins		USA (32), Hong Kong (15), China (14), France (13), Zimbabwe (12), Germany (3), Zaire REP (3), Canada (2), Denmark (2), Italy (1)	USA (52), Thailand (12), China (10), Sri Lanka (4), Netherlands (4), Malaysia (4), Australia (3), Taiwan (2), Somalia (1), Singapore (1)	China (42), Bangladesh (15), Germany (6), USA (5), France (4), Nepal (3), Hong Kong (3), New Zealand (2), Poland (2), UAE (2)

Source: DGCIS, Government of India,

Note: Figures within the parentheses indicate percentage shares of the respective country.

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India's Livestock Sector Trade: Opportunities and Challenges Under WTO Regime

Annexure III: Producer Prices of Livestock Products in India vis-à-vis Major Exporting Countries of the World

(US\$/tonne)

Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
BOVINE MEAT					
India	580	457	364	314	343
India (Cattle)	582	457	364	314	343
India (Buffalo)	578	457	364	314	343
Major exporters of the world					
Australia	1557	1597	1277	1517	2236
US	3061	2654	2633	2914	3612
Malaysia	3413	3720	3475	2904	2700
Germany	3072	3178	2500	1835	3090
Major importers from India					
Sri Lanka	544	616	687	597	657
Bhutan	860	890	1092	1185	1536
China	1101	1608	1520	1797	2091
New Zealand	1195	1270	1157	1536	1827
Bangladesh	1361	1345	1229	1059	974
Pakistan	1917	1780	1560	1498	1732
Algeria	2219	1790	2505	2015	2512
Philippines	2525	2966	2162	1854	1880
Indonesia	3178	3228	2052	2004	659
Denmark	3187	2926	2454	1833	2408
Saudi Arabia	3817	3869	3867	4413	5059
France	3847	3893	3479	2734	3855
Turkey	3878	4023	4118	3691	5238
Sweden	3970	3158	2365	1847	2036
United Kingdom	4075	6078	6143	5545	7791
Italy	5085	4742	4143	3594	4345
Switzerland	6286	6602	4460	4586	6265
POULTRY MEAT					
India	1316	2099	1800	1354	1518
Major exporters of the world					
Australia	1427	1458	1184	885	1263
US	994	1090	1149	1038	1247

...Contd.

References

Annexure III—Contd.

Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
Germany	1367	1333	1106	913	1236
Malaysia	1741	1754	1106	1095	1236
Major importers from India					
Pakistan	772	830	783	759	912
Denmark	922	1090	919	781	1013
China	1012	969	886	728	893
Bhutan	1071	1108	1359	1691	1583
New Zealand	1094	1251	1052	846	1402
Sri Lanka	1235	1295	1324	1099	1236
United Kingdom	1352	1395	1284	1040	1223
France	1500	1468	1283	1071	1386
Italy	1759	1534	1321	1135	1190
Indonesia	1780	1843	1300	1086	823
Saudi Arabia	1900	1915	1964	1842	2009
Bangladesh	1921	1873	1685	1119	1012
Philippines	2242	2297	1706	1435	1418
Sweden	2243	1720	1364	1102	1401
Algeria	2300	1876	1960	1406	1729
Switzerland	4075	3817	2741	2330	2972
Turkey	5658	3986	3317	2787	3968
PIG MEAT					
India	556	456	429	391	435
Major exporters of the world					
Australia	1488	1320	1380	1251	1593
US	1609	1445	1208	1245	1433
Germany	1670	1777	1395	1280	1502
Major importers from India					
China	659	1078	1160	928	1285
Sri Lanka	831	828	1289	1132	1797
Bhutan	995	1029	1262	1533	1865
New Zealand	1642	1905	1592	1520	2116
Indonesia	1643	1650	1296	1224	1096
Malaysia	1734	1955	1928	1761	1261
Denmark	1826	1915	1304	1302	1462

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Annexure III—Contd.

Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
Philippines	1848	2395	1945	1486	1624
France	1852	1768	1355	1228	1450
United Kingdom	1856	1926	1471	1458	1932
Sweden	2309	1851	1369	1181	1485
Italy	2658	2382	2059	1809	1962
Switzerland	3857	3949	3291	2744	3399
Turkey	5728	4022	3317	2787	3968
MUTTON					
India	1809	1934	2248	2126	2366
Major exporters of the world					
Australia	687	717	940	953	1703
US	2589	3567	3713	3458	4809
Malaysia	4525	3989	3620	3082	3393
Germany	3303	3959	3778	3431	4021
France	4100	4470	4222	4304	5633
Major importers from India					
China	951	1321	1556	1778	2076
New Zealand	1143	1276	1201	1302	1968
Bhutan	1439	1487	1825	2029	2601
Pakistan	1471	1442	1145	1240	2011
Denmark	1624	3264	2666	2449	2837
Bangladesh	2182	2118	1900	1654	1576
Philippines	2205	2765	2381	2133	2323
Algeria	2425	1977	2951	2116	2604
Sri Lanka	2498	2868	3554	3548	4070
Sweden	3047	2670	2397	1945	2958
United Kingdom	3479	2824	1922	1656	2412
Indonesia	3873	3180	2062	1914	1963
Saudi Arabia	4467	4510	4586	4641	5307
Turkey	4866	5807	4604	4473	7206
Italy	5472	4957	5248	4848	5809
Switzerland	8110	8370	6646	5652	7120

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References

Annexure III—Contd.

Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
EGGS					
India	393	558	555	505	552
Major exporters of the world					
Denmark	1061	1265	1208	1079	1404
France	1026	983	875	790	982
Germany	1493	1682	1182	997	1324
US	885	933	937	867	931
Major importers from India					
Algeria	1381	1298	1937	1354	1227
Australia	2324	1805	1749	1401	1783
Bangladesh	1052	1039	967	803	726
Bhutan	765	791	970	1917	2671
China	861	780	665	511	587
Indonesia	1739	2759	1976	1830	1358
Italy	1744	1684	1547	452	1148
Malaysia	1210	1252	873	789	917
New Zealand	1286	1406	1245	1090	1878
Pakistan	1021	1069	944	773	818
Philippines	1552	1733	1517	1158	1185
Saudi Arabia	1208	1217	1247	1186	1232
Sri Lanka	747	949	1072	829	909
Sweden	1292	1128	992	868	4402
Switzerland	4076	4255	3103	2706	3874
Turkey	1831	1534	1397	1384	2777
United Kingdom	1014	1044	939	984	1378
MILK: WHOLE OR FRESH					
India	227	237	241	240	269
Major exporters of the world					
France	358	389	345	297	376
Germany	383	387	335	299	336
Australia	210	226	194	156	206
Denmark	415	420	364	312	382
US	283	301	317	290	322

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India's Livestock Sector Trade: Opportunities and Challenges Under WTO Regime

Annexure III—Contd.

Country	TE 1993	TE 1996	TE 1999	TE 2002	TE 2005
New Zealand	139	189	166	171	225
Major importers from India					
Bangladesh	231	307	276	210	188
Bhutan	231	244	235	309	703
Philippines	233	310	335	291	301
Sri Lanka	236	253	271	242	263
Indonesia	283	268	160	115	137
Pakistan	315	345	326	277	287
United Kingdom	336	362	317	255	313
Turkey	401	319	371	289	412
Malaysia	404	440	465	415	431
Saudi Arabia	434	440	440	502	575
Algeria	450	383	344	317	331
Italy	457	550	557	467	558
Sweden	467	433	383	314	388
China	144	156	213	272	326
Switzerland	723	733	552	467	568

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